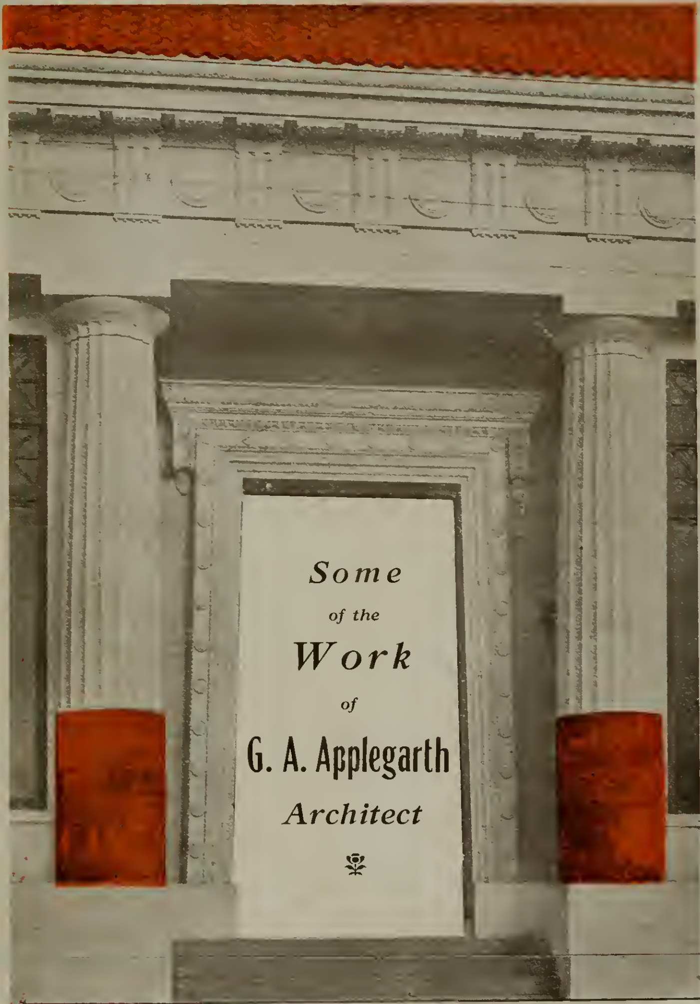
ARCHITECT & ENGINEER OF CALIFORNIA



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617 Monadnock Bldg.
SAN FRANCISCO

MAY, 1913

The GY SYSTEM

of Conveying and Distributing Concrete
is being used in this Building

The Nat Rafael Warehouse, Second Street and South Park, San Francisco
W. H. Crim, Jr., Architect *Frank M. Garden, Contractor*

The G-Y SYSTEM means Greater Speed
and Reduced Operating Expense

Patents Nos. 948719, 948723, 948746

Pacific Coast Representatives:

PARROTT & CO.

SAN FRANCISCO
TACOMA
LOS ANGELES
PORTLAND
SEATTLE
SPOKANE

Swimming Pool Mortimer L. Schiff Residence, Oyster Bay, L. I.
Stucco work waterproofed with CERESIT.

WARNING

From a Leading Civil Engineer:

"The number of mistakes made by inadequate provision for Waterproofing, and other costly consequences, running into thousands of dollars, should serve as object-lessons to those who have the design of concrete work in hand and the same degree of attention and study should be given the subject of watertightness as that given to other details of construction."

In the consideration of this subject we direct your attention to CERESIT Waterproofing.

This product when mixed with concrete or cement plaster coating has the power of repelling moisture, keeping them watertight and damp-proof.

"Ceresit" Waterproofing

Ceresit is used for waterproofing basements, boiler pits, conduits, culverts, foundations, tunnels, reservoirs, swimming tanks, walls, roofs, floors and every sort of construction in which cement enters

It is catalogued in "Sweet's" Index. Agents wanted in unoccupied territory.

CERESIT WATERPROOFING CO.

139 So. Clark St., Chicago, Ill.

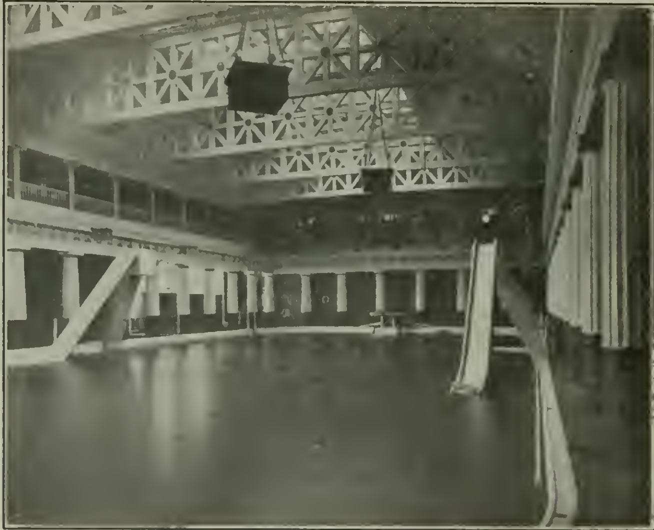
Branches: 1133 Broadway, New York 1218 Chestnut St., Philadelphia, Pa.

Ceresit factories are located in Una; Westphalia, Germany; London; Paris; Vienna; St. Petersburg.

PARROTT & CO., Pacific Coast Agents,

320 California St., San Francisco, Cal.

Los Angeles, Cal. Portland, Ore. Seattle, Wash. Tacoma, Wash. Spokane, Wash. (1)



Interior Lurline Baths, Bush and Larkin Streets, San Francisco, Showing Large Swimming Pool.
MacDonald & Applegarth, Architects

MEDUSA WHITE PORTLAND CEMENT AND MEDUSA WATERPROOF COMPOUND

USED IN BOTH BUILDING AND TANK

The Building Material Co., Inc.

583 Monadnock Building, San Francisco

ARCHITECTS' SPECIFICATION INDEX

(For Index to Advertisements, see next page)

AIR CLEANERS
"Tuec" air cleaners, manufactured by United Electric Co..........523 Mission St., S. F.

AIR COOLERS
California Air Purifying Co.. Monadnock Bldg.. S. F.
Kauffman Heating & Engineering Co., 2317 Olive St., St. Louis.
Sherman Kimball, Inc., San Francisco agents.

ARCHITECTURAL MODELING
O. S. Sarsi...............123 Oak St., S. F.
Florentine Art Studio..932 Vallejo St., S. F.

ARCHITECTURAL SCULPTORS
I. P. Lipp Co.........153 Seventh St., S. F.

ARCHITECTURAL TERRA COTTA
Gladding, McBean & Company, Crocker Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.
N. Clark & Sons ....112 Natoma St., S. F.
H. Johns-Manville Company, Branches in all Principal Coast Cities.

ASBESTOS FLOORING
Carrelin Asbestos Flooring Co., 11 Fremont St., S. F.

AUTOMATIC SPRINKLERS
Pacific Fire Extinguisher Co.. 507 Montgomery St., S. F.

BANK FIXTURES AND INTERIORS
Van Dorn Iron Works Co....Cleveland, Ohio
A. J. Forbes & Son...1530 Filbert St., S. F.
Fink & Schindler........218 13th St., S. F.
C. F. Weber & Co....365 Market St., S. F.

BEDS—DISAPPEARING
California Wall Bed Co., 1010 Phelan Bldg., S. F.

BELTING, PACKING, ETC.
H. N. Cook Belting Co., 317-319 Howard St., S. F.
New York Belting & Packing Co., Ltd., 129 First St., S. F.

BLACKBOARDS
C. F. Weber & Co.....365 Market St., S. F.

BOILERS
Keystone Boiler Works....Folsom St., S. F.
F. Harvey Searight......Shreve Bldg., S. F.

BOLTS
Union Hardware & Metal Co., ..Los Angeles

BONDS FOR CONTRACTORS
Fidelity and Deposit Company of Maryland, Mills Bldg., S. F.
Globe Indemnity Co.. 508 California St., S. F.
Levensaler-Speir Corporation, Monadnock Building, S. F
Massachusetts Bonding and Insurance Company......First National Bank Bldg., S. F.
Pacific Coast Casualty Co.. 416 Montgomery St., S. F.

BLUE PRINTING
Kieffel & Esser Co., Second St., near Market, S. F.

BRICK
Diamond Brick Co.......Balboa Bldg., S. F.
Gladding, McBean & Company, Crocker Bldg., S. F.
Los Angeles Pressed Brick Co., Frost Bldg., Los Angeles.
Livermore Fire Brick Co....Livermore, Cal.
N. Clark & Sons......112 Natoma St., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.
United Materials Co., Balboa Bldg., S. F.
Vallejo Brick & Tile Co.. 343 Sansome St., S. F.

BRICK AND CEMENT COATING
Wadsworth Howland & Co., Inc. (See Adv. for Pacific Coast Agents.)
Trus-Con Par-Seal, made by Trussed Concrete Steel Co., see adv. for Coast agencies.

BRICK STAINS
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

BRONZE AND BRASS WORK
Louis De Rome......150 Main St., S. F.

BUILDERS' HARDWARE
Lockwood's Builders' Hardware, sold by Pacific Hardware & Steel Co., San Francisco, Los Angeles and Portland, Ore.
Allith-Prouty Co.......693 Mission St., S. F.
Russell & Erwin Mfg. Co., Commercial Bldg., S. F.
Vonnegut Hardware Co., Indianapolis. (See adv. for Coast agencies.)

BUILDERS' SUPPLIES
C. Jorgensen......356 Market St., S. F.
Waterhouse & Price....59 Third St., S. F.
City Supply Co., Inc., Sixth and Channel Sts., S. F.
Burt E. Edwards, ..1025 Phelan Bldg., S. F.
Western Builders' Supply Co., 155 New Montgomery St., S. F.

BUILDING MATERIAL ....
C. F. Pratt Building Material Co., Hearst Bldg., S.F.

CEMENT
Atlas Portland Cement Co.. represented by United Materials Co.,....Balboa Bldg., S. F.
American Keene Cement, Levensaler-Speir Corporation, Distributors, 259 Monadnock Bldg., S. F
Building Material Co.. The (Inc.) 583 Monadnock Bydg., S. F.
Standard Portland Cement Co., and Santa Cruz Portland Cement Co. Crocker Bldg., S. F.

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ARCHITECTS' SPECIFICATION INDEX—*Continued*

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELECTRICAL CONTRACTORS
American Electrical Engineering Co.
435 Golden Gate Ave., S. F.
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Garden City Electrical Co......San Jose, Cal.
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company.
507 Montgomery St., S. F.

ELECTRICAL ENGINEERS
Hicks & Folte........320 Market St., S. F.

ELEVATORS
Otis Elevator Company,
Stockton and North Point, S. F.
Van Emon Elevator Co..54 Natoma St., S. F.
Wells & Spencer Machine Co.,
173 Beale St., S. F.

ELEVATOR DOORS
Variety Mfg. Co., Chicago, C. Jorgensen & Co., Pacific Coast Distributors, 356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co.,
593 Market St., S. F.

ENGINEERS
F. J. Amweg......700 Marston Bldg., S. F.
W. W. Breite...........Clunie Bldg., S. F.
J. C. Hurley........ 12 Geary Street, S. F.
Hunter & Hudson........Sharon Bldg., S. F.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co.,
593 Market St., S. F.

FAUCETS
Glauber Brass Mfg. Co.

FIRE DOOR HARDWARE
Kortick-Falls Mfg. Co., 327 First St., S. F.
Allith-Prouty Co., Coast agencies, 693 Mission St., S. F., and 413 E. 3d St., Los Angeles.

FIRE ESCAPES
Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.
H. Johns-Manville Company, Branches in all Principal Coast Cities.

FIRE EXTINGUISHERS
Pacific Fire Extinguisher Co.,
507 Montgomery St., S. F.
Levensaler-Spier Corporation,
259 Monadnock Bldg., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago.
(See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Gladding, McBean & Company,
Crocker Bldg., S. F.
Los Angeles Pressed Brick Co.,
Frost Bldg., L. A.
Roebling Construction Co., Crocker Bldg., S. F.
"Bestwall," manufactured by California Bestwall Co., Lilley & Thurston Co., distributors, Rialto Bldg., S. F.

FIREPROOFING AND PARTITIONS—Cont'd.
Levensaler-Speir Corporation,
259 Monadnock Bldg., S. F.

FIRE-PROOF PAINT
Liquid Stone Paint Co., Hearst Bldg., S. F.

FIREPROOF PARTITIONS
Rabbitt Partition Co., 34 Ellis St., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler........218 13th St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.

FLOORS
Indestructible Floor & Tiling Co.,
251 Kearny St., S. F.

FLOOR VARNISH
Bass-Hueter and S. F. Pioneer Varnish Works, 816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works,
Chicago, New York and S. F.
Moller & Schumann Co.,
1022 Mission St., S. F.

FLOORS—CORK
Nonpariel Cork Tiling, David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast., G. H Freear, Sharon Building, S. F.

FLOORING—MAGNESITE
Fibrestone & Roofing Co.,
704 Market St., S. F.
Mallott, Peterson & Adams,
682 Monadnock Bldg., S. F.

FORMS FOR CONCRETE
Metal form work, sold by California Sales & Supply Co.......................San Diego

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit,
Bowser & Co. ......612 Howard St., S. F.

GARBAGE CHUTE
Bill & Jacobsen..........524 Pine St., S. F.

GLASS AND GLAZING
W. P. Fuller & Co.,
San Francisco, Los Angeles and Portland.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co.....153 Berry St., S. F.
California Building Material Co.,
Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co......Crocker Bldg., S. F.
Grant Gravel Co......87 Third St., S. F.
Niles Sand, Rock & Gravel Co.,
Mutual Bank Bldg., S. F.

HARDWARE
Pacific Hardware & Steel Co..S. F. and L. A.
Richards-Wilcox Mfg. Co...........Aurora, Ill.
Russwin Hardware, Joost Bros., S. F.
Window Adjusters, mfrd. by The Casement Co......... 175 State St., North Chicago, Ill.
Allith-Prouty Co., 693 Mission St., S. F., and 413 E. 3d St., Los Angeles.

HARDWOOD FLOORING
Strable Mfg. Co...............Oakland, Cal.
Parrott & Co.......320 California St., S. F.
White Bros.. Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD LUMBER
Ohia hardwood, sold by Rolph Mills Co., Hansford Bldg., S. F.
Parrott & Co......320 California St., S. F.
Maris Hardwood Co., 951 Brannan St., S. F.
Strable Mfg. Co., First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.

HEATERS—AUTOMATIC
Pittsburg Water Heater, sold by Thos. Thieben & Co. ....667 Mission St., S. F.

LOCKERS
Keyless Lock Co.,......Indianapolis, Ind.

HEATING EQUIPMENT—VACUUM, ETC.
C. A. Dunham Co., Marshalltown, Iowa, Western Division Office, Monadnock Bldg., S. F.

HEATING AND VENTILATING
Atlas Heating & Ventilating Co., Fourth and Freelon Sts., San Francisco.
Fess System Co......220 Natoma St., S. F.
Hoffman & Meusser, 1129-1131 Howard St., San Francisco.
J. C. Hurley........ 12 Geary Street, S. F.
S. T. Johnson Co.....1334 Mission St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co., Monadnock Bldg., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.

HOTELS
The Angelus, Loomis Bros......Los Angeles

HOLLOW BLOCKS
Atlas Stone Co.......663 Mission St., S. F.

INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co., 5th and Parker Sts., West Berkeley.

INLAID FLOORS
Hardwood Interior Co., 554 Bryant St., S. F.

INTERIOR WALL FINISH
Satina mfg'd. by C. H. Brown Paint Co., F. A. Frisius, 341 Lincoln ave., Alameda, California.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 418 Montgomery St., S. F.
Smith, Emery & Co. Inc., 651 Howard St., S. F.

INSULATING MATERIALS
Armstrong Cork Co........... Pittsburg, Pa.

INTERIOR DECORATING
Allith-Prouty Co.......693 Mission St., S. F.
The Tozer Company, 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co., 680 Mission St., S. F.
Kortick-Falls Mfg. Co., 327-343 First St., S. F.

KEENE CEMENT
American Keene Cement, Levensaler-Speir, Corporation, 259 Monadnock Bldg., S. F.

LIME
Holmes Lime Company, Monadnock Bldg., S. F.
Shasta Lime Products Company, 1550 Bryant St., S. F.

LIGHTING FIXTURES
Adams, Hollopeter & Mallett, 353 Sutter St., San Francisco
Bauer Fixture Co......49-55 Jones St., S. F.

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.

LUMBER
Sunset Lumber So............Oakland, Cal.
Santa Fe Lumber Co., Seventeenth and De Haro Sts., S. F.

MANTELS
Mangrum & Otter ....561 Mission St., S. F.
Watson Mantel & Tile Co., Sheldon Bldg., S. F.

MARBLE
Columbia Marble Co...268 Market St., S. F.

MARBLE CARVING
Florentine Art Studio...932 Vallejo St., S. F.

METAL AND STEEL LATH
Atlantic Fireproofing Co., Pacific Bldg., S. F.
Baker & Hamilton, 433 Brannan St., S. F.
Roebling Construction Co., San Francisco and Los Angeles
L. A. Norris & Co., Monadnock Bldg., S. F.

METAL CEILINGS
Berger Mnfg. Co....1120 Mission St., S. F.
Ames-Irwin Co., Inc., Eighth and Irwin Sts., S. F.
San Francisco Metal Stamping & Corrugating Co................2269 Folsom St., S. F.

METAL DOORS AND WINDOWS
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., S. F.

METAL FURNITURE
The Keyless Lock Co.......Indianapolis, Ind.
Van Dorn Iron Works Co.......Cleveland, O.
M. G. West Co.........353 Market St., S. F.

METAL SHINGLES
Meurer Bros., J. A. McDonald, Pacific Coast Agent.... Third, near Townsend St., S. F.
San Francisco Metal Stamping & Corrugating Co................2269 Folsom St., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

OIL BURNERS
S. T. Johnson Co...1334 Mission St., S. F.
Fess System Co.......220 Natoma St., S. F.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., S. F.
Simplex Crude Oil Burners, Furnaces and Ranges, manufactured by American Heat & Power Co., 607 First National Bank Bldg., San Francisco

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal & Wire Co., 349 Seventh St., S. F.
J. G. Braun.........Chicago and New York
Ralston Iron Works, 20th and Indiana Sts., S. F.
Standard Iron Works, 235-39 Shipley St., S. F.
Golden Gate Structural & Ornamental Iron Works ....1479 Mission St., S. F.
Monarch Iron Works, 1165 Howard St., S. F.
C. J. Hillard Company, Inc., 19th and Minnesota Sts., S. F.
Shreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Sartorius Company..15th and Utah Sts., S. F.
West Coast Wire & Iron Works, 861-863 Howard St., S. F.

PAINT FOR STEEL STRUCTURES
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Buswell's Steel and Concrete Paints, Oakland, Cal.
Carbonizing Coating, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Trus-Con Bar-Ox, Trussed Concrete Steel Co. See adv. for Coast agencies.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

PAINT FOR CEMENT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.), [See adv. in this issue for Pacific Coast agents.]
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Trus-Con Stone Tex., Trussed Concrete Steel Co. See advertisement for Coast agencies.
Liquid Stone Paint Co., Hearst Bldg., San Francisco, Los Angeles and San Diego
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors

PAINTS, OILS, ETC.
Bass-Hueter Paint Company, Mission, near Fourth St., S. F.
R. N. Nason Company........San Francisco
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors
Glidden Varnish Co., Cleveland, Ohio, represented by Whittier-Coburn Co., S. F. and Los Angeles
Moller & Schumann Co., 1022 Mission St., S. F.
Paraffine Paint Co....38-40 First St., S. F.
Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and Los Angeles.

PAVING BRICK
Vallejo Brick & Tile Co., 343 Sansome St., S. F.

PHOTO ENGRAVING
California Photo Engraving Co., 121 Second St., S. F.

PHOTOGRAPHY
R. J. Waters Co..........717 Market St., S. F.
Walter Scott..........558 Market St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company, Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons, 112 Natoma St., San Francisco
Gladding McBean & Co., Crocker Bldg., S. F.
Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PLASTER BOARD
Colonial Wall board manufactured by Mound House Plaster Co., Levensaler-Speir Corporation......259 Monadnock Bldg., S. F.

PLASTERING CONTRACTORS
Geo. MacGruer....319 Mississippi St., S. F.

PLUMBING
Jno. G. Sutton Co.......243 Minna St., S. F.
Peterson-James Co.....710 Larkin St., S. F.
Wetzel & Grass.......105 Fulton St., S. F.
Wittman, Lyman & Co., 340 Minna St., S. F.
Alex Coleman..........706 Ellis St., S. F.

PLUMBING FIXTURES, MATERIALS, ETC.
Crane Co....Second and Brannan Sts., S. F.
Jno. Douglas Co....571 Mission St., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F.
P. F. Howard Co., Second and Folsom Sts., S. F.
Kobler Co.......1001 Monadnock Bldg., S. F.
Glauber Brass Mfg. Co., Cleveland, O., 1107 Mission St., S. F.
Louis Lipp Company, Winton Place, Ohio. Pacific Coast Office, 693 Mission St., S. F.
Mark-Lally Co..First and Folsom Sts., S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent ....135 Kearny St., S. F.

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

POWER PLANT EQUIPMENT
F. Harvey Searight...817 Shreve Bldg, S. F.

PULLEYS, SHAFTING, GEARS, ETC.
Meese and Gottfried Company..........San Francisco, Seattle, Portland and Los Angeles

RADIATORS
Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

RAILROADS
Southern Pacific Co......Flood Bldg., S. F.

ROAD MACHINERY
Langford, Bacon & Myers, Rialto Bldg., S. F.
Iroquois Iron Works (Barber Asphalt Company) ....Head Bldg., S. F.

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dohrmann Co., Geary and Stockton, Sts., S. F.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Lilley & Thurston Co., Rialto Bldg., S. F.
C. F. Weber & Co......365 Market St., S. F.

ROOFING AND ROOFING MATERIALS
Ames-Irwin Co., Inc., Eighth & Irwin Sts., S. F.
Biturine Co. of America, 24 California St., S. F.
J-M Asbestos Roofing, sold by H. W. Johns-Manville Co., Agencies in all the principal West Coast cities.
F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co., Rialto Bldg., S. F.
Mallott, Peterson & Adams, 682 Monadnock Bldg., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ROOFING & ROOFING MATERIALS—Cont'd.
- Grant Gravel Co............Williams Bldg., S. F.
- "Ferroinclave," the Brown Hoisting Machinery Co., Coast Agent, Chas. A. Levy, Monadnock Bldg., S. F.
- Fibrestone & Roofing Co., Mutual Savings Bank Bldg., S. F.
- Genasco Ready Roofing, sold by Parrott & Co...............320 California St., S. F.
- Mackenzie Roof Co., 425 15th St., Oakland.
- Meurer Bros. Co., A. H. McDonald, Coast Representative........630 Third St., S. F.
- United Materials Co.... Balboa Bldg., S. F.

ROOFING TIN
- American Sheet & Tin Plate Co., Pacific Coast representatives, U. S. Steel Products Co., San Francisco, Los Angeles, Portland and Seattle.

RUBBER TILING AND MATTING
- New York Belting & Packing Co., 129 First St., S. F.

SAND
- Del Monte White Sand, sold by Pacific Improvement Company, Crocker Bldg., S. F.
- Niles Sand, Gravel and Rock Co., Mutual Bank Building, S. F.

SANITARY DRINKING FOUNTAINS
- N. O. Nelson Mfg. Co., 978 Howard St., S. F.

SASH CORD
- Puritan Sash Cord Company. (For Coast Agents, see advertisement.
- Samson Cordage Works, Manufacturers of Solid Braided Cords and Cotton Twines 88 Broad St., Boston, Mass.
- Silver Lake A Sash Cord, represented by Sanford Plummer, 149 New Montgomery St., S. F.

SCAGLIOLA
- Western Art Marble Co., 727 France Ave., S. F.

SCENIC PAINTING—DROP CURTAINS, ETC.
- The Edwin H. Flagg Scenic Company, 1638 Long Beach Ave., Los Angeles.

SCHOOL FURNITURE AND SUPPLIES
- C. F. Weber & Co....365 Market St., S. F. 512 S. Broadway, Los Angeles.

SHEATHING AND SOUND DEADENING
- "Hydrex" Waterproof Building Papers, "Hydrex" "Saniflor" Deafening Felt, manufactured by Hydrex Felt & Eng. Co., N. Y. and sold by Rolph, Mills & Co., Hansford Bldg., S. F.
- Neponset Waterproof Building Papers,

SHEATHING & SOUND DEADENING—Cont'd.
- Neponset Florian Sound Deadening Felt, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co...........Rialto Bldg., S. F.
- Samuel Cabot Mfg. Co., Boston Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

SHEET METAL WORK
- Berger Mfg. Co......1120 Mission St., S. F.
- Capitol Sheet Metal Works, 1927 Market St., S. F.
- Yager Sheet Metal Co.........Oakland, Cal.
- Olive & Cox..............85 Irwin St., S. F.
- Western Furnace & Cornice Co., 1645 Howard St., S. F.
- Yager Sheet Metal Works, Oakland.

SHEET COPPER
- C. G. Hussey & Co....565 Folsom St., S. F.

SHINGLE STAINS
- Cabot's Creosote Stains, sold by Waterhouse & Price, San Francisco, Los Angeles and Portland.

SIDEWALK LIGHTS
- J. A. Steedman,........Phelan Bldg., S. F.

SKYLIGHT CORNICES, ETC.
- Yager Sheet Metal Co.........Oakland, Cal.
- Olive & Cox..............85 Irwin St., S. F.

SPIRAL CHUTE
- The Haslett Spiral Chute Co., 310 California St., S. F.

STEEL AND IRON—STRUCTURAL
- Central Iron Works..621 Florida St., S. F.
- Judson Manufacturing Company, 819 Folsom Street, San Francisco.
- Brode Iron Works,..31 Hawthorne St., S. F.
- Mortenson Construction Co., 19th and Indiana Sts., S. F.
- J. L. Mott Iron Works, D. H. Gulick, Agt., 135 Kearny St., S. F.
- Pacific Rolling Mills, 17th and Mississippi Sts., S. F.
- Pacific Structural Iron Works, Structural Iron and Steel, Fire Escapes, Etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.
- Ralston Iron Works, Twentieth and Indiana Sts., S. F.
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ARCHITECTS' SPECIFICATION INDEX—*Continued*

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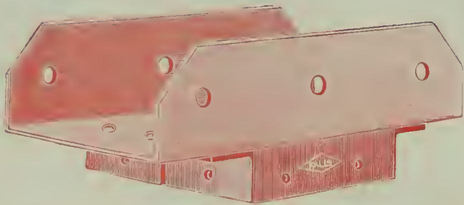

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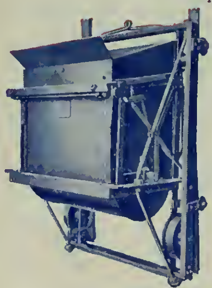

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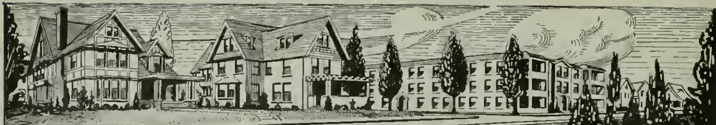

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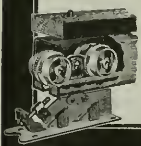

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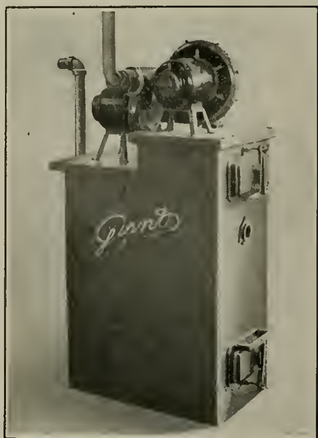

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Pacific Coast States

Issued monthly in the interests of Architects, Structural Engineers, Contractors and the Allied Trades of the Pacific Coast.
Entered at San Francisco Post Office as Second Class Matter.

Contents for May

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PROPOSED LOS ANGELES OFFICE BUILDING

Frontispiece
The Architect and Engineer
of California
May, 1913

THE

Architect and Engineer

Of California

Pacific Coast States

Vol. XXXIII. MAY, 1913. No. 1

Some of the Work of G. A. Applegarth, Architect*

THE accompanying illustrations show some of the work of Mr. G. A. Applegarth, who has been so actively engaged in the reconstruction of San Francisco since the fire. Mr. Applegarth was associated for some time with Kenneth MacDonald, and the work executed by this firm is distinguished by its refinement and dignity of style as well as its adaptability to practical requirements. While much of Mr. Applegarth's work has been on important steel structures, he made a special study of reinforced concrete on account of its fireproof qualities and its economy of construction and has built many buildings of this type.

Of Mr. Applegarth's personal work, a most interesting subject is the bird's eye view of the model garden city of Moraga now being constructed in Contra Costa County and which is designed especially as a residence city for beautiful villa sites. Being at the intersection of several charming valleys it is laid out on the radial plan to unite the converging boulevards leading through these valleys. There will be a public park and civic center in the middle of the composition and ample parking spaces surrounding the city.

The Hotel Clift which is in course of erection at the southeast corner of Geary and Taylor streets, San Francisco, is to be a hostelry of the highest type in both construction and furnishing, and with the most modern conveniences and luxuries as afforded in the best Eastern and European hotels.

The Adler Sanitarium is an example of modern hospital construction and its bright, cheerful character is a distinct departure from the old style factory-like design where the element of beauty was not considered.

The Eastern Outfitting Company building is an example of a simple monumental design adapted to the practical requirement of a commercial business and gives the maximum amount of light and window display. Not only is this a common sense treatment for commercial buildings but is very economical construction as plate glass and copper are comparatively inex-

* Plates marked with an asterisk are buildings designed by the firm of MacDonald & Applegarth. The partnership was dissolved in 1912.

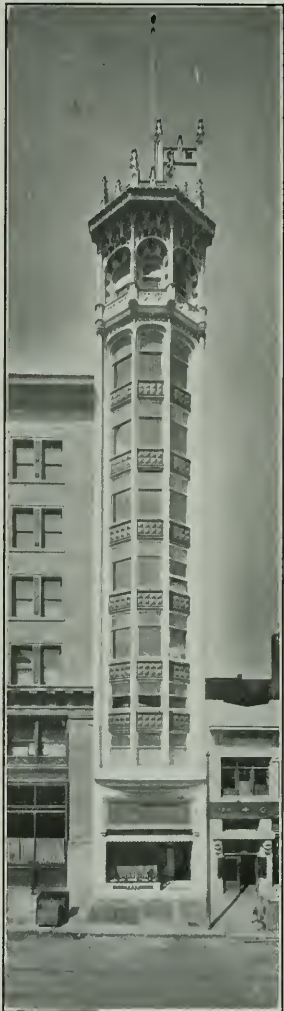
Clift Estate Hotel, Geary and Taylor Streets, San Francisco
G. A. Applegarth, Architect

*San Marco Hotel, San Francisco **
Exterior of White Medusa Cement

*The Holbrook Office Building, San Francisco **
Williams Bros. & Henderson, General Contractors
Steel vaults manufactured and installed by The Hermann Safe Co.

Lighting Fixture in Holbrook Building Designed and Manufactured by the Thomas Day Company

Building for the Macdonough Estate, San Francisco *



The Heineman Building, Sutter Street, near Market, San Francisco *

*The Davis-Schanwasser Building.**

pensive building materials and require little future maintenance. Other commercial structures of this type are the Abrahams Company building on Market street, the Gallois building on Sutter street near Grant avenue, and the Belden building on Market street. In the Davis-Schonwasser Company building a classic design has been combined with large window areas for a corner lot.

An opportunity for the use of color in a dignified manner was afforded in the design of the Lurline baths where the Pompeian reds were used for the roof and bases of columns.

G. A. Applegarth started his career as an architect in the office of his uncle, Mr. George H. Sanders, who was at one time one of the foremost architects of San Francisco, and it was under the influence and guidance of this sterling character that Mr. Applegarth received the splendid early training for his profession. After seven years of practical experience he went to Europe, where he traveled and studied for six years, and was awarded a diploma from the Ecole des Beaux art at Paris with high honors.

In 1906 he returned to San Francisco where he has since enjoyed a practice which has afforded a very wide range of experience in all classes of construction and design.

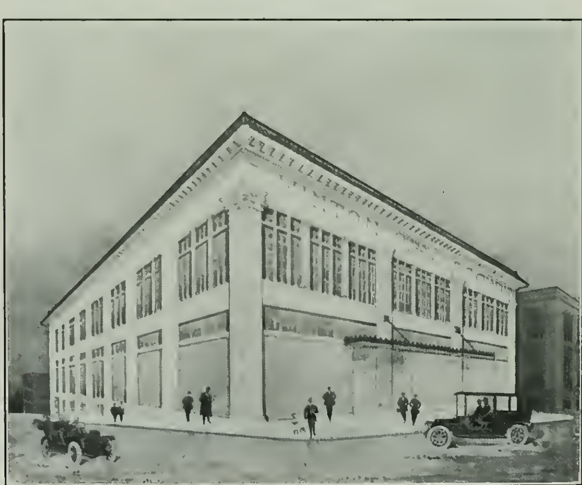
*Moore-Watson Dry Goods Building, San Francisco **
Sheet Metal Front by the Ideal Cornice Company, San Francisco

Entrance to Adler Sanitarium, San Francisca

*Adler Sanitarium, San Francisco**

*Apartment House, Van Ness Avenue and Bush Street, San Francisco**

Automobile Building for the Stutz Company, San Francisco, Dr. G. H. Palmer, Owner
G. A. Applegarth, Architect



Automobile Building for the Bancroft Estate, San Francisco
G. A. Applegarth, Architect

*Building for the Spreckels Interests, San Francisco**
Another story will be added to this building at once

*Building for Mr. Charles Belden, San Francisco **

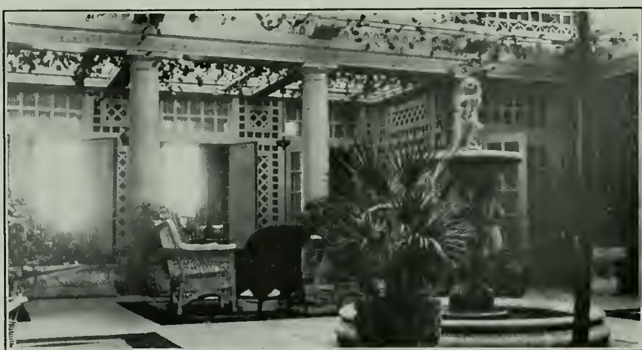
Bank of Concord
G. A. Applegarth, Architect
Sheet Metal Work by Yager Sheet Metal Works, Oakland

First National Bank Building, Walnut Creek, California
G. A. Applegarth, Architect
"Mt. Diablo Cement specified on both buildings

Lurline Bath House, San Francisco*

Interior, showing Main Swimming Pool, Lurline Baths, San Francisco

*Interior, Residence of Mr. R. G. Hanford, San Francisco**



Court of Residence for Mr. R. G. Honford, San Francisco

Aeroplane View of New Town of Moraga, Contra Costa County, California
G. A. Applegarth, Architect

Residence of Mr. Rudolph Spreckels, San Francisco *

Bronze Marquise, Residence of Mr. Rudolph Spreckels, San Francisco. Executed by Louis De Rome

*Competitive Plan, Pacific Union Club Building **

*Residence of Mr. Joseph Fredericks, Presidio Terrace, San Francisco **

*Memorial Arch for Golden Gate Park, San Francisco **

The *Sacramento School* *Competition*

The Winners

First — Frank T. Shea and Jno. O. Lofquist, San Francisco.

Second — Jno. J. Donovan, Oakland.

Third — W. H. Ratcliff, Jr. and H. G. Simpson, (associated) Berkeley.

The Jury

Arthur Brown, Jr.
Louis P. Hobart
John Parkinson
Two Sacramento Commissioners.

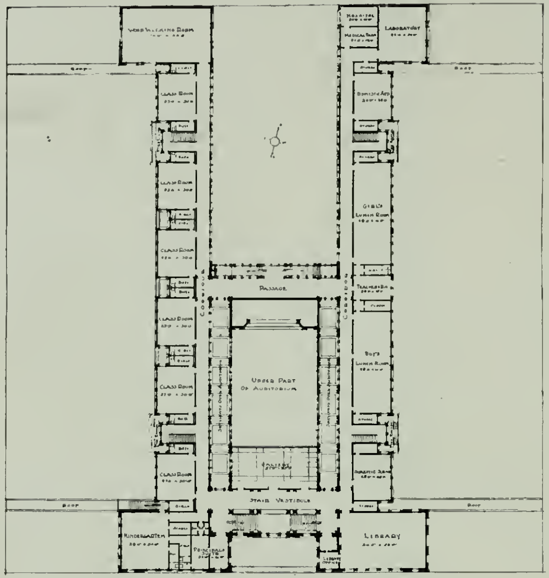
Architectural Advisor

Willis Polk & Company.

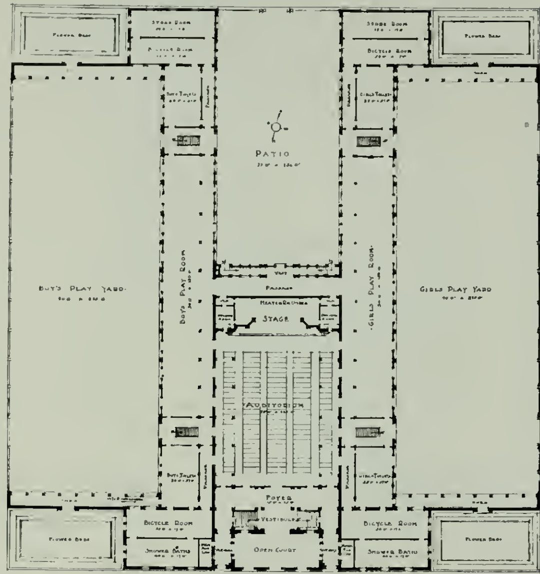
The Problem

Two-story building of fire-proof construction, cost not to exceed $180,000. Cubic feet not to exceed 1,100,000; figured from basement floor to average height of roof. Building to be combined elementary and grammar school for 1,000 pupils, half boys and half girls. Twenty-three Class rooms, auditorium, etc.

NOTE.—On the succeeding pages will be found the elevations and floor plans of the three prize winning designs.

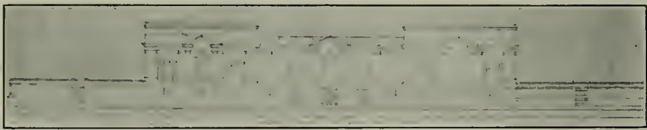


First Floor Plan, Winning Design Sacramento School Competition

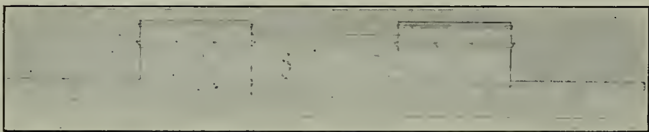


Basement Plan, Sacramento School

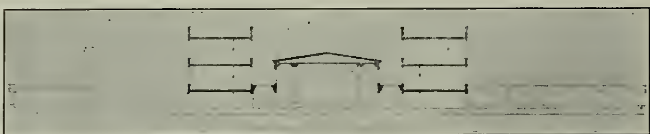
Shea & Lofquist, Architects



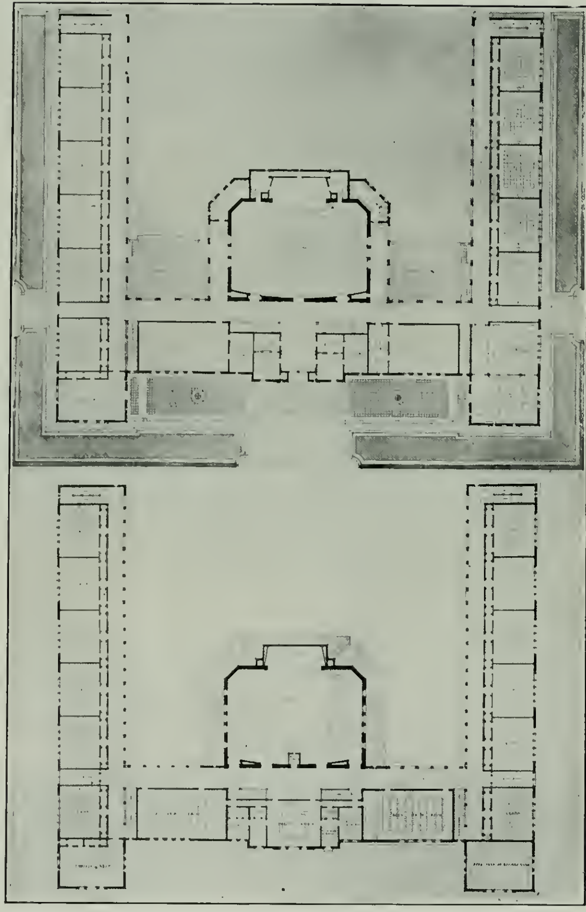
U Street Front, North Elevation
Winning Design Sacramento School Competition
Shea & Lofquist, Architects



V Street Rear, South Elevation
Winning Design Sacramento School Competition
Sheo & Lofquist, Architects

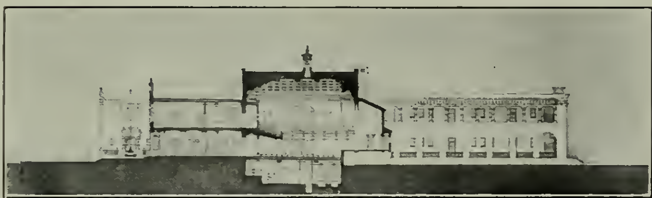


Transverse Section Toward Stage
Winning Design Socramento School Competition
Shea & Lofquist, Architects



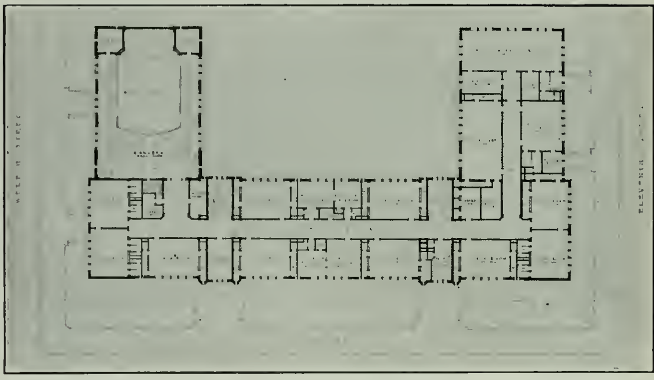
First and Second Floor Plans Sacramento School. Awarded Second Prize
J. J. Donovan, Architect

I' Street Elevation Sacramento School
J. J. Danavan, Architect

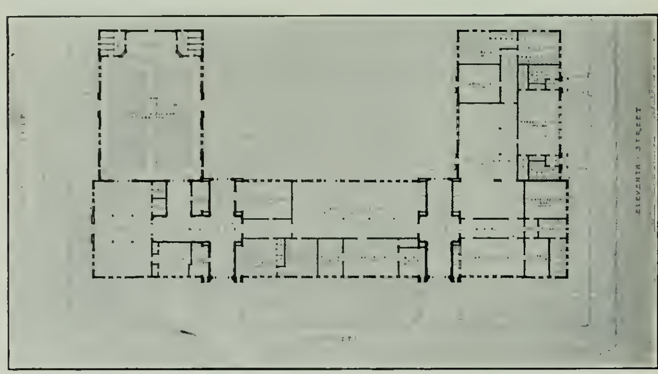


Transverse Section Sacramento School
J. J. Donovon, Architect

U Street Elevatian Sacramento School
J. J. Donovan, Architect

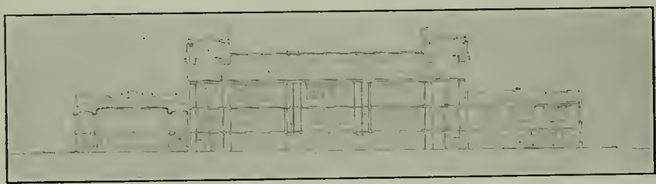


First Floor Plan Sacramento School

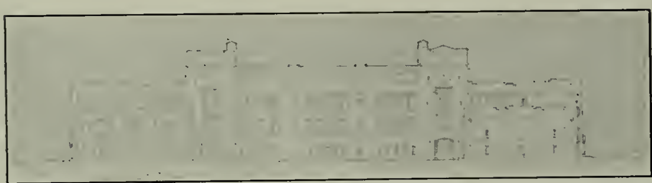


Second Floor Plan Sacramento School. Awarded Third Prize
W. H. Ratcliff, Jr., and H. G. Simpson, Berkeley

Front Elevation Sacramento School. Awarded Third Prize
W. H. Ratcliff, Jr., and H. G. Simpson, Architects



Transverse Section Sacramento School
W. H. Ratcliff, Jr., and H. G. Simpson, Architects



Rear Elevation Sacramento School
W. H. Ratcliff Jr., and H. G. Simpson, Architects

What is an Engineer?

By E. N. PERCY.

OF the four leading professions practiced in the civilized world, namely —Ministry, Law, Medicine and Engineering, the latter has the least standing today, although the nobility of its calling ranks favorably with that of any of the other professions. This lack of respected eminence is due to several causes, having their origin in the ancient custom of despising the man who works with his hands. The immediate and most important reason existing at the present time is the fact that while a member of the clergy must prove himself worthy and obtain certain licenses and diplomas, a member of the legal profession must establish himself before the bar and a Doctor of Medicine must be licensed by his government before they can practice their respective professions, an engineer is free to represent himself as such to the public regardless of his training.

The training of the three great professions just mentioned must be both academic and practical before they are permitted to practice.

The word "Engineer" is generally used today as a misnomer, conveying no information whatever.

Jones & Smith, who a few years ago were respectable and prosperous tinsmiths, have blossomed out as ventilating engineers without any known addition to their previous engineering knowledge acquired in the tin shop.

Mr. X., who for many years conducted a reliable draftsman and blueprint business, has announced himself as a civil engineer, despite the fact that the extent of his out-door experience has been an annual vacation of two weeks.

Frank Brown, who was chief engineer of the Cosmopolitan Life Insurance Building for the last fifteen years, has taken up consulting engineering notwithstanding that he has never designed an engine and could not do so if he wished, and has never built one.

Professor Z., of the Baptist College of Engineering, who elucidates equations for the benefit of embryo engineers, has opened consulting engineering offices in spite of the fact that he could not tell a file from a drill, and had never had a pair of calipers in his hands.

The truth of the matter is, in the writer's opinion, that a true engineer, whether civil, mechanical, electrical or of some other branch of industry, is a man trained practically and academically in all the branches of his specialty, and thoroughly qualified thereby to preceive the particular type of design required for his problem, to make that design, to personally supervise the construction in accordance with that design, instructing less expert workmen how to perform their tasks with the tools necessary, to assemble the elements of this design into an entirety and finally with his own hands or under his experienced supervision place the entirety in operation and operate the same to the satisfaction of all concerned.

If a man is able to perform one branch only of these various phases of engineering he is not an engineer, but a specialist of limited capacity, of limited opportunity or limited experience, it being conceded that it takes an exceptional man to make a good engineer just as it takes an exceptional man to make a good minister, lawyer or doctor. He must have the character and perseverance to properly serve his time practically and academically at his profession. He must have the memory, reasoning power and initiative necessary to the great work of creation, execution and operation incidental to engineering problems.

If a man is skilled in shop work only he is not an engineer but a mechanic, artisan or fitter and may well be proud of his calling provided he can do his work well.

If a man is skilled in draftsmanship he is not an engineer, but a draftsman. A draftsman should have a technical education, but this by no means makes him an engineer since his judgment is comparatively worthless outside of the realm of equations, curves and academic data. For instance, in the design of concrete, cast iron, piping and many other branches of engineering, academic education plays a comparatively small part, the designer being absolutely dependent upon his judgment which in turn is the fruit of actual experience with these materials and can be derived in no other reliable manner. Therefore, the academic draftsman, no matter what his education, is not a reliable designer. On the other hand neither can the draftsman who has served his time in the shop and the foundry or the steel works, but is practically without technical education, be a reliable designer for the reason that a great deal of work, such as the proportioning of fitted parts, design of structural steel, prospective pressures, stresses, etc., can only be arrived at through the medium of technical work. Such a man is not a reliable designer excepting under circumstances in which his work will be confined to detailing or copying the designs of others with such minor alterations as lie within the scope of his personal experience.

The proper training of an engineer is a problem which each man should solve for himself and in doing so should seek the advice of disinterested parties for the reason that experience and education in the various branches of his chosen profession are acquired from institutions which have in every case a view point of their own. A university with its renowned teachers, its laboratories, its super-scientific methods of approaching all problems, its horror of empirical methods, while offering what is probably the best possible mental discipline that a young man can have, holds the future engineer's ideas along channels that are a little narrow when in the commercial world. To illustrate this point—it is the experience of practically every technical student to learn the last possible word in the design of machinery or structures for economy of operation. His first experience in the industrial world is to learn that in the vast majority of cases economy of operation is a minor consideration and initial investment a very big consideraton. Furthermore he learns that the power plant, to which he has devoted so many years of study, is a minor part of, for instance, a shoe factory, and the shoe machine, about which he never learned anything, he is asked to improve and simplify, in order to increase production.

It is not the purpose of this article to criticise any institution and last of all our sources of learning, but merely to make certain statements in the endeavor to define an engineer. The only way to obtain practical experience is to apprentice one's self in a shop or on a pile driver or in an electrical plant or with a gang of laborers according to the branch of the profession in which a man may engage. With the apprentice system it is an unfortunate fact that the seeker for information and experience must suffer from economic conditions, that is to say, employers use apprentices not for the purpose of educating them for the shop, but as a means to obtain cheap labor, and in most shops an apprentice will be paid as little as it is possible to obtain an apprentice for, and they are usually kept on one task as long as possible with a view to increasing their production.

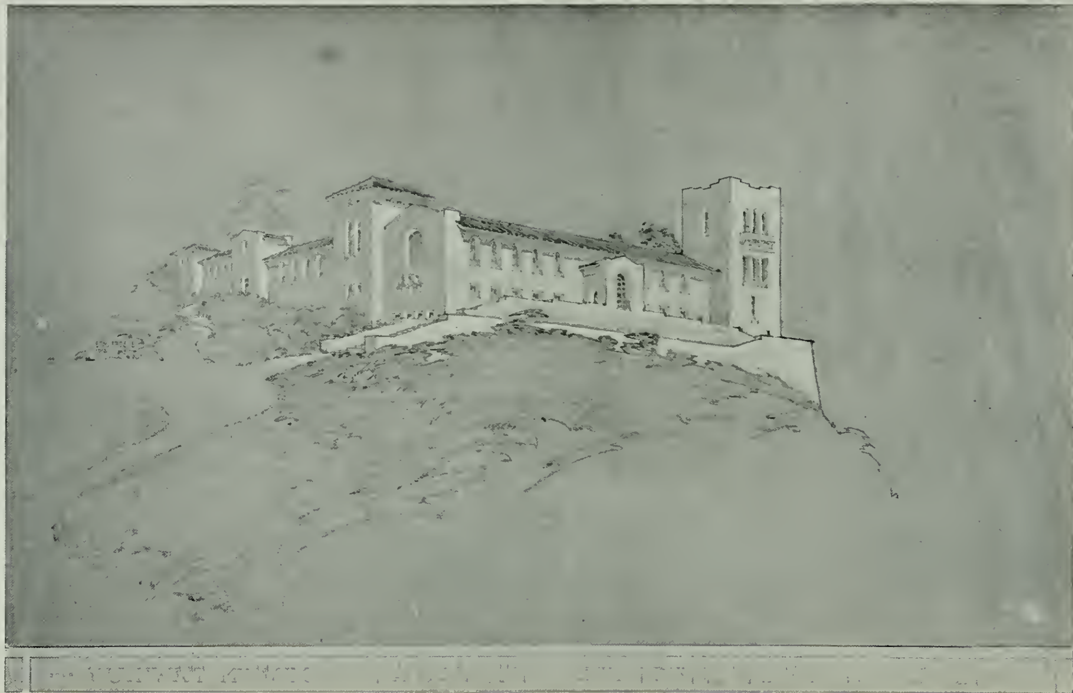
Their experience on one task is entirely out of proportion to the time necessary for obtaining a knowledge of the same. This is particularly so with young men whose minds have been thoroughly trained and who tend to grasp the details of practical experience more quickly than the untrained apprentices. It is a well known fact that a bright apprentice with from one year to two years' experience can leave and get a position at another shop for three or four dollars a day and thereby prove that he is worth that amount of money to his original employer. It is also a well-known fact that the shop which trains an apprentice will never pay him as much upon the completion of his apprenticeship as will another shop. At the same time they will take in an outside apprentice for more money. This is based purely and simply upon the idea that "a prophet hath no honor in his own country."

Therefore, cannot the various engineering societies determine upon a standard which shall define the engineer as a man who is trained in all branches of his profession, requiring that other members of the engineering society shall be known in accordance with their training as technical experts, artisans or fitters, operators, constructors, and honored as such in their respective branches, and to be known by two or three names as they progress from one department to another; that is to say, draftsman and machinist, mechanician and operator, tinsmith and ventilating mechanic. Reserve the honored term of engineer for those who are engineers and can, as stated above, conceive a design suited to a condition, make that design, build the structure to that design and place it in operation. Can not engineers work together to have this status recognized and legalized by the federal government with proper penalties for misuse of the term, making the engineer a man who is respected by every member in every branch of his profession because he is equally skillful with any of them.

It is a common expression in this day and age to hear that young engineers are a "drug on the market," and it is the truth with this qualification; they are not engineers. The shops are graduating men every day who call themselves engineers, when they are in reality machinists, unable to operate a large power plant. One of the finest training schools in the world, namely the Merchant Marine, is yearly licensing through the federal government competent young men as engineers, who are perfectly qualified to operate large power plants and in most cases are able to build them because of the necessary previous training in a shop, but are utterly incapable of designing same, forecasting results or even of analyzing sources of loss in engines. Such men are to be honored in their profession as skilled and licensed operators, but it is not proper to call them engineers any more than we would call a nurse or a skilled hospital attendant a doctor.

As engineering is practiced today in its higher branches, a brilliant academic man will as a rule co-operate with a brilliant practical man to bring about a desired result, neither one of whom could go ahead alone; but it frequently happens that one is acting for the buyer and the other for the seller, and it is only human that personal jealousies shall arise between men so differently trained, neither of whom is willing to concede, as a rule, that he lacks the particular training which has been the lot of his colleague, and it would be much better if one man had the complete training.

Sketch of Tower Southwest Museum, Los Angeles. Hunt & Burns, Architects



Southwest Museum, Los Angeles
Hunt & Burns, Architects

Southwest Museum, Los Angeles
Hunt & Burns, Architects

The Pioneer—A Panel by L. Maynard Dixon

The Trees

By W. E. DENNISON, President Steiger Terra Cotta Works

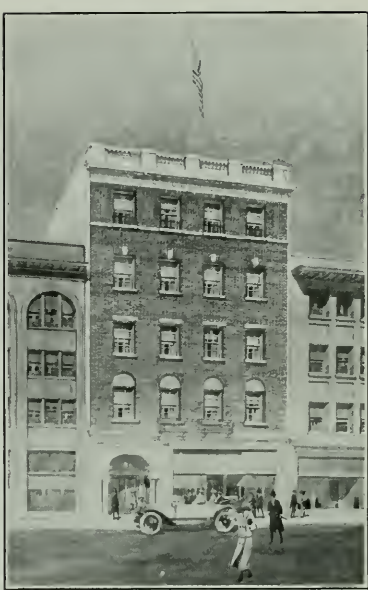
IN the olden days the Winds were a strange people. They wandered over the Earth and Sea. They fought among themselves. The Winds of the North, of the East, of the South and of the West were always at war. They dashed at one another hurling clouds of Earth against clouds of the Sea until the Rains came and brought the Trees, a peaceful country-folk, who by their quiet ways and engaging manners diverted the Winds and made them forget their strife. The Trees and the Winds became lasting friends. Where the Trees lived became the favorite visiting place of the Winds. Often the Rains were there too and the Trees grew to look for their coming. No matter how troubled in spirit or how torn with strife among themselves, the Winds were always sure of a welcome from the Trees, who sang softly to the Winds, bound up their wounds with fragrant balsams, quieted their passions with the gentle Rains and put them to rest in leafy glades and sleepy hollows.

The Trees changed the Earth from a howling wilderness to a place of bewildering beauty—a place where the Winds never tired of bringing with them, the peace-makers, the Rains, who still preserved the gentle art of quieting the Winds while nursing the Trees. Arcadia was never half so sweet and comforting as this meeting place of the Winds and the Rains among the Trees. Little they dreamed of the evil that was to come. In their simplicity they thought their sylvan pleasures were to last forever.

One day a vagrant Wind brought some strangers from beyond the farthest sea. These strangers worn, weary and ragged said they were Men and wanted a place to rest. They were taken by the unsuspecting Trees into their forest home. The Rains came and ministered unto them and the Winds were also kind and gentle. The strangers partook freely of the hospitality and after the manner of strangers bethought themselves of how they could possess the Land of Enchantment. While masquerading as Men they were really Vandals, the world's devourers. They violated all the rights of hospitality. They fell upon the innocent, beautiful Trees, despoiled and dismembered them. They threw their proud limbs into devouring flames and with demoniacal frenzy took their very bones to make dwellings for themselves, the Vandals! The Trees were helpless. In vain they told their anguish as they swooned in the primeval forest. The hands of the Vandals were not to be stayed until the uttermost parts of the land were littered with the skeltons of the Trees, brutally and cunningly fashioned into what the Vandals called Homes.

Then the Winds finding their beloved resting place gone said to their allies, the Rains, "Come let us avenge ourselves upon these recreant guests brought by the Vagrant Wind. Let us descend upon the habitations of the Vandals. Let us bring such havoc as has never been seen. Let us rid the earth of the Vandals and their brats. Let us requite the wrongs of the Trees."

And they brought Horror. With Horror came Desolation. Hand in hand they come every year riding in that awful chariot of the Rains driven by the relentless Winds. The Vandals pray aloud in their helpless terror and with every year become weaker and more helpless. The Winds and the Rains have sworn an awful oath with the Blast and Death as witnesses, never, never to stop their awful war upon the Vandals until they restore to them their friends, the Trees.



Building for Mr. Bruce Cornwall, San Francisco Wm. H. Crim, Jr., Architect

Tell the Advertiser Where You Saw It

MR. ARCHITECT, when a new client comes to you unsolicited, very naturally one of the first things you want to know is who sent him. Is it not so?

Mr. Contractor, when an architect sends for you and asks you to figure work in his office, if you have never figured for him before and if you never asked him for that privilege it would be no more than human for you to wonder who recommended you, would it?

Now, then we know that both the architect and the builder and a lot of other people, including prospective owners, bankers, real estate men, engineers and capitalists, read the advertisements in this magazine. They wouldn't be live wires if they didn't. By live wire we mean successful professional and business men. A man must read the advertisements nowadays if he wishes to keep abreast of the times. New devices continually are being perfected. New methods, too, are being followed. They may mean economy for the owner, greater efficiency for the builder and added glory for the architect.

But how many who read the advertisements and profit by them think to say WHERE they read them!

To go back to our opening paragraph—you, Mr. Architect, want to know who sent you your newest client, or you, Mr. Contractor, who stood sponsor for your ability—now our advertisers want to know—and are entitled to the information—where you heard about THEM. So next time you write or phone or call upon these firms who are helping to make possible this magazine that is working in your interests—don't forget to say "I read it in The Architect and Engineer."

A Plea for a Better System of Estimating Among Building Contractors*

By G. ALEXANDER WRIGHT, Architect

BEFORE touching on my subject this evening, may I say a word or two to those gentlemen present, whom I have not the pleasure of knowing personally? Although an architect by profession, it may perhaps be stated that I have had opportunity of closely studying the practice of estimating upon bills of quantities, or as it is more popularly termed, the "Quantity System." Indeed it is a subject in which I have always taken an active interest. I mention this however simply by way of "explanation," which seems to be necessary, for I believe this is the first occasion in the history of San Francisco, and probably in the United States, when a practicing architect has been honored with an invitation to address a body of contractors upon such a practical theme as estimating—a subject which, perhaps, in some quarters, architects are not supposed to know much about, and I regard it as a good sign, when a contractor's organization in this city is broad enough and progressive enough to invite an architect to address them upon such an important topic. I regard the invitation as a great compliment. It gives me the greatest pleasure to be with you this evening, and I trust that we may have a full discussion of the subject at the close of my remarks.

The ever increasing amount of unproductive time, and usually money, which contractors are called upon to expend in preparing gratuitously, "quantities" as well as prices (often for the owner's benefit only) suggests that the time has arrived when all concerned should take up, and seriously consider the possibility of adopting a modern and more sensible system of estimating, such as, for example, been long in successful operation in older communities. Not a mere "copying" of such methods, for I advocate the creation of a standardized method of our own—an "American" system—practical—above all things. A system that will be in line with our other progressive building methods. A system that shall be clear and accurate, and which shall stand for square dealing between contractor and owner—in short, a system that shall give every man his due; no more and no less. A progressive system, free from the defects of other systems, such as unnecessary "elaboration," and yet one that will reveal to the bidder, at a glance, the actual quantity of material and labor in a structure, in any individual trade. When bidders are invited to submit bids, they are, "theoretically," asked, of course, to submit competitive "prices," but in actual practice their bids are based upon competitive "quantities" before "competition in prices" commences, and which, in my opinion, is as unjust to the contractor as it is ridiculous. A building can only contain a certain amount of material, and no amount of figuring by contractors against each other, can make that quantity any more or any less. Where, then, is the sense in a dozen or more general contractors competing against each other in taking "quantities?" One or more bidders through being hurried, or being unable to take off the quantities accurately, leaves something out! Their bids are consequently low, and the owner benefits at the low bidder's expense, whilst the competent or more careful bidder loses the job, because his quantities are more accurate or because there may have been room for uncertainty when figuring the plans and specifications.

*An address given before the General Contractors' Association of San Francisco, April 10th, 1913.

Not long ago a general contractor (whom I have known over twenty years) told me that, if contractors figured to do competitive work, just exactly as plans and specifications called for, that a man would not get one job in fifty. Now, if this is true, and personally I believe it is, there is something "very rotten" in our methods. In my judgment it lies in our antiquated estimating practices.

Those of us who know something of the unsatisfactory conditions under which bidders are often obliged to figure, time after time without result, have realized that hundreds of thousands of dollars of time and money are taken from the contractors' pockets every year, simply because they do not so far limit competition between themselves to the matter of "price." They go on competing, and I fear, "gambling with each other," as to the quantity of material a building will take, whereas I contend that that is a question of "fact," and that competition in the "quantities" between contractors never can, and never will, in any way change the fact that a certain fixed quantity of material and labor is necessary to do every job. There can be no legitimate competition in taking off "quantities" of materials, except that unfortunate competition which bidders make themselves, when they take off "too much," or, as too often happens, "too little."

The legitimate competition can only come in where one man can handle a job better than another, or one man may have some advantage over another in buying, and so forth. All this kind of competition is legitimate enough, but it must be obvious that no amount of figuring can reduce the real quantity of material which a building will take, and so, my contention is that it would be proper and fair to start all bidders figuring upon the same basis, by furnishing each with a schedule, or bill of quantities, showing accurately and clearly the different quantities and kinds of materials which the bidder is invited to figure upon, and even then, there would be plenty of competition left, in placing profitable prices against each item.

Our present method (or rather, want of method) in estimating, and the rapid strides being made in construction are, as I have said, forcing upon the contractor more and more every year, an increasing waste of time and money in figuring out "quantities." This senseless waste and competition cannot go on forever. It has already brought men to bankruptcy all over the country, and has often prevented the making of a proper and legitimate profit among those who do succeed in keeping their heads above water.

This is a live question, and it deserves the earnest consideration of all contractors' associations and architectural societies from the Atlantic to the Pacific Coasts.

No new or untried principle is involved. It is simply that of a definite quantity of WORK, for a definite amount of MONEY—in substance the owner says—"I want this quantity of work done. The drawings and specifications show you how this quantity of work is to be assembled or put together. Now, tell me, how much money will this COST? I want you to do the quantity of work called for—no more—no less."

At present the successful bidder often says, in effect, to an owner—"I will erect your building according to plans and specifications," but—mentally—he says—"I do not figure that it will take as much flooring, concrete, plastering or painting as my competitors think it will." Let me ask—is this proper or fair competition? There is only one individual who stands to gain anything under such imperfect methods, viz: the owner.

It may be stated that the quantity system is equally applicable to engineering works, such as railroad work, sewerage disposal schemes, canals, pumping stations, etc.

Before proceeding to a further consideration of this subject, I may be pardoned perhaps for expressing the opinion after having had over twenty years' intimate experience with the workings of the quantity system of estimating, and another twenty years in San Francisco (without any such system), that I know of nothing in connection with the work of the contractor that would be more beneficial than the adoption of some recognized method of estimating upon bills of quantities, and these would be equally valuable, whether sub-contracts were eventually let or not.

It is not the idea that we accept the methods of any particular country, the author hopes he is too much of an American citizen to suggest that, but where contractors in older communities favor a certain system to the exclusion of the very method we practice here, then, I suggest, we might well stop for a moment, and take notice of what is being done. For example, in the year 1909 a conference was held in Great Britain between the National Federation of Building Trade employers, the Institute of Builders, and the London Master Builders' Association, and a resolution was adopted recommending contractors who were members of these powerful organizations to decline to bid in competition against each other, unless bills of quantities were supplied for their use at the owner's expense. A deputation from these contractors' organizations afterwards attended before the principal body of architects, who promised to further the aims of the contractors as far as was within their power, and today the quantity system is in full operation, not only in the case of private owners, but in all building work for government and municipal authorities, and upon the "principle" that it is impossible to obtain bids without accurate quantities.

There must be some good reason for all this—and I suggest that it is worth consideration by any body of men who are trying to elevate the building business to the honorable position which it is entitled to occupy, and to bring about such conditions as will cause owners to hold the competent contractor in higher esteem, and not regard him, as is too often the case now, with suspicion.

Now let us consider for a moment a few of the disadvantages of existing methods:

First—The time usually given for figuring is far "too short" for the accurate taking off of quantities, in addition to the pricing and figuring out of the many items. A bidder usually has contract work in progress, and other matters to be attended to during the day time; other plans are to be figured by a certain time, and but little can be accomplished in the eight-hour working day, and so advantage must be taken of the night hours, sometimes all night, and even Sundays (I regret to say) and any other time. Only those who have worked under these conditions and over blue prints at night, hour after hour, taking off items, can appreciate the many difficulties, pitfalls, and liability to error through figuring against time, after the real work of the business day is over. But the plans MUST be returned first thing in the morning, or the bid MUST be in by a certain hour the next day. Nothing but hurry—hurry—hurry—in not a few cases more information is necessary; something is not quite clear! The plans and specifications do not agree on some point—which is right? There is no time to find out; the only person who can enlighten you is asleep, perhaps, while the careful estimator is burning the midnight oil and wrestling with problems which can be entirely eliminated under a more modern system of estimating.

Again, the careful bidder who honestly tries to get in all the items, and figures to do the work as called for, is frequently beaten by a less competent bidder, who forgets something, or who, maybe, is willing to take a chance anyway in order to get the job. True, omissions in lists of materials are sometimes unavoidable, under existing methods, which unfortunately aim at "speed" rather than "accuracy."

It is, to say the least, disappointing to a careful bidder on a large job, to find his bid just above the lowest, and after the low man has signed up the contract, it develops that the "painting" or some such item was left out. This, however, could not occur with the quantity system.

This is no overdrawn picture, as I know from experience. The competent bidder who gets in all his items today is usually under a "disadvantage," unless he happens to be figuring against men of his own stamp. Meanwhile it would appear that the chances are in favor of the owner. most of the time, and it seems to be a case of "Heads, I win—tails, you lose." Surely there must be some remedy!

The existence of present conditions, whilst much to be regretted, is due to a blind continuance of early day custom. It is in no way up to date, or conducive to progress, or to that business success to which a bona-fide contractor is entitled. It is entirely unsuited to modern construction and modern methods. The tallow candle years ago was a great invention, but how many of us would light our homes today by this method, and yet our estimating methods of today date from the same identical period as the "tallow candle." Other countries have long ago graduated from such primitive methods, and we are, in this respect, away behind the times. It seems to be almost inconceivable that shrewd business men are still willing to spend their time, all going over the same ground, figuring against each other on quantities, knowing all the time that they are all, save one (and sometimes even that one), simply wasting their time. By the adoption of some sensible system, all this quantity taking could be done by one person.

The great difference we find in bids arises, in my opinion, not so much in the prices or money values placed against the quantities, as it does from errors in the "quantities" themselves, the accurate preparation of which calls for special training and continuous concentration of mind, which the busy contractor of today can seldom find time to acquire.

Now we will investigate a bill of quantities, such as we are considering—what is it?—and how is it used?

First of all, it is a document, handed free of expense to each bidder, lithographed or similarly duplicated, in order that each bidder's copy may be exactly alike. It will contain everything which it is essential for a contractor to know when making up a figure, with a separate section for each trade, such as excavation, concrete, brickwork, and so forth. A general summary is provided at the end of the bill in which is entered the "nett" cost of each trade—this summary is footed up, the profit the bidder expects to make is added, plus the cost of the quantities, the result being, of course, the amount of the bid.

The methods of measurement must conform to the standards used by each individual trade, and through the bill, the greatest care is taken to have everything systematized. All cubic, square feet, lineal feet and numbers of items will be found all together under their respective heads. In this way, immediate reference may be made to any item required, even though the entire bill may contain hundreds of items, and so every item has its proper place—nothing is left to chance. Detail sketches also appear in the margins whenever necessary, and show a bidder at a glance what is required. These, as we know, are of more value to an estimator than long written descriptions one sometimes finds in specifications. The key-note of the quantity surveyor is "accuracy." In going through the drawings and specifications he has come across all those doubtful questions which always crop up when figuring under present methods. He will have taken them all up with the architect, and adjusted them, before the quantities are handed to bidders, so that everything is all plain sailing. Nothing is "near enough" for a quantity surveyor—he scrutinizes every part of the work closely, clears up any doubts, or anything capable of a double interpretation, and his work leaves no loop-holes for either the owner, the contractor or the architect to take advantage of. The result is that it is seldom necessary for a bidder to ask questions of the architect when making up a figure. If he should wish to do so, probably he would be referred to the surveyor, who is familiar with every minute detail of the work. Further—and right here lies one of the greatest advantages of the quantity system—it is not necessary, except in a general way, for a bidder to study the drawings and specifications at all, and he certainly does not have to FIGURE THEM. He simply prices the bill of "quantities," and, in these days of hurry and bustle, this is as much as a contractor can be expected to do, FOR NOTHING. This enables the competent contractor (the one who has unit prices at his finger ends) to make up a bid for, say, a $100,000 building, in a few hours, and he has the satisfaction of knowing, when the unit price is placed against each item, that nothing has been forgotten—in other words, he only contracts to furnish so much material and labor—and surely this is absolutely right in principle. Good reasons exist why the GENERAL contractor should have faith in his own judgment and accustom himself to price items in EVERY trade which goes to make up the building business. It is the only consistent method of estimating for anyone who claims to be a general contractor. Experience has taught most competent men that it "pays to do it." The mere getting together of figures from sub-bidders, and footing up the totals of the lowest, is not estimating at all. That is mere schoolboy work. However, I am led to believe that this is now the exception among general contractors in San Francisco rather than the rule. The ideal contractor is the one who makes up his own estimates, and not he who is dependent, for any reason, upon sub-contractors, who thus become the real estimators. If every general contractor would keep a prime cost book of all trades, and quantities were supplied to him, he would soon be in a position to give a fairly close figure upon any sized structure, without first taking sub-bids, and this, I suggest, is the most consistent, satisfactory and profitable method to pursue when bidding upon work as a whole, but, of course, it requires care and experience.

Further, one of the greatest arguments in favor of letting contracts as a whole is of course the fact that a general contractor has the ability to figure all trades in his own office, and that he knows how to, and will, supervise the work of sub-contractors, if any. If architects can be assured of this, there will be much less segregation in the future.

In general practice I believe the accuracy of the bill of "quantities" should be guaranteed. Such a document might well be made the basis of the contract, equally with the drawings and specifications; if this were done, the chief cause of disputes between owner and contractor would be removed.

This, I submit, is entirely logical and right. A certain "quantity" of work for a certain sum of "MONEY," the owner to determine the former —and—the contractor to fix the latter—surely this is morally just and equitable.

It may be said—where are these competent surveyors to be found? and it would be a very natural inquiry, as it is no part of the duty of architects to prepare such quantities. In fact, the relation of the architect to the contractor should preclude him from having anything to do with furnishing quantities. This should be attended to by a disinterested specialist—the "quantity surveyor." In older countries, young men of education are now apprenticed to practicing surveyors, and it has become a recognized profession. Years ago these quantity surveyors frequently came from the ranks of the architects, others possessing the necessary education were possibly contractors, building superintendents or estimators. I have known contractors' representatives who commenced life in the workshop (who, after securing the advantages of special training), made experienced, and very competent quantity surveyors. There must be a beginning to everything, and doubtless there are many men in this country, who, after some little training in the technique of this work, should make reliable quantity surveyors. The principal qualifications are—honesty of purpose, a knowledge of architecture and construction. The surveyor should be a neat draftsman, and have actual experience in conducting building operations. He should possess the ability to readily detect discrepancies or conditions, which might give rise to misunderstandings during construction, and last, but not least, the necessary mentality to act disinterestedly. He must do what is "right" in measuring, as between the contractor and the owner. The usual custom is for the architect to furnish the quantity surveyor with a set of the drawings, and a draft specification, and the latter then commences work in his own offices. During this period the architect and surveyor are in frequent consultation, to the end that all uncertainties are cleared up and adjusted upon the drawings and specifications, in short, no effort is spared to obtain perfect clearness and accuracy before bidders commence to figure.

Such uncertainties are bound to crop up; they are unavoidable. They, nevertheless, perplex the contractor when he is figuring, and his foreman on the job, and create unnecessary trouble, and sometimes bitter disputes, and then in such cases, "one of the parties" to the contract is usually—a loser.

Now that we have briefly considered the qualifications of a quantity surveyor, let us take note of what the preparation of a bill of quantities involves. During the last forty years it may well be said that it has been brought to a mathematical science, and yet it is really surprising what a vague idea exists concerning the methods, objects and uses of the "quantity system." The fact remains, however, that where the system has been adopted, responsible contractors refuse to figure without it. Some day that will be the attitude of contractors in this country—when they fully realize the folly of wasting their time and money in competing against each other on "quantities," as well as on prices. But to return—three distinct processes are involved, and each process calls for different operations.

First—"Taking off" and entering every item (or "dimension," as it is called) upon the dimension sheets. This is always done in exactly the same order; in every building, no dimension, however small, is omitted—no guess-work of any kind is permitted. The exact location in the building of every dimension taken, is carefully noted, and every figure or note taken is carefully preserved for future reference.

It is impossible to illustrate here the work in detail involved in taking off each trade, but the following may serve to show the general idea. Let us follow a surveyor for a moment, in taking off his dimensions for a few items of—we will say—common brickwork. He always commences taking dimensions at the same point on each floor plan, every length of wall from one angle to the next is measured separately and the dimensions entered in "waste," as it is termed; we will assume it takes say fourteen dimensions to go clear around a building—these fourteen dimensions and their locations are permanently recorded, footed up, and the total lineal feet is then placed immediately below this, and a line drawn across the column to separate it from the next item. The dimension is squared, i. e., the number of square feet these figures represent is figured out, and opposite to the total we find a description thus—for example 21″ wall of standard common brick work laid up with lime, mortar and—Portland cement gauged three to one, pointed with flat joints one side for whitewash and raked out the other side for cementing.

In good practice it might be best to give the number of square feet superficial of wall, and give the thickness. The same method is adopted with each story, with its varying thicknesses of walls, every dimension being entered in precisely the same order with its particular location noted.

Then we come to deduction of openings, those with inside and outside reveals (as in the case of box frame windows) are taken separately, door openings the same, those of one size, and thickness of wall, are "timesed," as we say, and entered in the dimension column—so—DDt. 9/3′ 9″x7′0″ 13″ outside wall "fifth floor."

Then should follow an item, "extra labor" to so many 8″ common brick segment arches in say three half brick rowlocks to 4′ 6″ openings with 3″ rise in 8″ wall include for cutting skewbacks, etc., and for wood turning piece and setting and striking. In case richer mortar was specified for arches, it would be so stated, and the proportions.

When rough cutting to brickwork is required, every square foot of it would be measured. Brickwork in footings or foundations or walls below ground, or at unusual heights, should be all segregated and given separately with full descriptions.

Such items as the following are then taken by the square yard or square foot, viz., selected common brick facing. If joints are struck and cut (as face work) it is taken as a separate item, as should be the case with any portions that are to be pointed with special, or colored mortar. Cementing by the square yard if on ordinary plain surfaces, but if in widths of 12″ or under, then this is separated and taken by lineal foot—should this work occur on circular surfaces, it would be so described, kept separate, and the radius given. Lineal dimensions are taken of all rough splays and chamfers, flues, pointing to flashings, projecting courses, with the number of mitres, splays, or stops in same, brick sills, with the returns are numbered, if any. The labor of forming quoins, square or splayed, and (in certain cases) the lineal feet of plumbing angles and reveals might be taken, also leveling up for joists, bond iron, and the like. The foregoing applies to common brickwork as before stated. Now, where "face" brick are used, the entire surface of such facing is measured by the square foot, including reveals and soffits (but openings deducted), the kind of mortar and the labor of pointing being given. Here would be taken such items as face arches. Fair cutting by the square foot on same principle as mentioned for common brickwork. Then come lineal feet of each course, of which figures sketches should appear. Raking mouldings or belts separate, then follow the number of external, internal, raking, skew or other mitres, also square ends, etc. (if any). All other lineal feet items follow in their proper order, and then in a similar way, concluding with "numbered" items which would be described and (if necessary) sketched in the margin. I am aware that this is but a very elementary illustration of the detailed method of taking off—but the principle applies throughout every department, in every trade from the excavator to the painter, but it would be too great an undertaking to go fully into details here, in each case.

Surveyors' quantities are usually measured "nett," and is so stated in the preamble of the bill—upon the understanding that the unit price for each item is to be made, by the contractor, to cover trade customs, etc., which differ in each locality.

The before mentioned dimension sheets are usually checked over with the drawings by a second person, and then all totals are "abstracted"—that is to say, they are transferred to abstract sheets, under seperate headings. In this way many similar items of the same value are collected together and footed up, and checked. This reduces the number of items which appear eventually in the finished bill, which is written direct from those abstract sheets, and any further sketches or descriptions necessary for the bidder to thoroughly understand what is required, are then finally added. When completed, a sufficient number of copies of these bills are lithographed or similarly duplicated, and a copy is sent by the surveyor to the list of prospective bidders, whose names and addresses have been previously furnished him by the architect.

Some of the advantages of the quantity system of estimating to the contractor are as follows, viz.:

1. Saving of time and money.
2. Greater precision in measuring.
3. No uncertainty as to interpretation of plans or specifications (the quantities should govern).
4. No visits to the architect's office when figuring, for explanations or otherwise.
5. No other work is contracted for except the "quantity" set forth in the quantities.
6. The contractor, if he so desires, can check up the quantities before signing a contract. In an American system of estimating the quantities should, I think, form part of the contract.
7. No bidder can inadvertently leave out anything, and so in this way arrive at too low a figure.
8. Not having to spend time taking out his "quantities," the contractor has time to attend to more profitable business.
9. Systematically arranged bills of quantities duly priced (whether work has been secured or not) form excellent data for making future estimates.

Before any universal American system could be put into operation it would be necessary:

First: That a committee of representative contractors, from each trade, be selected to standardize a method of measurement to be universally followed by all mechanics, contractors and architects.

Second: That competent men, mutually satisfactory to contractors and architects, be retained in such numbers as the volume of work may demand. These men, or "quantity surveyors," could be placed under bond, covering their competency and integrity, until same have been assured. Such appointments to be permanent, except for cause. The compensation of these surveyors to be fixed at a certain percentage upon the total of each estimate. Each bidder, of course, adding this amount to his bid.

Third: I suggest, also, that a law be passed that a bill of quantities be furnished (free of expense to bidders) upon all State and public buildings. I advocated this as far back as the year 1893, and it may interest you to know that such a law is actually in effect in the State of Pennsylvania, and has been since 1895. It does not, however, go quite far enough, as the quantities furnished have no guarantee as to their accuracy. Quantity question is attracting much attention at the present moment among contractors in Boston, New York and other cities, and I may mention, perhaps, that I am now formulating a program to bring this quantity question to the attention of every Building Contractors' Association and every Architects' Society in this country.

Fourth: In connection with the quantity system, I still advocate (as I did in a Brochure on Arbitration which I published in 1894) the creation of a "Technical" tribunal, or court of arbitration where nothing but building suits and disputes should be determined and adjusted. Such court to be presided over by a specially selected judge and at least two other men of practical experience in the actual construction of buildings, in estimating the value of builders' work, and familiar with trade methods, terms, processes and customs. I maintain that such technical matters as building construction, values, etc., should NOT be decided solely by technical law, or by laymen alone, however skilled in other ways, and notwithstanding the custom of calling expert witnesses before them. I consider that it would be an advantage to disputants if the bench had a first hand practical knowledge of building construction and methods, such as I have indicated, and where technical disputes might be determined in a few days, once and for all, and without delays which only tire the contractor out and thereby bring him to a settlement more or less unjust, from a "practical" standpoint.

I am hoping to shortly see a committee appointed in every building employers' organization in this country, to take up and seriously consider such matters as I have touched upon this evening. Nothing in my judgment will tend to elevate the building business, and to promote a feeling of mutual confidence and respect between the contractor and owner, more than the quantity system of estimating, and which, as I think I have shown, aims at absolutely square dealing between the man who pays for the structure and the man who builds it.

Gentlemen, I fear I have kept you too long—but I hope there will be a full discussion of the subject. In what I have said, believe me, it is prompted SOLELY by practical experience and a sincere desire to see better estimating methods adopted.

In conclusion, during a recent trip East and to Europe, it was my privilege, through your courteous secretary, to be kept in touch with the progress recently being made by this organization, and I wish to extend to your president, directors and members my sincere congratulations upon the progressive methods you have so far adopted, and to tender you all my best wishes for continued success.

I would like to add, as President Wilson is reported to have put it recently, that "nothing is done today as it was done twenty years ago." THAT is the essential fact—I read somewhere the other day that this age we are living in today is a NEW age, an age in which everybody all over the world is doing new things, interesting, important, wonderful, new devices, new methods, new machines, to make new products, new proofs of the power of the human mind to conceive and to control, and the human hand to construct instruments, with which to conquer the forces of nature, and bring them to the surface of humanity—these are the characteristics of the age we live in. Never have the creative forces of mankind moved so fast as in the lifetime of us who are now on earth. Never before have there been so many people in the world eager to know what the world is doing, and HOW it is doing it. Gentlemen, I thank you.

Shearing Strength of Joints Between Old and New Concrete as Shown by Tests

By JOHN R. NICHOLS, C. E.*

IN REINFORCED concrete floor construction it is common practice to stop work at the end of the day at the middle of the span of slabs, beams, and girders. A vertical bulkhead or dam is erected on the forms for the purpose, and is taken down the next day when work is to be resumed. Thus there is formed a construction joint between old and new concrete.

The reason for placing this joint at mid-span is that nowhere else, in most cases, is the shear so likely to be a minimum except over a column where, for various reasons, such a joint is undesirable. For uniform loading the shear is zero at mid-span, but of course uniformity cannot be counted on and the shear may rise as high as one quarter the maximum live shear at the end of the beam, or more in special cases.

The writer knows of no tests made to determine the strength of such a joint in shear up to December 1911, when the question of the strength in shear of a horizontal construction joint between the stem and flange of a T beam was referred by a Boston contracting firm to Professor L. J. Johnson for solution. A series of tests of reinforced concrete beams was undertaken at that time to assist in answering the question. The results of these are fully reported in the Proceedings of the American Society of Civil Engineers for February, 1913.

At the same time two other tests of a different nature were made with the same object in view. It is the purpose of this paper to describe briefly these other tests and report the results thereof. They consisted, one of pushing a conical plug large end first out of a surrounding ring or casing, the other of crushing a prism with a sharply inclined joint —the plug being cast a week later than the ring, and the upper part of the prism some days after the lower part.

For the first of these tests, three concrete rings were cast 8 inches thick, each with a tapered hole 8 inches in diameter at the top and 8¼ inches at the bottom. The cores for the holes were of wood, turned in a lathe and finished with shellac. Notwithstanding the smoothness of the cores, the concrete surface of the holes was somewhat rough, due to leanness of the concrete mixture, and to abrasion occasioned by withdrawing the cores. The rings were reinforced with three steel hoops.

When the rings were a week old they were inverted and placed on 2-inch planks in which circular holes 7½ inches in diameter had been cut. The holes in the rings were made concentric with those in the planks. The planks rested on the floor. Concrete was then poured in to within two inches of the top, and was carefully tamped. Thus a plug 8 inches long was cast in each ring, projecting two inches at the smaller end and lacking two inches of filling the hole at the larger end.

The specimens thus prepared were placed at various ages in the testing machine and the plugs pushed out. The strength of the joint in bond-shear is measured by the load required to start the plug.

* Instructor in Civil Engineering, Harvard University.

The numerical results of this test are presented in the following table:

No. of Specimen	*Age of Ring (days)*	*Age of Plug (days)*	*Total Load (lbs.)*	*Unit Bond Shear (lbs. per sq. in.)*
1	35	28	122,000	800
2	14	7	92,400	605
3	21	14	90,200	591
			Average	665

The unit shear is computed on the assumption that the intensity is uniform over the area of the plug in contact with the ring. The maximum intensity was certainly not less than the value thus obtained, and was probably much greater.

The load required to start the plug was the maximum reached, but the frictional resistance remained high, after the plug started falling off slowly as the motion proceeded.

The other test was of two 5 in. by 5 in. by 10 in. compression prisms. The forms for the prisms were first tilted over to within about 30 degrees of the horizontal and filled half full, the top of the concrete remaining level. The top surface was fairly smooth.

Four days later the forms were righted and filled up. The result was a prism with a diagonal joint. The surface of the old concrete was not scraped or otherwise treated in any way before placing the new.

The specimens are placed in the testing machine and a load applied longitudinally, as in a compression test.

Both specimens broke at the joint suddenly with a report, one at a load of 26,200 lbs., the other at 33,700 lbs. The ultimate unit bond-shear is computed to be 496 and 621 lbs. per sq. inch, respectively. The break on the joint was clean, no signs of abrasion appearing on the surfaces.

While these tests are hardly numerous enough to warrant any sweeping conclusions, they at least tend to show that the shearing stress on a construction joint between sections of concrete cast at different times, the newer concrete cast in contact with the older, may easily reach 500 lbs. per sq. inch wihout yielding, even when no reinforcement crosses the joint. How high a shear the joint can resist with reinforcement to hold the two parts together, is yet to be determined by tests. It may reasonably be expected to reach a higher value than that attained in these tests, though even here the pieces of concrete connected by the joint were to some extent prevented from separating. In the case of the rings and plugs, the shape of the specimens precluded any substantial tension on the joint, and with the prisms the component of the load normal to the joint induced compression.

The value for the bond shear reached in these tests, however, is high enough to warrant the placing of a vertical construction joint in the middle of spans where the unit shear would seldom exceed 25 lbs. per sq. in., and never 100 lbs. per sq. in. in a floor designed in accordance with present accepted practice.

* * *

A great business man has said that the greatest risk in business and government is our dependence upon lawyers and as for ministers and churches each person has his private opinion. No such opprobium can ever be cast upon the architect for he is a producer and creator, ever rearing structures for the good of civilization and as monuments to his own skill.

Steel in Building Work—II.

The Use of Structural Steel, Showing Maximum Results at Minimum Cost

By. J. R. GRANT, As. M. Can. So. C. E.*

When it is necessary to splice a very light column, it is best to use sufficient rivets to take care of the whole load as this saves the expense of milling or planing the ends. For heavy columns, it is best to mill the ends to give a true bearing of the different pieces, and use splice plates with only sufficient rivets to take care of the bending, and hold the members true to line. If the metal in the one section does not come directly over that in the other, it is necessary to use a bearing plate between the sections. All the pieces forming the section of a column should be the same length or it will not be possible to mill the ends after the member is assembled.

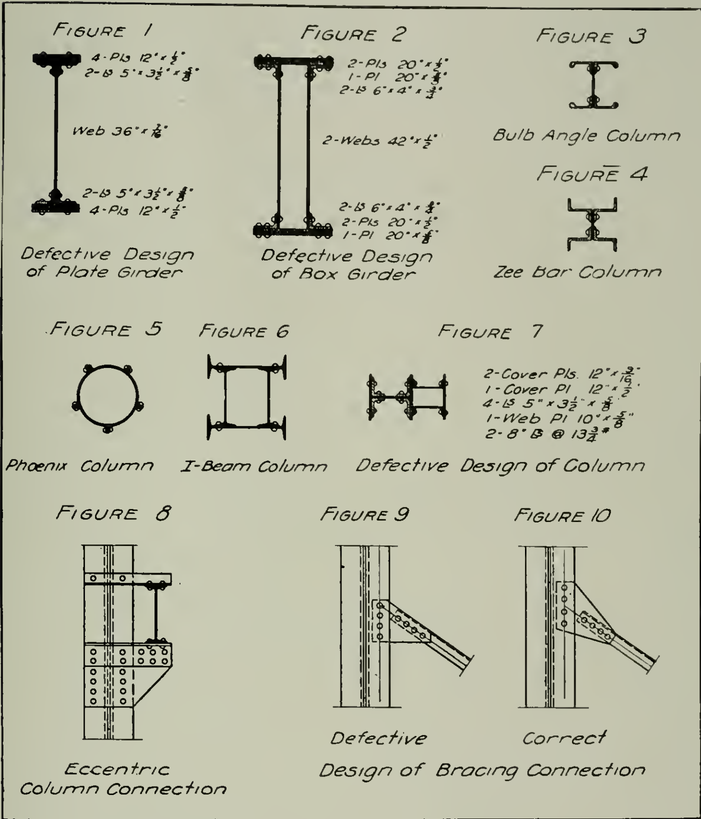
I have been building columns composed of four I beams arranged in shape of a box with the flanges of two of the beams projecting, as shown in Figure 6. This is the poorest column section I have ever seen. I can imagine no other excuse for using it than the possession of the material for which one would find no other use. In place of milling the ends of this section so as to transfer the stress from tier to tier, the outer beams were cut back a couple of feet so as to form a lap joint, and splice plates riveted to the lower section. This gave a very difficult and expensive piece of erection, and when erected the two halfs of the section did not come to a true bearing, but in places sheet metal was driven in between the two surfaces. The ends of the different pieces forming the section had been milled or finished before the columns were assembled, but this is practically of no value. To be effective for end bearing, the milling must be done after the section is assembled, and riveted together, and this can only be done when the ends are on one plane, and this plane must be perpendicular to the axis of the member.

The influence of the wind forces should be considered in column design, but it is not often necessary to increase the sections above those required for the dead and live load stresses, unless the building is very narrow or over twelve stories high, unless it be in the first or ground floor tier, where it is usually better to add the necessary material to the columns rather than use brackets or kneebraces, which would interfere with the architectural treatment.

Where special wind bracing is necessary, there are two methods that can be adopted, either of which will give the necessary stiffness. The most direct means is by the use of diagonal bracing such as was used for the Singer Tower, New York City. In this case each of the four corner panels is braced on all four sides. The bracing was arranged in alternate panels of shallow and deep diagonals so as to allow for windows and doors; diagonals were also used on the closed faces of the elevator shafts. One of the reasons why this was an economical arrangement for this building was that the panels were very small, being only twelve feet square. The tower is 60 feet square, so that large window openings are obtained in the three center 12 foot bays.

The most common method of stiffening a building to take care of the wind forces is by means of horizontal wind girders, and brackets or

* Conclusion of a paper read before the Victoria Branch, Canadian Society of Engineers.



STEEL IN BUILDING CONSTRUCTION

J. R. Grant
Nov. 19, 1912

kneebraces. Unless the kneebraces are run up half the story height this method gives bending stresses in the columns, but for buildings of ordinary height, this bending can easily be taken care of.

This method was adopted for the Metropolitan Life Building, New York City, the tower of which, 75 feet by 85 feet, is 48 stories high. The exterior faces alone are braced, at the corner columns, with kneebraces half a story high, at the center columns, with brackets having solid webs 8 feet 6 inches deep, including the wind girder. As the panel lengths were very long, this was the best system to adopt.

In the Woolworth Building, the steel work for which has just been completed, there is a tower about 85 feet square, and 55 stories high. For bracing they have used different systems for different floors, and different faces, using diagonal or X bracing, brackets, kneebraces or curved plate girder portal bracing, depending upon which best suited the architectural features. The curved plate girder portal bracing is usually too expensive to receive much consideration.

For mill buildings and similar structures where a wide open space is obtained by using steel columns and trusses. The wind forces are usually taken care of by kneebraces, and bending in the columns.

For an armory or rink roof, where the span is great, and the appearance is a consideration, it is best to use a steel arch, and carry the wind forces directly to the foundation by means of the arch truss.

The efficiency of kneebraces and diagonal bracing is sometimes very low on account of poor connections. Figure 9 shows the way in which this connection should not be made. Detail should be made as shown in Figure 10 where the center line of rivets connecting the bracing angle and the gusset plate, intersects the center of gravity of the group of rivets resisting the action of the angle.

A single angle if connected by only one leg as shown in Figures 9 and 10, has only that leg available for resisting tensile stresses. A clip angle must be used connecting the outstanding leg to the gusset plate if the whole net area is required.

Where it is desirable to obtain a clear open space on one of the lower stories of a high building, where the width is fifty feet or greater, it is often best to use trusses the depth of one floor, rather than shallow plate girders. The deflection is less, and the web members can be so arranged so as to leave good openings for doors and corridors. The trusses are lighter and very much easier to handle and erect than the heavy girders usually required.

In the design of trusses for buildings it is usually necessary to proportion the chords for the load from the floor, carried between panel points as well as the direct stress of compression or tension. If the outline of the truss is not the proper one for the location, the area required to resist the secondary stresses may be larger than that required for the direct load.

The top chord of the truss usually consists of two channels and a cover plate, the lower side being latticed. The channels should always be turned with the flanges outstanding. The cost of drivlny the rivets connecting the channel and cover plate is excessive if the flanges are turned in.

The web members should be made as narrow as possible in order not to use up too much of the floor space with the partitions, but it is absolutely necessary to fire proof every member of the trusses.

Very close inspection of the work in the field is required for trusses. The inspector must see that milled ends come to true bearing, and that all rivets are properly driven so as to fill the holes and grip the pieces connected firmly together.

During the erection of the steel frame, it is important to see that everything is plumb before the riveting of the beams, girders and columns splices is done. The neglect of this point even in a couple of tiers may lead to trouble in the elevator shafts.

Before allowing any of the steel work to be covered, the inspector should see that all rivets are driven. Loose rivets are of no value and should be cut out and redriven. If a rivet can not be driven a bolt should be substituted having a perfect driving fit in a reamed hole.

If the building is going to be a fire proof one, careful attention should be given to this point particularly for the columns. To wrap the column with wire mesh or expanded metal and incase in concrete, is the best method. The floor space taken up by the fireproofing is a minimum, and the fireproofing besides being able to withstand the action of fire, is able to resist a strong stream of water such as is thrown by the high pressure systems which cities are apt to install.

Plaster block is the most easily applied, but it uses up a large portion of the floor space, and it is not practicable to so anchor it to the column so as to prevent its being loosened or knocked out of place, thus exposing the column to the heat of a fire with the chance of the destruction of the whole building.

For columns it is best to use a cast iron base or if the load is large, cast steel may be cheaper. These should be designed for the loads they have to carry, and a factor of safety used to allow for the defects which are always present in cast material.

The design should be such that with the necessary strength the pattern is a simple one, and not difficult to cast in the foundry. Duplication is one of the greatest factors in reducing the price of castings.

For high buildings not built on a rock, the most important point is the foundation. It is not alone the safe bearing capacity of the material which has to be considered, but it is necessary to have the load per sq. foot uniform so that the settlement which is always present may be the same for all columns.

The bearing capacity of the soil should be reduced to the dead load equivalent for the column having the largest proportion of live to dead load, and all footings should be proportioned for the dead load only, at this value. If the footings are not properly proportioned, cracks are very apt to occur due to unequal settlement.

* * *

The Strength of Cement*

By H. C. JOHNSON, C. E.

THE main object in writing this paper is to show the wide range of strengths as indicated by these tests.

To many people it is, undoubtedly, a fact that any bag marked "Portland Cement" is just as good value as any other bag so marked, and also that—

(a) The cheapest cement is the most economical to use.

(b) Testing a cement with a "name" is unnecessary.

(c) The value of fine grinding is not considered, even if its advantages are known.

(d) The paste tensile 7 days' test is quite sufficient guide to a cement's value as a "binding" material.

That these conclusions are erroneous, the author will not be the first to point out.

The results of these tests are therefore put forward with the object of calling further attention to the importance of testing all materials entering into constructional works, in which they will be called upon to do their duty, with a predetermined factor of safety. This factor, if due attention be paid to excellence of materials in every particular, may reasonably be reduced from the customary 4 or 6 to 3 or 4½.

The term "Paste" here used means neat cement and water. The term "Mortar" means one part cement to three parts standard sand and water.

*Abstract of a paper read before the Concrete Institute, London, England.

From the detailed results of his experiments the author drew the following conclusions:

1. That a good strength in paste is no proper indication of a good strength in concrete.

2. That the best tests of a cement's value for reinforced concrete or similar work are—
   (a) Mortar compression cured in water,
   (b) Mortar compression cured in air,
and in addition to having to show a certain strength, any cement having a higher value in air than in water to be condemned.

3. That not less than 22 per cent of water be allowed in gauging paste, and not less than 3 per cent plus ¼ the percentage as used in the paste, in gauging mortar.

4. That the standard of values for cement to be used in reinforced concrete work be raised by 25 per cent—not that a cement only just passing the British standard specification is to be condemned for average work, but in order that first-class cements only shall enter into reinforced concrete structures; engineers may then reasonably expect to be able, in the near future, to use 1,000 lb. per square inch on concrete instead of 600 lb.

5. That for a given expenditure on cement a first-class one will allow a saving, since there will be—
   (a) Less cement to pay carriage on,
   (b) Less cement to handle.
   (c) Less sacks to clean, tie up and return,
   (d) With at least as strong a concrete.

6. That a given strength of cement should be specified, instead of a given mix—which does not take into account the proper proportioning of aggregate—even if a cement of first quality is used.

7. That cement should be sold by volume instead of by weight and in bags containing one cubic foot, to allow of quicker and easier handling. These bags should be made of paper for preference, this being the common practice in the United States. Among the advantages the author noted that paper bags have over canvas ones are:
   (a) No time is lost in shaking out the cement.
   (b) No cement is retained by the sacks.
   (c) There is no return freight on empties.
   (d) The packages are better looked after in storage
   (e) Cement is kept in better condition.

* * *

Not Reinforced Concrete

Mr. and Mrs. Aschenbrenner were touring Europe, and had just arrived at Pisa. Mrs. Aschenbrenner was all excited upon reaching the leaning tower of Pisa, and eagerly pattered up the spiral stairway, leaving her husband languidly awaiting her return.

As she weighed a shade over 200 pounds her husband always dug up an excuse when it came to accompanying her on any altitudes above easy falling distance.

He was just pondering on the beautiful flow of unintelligible language used by their guide when from the top-most rampart came the "Hi-lee, Hi-lo" trill of his wife who was leaning far out and waving a scarf.

Mr. Aschenbrenner obligingly looked up and then came to life with an anguished roar:

"Gretchen, for your life get back. You're bendin' the building!"

Concrete and Brick Work for Curtain Walls

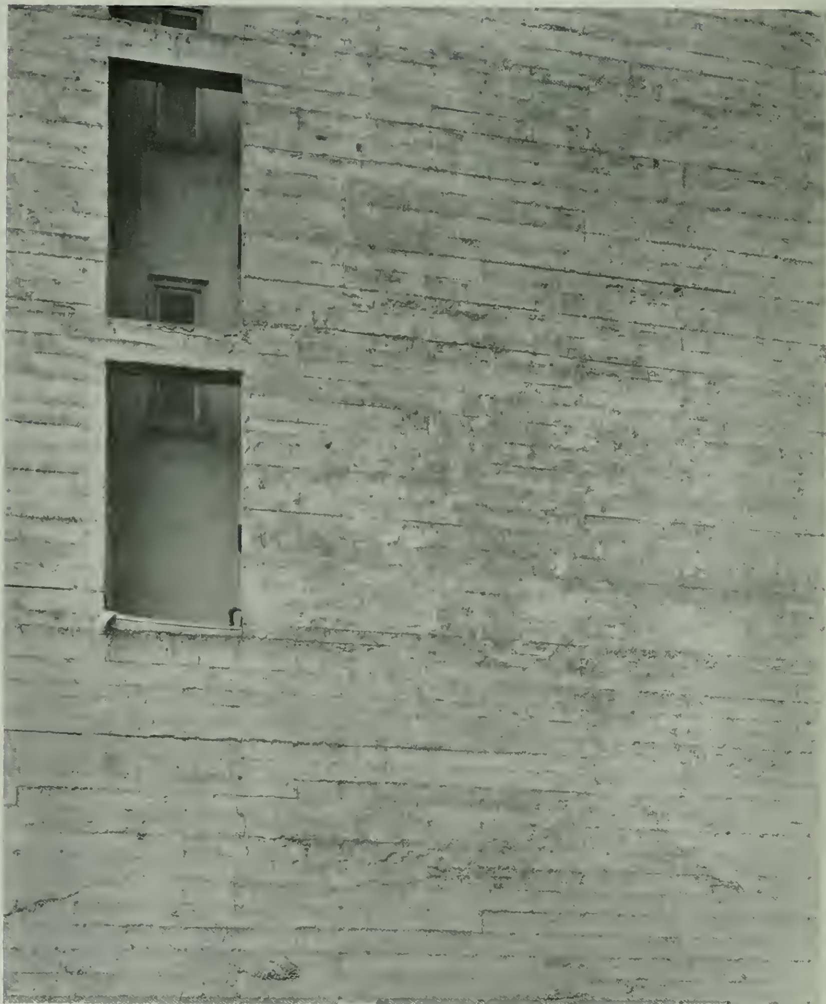
By NATHANIEL ELLERY, C. E.*

Much has been written relative to the merits of concrete in the construction of curtain walls of buildings of steel frame construction. I do not propose to discuss that type of building which is constructed, structurally, entirely of reinforced concrete but only the features of brick work and reinforced concrete for curtain or enclosing walls of steel frame buildings, that is, the relative merits of 8½-inch reinforced brickwork walls as opposed to 6-inch reinforced concrete walls.

In the various discussions which we hear relative to the values of these two methods of constructing the enclosing walls of buildings, we seldom hear anything said in direct argument against the brickwork construction, for the reason there is very little to be said. In general it is asserted positively by the inexperienced, mercenary or ignorant, that concrete is the new, that brickwork is the old; therefore, out with the old and in with the new. "The King is dead; God save the King." It is new and, therefore, must be the best. As the fashion in women's adornment changes, so must the fashion in the construction of the vital parts of buildings. The advocates of concrete say that concrete walls are of "monolithic" construction. The dictionary says monolith means "a column formed of a single stone." Obviously then a "monolithic" wall means one constructed as if it were a single stone. A large majority of the reinforced concrete walls in this city have more the appearance of mosaic.

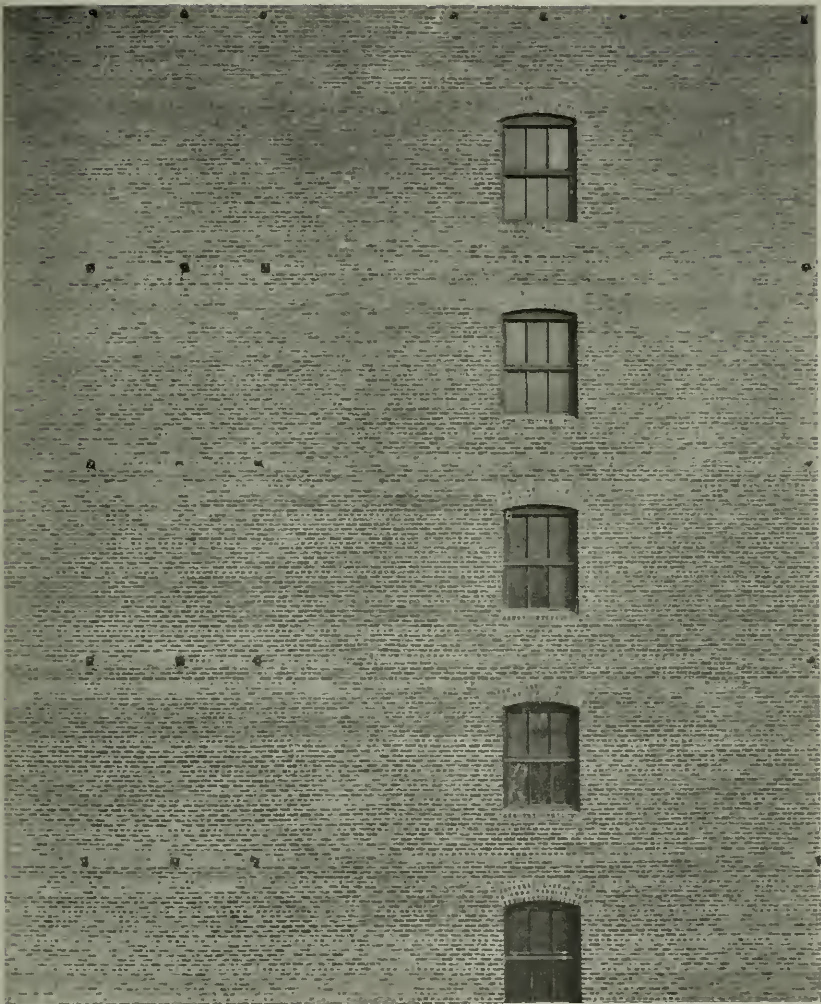
All of these walls are poured from the floor above, with an allowed space by law of 2 inches (and often this is less, although illegal) between the steel beam and the forms. This necessitates the concrete being dropped from 10 to 20 feet, or even more, which is universally considered, by competent engineers, to be poor practice, it causing an unequal distribution of the cement through the mass, and since cement is the binder, then the concrete in different sections of the walls is of unequal strength. Also, this great fall concentrating the cement leaves many sections more or less free of this material and at stripping shows "pockets" of concrete which are so weak as to frequently fall out. It must be rammed or tamped through this narrow space of 2 inches; it must, or rather should (but never does, it being impracticable), be made to fill up closely under the girders. This method of tamping and pouring, which is practically the only one to be used economically, cannot be made to properly distribute a properly proportioned mixture of concrete. No matter how well your materials are tested and are even properly mixed at the mixers, you cannot know what the mixture is in the wall. Note the invariable patching necessary after the stripping of the forms. Again, on contract work, and practically all this class of work is locally done by contract, there is the chance of the improper mixture of the materials, to cause a saving of the most expensive and the most necessary material, the cement. Even though the contractor may be honest and instructs his foreman in charge to follow the specifications, that foreman may not be so honest and against the order of his superior will cut the cement in order to make the job pay. Few people realize this important feature of the contracting game. They say, "Why should the foreman cut the cement where he is drawing a salary and gets no commission on the job?" The reason is obvious. He is making good with his firm and when his employer, seeing what he thinks a good job done at an unusual profit, readily compliments this man on the management of the work and assures him of the next opening,

* The publishers do not hold themselves responsible for opinions expressed or statements made in this article.



Reinforced Concrete Wall on Steel Frame Nine-Story Building. Wall Six Inches Thick. Cost to Owner 35 Cents a Square Foot of Surface.

frequently to the detriment of some more honest man. Again, a majority of journeymen think honestly that they know more of the particular branch of building construction in which they are employed than the



Reinforced Brick Wall on Steel Frame Eight-Story Building. Wall Eight and One-Half Inches Thick. Cost to Owner 25 Cents a Square Foot of Surface.

architect, superintendent or engineer and may frequently change things to suit themselves. It is the most difficult material to inspect, efficiently, that enters into the structural portion of a building. Again, there is the feature of carelessness. Another trouble is that none of the defects in concrete construction can be discovered until after stripping, say two or three weeks after pouring, when the walls will have gone several stories above, making it practically impossible to correct the faulty construction. And thus, thereafter, the man who pays must spend his days in the torment of damp-proof paint peddlers, not to mention his monetary loss.

As against this uncertain method of construction we have the time honored wall of brick masonry. All who saw the ruins after the fire of 1906 marveled at how well the walls of the tall buildings stood the conflagration. Invariably these were curtain walls of brickwork construction. On Mission Street near Sixth stands a monument in concrete construction; the west wall leaked, of course, and finally after other experiments it was covered over with felt or burlap and asphaltum—practically roofed; the front and several feet return on the west wall was of concrete and cement plastered. A fire occurred in the two-story building adjoining and the aforesaid "roofing" took fire, the heat affecting the cement mortar and concrete at and near the corner to such an extent as to cause it to pop off in great quantities, creating a rain of materials on the fire engine at the curb so that the engineer was forced to leave his engine temporarily to save himself from harm. This fact is merely mentioned to show the effect of fire, or heat, on concrete. No such result would have occurred had the wall been of brickwork.

Brickwork is easily inspected. Any experienced superintendent knows good bricks when he sees them and the mortar can be easily watched. Likewise, defective laying can be readily detected. If a section of wall is found defective it can be removed and replaced, readily and quickly, without causing delay to the building. In the 8½-inch reinforced brick walls the rods are bolted rigidly to the frame at each story and cannot be shifted from their position and are sure to be in the center of the wall, where the designer wished them placed. In the case of the usual reinforced concrete wall they are "wired" to their position. This wiring is more or less a joke and I doubt if there is a single job of concrete construction in the City where the rods are placed in their intended position, so as to preserve this position, within fifty per cent of where the designing engineer intended.

As to service, ask anyone how long a brick wall will last if built on a proper foundation, without showing cracks, and he will laugh at you. There is practically no limit to its durability, in a perfect condition, yet if you try to find a reinforced concrete curtain wall in San Francisco which has stood four years without showing cracks, you would have a task. I believe fully ninety per cent of the buildings of this construction show cracks.

The market today is flooded with so-called "damp-proof paints." There was hardly a material of this nature sold before concrete came into such frequent use for the walls of buildings. A defective material, thus used, caused hundreds of manufacturers to jump into the manufacture of these so-called "damp-proof paints," just as buzzards follow an army of destruction or a pestilence, in short, trading on a calamity.

A few years ago not many men in the building business knew what damp-proof paint was; today many firms are engaged in this business exclusively, either of manufacturing or applying this so-called "remedy" of a "recent felt want."

Practically every job of exterior cement plastering in San Francisco which has been done on a brick wall is in perfect condition; practically every job done on a concrete backing which has been on for four or five years is badly defective. Many of the old and beautiful cement finished buildings of the Colonial type, in the Eastern and Southern states, stand today, many of them a hundred years old, proving the efficiency of cement plaster on brickwork. I know of no cement plastered concrete building of four years of age that is not cracked.

Many architects and engineers, honestly and conscientiously, advocate the use of reinforced concrete for curtain walls, believing it to be a cheaper form of construction, while as a matter of fact the brickwork is not only the better but is also the cheaper. I do not mean the ultimate expense alone, but the first cost, not considering the yearly treatment of damp-proofing necessary on concrete walls, patching of the cement plastering or other treatment applied to the surface for purposes of decoration. A 6-inch reinforced concrete curtain wall made of good concrete and reinforced with a 6-inch by 6-inch mesh fabric of No. 6 wire (and this mesh does not meet the requirements of the San Francisco building law but its use is permitted) will cost from 32 to 38 cents per square foot at about the fourth floor height above the ground, according to whom you ask. A reinforced 8½-inch brick wall, laid up in good lime and cement mortar, in full compliance with the law and legally reinforced can be done at a cost of 25 cents per surface foot including the reinforcement. Of course this may be questioned by those favoring concrete construction. Let any layman who contemplates building such a building, on his own initiative, call on representative concerns in these two lines of business and ask. Truth will prevail and he will find that the foregoing statement is very conservative. If this is right, then concrete curtain walls cost the owner at least thirty per cent more than walls of reinforced brickwork.

While it is true that the weight of an 8½-inch reinforced brick wall is in excess of that of a 6-inch reinforced concrete wall, the difference is but slight. Basing my calculations on the weights of materials specified in the San Francisco building laws, the difference in weight is about 16 pounds per superficial foot.

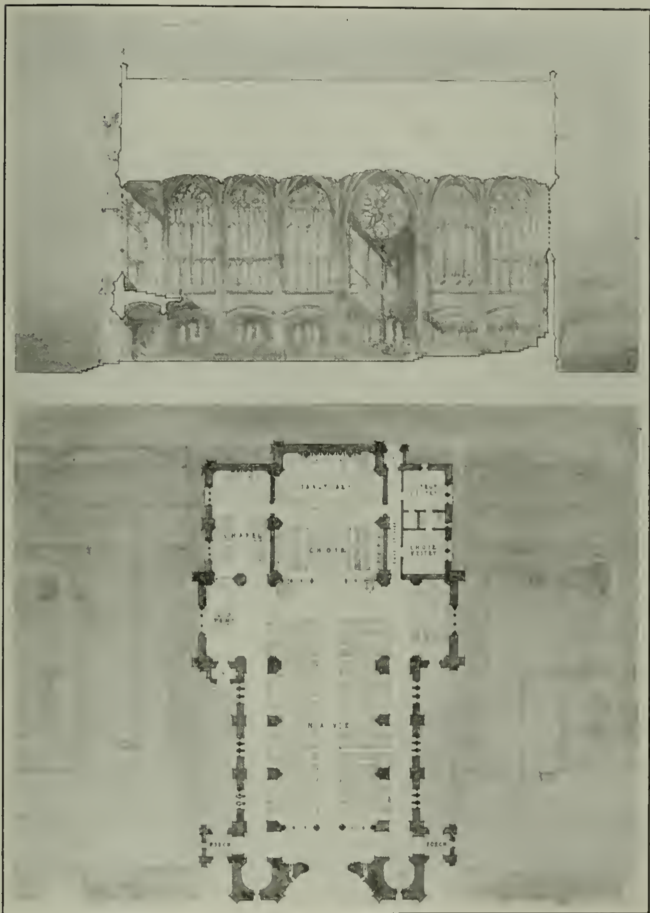
Take the case of a ten-story building, with story heights of 12'-0" from floor to floor and the columns placed 15'-0" apart on centers. A 6-inch reinforced concrete wall would require for the spandrel beams, exclusive of the floor load, a 9-inch by 21 pound "I" beam and an 8½-inch brick wall would require a 10-inch by 25 pound "I" beam, or an excess of 4 pounds of steel per foot of beam, which gives 60 pounds per bay of 180 square feet. Figuring structural steel at $80.00 per ton, which is a high price, this would amount to $2.40 per bay, or less than 1.4 cents per square foot of wall. Taking an average at the fifth story we find there is an excess load on the columns of 7.2 tons, requiring about 1⅓ square inches additional area of steel. Thus we have 4.6 pounds per foot, making 276 pounds per column, which costs $11.04 per column, or about .6 cents per superficial foot of wall. It is readily seen that this total cost per square foot of wall, for the increased weight of the steel frame, is only 2 cents per square foot of wall. The additional cost on account of the increased load on the footing is trivial, the above mentioned case of a ten-story building requiring less than four additional square feet of area of footing, calculating the bearing value of the soil at 4 tons per square foot.

The appearance of the completed wall should also be considered, particularly in San Francisco, where there are so many vacant lots which expose the side and rear walls to the view. There is nothing more distasteful to the eye than a rough concrete wall. The side of an old planked barn is far more pleasing. A neatly laid, red, common brick wall with white joints is very pleasing, in fact, the use of red bricks on the fronts of large buildings is coming into use very extensively. Many of the largest and finest buildings now being constructed in the large cities of the East have their fronts of red brick, either pressed, wire cut or tapestried.

ARCHITECTURAL LEAGUE
OF THE
PACIFIC COAST (Official)

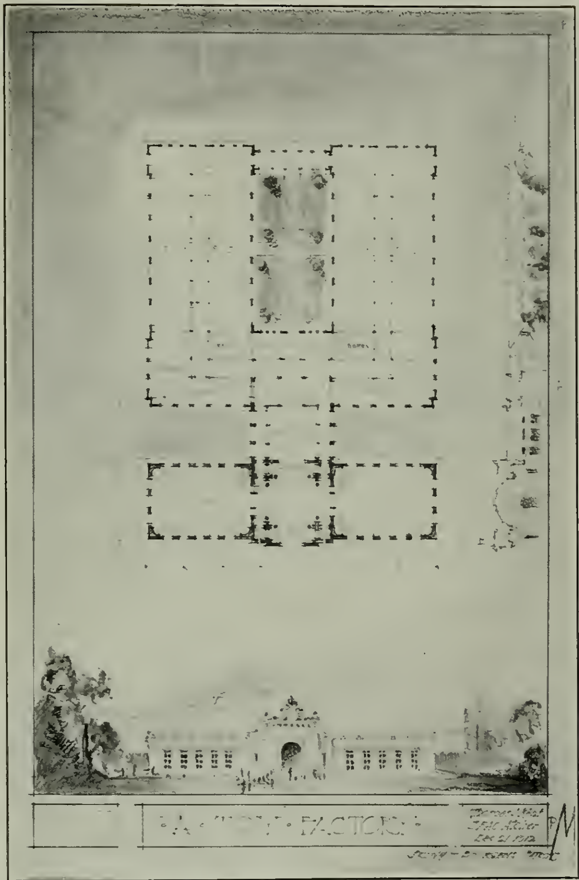
Some Mentions of Recent Atelier Work

A Public Drinking Fountain.
A Harcos, San Francisco Architectural Club.



Plan and Section A City Church, by H. C. White, San Francisco Architectural Club.

Elevation A City Church, by H. C. White.



A Toy Factory by Thomas J. Kent
San Francisco Architectural Club Atelier

DEVICES OF MERIT THE UP-TO-DATE ARCHITECT SHOULD SPECIFY

In this Department there will be printed from time to time articles dealing with new materials and inventions that appeal to the intelligent builder as desirable from both the practical and money saving standpoints.

Capitol Building, Sacramento, Cal.

Automatic Temperature Regulation

Thermostat Cover

WHILE automatic temperature regulation has for many years been accepted by architects and engineers throughout the East, as a necessity for the economical operation of heating plants, it was not until the first installations were put into use in California—about ten years ago—that the western architects and engineers began to realize the importance of temperature regulation. The most progressive adopted it at once, while others followed their lead, until today hundreds of installations testify to both the success and necessity of automatic temperature regulation in the moderate climate of California.

It is the very moderateness of our climate that makes temperature regulation so important an adjunct to our heating plants. Nowhere will you find more complete or up-to-date heating and ventilating plants than are being installed in our buildings today, but unless these plants are automatically controlled by thermostats we lose the benefit of comfort and economy through over-heating or under-heating of the building.

Outdoor changes of temperature, while not extreme, are more or less rapid, and manual control can never keep pace with the outside conditions or preserve an even and proper temperature within our buildings. While the mornings are cool enough to require artificial heat, as the day progresses the temperature rapidly rises to a point where artificial heat is no longer necessary and a continuation will result in over-heating. Sun and wind have their effect in producing uneven temperatures in buildings, to an extent where it is impossible to offset these conditions by manual control of the heat sources. An attempt at manual control usually results in the occupants resigning themselves to the discomforts and unhealthful conditions which the expensive heating plant in the building was intended to overcome.

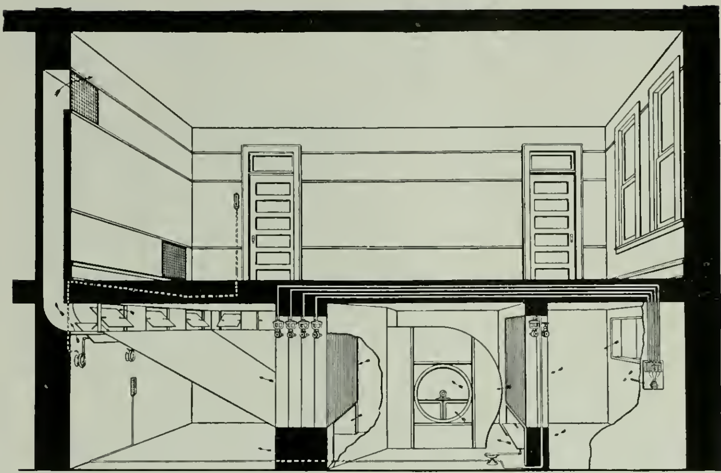
Second Church, Christian Scientists, Los Angeles, Cal.

Temperature regulation devices, which were invented in the early eighties by Warren S. Johnson of Wisconsin, Professor of Physics and Chemistry, take entire automatic charge of the heat sources, with a resulting even temperature throughout the building and increased economy in the operation of the heating plant, through the saving of heat. Thermostats located in each room turn on or shut off the heat to that particular room, just as needed, and maintain any temperature desired, within a variation of one degree.

Rooms with Southern exposure, under the influence of the sun, tend to heat up much more rapidly than rooms on the north side of a building. The thermostat prevents over-heating of the south rooms, by shutting off the heat when the temperature rises to the desired point, and reserves the extra heat for use in heating up the colder rooms on the north side of the building. There is no other way to successfully prevent the over-heating of some rooms of a building, while raising other rooms to a proper temperature except by Automatic Temperature Regulation. This is especially true of steam blast or fan furnace heating plants.

U. S. Customs Building, San Francisco, Cal.

The introduction of fan ventilating—a most important factor in churches, schools and public buildings—further complicates manual control, and in fact makes automatic control an absolute necessity. The large volume of air forced to the rooms by the fan must be properly heated to prevent cold draughts in the rooms. Over-heating of this air will result in the over-heating of the rooms. The velocity of the air required for ventilation purposes is so great that neglect of the heat sources



Plenum Hot Blast Heating System with Temperature Regulation

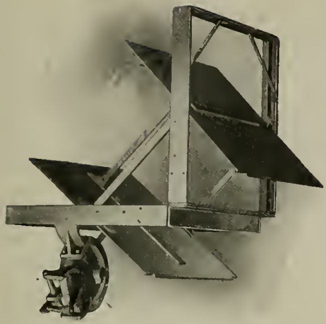
will in a few moments render the air either too hot or too cold. With the rising and falling outside temperatures, hand control, therefore, is neither practicable nor efficient. Temperature control thermostats should be located in the ventilating air duct, controlling the sources supplying heat to the ventilating air, in order to maintain the proper and constant temperature required.

The above is but a slight insight into the uses of thermostatic control, but will at once suggest the great possibilities of this device for all purposes where regulation of temperature is desired. Thermostatic control is used for many different purposes, such as regulating the temperature of water in hot water tanks, preventing the rise of temperature in cold storage plants, special manufacturing processes where a constant temperature is an advantage or a necessity in turning out perfect products.

Thermostat Without Cover

The illustrations show a few of the many fine buildings in California equipped with "Johnson" thermostatic control. School authorities have been quick to adopt this device for protecting the health and comfort of the pupils, as well as to effect a very appreciable saving in the cost of operation of the heating plants. Johnson control is in active operation in sixty-one school buildings in San Francisco and Oakland alone, as well as schools in Sacramento, Stockton, Santa Rosa, San Mateo, Berkeley, Fresno, Bakersfield, Los Angeles, Pasadena, San Diego and many other places. This shows conclusively that there

Thermostatic Control Valve

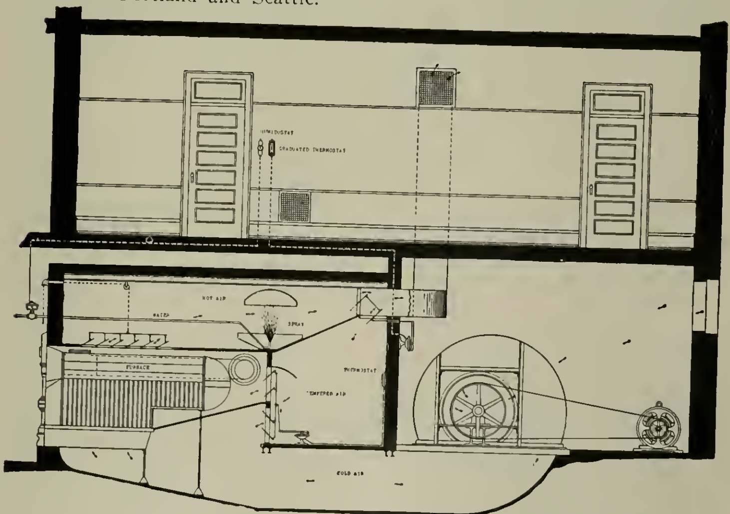


Mixing Damper with Attached Motor

is no part of California, even as far south as San Diego, where Johnson control is not an advantage and necessity.

The Johnson thermostat is the result of thirty years of practical experience. It is operated by compressed air, furnished by either steam, electric or hydraulic type of air compressor — usually located in the basement of the building and supplied to the thermostats through small pipes concealed in the walls. It is extremely simple in design, and will operate a steam-valve quickly and positively, or a mixing damper, such as shown in the accompanying illustration, with graduated action if desired. The mixing damper shown is the type used in hot blast heating plants, or in furnace blast plants, shown in illustrations, and is designed to deliver hot and cold or mixed air to the rooms. This damper is operated by a thermostat located in the room, and it will readily be seen that the damper will supply the required amount of hot and tempered air to maintain the required temperature in the room, without interfering with the ventilation.

The control and supply of humidity to the air, as shown in connection with the furnace blast plant, is equally adaptable to all other forms of heating plants. The Johnson Service Company, who manufacture and install this device, maintain offices at San Francisco and Los Angeles, as well as Portland and Seattle.



Furnoce Blast System of Heating with Temperature Regulation ond Humidity Control

The Skyscraper Parasite

WHAT the "Great White Plague" is to the human race, electrolysis may be to the skyscraper. Just as the worm eats into the hull of the ship, so may stray electric currents disintegrate the texture of the steel fabric of the skyscraper, and when it does the disaster will be measured only in proportion to the height and population of the building. Harnessed electricity has proven itself civilization's greatest boon of the century, but stray electric currents may become a source of incalculable danger. As an illustration of the acknowledged danger of electrolysis, a bill was recently introduced in the City Council of Chicago, compelling the street railway companies to equip their plants with a "negative booster," at a cost estimated by the city authorities at approximately $3,000,000, but estimated by the transit companies at $20,000,000. This bill has been contested by the railway companies on the basis that its cost is confiscatory.

That electric currents have been escaping from various sources of public supply for some time has long been known. It is not infrequently that mechanics repairing gas and water pipes have received shocks from stray currents and gas escaping from broken pipes has been known to be ignited thereby. In the city of Chicago conditions are recognized. What they may be in New York we can only guess, but with wires of large voltage leading from central stations for the supply of light and power; third rails for the supply of the subway and elevated and intricate telephone, telegraph and other services, the leakage must be enormous. What damage is being done we cannot tell, but experts in Chicago reported that in one building examined, the steel columns were being disintegrated at the rate of a pound an hour, and it is hardly credible that New York and other large skyscraper centers are exempt.

A gruesome feature of the danger is that high voltage is not essential to the accomplishment of these results, experiments having proven that even one volt can produce disintegration in either steel or wrought iron.

* * *

A New Gould Story

George Gould was making one of his last trips as president of the Missouri Pacific. His private car was laid out on a siding for some reason or other, and he got out to stretch his legs. An old Irishman was tapping the wheels. Gould went up to him.

"Morning. How do you like the wheels?"

"Not worth a darn," said the Irishman.

"Well, how do you like the car?"

"It's good 'nough for the wheels."

"What do you think of the road?"

"It matches the car."

Gould looked at the old chap for a minute.

"Maybe you don't know who I am."

"Yes, I do," retorted the Irishman. "You're George Gould, and I knew your father when he was president of the road. And, by gob, he's going to be president of it again."

"Why, my father is dead," said Mr. Gould.

"I know that," replied the Irishman, "and the road is going to hell."

Among the Architects

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Bad Luck for Riverside Portland Cement Company

The first misfortune that has befallen the Riverside Portland Cement Co. since it started the operation of its mills near Riverside five years ago, occurred recently when a premature explosion of dynamite killed ten or eleven workmen.

WORK IN ARCHITECTS' OFFICES

SAN FRANCISCO

WILLIS POLK & COMPANY are preparing working drawings for a ten-story addition to the Mills Building. It will occupy the lot on Bush street between the present Mills Building and the new Standard Oil Building. Construction will be Class A, and the estimated cost is $500,000. The same architect has completed plans for a three-story reinforced concrete garage at Twenty-fourth street and Broadway, Oakland, for Cuyler Lee. The building will be 100 feet square.

JOHN BAUR, Clunie Building, has prepared plans for an addition to the Fabiola Hospital in Oakland. Construction will be frame. Bids have been taken, but no contract has been let. The same architect has let contracts for an addition to the Parisian Dyeing & Cleaning Works on Tenth street, San Francisco.

DAVID C. COLEMAN, Merchants' National Bank Building, has completed plans for a three-story Class C restaurant and hotel for Wm. C. Streuli on Grant avenue, near Bush street, also two fine residences in Jordan Park for M. Fisher and another client.

HARRY SKIDMORE, Foxcroft Building, has completed plans for a six-story Class C apartment house for Mr. Burnett, and which will be erected by segregated contracts. The building was originally designed to be Class A.

WELSH & CAREY, Merchants' National Bank Building, have made plans for a modern French bakery to be erected on Howard street, between Eighth and Ninth streets, at an estimated cost of $35,000. There will also be a stable. Construction will be brick, with the interior of the bakery finished in white glazed tile.

J. J. FOLEY, Maskey Building, has plans under way for a five-story Class C apartment house in San Francisco and an orphanage in Berkeley. He has let contracts for a $30,000 Catholic church in Modesto and two store buildings in Burlingame. He has also made plans for a three-story concrete hotel in Burlingame. Contracts have been let for an apartment house at Cedar avenue and Octavia street for A. Solari. Mr. Foley is letting final contracts for the completing of St. Joseph's church, a steel frame edifice under construction on Howard street.

ROUSSEAU & ROUSSEAU, Monadnock Building, are among the busiest architects in San Francisco. They have over $250,000 worth of work under way and in prospect. Recent contracts let include a three-story brick apartment house on Ellis street, east of Polk, for Mrs. Joan Ruddy; a five-story Class C apartment hotel for P. J. Gartland on Geary street, west of Larkin, to cost $50,000; a garage in Oakland, and several smaller apartments, ranging in cost from $8,000 to $15,000.

HERMAN BARTH, 12 Geary street, has completed plans and taken bids for a four-story and basement Class C store and hotel to be erected on Clay street, near Stockton, for the Joseph Banchau estate. Building will cost about $30,000, and will be equipped with a steam heating plant and elevator.

EDWARD T. FOULKES, Crocker Building, will soon commence the construction of a $40,000 two-story store and hotel building for Judge Frank Short at Fresno. A contract recently was awarded by Mr. Foulkes for an attractive $8,000 residence in Claremont, Oakland, for A. S. Connor. Mr. Foulkes has several buildings under construction and in prospect in Portland, Oregon.

LEWIS M. GARDNER, Phelan Building, has let segregated contracts for a four-story brick hotel to be erected at Sixth and Minna streets for the Lange Investment Company. Building will contain 16 rooms to a floor, and will be equipped with an elevator, steam heat, vacuum cleaning plant, hot water service, etc. The exterior will be of red pressed brick.

MAXWELL G. BUGBEE, Lick Building, has let contracts the past month totaling over $100,000. The work includes a $60,000 apartment house on Bush street for Charles A. Stanton, an apartment flat building on Carl street for Peter D. Bernhard, a residence in San Anselmo for Geo. Breck, and an addition to the Hotel Alta Mira at Sausalito, the latter to cost about $10,000.

W. G. HIND, Maskey Building, has plans on the boards for three modern apartment houses to cost from $15,000 to $30,000 each. He has recently let contracts for a $30,000 frame apartment house to be erected on the south side of Washington street, near Jones, for Dr. Clyde S. Payne.

HERBERT SCHMIDT, Royal Insurance Building, has completed plans and taken bids for a $20,000 country residence at Burlingame for Bernard W. Ford.

* * *

SACRAMENTO

E. C. HEMMINGS, Diepenbroch Building, has, besides the Y. M. C. A. Building, which is in course of construction, new work in prospect amounting to over $100,000. This includes a $30,000 addition to the Windsor Hotel at Eighth and J streets, a waiting station at Oak Park and a church for the Unitarian Society.

CLARENCE CUFF, 530 Ochsner Building, has plans under way for a fire-proof warehouse to be erected on B street, near Eleventh, for the Sacramento Warehouse Company, and which will cost about $100,000. The same architect is preparing plans for an auditorium and builders' exhibition hall.

THEATER—Turner & Danken, who recently purchased from the Native Sons a 90 by 160-foot lot on K street, between Eleventh and Twelfth, Sacramento, expect to begin work on their new theater building, which will be constructed at a cost of $75,000, within the next sixty days. Plans are now being prepared by a San Francisco architect.

NATIVE SONS' HALL—The Sacramento Native Sons' Hall Association will erect a four-story building 60 by 160 feet. The structure will be on a foundation capable of sustaining ten stories. The ground floor will be devoted to stores. The building will cost about $90,000. The Board of Directors include Edward Kraus, chairman; V. E. Kohler, vice-chairman; S. E. Pope, treasurer; Percy West, secretary.

* * *

RICHMOND

JAMES NARBITT, 519 MacDonald avenue, has plans for a four-story and basement brick factory to be erected in Richmond for the Rebuilt Typewriter Co. of America. The building will cost approximately $40,000. The same architect has recently let contracts for a handsome Elks' building, to cost in the neighborhood of $60,000.

* * *

BERKELEY

W. H. RATCLIFFE, JR., First National Bank Building, has over $100,000 worth of work on the boards and under construction. The latter includes a $35,000 apartment house for the Alameda County Investment Company on College avenue, a $20,000 residence for T. M. Shearman in Piedmont, a residence for Mrs. J. H. Fuller on Bellevue avenue, a reinforced concrete house at Concord for L. Olsen, and a store building in Bakersfield.

* * *

OTHER CALIFORNIA TOWNS

MODESTO HOTEL TO BE COMPLETED—Indications are that the Crow-Hogin hotel, the concrete foundations of which, at Eleventh and H streets, Modesto, were laid nine months ago, will be built without further delay. The original plans provide for a four-story modern hotel. The property is 100x140 feet.

LODI HOTEL—Contracts have been let for the Hotel Lodi. The approximate cost of the hotel will be about $50,000.

BANK IMPROVEMENTS—Woodland (Yolo Co.). The Yolo County Savings Bank is contemplating improvements approximating $25,000. The building will be enlarged and remodeled.

TURLOCK'S THEATER—A number of the leading business men of Turlock have formed a stock company for the purpose of erecting a new theater, and Architect W. H. Weeks of San Francisco has already submitted plans and specifications for the building.

EIGHT-STORY OAKLAND BUILDING — Plans have been been drawn for an eight-story building at the northwest corner of Grove and Twelfth streets; the lease has been secured by the George Austin Company, and the building will be constructed by the Brugiere Company.

SANTA ROSA BUILDING—Mrs. William H. Upton has begun the construction of a two-story business and apartment house at the northwest corner of Fifth and Mendocino avenue, Santa Rosa. The contract has been let to James O Kuykendall of San Francisco.

Associated With Edward T. Foulkes

After an absence of several years in Boston and other parts of New England, where he was engaged in architectural designing and engineering, Chester J. Hogue has returned to Portland and has become associated with Edward T. Foulkes, of Portland and San Francisco. Mr. Hogue is a brother of Judge H. W. Hogue and son of the late H. A. Hogue.

Although he only recently established an office in Portland, Mr. Foulkes has prepared plans for several important buildings, including an eight-story hotel on Broadway, the H. L. Pittock residence, Dr. A. S. Nichols' residence and several other fine homes.

Mr. Foulkes and Mr. Hogue are graduates of the Boston Institute of Technology, both having won high honors in engineering and architectural designing.

Architects Who Will Decide California's Best School Buildings

A rather difficult task has been assigned to a committee of California architects—that of determining to the satisfaction of the State Superintendent of Public Instruction what constitute the best designed school houses in the cities and counties of the state, the selections to be made from plans and photographs submitted by the various school superintendents and principals. The idea is to provide a useful handbook for schools that contemplate new buildings. The following architects have been chosen by Superintendent Hyatt to pass judgment:

Lewis P. Hobart, chairman, San Francisco; Chas. H. Cheney, secretary, San Francisco; Robert Farquhar, Los Angeles; J. J. Donovan, Oakland; J. W. Woollett, State architect; Chas. S. Kaiser, Sacramento.

Personal

Architect E. T. Osborn, formerly associated with Charles C. Frye in San Francisco, has established himself in Sacramento with offices in the Ochsner Building.

Alex F. Oakey has been employed by Willis Polk & Co. to take charge of the acoustics in the new $1,000,000 municipal opera house, plans for which are being prepared by Mr. Polk. Mr. Oakey is one of the few men in this country who has made a special study of the science of acoustics.

Architect William Curlett of William Curlett & Son has been seriously ill in Los Angeles. Since this firm opened a Southern California office it has handled over $1,250,000 worth of work in the Angel City, the elder Mr. Curlett being in charge. The San Francisco office has been looked after by Curlett, junior, and Mr. Gottschalk.

Architect V. O. Wallingford, author of the excellent article on "Patent Medicine House Planning," which appeared in the April Architect and Engineer and who for several years was connected with the engineering department of the Santa Fe Railroad, lately stationed at San Bernardino, is now in charge of the San Diego office of Architect Norman F. Marsh, with offices at 623 Timken Building.

Infirmary Competition Jury.

With the appointment of Architect Henry A. Schulze, representing the competitors in the Alameda county infirmary contest, through the American Institute of Architects, the board of supervisors completed the jury to pass on the competitive plans for the proposed million dollar building. The jury includes members of the board, physicians and a representative of the tax association as well as the institute man. The personnel of the jury includes the members of the board of supervisors, Adolph Uhl of the Alameda county tax association, Dr. C. A. Wills, Dr. O. D. Hamlin, H. H. Meyers and Mr. Schultz.

A $1,500,000 Contract to Be Let

Here is an opportunity for a competition of the highest order, says Construction News. An appropriation of approximately $1,500,000 for a state capitol building and the creation of a state capitol commission to supervise its construction are among the provisions of two bills which have been introduced in the house of representatives at Oklahoma City, Oklahoma. One of the bills provides for a capitol commission of three members to receive $4,000 a year each. They are to serve two years, from June 1, 1913, and are authorized to let the contract for construction of the capitol building and governor's mansion upon twenty-five acres of ground.

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Vol. XXXIII. May, 1913 No. 1

THE ARCHITECT AND HIS COMMISSION

"It is a penny-wise and pound-foolish policy that prompts the client to ask his architect to give the best of his talent and experience and in the same breath to cut the rate of his commission," writes an architect to the Brooklyn Eagle. "The rates established by the Institute are no more than will give a fair return for the services rendered. The architect who shirks his duties to obtain a larger profit and the 'scab' who makes a practice of rate-cutting are in the same class, and inferior workmanship may be expected of both.

"No reputable architect will overcharge for his services. He is much more apt to undervalue them. Furthermore, he is in a position to save his client a sum as much as and often more than his commission by reason of his familiarity with the supply markets, and his experience in the use of materials of one kind and another. In a hundred and one ways he is fitted to suggest savings and economies unknown to the layman.

"It is not to be expected, however, that he will busy his brain seeking legitimate means of reducing the cost to the owner (when every dollar saved lowers his own commission proportionately), unless he feels that he is being adequately paid, and is insured a fair profit on his labors. The architect's commission is but a small part of the cost of the house, and the owner makes his first expensive mistake when he figures to 'save' anything on this score.

"When the architect is in possession of the 'clues' to the problem before him, its happy solution is merely a concern of his ability, to turn them to interesting account. The client should be the main source of needed information and assistance in supplying the 'personality' of the plan, but he should allow it to be evolved in a rational, individual manner in harmony with the environment and the spirit of the times. The architect should bear in mind that he acts largely in the capacity of an adviser, and he must respect the owner's wishes unless he can convince him of his error with clear argument and clean-cut illustrations. In other words, he must demonstrate what detriment to the work would result if any erroneous measures that his client might desire are enacted. It is supposed that the client will seriously consider the architect's advice before it is rejected, for it represents the fruit of many years' study and experience, which cannot be safely disregarded.

"Probably the most embarrassing moment in the architect's intercourse with his client is when there arises a question of taste. Unless you know your man it may well lead to blows. Taste is a product of personality and environment, and good taste is merely a measure of local standards. The Indian's wigwam and his personal attire may conform as accurately to the precepts of good taste as the fashionably dressed American millionaire in his modern chateau. Many a layman considers himself a competent art critic who would never question the opinion of his lawyer or his doctor, or advance any views upon finance or attempt to explain a problem in engineering.

"All of these gentlemen may successfully hide their failures. Even the engineer may temporarily cloak his defective structure with the architect's mantle. Endowed with such powers for good and for evil there rests upon the architect a grave responsibility, demanding from him the highest form of mental and moral equipment. Let him but show his capacity for good deeds, let him but prove his worth, and the public can be trusted to give him place in the councils of the Nation."

The Skyscraper Problem

The skyscraper problem is making trouble in Philadelphia as well as in New York, and an act has lately been drafted, based upon the Boston regulations and enabling cities to create within their limits from one to four districts, each with its special regulations. As to the method of regulation large latitude is given:—

> In prescribing the regulations for any district the city may fix either an absolute limit of height for the whole or part of a building based upon the width of the street or streets upon which it abuts, or it may adopt some other system, and the city may provide for one system in one or more districts and a different system in others, but the system prescribed by any district must be uniformly applied throughout that district.

The bill seems sensible and is warmly advocated by architects but of course will have to contend with the usual obstruction from selfish interests. Yet regulation is making progress. Chicago has reduced its maximum to 200 feet, Cleveland restricts the height of buildings to 2 1-2 times the width of the street, Baltimore has a limit of 175 feet for fireproof buildings and 85 feet for others. The list might be extended, and even in New York the movement is making much progress. It may be hoped that Philadelphia will fall into line with a model ordinance as soon as the enabling law is passed.

Opposition to Circular Design Court House

It is not surprising that so unusual a design as that for a circular court house for New York should meet with strong opposition from many architects. "I don't know yet just what form the fight will take," one of them said after attending the meeting of the county court house board recently at which Mr. Lowell explained his plans, but he intimated that an opposition is to be organized. Among the opponents are some of the unsuccessful candidates, who insist that they are moved not by jealousy, but by civic pride. Among their arguments are that the proposed building is not good looking, that round construction is more costly than plane surfaces, and that there is an advantage in corners which makes it possible to get light from more than one side.

Technical Society of the Pacific Coast

The following have been elected as the officers of the Society for the ensuing year: President, G. Alexander Wright; Vice-President, Professor Herman Kower; Secretary Otto von Geldern; Treasurer, Adolph Lietz, Sr.; Directors, Heinrich Homberger, Harry Larkin, Bruce Lloyd, Herman Meyer, Henry A. Schulze.

State, County and Municipal Engineering

Good Roads—Water—Sewers —Bridges—Fire Protection

SANITATION OF BUILDINGS

Problems in Domestic Engineering and the Answer as Viewed by an Expert

By ERWIN L. WEBER.*

IT affords me extreme pleasure to have the opportunity of addressing you on the subject of Sanitation of Modern Buildings. Although sanitation deals largely with water, it is nevertheless an extremely dry subject on which to lecture; so I deemed it advisable to have several lantern slides prepared to illustrate the principles involved.

As you all know the plumbing ordinances differ considerably in various localities so that designs of sanitary equipment for eastern buildings would hardly be adequate to illustrate the principles involved in western ordinances. The slides presented are all for local installations and will serve to illustrate the requirements of local conditions. They are slides of plans prepared by me.

As my work on these buildings involved the design of the entire equipment, you will find the plans somewhat complicated as they show not only the sanitary equipment, but also the electrical and mechanical equipment for these buildings. They will also serve to show the close relation which these different items bear to each other.

It may not be amiss to say a few words regarding that branch of engineering work known as domestic engineering. We have learned to regard engineers as being divided into three large groups, electrical, mechanical and civil. But with the rapid modern development it has become necessary to specialize in certain portions of these three divisions and numerous types of engineers have developed.

The electrical field has been divided into electric railway engineers, high tension engineers, telephone engineers, telegraph engineers, illuminating engineers, etc.

The mechanical field has been divided into steam engineers, gas engineers, railway engineers, shop economist, refrigerating engineers, heating and ventilating engineers, etc.

The civil field has been divided into bridge engineers, waterworks engineers, municipal roadbed engineers, structural engineers, sanitary engineers, etc. Of all these subdivisions, the engineers which are of the greatest service to architects are the illuminating, the heating and ventilating and the sanitary engineers. So it became the custom of architects to employ such engineers to design and supervise the installation of their particular branch of the work. This system gives excellent results but has one great disadvantage, best expressed by the old adage, "Too many cooks spoil the broth."

By having three separate equipment plans—electrical, mechanical, and sanitary—prepared by three different engineers it invariably follows that the architect in checking over the various plans finds a hot air duct, a soil pipe and several runs of conduit ocupying the same space; and oftentimes a beam or girder is also found in this same locality. A consultation of the architect and the three engineers follows with the result that the heating engineer insists that the hot air duct must occupy that space, the sanitary engineer will tell him that the soil pipe cannot possibly be removed and the electrical engineer insists that this is the only logical place for his conduits. The result is that the architect is placed in a rather embarassing position in deciding which piece of apparatus should occupy the space in question and much valuable time is wasted.

Then we come to the inter-connection of the various systems. The heating apparatus requires switches, feeders and cutout appliances for fan motors, electric driven pumps, hoists, etc.; and the sanitary equipment requires similar provisions for sewage ejectors, vacuum cleaners, air compressors, house pumps, etc., which must be provided for in the electrical equipment.

The sanitary equipment requires steam or electrical heaters and connections for hot water generation, steam and exhaust connections for house pumps, fire pumps, etc., all of which must be provided under other contracts.

Again, the heating equipment requires numerous drains for grease traps, drip pans, heating returns, blow-off basins, etc., as well as cold and hot water sup-

*Paper read before the Victoria Chapter, British Columbia Society of Architects.

plies which must be provided for under the plumbing contract. Thus we have a great complexity of what might be termed "missing links" for which definite provisions must be made in the various contracts, and it is necessary to state definitely where each contract begins and ends and which portion of the "missing link" shall be furnished by the heating, plumbing or electrical contractors to avoid "extras" of all varieties from making their appearance.

Necessity is the mother of invention. The necessity of having one man at the stern to safely pilot all the various pipes, ducts, etc., through a building, to secure the proper inter-connection of all equipment, and to save time which would otherwise be wasted in numerous conferences and settlement of disputes has ushered into the field another class of engineers, known as a domestic engineer. Kindly, gentlemen, do not conflict this with a domesticated engineer. They are two different kinds of creatures.

A domestic engineer should possess the following qualifications:

He should understand the principle and practice of that portion of electrical engineering which pertains to the illumination and miscellaneous power requirements, and the wiring of buildings for light, power, telephone, clock and other low tension services; that portion of mechanical engineering which deals with the heating and ventilation of buildings, refrigeration, elevator equipment, isolated power plants, shafting, etc., and that branch of sanitary engineering bearing upon the water supply and drainage of buildings, the disposal of garbage and refuse, gas distribution and fire protection.

He should be proficient in the proper use of language and be able to write clear and concise specifications.

A knowledge of law, especially that portion pertaining to contracts is very essential. He should understand architectural details and be able to interpret structural plans, and know where and how to provide openings in floor slabs and locate hangers without weakening the structure. And above all he should not have any connections or relations with contractors and not be interested in the sale or manufacture of any articles which enter into the construction of a building.

Of the various items of domestic engineering my talk tonight will bear mainly upon the sanitation of buildings.

As the dry and air carriage system of wastes is used in this country only in the removal of garbage we will confine ourselves entirely to the water carriage system of removing waste matter.

We will not discuss water supplies and the disposal of sewage but assume that a water supply system and a sewer are available for our purposes and confine ourselves to the sanitary system within the building. The sewerage system must provide for the removal of waste water from culinary sources and bodily ablution and urine; such pipes are known as waste pipes. The pipes conveying excreta are known as soil pipes. Pipes conveying rain water are known as leaders or conductors and those conveying miscellaneous wastes as drain pipes.

Wherever surface waters abound subsurface drainage must be provided to keep the lowest floor of the building dry as well as to prevent the formation of an hydraulic head under the floor, as such would result in breaking the floor from below and permit an inflow of surface waters. The disposal of such waters is best accomplished by laying field tiles with open joints in a gravel bed upon which the floor is laid, and running these drain lines to a basin. The discharge pipe from this basin should dip down below the basin water level and be vented on the sewer side. The basin thus becomes a large pot trap.

Regarding the size of pipes: It has been the practice to make all sewerage pipes entirely too large and the outlets from fixtures too small. In old practice we often find a lavatory with a strainer outlet with the equivalent area of a ¾ in. pipe discharge into a 2 in. waste pipe. Such an installation causes the water to run slowly or rather to dribble through the waste pipe. Advanced practice is to provide fixtures with large waste outlets and connect them to comparatively small waste pipes.

This practice insures a strong flush of the waste pipe every time the fixture is discharged and prevents the collection of solid waste matter to the side of the pipes.

Many plumbing ordinances now permit 3 in. connections to water closets and it is not uncommon to find 100 or more closets wasting into one 5 in. pipes with a surprising decrease in the frequency of obstructions occuring in the system.

As all these various fixtures are connected to the sewer some provision must be made to prevent the sewer air from entering the building. Many devices known as traps have been designed for this purpose. The most effective are those which provide a water seal between the drain-pipe and the fixture. The maintenance of this water seal has been the cause of the bewildering nightmare of complications which is required by most plumbing ordinances.

The compulsory use of a house trap is one of the most illogical requirements of many ordinances. It is not only a very costly piece of apparatus, but it prevents the use of the most efficient system of sewer ventilation known, that of ventilating the sewer through the drain pipes of each building. The thorough sewer ventilation thus secured prevents putrefactive decomposition in the sewer and makes sewer air less objectionable.

Pathogenic germs cannot pass from the sewer through the house pipes as they adhere to the moist surfaces of same and die before they have wandered many feet away from the sewer. Traps may lose their seals from various causes, principally syphonage, back pressure, evaporation and capillarity. A body of water flowing down a stack draws air after it and a partial vacuum in the piping system. This vacuum is sufficient to draw the water out of traps unless some provision is made to supply air between the stack and the trap. Hence the use of the back vent pipe. This same body of water flowing down the stack will force a volume of air before it, which, in its endeavor to escape may blow the seal out of a trap. This phenomenon does not become dangerous unless the stack is very high and the body of water has a high velocity of flow.

Evaporation occurs in dry seasons, due to air passing over the seal of the trap, and under conditions favorable to evaporation, traps may lose their seal in four days or less. Threads, lint or hair lying in a trap will act like a wick and drain the trap of its seal by capillary action.

It is the endeavor of sanitation to devise a trap which will not lose its seal through these various causes, will not require a vent pipe, and at the same time be shelf-scouring. Much progress has been made along these lines and many cities now permit the use of anti-syphon traps without the use of vent pipes.

We will leave the subject of traps, as the discussion of same requires volumes.

The discussion of hot and cold water supply systems is best taken up in connection with the slides.

Regarding fire protection systems, when an army is in the field the supply train is always in the line of retreat. Stand pipes should be similarly located, that is, on the fire escape. Interior stand pipes and hose are of little value in fighting a fire; but are of great value in checking a fire at its beginning, and are, therefore, best located in a central position where the are quickly reached from any part of the building. Vacuum cleaner outlets are advantageously located in the same position.

The question often arises whether to use cast iron pipe with calked joints or wrought iron pipe with recessed drainage fittings, known as the Durham system. This depends upon a large number of conditions. In general, it may be said, that for fireproof buildings the Durham system is best applied as it does not need such frequent anchoring and is less liable to leak.

In frame construction and for small buildings cast iron is somewhat preferable as the lead joints are more flexible and water closets are not liable to be raised above the floor level when the building shrinks.

Regarding cost: If the installation has many fittings and short pipe runs the cast iron is usually cheaper; but if the fittings are few and the runs are long the Durham system costs less.

This is due to the higher cost of screwed fittings on the one side and the higher cost of continuous runs of pipes with caulked joints on the other side.

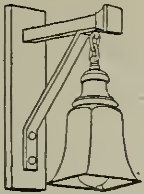
Clam Clamor

(From Concrete-Cement Age)

Iconoclastic college professors, in Washington, are suggesting that clamshells, stripped from the living bodies of one of our most nutritious bivalves, make good lime. In common with the Seattle Post-Intelligencer, our gorge rises at the thought. What? Shall the succulent clam be immolated on the altar of commercial greed? Not while Concrete-Cement Age can life an editorial whisper. The clam, whether his native heath is Scarborough or Seattle, lives not in vain. He sucks in fatness from the ocean's salty waters, that he may tickle the palate of the gourmet and warm the cockle's of the feaster's heart. Served raw, in cocktail, stewed, steamed or minced, he is one of our national delicacies. We cannot give him up at the behest of high-brow despisers of the delights of the table. Lime is important, but clams are essential. Our far western contemporary holds out a straw of hope. The matter is to be left to the final adjudication of the Washington legislature, in session at Olympia. Says the Post-Intelligencer: "An attack on the clam, such as is proposed, is an attack on Olympia and Olympia will be heard." We hope she will. We hope that she will thunder like the elder Olympus and that the Jovian thunderbolts of eloquence will overthrow the dastardly project to decimate the clam population of the Union.

Architect Parkinson Goes Abroad

Architect John Parkinson, senior member of the firm of Parkinson & Bergstrom of Los Angeles is enjoying a tour of European countries. Mr. Parkinson will be away two or three months, and of particular interest to him will be a visit to his birthplace at Bolton, England. The trip is primarily for rest and pleasure, but being an energetic and progressive architect, a study of foreign progress in architecture and construction will naturally be made.



Heating and Lighting

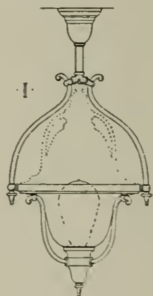
Plumbing and Electrical Work

Indirect Illumination—III. The Ideal Lighting Unit

By FOWLER MALLETT

THE requirements of "the perfect fixture" for illuminating, as discussed in the Architect and Engineer for March and April, might be summarized as follows:

1. Diffusion of the light to protect the eyes from the direct rays of the lamps, thus giving visual acuity without eye strain.
2. Distribution of the light with equal intensity over the area being illuminated, thus rendering the entire space usable and eliminating dense shadows and bright spots of light, or glare.
3. Efficiency; to furnish the greatest possible amount of useful illumination with a minimum current consumption.
4. Economy in the cost of wiring and installation aside from economy of operation.
5. Availability: The fixture must be of a type to conform with ordinary wiring installations and must use standard lamps and sockets. It must not be fundamentally more expensive than ordinary types of fixtures.
6. Convenience: This includes ease in cleaning and caring for the lamps, reflectors, etc., and effects economy in janitor service.
7. Agreeableness of form: It must be capable of unlimited variations in form and detail to harmonize with different surroundings. It must not be so striking as to jar with any architectural setting, nor so inflexible as to preclude the use of special designs for individual interiors. Yet even in its simplest unadorned form it must be graceful and pleasing.

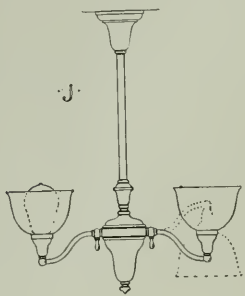


·I·

A fixture has been devised, the "Indirectdirect," * to meet all these requirements and to admit of the utmost flexibility of treatment. The single unit type is of peculiarly interesting form (I) and is made in 100 watt. 150, 250, 400 and 500 watt sizes according to requirements. The multiple unit type (J) is not unlike the ordinary chandelier in form. Both

*For trade information and catalog address the inventor, Wm. Adams, 353 Sutter Street, San Francisco. This fixture must not be confused with one called "Direct Indirect," which is of entirely different principle.

types involve devices completely covered by patents, but are no more expensive on that account. The sketches illustrate only the simplest forms. All the parts are capable of any degree of ornamentation and elaboration.



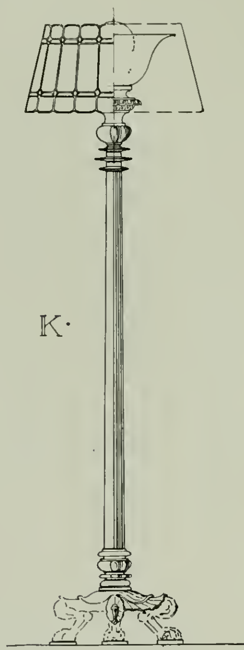
·J·

The fixtures are based on the use of a translucent reflector (o) of a special glass (Ahmlux) which transmits between ten and fifteen per cent of the light direct and reflects the balance. The curve of this reflector is scientifically designed by a reputable illuminating engineer to give the highest possible reflection of light with exactly the right direction ot the rays. The distance from the ceiling is likewise scientifically calculated for the best results. In short, it has been carefully designed to fulfill the first three requirements outlined above, diffusion, distribution and efficiency.

The fixtures are no more expensive than ordinary types and require no special wiring arrangements. They are easily installed, use standard tungsten lamps, and therefore satisfy the requirements of economy and availability. The question of convenience is fulfilled by a reversible arrangement of the reflector.

A simple swivel arrangement makes it possible to instantly reverse the reflectors to the position shown dotted in the sketches. A janitor standing below the fixture (I) can reverse the reflector (o) with a handled brush and with the same brush dust the lamp and reflector and return them to their original position. If a strong concentrated light is wanted for any purpose the reflector can be left in the direct position and a mechanical device holds it securely. The moving parts of this device are all so simple that there is nothing to wear out or break or get out of order. It may often occur that an intense concentrated light is wanted for some special purpose, and this convertible feature of the fixture is of inestimable value. But whether used thus or not, it will save a great deal in janitor service; and cleanliness makes for efficiency.

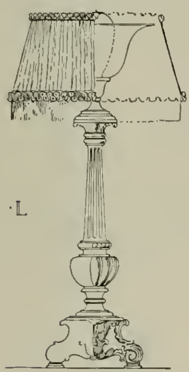
Finally, the requirement of agreeable form needs little comment. From (I) and (J) it will be evident that the forms the fixture may take are unlimited, and the artistic treatment is whatever the designer cares to have it. As the fixtures make no radical departures from the prevailing forms of lighting instruments, all the various forms of decoration which have been developed for this purpose are available. Fixtures may be made in metal, carved wood, or compo, according to the dictates of each interior, and the glass may be plain or decorated as desired. The staple forms of the fixture for commercial use have been developed on sturdy lines of solid brass construction and are available in several very handsome designs as well as in simple inexpensive forms.



K·

An interesting application of Ahmlux glass for residence lighting is illustrated in the floor standard (K) and table lamp (L) designed for rooms in which for any reason no ceiling fixture is desired. Here the reflector is set into a decorative shade of silk or art glass of Empire form, and mounted on a standard of any appropriate design.

K shows a standard of cast bronze with a shade of the dense soft-toned opalescent glass employed so much by the Tiffany studios; L, a portable of carved design with a silk shade. In either case the indirectdirect feature is accomplished without detracting in any way from the beauty of the lamp—without, in fact, making itself apparent. The reading light below the lamp, the soft illumination of the decorative shade, and the broad, even distribution of the indirect light, make this an ideal fixture for living room or drawing room.



L

For those who adhere to the dome for dining room lighting, the shades of K and L offer an efficient solution of the dome fixture. Dropped from the ceiling instead of mounted on standards, they have all the decorative value of the dome with the perfect illumination and freedom from glare of the indirectdirect.

Numerous other special applications of indirectdirect fixtures with Ahmlux glass will suggest themselves to the reader, but space is too limited to go further into the question here. The writer hopes, however, that these brief notes will enable architects and others interested in the subject to apply the test of logic to fixtures designed for indirect lighting, and to make use of really efficacious methods of illumination. A general discussion of the broader principles of residence lighting will be taken up in an early issue.

Installing Furnaces Properly

How many owners realize the fire hazard of a furnace improperly installed? How many are told by their contractor or architect? Every man on the job ought to be sufficiently interested in the new house to build it as carefully as possible, but, unfortunately, some are not. Furnaces are frequently installed with no thought of fire prevention and the owner finds later, to his cost, that he has been harboring a fire-promoting apparatus, ready to "start something" at the first opportunity. The furnace should be surrounded by a zone of actual fire protection. In a frame building joists above the furnace should be covered with two or three layers of heavy asbestos paper, which should in turn be covered by a layer of tin or galvanized iron, extending well out beyond the area of the furnace.

Another source of many fires is the smoke pipe extending from the furnace to the chimney flue. Often it is merely hung to the under side of the joists with pieces of wire. Then when the fire is forced on a cold day the hot smoke pipe radiates its excessive heat to the wooden floor above and a bad fire is the consequence. All this might have been prevented by a little timely advice from the architect or contractor, who, more skilled in matters of this kind, are entirely familiar with the proper methods of fire protection around a furnace. They should inform their clients of the necessity of fire protection, not only above the furnace, but above the smoke pipe as well.

When a fireproof floor, such as is built in a fireproof house, is extended over the furnace, no fire protection is needed, of course. Though the tin or iron protection of a wooden floor can only approximate the actual protection of real fireproof construction, it is, at least, a step in the right direction, and, when carefully applied, tin or iron over a furnace will go a long way toward fire prevention.

Next to the furnace itself the greatest way to spread fire is by means of the hot air pipes extending up through the partitions. Sometimes there is a tendency on the part of the owner to put in a cheap furnace installation. When the bids come in it is a great temptation to accept a bid which the architect himself knows to be so low it would be impossible to do a good job. In this way workmanship and material is skinned down to the last notch and single piping is in-

stalled, hastily thrown together regardless of fire risk.

Single piping is dangerous in a frame house because an overheated furnace sometimes sends hot air up the stacks, of much greater temperature than is safe. The dry timbers of partitions begin to char until a smoldering fire is started, which may quickly break into flame. Though the first cost is greater, double piping should always be recommended to an owner, not only on account of the fire protection it offers, but because of the great amount of heat wasted by single pipes and consequent increase in fuel consumption.

State Buildings at the Exposition

(From the Seattle Builder and Engineer.)

APPROPRIATIONS for state buildings at the International Panama-Pacific Exposition were features of the Oregon and Washington legislatures. Oregon set aside $175,000 and Washington $200,000 for these buildings. It is quite important that these north Pacific states should be well housed at the exposition and that their exhibits should adequately represent their wealth and resources.

Exposition buildings possess certain general architectural characteristics, and yet if a little thought is given to their design an individuality may be brought out to impress the passing sightseers and to create lasting memories. An excellent example of this will be recalled by many who visited the Alaska-Yukon-Pacific Exposition and saw the southwest Washington, or Chehalis county building, which displayed in decorative plaster the lumbering features of the district.

State buildings will, of course, be much larger than such district or county buildings and will possess somewhat more dignity. They should reflect, in the most impressive manner, the characteristic institutions of their respective states. The Oregon and Washington buildings should be designed by architects within the respective commonwealths, and the choice of the design should be determined by competition based upon the program of the American Institute of Architects, and limited, as stated above, to architects established and residing within the state.

Result of New York State Competition

Announcement has been made of the awards in the competition for a new County Court House to be erected in Albany, N. Y. Hoppin & Koen of 244 Fifth avenue, New York, were selected architects for the building and will receive for their services a sum equal to six per cent upon the cost of the work.

The next three architects in the contest who were successful in winning prizes were Griffin & Wynkoop, 30 Church street, who stood second, receiving $500; Hewitt & Bottomley, 527 Fifth avenue, third, $300, and Albro & Lindeberg, 2 West Forty-seventh street, fourth, $200.

Including plumbing, heating, ventilating, wiring, permanent furniture and fixtures, but exclusive of movable furniture, mural decorations, architectural and engineering fees, and the acquisition and clearing of the site, the building will cost about $672,000. Franklin B. Ware, 1170 Broadway, is architectural adviser, and Frank Miles Day and Walter Cook were appointed by the committee to act with the advisor on the jury of awards.

The Abuse of Plumbing Fixtures

THE difficulty which frequently confronts an inventor is to make the article of his invention "fool proof." In like manner the manufacturer is compelled to take into consideration means to make his product "abuse proof." One is almost as impossible to accomplish as the other.

In the case of the manufacturer of plumbing fixtures, what, other than common sense, can persuade the plumbing contractor not to deliver fixtures on the jobs until it is actually time to install them, and, when they are delivered, not to uncrate or unpack them until his journeyman is right to the point of setting them in place?

If they are delivered to the jobs and uncrated before they are needed, what is to prevent the plasterer, the carpenter, the setter or the electrician from dragging them across the rough floor to move them out of his way, or to use them as receptacles for his tools, or to make them do the duty of a step-ladder, to accidentally spill acid on them or occasionally to drop a hammer on them?

No manufacturerer can successfully cope with such contingencies; nevertheless, these things happen every day, and, as a result, the manufacturer has his goods roundly condemned and is called upon to make good in thousands of cases where there is no moral right whatever to call upon him. All this could be avoided by employing the proper care and consideration.

Of Course It Was a California Woman

Concrete-Cement Age reports that while watching cement finishers at work on a porch floor, the owner, a woman of California, took the plume-like branch of one of the graceful shrubs growing in the yard, laid it on the newly troweled surface near the border and instructed the finisher to "pat it down" with his trowel. With some hesitation at seeing his newly finished work apparently disfigured he complied. In a few minutes the plumed branch was lifted out. The stem end was raised first and the entire branch peeled out. The impression of the branch broke, in a pleasing way, the monotony of the surface. The workman saw the natural beauty of the decoration, got enthusiastic and repeated the impress as a border completely around the porch front. Depressions similarly made and filled with a mortar of contrasting color offer possibilities to the architect.

Correction

In the advertisement of the Standard and Santa Cruz Portland Cement Company, for April, there appeared in this magazine a half tone plate of the Oakland hotel, the printer having substituted it by mistake for the Oakland city hall. Santa Cruz cement was used in large quantities in the construction of the new municipal building and the high character of the cement was shown by the way it stood up under the severe tests of the chemists. When the architect specifies Standard or Santa Cruz he can bank on quality every time.

By the Way

Some Industrial Information Worth the While

Keying an Ad.

Keying an "ad" and paying a clerk to keep tab on "inquiries" is good business in a ten-cent mail-order proposition, but doesn't work out on anything bigger. We know a wall-board man who got 480 inquiries from a farm journal "ad," sent out a stack of catalogues and booklets, chased follow-up letters out in one-two-three order and has yet to sell a single foot of the board to any of the idle curious who answered his advertising. The same manufacturer got but two inquiries out of an "ad" in a building magazine, but sold both parties.—The Builders' Guide, Philadelphia.

Plan a California Land Show

The San Francisco, Cal., Real Estate Board is discussing plans for a land show, to be held for ten days in October as the beginning of a campaign to localize the California realty market in San Francisco. The development of real estate operations in farm and ranch lands in the State has been so great during the last few years that realty centers in different cities have been unable to handle it satisfactorily. A majority of the big land developments are now being financed in San Francisco and Oakland. The tendency has been toward centralizing the disposal of these lands in San Francisco. For several years land shows have been held in Los Angeles, Fresno, Stockton, Merced, Sacramento and other cities, while none have been held in San Francisco. The show will be along the lines of an industrial exposition, and every county in the State will be invited to exhibit its products.

"Medusa" Waterproofing

A pamphlet describing "Medusa" waterproofing processes has been recently issued by the Sandusky Portland Cement Company, who are the manufacturers of this compound.

This waterproofing is in form of a dry, white powder, and consists of fatty acids, chemically combined with lime.

The makers state that owing to its extreme fineness it may easily be perfectly mixed with cement in the necessary proportions to insure efficiency. This compound has now been on the market for a period of five years or more, and we are informed in the pamphlet above referred to that it has been successfully used in large railroad terminals, reservoirs and other important engineering operations.

The pamphlet will be sent on application.

A Handsome Hand-Book

The practice of Pacific Coast manufacturers' agents distributing and making use almost exclusively of hand-books, catalogues and trade literature issued exclusively by eastern manufacturers, is so general, that when a Pacific Coast firm gets out a publication such as the Hand-book on Rolling Steel Doors, it would seem to call for special comment.

The book is one of the most pretentious yet issued by a local firm, and, unlike the eastern publications, it does not deal with general conditions all over the United States, but applies absolutely to local construction. It is illustrated solely with San Francisco installations and should for these and other reasons appeal very strongly to the California architect, engineer and contractor. The Lilley & Thurston Company, Rialto Building, are the publishers.

Architectural Commission

A commission to consider the improvement of the architecture and surroundings of all public buildings, whether state, county, municipal or school, has been created by the adoption of Senator Birdsall's concurrent resolution by the State Legislature. Three legislators from each house, and an advisory committee of sculptors, painters and architects are to constitute the commission. The bill provides as follows:

SENATE CONCURRENT RESOLUTION NO. 16

Relative to the Appointment of a Committee of the Legislature to Consist of Three Senators and Three Assemblymen, Which Committee Shall Have Power to Appoint an Advisory Committee of Architects, Sculptors and Painters to Constitute a Commission with a View of Reporting to the Governor Ways and Means of Improving the Standard of Architecture and Painting in the Furnishing, Decoration, Repair and Construction of All State, County, School and Municipal Buildings, Grounds and Public Works Throughout This State.

Whereas, The state and various counties, municipality and school districts thereof have from time to time expended large sums of public moneys for the furnishing, decorating, repairing and construction of various public buildings, structures, works, and grounds; and,

Whereas, Said expenditures have in the past been made without reference to maintaining a definite high standard of architecture, sculpture, and painting; and,

Whereas, The results obtained for such expenditures in many instances, from lack of proper advice or complete investigation, are inadequately planned and much below what the people of this civilized state are entitled to receive; and,

Whereas, The State of California, with its rich heritage of climate and all inspiring scenery is pregnant with an art that should rival ancient Greece and Italy; and,

Whereas, The citizens of this state by their labor and industry, and by the early establishment of an unequalled educational system have advanced to a culture which decries the unprofitable and unsightly perpetuation of the makeshifts and temporary and hasty structures which in pioneer times were necessary; and,

Whereas, The citizens of this state are entitled to the development of standards of architecture, sculpture and painting equal to, if not better, than those existing in the eastern and middle western sections of these United States; and,

Whereas, The State of Illinois, the city of New York and other states and municipalities have by the establishment of art commissions and other regulating bodies definitely taken steps to elevate and maintain such standards of architecture, sculpture and painting; now, therefore, be it

Resolved by the Senate of the State of California, the Assembly concurring, that a committee of three senators and three members of the Assembly be appointed by the president pro tem. of the Senate and by the speaker of the Assembly, which committee shall have power and it shall be its duty to appoint as advisory members thereof, three architects, a painter, a sculptor, and a lawyer, all of whom are known for their desire to improve standard of architecture, sculpture and painting, which committee shall constitute a commission to investigate and report to the governor, ways and means of improving and elevating throughout this state, the standard of architecture, sculpture and painting on all state, county, school districts and municipal buildings, grounds and public works; and the furnishing, decorating and embellishment thereof; and be it further

Resolved, That said report, together with the recommendations of said commission, shall be filed with the governor at least forty days prior to the convening of the forty-second session of the California State Legislature; and be it further

Resolved, That the investigations and report of said commission shall be conducted and made without expense to the state.

Charles J. Lindgren

Charles J. Lindgren, one of the best known general contractors in California, died at his home in San Francisco April 24th after a lingering illness.

Mr. Lindgren came to this country when a boy, and was a member of the Arbitration Committee which settled the great bricklayers' strike in Chicago in 1883. He was a native of Sweden and came to California in the eighties, and shortly after the settlement of the Chicago bricklayers' dispute. He first settled in Bakersfield in 1889, contracting for work through the San Joaquin Valley, putting up many large structures in the growing cities of that locality. For many years he was a general contractor, and seldom took a contract where work was segregated.

In 1904 he came to San Francisco and made his office here, bringing his family with him. Many of the largest buildings in this city stand as a monument to his industry and ability, including such buildings as the Fairmont Hotel and a number of other large structures erected shortly after the fire, his firm having recently completed the Y. M. C. A. Building and the Olympic Club.

Mr. Lindgren was a man well loved by those who knew him best, was a staunch member of Calvary Presbyterian Church, and leaves a wife and three children and a brother, Mr. A. F. Lindgren, who will undoubtedly continue the business of the Lindgren Company. Decedent was only 53 years of age. During the last eighteen months he had been a constant sufferer from a nervous breakdown, which affected his stomach, and finally caused his death.

A Useful Device for Laying Concrete Sidewalks

By far the handiest tool on a sidewalk or curb and gutter job is a strike-off tool and it is somewhat surprising that more of them are not in use, says a writer in Concrete. They are easily made by any blacksmith and as they are not patented there need be no hesitation in having them made. The writer goes on to say: "The tool I refer to is simply a piece of angle-iron 6 in. or a foot longer than the width of the sidewalk on which it is used, with a large handle on each end. If, for example, you are laying a 5 ft. walk, get your blacksmith to take a piece of 1 1-2 in. angle-iron and on each end of it rivet a handle made out of a piece of round iron. The handles should be about 6 in. high and 8 in. long, and should be riveted to the inside of the angle.

"To use the strike-off tool a workman grasps it at each end, each handle being convenient for holding with two hands, and the surface of the top coat is cut off neat and clean with a sort of sawing motion. Each man in turn pushes his end slightly forward so as to keep the surplus material on the walk ahead of them. When this accumulates inconveniently it may be removed with a shovel. If a little care and judgment is used in the striking off process it saves a large part of the work of finishing, and this, by the way, greatly improves the quality of the work.

"It is perhaps needless to say that the strike-off tool is not particularly useful to the man who is in the habit of putting in his top coat as a sloppy mess, but it is to be hoped that this very bad practice is being discarded. As a matter of fact comparatively little of it is to be seen today, and it is evident that it will be generally forbidden in specifications.

"The proper way to put in the top coat of a walk or floor so as to secure a hard and durable surface is to mix the concrete with only enough water so that it can be molded in the hand."

Electric Water Heater

Attorney L. S. Channel, acting for the Lodi Electric Appliance Company, has applied for a charter for the purpose of manufacturing and selling automatically-controlled electric water heaters, the invention of J. M. Appleton of

Lodi and Louis Miles of San Francisco. The company is capitalized for $50,000, $30,000 of which has been subscribed.

A Handsome Catalog

The California branches of the Johnson Service Company have just received the new Johnson Catalog, containing illustrations of automatic temperature regulation apparatus, and the manner in which it is installed. A copy of the catalog will be mailed to any address on request of the San Francisco office, No. 243 Monadnock Building, or the Los Angeles office, No. 605 Van Nuys Building.

Back to Its "Before the Fire" Location

The Western Builders Supply Company, Inc., is now comfortably situated in its old location before the fire—155 New Montgomery street, near Howard, San Francisco. This firm is one of the pioneer manufacturers' agents and jobbers in the Bay City and enjoys the distinction of having supplied material of one kind or another for nearly every building of consequence erected in San Francisco both before and since the great fire.

Has Two Good Contracts in Woodland.

The Western Furnace & Cornice Company, 1645 Howard street, San Francisco, is doing the galvanized iron and sheet metal work on the new Porter building at Woodland and the Woodland High School. Both structures were designed by Architect William H. Weeks. Jas. T. Conway is manager of the Western Furnace & Cornice Company.

A Valuable Price Book

The Eighth Edition of Meese & Gottfried Company's price book of transmission, elevating, conveying and screening machinery is now off the press and available to engineers and others, to whom it will be sent on request to the company. It is a pocket-size book of 575 pages, printed by the offset process on thin paper and bound between flexible, permanent covers, and is a striking example of modern ingenuity in showing how much valuable information may be gotten between two covers in a pocket catalogue for engineers. The book is thoroughly illustrated and the last part of the book contains many pages of drawings of standards for regular goods, tables of horsepower, weights of various materials, gauges of metals, dimensions and weights of pipe, circles, formulae and other data of great value to engineers.

This well-known firm has leased an entire three-story building on Mission near New Montgomery street, which will be the company's future San Francisco headquarters.

Roofing Information

American Sheet & Tin Plate Company, Frick Building, Pittsburgh, has been distributing among the trade an attractive "weight card of formed roofing and siding products" which it manufactures. The information is given in the shape of comprehensive tables clearly printed in full-face type and illustrated by means of diagrams showing measurements for roofing and siding.

"Door-Ways"

The February issue of the new house organ of the Richards-Wilcox Mfg. Company, Aurora, Ill., known as "Door-Ways," contains among other things brief reference to the business outlook; a likeness of Milton D. Jones, the secretary and treasurer of the company, together with a short sketch of his business career; illustrations of some of the company's leading specialties, and a short chapter of special interest to architects and builders dealing with accordion folding doors. A statement signed by the president and general manager of the company states that 1912 was the best year in point of sales in its history, while December business was larger than that of any previous month. The company enters 1913 with a larger volume of business in unfilled orders on its books than in any previous year, all of which is pointed out as the strongest kind of evidence that the company's products and its service meet the approval of its patrons.

House Paint with a 5-Year Guarantee

The Charles H. Brown Paint Company, 188 and 190 Montague street, Brooklyn, N. Y., represented on the Pacific Coast by Felix Gross, San Francisco, is distributing to the trade a folder carrying a series of panels showing the many shades of pure linseed oil house paint which it is prepared to supply. It is stated that none but the best of pigments are used and that these are scientifically ground and reground with heavy machinery until they are thoroughly incorporated with the greatest amount of pure linseed oil, thereby insuring a maximum amount of durability. The claim is made that these paints effectively withstand the action of illuminating, coal and sulphurous gases, salt air and dampness. An analysis and five-year guarantee is on every package. The circular also carries directions for using the paint both in connection with new work and with old.

New Architects

The State Board of Architecture of Southern California has granted certificates to the following to practice architecture: G. Curtis Noble, 549 S. Grand Avenue, Los Angeles; Mott M. Marston, 532 Laughlin Building, Los Angeles; Richard C. Farrell, 405 Currier Building, Los Angeles; Jas. D. MacMullen, 940 Ivy street, San Diego.

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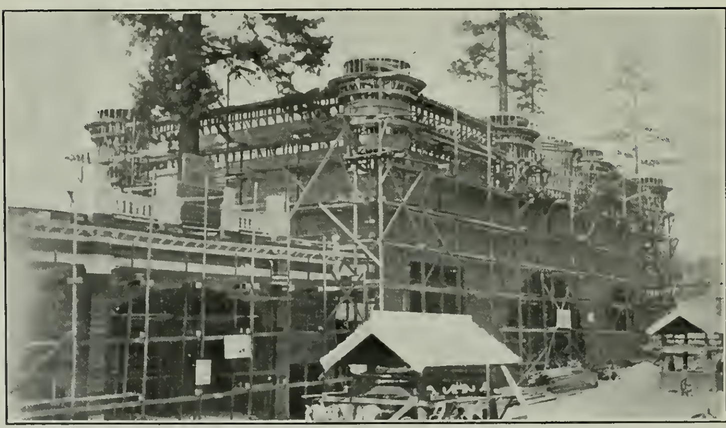
Will Erect Notable Concessions Building

One of the notable concessions at the Panama-Pacific Exposition will be the mimic reproduction of the famous naval battle between the Monitor and the Merrimac. This will be depicted in a specially constructed building on lines similar to the accompanying photograph. The building will be erected by the Gordon Construction Company, who have established offices at 3008 Webster street, San Francisco. This firm has had much experience in Exposition work as far back as the Chicago fair and it will probably do its share in the building of the Panama-Pacific Exposition.



View of Building in Course of Construction

C. F. PRATT

C. F. Pratt in Business for Himself

The Pratt Building Material Co., with offices in the Hearst building, San Francisco, is a new concern carrying a general line of building material, such as brick, tile, sewer pipe, sand, rock, and gravel. C. F. Pratt, well known in California building circles, is at the head of the new firm, and although in business only a month, the company is enjoying a splendid patronage with a number of good size orders on its books.

The company has the exclusive handling of a California-made pressed brick fire brick, and partition tile, also a high grade concrete gravel, the latter coming from the famous Austin creek pit, a view of which accompanies this article.

Austin Creek Gravel Pit, property of the Pratt Building Material Co.

State Armory at Sacramento

This building is using 18,700 4-inch hollow partition tile, made at Ben Ali, where the **Pratt Building Material Co.'s** new partition tile and pressed brick factory is located. C. F. Pratt, formerly manager of the Golden Gate Brick Co., is now in business for himself as the Pratt Building Material Co., selling fifteen kinds of sand, rock, and gravel; eleven kinds of brick, and fifty-seven varieties of building materials.

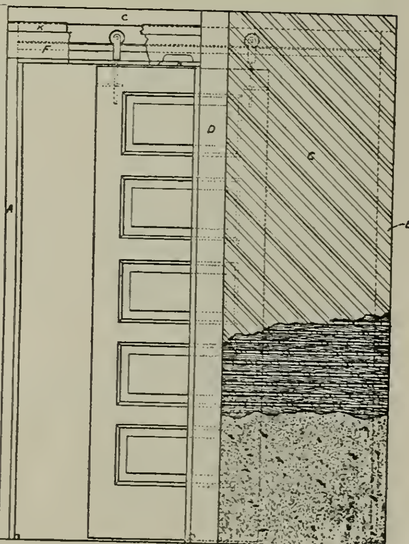


Fig 4

Interior Finish of the A. B. Spreckels House.

No expense has been spared in the interior finish of the A. B. Spreckels house at Washington and Octavia streets, San Francisco, and which is illustrated elsewhere in this issue. San Francisco houses have contributed largely in making this magnificent home possible and their work has occasioned much favorable comment, not alone from the owner but from the architect and others less interested. W. P. Fuller materials have been used throughout the house including the Standard Varnish Company's famous Satinette, for which the Fuller Company are exclusive sales agents, also the Pioneer white lead, plate glass, mirrors, etc. The millwork and interior trim were looked after by the Pacific Manufacturing Company and some exceptionally fine work has been done. The finish is principally in birch, oak and Southern cedar. Practically the entire house is laid with hardwood floors, this part of the work being contracted for by the Inlaid Floor Company. Some of the floors have expensive and artistic inlays of ebony, walnut an dmaple while others are laid in just the plain oak and beautifully polished.

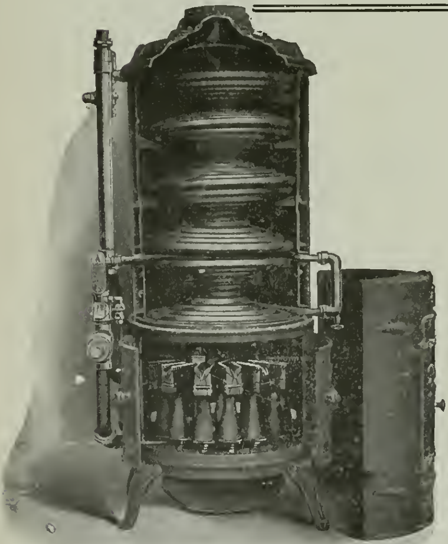
New Scagliola Concern.

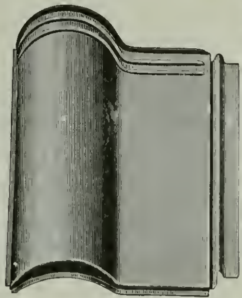
The Western Art Marble Works is a new concern recently started in San Francisco and it deserves the support of the local architects. The two members of the firm were formerly associated with the California Scagliola Company and they are expert workmen in manufacturing and moulding artificial marble. Their prices are less than any other Scagliola concern and the work is guaranteed. The temporary studio is at 727 France avenue.

Concrete Bricks.

The Golden State Concrete Products Company has been incorporated for the purpose of manufacturing and marketing concrete brick and tile. The company has offices in the Rialto building and will establish a factory in San Francisco. The Government has indorsed the brick and is using them now at Fort Bayard, N. M., and in Honolulu. It is expected they will be used in local government work as soon as the demand can be supplied. It is claimed this brick costs from 20 to 50 per cent less than clay brick and can be set more rapidly than the common clay brick. A limited amount of stock will be placed on the market and detailed information may be had by addressing the general manager, W. M. Pinney, 404 Rialto building, San Francisco.

*Notes for three lectures on Municipal Improvements, delivered before the School of Architecture





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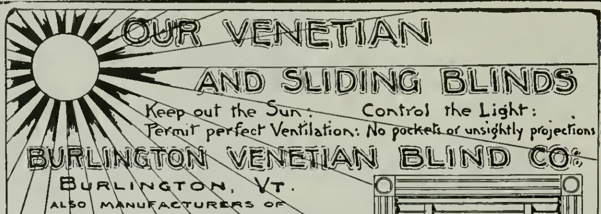

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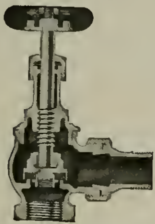

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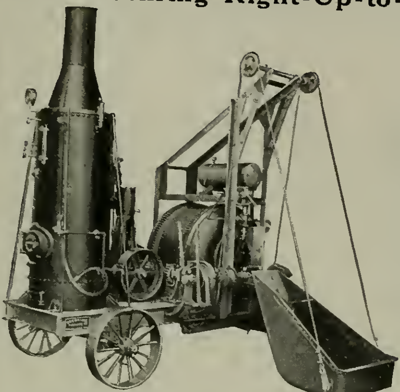

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Williams Bros. & Henderson. Holbrook Bldg., S. F.
Burt T. Owsley....311 Sharon Bldg., S. F.
Patrick-Nelson Company, 2025 Addison St., Berkeley, Cal.
Ward & Goodwin.........Sharon Bldg., S. F.

CORNER BEAD
"Prescott," sold by C. Georgensen, 356 Market St., S. F.
Union Metal Corner Company, 144 Pearl St., Boston, represented on the Pacific Coast by Waterhouse & Price.

CRUSHED ROCK
Grant Gravel Co., ...Williams Bldg., S. F.
Niles Rock, sold by California Building Material Company........Pacific Bldg., S. F.
Niles Sand, Gravel & Rock Co., Mutual Savings Bank Bldg., S. F.
Levensaler-Speir Corporation, 259 Monadnock Bldg., S. F.

CORK TILING
Nonpareil Cork Tiling, David E. Kennedy, Inc., N. Y. Pacific Coast office, Sharon Building, S. F., G. H. Freear, Mgr.

DAMP-PROOFING COMPOUND
Biturine Co. of America, 24 California St., S. F.
Concrewaltum Paint, made by Goheen Mfg. Co., Canton, O., sold by Sherman, Kimball & Co., Inc., S. F., A. J. Capron, Portland, and S. W. R. Dalby, Seattle, Wash.
Glidden's Liquid Rubber, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Lithoid Product Company, Merchants Exchange Bldg., S. F.
Trus-Con Dampproofing. See advertisement of Trussed Concrete Steel Company for Coast agencies.
"Pabco" Damp Proofing Compound, sold by Paraffine Paint Co......34 First St., S. F.
Liquid Stone Paint Co....Hearst Bldg., S. F.

DISAPPEARING IRONING BOARDS
F. G. Cox..........933 Phelan Bldg., S. F.

DOOR HANGERS
Pitcher Hanger, sold by Pacific Tank Company..................231 Berry St., S. F.
Reliance Hanger, sold by Sartorius Co., S. F.; D. F. Fryer & Co., Louis R. Bedell, Los Angeles, and Portland Wire & Iron Works.
Richards-Wilcox Mfg. Co.,............Aurora, Ill.
Allith-Prouty Co., Danville Ill., 693 Mission St., S. F., and 412 E. 3rd St., Los Angeles

DOORS—DISAPPEARING
Pacific Tank & Pipe Co.,231 Berry St., S. F.

DOORS AND SHUTTERS
Kinnear Steel Rolling Doors and Shutters, Lilley & Thurston Co., Rialto Bldg., S. F.

DRAWING INSTRUMENTS
Kieffel & Esser Company, Second Street, near Market, S. F.

DUMB WAITERS
Energy Dumb Waiters, Boyd & Moore, Agents............356 Market St., S. F.
Wells & Spencer Machine Company. 173 Beale St., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ELECTRICAL CONTRACTORS
American Electrical Engineering Co. 435 Golden Gate Ave., S. F.
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Garden City Electrical Co......San Jose, Cal.
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company. 507 Montgomery St., S. F.

ELECTRICAL ENGINEERS
Hicks & Folte........320 Market St., S. F.

ELEVATORS
Otis Elevator Company, Stockton and North Point, S. F.
Van Emon Elevator Co..54 Natoma St., S. F.
Wells & Spencer Machine Co., 173 Beale St., S. F.

ELEVATOR DOORS
Variety Mfg. Co., Chicago, C. Jorgensen & Co., Pacific Coast Distributors, 356 Market St., S. F.

ELEVATORS, SIGNALS, FLASHLIGHTS AND DIAL INDICATORS
Elevator Supply & Repair Co., 593 Market St., S. F.

ENGINEERS
F. J. Amweg......700 Marston Bldg., S. F.
W. W. Breite...........Clunie Bldg., S. F.
T. C. Hurley........ 12 Geary Street, S. F.
Hunter & Hudson........Rialto Bldg., S. F.

EXPRESS CALL SYSTEM
Elevator Supply & Repair Co., 593 Market St., S. F.

FAUCETS
Glauber Brass Mfg. Co.

FIRE DOOR HARDWARE
Kortick-Falls Mfg. Co., 327 First St., S. F.
Allith-Prouty Co., Coast agencies, 693 Mission St., S. F., and 413 E. 3d St., Los Angeles.

FIRE ESCAPES
Pacific Structural Iron Works. Structural Iron and Steel, Fire Escapes, etc. Phone Market 1374; Home, J 3435..370-84 Tenth St., S. F.
H. Johns-Manville Company, Branches in all Principal Coast Cities.

FIRE EXTINGUISHERS
Pacific Fire Extinguisher Co., 507 Montgomery St., S. F.
Levensaler-Spier Corporation, 259 Monadnock Bldg., S. F.

FIREPLACE DAMPER
Head, Throat and Damper for open fireplaces, Colonial Fireplace Co., Chicago. (See advertisement for Coast agencies.)

FIREPROOFING AND PARTITIONS
Cal. Safety Fireproofing Co., Head Bldg., S. F.
Gladding, McBean & Company, Crocker Bldg., S. F.
Los Angeles Pressed Brick Co., Frost Bldg., L. A.
Roebling Construction Co., Crocker Bldg., S. F.
"Bestwall," manufactured by California Bestwall Co..........................Alameda

FIRE-PROOF PAINT
Liquid Stone Paint Co., Hearst Bldg., S. F.

FIREPROOF PARTITIONS
Rabbitt Partition Co., 34 Ellis St., S. F.

FIXTURES—BANK, OFFICE, STORE, ETC.
A. J. Forbes & Son..1530 Filbert St., S. F.
Fink & Schindler........218 13th St., S. F.
C. F. Weber & Co., 365 Market St., San Francisco and 210 N. Main St., Los Angeles, Cal.

FLOORS
Indestructible Floor & Tiling Co., 251 Kearny St., S. F.

FLOOR VARNISH
Bass-Hueter and S. F. Pioneer Varnish Works, 816 Mission St., S. F.
R. N. Nason & Co...151 Potrero Ave., S. F.
Standard Varnish Works, Chicago, New York and S. F.
Moller & Schumann Co., 1022 Mission St., S. F.

FLOORS—CORK
Nonpariel Cork Tiling, David E. Kennedy, Inc., N. Y. Distributor for the Pacific Coast., G. H. Freear, Sharon Building, S. F.

FLOORING—MAGNESITE
Fibrestone & Roofing Co., 704 Market St., S. F.
Mallott, Peterson & Adams, 682 Monadnock Bldg., S. F.

FORMS FOR CONCRETE
Metal form work, sold by California Sales & Supply Co......................San Diego

GARAGE EQUIPMENT
Bowser Gasoline Tanks and Outfit, Bowser & Co. ......612 Howard St., S. F.

GARBAGE CHUTE
Bill & Jacobsen..........524 Pine St., S. F.

GLASS AND GLAZING
W. P. Fuller & Co., San Francisco, Los Angeles and Portland.

GRAVEL, SAND AND CRUSHED ROCK
Bay Development Co.....153 Berry St., S. F.
California Building Material Co., Pacific Bldg., S. F.
Del Monte White Sand, sold by Pacific Improvement Co......Crocker Bldg., S. F.
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Grant Gravel Co......87 Third St., S. F.
Niles Sand, Rock & Gravel Co., Mutual Bank Bldg., S. F.

HARDWARE
Pacific Hardware & Steel Co..S. F. and L. A.
Richards-Wilcox Mfg. Co..........Aurora, Ill.
Russwin Hardware, Joost Bros., S. F.
Window Adjusters, mfrd. by The Casement Co......... 175 State St., North Chicago, Ill.
Allith-Prouty Co., 693 Mission St., S. F., and 413 E. 3d St., Los Angeles.

HARDWOOD FLOORING
Strable Mfg. Co...............Oakland, Cal.
Parrott & Co.......320 California St., S. F.
White Bros., Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

HARDWOOD LUMBER
Ohia hardwood, sold by Rolph Mills Co., Hansford Bldg., S. F.
Parrott & Co......320 California St., S. F.
Maris Hardwood Co., 951 Brannan St., S. F.
Strable Mfg. Co., First St., betw. Washington & Clay, Oakland.
White Bros., Cor. Fifth and Brannan Sts., S. F.

HEATERS—AUTOMATIC
Pittsburg Water Heater, sold by Thos. Thieben & Co. ....667 Mission St., S. F.

LOCKERS
Keyless Lock Co.,......Indianapolis, Ind.

HEATING EQUIPMENT—VACUUM, ETC.
C. A. Dunham Co., Marshalltown, Iowa, Western Division Office, Monadnock Bldg., S. F.

HEATING AND VENTILATING
Atlas Heating & Ventilating Co., Fourth and Freelon Sts., San Francisco.
Fess System Co......220 Natoma St., S. F.
Hoffman & Meusser, 1129-1131 Howard St., San Francisco.
J. C. Hurley........ 12 Geary Street, S. F.
S. T. Johnson Co.....1334 Mission St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co., Monadnock Bldg., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.

HOTELS
The Angelus, Loomis Bros......Los Angeles

HOLLOW BLOCKS
Atlas Stone Co.......663 Mission St., S. F.

INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co., 5th and Parker Sts., West Berkeley.

INTERIOR WALL FINISH
Satina mfg'd. by C. H. Brown Paint Co., F. A. Frisius, 341 Lincoln ave., Alameda, California.

INSPECTIONS AND TESTS
Robert W. Hunt & Co., 418 Montgomery St., S. F.
Smith, Emery & Co. Inc., 651 Howard St., S. F.

INSULATING MATERIALS
Armstrong Cork Co........... Pittsburg, Pa.

INTERIOR DECORATING
Allith-Prouty Co.......693 Mission St., S. F.
The Tozer Company, 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co., 155 New Montgomery St., S. F.
Kortick-Falls Mfg. Co., 327-343 First St., S. F.

KEENE CEMENT
American Keene Cement, Levensaler-Speir, Corporation, 259 Monadnock Bldg., S. F.

LIME
Holmes Lime Company, Monadnock Bldg., S. F.
Shasta Lime Products Company, 1550 Bryant St., S. F.

LIGHTING FIXTURES
Adams, Hollopeter & Mallett, 353 Sutter St., San Francisco

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.

LUMBER
Sunset Lumber So...........Oakland, Cal.
Santa Fe Lumber Co., Seventeenth and De Haro Sts., S. F.

MANTELS
Mangrum & Otter ....561 Mission St., S. F.
Watson Mantel & Tile Co., Sheldon Bldg., S. F.

MARBLE
Columbia Marble Co...268 Market St., S. F.

METAL AND STEEL LATH
Atlantic Fireproofing Co., Pacific Bldg., S. F.
Roebling Construction Co., San Francisco and Los Angeles
Pratt Building Material Co., Hearst Bldg., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.

METAL CEILINGS
Berger Mnfg. Co....1120 Mission St., S. F.
Ames-Irwin Co., Inc., Eighth and Irwin Sts., S. F.
San Francisco Metal Stamping & Corrugating Co................2269 Folsom St., S. F.

METAL DOORS AND WINDOWS
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., S. F.

METAL FURNITURE
The Keyless Lock Co.......Indianapolis, Ind.
Van Dorn Iron Works Co.......Cleveland, O.
M. G. West Co.........353 Market St., S. F.

METAL SHINGLES
Meurer Bros., J. A. McDonald, Pacific Coast Agent.... Third, near Townsend St., S. F.
San Francisco Metal Stamping & Corrugating Co................2269 Folsom St., S. F.

OIL BURNERS
S. T. Johnson Co...1334 Mission St., S. F.
Fess System Co.......220 Natoma St., S. F.
T. P. Jarvis Crude Oil Burner Co., 275 Connecticut St., S. F.
Simplex Crude Oil Burners, Furnaces and Ranges, manufactured by American Heat & Power Co., 607 First National Bank Bldg., San Francisco

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.

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STORE FRONTS
- Kawneer System, Kawneer Manufacturing Company, 420-422 Turk St., S. F.; branches in Portland, Spokane, Seattle and Los Angeles.
- Hester System, sold by Western Builders' Supply Co., 155 New Montgomery St., S. F.

SURETY BONDS
- Globe Indemnity Co., 508 California St., S. F.
- Mass. Bonding & Insurance Co., First Nat'l Bk. Bldg., S. F.
- Fidelity & Deposit Co. of Maryland, Mills Bldg., S. F.

TEMPERATURE REGULATION
- Johnson Service Co., Monadnock Bldg., S. F.

TERRA COTTA CHIMNEY PIPE
- Dunlevy & Gettle....79 City Hall Ave., S. F.
- Gladding-McBean Co....Crocker Bldg., S. F.

TILES, MOSAICS, MANTELS, ETC.
- Mangrum & Otter....561 Mission St., S. F.
- Watson Mantel & Tile Co., Sheldon Bldg., S. F.
- Indestructible Floor & Tiling Co., 251 Kearny St., S. F.

TILE FOR ROOFING
- Fibrestone & Roofing Co., Mutual Savings Bank Bldg., S. F.
- Gladding, McBean & Company, Crocker Bldg., S. F.
- United Materials Co......Balboa Bldg., S. F.

TIN PLATES
- American Tin Plate Company, Rialto Bldg., S. F.
- Meurer Bros. Co., A. H. McDonald, Coast Representative........630 Third St., S. F.

VACUUM CLEANERS
- American Agencies Co., 501 Market St., San Francisco, 608 S. Olive St., L. A.
- American Agencies, Ltd..501 Market St., S. F.
- Bill & Jacobsen, ...524 Pine St., S. F.
- The Vak-Klean Vacuum Cleaner, Pneulectric Co., Pacific Coast Agts., 452 Larkin St., S. F.
- Sanitary Vacuum Supply Company, 1601-3 Broadway, and 1600-2 Telegraph Ave., Oakland, Cal.
- Giant Stationary Suction Cleaner, manufactured by Giant Suction Cleaner Co., 731 Folsom St., S. F., and 3d and Jefferson Sts., Oakland.
- "Tuec" Air Cleaner, manufactured by United Electric Co..........523 Mission St., S. F.
- "Rotrex" Cleaners, Guernsey & Wheeler, district managers., Rialto Bldg., S. F.

VACUUM VALVES
- Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

VALVES
- Jenkins Bros.................247 Mission St., S. F.

VALVE PACKING
- "Palmetto Twist," sold by H. N. Cook Belting Co............317 Howard St., S. F.

VARNISHES
- S. F. Pioneer Varnish Works, 816 Mission St., S. F.
- Moller & Schumann Co., Brooklyn, N. Y., Chicago and S. F
- Berry Bros., "Liquid Granite," mfrd. and sold by Berry Bros..250-256 First St., S. F.

VENETIAN BLINDS, AWNINGS, ETC.
- C. F. Weber & Co....365 Market St., S. F.
- Ericsson Swedish Venetian Blinds, Boyd & Moore, Inc., Agents..356 Market St., S. F.

VENTILATORS AND SHEET IRON
- Meurer Bros. Co., A. H. McDonald, Coast Representative.........630 Third St., S. F.

WALL BEDS
- Marshall & Stearns Co., 1154 Phelan Bldg., S. F.
- California Wall Bed Co. Phelan Bldg., S. F.

WALL BOARD
- California Colonial Wall Board, mfrd. by Mound House Plaster Co. 259 Monadnock B' S. F.
- Bestwall, mfr'd by California B vall Company, Alameda, Cal.

WATER HEATERS
- Jos. Thieben Co., agents Pittsburg Heaters, 667 Mission St., S. F.
- Hoffman Heater Company, Loraine

WATERPROOFING FOR CONCRETE, ETC.
- "Ceresit," manufactured by the Ceresit Waterproofing Co., sold by Parrott & Co., San Francisco, Los Angeles and Portland, and Julien A. Becker Co., Seattle, Wash.
- Concrewaltum, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
- Fibrestone & Roofing Co., Mutual Savings Bank Bldg., S. F.
- Glidden's Concrete Floor Dressing and Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
- Liquid Stone Paint Co., Hearst Bldg., S. F.
- Neponset Waterdyke Felt and Compound, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co. ....Rialto Bldg., S. F.
- Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
- The Building Material Co., Inc., 583 Monadnock Bldg., S. F.
- Buswell's Steel and Concrete Paints, Oakland, Cal.

WHITE ENAMEL FINISH
- H. M. Perry & Co., 145 Montgomery St., S. F.
- "Satinette," W. P. Fuller & Co.. San Francisco and all principal Coast cities.
- Trus-Con Sno-wite, manufactured by Trussed Concrete Steel Company. See adv. for Coast distributors.

WINDOWS, REVERSIBLE, ETC.
- Tabor Sash Fixture Co., C. Jorgensen Co., Agents..............356 Market St., S. F.
- The "Holdfast" Bulldog and "Hookfast" Window Adjusters, mfr'd by The Casement Hardware Co., 175 State St., North Chicago, Ill.

WIRE FABRIC
- U. S. Steel Products Co., Rialto Bldg., S. F.

WOOD MANTELS
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GALVANUM PAINT	The ONLY paint made that will adhere for years and protect Galvanized Iron.
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ASBESTOS ORE PAINT No. 1180	A fire-proofing paint, a paint preservative of wooden trestles, wooden railroad bridges, a fire resistant or Fire Proofing Paint.

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THE GOHEEN MANUFACTURING CO.

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S. W. R. Dally	69 Columbia Street	Seattle, Wash.
Lewers & Cooke, Ltd.		Honolulu H. I.
Takata & Co	No. 1, Yurakucho Ichome	Tokio, Japan

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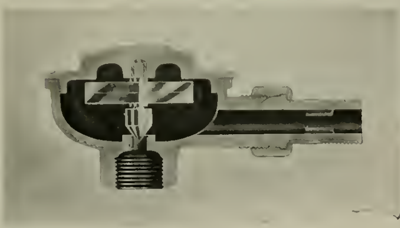
The Best Thermal Valve ever Devised—Can be used on any steam apparatus. Over 22,000 in daily use in many of the largest buildings in the United States



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Only a portion of radiator need be kept steam hot.

When steam is turned on there is no water-hammering or air-binding noises as are common with other systems.

Note the square diaphragm—it is a radical departure from other valves, and it's right.

Architects should specify THIS valve unconditionally. None others are "just as good."

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THIS STORE FRONT was given forethought by the Architect as well as by the Merchant — the brain-throbs are now bringing in actual dollars and cents. The Architect went to the Store — looked over the real local conditions

Kawneer
STORE FRONTS

— considered the kind of merchandise carried, the trade to which the Merchant appealed, the manner in which the windows were dressed—in fact he made the Front *fit* the Store—made it individual. The result is a Front characterizing this Store and not a thousand others.

The final, pleasing and efficient result was made possible only by KAWNEER. His ideas were carried out to the line because KAWNEER was in strict accordance with his modern ideas.

This is only one of thousands of examples. Call us up on the phone or drop a card — we will be glad to tell you all about KAWNEER — the Pacific Coast Store Front. Send for book No. 4, just a card will do.

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KAWNEER MANUFACTURING CO.
Francis J. Plym, President
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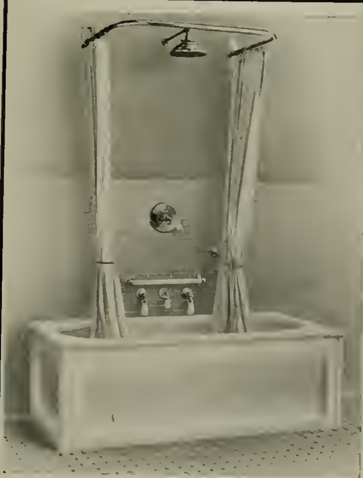

Plate A-2-J "Universal" Wall Bath Tub with Anti-scalding Mixer and Shower.
Sizes.......................... 4½′ 5′ 5½′ 6′
Width of Rim.............................. 3½″

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UNITED MATERIALS COMPANY, Balboa Building, San Francisco

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The weak spot in the average dwelling has heretofore been the roof. Wooden Shingles rot, warp, loosen, etc. And they readily catch fire. Slate and tile split and break. And their great weight puts a severe strain on the rafters. But J-M Transite Asbestos Fireproof Shingles haven't a single one of these faults—haven't a single weakness of any kind.

Residence of Mrs. Clara F. Taylor, De Land, Fla Roofed with J-M Transite Asbestos Shingles.

J-M TRANSITE ASBESTOS SHINGLES

are as fireproof and durable as a stone foundation. For they are all mineral—literally **stone** shingles. Made of **Asbestos** and **Portland Cement.**

More pleasing effects can be obtained with J-M Transite Asbestos Shingles than with any other kind of roofing material. They are made $\frac{1}{8}$-inch thick with smooth edges and $\frac{1}{4}$-inch thick with rough or irregular edges, in four colors—gray, green, red, and slate. Furnished punched for nails and ready to apply.

Write nearest Branch for Booklet.

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Send for descriptive circulars and list of purchasers. Advice cheerfully given. Consult our engineering department.

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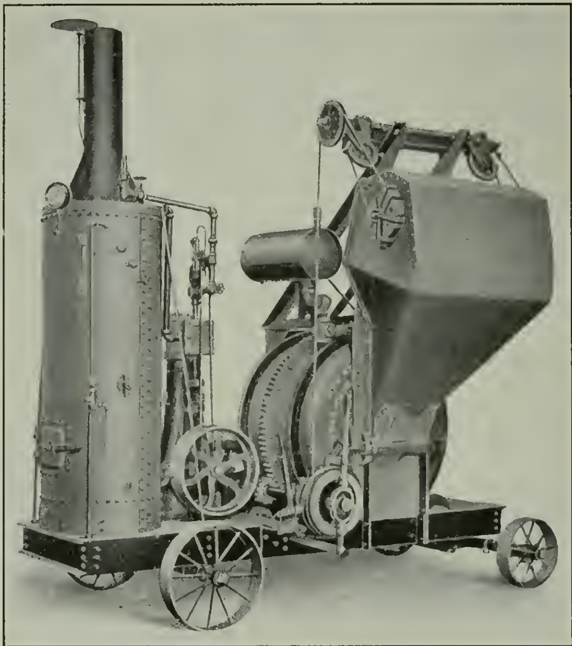

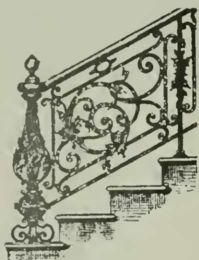

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Figures in Terra Cotta by N. Clark & Son. W. H. Weeks, Architect

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R. D. Farquhar, Architect

Frontispiece
The Architect and Engineer
of California
June, 1913

THE

Architect and Engineer

Of California

Pacific Coast States

VOL. XXXIII. JUNE, 1913. No. 2

Residence for Mr. E. P. Alling, San Diego. *W. S. Hebbard, Architect*

Some Observations on Domestic Architecture*

By HARRIE T. LINDEBERG in House Beautiful.

"I WOULD rather have my home comfortable and convenient inside than beautiful outside." That sentiment, expressed with a thousand variations, implies more eloquently than argument the gap which too often exists in this country between beauty and utility, particularly in domestic architecture. The gap is unfortunate and it is unnecessary.

It is a far cry from the cottage to the college dormitory or from the city house, built upon a narrow lot and walled against other houses on either side, to the manor house on its broad acres. Yet no matter what the site or class of dwelling the attempt should be made to embody that spirit of domesticity without which the mansion is magnificently mournful and the cottage like anything but a home. This attempt is surely the duty of all those who are striving to raise the standard of our native domestic architecture, of all who would prove that the sacrifice of exterior attractiveness and fitness to interior convenience is quite needless and unwarranted. It is an axiom of architecture that a building should rationally express the purposes for which it was designed, that a church should not look like a theater nor a library like a railroad station. The well-designed house then should be significant of, and adapted to the habits and life of its occupants, and should obviously express its purpose.

The design of a proper dwelling is based upon structural integrity and honesty of expression; on right proportion and simplicity of outline. It follows no whimsical fashion; it apes no popular style. It is neither fantastic in outline or frivolous in detail. It pretends to be nothing but what

*Illustrations are examples of Southern California houses, designed by Los Angeles architects and exhibited at the recent exhibition of the L. A. A. C.

it is, and it therefore contains no qualities which detract from simple dignity.

Build simply, whether a cottage or a castle. That is one of the fundamental laws of domestic architecture. This law applies especially to the architecture of country houses. A large living-room is obviously more acceptable to the average family than the same space cut up into a "parlor" and "reception-room," and a porte cochere is generally demanded for its name rather than its necessity. To avoid pretence, to ignore shams, to prune and cut the superfluous, these are the rules to follow in designing houses of real character.

In America the increased desire for country life has of late given rise to an increased demand for modest but well-designed country houses. Now, those architects who have the ability and the desire to put conscientious study into the planning of small houses, have long realized that the work involves even greater ingenuity than the work of building larger structures. The reward, on the other hand, is much less. It is, therefore, easy to see why so much of the work has been done by untrained men, whose lamentable monuments of bad taste are scattered through our countrysides and suburbs.

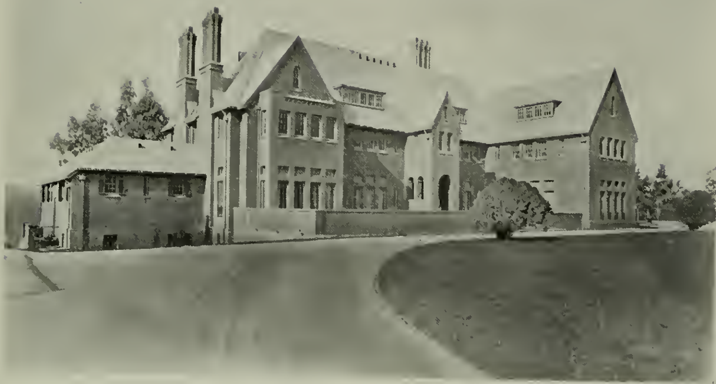
To treat the problem more specifically, we had best consider it under two distinct headings: The small house or cottage, and the large residence or manor house. We shall find that although a number of practical considerations vary widely with the two, yet the fundamental laws are the same for both.

For a small house the prime requisite is simplicity. Obviously, a "one-material" house is more simple and satisfying to the eye than a small house built of stone, brick, stucco, and shingles. Besides being more economical, the "one-material" house gains in character and dignity. For in working simply in one material, there is less temptation to introduce meaningless ornaments, showy paint, and superfluous mouldings. When possible, the materials to be obtained in the neighborhood of the site are the most appropriate.

The second requisite for suburban cottages is an attractive form. They should never be built on the plan of a square with their three dimensions equal. If we turn to examples of the old farmhouses of New England and the South, which always seem so well to fit their sites, we find one of the primary rules in their construction is that one dimension should dominate. A comparison of a square house of a given area with one that is oblong and of the same area will show, however, that the oblong house besides gaining in general exterior appearance permits of more exposure in the rooms.

The third requisite is a study of solids and voids and of grouping. The dignity of a quiet facade is dependent upon the rythmic spacing of the windows. Instead of several small windows, a great opening divided by many mullions, may give to the facade a simpler and finer treatment, as well as better wall surface in the rooms. Then, too, the size and shape of the panes of glass should be kept uniform throughout the house, for perhaps nothing does more to lend "scale" and domestic feeling to a dwelling than the careful study of the divisions of the sash. The effect of light and shadow may be used in a telling way in house designing, be the house but a humble cottage. The play of shadows produced by a simple lattice may readily take the place of architectural ornament, and may be far more effective.

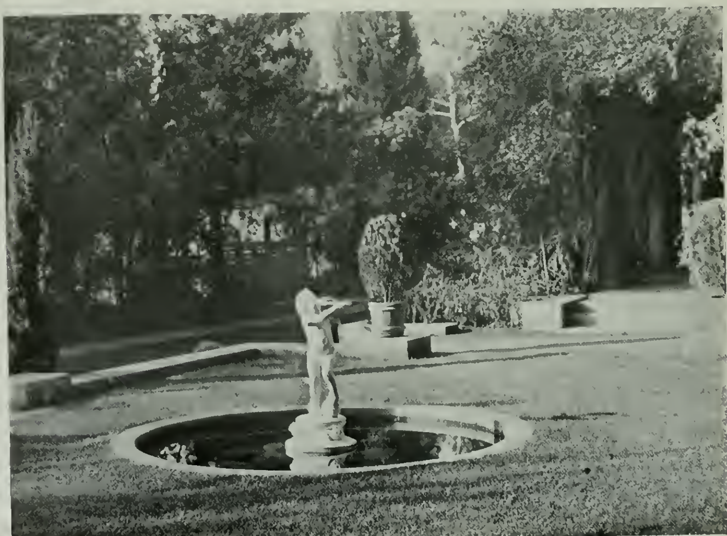
We now come to the question of height. As a rule, the small house should be low, or at least should give the effect of being low. A house



Residence of Mr. R. A. Rowan, Pasadena, California. R. D. Farquhar, Architect

Residence of Mr. R. A. Rowan, Pasadena, California. R. D. Farquhar, Architect

Russell Taylor Residence, Berkeley Square, Los Angeles, California. Myron Hunt, Architect



Fountain, Myron Hunt Garden. Maud Daggett, Sculptor

Russell Taylor Residence, Garden Front, Berkeley Square, Los Angeles, California
Myron Hunt, Architect

Residence of Mr. Elmer Grey, Los Angeles, California. Elmer Grey, Architect

Residence of Mr. Elmer Grey, Los Angeles, California. Elmer Grey, Architect

Bungalow of Mr. Julius Seyler, South Pasadena, California. Elmer Grey, Architect

MacGowan Residence, Los Angeles. Hudson and Munsell, Architects

Residence of Mr. J. T. Lindley, Azusa, Southern California. R. D. Farquhar, Architect

Residence of Mr. W. D. Petersen, Pasadena. Sylvanus B. Marston, Architect

Residence of Mr. W. D. Petersen, Pasadena, California
Sylvanus B. Marston, Architect

Residence of Dr. John R. Haynes, Los Angeles, California
R. D. Farquhar, Architect

that sits high is never quite friendly to its garden or lawn. Two stories are sufficient. A peculiar charm is often attained by rambling single-story wings. It is pleasant, too, to pass from the living-room or dining-room, through casement windows, down a single step to the brick terrace or out upon the lawn.

But the principal feature of the country house is the roof, sheltering, as it does, the whole building, and if properly handled, conveying at once a kindly feeling of homeliness. The beautiful roofs of English cottages owe their charm not only to their unbroken surfaces, but to their interesting materials—their thatch, quarried slate, and hand-made tiles. We in America, with our manufactured shingles and tile, are here at a disadvantage. Of late there has been devised a successful method of laying shingles, whereby has been produced a texture and softness of thatch without gross imitation. This effect is gained by permitting no sharp angles by rounding the hips and ridges and furring the valleys, and by means of steam the shingles are bent at the gables to meet the verge-

Residence of Dr. John R. Haynes *R. D. Farquhar, Architect*

board and eaves. The courses of shingles are laid out of the horizontal in long irregular ways, varying in width of exposed surface from one to five inches, thus giving the entire roof a texture, when sufficiently weathered, which no stain could possibly produce.

This type of roof, however, can be only used appropriately as an integral part of the design. Where it is put on structures not meant to receive it, we are inflicted with the absurdities that, since this method was devised, have been cropping up in our suburbs, literally, like mushrooms. The roof and walls, whatever they may be, should form a harmony and not a discord.

Simplicity, harmony of outline, proper proportions, and unity of design—these form the golden text for the architect of small houses. The right practice of this text, by the profession in unison, may well result in a transformation of our countryside and suburbs.

Turning now to the large dwelling or manor house, we may say, in general, that it should be a dignified structure. It should express, as the

RESIDENCE · FOR DR EDWIN JANSS WINDSOR · SQVARE J MARTYN HAENKE ARCHITECT L·A·

Residence for Mr. Thos. Thorkildsen, Beverly Hills, California
Thomas Franklin Power, Architect

Residence of Mr. Mortimer Fleishhacker, Woodside, California
Greene and Greene, Architects

Interior the Banning Residence, Los Angeles. C. H. Brown, Architect wisdom of generations has rightly felt, a certain quiet stateliness of planning and furnishing. In the old English manor house these qualities were generally realized. In America, on the other hand, we see varying degrees of affectation in our more pretentious homes. Of these affectations, perhaps the least to be condemned is the erection of a large house as a magnified cottage. The effect sought is domesticity. Even the large house in the country should not merely be a place for the reception of visitors; it should be a dwelling for a family, and it should express the domestic feeling as surely and straightforwardly as the small cottage. * * *

What is true of the necessity for giving the architect control over the exterior of the house, is no less true when the interior is considered. In spite of large, even lavish expenditures, the interior effect of many of our expensive houses is often that of a very commercial decorative art. Stanford White, the most brilliant and, perhaps, the only great architect-decorator our country has known, was successful because, while relying upon the professional decorator to assist him, he obtained his unity and integrity of effect by carrying out personally his designs to the end. In fact, he would accept no commission which would not allow him complete control down to the very smallest details. As the architect is entrusted with the exterior setting, so should his advice be sought and followed in the furnishing of the interior.

The interior trim, the mantels, panelling, wainscoting, and the staircase, are generally included in the builder's contract. For this work the architect's details are followed, and his designs accepted without question. Yet, how often is a carefully panelled room utterly ruined by the wall coverings, curtains, and furniture, because the owner considers these matters—which make or mar an interior—to be outside of an architect's province, or too personal for him to advise upon.

The rooms in a house should be homogeneous, not a collection of samples of historical periods. To design a Jacobean dining-room and a Louis XV drawing-room, in a Georgian building, immediately makes the house a series of unrelated compartments. On the other hand, when the rooms of a whole floor are treated broadly, we have, as a result, not only a unity of effect, but a fine sense of spaciousness.

The average man contemplates the building of a house with misgivings, not unmixed at times with fear. He has been told that building is an expensive luxury, and that the cost of a house invariably exceeds the initial estimates.

On this subject we can speak from our own experience. We have designed some houses which have been finished within the expenditure originally proposed, and others in which the initial estimates have been doubled. But we believe we are stating the experience of architects in general when we say that the additional cost has, in every instance, been incurred at the client's express demand.

One of the most important considerations in building is the selection of a builder. In this country, unfortunately, the selection is generally made by the competitive system of estimating. To give the work to the lowest bidder, without inquiring into his character and reputation, is the rock on which the most carefully designed house may be wrecked. Competition between builders of reputation is not necessarily bad; but, in competition between builders whose characters are not investigated, it will generally be the man who counts on making his profit by undetected "scimping," who offers the lowest bid. The whole process, as someone has remarked, too often results in the survival of the unfittest.

The Banning Residence. C. H. Young, Architect

Interior the Banning Residence. C. H. Young, Architect

Residence of Mr. A. C. Hershey, Beverly Hills, California — *Arthur R. Kelly, Architect*

Corner of Den, Residence of Mr. A. P. Johnson. R. B. Yo.ng, Architect

Residence of Mr. W. S. Crismon, Los Angeles. Arthur R. Kelly, Architect

Sketch of Residence for Mr. M. C. Russell. Elmer Grey, Architect

Water Color, William Hespeler Residence, Pasadena, California
Slyvanus B. Marston, Architect

Residence of Mr. William Hespeler, Pasadena. Sylvanus B. Marston, Architect

Residence of Mr. H. Page Warden, Pasadena, California *Reginald D. Johnson, Architect*

Sketch of a Residence Street Abroad. Charles H. Kysor

Although an architect, by playing the distasteful part of the amateur detective, may be able to obtain from an unscrupulous builder a minimum standard of workmanship, this is only achieved by the most rigorous spying—and the standard will surely be a minimum standard. Because of the absence of any pride in his work on the builder's part, the final result is altogether unsatisfactory.

Furthermore, a man who is going to erect a house should make up his mind at the outset that the architect does not determine the cost of the building. This is fixed by many conditions, the most important being the area it covers, the cubical contents and the type of construction.

Cost of building varies for many reasons. Among these may be mentioned vagaries in the material market, the distance of the building from the source of supplies and labor, the prevailing condition of the labor market itself, and often, whether the contractor needs work, or has plenty of contracts in hand. Among country contractors, particularly, this has been found to be a frequent cause of the variation in figures.

The architect can never determine actual cost from tentative plans. But on the cost of construction he is none the less a safer guide than the building contractor. In every-day practice it is shown that contractors' estimates figured in competition and from completed plans and specifications, often vary from ten to fifty per cent.

Residence for Mr. Garfield R. Jones, Pasadena *Walter Webber, Architect*

Garden Front, Residence for Mr. Garfield R. Jones. *Walter Webber, Architect*

Residence for Mr. Robert O. Gillis, Santa Monica. Elmer Grey, Architect

Sketch of Residence for Mr. Geo. A. Rogers, Los Angeles
Arthur R. Kelly, Architect

Sketch of Garden, Residence of Mr. Geo. A. Rogers, Los Angeles
Arthur R. Kelly, Architect

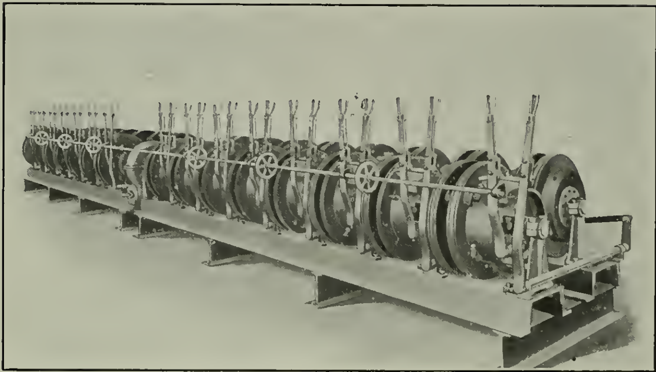
Lee A. Phillips Residence, Los Angeles. Hunt and Burns, Architects

Beaux Arts Problem—A Tea House on a Country Estate
C. Tracy Hoag, Architect

Detail of Entrance to Residence of Mr. A. W. McAllaster, Pasadena
Slyvanus B. Marston, Architect

In this matter, of course, there are two ways for a client to approach his architect. He may say, "I have $25,000 to spend; show me what I can get for it." Or he may say, "These are my requirements; keep the cost as low as possible." But he cannot say, "I must have this and that, and I will not pay over $25,000 for it."

The details and complications of building even the small house may seem at the outset to be many; but there is one way for the owner to avoid most of his worry, and that way is to place at the start a little real faith in the architect he employs. If you wish a successful house, give the architect free admission into your confidence and faith. He will work many times harder, knowing that you trust his judgment and stand behind his decisions. For the profession of architecture, like that of medicine and law, is one in which the results are judged by the services performed, and the creation of a beautiful and useful building is to the true architect his best reward.



An Electric Scenery Hoist

Electricity in the Theater

By CHARLES T. PHILLIPS, C. E.*

LOOKING back a few years and comparing the theaters of that period with the modern playhouse, the changes that have been wrought in the mechanical, lighting and scenic effects are wonderful. These improvements are due almost entirely to the use of electricity.

In early days gas was the sole mode of lighting, the speaking tube the only means of communication, and hand power was depended upon for the operating of mechanical effects.

The great progress of today made through electrical achievements, in staging vividly the big productions, as they are called, has been obtained only by the solution of many difficult problems, by thorough study of the requirements and repeated experiment on the part of the scientific and engineering forces of the producer of the play.

Today no theater, no matter how small, is without electric lighting and an intercommunicating system of telephones, and electric motors have replaced hand power.

It is not the object of this article to lay out a set of rules to cover the electrical equipment of any one class of theaters, as that would be impossible. To the uninitiated in the working of a modern stage, all theaters look alike, as far as the operation of the stage is concerned. This fallacy has been the cause of the majority of the mistakes in the designing of the electrical equipment.

Theaters can be divided into four general classes: Combination, vaudeville, comic opera and stock. In addition there are the moving picture theaters, concert halls, opera houses and such houses as the Hippodrome, New York, and others that are more or less special.

The equipment of each class of houses should receive different treatment, and, in addition, there are more or less special problems for each individual case. A simple, yet flexible, installation of sufficient size to handle any show that the house may play should be installed. Details

*Written for the Architect and Engineer by Mr. Phillips, Pacific Building, San Francisco.

should be carefully worked out and not left to the judgment of the contractor or manufacturer. An over-zealous designing engineer is apt to design a complicated and expensive system, which not only is high in first cost, but is frequently confusing to the stage mechanics. If the specifying is left to the stage electrician and carpenter, to quote a well-known manager and owner, "there would not be room enough left on the stage to stage the show and the management would go broke paying for the installation."

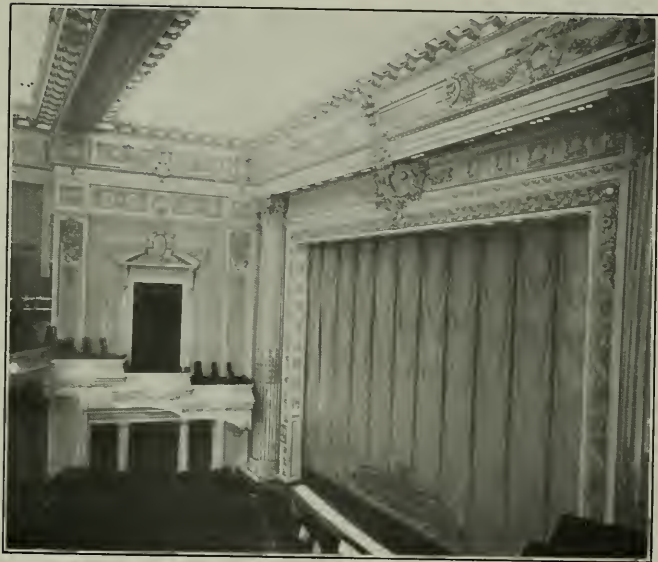
There are always a large number of special electric problems to solve and there is also a large variety of standard apparatus on the market from which to select. It is not advisable to design any more special apparatus than is absolutely necessary, where there is any possible chance to use a standard article, as repair parts have to be made special, causing a delay in getting apparatus back into service after a breakdown. In spite of this fact, there is hardly a theater of any importance for which the engineer is not compelled to design some special features.

It can not be too strongly stated that ruggedness should be the watchword of any theatrical installation, as the entire equipment will receive hard and constant service, and the failure of even an apparently minor item may ruin a show. There is no class of electrical work which receives the rough treatment that is found in the theater and the work should be designed accordingly. The stage equipment especially should be rugged, well protected from damage and as compact as possible. All apparatus should be easily accessible and in plain view, yet so placed that scenery or properties will not block the passage to same.

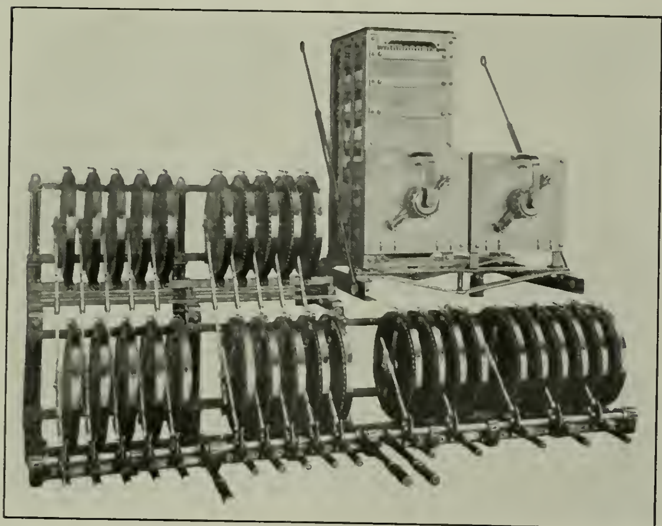
Frequently the architect, even in the case of a large theater, will not work out the details of the design carefully, but will leave it to the electrician or the electrical contractor to arrange the work as well as he can under fixed conditions already imposed. The result is that the electrical construction is costly, and the system, when finished, is badly lacking in the elements of neatness, flexibility and adaptability to its purpose, all of which might have easily been obtained if the installation had been given proper thought when the plans for the building were drawn. Fortunately, the more progressive architects have abandoned the above practice, and an intelligent set of plans and detail drawings are furnished to the contractor, showing details which are impossible to describe in a specification. Some of the less progressive ones, however, still cling to the old method of copying a specification originally intended for an office building, hotel or some other theater. These specifications are frequently made to contain an elaborate and tedious enumeration of the qualities of the materials with more or less detailed descriptions of the test which they should be able to withstand. The greater part of this can be omitted, as the National Electrical Code covers such matters so completely that it is of no value in the specifications.

It is said that people like to be fooled, and one sometimes sees specifications which seem to betray a marked tendency to take advantage of this alleged weakness. As the owner knows little or nothing about electrical or mechanical matters he is generally impressed with this class of specifications which leads him to feel that a conscientious and deliberate effort has been made. The contractor is then supposed to supply a satisfactory system without the necessary information to work from and is frequently condemned by the owner for his apparent ignorance and inability to interpret these specifications.

If the perfection of the visual and mechanical elements of theatrical production (especially when of an operatic or spectacular nature) are to



A Well Lighted Theater



A Bank of Dimmers

be obtained, the above mentioned methods will never accomplish the results desired.

In striving for realism through the refinement of representation that may result in a harmony of the whole, electricity has played the important part. Audiences are captivated by marvelously realistic reproduction of natural phenomena in form and motion. The theater-going public feels the greatest pleasurable emotion when it sees action delineated in a realistic atmosphere, but lack of proper attention to the electrical details will frequently "kill" a show by detracting the attention of the audience by grotesquely inadequate scenic accompaniment.

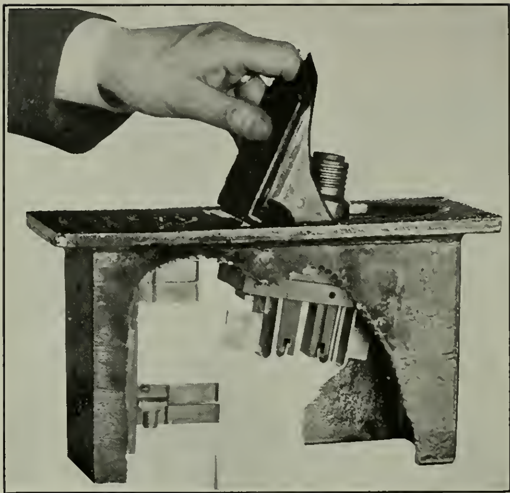
The mechanical appliances that have been introduced on the stage are almost legion, and the majority of them depend upon electricity for their operation. One has but to witness a production in a large opera house to realize the vast amount of intricate mechanism that enters into the business of spectacular entertainment, where electric power solely has made possible many of the astonishing scenic effects which have been obtained.

The uninitiated in the workings of a modern stage are frequently bewildered by the apparent chaos that reigns the moment the curtain touches the stage floor at the conclusion of an act. Stage hands, apparently in an aimless manner rush hither and thither, the director or stage manager is frantically waving his hands and there is every indication of confusion everywhere. Here is where the telephone and various signaling devices control the situation, and throughout the performance, whether the curtain is up or down, the telephone is almost constantly in use. The stage hands, the musical director, the lamp operators in the gallery front or on the calcium bridge, the head usher and the house manager are all in communication with each other by the telephone and other signaling apparatus. During the performance of any scene, instructions can be given without disturbance, orders for future changes such as criticisms of a setting or a performer, can be sent from the front of the house to the stage manager or technical director, thus saving many steps and much time. The trimming of ceilings, stage borders and hangings is simplified, and makes it unnecessary to shout from the stage to the fly gallery as formerly.

The nerve center of the theater is the stage switchboard, and, at this point is located all apparatus necessary to control the scenic and mechanical effects on the stage and the auditorium lighting. The stage switchboard is usually located on the prompt side of the stage with the stage manager's signal board and all other devices of a controlling or signaling nature. In a few of the larger theaters, the switchboard is located under the stage with a small hooded opening in the footlights for the operator to view the stage. The stage switchboard should be as small as can be consistent with the apparatus to be mounted thereon, and the switching connections should be so arranged that the operator will have a minimum of operations to perform to get any combination or result desired.

More trouble has been caused in connection with electrical effects by an improperly designed switchboard than any other one item. Frequently two or three men are required to operate a switchboard, where one man should handle any production with ease, and results would be better, due to lack of confusion from having several operators.

Interchangeable color effects, so essential to the successful staging of modern plays, are largely the result of the floor lamp and dimmers. Both have their particular sphere and both should be given careful consideration. The dimmers play, perhaps, the most important part, as they control not only the entire illuminating scheme on the stage, but frequently in the



Stage Door Pocket with Plug

auditorium as well. The illusion of the advance of dawn, creeping slowly over the hills and giving birth to the day, or the retreat of the sun, as the light mellows and gradually steals away into twilight and dusk, to the cold, weird, bluish light of the moon, are enacted with wonderful likeness by the use of these devices.

An innovation in stage mechanism is the electrical scenery hoist or the "electrical flyman"; this apparatus is used successfully by a number of modern theaters with great advantage over the old method, where frequently from ten to thirty flymen were employed in the fly gallery, and now, with the use of this machine, the force is cut practically in half. No counterweights are needed, and where rapidity is required both in hoisting and trimming, the "electrical flyman" does the work both quickly and noiselessly.

The ozonator is perhaps the least known of appliances for theatrical use. This machine should prove a boon to managers of theaters where smoking is allowed or where the ventilation is poor.

Confined air is relatively stale; ozonizing revivifies its oxygen, and is accordingly a valuable adjunct to ventilating systems, where stale and vitiated air cannot be entirely displaced by fresh air.

Ozone is a product of the sun's action and can be generated in an artificial manner in various ways. For commercial purposes, the ozonator is most satisfactory, and is designed to operate by connecting to an ordinary alternating current lighting circuit.

If Nature goes to the trouble of producing ozone for the purpose of destroying the bacterial life that is inimical to man and thus succeeds in making the earth habitable, surely man can well imitate Nature by the artificial production of ozone in the building from which he has excluded adequate air and sunlight.

An Attractive Reinforced Concrete Bridge with 40 foot Span and Ornamental Iron Railing
Designed by Daniel B. Luten, C. E.

The Intimate Theater Idea

By CLAUDE L. HAGEN*

The Intimate Theater movement is spreading all over the world, and with its advent has come the virtual passing of the larger New York play houses, such as are below 42d Street or what is called the theater zone. It is expected that the camera man will capture in due course Daly's and even Wallack's, just as he has the Herald Square, the Savoy, and the Bijou, and now that Weber and Fields have moved up to the acknowledged playhouse zone, the old Music Hall—one of the most intimate theaters that New York ever had—will probably pass over to the silent drama.

Winthrop Ames started the movement now spreading. He was impressed with the success of the Little Theater in London and the Camera Theater in Berlin, and the Messrs. Shubert have shown almost from the outset of their meteoric career that they were opposed to large auditoriums. On West 39th Street they now have three of these intimate playhouses, not one of which seats more than 600, while the new Princess Theater, which is being erected for Annie Russell to present old comedies in, will seat only 350.

Adolph Phillip, the German impresario, has just inaugurated the first season of his Bijou playhouse in the Yorkville district. Although it seats but 350 there is room for twice as many. Comfort and spaciousness combine here to give the wealthy Germans of the Greater City an ideal intimate playhouse where it is the intention to present a single play for an entire season. The intimate theater is here for all time.

* * *

THE Intimate Theater is so termed on account of the intimate relation of the audience to the stage. The revolving stage projects into the audience chamber, and is enclosed by the act curtain, just back of which are the footlights. On each side vertically are side lights and overhead the border or top lights, all concealed, and the light reflected onto the characters. This arrangement distributes the light equally, removing the blinding effects of the lamp filaments upon the eyes of the actors, permitting them to see their audience.

An orchestra chamber is provided on one side of the proscenium arch; an organ loft opposite. The top of the proscenium arch extends over the entire auditorium and returns down to the rear wall, forming an immense sounding board which will reflect sound waves to every part of the audience chamber and permits of a more efficient control of ventilation. Placing the curtain in front of the stage lights permits the stage director to light the picture properly before it is exposed to the audience.

Floor coverings, carpets, or rugs, may be extended to the curtain so that the entire scene is in repose when shown. Movable fire walls separate the stage from the audience chamber, and are arranged as sliding doors suspended from the top and closing in from the sides. This permits the proscenium opening to be closed quicker than if the door were lowered from the top. This arangement also removes the danger of such an enormous weight being suspended over the stage or dropped or lowered onto actors who might be trying to pacify an audience in a panic. There is also less danger of obsruction in its movement—as was illustrated in the Iroquois Theater fire.

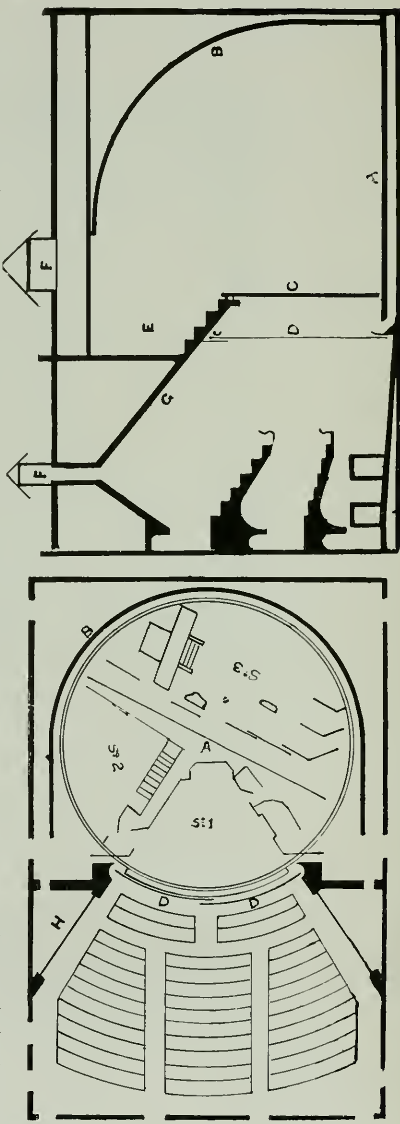
*With Introductory Note by Robert Grau in The Architect and Builder, New York City.

This arrangement permits of the construction of a light chamber over the proscenium arch. By means of flying or swing bridges, lights and effects can be produced at any portion of the stage.

The Drehbühne or revolving stage is surrounded within the sight lines by a horizon wall with a sky dome, preferably of steel construction, rough plastered and of such color as experiments may determine is best adapted to light effects projected from the light chamber. In this manner the entire stage may be flooded with diffused light.

This background also acts as a sounding board to project sound waves.

Beautiful effects may be obtained similar to those of the Artist Mariano Fortuny of Venice, who has invented a new process of stage illumination which closely imitates the conditions of nature, and presents all objects in diffused light. Arc lamps are used exclusively, as their light corresponds in composition more closely with sunlight. The light is reflected by surfaces of cloth and thus is diffused. In order to produce the various tones observed in nature, the reflecting surfaces are composed of a number of strips, some of which serve for the production of colors and others for the modification of the light by an admixture of black or white (white paper reflects 70 to 80 per cent., black velvet reflects 4-10 of one per



The Intimate Theater. Longitudinal Section and Plan
A.—Drehbühne. B.—Skydome. C.—Fire Curtain. D.—Act Curtain. E.—Light Chamber. F.—Ventilator. G.—Sounding Board. H.—Orchestra.

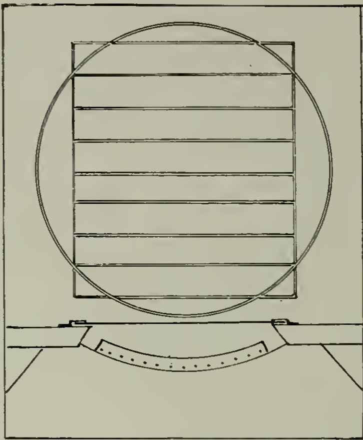
cent.). Fortuny has illuminated a stage scene so perfectly that it was photographed without the use of other light as clearly as though it had been out in the daylight.

The opportunity provided by the design of the "Intimate Theater" permits of a revelation in stage lighting.

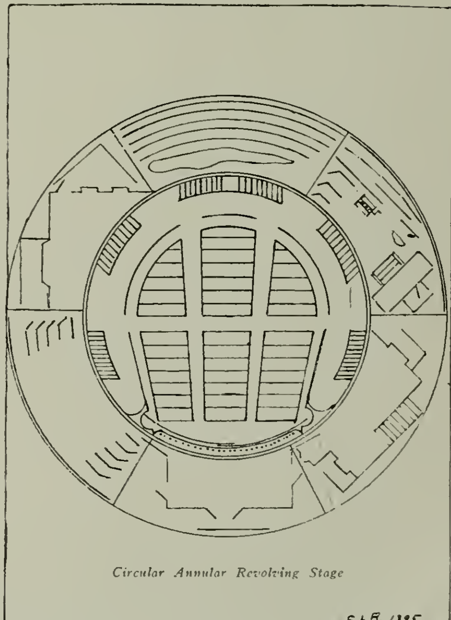
The Drehbühne permits of a number of scenes being arranged upon it at one time, with no portion of them extending over—thus permitting scenes to be moved into position rapidly and silently. Infinite time may be expended in preparing scene pictures with that care and detail so desired by the director and artist, and with the knowledge that they will appear undisturbed in their proper place in the play. And thus does the mechanical stage play its part in the advancement of the Drama.

Another form of stage adaptable to the Intimate Theater is the annular revolving stage. The stage is a large circular ring which revolves around the audience chamber which is entered by stairways or runs from underneath. The accompanying plan illustrates how six large scenes may be arranged upon it at one time.

The balcony and gallery may extend over the space occupied by the stage, thus giving enormous seating capacity. They would be entered by stairways or elevators from the outside. In a playhouse like the Hippodrome, New York City, the same performance could be given in about one half the time, and an annual saving of $300,000 effected. This type of stage has been in use many years—originally at the St. Louis World's Fair and later at Coney Island, N. Y., for the spectacular production of "Creation" and "War is Hell," where it was necessary to give a large number of performances daily.



Circular Revolving, Transverse and Vertically Moving Stage of the Century Theater



Circular Annular Revolving Stage

C. L. R. 1915

Cracks in Concrete — Causes and Corrections*

THE following inquiry letter was issued to all members of the Concrete Institute at the end of June, 1909:

DEAR SIR:—The Concrete Institute are impressed with the fact that much has yet to be learned on the subject of expansion and contraction of concrete, and that definite information on this subject will be of great value to their Members and to all who use this material The Reinforced Concrete Practice Standing Committee are investigating this matter, and you are asked to be so good as to assist them by giving answers to the following questions, and any further information which you may be kind enough to offer will be of great help:

1. Have you had experience with cracks in concrete?
2. What was the nature of the structure?
3. How old was it when the cracks occurred or when you first observed them?
4. How far apart were the cracks and what size?
5. To what do you ascribe the cracks?
   (*a*) Shrinkage from setting in air;
   (*b*) Variation in temperature;
   (*c*) Difference of temperature on different parts of the structure; or
   (*d*) Any other cause, and if so, what?
6. What precautions do you advise to prevent such cracks?

An answer as soon as possible would be greatly appreciated.

I am yours very truly,

(Signed) ARTHUR E. COLLINS, Hon. Secretary.

Fifty-four replies have been received and have been considered. As they record experiences which must be kept confidential, and cannot well be summarized in general terms, particular features needing description in order to enable useful conclusions to be drawn, the committee has not followed the usual course of printing the evidence, but presents the following review of the subject and recommendations for the prevention or diminution of the cracking of concrete.

The cracking of concrete is unsightly, but is not necessarily dangerous. Cracks in concrete may be divided into two classes:

1. Surface cracking.
2. Body cracking.

In the first category the cracks are often referred to as "hair" cracks, by reason of their fineness and semblance to hairs, and occur both in plain and reinforced concrete. They are also known as "crazing" and are of very frequent occurrence. They appear to arise from the surface skin of cement mortar, being richer in cement than the mortar of the body concrete, thus exposing almost a neat cement skin, which expands at a different rate on exposure to the sun's rays than the body concrete. It is worse upon the uppermost face in a mould, where the lighter and weaker particles of cement work up to the top and form a skin known as "laitance." If work be kept under water, and sometimes if shielded from the sun, this crazing may not occur. To overcome its unsightliness the surface skin should be removed either (1) by brushing the concrete when green with wire brushes; (2) by rubbing by means of a stone or piece of concrete and sand and water; (3) by dressing with hand or pneumatic operated chisels and hammers; (4) by brushing the surface with hydrochloric acid and subsequent washing with clean water. The last two named methods are best with completely hardened concrete.

The cracks extending through the body of concrete may be ascribed to the following:

1. Faulty design and construction so far as statical resistance is concerned.

*Abstract of a report submitted at the Thirty-sixth Ordinary General Meeting of the Concrete Institute. April 10. 1913. at Denison House. 296 Vauxhall Bridge Road. Westminster. S. W.

2. Expansion of cement or concrete.
3. Corrosion of embedded steel.
4. Shrinkage from setting and hardening in air.
5. Difference of temperature in different parts.

1. Under the first head the following causes have been noted:

(*a*) Settlement of the foundations.

(*b*) Too high a stress in the reinforcement, resulting in excessive deformation.

(*c*) Too thick a covering of concrete in particular where the effective depth of beams is very small.

(*d*) Too early removal of forms. The age of the concrete when the forms are removed must be sufficient to give the usual factor of safety due to the stresses caused by dead load and such accidental load as may at that time be anticipated. Generally the following recommendations are made, subject to the approval of the engineer or architect responsible for the works.

For mass concrete walls not subject to thrust, and where the height does not exceed 2 feet, the forms should not be removed under 24 hours. Where the wall is subject to pressure, forms should remain in place at least a week, although a fortnight is preferable. For mass concrete arches of more than 20 feet span, one month is recommended.

For reinforced concrete the following is recommended:

Slabs, a minimum of 7 days, but otherwise, for slabs carrying only their own weight, an allowance of 2 days per inch of thickness, or 1 day per foot of span, whichever is the greater. For sides of beams, walls, and columns not under sidethrust a minimum of 4 days; bottoms of beams, a minimum of 2 weeks, though a month to 6 weeks may be necessary under special circumstances; for arches the time of removal of the centering is better left to the judgment of the engineer, keeping in view the ratio of rise to span and special circumstances.

If it is intended that the structure should be used for carrying heavy weights, emergency props should be left in for such time as the engineer or architect may direct.

The foregoing periods to be increased by at least the time during which frost or rain has intervened.

(*e*) Defective design of forms with inadequate allowance for contraction and expansion due to variation of moisture. Dry timber may expand and crack the concrete unless wetted beforehand.

(*f*) Careless removal of forms, which may result in cracking the concrete by shock of falling timber, or by levering and prising on the green concrete.

(*g*) Vibration, resulting in deficient adhesion and excessive deflection. Forms should be very rigid.

(*h*) Insufficient allowance for continuity, fixity, and general monolithic nature of concrete work done *in situ*. Over supports the maximum degree of continuity and fixity should be provided for. Frequently cracks will be found over supports of continuous reinforced concrete beams and floor slabs, owing to the omission or insufficiency of steel there. Concrete floors are often built in chases in walls and carried over walls, others standing above, and sufficient fixity is given to cause cracks, if provision has not been made in the reinforcing. Columns and piers when built monolithic with beams will give more or less fixity to end of beams resting thereon, both at end and intermediate supports.

(*i*) Too close spacing of steel, so that there is no room for the concrete to get round and adhere or bond with the bars.

Expansion of Cement or Concrete

Under this heading the following causes of cracking are noted:

(*a*) Overlimed and coarsely ground cements which were frequently met with years ago caused expansion, to overcome which it was necessary to leave room for expansion:—*i. e.,* expansion joints. Especially was this precaution adopted round the edges of floor slabs adjoining walls.

(*b*) Coarse materials containing sulphur, compounds, unburnt fuel, oxidisable or hydratable iron compounds, unslaked lime, and other deleterous substances. Breeze, clinker and slag frequently contain sulphur and metallic iron or oxide of iron, while boiler ashes may contain both sulphur and unslaked lime (the latter derived from limestone in the coal). Some bricks contain sulphides and sulphates and lime, and should not be used broken for concrete. Old bricks also sometimes have old plaster adhering to them; the sulphate of lime may cause no trouble in plain concrete while it is kept dry, but in the presence of water reacts chemically with the aluminates of the Portland cement, forming sulpho-aluminate of lime, which is attended by increase in volume, and may cause blowing if in large quantity, and even a small quantity may result in cracking. Free lime in the same way will swell or contract with water. Black magnetic oxide of iron will become converted into hydroxide of iron in the presence of moisture. Indeed, any iron compounds are dangerous in reinforced concrete as likely to react electrolytically with the steel in the presence of moist air or dampness, and sulphur causes speedy corrosion.

Corrosion of Embedded Steel

Should the steel in reinforced concrete corrode by reason of porosity of the concrete or the presence of deleterious substances in the coarse materials of which it is made, or by electrolytic action, the concrete cover to the bars will crack and burst off.

Shrinkage from Setting and Hardening in Air

This is probably the most frequent cause of cracking.

Concrete will expand slightly in water and contract on drying out, so that cracking is frequently not evidenced from this cause until the concrete is allowed to dry, varying usually up to two months, and in thick mass walls moisture and heat are retained for a long period and may delay cracking up to six months and even longer. It is usual to keep concrete wet for several days after manufacture in order to ensure it gaining maximum hardness, and it is specially important to prevent rapid drying by sun and wind, so that the surface of concrete should be shielded against such exposure. A dry mixture of concrete shrinks less than a wet mixture, and concretes richer in cement contract more than lean mixtures. For reinforced concrete work medium wet mixtures are desirable, and therefore concrete richer in cement than 1 to 5 is not advisable for curtain walls. The coefficient of contraction of concrete on exposure to air appears to be about 0.0002 to 0.0005 at one month, and increases to about 0.0004 to 0.0006 at 1½ years. The variation recorded is between poor and rich concretes. Such contraction is usually prevented from taking place uniformly throughout; in retaining walls and pavings it is prevented by friction of the soil, in other cases by the holding of other parts. Plain concrete will usually hold together for some distance, so that contraction joints need only be inserted at intervals; the following are advised as suitable distances apart of such joints in plain concrete:

Paving, 4 to 5 feet.
Curtain walls 10 feet.
Exposed retaining walls, 15 to 20 feet.
Basement retaining walls (not exposed) and dock walls or dams, 50 feet.

If curtain walls adjoin heavy columns and beams, the rigidity of the latter would probably result in cracking if constructed monolithically, even if reinforced. It is best, therefore, in such cases to provide joints adjoining beams and columns.

If concrete be laid over the joints of a thicker lower surface of concrete, the joints of the latter will most probably be evidenced in the upper surface.

Large surfaces have been successfully constructed without apparent cracks by properly reinforcing the concrete and laying all at one operation. The object of the reinforcement is to break down the tensile resistance of the concrete and cause it to crack uniformly at such close distances as to render the cracks invisible to the eye. If one portion of the concrete be left overnight, great care should be taken to roughen the hardened surface by tooling away; then clean by brushing with water, and apply half an inch of mortar of the same proportion as the mortar in the concrete and ram the fresh concrete well against it. Such joints will often show, even though well reinforced. In calculating the amount of reinforcement for such purpose, the ultimate tensile strength of the concrete at one month should be equated to the resistance of the steel at the yield point. Usually for a 1:2:4 concrete ½ per cent. of steel is required each way, the bars or meshwork being laid at right angles. The reinforcement should be in small sections and well disseminated through the thickness of concrete, and a layer of bars should be near each face. So-called "distribution bars" near the bottom of floor slabs are not sufficient if cracking is to be resisted; rods should also be placed near the upper surface. Cracks frequently occur parallel to rods where "distribution bars" are not used, and also occur at right angles to main bars where continuity bars stop; top reinforcement would avoid this. Contraction reinforcement should be in addition to the section of steel required to resist static forces.

The sudden drying out when heating apparatus is installed frequently causes excessive cracking.

Difference of Temperature in Different Parts

Considerable difference of temperature will cause cracking and should be avoided as much as possible. Heavy reinforcement is not always an effectual preventative. Most reinforced concrete chimneys in which the internal temperature is over 500 deg. F. seem to be cracked vertically, externally, and often horizontally as well, though possibly the latter could be avoided. This cracking is probably due to the difference in temperature between the outside and the inside, which may be considerable with a cold wind blowing. A continuous lining with cavity between it and the outer shell would probably prevent serious cracking.

Vista to the Sea. By I. E. Frary

Entrance to Santa Monica High School, Los Angeles. *Allison & Allison, Architects*

Detail, Santa Monica High School. Allison & Allison, Architects

Santa Monica High School. Allison & Allison, Architects

Standard Oil Building, San Francisco
Benjamin Geer McDougall, Architect

The Standard Oil Company's New San Francisco Home

ON JUNE 1st the Standard Oil Company moved into its splendid new office building at Sansome and Bush streets, San Francisco. The photograph shows the building as it was nearing completion.

The building will be occupied by the general offices of the company and the local San Francisco agency, nine floors of the building having been designed and subdivided to exactly suit the particular needs of the various departments.

The ground floor will be devoted to the San Francisco agency and in addition to the salesroom, there will be a display room for the exhibition of samples of all the many products of petroleum.

Other floors will be occupied by the producing, refining, marketing, pipe lines, marine and accounting departments, the upper floors having been reserved for the executive officers of the company, their immediate assistants, and a board room for the directors.

In the basement will be located the Company's laboratories for the testing of road materials and other scientific purposes.

By way of contrast, it is interesting to note that the first office of the Standard Oil Company in San Francisco was opened in 1878 and consisted of only two rooms. The organization included a manager, a clerk, and an office boy. On June 1st, in this new building alone, the Standard Oil Company assumed possession of 88,000 square feet of floor space and gave employment to 420 people. Its total number of employes on the Pacific Coast is 6,819.

Some idea of the beauty and up-to-date construction of the new building may be gained from this brief description:

The first two stories are of light gray limestone on a two-foot base of polished granite. The eight upper stories are finished in pressed brick with terra cotta trimmings, including the cornice.

The frame is of steel, the floors of concrete and the window frames, doors and trimmings of metal—fireproof construction throughout.

The main lobby and corridors have ceramic tile floors with marble wainscoting for walls and columns, while the elevator fronts and main stairway are of solid bronze of an elaborate design.

A pneumatic tube service extends throughout the building, by means of which letters and other papers may be transferred easily between departments.

The new building is centrally located and convenient to the chief business districts of San Francisco. It is adjoined on the north by the site of the proposed United States Sub-Treasury.

Benjamin G. McDougall was the architect.

* * *

Stained and Leaded Glass for the House

Among the architectural accessories that lend refinement to the dwelling house are to be considered windows of stained and leaded glass. Stained glass, as distinguished from leaded glass, is that material which depends primarily upon color for its effect, whereas leaded glass is dependent upon the lines of lead that form a patterned network to hold the bits of plain glass that compose the whole panel, and rarely contain color at all, although occasionally color is introduced in a slight degree into the decorative scheme.

There are, of course, certain rooms in the house where windows of stained glass will find their most appropriate setting. In the library—that is to say, in the room which is a real library—the stained glass window above the book shelves may form a most appropriate decorative feature, and while admitting a certain amount of light, will obviate the strong crosslights that would otherwise result from the use of windows throughout of clear glass. In some instances small window spaces above the book shelves have been filled by portrait heads in stained glass, and in other instances larger spaces have been occupied by landscape windows worked out with subdued or glowing tints, as good taste determines.

Hall, staircase and music room windows of stained glass are appropriate in the proper setting, and in town houses, where the rear of the dwelling has an unpleasant outlook and yet must give place to the dining room, stained glass windows let in a sufficient amount of light and yet screen the undesirable view. Naturally one does not look for large figure composition in stained glass windows intended for small rooms, for in this, with all other matters under the dictatorship of good taste, consistency must be studied and maintained.—House and Garden.

A Concrete Protest by Harrison Albright

THE following letter addressed to the Los Angeles Building Commission embodies the protest of Architect Harrison Albright against a proposed ordinance providing for detailed inspection by the city of concrete work:

It has been reported to me that there is under consideration an amendment to the building ordinance which will make it unlawful for any concrete work to be done hereafter on any reinforced concrete construction in the city except in the presence of an inspector from the city building department. I wish to call the attention of your honorable committee to the following reasons which lead me to protest against the enactment of this law:

1. It is a well recognized fact among the architects and engineers of the city that competent inspectors for reinforced concrete work are scarce. I believe that the passage of this law would result in many incompetent and impractical men being placed on buildings where their acts would result in no benefit to either the owner or the public, but would add materially to the cost of the building.

2. The exigencies of construction work on large buildings make it impossible to foretell exactly when it will be necessary to have the concrete mixer in operation. To wait for the arrival of an inspector would entail a hardship upon the contractor which would be reflected upon the owner in the shape of increased cost of his building.

3. The building ordinances are intended to establish the minimum standard of quality in materials and workmanship. Even though the presence of a city inspector might guarantee that minimum to an owner, it would guarantee him nothing more, although he might be paying for work of a higher grade than that established by this minimum.

4. The owner would feel that since he is compelled to pay the salary of a city inspector on his building, he could not afford to include cost of superintendence in the architect's fee; although the inspection included under this ordinance would cover only concrete work. The hundreds of dimensions that appear in an architect's working drawings are not for the convenience of the contractor alone. Under proper inspection the building is constantly under check by the inspector for lines, levels and dimensions. This is one of a dozen vitally important functions of the architect's inspector not secured for the owner except by means of an inspector responsible to the architect.

5. The present rulings of the building department require drawings for a reinforced concrete building to be signed by an architect holding a State certificate. If he is competent to design, why is he not competent to superintend?

6. In the year 1912, over one-half of the Class A construction in Los Angeles was of reinforced concrete. In the last eight or nine years many millions of dollars have been expended on reinforced concrete work in the city. All this has been accomplished without the loss of a single life, or even a serious accident, until the recent accident at the Pioneer stables. It is a record for safety to workmen and the public that has not been equaled in that period by any other common type of construction in the city.

Finally I wish to make the following personal statement: My work throughout the Southwest, which has been exclusively of reinforced concrete, has always been of a grade that would meet the requirements of the Los Angeles building ordinances; in many details it has been better. My inspectors are chosen for competence and reliability only. If they should be displaced by men who hold political positions I would not know a moment's peace of mind thereafter.

I submit to your honorable committee that the history of the reinforced concrete industry in Los Angeles, the various discriminatory restrictions already imposed upon it by the city, the economical and efficient type of construction it offers to owners of property, and the manifest inability of this proposed law actually to secure better than what we have now attained, are all good and sufficient reasons to show that this proposed law will be of no benefit to owner or public, but will, instead, impose an additional tax upon improvements to property.

* * *

Spelling reformers are advocating the spelling of architect minus the "h"—thus: "arcitect." Frankly, we don't like it, but then we never did like this simplified spelling stunt anyway. The chief objection to architect without the "h" is that in the new form it is neither tadpole nor frog.—Builders' Guide.

Woodland High School Building, Woodland, California. William H. Weeks, Architect
Sheet Metal Work by Western Furnace & Cornice Company

The New Woodland High School Building

MORE and more the high school is becoming the people's college, where not only the beginning of a cultural education can be obtained, but also a knowledge that will help the young man or woman to do better the every-day tasks of life.

The Woodland High School will be one of the leading schools to carry out this idea. With the erection of the new building, together with the gymnasium and manual training buildings, there will be ample facilities for complete four-year courses in manual training for the boys and home economics for the girls.

The new building will probably be completed in February. It is being constructed of re-inforced concrete and brick, and will accommodate three hundred pupils. The size is 188 by 70 feet, with an auditorium wing 40 by 50 feet. It will have a floor area of about 38,000 square feet. The building will contain twenty-one recitation rooms and laboratories, not including offices, storerooms, recreation and lunch rooms, and other necessary rooms; also an assembly hall with a seating capacity of over 600 pupils. The building will also be provided with modern heating and ventilating, vacuum cleaning, program clocks, plumbing and lighting systems, and is arranged for academic, scientific, and business departments for boys and girls and a complete domestic science department for the girls.

The gymnasium and manual training building will have a gymnasium 50 by 70 feet and three rooms well equipped for a complete manual training department for the boys. William H. Weeks of San Francisco is the architect.

* * *

Women Bricklayers

Will women lay bricks? It appears from a New York report that the Women's Trade Union League will at their biennial convention take up the question of the invasion by women of trades heretofore monopolized by men, including brick laying and brick making. The call for the convention says: "The establishment of schools for women bricklayers and brickmakers, the introduction of women street car conductors and messengers, women coremakers in foundries, women taxicab drivers, even a woman smokestack painter, are only a sign of the time when all trades are thrown open to women, even if it should be for the purpose of creating cheaper labor."

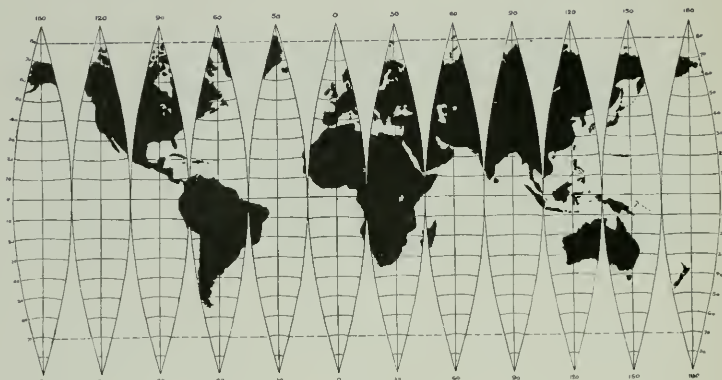

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Fig. I


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Fig. II

Fig. III

The Ground Plan of the Earth

A New Projection for a World Map

By B. J. S. CAHILL, A. I. A., F. R. G. S., the Inventor.

ARCHITECTS and engineers are vitally interested in the subject of projection. Every drawing they make in their professional work is some version of the famous "orthographic" projection invented by Hipparchus, the Greek astronomer. In laying out the surface of domes, in constructing centering for vaulting, bridges, rotundas, etc., the designer must go rather deeper into the subject.

As the world is the home of the human race we ought, all of us, moreover, to be interested in the ground plan of the house we live in.

As the whole world is usually shown on Mercator's projection, one gets wholly false notions of the relative sizes of the land as we go north or south from the equator.

How would an architect or engineer grasp the size and proportions of a building if the center were drawn to the scale of one-sixteenth of an inch and then it changed to an eighth, then to a quarter, a half, an inch, three inches, and ended at the margin of the paper at full size!

Such a plan would be a joke. It would be still funnier if these scales merged into one another from top to bottom of the blue print, so that at no part of the plan was the scale true except on the central axis and nowhere uniform except at stated lines from left to right.

Now the earth, our home, has its exact boundaries just as definitely laid down by the Supreme Architect, as the subdivisions of a great palace planned by man. In an orographical globe we have what would correspond to an excellent model of our home, the earth.

It is in transferring the surface of this globe to a plan that we get into difficulties. To illustrate the exaggerations of a developed cylindrical projection as compared to the actual facts as revealed by the globe from which it was derived and to show the truthfulness of the new projection I have prepared three drawings, all to the same scale at the equator. The first picture shows the gores peeled off a globe that has been soaked in boiling water. Below is Mercator's version of the same globe, which is only true to scale on one line, the equator. The next figure shows the world on the new projection, also to the same scale. It consists of six radial extensions, the four lower ones of which contain the outlines of the whole earth, the upper ones to the right and left being extensions, or "repeats." These may be omitted. The map may be cut out to shape and hinged where one triangular lobe touches its neighbor. If this is done the map can be folded so as to connect the parts now severed. Also the south polar regions can be folded over into juxtaposition, as the northern regions now are. Finally the whole map can be folded to the small size of any one section.

A comparison of Alaska, Greenland and Scandinavia will show the accuracy of the new map and the exaggeration of the one in commonest use. North America is really about the same size as South America. It is one million square miles less than Africa. These things are made clear in the new map.

On the old Mercator map a course from Panama to Yokohama goes about 1500 miles southwest from San Francisco! We are not on the route to the Orient; far from it, if we are to believe the old-time map. However, as every navigator knows, this is an illusion. The short route a bird or an airship would take passes through the Gulf of Mexico to Galveston, thence through Texas, east of San Francisco, out into the Pacific somewhere above Portland, thence up to Alaska almost, and down the coast of Asia to Japan.

Now a straight line drawn on the new map from Panama to Yokohama coincides practically with the ideal great circle route, as any one can see for himself. As ships don't steam overland, they should hug the coast from Panama to Portland.

San Francisco is the biggest port on the road. And that is why we are celebrating here in 1915 with the most beautifully housed exposition ever attempted.

* * *

Coming of Tapestry Brick

Tapestry brick would seem to herald the time when everyday articles shall be made to appear like the ideal of the artists. For tapestry brick, no doubt, hints a sort that will make your house look as soft and olive green or dully red or dimly blue as the houses in old tapestries appear. We have long had gowns and furniture after the old models recorded in pictures, and stone in new houses has been artfully weathered to make it look as if the house had been built for generations.

American Institute of Architects

Official Proceedings of the San Francisco Chapter

May Meeting of San Francisco Chapter, A. I. A.

The regular monthly meeting of the San Francisco Chapter, American Institute of Architects, was held on Thursday evening, May 15th. After dinner, the meeting was called to order by the president, Mr. McDougall, at 8 o'clock.

Mr. Mooser, a member of the Competitions Committee, reported that it had been stated that a limited competition was about to be held for a tubercular hospital for the city and county. A program for a competition for an Elks' Hall at Berkeley had been issued but was unsatisfactory as not complying with the Code in any respect.

Mr. Mooser of the Supervisors Committee stated that the matter of buildings on hillsides, and garages had been under discussion at the previous meeting of the Special Committee.

Mr. Schulze, chairman, reported that his Committee on Commercial Bodies had had a meeting with the Specialty Contractors' Protective Association, for the purpose of considering the remedying of certain abuses which had crept into the methods of figuring on drawings and specifications.

Mr. E. A. Mathews reported that the substitute for the law of 1872 was in the hands of the Governor and that the new act empowered County Boards to employ architects. The revised Tenement House Law was also in the hands of the Governor.

Regarding the Architectural Commission bill, Mr. Mathews stated that another bill had been passed, consolidating various boards, and that the architectural work would still be under the direction of the State Engineer. He considered it would require the assistance of Chapter members to bring influence to bear so that the State work would be placed in competent hands.

Mr. Geo. Ashmead Ferris, having filed the necessary application, was declared unanimously elected to Chapter membership.

The following communications were received: From General Contractors' Association, extending an invitation to the Chapter to make use of its new headquarters; from the City Beautiful Convention, requesting the appointment of two members to serve on Committee on Architecture; from the Technical Society of the Pacific Coast, invitation to the Chapter to be present at an address on the Water Supply of San Francisco; from the Finance Committee, Portola Festival, request for subscription; from Frank C. Baldwin, Chairman Committee on Publications of the Institute, communication regarding the Journal; letter from Jos. M. Cummings, Secretary to President, Panama-Pacific Exposition Company, acknowledging Chapter's communication and resolution in regard to the controversy between the Consulting Architects and the Chapter; from Geo. H. Perry, Director Division of Exploitation, P. P. I. E., acknowledging and thanking Chapter for its communication in regard to an appropriation for a State building; from Theodore Hardee, Chief of Liberal Arts, P. P. I. E., regarding architectural exhibit at Exposition; from L. B. Dutton, communication of withdrawal from the Chapter; from Michigan Chapter, A. I. A., copies of minutes of January, March and April meetings; statement from Carnegie Endowment for International Peace; report of Joint Advisory Committee, Boston Society of Architects and Master Builders' Association; Proceedings of Tenth Annual Convention of Iowa Chapter; By-Laws of the Iowa Chapter; and Year Book of the New York Chapter, A. I. A., for 1913.

After discussion and on motion duly made, seconded and carried, the matter of fixing the time for passing sentence on Messrs. John Galen Howard, Frederick H. Meyer and John Reid, Jr., was left to the discretion of the Board of Directors to determine whether same should be taken up at a special meeting called for the purpose or made a special order of business at the next meeting.

On motion made, seconded and carried, and acting upon the communication from the City Beautiful Convention, Messrs. Vogel and Polk were designated to represent the Chapter.

After some discussion regarding the communication from Mr. Frank C. Baldwin, Chairman, Committee on Publications of the Institute, the Secretary was directed to inform the membership of the Chapter that, unless word was received to the contrary, $1.00 would be added to the yearly dues of each member, to pay for individual subscriptions to the "Journal."

Mr. Mooser took occasion to state that resolutions had been passed by the Board of Supervisors for the employment of architects for full services at 6 per cent for the City Hall and several new school houses and that the small amount allotted to the Bureau of Architecture in the budget, foreshadowed the first step in the dissolution of this Bureau.

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* *

Regrading Rincon Hill in San Francisco

The San Francisco Chamber of Commerce is working on a scheme to grade down Rincon Hill, which interferes materially with the use for mercantile and industrial purposes of the area most convenient to the new southerly extension of the docks in the harbor. At least three plans for the work are proposed. By the most extensive plan the area to be graded down is twenty-five city blocks. The maximum depth of cut on this plan is 61 feet at Harrison and First streets. This plan, which is most in favor, will affect 779 separate parcels of property with 725 different owners. It will require moving 2,861,800 cubic yards of material at a cost of $3,577,050, from these properties, which have an area of 4,578,369 square feet. Assuming that the tax assessment is made on a basis of 50 per cent, this property is worth $8,818,020. It is estimated that the regrading will increase this valuation 75 per cent, or $3,000,000 more than its cost. Besides this cost for the work on private property there will be required excavation of 1,100,000 cubic yards of material from the city streets lowered at the same time, and $314,800 for reconstructing the public improvements affected, sewers, sidewalks, pavements, curb, parks, etc., or a total of $1,689,800, which is covered nearly twice by the profit in the increased valuation of the private property.

Serious and Frivolous Paragraphs of World's Progress

By THOS. J. WELSH,
Chairman Publicity Committee, San Francisco Chapter, A. I. A.

YOUR committee on publicity stated in its last report that of the eighty-seven universities in the United States, the State of California took the lead for attendance. Now, the following comes from Paris: In speaking of American art, a great tribute has been paid to our American painters by the Paris Salon. No less than 40 American artists are represented by pictures. To have secured 100 out of a total of 1300 selected canvasses is a grand achievement, especially since the fact is coupled with the comment that our quality surpasses that of other artists.

* * *

Under the heading "A Noiseless World," Dr. Clarence G. Blake, professor of Ethnology at Harvard Medical School, Cambridge, Mass., says that in time the world will become noiseless. Your committee begs leave to state for the benefit of the bald-headed members of the Chapter, that owing to the successful experiments made with spun glass, it is possible to use spun crystal and reduce it to any shade or degree of fineness, and the resemblance to human hair is almost perfect. It is light, also lustrous, and absolutely hygienic.

* * *

A German engineer has invented a way to transform ashes into marble of rare beauty and which will take the highest polish. But he absolutely refuses to reveal his secret, although several owners of large quarries have made him splendid offers for his secret.

His method seems harmless as far as his apparatus is concerned. He has a small gas stove and kettle. It is known, of course, that his process is a matter of chemical synthesis, and with these few implements and his secret he has been known to manufacture a medium sized slab of marble in half an hour.

* * *

A lesson to members of this Chapter who are exhausting all their energies to become rich:

"Mr. Morgan's death was due to lack of nourishment," a Rome dispatch says. There seems to be a lesson or moral, or a sermon or something in the fact that the world's most eminent financier died from lack of food.

* * *

What is an architect?

Baron d'Estour Nelles de Sausson, the eminent critique, is in sixty raptures at once over the newer architectural glories of New York City. "What emosions! What impressions! How it is magnificent! I am in Venice, in Rome, in Paris, in Antwerp, a new world. No, by blue, it is the old world repeated." To which laudations we tearfully assent. What is an architect? A man who buys a picture post card in Europe for two cents and sells it in New York for $39,000.

* * *

Lovers of fine arts, it is with regret that we hear that many of Rome's ancient glories are sinking into hidden floods through the choking up of springs and rising of the Tiber bed. The notable temple of Mars is cracking and falling down through the action of the underground waters. Also the Church of Santa Marie, Coliseum, Forum Theatre of Pompei, and others.

A distinguished Eastern engineer says: "San Francisco is, by nature and design, pre-eminent."

After describing New York, Boston, Philadelphia, Chicago, Los Angeles and Seattle, speaking of San Francisco, he says:

"A harbor possessed of the amplest, easiest and prettiest front door of any harbor of my knowledge. A water front only measurable by the dredge. Her Market street is comparable with Broadway. Her commercial transportation facilities will make San Francisco the New York of the Pacific Coast."

* * *

Portland Auditorium Competition Jury Upheld

THE following is the report of the standing committee on competitions of the American Institute of Architects anent the Portland Auditorium competition, the jury of award being Ellis F. Lawrence of Portland, Courtland K. Cutter of Seattle and Willis Polk of San Francisco:

"The board of directors also instructs this committee to bring to your attention the case of the Portland Auditorium. The city of Portland, Oregon, being about to erect an auditorium, the recently established Oregon Chapter conducted a successful campaign for the adoption of proper methods. An adviser was chosen to conduct the competition and a program was issued which received the approval of the Institute.

"Upon the conclusion of the competition, there appeared over the signature of a member of the Institute an article vigorously attacking the jury of award. [Written by B. J. S. Cahill of San Francisco.]

"The committee on practice, acting under instructions from the board of directors, conducted a very careful investigation into the conduct of the jury and transmitted to the board a report accompanied by twenty-one exhibits.

"The committee on practice finds that 'the competion was * * * honestly and conscientiously judged,' and that there was 'no prima facie evidence of misconduct on the part of the jury.'

"It is to be supposed that members of the Institute desire to support it in its efforts to improve competition practice. From coast to coast they have given every evidence of such a desire. Yet in the case of the Portland Auditorium, where the city had recognized the Institute's advice by establishing an orderly competition, architects themselves, by rushing into print in denunciation of the judgment, have done much to jeopardize all that the profession has gained. The public cannot readily distinguish between an attack upon the jury's judgment and an attack upon the method of holding a competition, the result being that they are given the impression that the well-considered methods commended by the Institute are not better than those of the days when competitions were a stench in the nostrils of honest men.

* * *

May Practice Architecture

At the last meeting of the California State Board of Architecture certificates to practice architecture were granted Mr. William E. Higgins, John H. Christie and Henry F. Starbuck. Mr. John Bakewell, Jr., is now the President of this board, succeeding Mr. William Curlett.

Report of the Committee of the American Institute of Architects on Government Architecture

THE American Institute of Architects stands as the recognized champion of architecture in America, and if the important influence of this great fine art in the upbuilding of our national life is misunderstood, or is not appreciated by the American public, the responsibility rests upon us and we have failed in our self-appointed task.

That this is happily not the case is apparent from the most casual comparison of the greater public and private works undertaken today and similar undertakings at the time of the Institute's foundation, and the even more significant comparison of Ecclesiastical, Educational, Commercial and Domestic work of the same periods.

In all this Institute has played a leading part and has ever, through its officers and committees, lent its aid and influence to every effort to make the architecture of this country a worthy monument to the highest standards of the civilization which it unconsciously but permanently records.

While we are all familiar with such notable work as that in connection with the movement for the preservation and development of Major L'Enfant's plan of the city of Washington, the establishment of the Fine Arts Commission, etc., few realize how often the Institute, through its representatives, has plead the cause of a nobler architecture before committees of the National Congress and before commissioners in charge of State and municipal works, and the fact that almost daily members of the Institute throughout the country are urging the Institute's plea for the highest type of practice upon those entrusted with the erection of almost every type of structure.

No class of construction is more far reaching in its immediate influence than the public works constructed for the people collectively by their chosen representatives, and of those none are more important than those erected by the Federal Government. The American Institute of Architects has long urged that these structures should represent the noblest expression of American civilization in design and scientific planning, not only because they are enduring evidences of America's status in the world's artistic progress and because of their powerful influence locally, but also because structures so designed and planned have always been the most economically constructed and maintained. This latter fact is universally recognized in the construction and maintenance of engineering works and public utilities generally.

Let us therefore consider the manner in which these great public works are conceived and brought to completion as this is the particular department of the Institute's activities committed to your Committee on Government Architecture.

In the first place, Congress has full authority over the entire question, and may in making appropriations for any public work, specifically set forth in detail the manner in which the work shall be conducted both in design and execution. This direct method has very rarely been adopted, and if adopted frequently would very shortly disclose the necessity of a carefully devised system, resulting, through the power of precedent, in an established standard of Government practice.

This direct method has been advanced by the present Congress as an argument for the repeal of the "Tarsney Act" and as a means for keeping the control of public constructions more directly in the hands of Congress.

The practice has been in the past and, for all but a few of unusually important works, will undoubtedly be in the future, to leave the administration of appropriations for public constructions to the various executive departments of the Government directly interested, unless legislation is enacted, fixing the procedure in all cases.

In the absence of such legislation and with the repeal of the "Tarsney Act," the great bulk of Government constructions will be directly undertaken by the various departments, a system which today results in the design and construction of buildings for the Navy Department by the Bureau of Yards and Docks and which places future buildings of the Treasury Department altogether in the Supervising Architect's office, a condition very similar to that existing in 1894 and 1895 when the late Mr. John M. Carrere was under consideration for the office of Supervising Architect. The conclusions reached by Mr. Carrere at that time apply equally today. The following quotations are taken from Mr. Carrere's letter to the Secretary of the Treasury, dated January 22, 1895:

"I have had every opportunity, owing to your courtesy, to fully investigate the office, and I have been trying for the last two weeks to convince myself that under certain conditions which I asked for and which I understand you are prepared to grant, I might accept the office with a fair chance of accomplishing the purpose which both you and the profession have in mind, namely, to raise the artistic standard of our public architecture.

"In my anxiety to respond promptly and fully to the confidence which has been placed in me, I have at times thought that the task might at least be attempted, and have stood ready to accept the office. After further reflection, and after having fully explained the situation to several leading architects of the country, and after consultation with them, I am now convinced that if I should accept the office and meet with even partial success, I would be defeating the true object which both you and the profession have in view. To our minds the undertaking is a physical impossibility and must fail.

"Any man, no matter what has ability or his power for work and concentration, and no matter what conditions might be offered to him, even those of absolute responsibility and absolute authority, would have to devote himself either to managing the office, allowing the designing to be done by draughtsmen, as at present, or to designing, allowing the office to be managed by heads of departments, as at present, and no man of ability, with a reputation to lose as an artist, would be presumptuous enough to accept the office, even if his duties were confined to the designing, irrespective of any other work or responsibility, because it is absolutely beyond the grasp and the ability of any man who has ever lived to imprint his personality upon this much work, and much less to design it and study it himself.

"The time must come, I believe it has come, when this work should be divided and entrusted to the best architects in this country, as suggested by the bill proposed by the architects, leaving the administrative portion of the work only in the hands of the Government, where it belongs.

"My examination of the office and its possibilities convinces me that the underlying principle upon which it is based is radically wrong, and that it is beyond the power of any one man to make a success of it. The systems, not the man, should be changed."

The bill referred to by Mr. Carrere as the McKaig bill, provided for the appointment by the President, with the approval of the Senate, of a commission of three architects, to prepare programs, conduct competitions and select architects for public buildings.

This bill was draughted by the Permanent Committee of the Institute, consisting of Mr. Bruce Price, Chairman; Mr. E. H. Kendall and Mr. John M. Carrere, acting with an Advisory Committee consisting of Mr. R. M. Hunt, Chairman; Mr. Charles F. McKim and Mr. George B. Post. The original draught was revised a number of times by these Committees and by the Treasury Department and was introduced into the House by Mr. McKaig and into the Senate by Senator Brice. It is known as House Bill 7470, Fifty-third Congress, First Session. It received the approval of the Secretary of the Treasury and passed the Committee on Public Buildings and Grounds of the House.

* * *

Demand for Brick in the East

It is difficult to realize the enormous quantities of brick used annually in Greater New York. During 1912 there were over 1,000,000 thousand used. The principal source of this vast quantity is the Hudson river region, which extends along both sides of the river from New York City to Cohoes and embraces ten counties, nine in New York and one in New Jersey. Other sources of supply are the Raritan river region of New Jersey and Connecticut. The year 1912 was one of unusual interest in the Hudson river region. It opened with an increasing demand for brick, and the price for common was $7 a thousand compared with $4.25 in 1911. For several years the use of cement or concrete construction appeared to be displacing brick to some extent, but owing to the strong "back to brick" movement the year 1912 saw in the New York market a change favoring brick as the best building material for many purposes. Influences that have contributed to this are the failure of some concrete buildings, the advertising campaign carried on by the brick makers, and the improved quality of the Hudson river brick. The average price was the highest since 1906.

The figures used in the above statements are based upon the statistical reports of Jefferson Middleton of the U. S. Geographical Survey.—Exchange.

* * *

Architecture and School Hygiene

"The relation of School Architecture to School Hygiene" will be one of the important topics on the program at the Fourth International Congress on School Hygiene, which is to be held at Buffalo August 25-30.

A special symposium is being arranged on the subject of "School Illumination" by the Society of Illuminating Engineers. Dr. James Kerr of London, England, for many years an active member in London Council, and an international figure in affairs relating to School Hygiene, will read a paper on "The Illumination of Class Rooms." "Recirculation and Ventilation" is the title of the paper to be given by Dr. Luther Gulick of New York. Other papers on the subject of architecture will be read by Frank Irving Cooper, president of the Boston Society of Heating and Ventilating Engineers, who will speak on "The Planning of School Houses Against the Fire Hazard," and by Prof. Theodore Hough, of the University of Virginia, on "Some Aspects of the Problem of Ventilation."

Hygiene Needed for Draftsmen

THERE is a very prevalent notion that drafting is an unhealthful occupation. Just why reasonable people should cling to such an unwarranted belief is difficult to explain, yet it is not an uncommon experience to hear men voicing a dislike for drafting for no good reason, writes F. G. Higbee, chief instructor of descriptive geometry and drawing, State University of Iowa, in the May issue of "American Machinist." So strong is the belief that drafting is an unhealthful business that I have actually known of college graduates turning down offers of good jobs in first-class drafting offices; yet so far as anyone can discover such a belief is warranted neither by facts nor by conditions.

There are a few simple matters of comfort, and convenience, and sanitation which every draftsman and every employer of draftsmen should bear in mind, and these matters relate to parts of the drafting office and its equipment which are sometimes given scant attention. In these enlightened days no man is obliged to work under unreasonable conditions of labor, and if draftsmen will give some of their attention to the essentials of hygienic working conditions in the drafting office they will have every right to expect a long and useful career at the board.

One of these simple matters is cleanliness; it is desirable not only because it makes for sanitary conditions, but because it is essential to good drawing. Many drafting rooms are so situated as to make this not only a difficult problem to solve, but an expensive one; yet the constant effort which may be required to keep the office free from dust and dirt will prove a good investment. To provide clean quarters and clean toilet facilities is to set before the men a standard to which they will quite unconsciously conform; and to provide them with covers for their work and to assist them to keep their work clean is an effective method of asking for and expecting clean work.

For sanitary as well as humane reasons flies should be excluded from the drafting room. In addition to being a menace to the public health flies are a nuisance which can cause more trouble than one would expect from so small a source. Last fall I worked in a drafting room which was located near a stable; in consequence we were in a position to attract all the flies which were hatched there and we had no screen to keep them out. During the first frosty days of the fall they would come in swarms into the warm drafting room; there they would drag their half dead bodies through the wet ink; they would crawl with excruciating tickles over the backs of our necks, loving the warmth they found there; and at critical moments of inking they would buzz most distractingly in our ears. Without undue exaggeration, those flies caused enough agony of mind and body, enough loss of time and enough loss in efficiency to more than warrant the expense of excluding them from the office.

The furniture and equipment are also a factor in the problem of good working conditions for the drafting office. In most modern offices the kind and quality of the office equipment are usually of a character and grade quite satisfactory. Under these conditions the equipment is less important than its arrangement and fit. When the equipment is installed it is important to bear in mind the comfort of the plan of arrangement, as well as its effectiveness. When comfort is lacking it is usually due to the fact that the furniture is ill-fitting. Draftsmen are tall and short, lean and fat, long-limbed and short-limbed, and furniture is built to fit men of average dimensions.

It is not an uncommon sight to see a tall man with his knees cramped under a table too low for him; or to find a short man perched upon a stool too high for him.

Decorating Modern Bathrooms

IN DOING away with the cabinet work about the tub and other fixtures, the wainscot has naturally suffered the same fate. The custom has grown up to finish the walls of bath rooms with tiles, or at least to make a dado of tiles, and to paint the wall above, using as little woodwork as possible. But tiles are expensive and people of moderate means are often compelled to forego the luxury of having them. Still they want the effect of tiles upon the wall. To meet this, many wall paper manufacturers have put upon the market papers specially designed for bath rooms having tile figures, and being finished with a varnished surface that makes them perfectly waterproof. They answer the purpose fairly well, but are not so permanent as a painted wall. They are more difficult to hang than ordinary wall paper and to do a first-class piece of work requires that the wall shall be first covered with white lining paper, in order to make a perfectly smooth job and to keep the joints of the varnished paper from separating after drying.

Probably the most satisfactory painted treatment of bath room walls is in stenciled tile effects. The entire wall may be given this tile effect, or the tile design may be carried up as a dado to a height of some five feet where it should be capped with the border, and the wall painted in a plain tint above. For these tile designs light colors should be used in imitation of the tiles most generally used in bath rooms. Delft colorings are very popular, either dull green or white or ivory white. Blue green on a background of pale cream is very pleasing, or a more pronounced green on a pale pink ground. Very light lemon yellow might be used as a ground color with the design stenciled in a light ochre tint. The color should be mixed so as to dry with a gloss. A good result could be obtained by mixing the color very thick for the last coat and adding a certain proportion of varnish, then stippling it on the wall in such a manner as to give a roughened effect. A coat of outside or flowing coach varnish over this would give the work the mellow tone that many of the art tiles have.

It is remarkable how conspicuously the tiniest bit of dust that may get worked into the varnish will show up when the work is finished, and great care must therefore be taken that dust is not present.—"Practical Decorator."

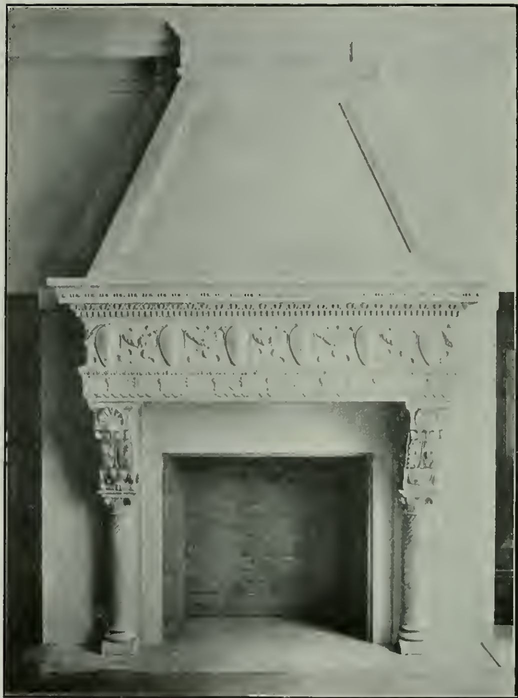
* * *

Structural and Industrial Materials in California

THE development of structural and industrial materials in California has received but scant attention as compared with that of petroleum and the metals, and is capable of very great expansion. Notwithstanding this fact, the output of minerals coming under this heading now have an annual value of over 20 per cent of the mineral total for the State. In 1911 the value amounted to $19,177,825 and the final returns for 1912 will show an increase of at least $2,000,000 over these figures.

At present 90 per cent of this total is made up of the following well known substances: Brick, borax, cement, clay and granite. In addition there are thirty-odd minerals used as structural and industrial materials, the possible production of which has been barely touched upon, among them being asbestos, barytes, bauxite, calcareous and other tufa, chrome, feldspar, fullers earth, gypsum, iron ore, marble, mineral paint, onyx and travertine, potash, pyrites and sandstone.

Over a million dollars' worth of asbestos is annually imported into the United States; the uses of this mineral are many and constantly increas-



Mantel in Art Caen Stone, in the Annex of the Merchants National Bank, San Francisco, Made in Sarsi Studios

ing; deposits and surface indications are known in thirteen counties of the State, yet the annual production is worth but a few hundred dollars.

Fifteen counties have well-known deposits of gypsum. Only four reported production for 1911 to the amount of some 30,000 tons. During the same period 500,000 tons of crude gypsum were imported by the United States, and production in other States amounted to 2,500,000 tons. It is used in making plaster, fertilizer, paper, glass, etc. The demand is increasing.

Marble and sandstone, of which we have practically inexhaustible amounts, are shipped into the State from other States and foreign countries while comparatively little of the domestic supply is utilized. Numberless instances of similar character could be cited.

The fact remains that the mineral industry of California has a future that will be in keeping with its remarkable past; one that depends upon no single mineral nor group of minerals; and one that offers an unlimited field to capital as a means of profitable investment.

Three-Span Concrete Bridge at Plainfield
Designed by Daniel B. Luten, C. E.

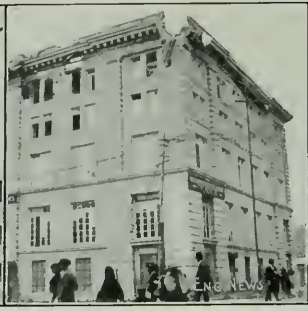


Fig. 1. Apartment Hotel of Reinforced Concrete

Figs. 2 and 3. The Reinforced-Concrete Y. M. C. A. Building

Effects of Cannon on Reinforced-Concrete Buildings

CANNON firing is not such a terrible thing after all—if the man behind the gun is a Mexican. By way of proof, a correspondent of the "Engineering News" produces the accompanying pictures of public buildings that successfully withstood the ten days' bombardment during the Diaz-Madero fight.

It will be noticed that all the buildings are intact, though the firing was at close range by heavy caliber field guns.

Fig. 1 is a reinforced-concrete apartment hotel on the Paseo de la Reforma, Mexico City, built in 1912. The Madero troops occupied the roof of this building and some of them are seen in the picture guarding the windows on the first floor. The windows on the top floor were broken by bullets and the surface of the concrete wall, which had an excellent smooth finish, was pitted by machine-gun fire, otherwise the building was not injured.

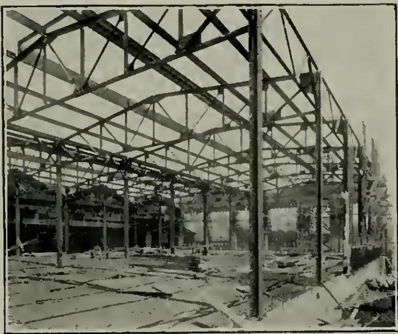
Figs. 2 and 3 show the results of ten days' cannonading on the reinforced-concrete Y. M. C. A. building in Balderas street. This building was erected about 1910. It has a metal cornice with a low parapet of hollow tile above. The exterior of the building was badly pitted by the shots, but the structure received comparatively little injury considering the heavy fire to which it was exposed for several days. The building was occupied by the troops of Felix Diaz, and cannon were mounted on the roof, which did effective work.

The Steel and Iron Industry of California

Beginning with this number THE ARCHITECT AND ENGINEER publishes the first of a series of articles describing the part San Francisco structural steel and ornamental iron companies have played in the rebuilding of the Wonder City. Illustrations will show the plants of these concerns as well as some of the more important work they have done since the fire of April, 1906.

The following will be included in these articles: Pacific Rolling Mills, Judson Manufacturing Company, Central Iron Works, Ralston Iron Works, Western Iron Works, Schrader Iron Works, Pacific Structural Iron Works, Mortenson Construction Company, California Artistic Metal & Wire Company, Standard Iron Works, Monarch Iron Works, C. J. Hillard Company, Inc., Dyer Bros., Sartorius Company, West Coast Wire & Iron Works, Brode Iron Works, Rudgear-Merle Company, and Louis De Rome.

The purpose of these articles is to give the readers of this magazine some idea of the size and scope of the California steel industry and to acquaint them with the splendid plants that are maintained, representing as they do a combined investment of millions of dollars.



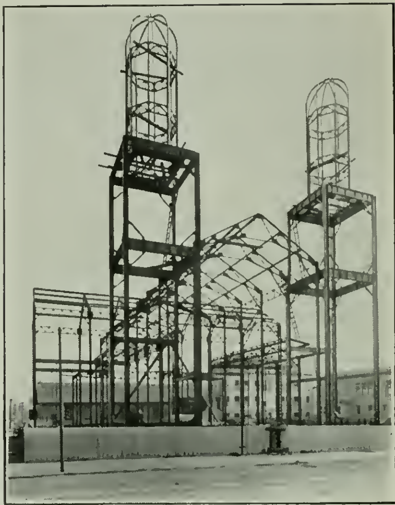
United Railroads Car Shop, San Francisco

JUST as reinforced concrete demands careful and personal supervision, so the fabrication and erection of structural steel requires thorough inspection and competent superintendence. The erection of steel is rather precarious in the sense that a close watch must be kept lest the workers injure the parts in their efforts to match holes for riveting.

The component parts of a steel cage structure must all fit one into another like the parts of a Chinese block puzzle—every rivet hole must match the corresponding hole in another member; beams and girders must be of such length as to keep the columns exactly plumb; columns must be all of the same length. The steel is generally erected at some distance from the shops wherein it was fabricated, and so, when it is found that parts do not match, or are too short or too long, it is a difficult matter to properly remedy the defect without returning the piece to the shops.

Iron Stairs for McCoppin School, San Francisco

A brief resume of the manufacture of structural steel may not be amiss as serving to indicate the care and inspection throughout the process. From the beginning of the manufacture the steel is subject to close chemical inspection at all times. The purpose of each "blow" is decided upon beforehand and the chemical ingredients in their proper proportions are so controlled that the resultant "pour" is suited to the predetermined product whether it be ingots for rolling structural shapes or ties or what not. Steel is first cast into "ingots," and these ingots are subject to severe chemical tests before their final use is determined, are cut into "billets," which in turn go through the rolls to be rolled into flats, angles, channels, beams and other shapes for use in steel frame buildings. Pieces are sheared from the various rolled shapes and are subjected to physical tests as to strength before any particular consignment may be shipped. From the mills, the materials go into the shops, to be fabricated into built-up and simple parts of the building, and not only are the details most carefully worked out in the office, but during fabrication each member is subjected to very close inspection to be certain that the correct materials are used and that the workmanship is good, before the pieces are allowed to be shipped.

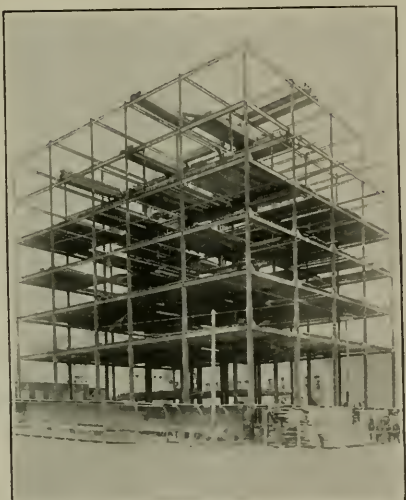


St. Joseph's Church, San Francisco

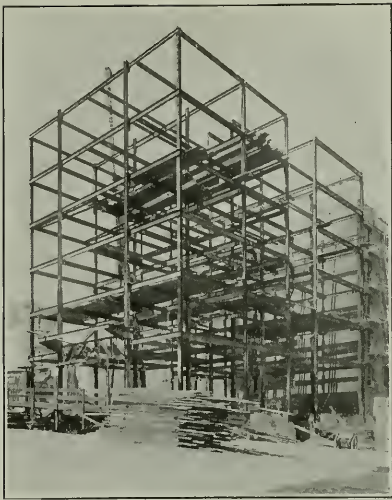
In some shops it seems that as soon as the material is transported to the building site man's vigilance ceases to a great degree. Such large amounts of capital are involved up to this point that care and refinement secure the best returns upon the investment, but too often the companies lose interest and responsibility as soon as the steel is out of the shops. Very often they erect their own product, and when this is the case the owner is assured of a good job. The largest and most responsible dealers in concrete reinforcing prefer to have a representative on the jobs as a safeguard against ignorance or carelessness, but unless they are doing their own erecting, few companies deal-

Ornamental Iron Elevator Doors, Stockton Savings and Loan Society Building, Stockton, California

Building at Sutter and Leavenworth Streets, San Francisco
for A. Roy Harrison



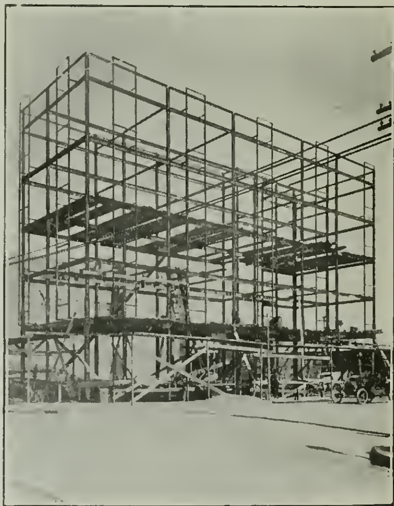
Hotel for F. H. Meyers, San Francisco



Building on Jones, near Eddy Street for Bernard Altube

ing in structural steel have a representative on the building during this erection. A San Francisco company that is an exception to this rule is the Golden Gate Structural & Ornamental Iron Works, some recent examples of whose work are shown in the accompanying illustrations. Although less than eight years old this company has enjoyed a remarkably prosperous period, and for the third time finds it necessary to seek larger quarters in order to properly handle its business. Application has been made for a permit to erect a new building on Howard street, extending south to Kiesling street, and work on the structure will be started immediately, the intention being to take possession of the new plant in December. The building will be 50x180 feet and will provide about 9,000 square feet of room, or double the capacity of the present works. That part of the building devoted to the manufacture of ornamental iron will be two stories, while the portion given up to structural steel will be one story. Messrs. Fliegner & Hoffman expect to spend upwards of $5,000 on the new plant.

The accompanying plates give some idea of the class and character of work this company turns out. The St. Joseph's church job represents a 230-ton contract, while the Meyer hotel contains something like 150 tons of medium structural steel. The Turk and Polk streets job was fabricated and erected in 30 working days. The company has under contract at the present time the steel for the manual training school in Oakland — about 100 tons — and has recently completed in 45 days the steel for the Hansen & Johnson Building on Turk, near Larkin street, San Francisco.



Bannan & Malletz Building, Turk and Polk Streets, San Francisco

Among the Architects

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Secretary-Treasurer...............D. V. Deurl

Library Competition

The San Francisco Consulting Architects, John Galen Howard, John Reid, Jr., and Frederick H. Meyer, have recommended to the Library Trustees that a limited competition be held to secure plans for the main library building, which is to be erected in the Civic Center. From a list of twelve of the leading members of the profession the Library Trustees will select six members to compete.

WORK IN ARCHITECTS' OFFICES

SAN FRANCISCO

ARCHITECTS ROSS & BURGREN, 310 California street, have prepared sketches for a seven-story Class A office building for the gore corner of Market and Fulton streets, when the latter street is extended through the Civic Center. The owner of the property is Mrs. Katherine Forbes. The owner is considering applications from a number of prospective lessees and until these have been closed details will not be settled.

ARCHITECT WILLIAM H. WEEKS, 75 Post street, has let a contract to a local builder to erect a splendid two-story bank building for the Bank of San Leandro. The structure will cost close to $50,000. Architect Weeks has also let contracts for a new school house at Maxwell and one at Quincy, Siskiyou county. Plans are being drawn for a fine country residence to be built in the Saratoga foothills.

ARCHITECTS O'BRIEN BROS., Clunie Building, have completed plans for a three-story store and apartment house to be erected at Oak and Divisadero streets at a cost of about $12,000. Figures have been taken by the same firm for a large brick warehouse 100x160 feet.

ARCHITECT HENRY H. MEYERS, Kohl building, has recently awarded contracts for extensive alterations to the Yosemite hotel and theater in Stockton. The work will include a steel frame, new interior finish, two elevators, heating plant, etc. The building is five stories and was the first high building erected in the Slough City.

ARCHITECT ALBERT PISSIS is exceptionally busy. He is completing the working drawings for a substantial addition to the Emporium Building, which will give the company at least three additional floors. Construction will be Class A. Mr. Pissis has finished plans for a two-story steel and brick store and loft building for himself at Market and Sacramento streets. Plans are well under way for a school building for the city of San Francisco, the commission for this work having been authorized by the Board of Supervisors.

ARCHITECTS WELSH & CAREY, Merchants' National Bank Building, San Francisco, have completed the working drawings for two substantial buildings to be erected for Former Sheriff R. E. Whelan. One of the buildings will be erected on Howard street and will cost $27,000. It will be a brick bakery and stable. The other building will be on Ninth street and will be Class B construction. The work will comprise the reconstruction of a three-story Class C building that was occupied by the California Paint Company. Steel columns, concrete floors and roof will be put in and about $30,000 will be expended.

ARCHITECT G. A. LANSBURGH, Gunst Building, San Francisco, has been commissioned to prepare plans for a Class A theater for the Orpheum Amusement Company at Kansas City. The building will cost $300,000 and will be of steel, concrete, brick and terra cotta. Coast firms will be given an opportunity to figure the plans, which will be completed in from thirty to sixty days.

ARCHITECT WILLIAM MOOSER, Nevada Bank Building, has let contracts for a three-story and basement reinforced concrete lodging house on Jackson street, between Front and Davis streets, San Francisco, for S. Nathan. The estimated cost is $23,000. A contract has also been awarded in connection with this work for a concrete stable to cost about $9,000.

ARCHITECT SMITH O'BRIEN, Humboldt Bank Building, has let contracts for a fire-proof three-story factory for the C. H. Workman Packing Company, which will entail an expenditure of $50,000. The interior finish will be white enamel tile, oak and hardwood floors. The exterior will be red-face brick.

ARCHITECT WILL D. SHEA, 244 Kearny street, has let contracts for an apartment house for the president of the Bank of Italy; also part of the contracts for a $200,000 building on Van Ness avenue for the Young Men's Institute, and is working on plans for the Administration Building at Santa Clara College.

ARCHITECT HOUGHTON SAWYER, Shreve Building, has completed plans and taken a number of bids for the largest and finest equipped apartment hotel on the Pacific Coast. The site is the corner of Mason and Sacramento streets (Nob Hill), and the plans call for a nine-story structure of Class A design, costing more than $500,000. The same architect is drawing plans for a fire-proof school building for the city and county of San Francisco.

ARCHITECT HENRY C. SMITH, Humboldt Bank Building, is personally superintending the construction of an elaborate estate at Woodside, near Redwood City, for J. J. Graves, a San Francisco capitalist. Upwards of $50,000 will be expended and the work will include the construction of a 20-room house, large garage and stable, gasoline and power plants, chemical laboratory, swimming pool, sunken gardens, brick terraces, pergolas, arbors, concrete walks, fountains, etc.

ARCHITECTS BAKEWELL & BROWN have completed plans for a $20,000 residence to be built in Piedmont, Oakland, for Horace Miller, secretary of the California Lighting Company. The same architects are finishing plans for a three-story Class C wholesale grocery building, to cost in the neighborhood of $60,000.

OAKLAND

ARCHITECT C. W. DICKEY has several large jobs in prospect, including a seven-story Class A hotel for Geo. C. Clark and a $60,000 apartment house facing Lake Merritt for B. F. Durphy, the lumber magnate.

ARCHITECT C. W. McCALL, Central Bank building, has made plans for a $20,000 residence to be erected in Piedmont for H. J. Knowles of 1331 Oak street, also sketches for a six-story Class C apartment house for Major McClenehan at Twelfth and Grove streets, Oakland.

ARCHITECT F. D. VOORHEES, Central Bank Building, is preparing plans for a seven-story steel frame and brick store and hotel at Thirteenth and Webster streets for H. A. Powell, and which will cost $100,000. The hotel portion will contain 90 rooms.

WHAT CALIFORNIA TOWNS ARE DOING

GRASS VALLEY will have a new Post Office Building, to cost $40,000. Bids for the construction will be opened June 30.

VACAVILLE is to have a tourist hotel, over $15,000 having been subscribed by its citizens.

PETALUMA'S militia is negotiating with J. Lepori, owner of the Continental Hotel, to build an armory.

RICHMOND laborites are raising funds for a temple.

BERKELEY will have a $75,000 vaudeville theater from plans by Architect A. W. Cornelius of San Francisco.

FRESNO will have a $60,000 theater to seat 2,000 persons. The Turner-Dahnken Company are the promoters.

LOS GATOS will have a $10,000 mission style town hall from plans by Architect William H. Crim of San Francisco.

VISALIA and PORTERVILLE will each have new mission style depots from plans by the Engineering Department of the Southern Pacific.

Personal

William F. Martin, Assoc. M. Am. Soc. C. E., and Nathaniel Ellery, M. Am. Soc. C. E., formerly state engineer of California, have formed a partnership with offices in the Merchants' Exchange Building, San Francisco, as civil and consulting engineers. Mr. Martin is well known in professional circles in Los Angeles and is a member of the Engineers' and Architects' Association of Southern California.

Clinton Nourse, formerly of Des Moines, Iowa, and Karl Keffer, formerly of New York City, have formed a partnership under the firm name of Nourse & Keffer and have opened an office at 918 Story Building, Los Angeles, for the practice of architecture. Both were recently granted licenses to practice in California.

S. A. Jubb, who has been assistant chief engineer in charge of harbor improvements for Los Angeles harbor, will become chief engineer by appointment, a position created by the new charter and not under the civil service. The position carries the same salary, $400 per month, which Mr. Jubb has been receiving. Jubb was formerly associated with the Crowley Construction Company of San Francisco.

Architects Are Not Builders

A decision having an important bearing on the expenditure of school bond money through California has been received by State Superintendent of Public Instruction Hyatt from Attorney General Webb, dealing with the matter of whether or not architects whose plans have been accepted for school buildings are obligated to provide bonds to construct the buildings themselves within their estimates in case the contractor's figures go above the estimates.

It is held by the Attorney General that there is nothing in the present law which makes possible an affirmative answer to the question. The law, according to the Attorney General's opinion, does not contemplate that architects shall be builders.

Unique Hollister Residence

Architects Wolf & Wolf, First National Bank Building, San Jose, have let part of the contracts on a $50,000 country estate to be erected near Hollister on the ranch of A. K. Macomber, which comprises several thousand acres. The house is to be in the Moorish style and will cover a ground area of 124x116 feet. It will be frame and plaster with five steel girders supporting an arch roof of Roman bronze screening. A feature of the house will be a patio in the center with a concrete swimming pool, 52x72 feet. There will be 18 rooms, all of which will be finished in hardwood, principally white cedar and birch.

Architect Must Keep Cost Within Estimate

An Oakland press dispatch reads: "The decision of Judge Murphey in favor of former Governor George C. Pardee and against Charles Taylor, architect, it is believed will afford the Institute of Architects a theme for discussion. Pardee entered into an agreement with Charles Taylor and his father, under the terms of which Taylor was to draw plans for a home to cost not over $25,000. After the house was built Pardee found that he had spent $34,000 in its construction, and refused to pay Taylor's fee. Taylor sued for $751, and Judge Murphey held that he should have kept the price within the original estimate, if he desired to collect for his services under his contract.

Will Design School Buildings

The San Francisco Board of Public Works has appointed Albert Pissis architect for the Oriental School, and Houghton Sawyer as architect for the Columbus School. They will prepare plans and specifications and receive as compensation 6 per cent of the cost of the buildings.

This action is in accordance with the decision of the Board of Supervisors to have the consulting architects confine their attention to the civic center and to such buildings as they have under way or have prepared plans and specifications for, and to employ outside architects for the other public buildings to be erected.

Plans for Big Honolulu Building

Plans are being prepared by Architect O. G. Traphagen, 244 California street, San Francisco, for a large business structure to be erected at Honolulu. The building will have a frontage of nearly 400 feet and will be four stories high with steel frame and brick and terra cotta exterior. It will contain stores, offices and lofts, and it is said will cost close to $1,000,000. The working drawings are now being prepared.

Honor For San Francisco Boy

Faxton Atherton, formerly a draftsman in the employ of Bakewell & Brown of San Francisco, and who is now a student in architectural work in Paris, recently won the preliminary prize, which entitles him to compete for the American-Roman prize scholarship; an honor which is coveted by students from all parts of the world.

Sacramento Native Sons' Building

Architect Washington Miller of San Francisco has been selected to prepare plans for the new Native Sons' building in Sacramento. The structure will cost $100,000, and will be of reinforced concrete with Sacramento sandstone brick exterior.

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COMPETITIVE BIDS

A prominent firm of decorators on being asked to figure on a suite of rooms in a sumptuous town house replied they would do so only on condition that the estimate was not to be in competition with other firms. "For," they explained, "we have a high reputation as a firm and individually; we pay the highest salaries I know of in order to secure the most talented designers. The concerns doing our cabinet work are the very best in the field; so are our metal and leather workers. To put all this uniformly excellent work into a room costs money; but it is worth it and we want only those clients who realize this and who will not expect us to estimate in competition with firms of lower standard; for these, by employing second-rate talent and material, can underestimate us by a thousand dollars or more. When you architects compete," and here the speaker turned to the architect of the house in question, "it is the artistic merit of your designs and not the cost of them that decides the winner! Now if you will tell me how much can be spent on this suite, I will draw up a scheme within your figure, but I will not send in an estimate in competition with other decorators."

Two similar experiences a few days later convinced the architect that these sentiments were general among the higher grade decorators. The first was where a firm figured, but under protest, on the hardware for a Spanish Renaissance library. They offered to make it for $400 and lost to a firm who could do it for $100. What the architects wanted was work of the best material and of individual design, and this was what the $400 bidder offered; the $100 man had simply specified stock articles; and as the owner did not know the difference the architect could not persuade him to pay four times as much to the competing firm. These latter vowed never again to waste their time on competitive estimates. The second case was when a set of fine iron gates for a university were under consideration. A well-known worker in ornamental wrought iron when asked to estimate on the designs answered, "I will give you my price, but not in open competition. These gates could cost anywhere from $5,000 to $50,000, according to the workmanship and material put into them. My reputation is such that I cannot afford to compete with cheap iron workers." It was finally arranged that only he and one other, a man of equal standing, would be asked to figure; their estimates were almost identical.

And so it is evident, says House Beautiful, that to ask craftsmen to compete must necessarily reduce the standard of the work. This is why several of the best buildings recently erected in New York, including Columbia Chapel and the Stock Exchange, were given directly to reputable contractors without any preliminary competitive bids.

FAULTY CONSTRUCTION

Two indictments, that of faulty engineering and of non-compliance with the plans and specifications, have been returned against the Long Beach auditorium building and pier approach by the committee of three appointed to determine the cause of the falling in of the floor last month, causing the death of two score persons and the injury and permanent maiming of others. The committee comprised A. C. Martin, architect and engineer of Los Angeles; Wm. H. Austin, architect of Long Beach; and C. E. Richards, engineer and contractor of Los Angeles. The report of this committee follows:

The building does not at all agree with the plans and specifications furnished us. There were evidently many items omitted and changed from what the contract called for, but certain parts of the building are stronger than specifications called for.

The entire construction leads your committee to believe that the stresses and strains were never properly computed. In general, it appears that the main members had a safety factor of approximately two, whereas, good engineering practice requires a factor of six.

However, the connections had even a smaller safety factor than two. In other words, girders which are 4 to 14 should have been 13 inches by 14 inches, and floor joists resting on these girders should have been two inches by 14 inches, and not 2 by 12 inches.

The cause of failure was the breaking of a 4-inch by 14-inch girder at its support on a post in the center of the wrecked section. This girder had entirely decayed for some inches outside of its seat on the post, and all its load was being carried by a 3-inch by 4-inch angle brace, which was imperfectly connected.

There was a 2-inch by 14-inch scab or splice, 24 inches long, tieing this girder to the adjoining girder, but this scab had no bearing on the post and so was affording no assistance in carrying the load.

However, this scab effectually concealed from detection, by a casual examination, the rottenness of the girder which failed.

It would have been a simple matter to have detected this decay, if proper minute inspection had been made by one familiar with such work.

The excessive decay of this girder was doubtless caused from the fact that the floor above had no drainage, and, as we understand, after each rain water stood for quite a time over this portion, slowly percolating into the joints. The top of the post shows a marked degree of decay.

The weakness of the existing knee bracing, and the total absence of adequate bracing at right angles to girders, contributed to the failure of the remaining portion.

As the direct cause of this accident is so apparent, it seems unnecessary to seek for contributory causes.

Had the lower floor been properly constructed, it would have withstood the impact of the falling load, but the girders of this floor had such poor support the wonder is that it held under ordinary usage. Had the lower floor remained intact, we believe the accident would have been far less serious.

No minute inspection of other portions of the building or approaches was made, but enough was noted to justify your committee in recommending that the building be condemned.

Respectfully submitted,
(Signed) ALBERT C. MARTIN.
W. H. AUSTIN.
CHAS. E. RICHARDS.

State, County and Municipal Engineering

Good Roads—Water—Sewers—Bridges—Fire Protection

A Plea for Good Roads

THE Modesto Herald prints the following communication from Mr. N. O Haltberg, a local citizen, which is one of the best pleas for Good Roads we have read for some time:

"Since the Good Roads agitation seemingly has become very popular, I cannot restrain myself from assisting in blowing on the fire, with a hope that the blaze may be strong enough to affect the mind of every individual in Stanislaus county.

"A demonstration of the value of good roads and the affect of same is certainly had along and on the new state highway now finished between Modesto and Turlock. A single trip over this road should inspire everybody to clamor for a general system of the same kind, if not better roads all through the county Just think of the benefit derived by those living along the state highway, or near to it. They can't overload their horses any more. They can get their products to the nearest shipping point for one-third the cost of same prior to the building of the road, because if their wagon is strong enough, they can carry a load at least three times as large as they could possibly carry before the road was built. Hence, it is easy to figure out the profit and the benefit, to say nothing of pleasure and convenience, of a general system of good highways through the county.

"Hitherto, a load of a ton and a half, or even less, has been a heavy haul for a team of horses. On a road like the state highway, five tons would not be as heavy to haul as one and a half tons on the unimproved roads. The writer was born in Sweden, and in that country learned the wagon-making trade, and it was not uncommon there to make wagons for ordinary farm use to carry from six to seven tons, and these loads were drawn by a single team of horses. I never, until I landed in America, saw a four-horse team hitched to one wagon. An important matter to the small farmer, as well as to the larger farm, is to get the products to the market as quickly as possible, and it is not possible without good roads, because as long as the farmer can only load one and a half tons on his wagon and single team, it is and will be a tedious and expensive job, often connected with great loss on account of drop in prices of products, etc., when he can not get the proportional large portion of his products to market in time. The economical feature of the proverb, 'A penny saved is a penny earned,' most certainly can not be applied to greater effect to anything in the county as it can be applied to the road situation. The only question is for the individual farmer, as well as business man, to wake up and realize this fact.

"There is an endless chain of points which can be put forth as a demonstration of the value of good roads, and it seems very peculiar that these points cannot be seen by everybody. Everybody is complaining of the bad roads, and there certainly is a good reason for such complaint. But did you ever consider that these complaints will be continuous until such time that you and I and the other fellows get together and agree upon a system of permanent highways, and when that system is agreed upon, vote a bond issue sufficient to build the roads permanently? 'Taxes, taxes,' I hear someone say. Why, my friend, did you ever buy a new suit of clothes, a wagon, a team of horses, or anything else that you didn't have to pay for? How do you expect to get the roads without paying for them? The additional taxes on account of a bond issue of say about $1,500,000 or $2,000,000, would be so small that with the good roads you would make your additional yearly taxes in some cases in one single haul of products to your nearest shipping point."

Some Ideas on Concrete Highways

At a recent session of the road congress at Atlantic City an interesting paper dealing with the concrete road was read by State Highway Engineer A. N. Johnson of Illinois.

Mr. Johnson's paper comprised a description of the ideal pavement, with especial attention given to the various details of construction such as proportioning and depositing the concrete, providing for expansion, finishing, and the like. The action under temperature changes is one of the most striking features of concrete pavements, he said. Such a pavement is always moving and the motion is resisted to some extent by the friction of the pavement on the soil. Cracks are bound to occur, he said, and to prevent their haphazard formation expansion joints must be provided. These, however, are the weak points in the pavement and the fewer of them there are the better. They should be put in at intervals of 40 to 50 ft., according to Mr. Johnson. It has been said that expansion joints are not necessary as the shrinkage when setting about equals the expansion, but Mr. Johnson stated that he did not believe the theory would work out as concrete in a pavement is in the form of a long, thin sheet not capable of sustaining high stresses. In regard to the longitudinal cracks which sometimes develop in concrete pavements. Mr. Johnson said that the setting of the center before the rest of the pavement sets may be responsible for this, but he thought it more probable that these cracks are caused by the surface water running to the side of the pavement and getting under it. To prevent this, he said, coarse aggregate may be put under the pavement at the edges and leakouts, in the form of drains leading to the side ditches, put in at intervals of about 50 ft. Most concrete roads, he said, are built in either one or two courses, in the two-course work, the first course being a lean course and the upper course a richer mixture. There is a distinct disadvantage, according to Mr. Johnson, in the two-course work because of the likelihood of the upper course buckling under expansion and leaving a small space between it and the lower course.

In laying a concrete pavement, he said, care must be exercised to prevent the drying out of the pavement too quickly. The thickness of a concrete road need not be much greater than that of a macadam road, but the subgrade must be kept drained, perhaps even more thoroughly than with macadam. The crown of a concrete road, he held, need not be greater than 3-8 in. to the foot in most cases and can be reduced to 1-4 in. to the foot for wider roads.

In closing, he said that concrete construction has not been under observation long enough so that general rules for maintenance can be laid down. The most common trouble, he said, is the crumbling of the pavement at the edges of cracks, and although repairs may be made by grouting, such a method will not remove the cause and so a pavement must be allowed to move by providing expansion joints. The soft material used for filling expansion joints, he said, will be squeezed out during the summer when the pavement expands, and in the fall the joints should be thoroughly cleaned out and refilled with plastic material.

In reply to a question as to the cost of concrete pavement, Mr. Johnson replied that it should not exceed $1 per sq. yd. In reply to another question in which the matter of super-elevation on curves was brought up, Mr. Johnson replied that road builders would sooner or later have to provide for this feature. In reply to a question as to whether sand or gravel is necessary for the subgrade, Mr. Johnson replied that it is not.

Mr. Johnson then went on to describe briefly the experimental work of the government near Washington. Nine sections of bituminous road have been built, he said, some by the penetration method and some by the mixing method, and traffic records have been kept. The government is now continuing the work and putting down the more expensive forms of pavements, which will include bituminous roads built by the mixing method under both the Washington and Topeka specifications and with various minor differences in the construction. There will also be sections of vitrified brick and of concrete.

East San Diego's Open Air City Hall

East San Diego is a thriving California municipality of the sixth class, incorporated November 2, 1912, with a population of 4,000, which is still growing at a rate faster than the 2,000 a year which that population represented.

Harvey M. Holleman is a young man with financial training in New York, sent to Texas to carry out some important work for the Southern Pacific railroad, and passing thence to Denver, where he was a president, vice-president or treasurer of several financial institutions, including bank, insurance, bond and loan companies. After three successful years there he moved to San Diego two years ago. He built a bungalow on City Heights, which was a little community of 200 population on the table land east of San Diego and 420 feet above the sea. His energy was evidently communicated to the place, for it has become the present city of East San Diego within that time. Very naturally Mr. Holleman is the first mayor of the new city, an honorary office, for no city officers draw salaries except the city attorney and the city clerk, $300 a year, and the city treasurer, $120 a year.

The new city has already street cars, telephones, water, electric lights, a $75,000 school house with adequate playgrounds, no saloons, and is occupying a unique city hall.

An observation tower was built some years ago to give views of the wonderful scenery in every direction and when the city grew the lot on which it was located was sold. To get rid of it the tower was sold at auction for 35 cents, sold again for $25, moved across the street and improved and now its five floors rent for $1,600 a year. The first three floors are business rooms, the fourth is fitted up for the city hall and the fifth is the city's council chamber. It is open to the air on all sides, as the protograph shows, and a special meeting of the board of trustees was held on Christmas day, 1912, with straw hats and shirt sleeves to demonstrate the beauties of the San Diego climate. The thermometer registered 71, nine degrees higher than at the beach, four miles away. The owner of the tower, C. O. Stensrud, has donated one year's rent of the council chamber to the city. The fifteen city officials hail from fourteen different states.

Corrugated Iron Pipe

THE United States Department of Agriculture, Office of Public Roads, devotes its Bulletin No. 45 to "Data for Use in Designing Culverts and Short-Span Bridges," by Charles H. Moorefield, highway engineer. On pages 11 and 12 there occurs a discussion of the merits of Corrugated Iron Pipe of which the following is an abstract:

Many culverts are now being constructed of corrugated pipe made of pure iron. The corrugations make the use of relatively very thin metal possible without danger of collapse, and it is claimed that the pure iron of which the pipe is made offers superior resistance to corrosion. As far as is known, these culverts as proving generally satisfactory, but since they have been in use only a comparatively short time, their claim to durability under service conditions has not yet been fully established. It may be stated, however, that tests made on iron by the Office of Public Roads have uniformly indicated that segregated impurities present in iron affects its power to resist corrosion in a marked degree. The tests of the Office of Public Roads, in fact, formed the basis for the development of the pure-iron industry.

Corrugated-iron culvert pipe should be laid in the same manner as vitrified clay and cast-iron pipe. The accompanying table gives dimensions, weights and prices as furnished by a leading manufacturer of pure iron-corrugated culvert pipe and is representative. The prices are f. o. b. factory and are subject to variations:

Diameter inches	Gauge No.	Weight per lin. ft pounds	Price, lin. ft. net
10	16	9	$0.80
12	16	11	.90
15	16	13	1.00
18	16	16	1.25
20	16	20	1.40
24	14	25	1.75
30	14	30	2.50
36	14	38	3.40
42	14	45	4.50
48	14	52	5.25

An Engineering Feat.

Charles R. Wilson, an architect with offices at 328 Montgomery street, San Francisco, has worked out elaborate plans for the construction of a second entrance to San Francisco Bay, and through his plan sees the solution to the problem of the disposal of the large amount of machinery which will be left on the hands of the government at the conclusion of work on the Panama canal.

Wilson plans to have a deep channel, 200 feet in width, cut from Tennessee cove, on the ocean side in Marin county, through the Elk valley to the head of Richardson's bay, north of Waldo point. The cost would be under $10,000,000, according to Wilson.

He considers that the canal would be of incalculable value, not only in times of peace, but also in war times. It would allow the closing of the Golden Gate with mines and still allow an ingress to the bay. It could also be used as a temporary dry dock. In stormy weather the channel could be used in preference to Golden Gate, as the section to the north is always comparatively smooth. It would also be of great advantage to small craft, continues Wilson, as they would not have to cross the bar outside the Gate. The water off the cove is ten fathoms deep, while on the bar it is four.

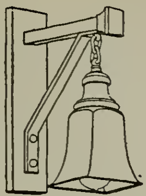
The canal planned by Wilson goes through a natural hollow from the ocean to the bay and would be about four miles in length.

New Architects

The State Board of Architecture has granted certificates to practice architecture to the following. William J. Dodd of the firm of Haenke & Dodd, 1114 Story Building; Ross Montgomery, 805 Trust and Savings Building; Karl Keffer, 2628 Pasadena avenue; Clinton Nourse, 496 West Central avenue, Sierra Madre; and Harry L. Pierce, 554 West Forty-third Place, Los Angeles.

Personal

Arthur B. Benton of Los Angeles, who has for twelve years been architect for the Glenwood Hotel Company, and who has designed and superintended the construction of all the buildings of the Mission Inn, Riverside, because of exacting professional engagements, has withdrawn from immediate connection with Mr. Miller's architectural projects at Riverside and elsewhere. He will, however, continue to be associated with Mr. Miller as general consulting architect. It is probable that Architect Myron Hunt will handle the Glenwood improvements which are in contemplation at this time.



Heating and Lighting

Plumbing and Electrical Work

Notes on Successful Illumination

By FOWLER MALLETT

Introductory.

THE matter of lighting fixtures may appear to be a very small corner of human thought, but it cannot too often be pointed out that our present mode of life is so largely spent by artificial light, that in building and furnishing any structure—more especially a home—the owner and architect should take a keen interest in its illumination. The preservation of our eyesight under the trying conditions to which the eyes are subjected in the prevailing modes of lighting demands immediate remedy of the most glaring faults.* Then, too, lighting fixtures compel attention by the conspicuousness of their form and position. They should therefore be beautiful in themselves, harmonious with their surroundings, and so placed as to accomplish their two-fold purpose of illumination and decoration.

Upon the lighting depends the comfort and beauty of the home after sundown, for while the fixtures contribute more conspicuously to a room than any other decorative feature, their prime object is to produce useful illumination. This requires care in design and execution, and means that suitable provision for fixtures should be made early in the course of construction. A study of the lighting should precede the making of an appropriation, as it is disconcerting to find, after other matters are settled, that appropriate lighting will add considerably to the already planned expenditures. Nothing could be more unsatisfactory from a business standpoint than the prevalent custom of treating lighting fixtures as a much-vexing "extra" to be taken care of "when the time comes."

General Illumination: As writers on the subject have already pointed out, both general and local illumination have to be considered. General illumination distributes light over walls and ceiling and throughout the room, and is best accomplished by some form of indirect or "semi-indirect" fixture. As already pointed out in these columns, much experimenting has been done with indirect and quasi-indirect lighting, and while some of the results, as might be expected, are poor, this method properly installed is by far the most effective. Fixtures designed to transmit ten to fifteen per cent

*For a most interesting discussion of the effect if high-efficiency illuminants upon the eye and its functions, see the group of articles by F. Laurent Godinez, consulting lighting specialist, appearing in the Architectural Record, especially the first of the series in the issue for March. 1913, entitled "What Do We Know About Lighting?"

of the light direct and reflect the balance to the ceiling may be made at once most decorative and efficient. Where for any reason this type of fixture is not feasible for general illumination, either wall brackets, chandeliers, shower lights, or ceiling clusters may be used, the exact method depending upon individual conditions.

Local illumination concentrates light for reading or other close work, and is obtained from portable lamps, or from brackets, pendant domes, or chandeliers directly over the spot to be lighted. Special forms of portables for piano and desk lights, Morris chair lights, and the like have been brought to a high degree of perfection, and when artistically designed in harmony with the other fixtures of a room, contribute comfort and beauty far beyond their proportion of the cost of an installation. The most recent use to which portable floor and table lamps have been put is that described in the May issue of the Architect and Engineer, wherein the lamp is made to serve the combined purposes of direct local illumination and indirect general illumination. This makes an ideal fixture for a room in which it is desired to eliminate a ceiling fixture, and should always, if possible, be employed in a room which would otherwise have to depend on wall brackets for its general lighting.

Plans: From the foregoing it will be clear that to obtain satisfactory results the kind of illumination sought and the type of fixtures required should be determined and lighting plans should be carefully laid out before the wiring and piping are begun.

Evolution in Lighting: Prior to the systematic study of light distribution, at a time when this country was suffering from general "artistic chaos," fixtures irredeemably ugly were located by the workman's fancy or the dictates of convention. The most costly interiors were often most defective, being merely an elaboration of the inadequacies found in cheaper work. We grew accustomed, therefore, to hideous, inefficient fixtures for gas and kerosene, with awkward adaptations of them serving as electroliers. If, however, we go still further back to the days of our Colonial ancestors and earlier periods in Europe, we find charming lamps and candelabra well worth careful study and reproduction with the modern illuminants, gas and electricity, so that whatever the scheme or "period" of a room there are always appropriate motifs to incorporate in the lighting.* It is right to demand for each interior, as so many are now doing, a characteristic lighting scheme and consistent fixtures. This is just as true in the simple interior as in the most elaborate.

*For an able discussion of the architectural treatment of lighting fixtures, see the profusely illustrated paper by L. R. Hopton and H. E. Watkins printed in April, 1910, by the New York Section of the Illuminating Engineering Society.

True Economy: Nevertheless, it is true that lighting fixtures are the jewelry of an interior. A trifling saving in first cost should not be permitted to permanently discount an installation and the building it should adorn. If the cost must be limited to a minimum, then all the more should the fixtures be so designed and constructed as to give the best value for the investment made. Too often a meagre allowance has brought forth poor workmanship, while an abundant appropriation has resulted in mere spectacular effect, in neither case involving designs of any merit. Your advisor, if a permanent member of your community and a student of his art, will profit, not by selling his highest-priced fixtures, but by installing lighting at once appropriate and efficient, for upon this point his ultimate success depends.

Appropriation: In general, five per cent of the cost of a building should be devoted to fixtures and the wiring for them, although frequently this proportion or more should be spent for fixtures alone. Their importance can hardly be over-estimated, as either an insignificant or an over-ornate fixture may ruin an entire interior. Poor fixtures add nothing to the value of a building — may greatly depreciate it—while good designs in a building even mediocre in other respects may be made its saving grace.

Quality: In judging a group of fixtures, however, or samples in a show room, the layman as a rule sees only the general effect. It takes, to a certain extent, a trained artist experienced in the manufacturing processes to discern the little things which make up the difference in these impressions. It therefore behooves one to give especial attention to details of construction and finish, as these matters are capable of very different handling, dependent upon the integrity of the designer and manufacturer. For this reason no exact comparison of prices can be made between well-finished fixtures and ordinary commercial goods, but whether the price seems higher or lower, bear in mind that "The recollection of quality remains long after price is forgotten." The flimsy imitation is never cheap.

Selection: It is scarcely necessary to add that in all well-maintained display rooms, sample fixtures and designs are shown with the attempt to suggest schemes of decorative lighting for every variety of interior, with prices graded to suit the simplest bungalow or the finest mansion, and everything is furnished from the simplest lamp receptacle to the most elaborate "period" fixtures exquisitely carved or wrought. Radical departures from the ordinary types of fixtures may be seen, sometimes more logical and more artistic, and there is practically no limit to the possibilities of special designs.

The best firms study each house as an independent problem demanding a certain amount of individuality in the solution, and maintain for the purpose a staff of trained designers. An establishment equipped to furnish any kind of work in metal or glass is required for this purpose, but the purchaser must understand that under any circumstances sufficient time must be allowed for the execution of the work with proper artistic consideration.

Reputation: When a man solemnly offers us as testimony of his own worth his own statement of his own cleverness, we cannot be expected to take him seriously. The judgment of the consumer is the only reliable standard of opinion, and the purchaser must seek information from those whose work has been satisfactorily accomplished. A satisfied customer is the best possible advertisement because the most sincere and unbiased.

In another issue of the Architect and Engineer an effort will be made to discuss briefly, yet in more or less detail, some of the principal considerations which should be taken into account in the lighting of residences, or in fact, of any interiors with a distinct functional expression.

The Heating of Country Houses

JUDSON H. BOUGHTON,
In Country Life in America.

FROM the standpoint of comfort, health and economy there is no element of its heating plant. Yet this is a feature a country house of more importance than of house building with which the average owner deals under great disadvantages, which unfortunately are not usually offset by the assistance of architects and builders who may ordinarily be entrusted to carry out the owner's wishes and ideas in other respects. There are several modern conveniences as, for example, gas, electricity, running water, and sewerage, which are not so readily available in the country as in the ctiy, but in the matter of heating, which should depend only upon the fuel supply, the country house should present no more difficulty than the city dwelling.

Architects of ability and reliability may be depended upon, so far as respects the design and construction of the house proper, to serve their full function as the personal representative of the owner; but with the heating plant, involving technical problems of quite a different nature, the architect must rely largely upon the heating contractor whose relations to and interest in the work are of an entirely different character. The common result is that after having determined to provide heating apparatus which would be both adequate and efficient, the owner discovers in the course of time that he has either failed to accomplish this or has made undue expenditures in one part or another of the system, as a result of unskilled design, without securing any compensating advantages whatever.

With the so-called warm-air furnace, which is frequently selected because of its lower first cost, the main considerations are to secure proper capacity and efficiency in the furnace itself; a good chimney draft; an ample intake pipe for the cold air; and last, but not least, conductor pipes to the various rooms of sufficient size to convey readily the heated air from the furnace. Finally, it should be seen that the furnace and the conductor pipes are well insulated with asbestos or similar material to prevent undue loss of heat by radiation. Each heating installation must be treated as a distinct problem, and no universal rule or set of rules can be formulated which will cover every case, and this is particularly true of warm-air apparatus.

In steam and hot water heating there are three main elements: the boiler with its chimney, the distributing or circulating system, and the radiators. In most house specifications and building con-

tracts the amount of radiating surface, the visible evidence of the heating plant, is usually quite clearly stated; the size or type of boiler is sometimes stipulated; but ordinarily no reference at all is made to the equally important connecting link, the circulating system of pipes. This looseness permits unscrupulous and incompetent heating contractors to make lower bids in the face of competition and secure profits through "skimping." The saving to the owner in first cost is in no way commensurate with the unsatisfactory service and high operating cost which he encounters upon putting the plant in commission.

Heating plants are usually designed to maintain a temperature of 70 degrees F., with normal firing, when the outside temperature is zero; any greater or less duty being obtained to meet other weather conditions by regulation of the dampers of the furnace, and its firing.

In the matter of radiating surface a common rule for steam heat considers three factors: surface area of the walls, the area of the glazed openings in the walls, and the cubical contents of the building, allowing 1 square foot of radiating surface for each 20 square feet of surface area of the walls, and adding 1 square foot of radiation for each 2 square feet of glazed opening, and 1 square foot for each 200 cubit feet of cubical contents. The thickness and character of the walls, if they vary from the ordinary must, of course, be duly considered in applying this rule. Double windows will tend to reduce the necessary allowance for this item, while extra radiation must be provided if the openings are not reasonably well fitted. If hot water is used instead of steam the radiating surface determined in this manner must be increased by 60 per cent. because of the comparatively low temperature at which hot water is delivered to the radiators

To make effective the prescribed radiating surface, a boiler with a sufficiently large grate area to burn the amount of fuel required must be provided. The boiler should also be designed so that the maximum amount of heat liberated from the fuel will be absorbed by the water whether it is to be circulated directly or converted into steam. There should be a sufficiently deep firepot to hold enough fuel for twelve hours in severe weather.

A good draft, which is essential to proper combustion of fuel, contemplates a chimney rising well above the highest portion of the building and so located that the prevailing winds will not create down-draft eddies; and the area of the flue must be at least 100 square inches for medium-sized boilers. The bore of the flue should be made as smooth and as free from turns as possible and will be most effective when circular in section. If made of brick only, the walls of the chimney should have at least two four-inch courses, and great care ought to be taken to make it air-tight at all joints.

Ample radiating surface and ample boiler capacity may be provided, but unless the water or steam, as the case may be, is free to circulate from the boiler where it is heated, to the radiators where it gives off its heat, and back to the boiler to be reheated, the results are bound to be unsatisfactory. This circulation, which is essential, depends, in a hot-water boiler, upon the difference in weight of a column of hot water and a similar column of colder water; and in steam boilers upon the difference in weight between a column of steam and a column of hot water formed from condensed steam. With hot water, the difference is quite small (at 39 degrees F., a cubic foot of water weights 62½ pounds, while at the boiling point, 212 degrees, it weighs 59½ pounds), so that to secure active circulation with this small force the distributing or circulating pipes must be of ample area and free from unnecessary bends or obstructions. The tendency is to install pipe work which is far too small, and this is also true in steam heating, although not nearly as large conductors are required with steam as with hot water.

The gurgling or hammering noise frequently heard in heating systems is by no means always due to the presence of air, which tends to reduce the capacity and efficiency greatly, but it more often indicates poor circulation, a source of constant dissatisfaction and loss.

Largest Searchlight in the World

Electricians are now planning for the construction of the largest searchlight in the world which the Mount Tamalpais Railroad intends to install on top of Mount Tamalpais as an added Exposition feature. It is hoped that the rays of the powerful light will reach across the Golden Gate and tip the mountain tops for miles around and that they will also illuminate the 1915 Exposition grounds. There is a doubt among experts as to whether rays of light can be made to illuminate the Exposition site. Some claim that on clear nights this can be done, but a test will have to be made before the question is settled. A local firm of electrical engineers are at present making a searchlight fitted with a parabolic Bausch and Lomb mirror lense and an arc lamp capable of one hundred and twenty amperes of current capacity, to be increased as desired. The lens is so constructed as to concentrate the intense light on a 100 foot square spot at a distance of nine miles from the lense. Thrown into the sky a beam from this lamp will be seen at 100 miles distance, and objects will be illuminated at a distance of ten to twenty miles. The searchlight will have a range of at least twelve miles and will be sufficient to blind a man at this distance.

By the Way

Some Industrial Information Worth the While

Meese & Gottfried Move

The Meese & Gottfried Company, well known along the Coast as the largest manufacturers in the West of transmission, elevating, conveying and screening machinery, having outgrown their present main offices, have taken a ten years' lease for $78,000 of the four-story steel and brick building, corner Mission and Annie streets, San Francisco.

A force of experts are now hard at work fitting up what will be the finest offices for a concern of this kind in the West, if not perhaps in the country. The firm will occupy the whole building.

On the ground floor will be up-to-date salesrooms and the executive offices. The second floor will be arranged to care for the estimating department, the engineering department, drafting room, advertising department, blueprint and photographic rooms. The balance of the building and large basement are to be used for the carrying of certain standard goods—such for instance as wood and steel pulleys, bearings, hangers, shafting, chain and link belting, etc., which will supplement the stock carried at the factory to expedite local deliveries.

The new location marks but another step in the aggressive policy of this wide-awake concern and will place them in easy reach of all the machinery interests, the big hotels, banks and offices of manufacturing, engineering and mining men.

Berkeley Elks to Build

The Berkeley Lodge of Elks have appointed a building committee, of which J. H. Wheeler is secretary, and will receive competitive plans from architects up to the 15th. The amount to be expended is $65,000, and the building will be three stories and basement (no elevator), to be erected on the southwest corner of Allston Way and Henry street. The construction can be either steel and brick or reinforced concrete. The entire building is to be occupied by the lodge.

Pacific Sewer Pipe Company Expands

The Pacific Sewer Pipe Co. is still expanding. Having gotten their big new sewer pipe plant at Los Nietos into operation, they are now changing their Plant No. 4 on Avenue 26, Los Angeles, to a high grade brick plant. Among the products to be turned out from this factory in the future will be pressed brick, enameled brick, firebrick, roofing tile, mantel tile and similar high-grade products. Pressed brick are already on the yard, and the company expects to show enameled brick inside of 60 days, one large order for the latter being already booked. The plant is thoroughly equipped, occupies six acres of ground on the Santa Fe and Salt Lake railroads, and has facilities for a large output. With these new lines the Pacific Sewer Pipe Co. will be one of the largest manufacturers of clay products, as well as most prolific in point of variety of products, of any west of St. Louis.

"Carpentry"

This interesting and instructive book has just been published by the American School of Correspondence, Chicago. Gilbert Townsend, S. B., is the author, and he has prepared a helpful working manual for carpenters and wood workers in general. It is not a theoretical treatise, but a practical working guide. Price $1.50.

Perils of the "Skyscraper"

New York City has at last come to the conclusion that it has too many tall buildings, and a movement is on foot to prevent further construction of skyscrapers.

It is now conceded that in case of fire in Wall Street there would not be room in that and adjacent narrow streets for the multitude of people who would pour out from the twenty to fifty-story buildings. Thousands would be crushed to death if there was a panic in the daytime among the occupants of the big buildings.

Boston is fortunate in not having followed the example of New York architects and builders and reared so many piles of stone and brick to a height that would render them unsafe in case of fire or panic. There may be grumbling sometimes over our 125-foot limit, but it is best to be on the safe side.—Boston Globe.

Competition on Public Buildings

A bill introduced by Mr. Spencer at the request of the Oregon Chapter of the American Institute of Architects and known as House Bill No. 372 is of considerable interest to the members of the architectural profession in Oregon. The bill provides for the manner of conducting and for the regulation of architectural completion of public buildings in the State of Oregon where the architectural work on same is or is to be awarded by competition. The measure has the hearty endorsement of the members of the Portland chapter and while not limiting the number of architects engaged in any public competition it provides for a specific method of making the award according to the rules as laid down by the American Institute of Architects which is absolutely fair and just to all competitors and eliminate many of the most objectionable features which have heretofore been found in competitions of this character.

Prince Rupert Building Plans

Architect A. A. Cox of Vancouver and Victoria has been commissioned to prepare plans for the provincial government building at Prince Rupert. This, it is expected will cost, before it is finally completed, from $300,000 to $400,000, the intention being that it shall be fully adequate to future as well as present demands, and set an example for the Dominion in the erection of the federal buildings which must also be provided for Prince Rupert in the near future.

The Swiss Chalet Book

This new book by Mr. William S. B. Dana tells the story of the chalet in Switzerland, its history, evolution and construction. The book is replete with illustrations and numerous diagrams, sections and plans. It is picturesque as well as instructive. Mr. Dana has not neglected the Swiss chalet in America and tells the reader something of the use that has been made of chalet forms in California, accompanying his text with most attractive pictures. Cloth, 7½x 10. Price, $2.50. The Wm. T. Comstock Co., 23 Warren St., New York.

Elected a Fellow of the Royal Geographical Society

Architect B. J. S. Cahill of San Francisco has recently been elected a Fellow of the Royal Geographical Society of London, a distinction shared with but one other architect in the United States, viz., Mr. Ralph Adams Cram of Boston. Mr. Cahill's contribution to the science of projection is briefly described in another part of this magazine. Endorsements of the new map have come from some of the leading geographers of the world. The latest is from the venerable Dr. Alfred Russell Wallace, the co-discoverer with Darwin of the theory of evolution by natural selection. Dr. Wallace expressed his appreciation of the new world-map as being "more accurate than any other yet attempted."

Contracts Completed on San Francisco Hospital

The following contracts on the San Francisco Hospital have been completed and accepted by the Board of Public Works: Installing high-pressure steam mains and heating system in the receiving building, Wittman, Lyman & Co., contractors; plumbing work, receiving building, John G. Sutton Co., contractor; tiling work, Lowry & Daly.

Structural Steel Contract

The Central Iron Works of San Francisco has been awarded the contract for the steel frame work for the new Gottschalk department store building, which is to be three stories in height and will occupy a site 150x200 feet at J and Kern streets, Fresno. The completed building will cost about $350,000. C. A. Meussdorffer of San Francisco is the architect.

Tourist Hotel

Frank A. Miller of the Glenwood Mission Inn at Riverside announces that he has secured a lease on a site in Yosemite Valley for a large tourist hotel and will erect a building to contain from 200 to 300 guest rooms. Myron Hunt, Hibernian Building, Los Angeles, will be the architect. The hotel will be completed by April 1, 1915. This fully confirms previous reports regarding the Yosemite Hotel.

Concrete Pavements

One of the most comprehensive booklets recently issued to contractors, is the American Steel & Wire Company's "Triangle Mesh Wire for Reinforced Concrete Pavements and Roadways." Concrete construction for the purposes named is given the fullest consideration, enhanced by tables of costs and estimate of life of various types of pavements. Many diagrams are shown and the booklet is illustrated throughout with views of work under actual way in varying stages. It is a complete and authoritative work in the use of reinforced concrete for the construction of pavements and roadways.

New Power for the White House

The firm of Hunter & Hudson, mechanical engineers, with offices in the Rialto Building, San Francisco, has been retained by Raphael Weill & Company to prepare plans and specifications for a new power plant to supply electric current for all lights and power in the White House. Drawings for the improvements are now in course of preparation.

Home-Made Fire Door Hardware.

SAN FRANCISCO is fast becoming a manufacturing center. Time was when it was necessary to go east to get materials with which to build. Brick, cement, high-class mill work, hardware, steel and machinery of all kinds formerly had to be transported to the coast by rail or water and the consumer paid the freight. Today many of these necessities in building construction are made right here in California and the owner, of course, reaps the benefit.

But the sentiment for home industry is far from general, if the following communication addressed to a San Francisco architect by President J. C. Kortick of the Kortick-Falls Manufacturing Company is to be taken as a criterion:

Considering the spirit of home industry that apparently pervades this community we feel that as manufacturers of a standard line of Fire Door Hardware carrying with it the endorsement and label of the National Board of Fire Underwriters whose jurisdiction covers the entire United States, we are not being supported by the rank and file of the architects.

Our line of post caps, bases and joist hangers have long been recognized as equal to the best and a few of the most reputable architects and engineers having permitted them to be used in the construction of some of the largest and best buildings in San Francisco seems in itself an endorsement which has satisfied us of the merits of our product.

At the time of the Home Industry League exhibit we went to considerable expense in constructing an exhibit duplicating the actual form of construction of a Class "C" building showing our post caps, bases and joist hangers in position.

We mailed out 119 personal letters (not carbon copies) inviting that many architects of San Francisco to visit our exhibit. To the best of our knowledge the result was one architect, Mr. Nathaniel Blaisdell, called and saw our exhibit and wrote us congratulations on our enterprise and products.

We have spent large sums of money and unlimited time in introducing and advertising our line, but it seems that many of the architects, being Eastern educated men, have become imbued with Eastern specifications and products, and it is difficult to penetrate their skins of early environment and induce them to specify a local product.

What would the architects of our city think and how would they feel if our patriotic citizens sent East for all their plans and sent work that rightfully belongs to our own architects out of the state?

Is there one architect in San Francisco that would not be up in arms if he heard of a single instance of such an occurrence?

We could quote you instances wherein architects here have turned down our product and in some cases the Eastern factory agent, being out of stock, has had us fill his orders for caps and hangers that went into a building where in the first place our product was not specified.

If our goods are satisfactory in such instances why is not our product good enough to specify?

We conducted a campaign among the architects of this city wherein we filed a card system of those architects who verbally promised to specify "Falls" brand hardware. The card system is in our office now and stands a monument to what we consider broken promises, we trust not intentionally, but just negligence.

How much better would it be if our architects could only realize the importance of assisting the local manufacturers to establish industries in their midst which would ultimately give them the source of supply requisite to their own profession seeming to us that they more or less are blind to the importance of this.

The Kortick-Falls Manufacturing Company recently moved into their large new factory building adjoining their old plant. The new quarters consist of roomy, light and well ventilated offices, show rooms, stock room, ample warehouse space where the large stock is conveniently handled and segregated, insuring prompt shipments and delivery.

Their show room consists of an attractive display of every article they manufacture. The second story of the main building is devoted exclusively to the finishing department.

The main factory building and machine shop are exceptionally well lighted and ventilated, having many modern improvements for the convenience of the employees.

Much of the machinery from the old plant, as well as the new machinery, has been installed and within a short time will be in full operation.

The Kortick-Falls Manufacturing Company are pleased to announce that they own the land and buildings of their new plant and will also continue to use their old factory as a raw material warehouse, thus giving them ample facilities for carrying on the steady increase of business.

The firm enjoys the benefits of a well established chain of agents in Vancouver, B. C., Seattle, Portland, Salt Lake, Sacramento, Fresno Los Angeles and San Diego. Also much of their product is regularly stocked by the largest jobbers of the Pacific Coast.

Mr. Kortick, the president and general manager and founder of this business, is prominently identified with the commercial and improvement organizations of San Francisco and is generally interested in the welfare of the whole Pacific Coast cities. He sacrifices a great deal of his time in the interest of any movement having for its end the advancement of this community, at the expense of his own private affairs.

The Skyscraper "Hits" Paris

A news dispatch from Paris reads: Great changes are taking place all over Paris at present, and in a few years even the center of the city will be hard to recognize. The American skyscraper in a modified form has made its first appearance here, and within a few minutes' walk from the Madelin Church the first steel and concrete building is at present nearing its completion as far as the exterior is concerned.

It is an ugly looking structure and looks glaringly out of place among its aristocratic looking neighbors on the boulevard, but it will be followed by many others, for ground is growing terribly dear in Paris, and it is necessary to build houses containing a great number of apartments.

I only wish that some real good American architect would come over here to show the people of Paris that it is possible to build modern houses of this kind without making them an eyesore to the whole district, for the French architects who are able to construct veritable poems in brick and mortar, when building private residences or public buildings, do not know how to put up a decent looking office building or apartment house in the American way.

Among the buildings doomed to disappear none will be more missed than the famous Cafe Anglais, which is shortly to be replaced by a skyscraper of steel and plaster.

"Concrete Bridges—Roads and Curbs"

This book is a brand new publication, comprehensively covering reinforced concrete bridges, as well as concrete roads and curbs, and incidentally concrete sewers, retaining walls, docks, etc. It includes a complete discussion of the design of reinforced concrete bridges for both highways and railroads. Also complete tables of designs for flat highway bridges, for girder highway bridges, 16' and 20' roadways, for railroad box culverts, for highway arch bridges, etc.

Numerous illustrations of bridges are given, showing all types of designs for girders and arches of small and large spans for country uses and for large viaducts, as well as culverts, sewers and retaining walls.

The latter part of the book is devoted to concrete roads and the protection of the expansion joints in them with Trus-Con Armor Plates. Also the new Trus-Con Curb Bar is shown with its various applications as a concrete edge protector, particularly for concrete curbs. The book is published by the Trussed Concrete Steel Company, Detroit, and is mailed free on application.

St. Paul Architects Ignored Again

(From "The Improvement Bulletin.")

A large bank in St. Paul, having a skyscraper to build in its home city, where the owners for the most part make a banker's living from the patronage of the people, loyally went to Chicago for an architect and now the checks will begin to flow to this gentleman and help him maintain his position among the Upper Ten. Meantime St. Paul architects can meet their grocery bills as best they can and consider what the poet said: "Laugh and the world laughs with you." The St. Paul architects know that other large checks are flowing to out-of-town architects from St. Paul patriots and so they all go about now wearing a broad grin. The Gargoyle club, the St. Paul architectural club, felt so tickled at the way things were going that it adopted a resolution of protest, in which it says:

"The awarding of plans for the Merchants' Bank building, public library, union depot, Hill building and St. Paul Bread factory will involve the spending of at least $300,000 in commissions to foreign architects. It is like a man in St. Paul ordering a suit from a New York tailor who never saw and doesn't know his measurements. An applicable instance is that of a St. Paul man who gave the plans for his residence to a New York architect. When the house came to be built it was found that the architect specified materials that could not be got in St. Paul, and bringing the stuff in from the outside raised the cost of building several thousand dollars above the contract price.

"It was this shortsightedness on the part of St. Paul builders that caused Cass Gilbert, one of the tip top men in the profession, to leave St. Paul and locate in New York.

"For ten pears after he drew the plans for the new capitol he tried to make a living in St. Paul and could not. Then he went to New York and built the 55-story Woolworth building, the tallest skyscraper in the world. A year after he left St. Paul he was awarded a gold medal by a British architectural society as one of the leading architects in the world. If he had remained in St. Paul this honor would have been reflected on this city. Only recently he was interviewed by the New York World for an article in their Sunday magazine section on the possibilities of a 100-story skyscraper. And this is the architect who could not make a living in St. Paul. That peculiar attitude of human nature which invoked the proverb that 'a prophet is not without honor save in his own country,' is possessed by St. Paul business men to a high degree."

Showing the Progress of the Fire Inside the Two Buildings

Gold Medal "Blenio Process." This Process is a liquid, NOT A PAINT, which is applied to all kinds of combustible material. The Process is, of course, a secret, as is the method of application. Whatever the ingredients may be, the result of their application to inflammable articles is truly astonishing. Even excelsior, lace curtains and cotton refuse to burn with their usual fury

The Building on the Left was Fireproofed. Only the Ashes Remain to Indicate Where the Other Building Stood

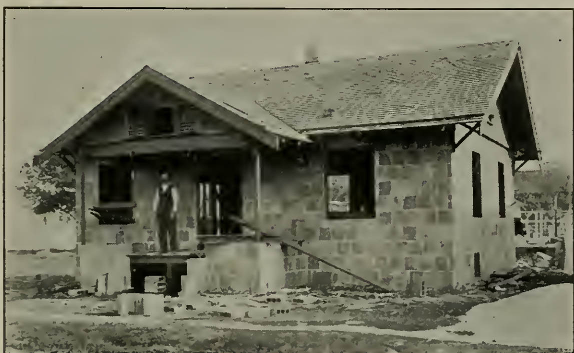
when "treated" with the Gold Medal Blenio Process.

Having established the practicability and lasting quality of this fireproofing to the satisfaction of the Fire Chiefs and Building Commissioners in the principal cities of the world, Mr. Blenio received their endorsement; also a gold medal at Torino, Italy, against 142 competitors from all over the world. He also has letters and testimonials, showing that his process has a permanency and lasting quality. Materials which have been fireproofed five or six years ago have the same fire resisting quality today as they had the day the fireproofing was applied. A local company has been formed, known as the California Safety Fireproofing Company, incorporated, with offices in the Head Building, San Francisco. A factory has been built to manufacture the fluid and arrangements are well advanced to use the Process in fireproofing theaters, sceneries, wood, house furnishings, inflammable stock, canvass, duck, etc. Waterproofing, too, will be made one of the company's specialties.

The Plant at Ben Ali

The Sacramento Clay Products Company

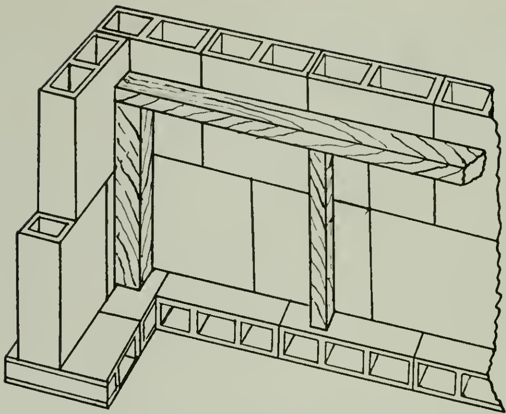
THE SACRAMENTO CLAY PRODUCTS COMPANY has completed its new brick and tile factory at Ben Ali near Sacramento and the plant is running to full capacity, filling orders from Sacramento, Stockton, Oakland, Fresno and other cities. This company manufactures pressed brick, wire cut brick, fire brick and hollow partition tile. A special run is being made in partition tile for residences. Partition tile is being used very extensively in the East for bungalows, apartment houses, etc., giving a house that is cool in the



This Sacramento bungalow was built of their hollow tile at the same cost as its equivalent in wood. In a hundred ways it is superior to a wooden structure

summer and warm in the winter. This fact is making the Sacramento product very popular, especially in the San Joaquin and Sacramento valleys.

A large packing house in Fresno is being built of the tile on account of furnishing a cool place in which to pack dried fruit and raisins.



The above illustration shows a very successful method for supporting floors. These are as rigid as any wood construction can be. If desired tile can be substituted for the upright wood supports

C. F. Pratt, president of the Pratt Building Material Company, who are marketing the product of the Sacramento Clay Products Company, reports a nice order for fire brick at the University of California and another order for pressed brick to be used on a large building at St. Helena.

The State Armory at Sacramento is using 187,000 of 4-in. tile.

The Pratt Building Material Company, Hearst Building, San Francisco, will be glad to furnish any additional information about the partition tile or brick made by the Sacramento Clay Products Company.

Portland to Have Exchange Building

The Builders' Exchange of Portland, Ore., is receiving more enthusiastic support than ever before, and is now preparing to build a permanent home. According to present plans, the building will be eight stories high, of reinforced concrete, faced with light-colored brick. It will cover a lot 50 by 114 feet at Fifth and Ankeny streets, costing about $100,000. The lower floor will be given over entirely to the use of the Builders' Exchange, provision being made for numerous displays of materials. The upper floors will be equipped especially for the use of architects, the idea being to make this building the center of Portland building activities.

Does Advertising Pay?

The Answer

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THE LIQUID-STONE PAINT COMPANY

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LIQUID-STONE--THE PAINT ETERNAL

1203-4-5 HEARST BUILDING

SAN FRANCISCO, CAL., May 12,1913.

The Architect & Engineer of California,
617 Monadnock Building,
San Francisco, California.

Gentlemen:-

For sometime passed we have been advertising in your valued periodical and find that the same reaches a very large territory.

Your April Number produced a large number of inquiries from Los Angeles on the South, Oregon and Washington on the North and New York City on the East, showing that the same has a very wide circulation and a high class of readers.

The results attained from our advertising in your last issue is certainly very gratifying to us.

Youre very truly,

THE LIQUID STONE PAINT CO.,

by Chas. E. Moody

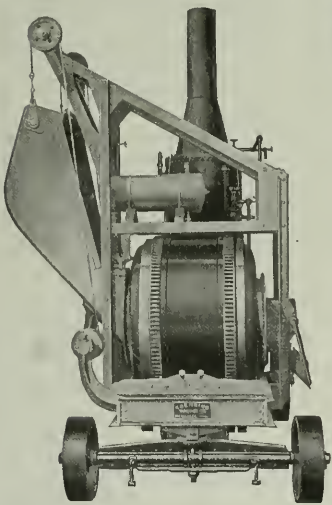
Vice President.

CEM.FR

The Koehring Three-in-One Principle of Mixing

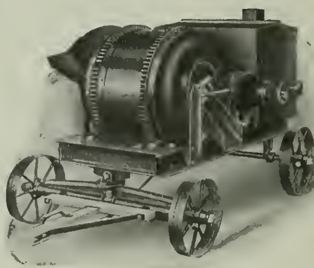
MECHANICAL mixers are only used because they mix more thoroughly and more rapidly than hand mixing. The first thing to consider, therefore, in the Koehring mixer, or any other machine, is its mixing principle—will it mix better and faster than other mixers, and why?

Near the longitudinal center of the interior periphery of the drum is an annular row of low, flat buckets, alternating with long, slightly rounded, diagonal mixing blades, which are arranged to carry the material alternately to each end of the drum, and the inner end of the discharge chute, when in mixing position, extends a considerable distance into the drum and slopes downward.



In mixing, by the rotation of the drum, the buckets cut through the contained material at the bottom and carry portions of it up and pour it from the side. The mixing blades also cut through at the bottom, and carry material up and discharge it alternately from end to end, breaking it over against the heavy heads of the drum. Material carried to sufficient height by both buckets and blades falls on the inwardly extending discharge chute, and flows off the inner end of the chute in a shower or sheet, the entire width of the chute. This action is precisely the same as a body of water dashing downward over rocks or a cataract flow.

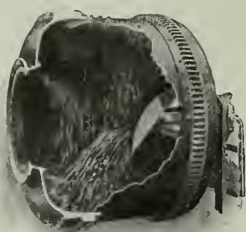
Since these three independent mixing actions are constant and opposed to one another, there is a continual intermingling of all the material in the drum, and practically three times as much

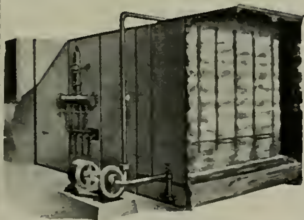


mixing, which means practically three times as fast mixing, as would be possible with any one of these actions alone.

Then there is the husky frame construction and the longitudinal trusses, which support the trunnions, are of the most substantial construction, with very wide bearings for the axles and, since the trunnion rollers are keyed onto the shafts each shaft rotates with the rollers, exactly in the same manner as a railroad truck, making it impossible for the rollers to get out of alignment and producing a more dependable drum support than is used on any other mixer.

A very complete stock of the different sizes and styles of Koehring mixers is carried by Harron, Rickard & McCone, 139 Townsend street, San Francisco, who have secured the exclusive selling right of Koehring mixers on the Coast.





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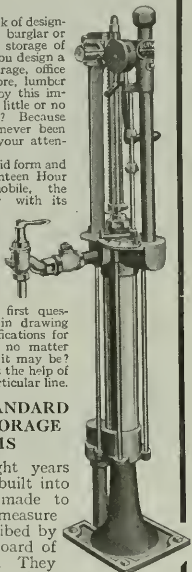

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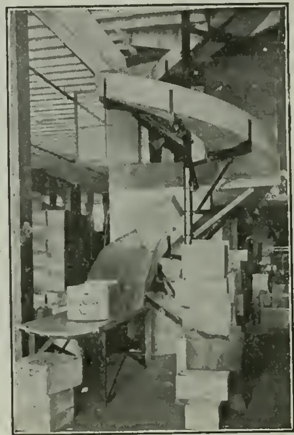

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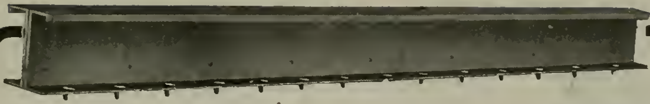

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC.

(Required by the Act of Congress, August 24, 1912.)

The Architect and Engineer of California and Pacific Coast States; published Monthly at San Francisco, Calif.

Note: This statement is to be made in duplicate, both copies to be delivered by the publisher to the postmaster, who will send one copy to the Third Assistant Postmaster General (Division of Classification), Washington, D. C., and retain the other in the files of the postoffice.

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Editor . . . .
FREDERICK W. JONES,

Publisher and Manager . . . .
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POSTOFFICE ADDRESS
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Subscribed and Sworn to before me this 17th day of June, 1913.

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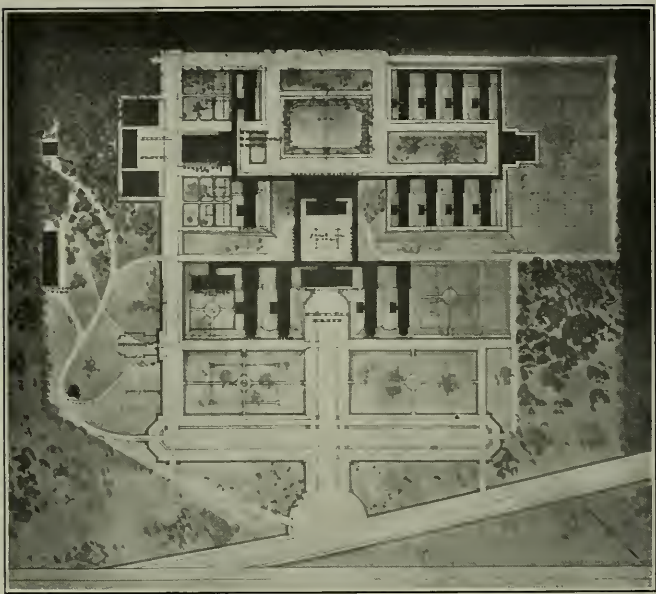


Block Plan Winning Design for Alameda County Hospital Group.
Charles Peter Weeks, Architect

Result of Alameda County Infirmary Competition

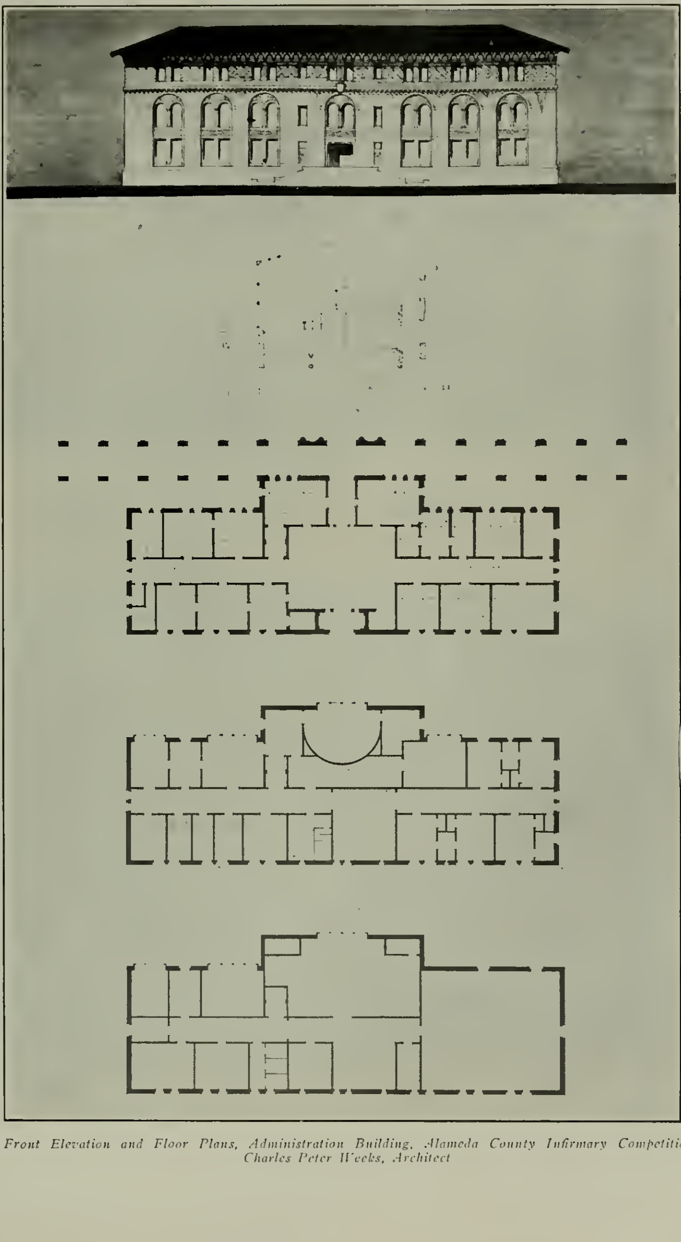
WITH the approval of San Francisco Chapter, the competition for a group of infirmary buildings for Alameda county was decided on June 10th by the selection of the plans of Architect Charles Peter Weeks of San Francisco. Twenty-four architects competed. The program was prepared by a San Francisco architect and was in strict conformity with the rules of the American Institute of Architects. The judges were members of the Board of Supervisors, physicians and surgeons and Architect Henry A. Schulze, the latter representing the Chapter. The buildings will cost $1,000,000.

On the following pages will be found the plot plan and general perspective, also the floor plans of the Administration building by Mr. Weeks, together with birds-eye views of the ten designs awarded $1,000 each. The list of winners follows:

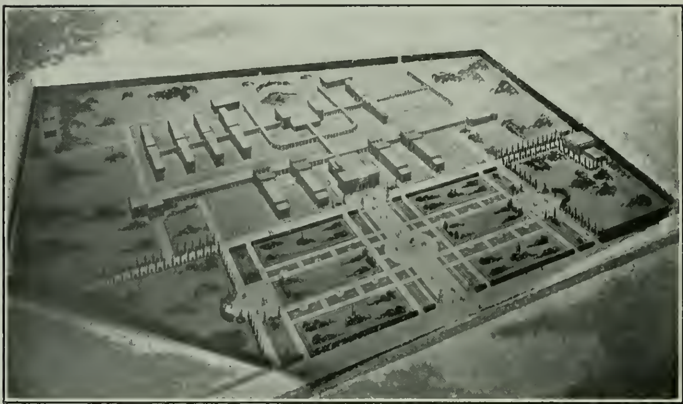
John J. Donovan, Oakland; Leo J. Devlin, San Francisco; Ellis F. Lawrence, associated with William G. Holford, Portland; O'Brien & Werner, San Francisco; Righetti & Headman, San Francisco; A. R. Widowson & Co., San Francisco; W. H. Ratcliff Jr., Berkeley; William Mooser, San Francisco; Kenneth MacDonald Jr., San Francisco, and C. W. Dickey, Oakland.

Birds-eye View of Haspital Group, Alameda County Infirmary Competition — Charles Peter Weeks, Architect

This Plan Was Awarded First Prize of $5,000 and Architect will Receive 6 Per Cent Commissian if Buildings are Constructed.



Front Elevation and Floor Plans, Administration Building, Alameda County Infirmary Competition
Charles Peter Weeks, Architect



Awarded Second Prize of $1,000
William Mooser, Architect

Awarded Second Prize of $1,000
Kenneth MacDonald Jr., Architect

Awarded Second Prize of $1,000
Leo J. Devlin, Architect

Awarded Second Prize of $1,000
A. R. Widowson & Co., Architects

Awarded Second Prize of $1,000
Ellis F. Lawrence and William G. Holford, Architects

Awarded Second Prize of $1,000
C. W. Ratcliffe, Jr., Architect

Awarded Second Prize of $1,000
John J. Donovan, Architect

Awarded Second Prize of $1,000
C. W. Dickey, Architect

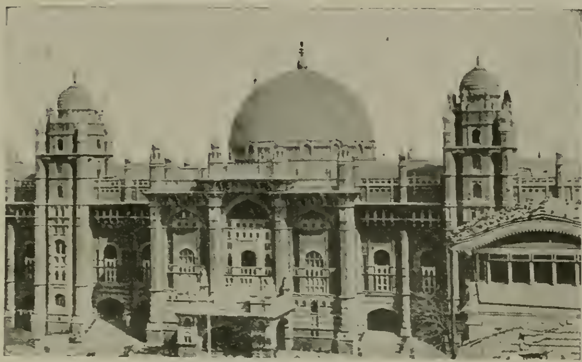
Awarded Second Prize of $1,000
O'Brien & Werner, Architects

Awarded Second Prize of $1,000
Righetti & Headman, Architects

July Feature—SAN FRANCISCO'S CIVIC CENTER

THE ARCHITECT & ENGINEER OF CALIFORNIA

Published Monthly by THE ARCHITECT & ENGINEER CO. 617 Monadnock Bldg. San Francisco
25c a Copy
$1.50 a Year
Entered at the Post Office, San Francisco, as Second Class Matter
Vol. XXXIII. No 3



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Yours very truly,
HENRY APPEL & SON CO.

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ARCHITECTS' SPECIFICATION INDEX

(For Index to Advertisements, see next page)

An Index to the Advertisements

ARCHITECTS' SPECIFICATION INDEX—*Continued*

CEMENT—Continued
The Building Material Co., "Medusa White Portland" ....583 Monadnock Bldg., S. F.

CEMENT EXTERIOR WATERPROOF COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See distributing Agents on page 153.]
Petrifax Cement Coating, sold in San Francisco by Sherman Kimball, 503 Market St.
Biturine Co. of America, 24 California St., S. F.
Hercules Waterproofing, manufactured by Hercules Waterproofing Cement Co., Buffalo, N. Y. Distributors: Waterhouse & Price Co., San Francisco and Oakland.
Liquid Stone Paint Co., Hearst Bldg., S. F.
Trus-Con Par-Seal, made by Trussed Concrete Steel Co. See advertisement for Coast agencies.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

CEMENT EXTERIOR FINISH
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing agents on page 153.]
Concrewaltum Paint, manufactured by Gobeen Company, Canton, O. Coast branches, San Francisco, Portland and Seattle.
Glidden's Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
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Liquid Stone Paint Co., Hearst Bldg., S. F.
Medusa White Portland Cement, California Agents, the Building Material Co., Inc., 587 Monadnock Bldg., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.

CEMENT FLOOR COATING
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. [See list of distributing Agents on page 153.]
Glidden's Concrete Floor Dressing, sold on Pacific Coast by Whittier, Coburn Company, San Francisco.

CEMENT GUN
Pacific Coast Gun Co..766 Folsom St. S. F.

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E. Howard Clock Company......New York
For Pacific Coast agents see advertisement.

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California Air Purifying Co., Monadnock Bldg.

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Richard Keatinge & Son, 693 Mission St., S. F.
Petersen, H. L. ....62 Post St., S. F.
Ransome Concrete Company, Oakland and Sacramento
F. J. R. Rickon............1859 Geary St., S. F.
F. J. Klenck..........Sharon Bldg., S. F.

CONCRETE MIXERS
Austin Improved Cube Mixer. Pacific Coast Offices, 338 Brannan St., S. F., the Beebe Company, Portland and Seattle, and P. B. Engh, Los Angeles.
Foote Mixers sold by Edw. R. Bacon, 40 Natoma St., S. F.
Ransome Mixers, sold by Norman B. Livermore & Co....Metropolis Bank Bldg., S. F.
Smith Mixers sold by Parrott & Co., San Francisco, Los Angeles and Portland.
Wallace Concrete Machinery Co., Monadnock Bldg., S. F.
Marsh-Capron Mixers, sold by Langford, Bacon & Myers, Rialto Bldg., S. F.
Koehring Mixer, sold by Harron, Rickard & McCone, San Francisco.

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Harron, Rickard & McCone. Townsend Street, San Francisco.
Portland Concrete Pile Co., 754 Phelan Bldg., S. F.

CONCRETE POURING APPARATUS
Concrete Appliances Co., Los Angeles; Parrott & Co., Coast Representatives, San Francisco, Portland, Seattle.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ARCHITECTS' SPECIFICATION INDEX—*Continued*

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American Electrical Engineering Co. 435 Golden Gate Ave., S. F.
Butte Engineering Co..683 Howard St., S. F.
Central Electric Co..185 Stevenson St., S. F.
Garden City Electrical Co......San Jose, Cal.
Jno. G. Sutton Co.....243 Minna St., S. F.
Pacific Fire Extinguisher Company, 507 Montgomery St., S. F.

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Hicks & Folte........320 Market St., S. F.

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Van Emon Elevator Co..54 Natoma St., S. F.
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Levensaler-Spier Corporation, 259 Monadnock Bldg., S. F.

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Roebling Construction Co., Crocker Bldg., S. F.

FIRE-PROOF PAINT
Liquid Stone Paint Co., Hearst Bldg., S. F.

FIREPROOF PARTITIONS
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White Bros., Cor. Fifth and Brannan Sts., S. F.
Hardwood Interior Co., 554 Bryant St., S. F.

HARDWOOD LUMBER
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Maria Hardwood Co., 951 Brannan St., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

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White Bros., Cor. Fifth and Brannan Sts., S. F.

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Hoffman & Meusser,
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J. C. Hurley........ 12 Geary Street, S. F.
S. T. Johnson Co.....1334 Mission St., S. F.
Mangrum & Otter, Inc., 507 Mission St., S. F.
Jno. G. Sutton Co....243 Minna St., S. F.
Pacific Blower & Heating Co.,
Monadnock Bldg., S. F.
Pacific Fire Extinguisher Company,
507 Montgomery St., S. F.
Petersen-James Co....710 Larkin St., S. F.

HOTELS
The Angelus, Loomis Bros......Los Angeles

HOLLOW BLOCKS
Atlas Stone Co.......663 Mission St., S. F.

INGOT IRON
American Rolling Mill Co., Middleton, Ohio.
California Corrugated Culvert Co.,
5th and Parker Sts., West Berkeley.

INTERIOR WALL FINISH
Satina mfg'd. by C. H. Brown Paint Co.,
F. A. Frisius, 341 Lincoln ave., Alameda, California.

INSPECTIONS AND TESTS
Robert W. Hunt & Co.,
418 Montgomery St., S. F.
Smith, Emery & Co. Inc.,
651 Howard St., S. F.

INSULATING MATERIALS
Armstrong Cork Co........... Pittsburg, Pa.

INTERIOR DECORATING
Allith-Prouty Co.......693 Mission St., S. F.
The Tozer Company, 228 Grant Ave., S. F.

JOIST HANGERS
Western Builders' Supply Co.,
155 New Montgomery St., S. F.
Kortick-Falls Mfg. Co.,
327-343 First St., S. F.

KEENE CEMENT
American Keene Cement,
Levensaler-Speir, Corporation,
259 Monadnock Bldg., S. F.

LIME
Holmes Lime Company,
Monadnock Bldg., S. F.
Shasta Lime Products Company,
1550 Bryant St., S. F.

LIGHTING FIXTURES
Adams, Hollopeter & Mallett,
353 Sutter St., San Francisco

LIGHT, HEAT AND POWER
Pacific Gas & Elec. Co..445 Sutter St., S. F.

LUMBER
Sunset Lumber So...........Oakland, Cal.
Santa Fe Lumber Co.,
Seventeenth and De Haro Sts., S. F.

MANTELS
Mangrum & Otter ....561 Mission St., S. F.
Watson Mantel & Tile Co.,
Sheldon Bldg., S. F.

MARBLE
Columbia Marble Co...268 Market St., S. F.

METAL AND STEEL LATH
Atlantic Fireproofing Co.,
Pacific Bldg., S. F.
Roebling Construction Co.,
San Francisco and Los Angeles
Pratt Building Material Co.,
Hearst Bldg., S. F.
L. A. Norris & Co., Monadnock Bldg., S. F.

METAL CEILINGS
Berger Mnfg. Co....1120 Mission St., S. F.
Ames-Irwin Co., Inc.,
Eighth and Irwin Sts., S. F.
San Francisco Metal Stamping & Corrugating Co................2269 Folsom St., S. F.

METAL DOORS AND WINDOWS
U. S. Metallic Products Co., 525 Market St.
Dahlstrom Metallic Door Co., Western office, with M. G. West Co., 353 Market St., S. F.

METAL FURNITURE
Dahlstrom Metallic Door Co., represented by M. G. West Co..353 Market St., S. F.
The Keyless Lock Co.......Indianapolis, Ind.
Van Dorn Iron Works Co.......Cleveland, O.
M. G. West Co.........353 Market St., S. F.

METAL SHINGLES
San Francisco Metal Stamping & Corrugating Co................2269 Folsom St., S. F.

OIL BURNERS
S. T. Johnson Co...1334 Mission St., S. F.
Fess System Co.......220 Natoma St., S. F.
T P. Jarvis Crude Oil Burner Co.,
275 Connecticut St., S. F.

OPERA CHAIRS
C. F. Weber & Co....365 Market St., S. F.

ORNAMENTAL IRON AND BRONZE
California Artistic Metal & Wire Co.,
349 Seventh St., S. F.
T. G. Braun.........Chicago and New York
Ralston Iron Works,
20th and Indiana Sts., S. F.
Standard Iron Works,
235-39 Shipley St., S. F.
Golden Gate Structural & Ornamental Iron Works ....1479 Mission St., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

ORNAMENTAL IRON AND BRONZE—Cont'd.
Monarch Iron Works, 1165 Howard St., S. F.
C. J. Hillard Company, Inc., 19th and Minnesota Sts., S. F.
Shreiber & Sons Co., represented by Western Builders Supply Co., S. F.
Sartorius Company..15th and Utah Sts., S. F.
West Coast Wire & Iron Works, 861-863 Howard St.. S. F.

PAINT FOR STEEL STRUCTURES
"Biturine," sold by Biturine Co. of America. 24 California St.. S. F.
Buswell's Steel and Concrete Paints, Oakland. Cal.
Carbonizing Coating, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Trus-Con Bar-Ox, Trussed Concrete Steel Co. See adv. for Coast agencies.
Glidden's Acid Proof Coating, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.

PAINT FOR CEMENT
Bay State Brick and Cement Coating, made by Wadsworth, Howland & Co. (Inc.), [See adv. in this issue for Pacific Coast agents.]
"Biturine," sold by Biturine Co. of America. 24 California St.. S. F.
Ad-el-ite paint, sold by Comyn-Mackall & Co., 310 California St., S. F.
Comyn-Mackall & Co., 310 California St., S. F., agents for Ad-el-ite Paints.
Trus-Con Stone Tex., Trussed Concrete Steel Co. See advertisement for Coast agencies.
Liquid Stone Paint Co., Hearst Bldg., San Francisco, Los Angeles and San Diego
Glidden's Liquid Cement, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
Goheen Mfrg. Co., ...Canton, O. See advertisement for Coast distributors

PAINT SPECIALTIES
Comyn-Mackall & Co., 310 California St., S. F., agents for Ad-el-ite Paints.

PAINTS, OILS, ETC.
Bass-Hueter Paint Company, Mission, near Fourth St., S. F.
R. N. Nason Company........San Francisco
"Biturine," sold by Biturine Co. of America, 24 California St., S. F.
Goheen Mfrg. Co.. ....Canton, O. See advertisement for Coast distributors
Glidden Varnish Co.. Cleveland. Ohio. represented by Whittier-Coburn Co., S. F. and Los Angeles
Moller & Schumann Co., 1022 Mission St., .S F.
Berry Bros..............250 First St., S. F.
Paraffine Paint Co....38-40 First St.. S. F.
Standard Varnish Works, represented by W. P. Fuller & Co., S. F. and Los Angeles.

PAVING BRICK
Vallejo Brick & Tile Co.. 343 Sansome St., S. F.

PHOTO ENGRAVING
California Photo Engraving Co., 121 Second St.. S. F.

PHOTOGRAPHY
R. J. Waters Co..........717 Market St..S. F.
Walter Scott..........558 Market St., S. F.

PIPE—CORRUGATED INGOT IRON
California Corrugated Culvert Company. Los Angeles and West Berkeley.

PIPE—VITRIFIED SALT GLAZED TERRA COTTA.
N. Clark & Sons, 112 Natoma St., San Francisco
Gladding McBean & Co.. Crocker Bldg., S. F.
Pacific Sewer Pipe Company, I. W. Hellman Bldg., Los Angeles
Pratt Bldg. Material Co., Hearst Bldg., S. F.
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

PLASTER BOARD
Colonial Wall board manufactured by Mound House Plaster Co., Levensaler-Speir Corporation......259 Monadnock Bldg.. S. F
"Plastergon," sold by the Comyn Mackall & Co., 310 California St., San Francisco.

PLASTERING CONTRACTORS
Geo. MacGruer....319 Mississippi St., S. F.

PLUMBING
Jno. G. Sutton Co.......243 Minna St., S. F.
Peterson-James Co.....710 Larkin St., S. F.
Wittman, Lyman & Co., 340 Minna St., S. F.
Alex Coleman..........706 Ellis St., S. F.

PLUMBING FIXTURES, MATERIALS, ETC.
Crane Co....Second and Brannan Sts., S. F.
Jno. Douglas Co....571 Mission St., S. F.
N. O. Nelson Mfg. Co., 978 Howard St., S. F.
Kohler Co.......1001 Monadnock Bldg., S. F.
Glauber Brass Mfg. Co., Cleveland, O., 1107 Mission St., S. F.
Louis Lipp Company, Winton Place. Ohio. Pacific Coast Office, 693 Mission St.. S. F.
Mark-Lally Co..First and Folsom Sts.. S. F.
J. L. Mott Iron Works, D. H. Gulick, selling agent ....135 Kearny St., S. F.

POTTERY
Steiger Terra Cotta and Pottery Works, Mills Bldg., S. F.

POWER PLANT EQUIPMENT
F. Harvey Searight...817 Shreve Bldg, S. F.

PULLEYS, SHAFTING, GEARS, ETC.
Meese and Gottfried Company..........San Francisco, Seattle, Portland and Los Angeles

RADIATORS
Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

RAILROADS
Southern Pacific Co......Flood Bldg.. S. F.

ROAD MACHINERY
Iroquois Iron Works (Barber Asphalt Company) ....Head Bldg., S. F.
Langford, Bacon & Myers, Rialto Bldg., S. F.

REFRIGERATORS
McCray Refrigerators, sold by Nathan Dohrmann Co.. Geary and Stockton, Sts., S. F.
Automatic Refrigerating Co. Holbrook Bldg., S. F.

ROLLING DOORS, SHUTTERS, PARTITIONS, ETC.
Lilley & Thurston Co., Rialto Bldg., S. F.
C. F. Weber & Co......365 Market St., S. F.

ROOFING AND ROOFING MATERIALS
Ames-Irwin Co., Inc., Eighth & Irwin Sts., S. F.
Biturine Co. of America, 24 California St.. S. F.
J-M Asbestos Roofing, sold by H. W. Johns-Manville Co., Agencies in all the principal West Coast cities.
F. W. Bird & Son, East Walpole, Mass.. Coast Agents, Lilley & Thurston Co.. Rialto Bldg., S. F.
Mallott, Peterson & Adams, 682 Monadnock Bldg., S. F
Grant Gravel Co............Williams Bldg., S. F.

ARCHITECTS' SPECIFICATION INDEX—*Continued*

STEEL PROTECTIONS FOR CONCRETE
Steel Protected Concrete Co., Represented by Lilley & Thurston. S. F.

STEEL STUDDING
Collins Steel Partition, Parrott & Co., S. F.
"Lesco," Metal Stud, Levensaler-Speir, Corporation,..........Monadnock Bldg., S. F.

STONE
Parry Stone Co., "Sanpeta," "Colete," and "Manti" white stone, 417 Montgomery St., S. F.

STONE MANTELS
Atlas Stone Company, Inc., 663 Mission St., S. F.

STORAGE SYSTEMS
S. F. Bowser & Co., 612 Howard St., S. F.

STORE FRONTS
Kawneer System, Kawneer Manufacturing Company, 420-422 Turk St., S. F.; branches in Portland, Spokane, Seattle and Los Angeles.

SURETY BONDS
Globe Indemnity Co., 508 California St., S. F.
Mass. Bonding & Insurance Co., First Nat'l Bk. Bldg., S. F.
Fidelity & Deposit Co. of Maryland, Mills Bldg., S. F.

TEMPERATURE REGULATION
Johnson Service Co., Monadnock Bldg., S. F.

TERRA COTTA CHIMNEY PIPE
Dunlevy & Gettle....79 City Hall Ave., S. F.
Gladding-McBean Co....Crocker Bldg., S. F.

TILES, MOSAICS, MANTELS, ETC.
Mangrum & Otter....561 Mission St., S. F.
Watson Mantel & Tile Co., Sheldon Bldg., S. F.
Indestructible Floor & Tiling Co., 251 Kearny St., S. F.

TILE FOR ROOFING
Fibrestone & Roofing Co., Mutual Savings Bank Bldg., S. F.
Gladding, McBean & Company, Crocker Bldg., S. F.
United Materials Co......Balboa Bldg., S. F.

TIN PLATES
American Tin Plate Company, Rialto Bldg., S. F.

VACUUM CLEANERS
American Agencies Co., 501 Market St., San Francisco, 608 S. Olive St., L. A.
Bill & Jacobsen..........524 Pine St., S. F.
The Vak-Klean Vacuum Cleaner, Pneulectric Co., Pacific Coast Agts., 452 Larkin St., S. F.
Giant Stationary Suction Cleaner, manufactured by Giant Suction Cleaner Co., 731 Folsom St., S. F., and 3d and Jefferson Sts., Oakland.
"Tuec" Air Cleaner, manufactured by United Electric Co..........523 Mission St., S. F.

VACUUM VALVES
Kauffman Heating & Engineering Co., St. Louis, represented in San Francisco by Sherman Kimball, Inc.

VALVES
Jenkins Bros................247 Mission St., S. F.

VALVE PACKING
"Palmetto Twist." sold by H. N. Cook Belting Co.............317 Howard St., S. F.

VARNISHES
S. F. Pioneer Varnish Works, 816 Mission St., S. F.
Moller & Schumann Co., Brooklyn, N. Y., Chicago and S. F.
Berry Bros., "Liquid Granite." mfrd. and sold by Berry Bros..250-256 First St., S. F.

VENETIAN BLINDS, AWNINGS, ETC.
C. F. Weber & Co....365 Market St., S. F.
Ericsson Swedish Venetian Blinds, Boyd & Moore, Inc., Agents..356 Market St., S. F.

WALL BEDS
Marshall & Stearns Co., 1154 Phelan Bldg., S. F.

WALL BOARD
California Colonial Wall Board, mfrd. by Mound House Plaster Co. 259 Monadnock Bldg., S. F.
Bestwall, mfr'd by California Bestwall Company, Alameda. Cal.
"Plastergon," sold by Comyn-Mackall & Co., 310 California St., San Francisco.

WATER HEATERS
Jos. Thieben Co., agents Pittsburg Heaters, 667 Mission St., S. F.
Hoffman Heater Company, Loraine

WATERPROOFING FOR CONCRETE, ETC.
"Ceresit," manufactured by the Ceresit Waterproofing Co., sold by Parrott & Co., San Francisco, Los Angeles and Portland, and Julien A. Becker Co., Seattle, Wash.
Concrewaltum, made by Goheen Mfg. Co., Canton, O. See advertisement for Coast distributors.
Fibrestone & Roofing Co., Mutual Savings Bank Bldg., S. F.
Glidden's Concrete Floor Dressing and Liquid Cement and Liquid Cement Enamel, sold on Pacific Coast by Whittier, Coburn Company, San Francisco and Los Angeles.
Hercules Waterproofing Cement Co., represented by Waterhouse & Price, San Francisco and Oakland.
Liquid Stone Paint Co., Hearst Bldg., S. F.
Neponset Waterdyke Felt and Compound, manufactured by F. W. Bird & Son, East Walpole, Mass., Coast Agents, Lilley & Thurston Co. ....Rialto Bldg., S. F.
Samuel Cabot Mfg. Co., Boston, Mass., agencies in San Francisco, Oakland, Los Angeles, Portland, Tacoma and Spokane.
The Building Material Co., Inc., 583 Monadnock Bldg., S. F.
Buswell's Steel and Concrete Paints, Oakland, Cal.

WHITE ENAMEL FINISH
H. M. Perry & Co., 145 Montgomery St., S. F.
"Satinette," W. P. Fuller & Co., San Francisco and all principal Coast cities.
Trus-Con Sno-wite, manufactured by Trussed Concrete Steel Company. See adv. for Coast distributors.

WINDOWS, REVERSIBLE, ETC.
Tabor Sash Fixture Co., C. Jorgensen Co., Agents..............356 Market St., S. F.
The "Holdfast" Bulldog and "Hookfast" Window Adjusters, mfr'd by The Casement Hardware Co., 175 State St., North Chicago, Ill.

WIRE FABRIC
U. S. Steel Products Co., Rialto Bldg., S. F.

WOOD MANTELS
Fink & Schindler......218 13th St., S. F.
Mangrum & Otter....561 Mission St., S. F.

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Fuller's Washable Wall Finish

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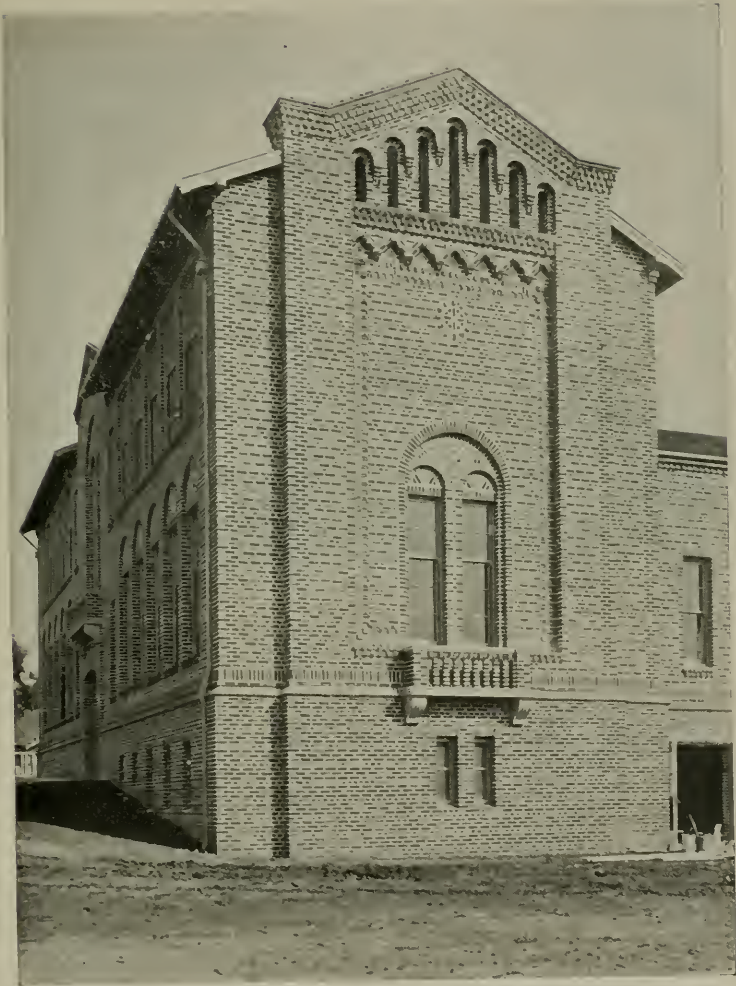

End Detail of Malabar School, Los Angeles — Withey & Davis, Inc., Architects

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For LOBBIES OF HOTELS, APARTMENTS, PUBLIC BUILDINGS, etc.

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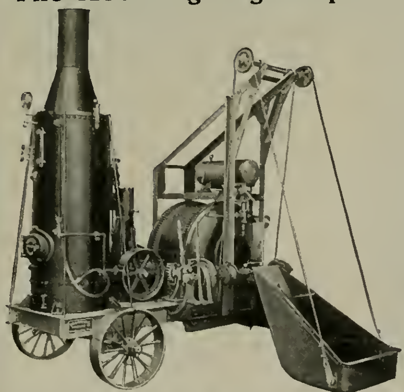

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Contents for July

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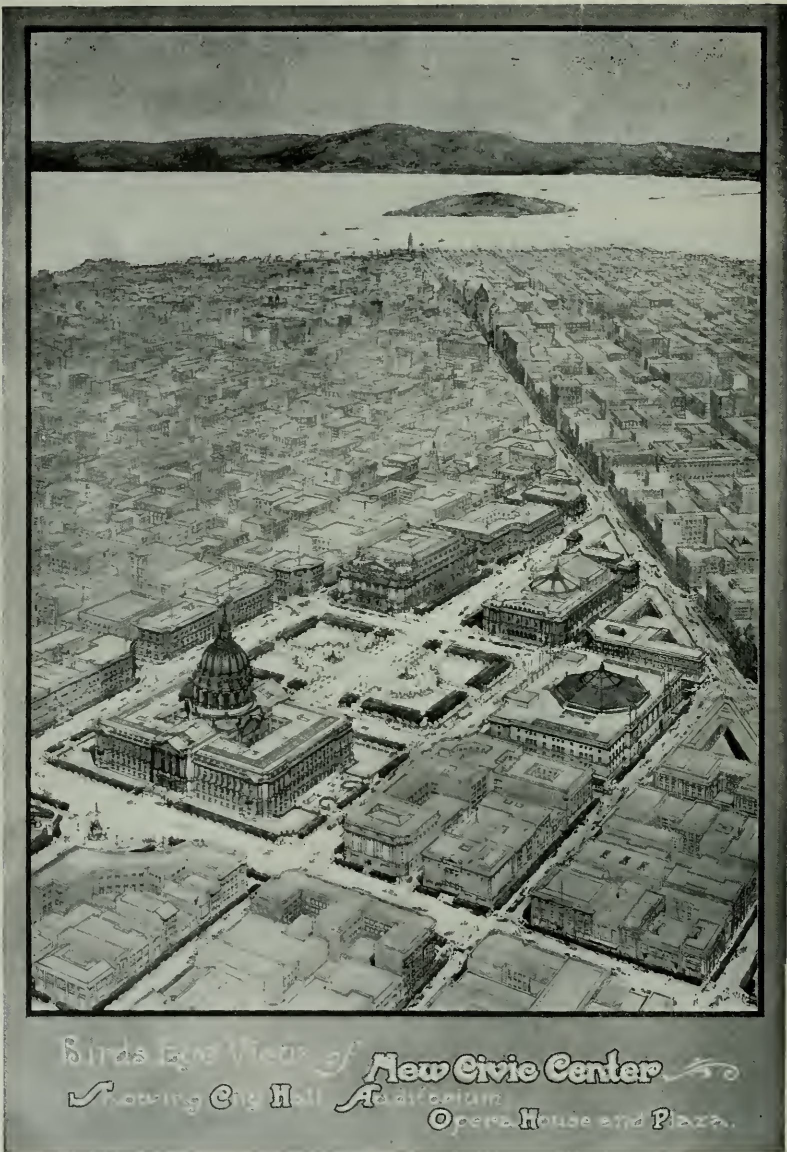


THE SAN FRANCISCO CIVIC CENTER

John G. Howard, Frederick H. Meyer and John Reid, Jr. Consulting Architects

Frontispiece
The Architect and Engineer
of California
July, 1913

THE
Architect and Engineer
Of California
Pacific Coast States

Vol. XXXIII. JULY, 1913. No. 3

San Francisco's Civic Center

By JOHN GALEN HOWARD, F. A. I. A.*

THE Civic Center for San Francisco is beginning already to be a reality. Ground has been broken for the foundations of both the City Hall and the Auditorium, two of the most important buildings in the group; and the ground has been cleared for most of the other parts of the work.

Not the least spectacular operation in point of popular interest is the removal of the Newton J. Tharp Commercial High School from the site of the square around which the various public buildings are to be grouped. This brick and steel fireproof building, two stories in height and measuring 120 by 140 feet, has already been moved about two blocks west and is practically entirely off the area affected by monumental building operations.

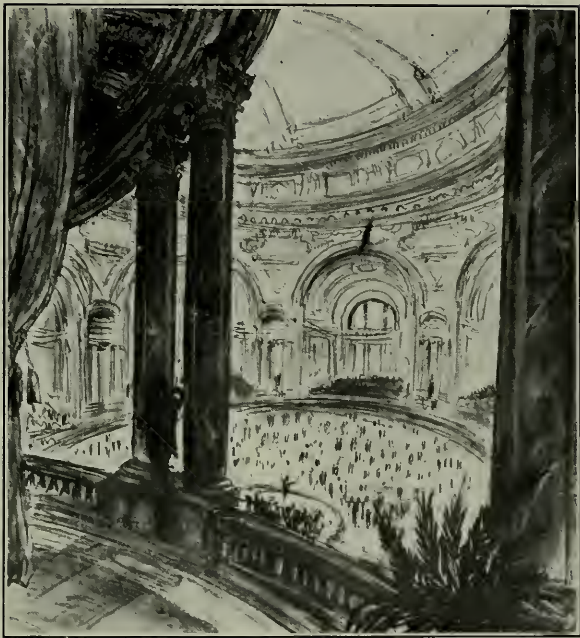
What has already been accomplished toward bringing the Civic Center into being, makes a most gratifying showing. It is difficult to believe that only eighteen months have elapsed since the Rolph administration took office, when it is realized that even the question of a new City Hall, to say nothing of a Civic Center, was still a debated question, even up to the 29th of March, 1912. At that time the city owned only the triangular piece of ground between Larkin street, McAllister street and City Hall avenue. It now owns in addition to that area the three and one-half blocks bounded by Larkin, Hayes and Polk streets and Locust avenue, and the two blocks bounded by McAllister, Polk and Grove streets and Van Ness avenue, as well as a large portion of the holdings between City Hall avenue and Market street, which are planned for a complete development of the Civic Center with a magnificent approach from Market street. The acquisition of all this property is alone a monumental achievement.

Meantime plans for the various buildings in the Civic Center have been rapidly progressing. On the 29th of March, 1912, the issuance of bonds to the amount of $8,800,000 was authorized by the people of San Francisco. Since that time a competition has been held for the City Hall, which is to cost about three and one-quarter millions, and the drawings for the erection of that building have been nearly completed; contracts having been already let for the foundations and the steel framework. Bids will be asked for exterior stone and general masonry at once.

In regard to the design of the City Hall, of which Messrs. Bakewell and Brown are the architects, it is not too much to say that it gives promise of being one of the most distinguished architectural creations of our time; a building of which all San Franciscans and all Californians can be justly proud. The monumental scale of the building is indicated by the fact that the height of its principal feature, the dome, from the ground

*The Civic Center Commission is composed of Mr. Howard, Frederick H. Meyer and John Reid, Jr.

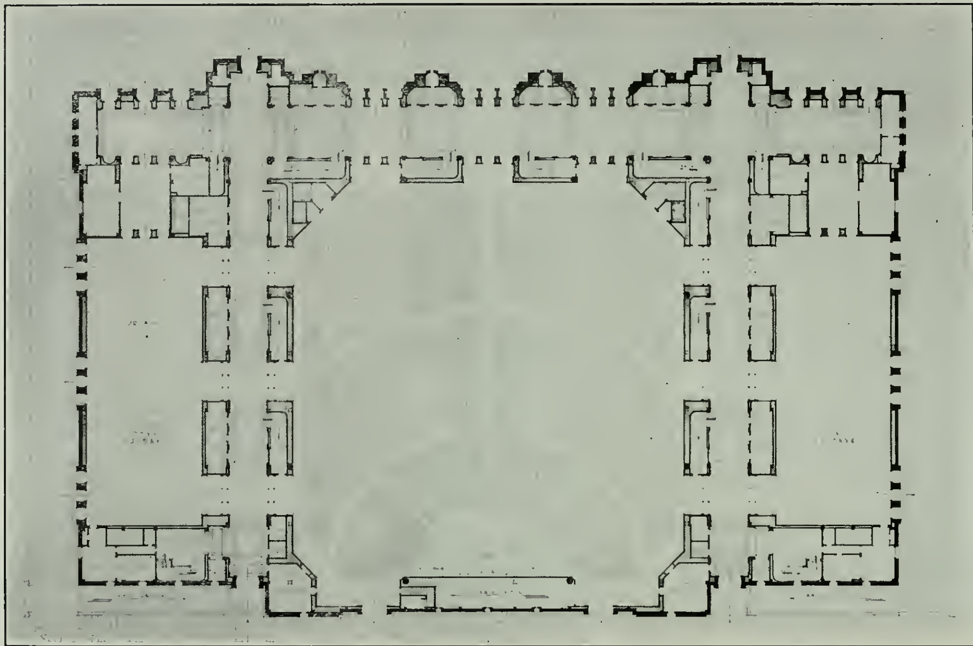
Municipal Auditorium, San Francisca



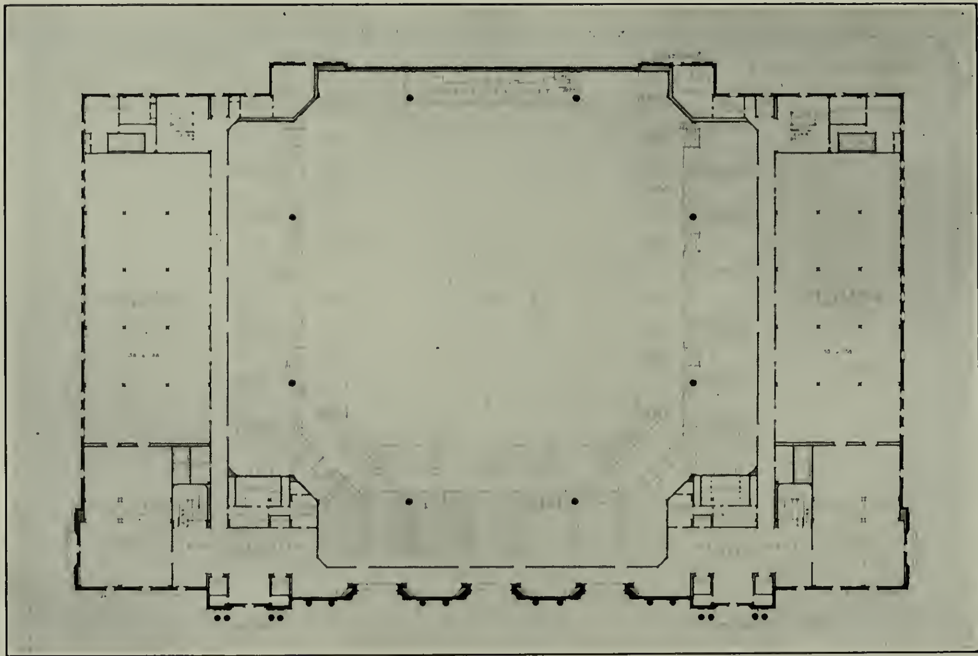
Preliminary Study, Civic Center Scheme

level to the top of the cupola finial will be about three hundred feet; while the building covers an area of 287 feet by 415 feet.

The Exposition Auditorium, to cost approximately one million dollars, is pushing the City Hall for honors in rapidity of preparation. The working drawings and specifications have been completed and contracts have already been let for the foundations and the steel framework. Excavation for the foundations is now under way. It is intended to have this building ready for occupancy by the end of next summer. Every effort has been made to make the building useful and convenient in a multitude of ways. The main auditorium will seat ten thousand people; five thousand on the floor and five thousand on a single great sloping balcony so arranged in relation to the ground floor as to give the impression almost of a single great saucer. The roof of the auditorium is treated in an uniquely effective way in the form of a vast octagonal pyramid supported on open steel trusses. The light for this great room, which measures 250 feet across, will come from the ceiling. The entire hall is surrounded by spacious corridors. There are forty-one exits on the ground floor, while twelve wide staircases enable persons in the balcony to reach the ground level with the greatest convenience and dispatch. In addition to the auditorium proper the building contains spacious reception rooms and exhibition halls. Arrangements have been made to adapt the entire structure,



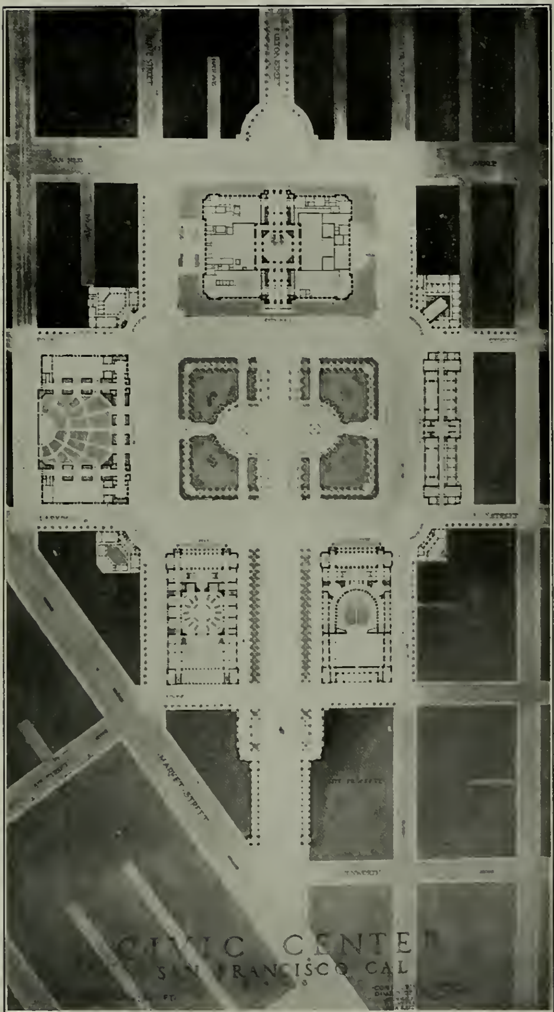
First Floor Plan, San Francisco Municipal Auditorium



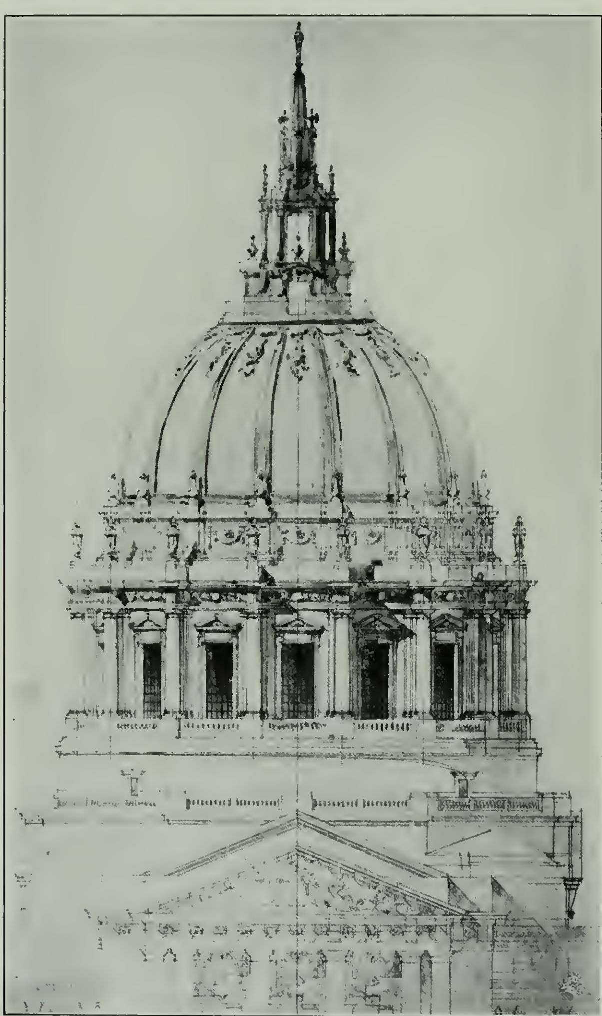
Fourth Floor Plan, Showing Balcony, San Francisco Municipal Auditorium

Preliminary Sketch, Made During Development of Civic Center Scheme

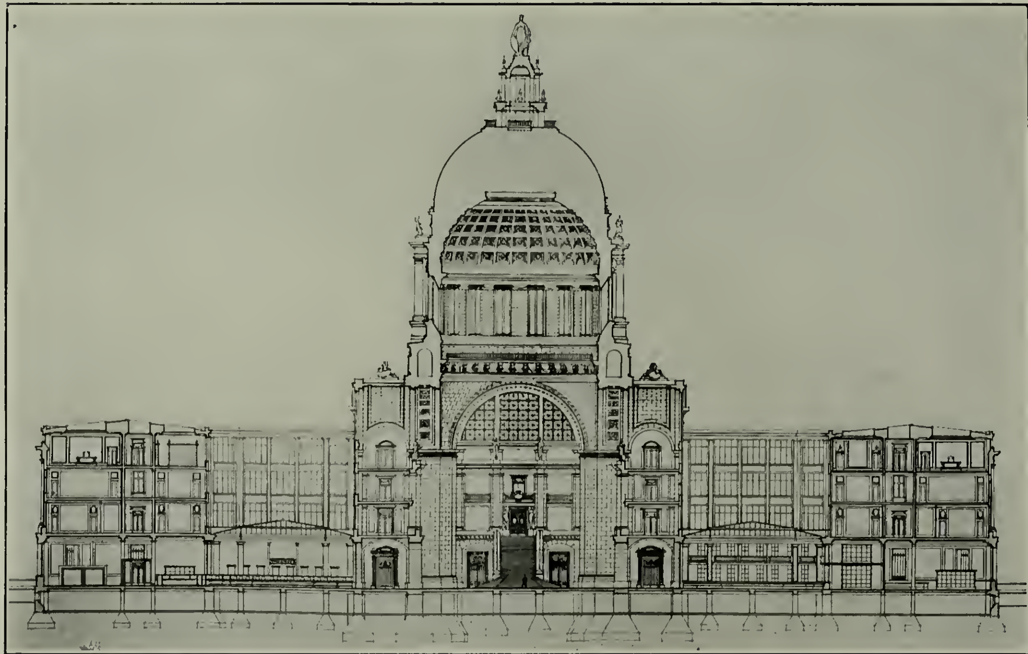
Preliminary Study, San Francisco Civic Center Scheme



Plan of Civic Center, San Francisco

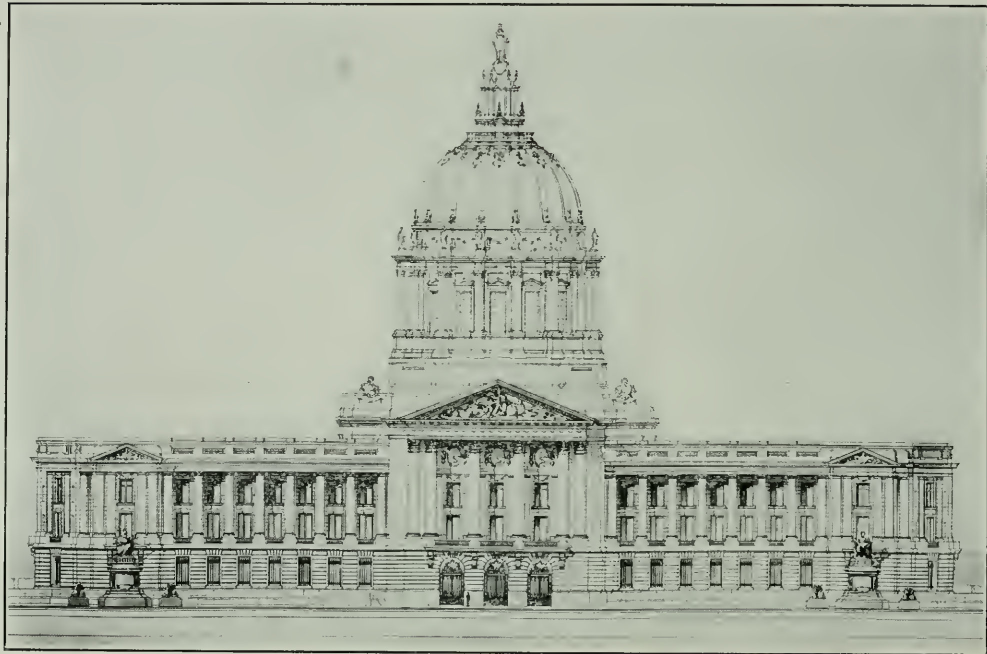


Detail of San Francisco City Hall Dome
Bakewell & Brown, Architects



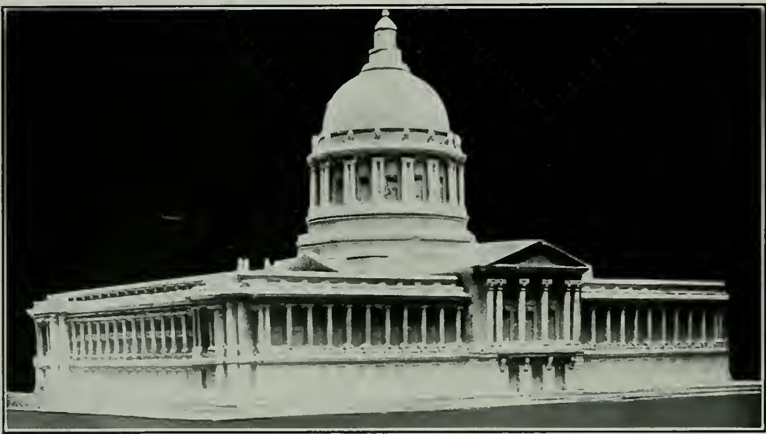
Section, San Francisco City Hall

Bakewell & Brown, Architects

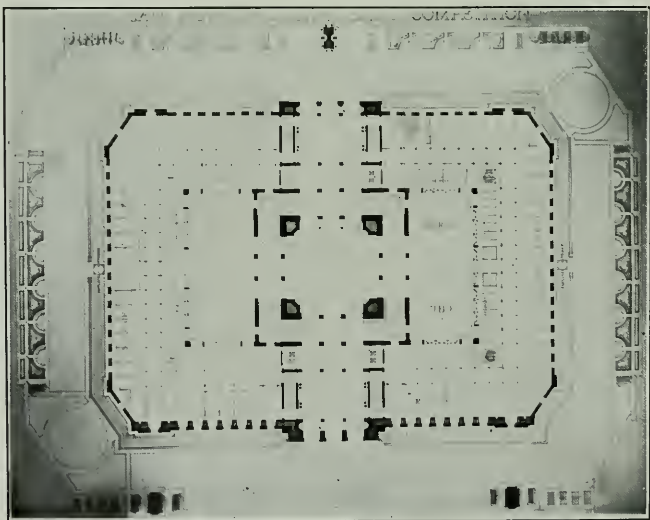


East Elevation, San Francisco City Hall. Original Drawing. *Bakewell & Brown, Architects*

East, or Polk Street Elevation, San Francisco City Hall, as Revised *Bakewell & Brown, Architects*

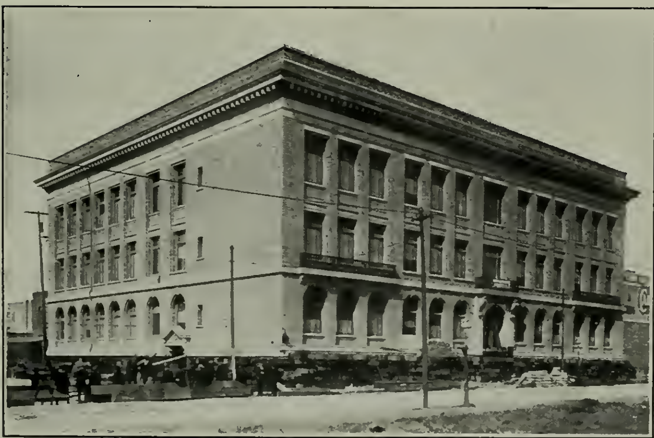


Study Model of City Hall Dome in Plaster, by A. Lejeun

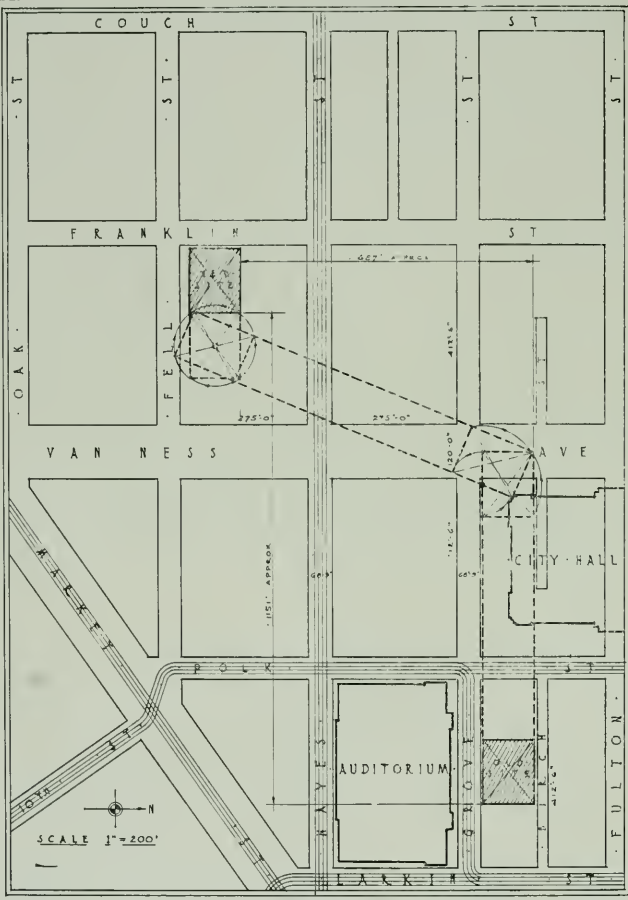


Ground Floor Plan, San Francisco City Hall

Preliminary Sketch, San Francisco Civic Center



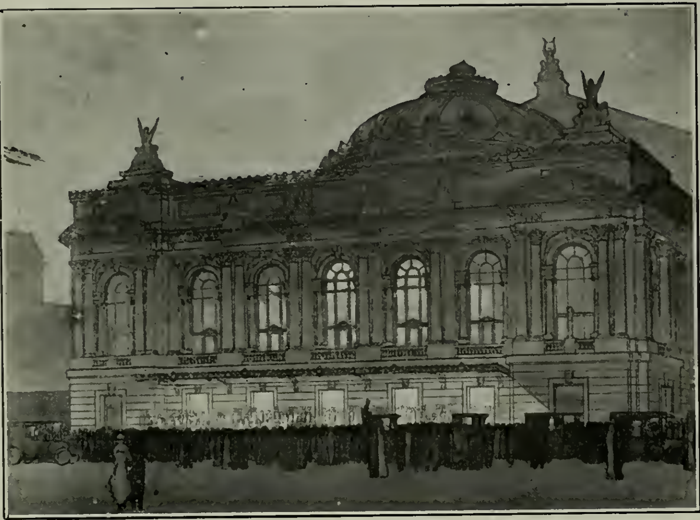
Commercial High School Propped on Rollers Ready to be Moved



MAP
SHOWING
ROUTE · FOR MOVING OF · COMMERCIAL HIGH · SCHOOL
SITES AS SHOWN

BUREAU OF ARCHITECTURE
BOARD · OF PUBLIC WORKS

SAN FRANCISCO
1913



Preliminary Study, Municipal Opera House, San Francisco
Willis Polk and Company, Architects

with a minimum of labor, to such uses as concerts, balls, receptions, banquets, skating rink, horse show, circus, pageants and almost any conceivable kind of gathering.

A third building projected in the Civic Center is the library, which is to occupy the site bounded by McAllister, Larkin, the extension of Fulton and the extension of Leavenworth. This building will probably cost about a million dollars furnished and equipped. It is proposed to select an architect for this building by competition.

A fourth great building is the million dollar opera house to occupy the block surrounded by Larkin and the extensions of Fulton, Leavenworth and Grove streets. The original arrangement between the city and the Opera House Company has been declared contrary to the Charter by the Supreme Court, but negotiations are now under way looking toward a new arrangement which will enable the project to go on in the near future.

It is hoped that a fifth magnificent site will be occupied by the State Building, for which the recent Legislature authorized an election for a bond issue of one million dollars.

Four other smaller buildings at the corners of the group will, it is hoped, be a matter of the not distant future. These four comparatively small buildings will probably house the Central Fire Station, the Central Police Station, a building for the Department of Health and a power plant for the entire Civic Center.

Taking everything into consideration, the San Francisco Civic Center project must be reckoned as one of the most important undertakings of this character in our own country or the world at large. In rapidity of execution up to the present time it probably has no rival.

Villa for Mr. John H. Spring, Thousand Oaks, Berkeley *John Hudson Thomas, Architect*

Domestic Architecture of To-day*

With Some Pleasant References to the California Bungalow and Hillside Home

By MR. WM. KOEHL, Architect.

"Every man has at some time of his life, personal interest in Architecture."—*Ruskin.*

IT IS HELD that architecture is essentially and inevitably the unconscious expression of a national spirit: that architecture reflects the history, character, and temperament of a people; and that an indigenous style in architecture is produced by important factors—wealth, peace, leisure, civilization, and culture. The object of this paper is to illustrate these facts as manifested in the branch of architecture called domestic, with special reference to the country and suburban home of moderate cost in America.

In every art and science we find good interspersed with bad. The cockle is sure to appear, and appears in proportion to the power of the enemy under the guises of ignorance, commercial gain, and ostentation. America, up to within a few years, was one vast cockle field of bad architecture. Rarely was an ideal home to be found, except those that remained from Colonial times. The majority of small houses during that period were built by men who had no knowledge or skill in planning, and whose notions and thoughts were entirely commercial. True, there are still many such men committing abominations for personal gain, but luckily, the people at large are realizing the deceit and are demanding homes to suit the conditions of today. What influence this demand has done to domestic architecture is apparent throughout the land.

To cover the entire field properly we cannot confine our observations to one region. We must go to Massachusetts, New York and eastern Pennsylvania to study Colonial and Italian adaptations; Western Pennsylvania, Ohio and Michigan abounds with English types; Chicago has produced a style of her own, called the Progressive, and California claims the Bungalow. This variation of styles is due no doubt to the predominant sentiment that prevails in each section in favor of some particular style. Art of building always yields to the demand.

Yet all these styles are being made thoroughly native, indigenous American, no matter whence the influence. Indeed, we still go back to precedent, but we use it no more as a model, but as an inspiration. The Colonial and the English especially serve as guiding impulses, and on their simple and sound foundations we are building notable work redolent with race and informed with fine feeling. Examining the work in the various styles, we find no copying. Good architects today assimilate the fine spirit of past masterpieces, grasp the essentials, and make it more or less their own.

Perhaps the Colonial, on account of its note of sincerity, is the most favorite precedent on which we depend. It is the most national. True, it abounds chiefly in the east, yet is found in every section or region. Its simplicity of mass, directness of expression, and its refinement of detail

*Abstract of an article in the "Ohio Architect." The illustrations are of homes designed by Architect John Hudson Thomas of Berkeley, and include some clever examples of hillside architecture.

Residence of Mr. W. F. Kelly, Piedmont
John Hudson Thomas, Architect

Residence of Mr. W. F. Kelly, Piedmont
John Hudson Thomas, Architect

Residence of Mr. A. Meyer, Claremont Park
John Hudson Thomas, Architect

Residence of Mr. W. E. Gregsby, Berkeley
John Hudson Thomas, Architect

Residence of Mr. Wm. C. Murdoch, Jr., Thousand Oaks
John Hudson Thomas, Architect
Patrick-Nelson Co., Builders

Residence of Mr. Wm. C. Murdoch, Jr.
John Hudson Thomas, Architect

The John R. Pratt House, Berkeley
John Hudson Thomas, Architect

Residence of Mrs. Henry Glass, Berkeley
John Hudson Thomas, Architect

are appealing. English homes have much that attract our admiration. We cannot but admire the quaint beauty of the old English country houses. They are well adapted to the English landscape, but to copy them outright would be disastrous in America. We can, however, emulate the spirit in which the early English home-builders worked. They knew the principles that underlie a good home. Some of the most salient characteristics are the groups of chimney stacks that suggest warmth and hospitality, and long lines of ridge and wall contribute to an air of restful seclusion and retirement. The general plan, however, is unsuited to our conditions of living, excepting for details. The Colonial and English types predominate here, but there is still another type that is eliciting much admiration—the bungalow. To California we principally owe this charming, free, rugged, and cozy type. Influenced by mostly oriental—Japanese, Sikkhi, Bhutan, Thibet—sources, is yet so nicely assimilated by an architect of knowledge and taste, and so thoroughly adapted to every condition—environment, cost, service, beauty—that it has spread like witchery throughout the land, and verily threatens the supremacy, especially in the more inexpensive types.

All these types, though widely varied on the exterior, are yet much alike in plan. The American's inherent desire for fresh air and sunshine prompts him not to omit sun rooms, sleeping porches, and to have, if possible, every room face the south, not only for the sun, but also for the cool breezes. On the first floor all main rooms are connected with large openings forming long vistas, and realize the importance of working from within outward instead of as in former years from without inward. Whatever beauty the house possesses is based on sound and logical planning and construction. The plan is the outcome of actual requirements based on the habits of living of its occupants.

Unlike the city house built on a narrow lot with only a few feet between, the ideal home always has a beautiful setting with sufficient space between houses. Therefore the garden is likewise eliciting as much care and attention as the house itself. We are getting back to mother earth —to nature, and under nature's influence we cannot go far wrong. A home surrounded by a beautiful garden has and will always be admired. Consequently in speaking of the home the garden is necessarily included to make one harmonious whole.

Perhaps in no other class of building has been more thoroughly developed, within the last few years, the principle of beauty known as harmony or adaptation which includes economy, order, unity in variety and proportion, and has more thoroughly inculcated the characteristics of durability, comfort and homelike charm than in the home of moderate cost. This principle and these characteristics are also found in the more expensive home, but these cannot so well reflect the spirit of the people at large, as do the smaller and more humble types.

This enthusiasm displayed in the development of the American home is attributed to various causes. Good architecture has always been held to be the outcome of gradual accessions to a simple demand—hence the study of past work. Architect (he is now considered a necessary evil) and owner alike seem to vie with each other in the gathering of ideas and material through various media: by travel abroad and at home, books and periodicals on architecture find their way into every home. These means especially coupled with good taste are keeping us in touch with all past and present achievements. Also, at no time in the past has country life been more desired and appreciated than at the present time. This condi-

Residence of Mr. C. E. Fleager, Berkeley Heights
John Hudson Thomas, Architect

Residence of Mr. L. H. Jeffress, Piedmont
John Hudson Thomas, Architect

House of Mrs. E. A. Kruegel, Berkeley
John Hudson Thomas, Architect

House of Mr. H. L. Dangan, Claremont
John Hudson Thomas, Architect

Residence of Mr. J. H. Porteous, Piedmont
John Hudson Thomas, Architect

Residence of Mr. G. A. Mortell, Northbrae
John Hudson Thomas, Architect

Residence of Mr. John F. Conners, Piedmont
John Hudson Thomas, Architect

Residence of Mrs. W. S. Seabury, Claremont
John Hudson Thomas, Architect

Residence of Mr. W. M. Hall, Piedmont
John Hudson Thomas Architect

Residence of Mr. H. L. Johnson, Claremont Park
John Hudson Thomas, Architect

Residence of Mr. W. L. Locke, Oakland
John Hudson Thomas, Architect

tion is somewhat due to the improved modern transit facilities, to high cost of living, and the over-crowded conditions of our cities. The people have learned to prefer the beautiful flowers, pure air and fresh, wholesome food, to the foul smell of the gutters and dirty streets of the city.

Again, it is fully realized that the home to be ideal must be both beautiful and practical—must perform its functions well and be pleasant about it. Where can it perform these functions better than in the country? Within we have not only shelter from the elements but also the benefits of the sun and breezes; without it is made indigenous by the proper selection of style, materials and colors that harmonize and blend happily with the immediate surroundings. This is true in eastern Pennsylvania, where stone is easily and cheaply had, and the Colonial style prevailing, the ideal home that is accepted as native is the home built of stone in Colonial style.

In California the landscape is dotted with beautiful homes that appear as a natural growth. Field stone and rough timbers constitute the principal material, and in the hands of the architect who knows the caprices of the style, inject into it the fine, free, rugged and hospital spirit of the bungalow. Thus it was in old England where we find in the various regions styles that harmonize and blend nicely on account of this law of nature. In those early days they were compelled to build of materials most easily obtained, thus fulfilling this law unconsciously. We, on the contrary, by our present means of transportation can build of materials gathered from every part of the globe as economically as the materials gathered near at hand.

Travel and reading, besides working wonders throughout the land, have also wrought their mischief. There are always some who do not comprehend the value of a native style and erroneously model their homes after types individually beautiful and perfect under its local conditions, but brought forth and planted bodily in a foreign land and climate loses

Residence of Mr. George H. Hoyt, Berkeley Heights
John Hudson Thomas, Architect

its charm and wilts like a tropical plant in the arctic zone. It behooves us to go back to precedent, but we must not remain there. The spirit and principles alone are of value to us.

If we are fortunate to have the inheritage of past and foreign examples to lead us aright, how much greater will the inheritage of future generations be! They will not be required to look beyond the confines of their own country for inspiration as we do today, but culture and taste will guide them to avoid what is ugly, uncomfortable, impractical, and follow in the footpath of the present generation until the final principles and ultimate ideals will be fully realized by all classes throughout our country.

This fine spirit of home life so broadly manifested in the building and adornment of the house is surely the most important as well as the most human expression of the art of man, and cannot but affect and uplift the national character. Shallowness, ostentation and pretention will soon be entirely avoided, and stillness, quiet earnestness that seems to lull and soothe the spirit with promises of peace, are the things that will predominate. Such a home is truly a great achievement, a daily influence and delight.

Architecture and its Interpretation to Men†

By W. R. B. WILCOX, F. A. I. A.*

THE talk one evening had turned upon the character and elements of appeal in works of art and nature; in architecture, music, the drama, sculpture and the landscape and how they are interpreted to men.

The day following I strolled out towards the hills. It was a warm and fragrant day in early summer. The foliage of trees and shrubbery was rich and colorful. The lawns, woven thick with the year's new life, rolled away between banks of verdure. Afar in one direction lay a gently rolling country through which a winding river coiled a silver thread, and miles away, glistening like a floor of burnished metal, lay the clear waters of a mountain lake, from which low foothills climbed to rock-topped peaks beyond.

The glowing sun drew from the earth a pungent springtime moisture and distant outlines were softened by a haze, while clouds of fleecy whiteness came and went in the wonderful depths of the sky. How pale the blue of distant mountains! How bright the sun-flashed meadows! How cool and still, and deep the green, where shadows stretched beneath the nearby groves!

Oh, what a day! And what a vision! Though vaguely conscious that the city yonder seemed a scar upon the landscape, that its factory stacks poured forth great clouds of black-brown smoke and the barren reaches of its mills of somber brick obtruded, yet, even so, I caught the glint from flashing windows and marked the coils of smoke revolve upon the breeze.

It was a gala day, a day of festival, and people, pleasure bound, strolled round about; some sought out flower bordered paths, while others chose half hidden lanes beneath the trees. But a steady throng, in groups and singly, passed up the hill over a broad, grass-carpeted thoroughfare. Many stopped, from time to time, to gaze in silence on the scene, or to voice a deep contentment in its harmony.

Moving with this happy company, in the shade of high over-arching trees, I climbed the gentle slope and presently approached a park. The entrance, through a shrubbery wall, was flanked by granite pedestals on which two bronze equestrian groups were raised. Alike in character, a youthful rider sat bareback a charging horse, whose prancing, plunging mate he strove to hold in check. What power! What action! How true the poise! How fearlessly the young man hung upon the bridle of his wilder charge! How confident of mastery! And passing people paused to contemplate. What was it seized their interest? Was it modelled bronze or molded granite die; or the tale they told with strength of line and grace of form, the power of those frantic horses, the calm determined courage of the boy?

Inside the park the way led towards a forest's edge and there within the grateful shade, framed in by rising ground, were circling tiers of marble seats and down between their curving ends an open stage. The seats were filled and on the stage a play progressed. There was a battlefield and struggling armies, and in their midst two champions met and fought. The audience was hushed and tense; it followed the rush of passions. Lifted to a share in the combatants' emotions it felt the spirit of the play; forgot the tinsel armor in the rhythm of the vanquished's dying words:

†Address delivered at the annual banquet, third annual convention of the Architectural League of the Pacific Coast, Portland, June 9-11, 1913.

*President of the Washington Chapter of the American Institute of Architects and member of the firm of Wilcox & Sayward, Central Building, Seattle.

"Oh, Harry, thou hast robbed me of youth!
I better brook the loss of brittle life
Than those proud titles thou hast won of me:
They wound my thoughts worse than my sword my flesh:
But thought's the slave of life, and life time's tool;
And time, that takes survey of all the world,
Must have a stop. O, I could prophecy
But that the earthy and cold hand of death
Lies on my tongue!"

Soon the play was over and with those who, like myself, had loitered for a time, I joined the number who were seeking recreation farther on, reflecting the while how, whenever the great thing is done, or the little thing with seriousness, it is not the means employed, the phraseology, that stirs the deep emotions, but the meaning conveyed.

As I turned these fancies in my mind my attention was diverted by the faint notes of distant music. Quickening my pace in their direction I soon came within view of a pavilion far across a spacious common, whence came the sounds. As I drew near the humming noises of an intermission ceased, the deep wood instruments gave out the old familiar theme of the overture to Tannhauser and over the silent audience swept the well-known strains. With what tingling satisfaction did one hear the oft-recurring voices of first one, and then another, instrument, as their mingling tones wove the wondrous fabric. And when, at last, like rich embroidery of gold against a bright, clear field of blue, the blaring horns set forth the mighty pattern on the trembling background of the violins, the very soul of music seemed revealed.

The day was now quite well advanced, and with a wish for one broad outlook over the country, ere the shadows grew too long, I turned my steps toward a not far distant headland. From the plain great flights of steps, between successive terraces, led upwards to the summit. At every higher level a wider prospect spread, while restful seats beneath the trees invited one to tarry. The upper terrace was elaborated with an imposing central stairway with statuary at its foot and head. It clearly marked approach to a formal landscape scheme above and gently led the mind from contemplation of the distant view to speculate upon the hidden scenes beyond.

So with eager anticipation I gained the topmost steps, but as the picture burst upon me I stopped in wonderment. Imagination had failed to conjure up a scene of such magnificence. A spacious avenue led straight away for many hundred yards; great trees in formal rows closed in the sides and cast their dark reflections on the placid surface of a shallow pool, which, bordered with cool, white marble walks, stretched from end to end. On either side, outside the walks, lay turf, like long green bands of velvet, and on its outer edges, just within the rows of trees, as if jeweled hem, were narrow beds of many-colored flowers.

Yet this was but a setting, a concentrating framework. Far down the narrowing perspective the eye beheld what seemed an apparition. There, terminating the marvelous vista, arose in dazzling splendor a snow white marble structure, and in the waters of the pool its stately form was mirrored. Its polished surface shimmered in the sunlight, its glistening, curving dome against a clear blue sky seemed floating in mid-air and like gray mists transparent shadows hung beneath its cornices. Its like I'd never seen.

Forward I walked along the path beside the pool, fascinated by the sight. So perfectly did its lines and masses balance, so delicately proportioned to each other were its several parts, so beautifully the sunlight played upon its varied surfaces, it seemed instinct with life. It seemed to lift itself and soar above the broad, white marble table on which it stood, and yet, it left no sense of insecurity. With all its seeming conscious power it stood there calm and self-contained.

As I drew near I saw that many of its parts were unfamiliar shapes; strange carvings and mosaics embellished them; their colors, outlines, sizes and positions resolving into an appealing harmony. The pleasurable emotions which the sight occasioned were interrupted by a nearby conversation which stirred my interest: "A strange structure," the speaker was saying, "it does not seem to conform to any of the accepted models of architecture. Why do some artists, some architects, presume to attempt originality when it is futile to try to surpass the perfection of the ancient Grecian architecture—why depart from the old types? To which an eager companion rejoined: "Why depart from the old types? Because no artist is truly an artist who does not depart from the rigidity of accepted types, who does not stir us from inert acquiescence in habit and custom, who does not incite up to revolt from the tyranny of the standards of the past."

"Why, pray, concern onesself with an archeological diagnosis of architectural symptoms? Do you think to discover its spirit by such a process? Is the soul of man to be revealed by a review of the conventionalities of his manner and speech? Must these very flowers here be subjected to a botanical analysis before their charm of delicacy, fragrance and color may regale our senses? Think you, forsooth, the spirit of the overture we have heard is impossible of interpretation because to the orchestration of Beethoven is added the timber of instruments unknown to him? Did not Beethoven himself break the rules, and was he not a dreadful radical in his day while today he is a classic?

"Were the sculptures of the boy and the horses, surcharged as they are with the strenuosity of our own day, dumb to you because they do not counterpart the figures of a Praxeteles or a Donatello? Is the spirit of the drama, its message to our day, found in the historical accuracy of the garments worn, the mimicry of weapons of the olden days? Is it an intimate knowledge of the flora, or the geologic formation of this country about us that makes all these people respond to the beauty and the glory of the landscape? Is it any more likely that the spirit of architecture, its power and purity, is to be felt only as we come to know its obvious, historical associations; that the latter are, as we say, consistent, true to some particular period, true to some particular racial mnner?

"Would you have the spirit of architecture communicate only with those who may have critical knowledge of its outward manifestations; with the educated and cultured? Must it be silent for the uninformed majority? And you fail to catch the spirit of this building, although it speaks in flowing rhythms and measured cadences because, familiar as you may be with the full catalog of architectural precedents, your knowledge does not embrace the forms and features which supply its media of expression! Could you know that it was, in fact, the consistent flower of some distant architectural culture of a strange, yet verile, race, would you open your heart to its emotional appeal? Must sympathy and understanding wait, always, upon knowledge? If so, how shall the spirit of architecture speak to all people, to the untutored public; and if it shall not speak to them why should the untutored public be expected to give heed to it? Why should it interest them and why should we waste our efforts in trying to educate the ordinary citizen, who has neither time nor inclination to inform himself upon the evolution of architectural styles, if an understanding and appreciation depends upon a broad knowledge of precedents?

"Why, we have tried to build an architecture largely out of forms; we have looked abroad and beholding some lovely manner of building have seized upon the forms there used and thought to build a new and vital architecture out of them, whatever in the foreign land has been the motive for their use. We've tackled every foreign style in turn and sometimes to an ancient style returned a second time. But only now and then our buildings seem to have the breath of life within them. For the most part we have set these oft-used shapes up side by side and hoped that by some chance the spark of life would enter them and make them live.

"Why do we always hope? Because, from time to time, some man appears who is more intent upon the freshness and verity of an idea he would express than he is concerned with a conscientious and painstaking reproduction of a vehicle used long since for the conveyance of an idea of a different sort. He imbues his structures with the spirit, not the forms necessarily, of the ancients; he sees that life is in the union rather than in the category of shapes employed; has felt down in his heart the rhythm of such union and has liberated its spirit to live on and on forever

"Others, mistaking substance for soul, have foolishly concluded that the abode of the spirit of architecture had been discovered, that it dwelt in the forms he used and that by their use alone it could be invoked at will. An attempt so to do, however, revealed what an elusive, wraithlike wanderer that spirit is.

"The years pass by and then another man beholds the light of that spirit and lets it shine for us, and while he lives to do so, we think we add to its lustre, when the truth is we supply only reflections—sometimes quite perfect, but still only reflections. Consider the case of a man like Richardson; despite what we are assured was a barbarous medium of expression, many of his buildings live and sing. Surely it was not the forms that produced the effect, for soon a hundred others grouped them in a thousand buildings, and yet, in them, there was no life, no song.

"Again, a man imbues with life the forms of ancient Grecian architecture, and soon the classic style becomes the vogue. A bank, a school, a church or library, a club, a depot or a house, or any other structure, need only have upon its front a row of columns, a pediment, or attic stage, and there, behold, is architecture. Alas! Such forms are all too often lifeless masks, or shrouds, appropriate perhaps for things so dead; they lack that vital thing, the living spirit of architecture, which awakens only at the call of truth, of frankness, of courage, of individuality. If we would find that spirit we must rid ourselves of shame, of indirectness, of timidity, of servility, and with unwavering faith, undismayed by many failures, press on toward the future, for at any given time the spirit of architecture, of any art, dwells just beyond the present, and concerns itself with the hopes, the aspirations of a people. It is the prophet of an ever-changing, ever-expanding appreciation of what is true and noble and beautiful."

As the speaker paused I awakened from my reverie. The setting sun was casting purple shadows round about and making deep the blue of distant mountain sides. The lake was pink from sunset clouds and evening stars began to dot the sky. It was drinking in the beauty of that scene that charged my thoughts and colored them. If we, as architects, would more and more cultivate that simple attitude of appreciation and receptivity for the larger qualities of architecture with which we approach the drama, sculpture, music, yes, even the landscape, we would be able the better to seize and imprison in our buildings the spirit of architecture to interpret to all who follow us the ideals of our people and our day.

Echoes of the Architectural League Convention in Portland

THE next convention of the Architectural League of the Pacific Coast will be held in Seattle in 1914. This was decided at the recent meeting of the League in Portland. At this gathering California architects were represented by John Bakewell, Jr., vice-president of the Society of Beaux Art Architects, San Francisco, and Warren Perry, architectural department, University of California.

The Washington Chapter and Seattle Architectural Club were represented by W. R. B. Wilcox of Wilcox & Sayward, Seattle, president, and Harlan Thomas, Seattle, treasurer of the chapter; James H. Schack, W. Marbury Somervell, Clancey M. Lewis, J. S. Cote and Frank Baker, all of Seattle.

C. H. Whitaker, Washington, D. C., editor of the Journal of the American Institute of Architects, who claimed to enjoy the distinction of having come the fartherest, was a guest of the League.

Beginning with June 2 and continuing through the convention days and until June 21, the Architectural League of the Pacific Coast and the Portland Architectural Club held their third and fifth exhibits, respectively, on the eighth floor of Lipman, Wolfe & Company's store.

Bliss & Faville of San Francisco showed the Masonic Temple, Columbia Theater, Liverpool & London Insurance Building and competitive drawings for several public buildings. Willis Polk had some attractive renderings of work for the Spring Valley Water Company, the D. O. Mills' bank in Sacramento and the Templeton Crocker residence.

B. G. McDougall, L. B. Dutton & Co., Walter H. Parker, George W. Kelham, Bakewell & Brown, Fabre & Bearwald were represented by business buildings and domestic work.

Elmer Grey and Myron Hunt of Los Angeles showed photographs of many attractive residences.

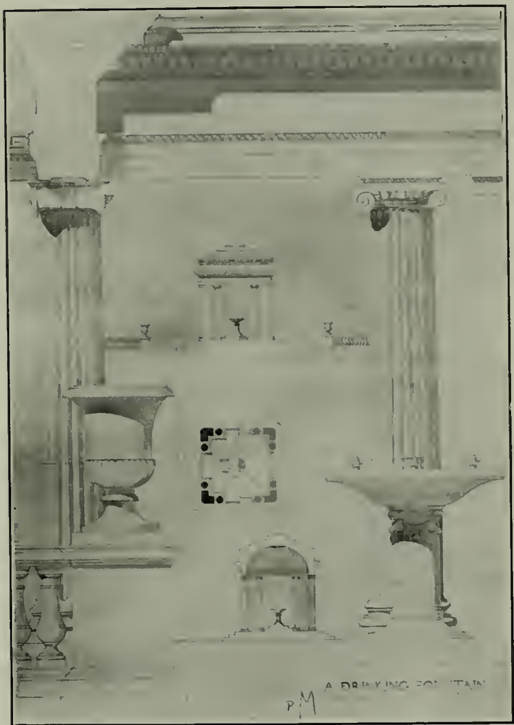
Morgan, Walls & Morgan had drawings of the Little Theater, Los Angeles.

Withey & Davis, Thomas F. Powers and S. B. Marston had attractive houses from Los Angeles and Pasadena.

Portland, naturally, had the largest number of exhibitors, numbering among them the following individuals and firms: F. A. Naramore, Lloyd Dittrich, Russell E. Collins, John Bauman, Roy Wright, Charles C. Rich, Emil Schacht & Son, Lazarus & Logan, Bennes & Hendricks, John G. Wilson, Aaron Gould, Tourtellotte & Hummel, Bridges & Weber, George Foote Dunham, Gardner Manning Gale, William J. Kratz, F. A. Burton, Lewis E. Macomber, Ernest Kroner, J. Terry Wilding, Johnson & Mayer, Sutton & Whitney, Albert Sutton, Lawrence & Holford, William G. Holford, Ellis F. Lawrence, Lewis I. Thompson, Otto Kleeman, David C. Lewis, Whidden & Lewis, Whitehouse & Fouilhoux, Doyle, Patterson & Beach.

Seattle architects responded generously, and among the exhibits the following work was conspicuous:

W. Marbury Somervell, Queen Anne branch library and his own country house and grounds; Howell & Stokes, Metropolitan Theater; John Graham, the Furuya Building and Bon Marche; Somervell & Putnam, Vancouver, B. C., the Bank of Ottawa, Vancouver Club, Railway Hotel, B. C. Electric Company's building and a proposed park scheme for the city of Vancouver; Carl F. Gould, Wilson & Loveless and Willatzen &



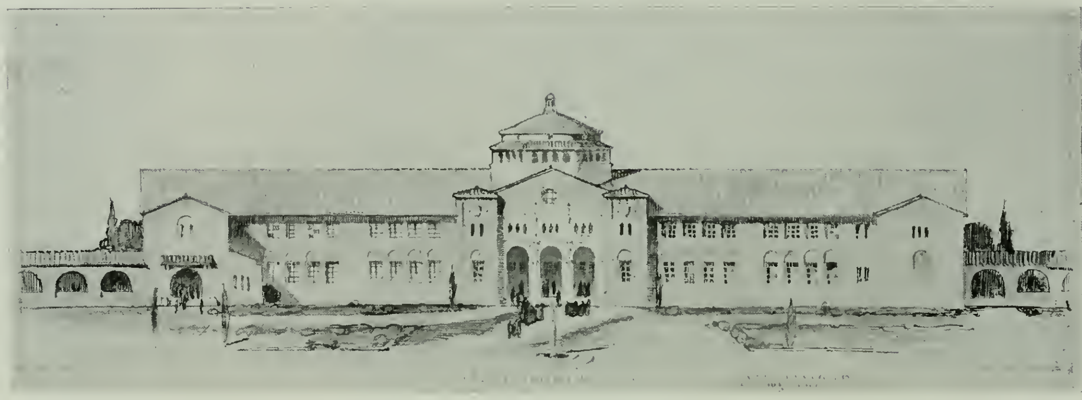
A Drinking Fountain, by A. Reinecker, San Francisco Architectural Club

Byrne, attractive houses, and Wilcox & Sayward, the Washington park aqueduct, a store and fine houses.

Tacoma architects were represented by the work of Heath & Gove, school houses; Bullard & Hill, museum of fine arts; M. P. Potter, residences; Dugan & Lewis, houses.

From Spokane came the work of Cutter & Malmgren, Chester Thorne residence at Tacoma and the Western Union Life Insurance Building, Spokane; C. Harvey Smith, apartment houses and residences; Keith & Whitehouse, Spokane Country Club.

Group studies covered a considerable portion of the walls and attracted many visitors and students of the subject. The principal ones were the E. H. Bennett plans for Portland; the successful and unsuccessful plans for the Washington state capitol at Olympia, and the Panama-Pacific Exposition Plans.

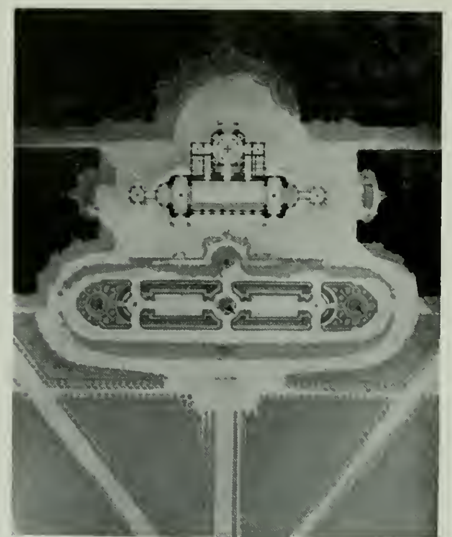


Administration Building, Los Angeles State Normal School — *Allison & Allison, Architects*

Fine Arts Building, State Normal School, Los Angeles
Allison & Allison, Architects

Stage Entrance, Administration Building, Los Angeles State Normal School
Allison & Allison, Architects

School Drawing E. A. Titcomb, Architect



School Drawing E. A. Titcomb, Architect

The Walls of This Concrete Building Lean Over More Than Two Feet at the Top

Engineers Will Now Attempt to Save Toppling Concrete Building

A SECOND attempt will be made to save the four-story reinforced concrete building on Folsom street, San Francisco, that has been toppling worse than the leaning tower of Piza, because the architect and builder neglected to provide the structure with adequate foundation support.

In the March number of "The Architect and Engineer" Architect Jacobs told of his efforts to save the weakened building. In that article he stated that the building had been designed and constructed under the supervision of Frederick Noonan, formerly of San Francisco, and now of Los Angeles. The structure was erected about two years after the fire of 1906. The owner was Joseph Baer, and it seems he thought it was economy to employ a contractor who was his own architect. The architect's fee was saved, and that was something, even though the builder put in foundations which run down but a few feet below the sidewalk level, with footings such as are ordinarily laid for three story and basement frame buildings.

At a depth of five or six feet under the building the earth is "blue mud," such as is found in marshes about the bay. The builder, however, did not drive piles, nor even lay concrete connecting girders for the foundation, and the structure has from the beginning been slowly settling down on its west side, with the settlement most marked at the northwest corner. The walls lean over more than two feet at the top, and they are cracked badly in many places.

Mr. Jacobs did not guarantee to save the building, but he consented to make some experiments, as he was allowed only a limited sum to carry on the work. Large timbers were placed against the west wall and screwed up tight, and then began an attempt to put in massive concrete piers, but even these piers began to sink. The stores were vacated and heavy timbers set up in them for the purpose of holding up the house preparatory to raising and strengthening it.

At this point George E. Bates became the owner of the property in taking over a mortgage. He employed Edward L. Soule, the structural engineer, with whom is associated Smith, Emery & Co, inspecting engineers. The latter made exhaustive tests of the concrete, soil and other elements in the problem, while Soule took up the work of saving the structure. The concrete was found to be of a good class, which the engineers say saved the building from collapse. The mud underneath was found to be the bed of a slough under about half the building.

As a result of the examinations made the engineers decided to cut off the building under the second story and put the upper part on a level base. The next move approved is to shift the building into the lot on the west side, after which the first story and foundations are to be removed. Then 142 piles will be driven, new foundations set and the piers and walls to the second story built anew, and when the concrete has set sufficiently the upper three floors will be moved back where they were before. The contract for this work, recently recorded, is for "moving a four-story concrete building to the lot adjoining and installing pile foundations and then returning the building."

Soule estimates the weight of the upper portion to be removed at 1650 tons, which figure does not include the first story and foundations.

The contractors are the same men who are performing the interesting engineering feat of moving the Class A Commercial High School from its site in the Civic Center to the Library lot on Van Ness avenue. They have ninety working days from June 23d to complete the work.

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The Joys of a Bungalow

The ants are in the butter dish, the flies are in the cream,
The only water we can get is carried from the stream;
The farmers will not sell their eggs, they say they salt them down,
And all their fruit and vegetables they send away to town.
The planks beneath our rugs are full of cracks, both deep and wide,
And snails and slugs and crawling bugs come creeping up inside.
I found a caterpillar once encamped upon my toe,
But that is what you must expect when in a bungalow.

We can not sit upon the porch, a hornet's nest is there,
At every sound they all come out with fierce and angry air;
The shingle roof is leaky, too, you wake and find the bed
Is soaking from the shower bath in action overhead.
My face and arms are all tattooed with raw mosquito bites,
And concerts by the owls and frogs make horrible the nights;
But when we write to city friends we say: "Why don't you go
And buy an acre in the woods and build a bungalow?"

[Needless to say, the above verse was penned by an Eastern pessimist who envies our style of home comfort.—Ed.]

Butler County Memorial Building, Hamilton, Ohio
Frederick Noonan, Architect

A Foreign Sketch, by Charles H. Kysor, Architect, Los Angeles

Oyster Shells Replace Gravel

BRANCHING out from the fields of stews, frys, cocktails, and other table delicacies in which it has long ranged supreme, the humble oyster, whose nervous system has of late caused Dr. Wiley so much concern, has entered the strenuous life as a chief component in a concrete from which a new business structure is to be built at Galveston, Texas.

A five-story building, designed for mercantile and office purposes and occupying a space 120x43 feet in the heart of the Galveston business district adjoining the City Hall on its east side, has nearly reached completion. The face of the concrete on which the framework of the building is constructed is shell taken from the reefs of Galveston Bay. Generations of oysters for hundreds of years past, have gone to the making of these massive reefs that now form one of the new monuments to Galveston's material progress.

The owners of the building met with much technical opposition in their plan, but are still firm in the belief that they have produced a building material of remarkable strength and cheapness. There is but approximately 10,000 pounds of metal reinforcement in the building, and Mr. Bohn, one of the proprietors, argues that the building could have been constructed with perfect safety with nothing but the oyster shell concrete in the walls. The concrete skeleton of the building contains about 26,423 cubic feet of material formed of one part cement, two parts sharp sand and four parts shell. An estimate based on the weight of the average common shell shows that approximately 5,500,000 bivalves sacrificed their outer garments that the five-story structure might rise in the Galveston business district.

Resting on a shell concrete foundation four feet wide, the walls for the first three stories are fourteen inches thick with 18-inch pilasters at frequent intervals to strengthen and support the walls of the five floors. After the third story the wall is reduced to 12 inches with 16-inch pilasters for one story, and for the fourth and fifth floors a still further reduction is made to 10-inch wall and 16-inch pilasters.

Expressing complete confidence in his plan of construction and the strength of the material used, Mr. Bohn says that he could, with perfect safety, add three more stories to the building.

Mr. Bohn first used concrete mixed with shell in 1882, when he built a sidewalk curbing and foundation three feet high and 336 feet long. Two years later a conflagration swept over this part of the city and against the wall of the curbing there was piled 25,000 feet of lumber. This was entirely consumed without a particle of damage resulting to the wall or the curbing. The same wall has stood the test of weather and water since that time, and today it is as firm and apparently as solid as the day it was constructed. In 1888 Mr. Bohn built a cistern and foundation for a two-story building, both of which are standing today, firm and solid, without a crack or evidence of decomposition.

Shell is delivered in Galveston by barges at the wharf. After it has been picked up and loaded by suction dredges at the wharf, hopper dredges are used to transfer the materials from the barges to the wagons on cars waiting for it, and it is delivered about the city at a cost of approximately 75 cents a cubic yard. Gravel costs, delivered, about 81 cents a yard. Shell from Galveston Bay has long been used as surfacing for streets, roads and railroad beds. There is now within the city limits approximately 45 miles of shell streets which have been greatly improved and given practically an asphalt finish by the use of crude oil. Four big concerns with equipment valued at over $1,500,000 are now exclusively engaged in the shell business at Galveston.—Dealer's Building Material Record.

Poured Concrete Houses Now a Success

HOW would you like to have a house constructed of poured concrete even to the floors, staircases and roof—hence, absolutely fireproof—for a monthly rental of only eight dollars?

This is what the coal department of the D., L. & W. R. R. has done for its miners, and the miners seem to appreciate it. So far twenty double houses, each containing six rooms, have been constructed on what is generally known as the Edison plan, because he was the first to suggest houses made of poured concrete.

That inventor estimated that an equipment of heavy cast-iron molds would be necessary, costing $30,000 for each design, says a writer in "Coal Age." His suggestion could hardly have commended itself to those who are interested in the improvement of dwellings, because a distressing uniformity would inevitably have resulted, and the designs would, in many cases, have been entirely unsuited for the tenants of the houses thus built. Moreover, so heavy would the molds have been that it is probable that it would not have been possible to have shipped them from place to place economically where only a few buildings were to be constructed.

Contrast this heavy expenditure for molds, the inflexibility of design and the weight of material to be transported, with the simplicity, tightness and portability of the Morrill molds which are described in this article.

The plates used are two feet square and are made of one-eighth inch cold-rolled steel, all four edges of these plates being slightly flanged as shown. Two horizontal rows of square holes are punched in each plate, and three square holes are punched in each of the small flanges. These plates are arranged around the building with their flat sides back to back and set at a distance equal to the width of the wall which it is desired to construct.

In order to maintain a uniform width of wall, straps of one-eighth inch cold-rolled steel punctured with square holes are passed through the opposing belts of plates and through a pipe distance piece. The straps are secured in places by wedge pins which are lightly driven into position. Thus the walls are prevented by the pins and straps from becoming too large, and by the pipes provision is made that they are not less than the required width. For all kinds of houses the same molds will do, the only variation consisting in the variant use of the same plates.

There are many advantages in connection with these houses. They are entirely incombustible except in so far as the window frames, doors and any moldings which may be inserted are concerned. A fire would not in any way destroy the building, though, of course, as a result, it would be somewhat disfigured by smoke. In fact, in a suburb near Washington, it has been the habit of a concern which is engaged in exploiting a piece of available suburban land, to start a fire in a house of this construction, having previously announced that this experiment would be made and thus gathered a crowd to attest the fire resistance of the structure. Another advantage is that the house is entirely sanitary, and should an undesirable tenant occupy the building, it is extremely easy to clean it out with a water hose when vacated.

Accustomed as we are to wooden floors in all our dwellings, it is perhaps necessary to point out that some of the finest hotels in New York City have concrete floors in their lobbies, which are covered with rugs.

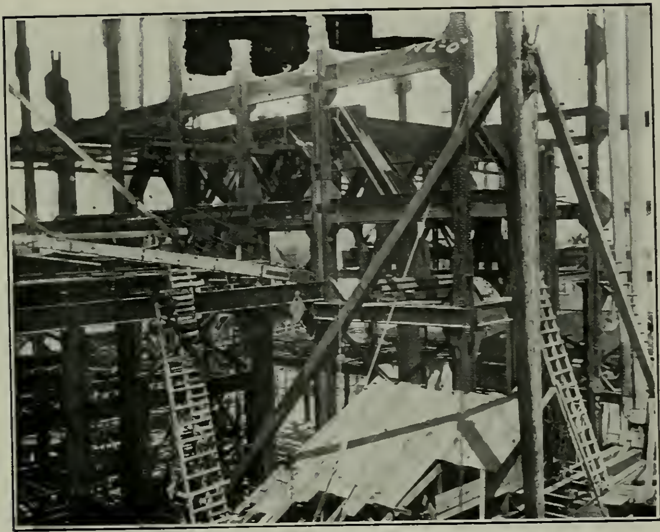
* * *

"What's your husband's business?"

"Contractor."

"What line?"

"Debts."—New Orleans Times-Democrat.



A Near View of the Huge Girders, Oakland City Hall

The Steel and Iron Industry of California

II—The Judson Manufacturing Company

ONE of the largest structural steel shops on the Pacific Coast is located across the bay from San Francisco at Emery and is a part of the extensive plant of the Judson Manufacturing Company. It was here that there was fabricated the largest steel structure so far erected on the coast—the Oakland City Hall, whose three thousand six hundred tons of steel supporting the great marble shaft of its tower, which dominates the bay regions, stand as a testimonial that local shops and local workmen can turn out steel structures equal to any in the country. The trusses in this building, forming the arch that supports the enormous weight of the tower, were necessarily very heavy work, and some idea of their size and complexity can be gained from the photograph here shown, taken while the work was in progress. The large trusses weighed just under 100 tons each, and special facilities had to be provided to haul and handle these heavy members from the shop to the site of the City Hall.

The structural shop of the Judson Manufacturing Company is a steel frame building, 102 feet wide by 600 feet long, divided into three bays, each served by two electrically operated overhead traveling cranes, with a clearance of 18 feet and as many tons capacity. At one end of the long building is a beam storage and shipping shed, also a steel frame structure, 42 feet by 400 feet, served by two overhead traveling cranes, one of 16-ton and the other of 10-ton capacity. In addition to these facilities for handling the material there is a large locomotive crane for work in

A Sample of the Immense Trusses Used in the Oakland City Hall

the yard and elsewhere about the plant. The shop is up-to-date in every respect, the machinery modern, most of it having been installed within the last three years, and it has a productive capacity of from 1000 to 1500 tons per month. At the present time this is far beyond the local needs, for much of the steel work still goes East.

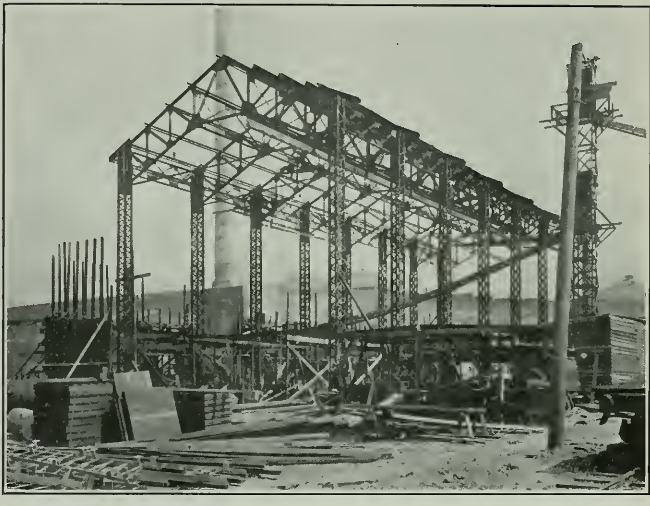
When the structural organization was being built up the shop was placed in charge of Mr. G. M. Hubbard, a man with large shop experience, who received his training in some of the largest eastern plants. It has been under his efficient management that the Oakland City Hall was turned out, as well as many lesser structures, a few of which may be mentioned: On the Oakland side of the bay—the Woodmen of the World building, Free-market, First M. E. Church, Bell Theater, the addition to the Y. M. C. A. building, Portuguese Hall; and in San Francisco, the Municipal Incinerator Plant and the Fort Mason Pumping Plant No. 2, both city work, the new Phelan building and the Wigwam Theater, as well as many other structures. The Judson Company's capacity for rush work was indicated last year when they delivered a 300-ton power station for the Pacific Gas & Electric Company in less than 30 days from date of order, earning a bonus of five days on their contract.

The Judson Manufacturing Company is a California corporation and has been in business for so many years and is so widely and favorably known as a manufacturer of bar and merchant iron that many people do not know of the great changes which have been going on, not only in the up-building and improving of the departments of the plant, but in the internal organization as well. Something over a year ago the entire management of this firm changed hands, the active control being assumed by

Mr. W. H. French, now vice-president, and with this change came sweeping alterations, both as to the general business policy and in the staff. Mr. Fred M. Green, C. E., associate member A. S. C. E., was placed in charge of the plant as general superintendent. He is an engineer of wide experience, both technical and practical, and was for many years with the Pennsylvania Railroad in New York in charge of construction work on their great railway terminal in the heart of the city, and in boring the

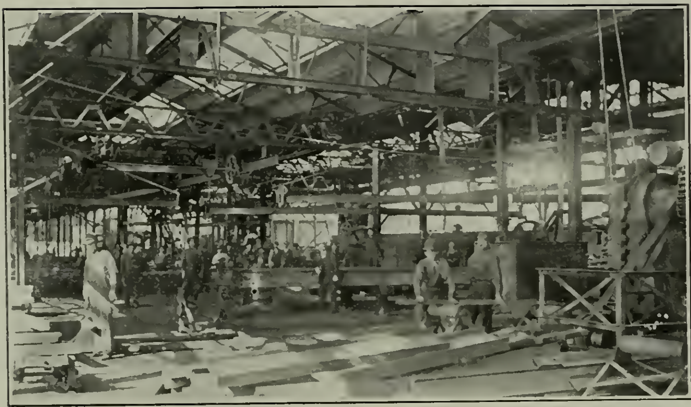
An 18,000-Pound Casting Poured at the Oakland Foundry of the Judson Manufacturing Company

large tubes under the Hudson river which give the trans-continental trains access to Broadway. He is ably assisted by Mr. E. E. Burnett, M. E., member A. S. M. E., who specializes on the mechanical work of the plant. These two have under them a thoroughly trained and competent organization to carry on the diversified work of this HOME INDUSTRY corporation, which, besides a structural shop, includes a rolling mill, making full range of bar and merchant iron, curb iron, gib steel and other specialties;



Steel Frame, Incinerator for the City of San Francisco, Delivered in 30 Days

Interior of Judson Manufacturing Company Plant, Oakland



Interior of Judson Manufacturing Company Plant, Oakland

a machine shop which has supplied many of the working parts for the Alaska dredgers, as well as doing a general machine shop business; a foundry, a pattern shop, and a bolt shop, which not only makes a standard line of bolts, but can turn out anything to order in its line.

The foundry recently poured some of the largest castings which have been made in this vicinity for some time. The largest one of these weighed 18,000 pounds, and is illustrated in this article. The complete shipment of five pieces weighed over 40,000 pounds.

Speaking of local conditions, Vice-President French said: "Many people do not realize the handicap under which the local structural shops work as regards wages as compared to those paid by their eastern competitors. The average wage per hour in the Judson Manufacturing Company is just twice that paid in the east, and this means that local fabricators must not only secure as great efficiency as possible in their organizations, but must often sacrifice a great deal in profit in order to keep work at home. They should have the loyal support of every resident of the State who has come to realize the benefits to be derived from home industry, and it is to be hoped that as local architects, builders and investors learn of the facilities which coast shops have for turning out their work that they will be patronized to such an extent as to keep them working to capacity. This could easily be if all of the work was let locally instead of a large part being sent East."

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"Quite True"

Here's a little jest from the pages of the New Orleans "Times-Democrat" that will win an appreciative smile from the average busy architect:

"How are the plans for your new house coming along?"

"Splendidly. My wife has finally laid out all the cupboards she wants, and now all the architect's got to do is to build the house around them."

"What Is A Chapter For?"*

By ROLLAND ADELSPERGER, President of the Indiana Chapter.

THE object of our Chapter, to quote from the Constitution, is to "unite in fellowship the architects of the State" and to "combine their efforts to promote the artistic, scientific, and practical efficiency of the profession. To make this object more and more nearly an accomplished fact, instead of a desirable something that has slipped the memory of most of us, so far away from the daily routine of business cares has it seemed to be, is your President's chief ambition.

Let us ask ourselves a question or two:

Is it desirable that we "unite in fellowship" in all that these words imply? Is it desirable that we "promote the artistic, scientific, and practical efficiency of the profession?" If the answer is "Yes" to both these questions, then should we not seriously set about doing these desirable things?

Sometimes a phrase is so pregnant in meaning that, once heard, a whole nation remembers it. "What are we here for?" is one; "The way to resume is to resume" is another.

If we are members of this Chapter merely to enable us to state that fact on our stationery, the Chapter is not valuable to us not we to the Chapter. Indeed, if our interest in the Chapter is no greater than this, then the Chapter is moribund and will shortly die a painless death. But if but one member holds the faith, despair should not seize us, for one measure of leaven may leaven the whole mass; happily the interest of many of you in the objects of the Chapter is loyal and whole-hearted. As I read the roll of membership I say, "This one, and this one, and that one, and that one have the spirit."

But no work succeeds so well, so easily, so quickly as that which united effort accomplishes. Not united moral support, but united effort. We have work to do—important work—which can be accomplished only by united effort. We want to see the Institute's Code of Ethics the rule of action of every practitioner in the State; we want a public educated so that we can conform to the Institute's schedule of charges; we want a license law passed. This is an ambitious program, and one that may take years to accomplish, but it can be accomplished by united effort; in fact, united effort on our part, without the help of any of our friends in other walks in life, will accomplish most of it. There are other things to do that are only less important.

The unsatisfactory situation is this: It is impossible to call on any member of the Chapter to give a little of his time to some Chapter activity, knowing that he will do the best that is in him. There are a number of standing and special committees with whose membership you are familiar. You perhaps have noticed and commented on the fact that some names appear once, twice, three times. This is not favoritism, it is imposition; but imposition which has been forced by the selfishness, touchiness, or indifference of many of you. On each member's card in my index are many notations, such as, "Will work," "Won't work"— and the "won't works" are in the majority.

The life of the Chapter is much as the life of the individual; there is an inner life of the spirit and an outer life of works. The individual's contentment depends on how he lives both of his lives. Your contentment as members of the Chapter should depend on how you live the inner and outer life of the Chapter. The expression of the inner life of the Chapter is the

*Mr. Adelsperger handles his subject without gloves, to use a forcible maxim, and the shortcomings which he notes in the Indiana Chapter are characteristic of the Chapters in many other states, California not excepted.

Code of Ethics. It is its ten commandments. But these commandments may be summed up into the greatest of commandments, and, similarly, the Code may be summed up into the preamble of our Constitution—to unite in fellowship. The outer life of the Chapter lies in the committee work, and just as a man's value to the world is measured by the amount and quality of his daily work, so your value to the Chapter, and the Chapter's value to you can be measured by the amount and quality of your committee work. Some of the committee tasks are difficult, and some of the committeemen dubious of success. They fear that we can't get what we are after. No one thing that we want is going to be handed to us by an altruistic public; so what we want we must work for, and let us work for what we want. If our doubting Thomases will work for the Chapter as they work to land a profitable commission, success is assured. "Where there's a will there's a way."

* * *

Arnold Bennett on the Influence of Architecture

IN the first of a series of articles, entitled "Seeing Life," Mr. Arnold Bennett has a good deal to say that is pertinent and interesting concerning matters architectural. The writer states that "any logically conceived survey of existence must begin with geographical and climatic phenomena," and that all other influences are secondary to them, but the greatest of these secondary influences are roads and architecture. Entering England at Folkestone, for instance, the architectural illustration which greets you is absolutely dramatic in its spectacular force. As the tram winds on its causeway over the sloping town you perceive thousands of squat little homes, neat, tender, respectable, prim, at once unostentatious and concerted, each of which is a clearly defined entity and each with a ferocious jealousy bent on preserving its own individuality, all careless of the general effect, but yet making a very impressive general effect. This the writer contrasts with the immense communistic and splendid facades of a French town, and if you intend to see life you cannot afford to be blind to such general phenomena. Even the fact that the English lamp-posts spring from the curb, while French lamp-posts cling to the side of the house, has its significance. If one is struck with the magnificence of the great towns on the Continent, similar reflection will convince us that the major characteristic of the great towns of England is their higgledy-piggledy slovenliness. The English idiosyncrasy is, Mr. Bennett says, that awful external slovenliness causing it and being caused by it. And yet many novel writers describe a domestic organism as though it existed in the Sahara,, or a vacuum as though it reacted on nothing and was reacted on by nothing. How can such novels satisfy a reader who has acquired or wants to acquire the faculty of seeing life? We think that such criticism as this, and that of Mr. March Phillipps, is most valuable to both the architect, whose work to be of living value requires the humanizing influences of a liberal education and wide sympathies, and also to the amateur, whom we hope to induce to take that interest in and appreciation of architecture which is essential to its growth as a great living art.—The Builder (London).

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It Wouldn't Ring

"Why didn't you send your man to mend my electric bell?"

"He did go, madam; but, as he rang three times and got no answer, he concluded that there was nobody at home."—London Opinion.

Safety in Concrete Construction

By CHARLES F. LEWIS, in Engineering Record

IT has occurred to the writer that a short review of the structural iron and steel industry, touching on its growth in this country from a period of ignorance and uncertainty to its present state of near-perfection and security, and a comparison of this condition, from a safety viewpoint, with that of reinforced concrete, which is largely taking its place for structural framework, might be of some interest to your readers.

The older engineers will readily recall how, in the early years, when wrought iron began to take the place of wood for bridges and other structures, bridge builders and shops sprang up in all parts of the country; how foundries, machine and even blacksmith shops were converted into bridge plants, and how the land was flooded with circulars and advertisements extolling the merits of iron over wood, the result being a strong conviction in the public mind that these claims were true.

Hundreds, if not thousands, of bridges were sold and erected by men ignorant as to design and with very little knowledge of the strength of the materials. These bridge builders were "out for the dollars," and the only competition, if any, was to see who could give the least for the most money. Some of these bridges hardly sustained their own dead weight, and many found early graves in the beds of the streams over which they had been erected. One suspension bridge, over the Genesee River at Rochester, N. Y., went down under no other load except its own weight and that of about six inches of snow falling between midnight and morning, at which time the wreck was discovered; and this occurred even before the bridge had been paid for. Some of these light and insecure bridges lasted for years and sustained traffic—but not with safety.

In the '70s a bridge of about 90-feet span over the Erie Canal in Orleans County, New York, and owned by the State, after carrying heavy loads for years collapsed one Fourth of July morning from the recoil of a small canon fired from its roadway and elevated about 30 degrees. A highway bridge of peculiar design located on a main road in northern Ohio went down under a moderate load after being in use 30 years, and an examination made after the wreck disclosed the fact that this bridge should have failed under the first heavy wagon crossing it; but it served its purpose for years, though a "man trap," claiming its victim at the end.

A highway suspension bridge in western Pennsylvania, built in 1873 and still in use, has its cables stressed fully to their elastic limit by the dead weight, plus a light load of snow, which it receives several times each winter; and this on the assumption that the cables are new, while, in fact, they are and have been very badly corroded for years. (Good engineering on the part of its builder?)

Disasters in the early years were frequent, and hundreds of people were killed and injured. A list of these calamities is here unnecessary; suffice it to mention those that occurred in Ashtabula, Ohio; Dixon, Ill., and Albion, N. Y.

Frequent disasters and public clamor led to better designs, especially in railroad work. Purchasers began to employ experts to inspect all materials at the mills as well as the shop and field work, in order to see that the specifications were complied with in every particular. This inspection of material and workmanship soon grew to considerable proportions and has been the leading cause of the present high state of shop efficiency, as it compelled the bridge shops to discard their old "slipshod" methods, go out of business or seek new fields.

After years of thought, consultation and work on the part of the engineering societies and their committees (with the assistance of the engineering journals and the manufacturers themselves), some system was brought out of chaos, and a quality of material was decided upon and approved which today is the standard for railroad and highway bridges and for building framework. The working units were fixed at about one-half the elastic limit of the material, thus leaving about 100 per cent inside the crippling stresses as a margin of safety against the uncertainties in material and fabrication. The details of connections designed to develop the full strength of the main members were carefully worked out, simplified and standardized.

The field work has been so improved as to be almost equal to that of the shop. In our modern structural plant, experienced technical men are employed to detail all work, and their drawings are carefully checked by men of still more experience.

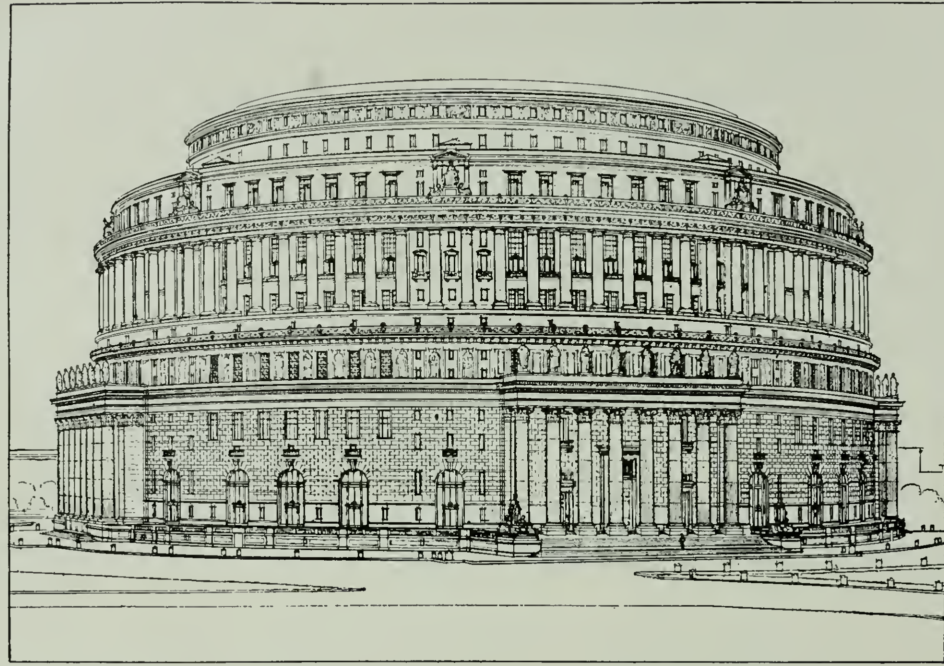
This high efficiency in modern shops and field practice, coupled with the fact that the material furnished by the rolling mills can be depended upon with almost absolute certainty, together with the low units insisted upon for new work, makes it possible nearly to double the assumed dead and live loads of our modern skyscraper and still be within the crippling stresses and, therefore, be safe against collapse (undue deflection, of course aside).

In this connection it may be stated that on our best steam railroads it is the practice to retain bridges in service while allowing the weight of rolling equipment to increase until the units produced by the live load, added to the dead and impact, have increased the original units by 50 per cent, or until about 75 per cent of the elastic limit is reached, which would not be safe were there any uncertainties as to the materials and workmanship.

There is no doubt that reinforced concrete has come to stay and will largely replace the "all steel" type for many structures—one item in its favor being time, often a very important consideration, for as soon as the engineer or architect has completed his plans, say for a building, the contract may be let and work begun immediately, whereas with the "all steel" type, two weeks, or even months, may be required for the delivery of the grillage beams, the first thing needed.

The combined action of the two materials, steel and concrete, has been largely investigated by engineers, formulae have been worked out and published, full sized members have been tested to destruction and found to develop the full strength of the calculations only when the materials were of the proper quality, correctly proportioned and skillfully put together—a result which depends on a chain of nearly a dozen links, a weakness in any one being a cause for failure. How often are we perfectly sure our chain is perfect in every link? We do know that the human element enters into reinforced concrete to a much greater extent than the "all steel" type of construction, and here is the main point of issue. The field work connected with reinforced concrete construction is a maximum against a minimum in that of "steel," and its quality as far from that attained in the laboratory, in spite of any inspection which may be given it.

Our building codes call for a competent inspector to be on the job during the mixing and placing of all concrete. Can any one man properly inspect even the smallest job of reinforced concrete when the mixing and



Perspective View of New Court House for New York County — *Guy Lowell, Architect, New York City*

The New York County Court House

MR. GUY LOWELL, in his competitive plans for the New York Court House, has undoubtedly surprised the public by choosing a round form. He makes no attempt to justify his choice on grounds of beauty alone. He modestly rests his work on use and convenience; on imperative demands for light and air and inner quiet and easy passage from apartment to apartment. Herein he follows good precedent. For the ancients, to whom he frankly says he owes his inspiration, seem not to have used the circular ground plan instead of the rectangular unless they found it much better suited to the building's main purpose. The Greeks, except for hillside theaters and for tombs, did not use the rotunda; they had not developed the allied arch and dome; the Romans used the round plan as means to an end, rarely if ever as an end in itself. So, too, the older Italians, for church and baptistry, adopted the eight-sided, the ten-sided, or the smooth circular plan for reasons like those that led the Druids to set the gray monoliths of Stonehenge in concentric circles, or that led the French to choose the round plan for their Pantheon at Paris and for Napoleon's tomb. For circles, whether of rude stone or of polished columns, and the unbroken wall recurving into itself, give a strong central emphasis on altar or font or memorial. The radial arrangement also, and the simple lighting, heighten the unity of the space inclosed. But these were not the reasons for Mr. Lowell's choice. His plan differs from the earlier instances in one essential respect: while mausoleum, pantheon, and amphitheater enclose an openly continuous interior, the new court house packs within itself, tier on tier, a myriad of economically dovetailed rooms, offices, and passageways. Viewed from without, the vast building will be impressive for its mass; but viewed from within it will be impressive for its ingeniously complicated contents.

The plan of the new court house is an outgrowth of the idea that the general scheme of the building should be such that all the work of the court can be carried on in the simplest and most straightforward manner. It makes no difference from which direction one approaches the building, there is always an entrance that leads directly to the large circular lobby in the center, around which all the elevators are arranged in one continuous ring. The court house, therefore, though monumental in character approaches in its practical details the business building type.

On the ground floor adjoining the entrance are important offices of the county clerk, the waiting rooms for the public and the general consultation rooms for the lawyers, with rooms for the press. On the floors above are the court rooms, there being one complete floor for the city courts and four floors for the supreme court. Above the court rooms are the library and dining rooms for the Justices and then adjoining a broad terrace overlooking the city and the harbor are the Justices' chambers.

A feature of the scheme is that separate elevator service for the public and the Justices is provided.

Each court has adjoining it rooms for witnesses and for counsel; also a gallery for the public and is amply lighted and ventilated both by windows on the outside and by windows in the interior light court. This arrangement is particularly advantageous as it provides in addition to the artificial ventilation ample natural ventilation and adequate protection against street noises.

Everything has been planned so as to make the saving of time all important and for that the circular form of building with its resulting compact scheme would seem to be particularly adapted.

Artificial Caen Stone Mantel, Merchants National Bank, San Francisco, by Sarsi Studios

The building itself covers about 120,000 sq. ft. of ground and the actual height to the Justices' terrace is 200 feet.

The architect was born in 1870 and is a member of the Lowell family of New England, he being a cousin of A. Lawrence Lowell, president of Harvard University, and of Percival Lowell, the astronomer. After graduation from Harvard in 1892, he studied for two years at the Massachusetts Institute of Technology, and then went to Paris to carry on his work in architecture at the Ecole des Beaux Arts.

Among his work is the new Museum of Fine Arts in Boston, the Emerson Hall at Harvard and the residence of the president of the university; the Cumberland County Court House at Portland, Me.; the country place of Clarence H. Mackay at Harbor Hill, the new Piping Rock club house at Locust Valley, Long Island, as well as several buildings at Brown University, Andover College and Simmons College. He also designed many private residences of note, including those of Harry Payne Whitney, C. K. G. Billings, and Paul D. Cravath.

Malabar Street School, Los Angeles
Withey and Davis, Architects

General Contractors Have a Grievance

ALLEGING that the officers of the First Trust & Savings Bank of Oakland have been guilty of a serious breach of business ethics in the handling of bids for the erection of a $100,000 building at Sixteenth street and San Pablo avenue, Oakland, the General Contractors' Association of San Francisco recently sent a letter of protest to the bank, and a few days later similar action was taken by the Oakland Builders' Exchange.

"Such tactics as you have followed have never been pursued by any bank or responsible institution in this city," say the contractors in this letter, "and we regret to have to place the matter in this light, as we regard your conduct as discreditable to the banking interests of Oakland."

The trouble grew out of the fact, as understood by the builders, that the bank officials have hired the P. J. Walker Company to erect the building on a percentage basis, after the cost of erection had been carefully figured out by nineteen competing contractors in response to a call for bids issued by L. B. Dutton & Co., architects, at the request of the bank.

An unwritten law among builders gives the contract to the lowest competing bidder. It is alleged that the Walker concern submitted no bids, but was given the order, and that the competing contractors, after twice figuring the work, estimating the costs and submitting bids, have been ignored. The bank officials disclaim all knowledge of the dissatisfaction of the contractors.

Present System of Estimating an Injustice to the Owner

Editor The Architect and Engineer:—A movement has been started to establish a new system of estimating in this country. I am writing you in the hope of actively interesting you in the campaign, and in the belief that you appreciate the inefficiency and wastefulness of the present method of estimating. The more efficient method we wish to establish is that of estimating on bills of quantities.

By way of introduction, I am going to set down a few familiar but, nevertheless, pertinent facts which serve to illustrate the compelling need of a change.

For each of the jobs costing $100,000 or more that are estimated in this country, there is an average of ten bidders. Following the law of averages, each bidder secures one of each of the ten jobs on which he submits estimates. The cost of preparing those estimates is charged to "overhead" and is distributed pro rata over all of the work actually secured. Therefore, the cost of estimating the nine jobs lost is charged against the one job secured. No matter what obscure system of bookkeeping is followed, in the last analysis, the fact remains that the owner of the tenth job pays the cost of estimating the other nine in which he has not the slightest interest. I need not point out to you the shameful waste of energy and money resulting from such a system.

The architect or engineer issues to these ten contractors the drawings and specifications for the job on which tenders are asked. Each of the ten contractors turns the drawings and specifications into his estimating department and the work of quantity taking is carried on, generally, under high pressure—since the time allowed for estimating is invariably much too short—and, with more or less difficulty according to size and complexity of the job, and according to the degree of completeness and clearness of the drawings and specifications. The estimate summary sheet of quantities is finally prepared and turned over to the men who price up. All ten bids are handed in and the contract is awarded to the "wildcat" contractor who has been unfortunate enough to have made an error in his computation of quantities. This unfortunate contractor is not in business for love or glory; so he immediately starts to see how he can make good his loss. He sizes the job up for extras. He takes advantage of every technicality in the specification and drawings. He "shops" around for his sub-contractors, if he is a general contractor, until he hooks a "sub" who, unfortunate like himself, has also made an error in quantities. The result is inevitable—the work suffers. It is an axiom that the owner never gets more than he pays for. Estimating under such conditions—estimating as it is done today—is nothing more or less than reckless gambling on the precision with which quantities are taken. As an after consideration, and as a matter of necessity the contractor is forced to resort to methods efficient and economical, if not ethically dishonest.

These statements of fact hold true with equal force as applied to any contract of any size awarded through the architect, no matter whether it embrace one or many classes of work.

Contractors have fallen into the habit of calling these unwholesome conditions "keen competition." They are deceiving themselves. There is no real competition on the basis of efficiency and ability, and there never can be while the present system, or lack of system prevails.

The few of us—which few I firmly believe will soon become an army working in harmony—have gravely set ourselves to work a change. We need your cooperation and support, and if you will interest yourself enough to think a little about the matter, your common sense, I am convinced, will swing you into the firing line where you belong.

We propose to establish in place of the present inefficient and wasteful methods, a system of estimating on bills of quantities; that is, the architect and engineer shall issue with his drawings and specifications a survey or bill of the quantities of the various classes and kinds of work and materials entering into the proposed construction. And the contractor shall set his prices against the various items in the survey. His estimate will then be a statement of the fixed amounts of money for which he will work the fixed quantities of materials in accordance with the requirements of the plans and specifications. Under such a system, estimating will become a competition between contractors in efficient methods and sheer ability. Efficiency will be rewarded. The careless, dishonest and inefficient contractor will be obliged to change his policy and methods or die of starvation. He will leave no mourners. If the ultimate quantities of materials actually entering into the construction vary from the quantities set forth in the bill or survey, constituting the basis of the contract, the money amount of the contract will also vary accordingly. There will be no disputes over extras and deductions resulting from changes.

The owner must assume full responsibility for the bill of quantities published with the drawings and specifications. Otherwise the ends sought will be completely defeated.

The quantity system of estimating will very naturally appeal most strongly at first to the contractor. The architect and engineer will find it necessary eventually to organize his office to prepare accurate bills of quantities; the owner to pay the cost. He does so now, indirectly, and it ought not to be difficult for the architect or engineer to convince him that he will pay no more, but in fact considerably less, since he pays for the estimating of his own job only and not for the nine other jobs as well which his contractor failed to "land."

The adoption of such a system will, indirectly, have another beneficial effect: it will impose upon the architect—and the implied criticism is, I regret to state, more fully justified in the case of the architect than in the case of the engineer—the necessity of following more precise and fairer methods in the matter of making estimates for payments; since all payments will be computed on the basis of units of materials worked times the unit price.

To establish such a system as that proposed, it is first essential that there should be a standard unit for the measurement of each and every class of materials entering into modern construction. It is in this connection particularly that we need your co-operation; and it is for the purpose of taking this intermediate step that the Association of United States Quantity Surveyors has been organized. We want you to become a member and to talk about the system and to secure as many converts as you can. If we can start people talking, we will succeed.

There is nothing new or revolutionary about the system of estimating on bills of quantities. It has been firmly established in the countries of the old world for years, as the result of discarding the very same improper and extravagant methods now in vogue in this country. In 1909, at a conference between the National Federation of Building Trades Employers, the Institute of Builders and the London Master Builders' Association, all of Great Britain, a resolution was adopted recommending that the members of these powerful organizations decline to bid in competition with one another unless bills of quantities were supplied for their use at the owner's expense. It would be well if some such concerted action were taken by the many contractors' organizations in this country, but that will come in due course.

The work of formulating the rules for measurements will be done by the Association through committees in each trade. The reports of these committees on standard rules for measurements, as they are adopted, will be established as standards throughout the country.

The officers, pro tem, of the Association are: G. Alexander Wright, San Francisco, Cal., president; Sullivan W. Jones, vice-president and treasurer, and Duncan M. Robertson, secretary.

SULLIVAN W. JONES,

110 Park Avenue, New York City.

* * *

The Skyscraper Problem

NEW YORK, where the skyscraper was architecturally born, has decided that this child of its necessities has gone about far enough in its heavenly aspiration. It has come to be more than suspected that a limit has been about reached to the height of buildings; that there are questions of public safety and health which thrust themselves sharply to the front, that must not be ignored.

It has been a conviction which has taken a strong hold on public sentiment that the manner of structural sky building has been run far beyond the rationale which inspired it. The immense relative values of realty in many business portions of the city naturally suggested utilizing the air-spaces. But when it comes to building fifty or sixty stories toward the zenith the practical philosophy of the question assumes a different aspect. New York has now 1136 buildings ten or more stories in height, sixty of twenty or more, nine of thirty or more, and three of fifty and upwards. It is in the air that a building project is now afoot, which if not forbidden, will top sixty stories. This would make a height probably of 900 feet, nearly the sixth of a mile above the surface of the ground. Other cities have followed the New York lead, if there is no imitation which quite equals the New York architects and builders in reckless daring. There is one business court in Chicago, however, where at high noon for half an hour only, the sun scarcely shines on merely one side of the street and the pavement would be shrouded in deep continuous dusk but for the electric lights. This is progress run to insanity, which is true also of a good deal of other alleged progress.

It is evident that a reaction has set in. Foreign cities, even where the land is enormously valuable, have never shown any desire to follow the American practice, and the cities which have pursued the same building pace have begun to set very decided limitation to the skyscraper, as a matter of public protection.—The Evening Post, New York City.

* * *

Some Facts About Granite

Granite is two and two-thirds times as heavy as water; its specific gravity is 2.663. A cubic yard of granite weighs exactly three-quarters of a ton. The strength of granite is tremendous, although the different granites vary greatly. Poor granites will withstand a pressure of 18,000 pounds to the square inch. Good, close-grained granite will withstand 30,000 pounds; but certain Wisconsin granites have withstood a crushing pressure of 43,973 pounds to the square inch—22 tons weight resting on a tiny cube of stone not much larger than a lump of sugar.

Why Architects Should Understand Mill Details

By JOHN WAVREK, JR.

PRACTICALLY every mechanic connected with the woodworking industries, and especially with the planing mill, is well aware that the majority of the so-called architects lack very much in the execution of practical details. I do not wish to say their detailing is executed badly, or does not look well—that is, in style and proportion—but I mean that most of them are not practical from the standpoint of the planing-mill man.

One will almost invariably find in the average details that the thickness of a doorjamb or sill is shown 2 in. exact, or a window seat will be drawn 1 in. exact. Then, again, a door is detailed 1½ in. or 1¼ in. An outside casing of a skeleton frame is shown 1¼ in. Very frequently cornice members—that is, the frieze or moldings—are drawn 1 in. exact, and so on.

Now, if the architect had worked in a mill sufficiently long to have gotten some practical knowledge as to how thick the different kinds of wood can be worked when dressed, I am sure he would not put down such impractical details. It should be well known that it is not possible to dress 1-in. stock on both sides to more than ⅞ in., and 1¼-in. stock will only work to 1⅛ in., while 2-in. stock is almost always dressed to 1¾ in. when finished.

Of course, the architect might say he could not afford to sacrifice his design or the outline of certain moldings, on account of ⅛ in. of wood, more or less. However, it seems to me he would be greatly benefited by making the sacrifice, because contractors would certainly demand his work in preference to the other fellow's, who will not depart one particle from his theory.

If one can believe half the statements which are discussed in the papers and magazines relating to the scarcity of lumber and the necessity of conservation of the forests, it would certainly be of great benefit to dispense with some theory, and use, instead, a little common sense, added to good judgment, and make details so that they can be used by the millman to advantage, besides relieving him of a lot of swearing about the draftsman who insists on drawing 1 in. when ⅞ in. would have answered the same purpose. Also, it would be no serious matter to substitute 1⅛ in. for 1¼ in. or 1⅜ in. instead of 1½ in., and so on along the whole register of sizes.

An illustration showing how very troublesome a wrongly detailed piece of work can become, is the following (and let me assure you it is almost invariably the case): The architect drawn up details of frames for a certain building. These frames are shown in section through side and head, having drawn in a 2-in. sash. When the mill foreman inquires of the draftsman whether it is positively necessary to have 2-in. exact sash, he will probably say that it does not need to be strictly 2 in., but that 2-in. stock should be used. This at once changes the detail because of the fact that there is a difference in the thickness of the stock, which only holds out 1¾ in., as stated before. This being the case, you must of necessity change the detail to conform with the requirements. The pulley stile, head and sill have to be narrower and the sash beads wider.

If the detail is not changed, then the machine man who runs the stock will be liable to make a very costly mistake and it becomes necessary to run the stock over again; this has happened more than a few times, to my knowledge.

Again, there are others of the architects who are familiar with the sizes of stock and will detail a 1¾ in. sash, but very seldom make any allowance for play, of which there should be about 3/32 in., for each sash, to allow easy working. In this case, also, it would be necessary to change the drawing, for the reason that the pulley stiles, head and subsill would be too narrow and the sash stop too wide. This error we also find quite frequently.

In my estimation it would be greatly to the benefit of the architect if he would get the necessary data from the lumber people, also a number of stock moldings which the large planning mills have on hand. By thus working with the mill, a great deal of trouble could be avoided and a state of harmony would prevail among all concerned.

* * *

A Plea for Harmony

By THOS. J. WELSH, Chairman of Publicity Committee*

YOUR committee takes exceptions to the words "quarreling" and "back-biting." It is a very serious charge to accuse men of this Chapter, who have been attending these meetings, who, over a good dinner and a cigar, have been holding social as well as professional converse and in strict compliance with Article II of the Constitution, viz.: to unite in fellowship the architects of California so as to promote the artistic, scientific and practical efficiency of the profession. Your Committee finds that Webster defines a "back-biter" as one who slanders, calumniates, or speaks ill of the absent. The language is, therefore, unjust, ungenerous and uncalled for. However, the members of this Chapter, being possessed of great big American hearts, and as the spirit of revenge nowhere lurks in their souls we forgive the gentlemen who took it upon themselves to reflect on the members of this Chapter through the press.

If it can be shown that we have been "unethical," and have acted contrary to the science that treats of the principles of morality and duty, moral philosophy and morals, then the members of this Chapter will, we are sure, express their regrets in person and not through the public press. But it is the old story of man's inhumanity to man, and will continue to the end of time, notwithstanding the sacrifices that individuals make for the cause of right and justice. The architect, Michael Angelo, and other distinguished men, were the victims of persecution and calumny, but sometimes there is a change of places. Life, all sunshine without shade, all happiness without sorrow, all pleasure without pain, were not life at all; at least not human life, since life is made up of sorrows and joys, and the joys are all the sweeter because of the sorrows. He who would live at peace with all other men must learn to bear and forbear.

In conclusion, let each member of this Chapter be true to each other, (and I have often repeated this expression), "for sincerity and truth are the basis of every virtue." Let each one feel that he is cultivating the vineyard of good architecture, notwithstanding the little differences, and be ready to present the Loving Cup to our brothers as the great Spartan lawyer, Lycurgus, did when he succeeded in bringing together his fellow citizens who were distracted by worldly and commercial interests.

Your Committee is now looking forward to the time when wisdom and good fellowship will prevail, when all differences are abrogated, and the loving cup will again be passed around, so constructed that the mud will sink to the bottom and only the purest water will come to the mouth of him who drinks. Let us live, all, with equality and friendship of co-heirs and brothers, and allow virtue only to be pre-eminent, as if there were no difference or inequality between one man and another.

*San Francisco Chapter, A. I. A.

Among the Architects

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Next Convention City—Seattle.

Save Old Hall of Records

The Outdoor Art League of San Francisco believes that the present Hall of Records building should not be torn down when the new City Hall is built, but should be preserved at its present location because of its historical associations and as a possible depository for articles of interest. It is suggested that there will be many gifts by foreign countries as well as States of the Union to the exposition that might fittingly be preserved there.

WORK IN ARCHITECTS' OFFICES

SAN FRANCISCO

WILLIS POLK AND COMPANY, Merchants Exchange Building, will shortly award contracts for the construction of a ten story addition to the Mills Building at the corner of Bush and Montgomery streets. The same firm is completing the working drawings for a twenty story class A office building to be erected by the Hobart Estate on the site of the old Postal Telegraph Building, Market street near Montgomery. The building will be of cream color stone and white terra cotta and will cost one million dollars.

EDWARD H. DENKE, 1317 Hyde street, has completed plans for a three-story and basement frame, plaster and brick veneer residence flat building to be erected on the south side of Sutter street west of Webster for Dr. Matilda A. Feeley. Building will cost about $10,000.

ARCHITECT W. C. HAYS, Foxcroft Building, has recently let a contract for erection of a two-story, basement and attic frame and plaster fraternity house in Berkeley for the Alpha Tau Ometa Society at a cost of about $20,000.

ARCHITECT JULIUS KRAFFT & SONS, Phelan Building, have drawn plans for a two-story and basement frame store building to be erected on the northeast corner of Polk street and Austin avenue for the Wright Estate. The cost will run in the neighborhood of $10,000.

ARCHITECT FREDERICK H. MEYER, Bankers Investment Building, has over one million dollars worth of work on the boards and in course of construction, including a $200,000 apartment house for the Schmeidell Estate; a $250,000 physicians' building to be erected on Sutter street for the Trowbridge and Perkins' interests; a $100,000 residence for Mr. Fleishhacker; several power stations for the San Francisco Gas & Electric Company and an automobile sales building of reinforced concrete to be erected at the corner of Van Ness avenue and Geary street at a cost of more than $75,000.

ARCHITECTS RIGHETTI & HEADMAN, Phelan Building, have let contracts for an addition to the residence of Angelo J. Rossi on Union street and have just completed plans for a three-story and basement frame apartment house to be erected at the corner of Green and Montgomery streets for C. Fabilla. Estimated cost, $12,000. The same firm are also working on plans for a laundry building in Oakland.

ARCHITECTS DUNN & KEARNS, Monadnock Building, have completed plans for a six-story and basement Class A apartment hotel to be erected on the northeast corner of Polk and Leavenworth streets for George M. Caesar. The building will be one of the finest equipped apartment houses in the city and will cost close to $200,000.

ARCHITECTS SHEA & LOFQUIST, Bank of Italy Building, have completed plans and taken bids for the new Sacred Heart College, a three-story Class C structure to be erected on Franklin street and to cost in the neighborhood of $100,000. The same firm have let a contract for the erection of a two-story frame parochial residence in Petaluma for St. Vincent's Parish, Rev. J. Leahy, pastor.

ARCHITECTS HAVENS & TOEPKE, Maskey Building, San Francisco, have recently let a contract for a $15,000 frame and plaster residence, to be erected on Laurel avenue, San Mateo, for George C. Ross.

ARCHITECT G. A. LANSBURGH, Gunst Building, is about ready to take figures for a $300,000 Class A theater to be erected in Kansas City for the Orpheum Circuit. Playhouse will seat 2350 persons and construction will be of steel, concrete and terra cotta. The same architect has let a contract to Macdonald & Kahn for a one-story Class A addition to the Sanford Sachs Building at 140 Geary street. Mr. Lansburgh has also let contracts amounting to about $60,000 for the construction of a Jewish Synagogue.

ARCHITECTS BAKEWELL & BROWN, 251 Kearny street, have completed plans for a Class B wholesale grocery house, also plans for a two-story mill construction warehouse at Spear and Howard streets for Orville Pratt Jr. Plans have also been completed for a $20,000 residence for Mr. Miller.

ARCHITECT W. G. HIND, Maskey Building, has let a contract for a three-story and basement frame brick veneer apartment house to be erected on the west side of Mason street south of Broadway for Mrs. Sarah Pickard and to cost about $15,000.

ARCHITECTS WARD & BLOHME, Alaska Commercial Building, have made preliminary sketches for a twelve-story Class A physicians' building to be erected on the northeast corner of Post and Powell streets at an estimated cost of $1,000,000. The property is owned by Abby M. Parrott.

ARCHITECT MILTON LICHTENSTEIN, 111 Ellis street, has recently let contracts for alterations and an addition to the residence of Judah Boas at 2221 Pacific Avenue. The work will include considerable hardwood finish, pressed brick fireplaces, brick veneer exterior, new plumbing, etc.

ARCHITECT CHARLES S. KAISER, 57 Post street, has completed plans and the contract has been signed to the Ransome Concrete Company for a ten-story reinforced concrete store and office building to be erected on the southwest corner of Fourth and J streets, Sacramento, for the Merchants Investment Company. The building will be largely occupied by the various fruit interests of Northern California. The estimated cost is $125,000.

OAKLAND

ARCHITECT EDWARD B. SEELY, 2615 Etna street, Berkeley, is preparing working drawings for a ten-story and basement steel frame and concrete hotel to be erected on Sixteenth street, between San Pablo and Telegraph avenue, Oakland, for Frank W. Bilger. Building will contain one hundred rooms and will cost $150,000.

BERKELEY

ARCHITECT JAMES W. PLACHEK, 1424 Spring street, Berkeley, has completed plans for a $15,000 bungalow style church to be erected at Cedar and Walnut streets, Berkeley, for the West Berkeley Methodist Church. An illustration of this building is shown elsewhere in this issue.

MENLO PARK

ARCHITECT C. J. I. DEVLIN, Pacific Building, San Francisco, has completed plans for a three-story Class A addition to the Sacred Heart Catholic school at Menlo Park. The cost will run close to $100,000.

SAN MATEO

ARCHITECTS MAYBECK & WHITE, Lick Building, San Francisco, are taking figures for the construction of a handsome country residence in San Mateo county, for Frederick C. Kohl, the San Francisco capitalist. The same firm has recently let a contract for a $10,000 residence to be erected in San Mateo for Julius Brown.

Architecture and Engineering at the Panama-Pacific Exposition

Theodore Hardee, who was the general secretary and also the director of exploration for the St. Louis World's Fair, has been appointed chief of the Department of Liberal Arts of the Panama-Pacific Exposition. The exhibit in this department will include architecture and engineering. The work shown will include drawings, models and photographs of architecture and engineering in their various branches, plans followed in the improvement of rivers and harbors, water works and sanitation, irrigation and road making methods, specimens of artificial stone and kindred building material, processes used in testing structural materials, and special contrivances for safety, comfort and conveniences in buildings.

Among the most interesting exhibits in modern architecture for study and admiration here in 1915 will be the splendid structures and landscaping of the Exposition itself and the remarkable reconstruction of the City of San Francisco. In engineering the crowning achievement is the Panama Canal, which will be illustrated by working models. These exhibits will be housed in the Palace of Liberal Arts.

Sacramento Architects Have Grievance

J. Fontaine Johnson, on behalf of the Sacramento Society of Architects, has filed a protest with the Sacramento City Commission objecting to the selection of Architect J. J. Donovan to draw plans for the Oak Park School without resorting to competition.

No indication of a change in procedure was manifested when the matter was discussed by the commissioners. Attorney Johnson says legal proceedings will be commenced.

Architects Who Will Participate in Library Competition

The San Francisco Board of Library Trustees has invited the following named architects to submit plans for the new library building to be built in the Civic Center at the corner of Larkin and McAllister streets: George W. Kelham, Reid Bros.; Albert Pissis, Ward & Blohme, Willis Polk & Co., Edgar A. Mathews.

Polk is a Live One

Willis Polk & Company, already carrying one of the largest and best organized architectural forces on the Pacific Coast, have established a Publicity Bureau in charge of Mr. Harwood, formerly of the Chronicle staff. This explains why the daily press has been using so much feature stuff lately about the Polk organization and its several million dollars worth of construction work.

A Marvelous Building Record

Since the fire of 1906 the San Francisco Board of Public Works has granted 50,000 building permits, representing an investment of $225,277,000 in private building enterprises. In addition money expended for public buildings including federal, state and city governments will bring the total investment up to approximately $400,000,000.

Girls' Orphanage for Southern California

Architect J. Martyn Haenke has returned from the East where he visited the orphanages and allied institutions in and about New York City and all the eastern and middle western States, collecting data for the new Canfield Orphanage to be built near Beverly Hills. It is Mr. Canfield's desire to build the most up-to-date and efficient orphanage for girls, and Mr. Haenke has been commissioned to prepare the plans. The home will accommodate 500 or more girls.

San Diego Architectural Club

The San Diego Architectural Club has opened its new quarters in the Isis theater building, for the general study of architecture and the building arts. The Beaux Arts competition has already commenced, and general classes and lectures will be in progress throughout the year.

The officers of the club are James W. Corking, president; F. Hodgsdon, vice-president; Ernest Flores, secretary; H. Vaughan and Mont. Fernbach, directors.

Don MacMullen and H. Vaughan have been appointed class committee.

Architectural League's New Officers

At a meeting of the Architectural League of the Pacific Coast held last month in Portland, Ore., the following officers were elected for the ensuing year: Carl S. Gould, Seattle, president; Myron Hunt, Los Angeles, vice-president; J. F. Cote, Seattle, secretary; W. C. Hayes, San Francisco, treasurer. Seattle was chosen as the next place of meeting.

Personal

The architectural firm of Parker & Kenyon of San Francisco has dissolved partnership. Mr. Walter Parker remains in charge of the San Francisco office and Mr. Kenyon has removed to Sacramento.

Architect A. Wesley Eager, of the firm of Eager & Eager of Los Angeles, has been enjoying a trip East which included a visit to his former home at Hamilton, Ontario, Canada. The return journey to Los Angeles will be by way of South America, stops being made at all of the larger cities and interesting places.

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LIMITING THE HEIGHT OF BUILDINGS

Anent the agitation of the question of limiting the height of buildings in New York, and other large cities, it is interesting to note the places where, under municipal or state laws, a limit has been placed on the height to which buildings may be erected. The list includes:

Baltimore—Fireproof buildings limited to 175 feet and non-fireproof buildings to 85 feet.

Boston—Two and one-half times the width of the street, the maximum being 125 feet.

Buffalo—No height greater than four times the average of least horizontal dimension of the building.

Chicago—An absolute limit of 200 feet.

Cleveland—Two and one-half times the width of street, with maximum of 200 feet. Recesses or set-backs to be counted as added to the width of the street.

Denver, Colo. — Not to exceed 12 stories and those more than 125 feet to be fireproof.

Jersey City, N. J.—No building or structure except a church spire shall exceed in height two and one-half times the width of the widest street upon which it stands.

Los Angeles, Cal.—A limit of 150 feet.

Newark, N. J.—Not to exceed 200 feet.

New Orleans, La.—The height at the street line shall not exceed two and one-half times the width of the widest street which the building faces. Set-backs are to be counted as added to the width of the street.

Paterson, N. J.—Warehouses and stores must not exceed 100 feet in height.

Portland, Ore.—All buildings except churches are limited to 150 feet.

San Diego, Cal.—A limit of 150 feet.

Scranton, Pa.—The limit is placed at 125 feet.

St. Louis, Mo.—On streets less than 60 feet the limit is two and one-half times the width.

An act has been drafted in Pennsylvania "to empower cities to create from one to four districts within their limits and to regulate the heights of buildings to be thereafter constructed within each district." The act is thus based on the principle which was upheld by the Supreme Court of the United States in the Boston case of Welch vs. Swasey. The preamble of the act states that it is designed "to protect the health of the citizens. * * * and to promote the safety of public and private property." A maximum height limit of 250 feet is named in the act, but a lower limit may be placed, and the act explicitly declares that "in prescribing the regulations for any district, the city may fix either an absolute limit of height for the whole or a part of a building based upon the width of the street or streets upon which it abuts."

Any owner who contemplates erecting on any given street a building which by its very size and nature will attract more people and more business to that particular portion of the street than it can reasonably be expected to accommodate should be made to furnish a somewhat adequate amount of space, or rendezvous, in front of it. D. Knickerbacker Boyd, the Philadelphia architect, suggests that the height of buildings erected on an established building line should be limited to one and one-quarter times the width of the street or open space upon which the structure faces. This would give on a street 50 feet wide a 62½-foot high building (if erected at the usual building line), which would be equivalent to a six-story building used for residence or office purposes or a five-story light manufacturing establishment. Any building taller than this initial height should then, he thinks, be so set back that the cornice or top of its perpendicular face shall not extend above an imaginary line, which might be called the "building and height line." If this imaginary diagonal be drawn from the curb of any of these streets, assuming the sidewalk to be one-quarter the width of the street to the top of any building which is the limit of height above mentioned at the normal building line, and continued into space, it becomes the line of restriction. Thus to go up one must go back. This scheme, therefore, forces the entire perpendicular face of the building back from the curb in a fixed proportion to each additional story the building may go up, which can be roughly figured upon as a two-foot increase in the width of the sidewalk for each ten-foot story above the initial height.

There is this to be said for Boyd's scheme, as compared with the idea of permitting above a given height only tower construction which shall use but a small part of the floor area, that the unused ground area is now placed where it is of public value.

Eaves of Gold? Oh, My!

From the Southwest Contractor.

We do not know in which branch of the art of structural fabrication it is that San Francisco has put one over on us—whether in that of an innovation in cornice making in fact, or in the fabrication of a pleasing boast. In one or the other, the Bay City has gone us one better, for report is being spread broadcast over California through the medium of the daily press that San Francisco is to have a house with cornices of beaten bronze heavily plated with pure gold. It is said that these golden eaves are demanded by James H. Flood for his new residence, in the structure of which richly carved Venetian marble is to play a prominent part. We had always thought it was the plumber who in popular opinion was supposed to equalize his materials and the coin of the realm by weight for weight measure. Is the cornice maker now to claim the same popular reputation?

Why San Francisco's Building Record Is Not Larger

A communication was recently sent to the San Francisco Supervisors by the Chamber of Commerce requesting that the building ordinance be so amended as to require building permits to be taken out for municipal or public buildings, as is the general custom in other cities.

Under the local system, where permits are required only for private structures, the record of the amount of building construction in the city is incorrect, to the detriment of the city's reputation for progress and building activity.

It is pointed out by the Chamber of Commerce that the building contracts for municipal buildings alone in the last three years amount to more than $7,000,000, none of which shows in the record of the building permits, by which building operations are judged.

Personal

Architects John P. Krempel and J. E. Kunst of Los Angeles attended the Thirty-first Annual Bundesturnfest held in Denver last month. Upon returning they visited Yellowstone Park and the Grand Canyon.

State, County and Municipal Engineering

Good Roads—Water—Sewers —Bridges—Fire Protection

Method of Constructing a High Retaining Wall in Trench in a Narrow Side Hill Space

RATHER difficult conditions in respect to limited area and inaccessibility of working space prevailed in the construction of a high and thin retaining wall at Toronto, Canada. The accompanying sketch indicates fairly the construction required and the following description is condensed from an article by C. S. L. Hertzberg, consulting engineer, Toronto, in "Applied Science" for May, 1913:

Figure 1 shows a section of the Canadian Pacific Ry. reinforced concrete retaining wall on the south side of Front street, between Bathurst street and Spadina avenue, Toronto. This wall protects the Canadian Pacific Ry. track which leads up to the company's new freight sheds on the old Government House property. The track parallels the wall on the south side of it, rising from an elevation of about 20 ft. below Front street at Bathurst street to the street level at Spadina avenue, where it crosses Front street on the level. The wall is about 2,000 ft. long and varies in height from 22 ft. at the Bathurst street end to 8 ft. at the Spadina avenue end. The lack of space on which to carry on construction work made the execution of the contract considerably more difficult than would otherwise have been the case. The strip owned by the Canadian Pacific Ry. was about 14 ft. wide and was all on a steep slope from the elevation of Front street on the immediate north to that of the Grand Trunk yard immediately south. The wall itself was built with the face on the south line of Front street. The base of the wall at the deepest part projects under the track of the Toronto Railway Co., which runs along the south side of Front street. From this it will be seen that there was no room to operate on the north of the wall excavation, while, to the south the ground sloped sharply down to the Grand Trunk tracks.

The material to be excavated was the very hard blue clay found in that locality. As there was in the neighborhood of 10,000 cu. yds. of excavation to be done, it was decided to use a steam excavator for the deepest sections, while the shallower part of the trench was taken out by hand labor.

The Toronto Railway Co. was approached with a view to getting them to abandon their southerly track for certain hours of the day, in order to allow wagons to be placed on the track for the removal of the excavation. The railway company, however, would not consider any such plan, and a temporary plank roadway had to be built out over the bank to allow teams to approach the excavator. Here they were loaded from the Harris orange-reel machine which straddled the trench on a temporary track. The machine dug a trench about 10 ft. wide at the rate of about 120 cu. yds. per day of 10 hours, under the most favorable conditions.

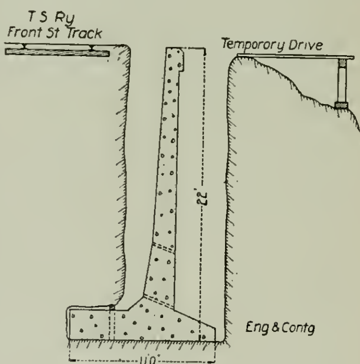


Fig. 1—Sketch of Retaining Wall Built in Trench. Canadian Pacific Ry., Toronto

The temporary roadway was so narrow that several teams fell down the bank to the Grand Trunk tracks and one horse slipped out of his harness and fell 20 ft. to the bottom of the excavation. This horse reported for duty next day after having walked out on a ramp built for the occasion.

Fortunately the blue clay was very stiff and stood up well with comparatively little shoring, until the excavation was made for the toe of the wall, which projected under Front street and under the south rail of the Toronto Ry. tracks. The bottom of the trench was prepared to receive the concrete before the undermining for the toe was commenced.

The undermining extended inwards about 5 ft. from the face of the trench at the deepest part. As this undermining left an unsupported overhang of earth about 20 ft. deep, along which street cars were continuously running, great care had to be taken in carrying on operations. This work was done in the early part of last summer during which we had an unusual amount of rain, increasing the danger from cave-ins. The undermining was done in sections about 12 ft. in length, after which the base was immediately poured and the concrete tamped in under the overhanging clay. A whaling piece of timber, 6 ins. square was also placed under the edge of the overhang and supported with uprights. No attempt was made to recover these timbers. The framework for the shaft of the wall was then erected to about 6 ft. above the top of the footing, and the cross braces were removed to this elevation. The wall was then poured to this height. After this had been allowed two days in which to set, and while the next 6 ft. of forms were being erected, the bottom 3 or 4 ft. of the north face was stripped and painted with tar and asphalt. Then a backing of 12 ins. of head size stone was placed against the wall and the excavation was filled to this level at the back of the wall.

This process was continued until the level of the under side of the coping was reached. For the coping, special forms were made in sections which were shifted for each section. By pouring the coping last it was possible to line it in independently of the face of the wall and thus any irregularities were overcome. It may be of interest to state that the average cost of this wall ran about $25 per lineal foot, including excavation, backfill and a pipe railing along the top.

California State Highway Policy

In bonding itself for $18,000,000 for a state highway system without restrictions as to the time in which the money should be expended, California adopted a bold and unique program. Other states had heretofore voted even larger sums for public road improvement, but with the proviso that the money should be disbursed in installments over a long term.

California's venture in state highway building is distinguished by still another radical departure from the methods of other states in that the highways act itself, which the people adopted when they voted the $18,000,000 bonds, practically determines within narrow lines the location of the two main trunk roads for which it provided.

In other states, after the bonds were voted, the matter of locating the state roads has usually been left to some commission or advisory board.

Many of the eastern states have adopted the state aid method of encouraging the various counties to improve the public highways. A bonus, varying from $250 to $1,250 per mile, according to the character of road, is paid by the state upon proper proofs. By this system those counties that are most enterprising get the most road "benefits." There is no mandatory road construction, and in practice, desultory and scattered work is the result.

The California plan, whereby the state makes available its funds as rapidly as they may be utilized, and plans the work as a magnificent whole and to be prosecuted as one great enterprise, commends itself as the wisest and most progressive.

The Bulletin, in its October issue, published the full text of Attorney General U. S. Webb's opinion as to the meaning of the State Highways Act. Any one who has read the act itself with any degree of attention could not have been surprised at the Attorney General's findings. The framers of that act clearly contemplated that the State should proceed to construct two main or trunk roads throughout the length of the state, one along the coast and one up and down the two great valleys, Sacramento and San Joaquin. The act specifically declares that these trunk lines shall be laid out by the "most direct and practicable routes," and that the county seats of such counties as may lie east or west of the said trunk lines shall be connected by laterals.

The law very explicitly limits the discretion of the Commission in the matter of locating these highways, but gives it unchecked freedom in the manner of spending the money and the time in which it may accomplish the work. In routing the state highways, the California Highway Commission has studiously undertaken to comply with the provisions of the State Highway Act.

Glenn County Stony Creek Bridge

The bridge to be constructed over Stony Creek, near Orland, in Glenn county, on the route of the California state highway, will be one of the largest concrete bridges in the United States. The plans and specifications for this bridge were adopted as the result of a competitive examination, and were prepared by Daniel Luten.

These plans provide for a structure twelve hundred feet long composed of thirteen monolithic concrete arches, varying in length of span from seventy to one hundred feet. It will have a twenty-four-foot clear roadway composed of a concrete base with a two-inch asphalt wearing surface.

The concrete foundations are carried, approximately, twenty-five feet below the bed of the stream, at which depth thirty-foot piles will be driven as a further support. The bridge is designed to carry a uniform load of one hundred and fifty pounds per square foot over the entire floor surface, and a concentrated load of twenty-four-ton road roller. However, the bridge, considering the factor of safety, is designed to carry four times these loads.

It is to be built well above high water, but the designer states that in case of a flood it would stand the test of being entirely submerged. Mr. Luten states that over two thousand concrete bridges of the same design were in the recent Ohio and Indiana floods, and although three thousand bridges were destroyed, not a bridge of this type was seriously injured.

While strength and permanence are essential features in the design of the Stony Creek bridge, the artistic elements are not forgotten. The long, graceful curves of the arches will be surmounted by an ornamental concrete railing in harmony with the balance of the structure.

It is estimated that this structure complete will cost $145,000. Construction work will begin in May, 1913, and it is expected that the bridge will be ready for traffic by December of this year.

Build the Roads for the Traffic to Come

The most important question in road design and construction at present is that of the character of the traffic which will be developed over the new road when it is built. Many miles of improved macadam and gravel roads were built by the first state highway commissioners at heavy expense which were fully adequate for the traffic of the day. But the automobile developed into a practicable fast-moving vehicle which proceeded to tear these roads into pieces. Many miles of these roads have received additional treatment or have been more or less completely rebuilt at large additional expense to carry this new traffic.

And now, over these new roads comes a new development of automobile travel, the truck, with or without its trailers, and demonstrates the necessity for still better roads than it has been customary to construct.

Each change in traffic conditions has been contested by means of laws regulating the use of the roads, and each new class of traffic has been assessed what was thought to be its share of the increased expense of maintaining the roads in good condition.

The theory seems to have been that the traffic must be regulated to suit the road over which it must go. But that theory is wrong, as the most progressive commissioners and engineers have long recognized, and the true theory on which we should proceed is that the road must be built to carry the traffic which comes to it. So those states which are just beginning their modern road improvement must consider, in making the design of a road, not what its traffic is at present, but whether the improved road will have a small amount of ordinary farm traffic, a larger amount of such traffic on its way to market and gathered up from the neighborhood roads, a through traffic of fast-moving automobiles, horse-drawn or motor-drawn heavy traffic, or combinations of one or more of these.

The main roads are those which are most difficult to care for, and it is each year becoming more evident that they must be built with foundations heavy enough to carry any loads which the new traffic can bring to them, and must at the same time have surfaces good enough to withstand lighter rapidly-moving vehicles.

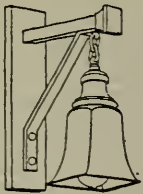
To Make "Goat" Island Railroad Terminal

In a communication which Leo. V. Merle, Jr., Secretary of the State Board of Harbor Commissioners, has addressed to the Legislature suggestion is made to Governor Johnson and the lawmakers of the state that Congress be urged to initiate and prosecute legislation to the end that Yerba Buena Island in the Bay of San Francisco, commonly known as "Goat Island," be ceded by the National Government to the State of California.

It is proposed to convert Goat Island into a great union terminal for transcontinental and other railroads, according to Merle's letter. The Harbor Commissioners are on record as saying that the transfer of the island to the state will be of inestimable value to the port of San Francisco, to the traveling public of the whole country, to the people of California and particularly to the residents of the counties bordering on the bay.

Competent engineers have said it is entirely practicable to connect Goat Island with the Alameda shore, either by a solid causeway, or by a causeway and bridge, within a cost amply justified by the size and importance of the undertaking. The present use of the island as a naval training station by the government is an extremely limited use, "utterly out of proportion to the real value of the island," is measured by the larger possibilities, says the communication.

The further argument is made that the use of the island as a railroad terminal will permit the running time of the ferry service between San Francisco and Alameda County to be cut down more than two-thirds, and also greatly reduce the chances of collision in foggy weather.



Heating and Lighting

Plumbing and Electrical Work

Profits in Plumbing Business

The matter of profit in business is important in many ways, and it is profit that makes any business worth while. That being true, the plumbers of a community cannot ignore the way any of the members conduct their business. The actions of one are the actions of all in that one plumber quoting low prices will demoralize prices in that place, in spite of what the others might do, individually, to prevent it, says "Construction News." The thing to do, then, is to prevent the cutting of prices. Apply preventive measures in business the same as we do in sanitation, by teaching the merchant plumbers, new and old, how to successfully conduct a business.

Nobody cuts prices because they want to make a small profit in preference to a large one. Something is radically wrong when prices begin to fall, and the thing to do then is to find out what is wrong and right it. Lend a helping hand and steady the whole line. Do not treat the price cutter as an enemy, an outcast; he is an unfortunate, striving to do right, ambitious to better his condition and yours. Meet him half way and show him how. Educate him, enlighten him, make a good business man of him and he will never cut prices again. Until the educational authorities make it possible for the plumber to receive the necessary help through the logical channel, each community can do much towards bettering their own conditions, and they will be better citizens for their efforts. In every city there are successful business men who are public-spirited citizens, willing, able and glad to help others. At no expense whatever a series of talks could be arranged to be held in the rooms of the association. In the large cities, the jobbers would lend their aid to the movement, while in the smaller cities the scope could be broadened to take in merchants in other lines of business.

There are bankers a-plenty who would be glad to talk on banking, interest, discount, notes, loans, deposits, collections and various other banking subjects vital to the business man. The railroads would gladly send a representatve to make simple many of the mysteries of transportation, delays, claims, losses, breakage, rates and many other subjects. Lectures on salesmanship, advertising, display, buying, insurance and the thousand and one branches making up modern complex business methods could be arranged.

The Abuse of Plumbing Fixtures

Quite recently the writer had occasion to watch closely the installation of a decorated exterior tub, of the type which tiles into the wall and floor. The tile setter and plumber were requested to handle the fixture wth care in order not to mar the outside finish.

The tile setter followed instructions admirably, even going so far as to fully cover the fixture inside and out with a large tarpaulin, in order to prevent its being splashed. When he had finished his work the tub was perfectly fresh and clean, but after the plumber had put on the brass fittings there was an entirely different story.

The end of the tub on which the supply and waste fittings were installed was entirely covered with the marks of greasy fingers and hands and there were several deep scratches in the outside finish, indicating that his wrench had slipped or was carelessly permitted to rub against the tub.

The condition of the tub was really distressing after the plumber took his leave, without even trying to restore it to its original condition.

It is universally agreed that a good job of plumbing is the plumber's best advertisement. On this particular job the piping system indicated the best of workmanship, but the installation of the fixtures was quite the opposite, and it was the result of nothing but pure carelessness and indifference. The owner was left with anything but a good impression and the chances are that he would not employ the same plumber in the future.

San Francisco Society of Architects

The San Francisco Examiner, under date of June 16, prints the following:

Wearied of the quarreling and backbiting which has marked the history of the San Francisco Chapter of the American Institute of Architects, a coterie of two dozen designers of this city and the surrounding bay community have organized something new—the San Francisco Society of Architects—whose watchword is peace with a capital "P." No troublemakers, say they, need apply.

The charter members of the new association explain with much detail that they are not organizing in opposition to the local chapter of the institute; they have no desire to affiliate with any architectural association with a national standing. All they want is good company, congenial spirits who will get together over a good dinner and a cigar and hold social, as well as professional converse.

In the new organization are John Galen Howard, John Reid, Jr., and Frederick H. Meyer, the three members of the city's consulting architects who incurred the wrath of the local chapter of the American Institute of Architecture a few months ago over the manner in which the City Hall architectural competition was conducted, and who were, in consequence, made to defend themselves against charges preferred by their artistic associates. These charges were sustained at a trial held by the Chapter, but, so far, nobody has been expelled from the organization.

So great has been the friction, however, and so sharp the dividing line between the two factions, that those supporting the consulting architects and those opposing them and their alleged "unethical" methods, that it was only natural that some offshoot of the original organization should result.

In the list of members also are Willis Polk, George W. Kelham, Louis Christian Mullgardt, Charles Peter Weeks, Lewis Hobart and Houghton Sawyer. There have been two meetings of the society.

Rigid Law Now Suggested for Use of Cement in Los Angeles

J. J. Backus, chief inspector of buildings has asked the Board of Public Works to recommend changes in the building ordinance requiring: First, that no concrete for reinforced concrete in buildings be mixed or poured except in the presence of an inspector working under the jurisdiction of the department, the inspector to receive his remuneration from the owner of the building; second, that all test reports be made on blanks furnished by the department and sworn to by the person making the test that it was made in conformity with the city ordinances and the provisions adopted by the American Society of Testing Materials. The Board of Public Works, under whose jurisdiction the building department works, adopted Mr. Backus' request and sent it on to the City Council for action.

Mr. Backus explains his position in his communication to the Board of Public Works, which was as follows:

"I respectfully beg to recommend to your honorable board that Ordinance No. 19,900 (New Series), generally known as the 'Building Ordinance,' be immediately amended so that its provisions will make it unlawful for any person, firm or corporation, either as owner, architect, contractor, superintendent, foreman, or in any other capacity, to do any mixing or pouring of concrete in a reinforced concrete building or other reinforced structure or in any reinforced concrete in a reinforced concrete building or structure except in the presence of an inspector under the jurisdiction of the Board of Public Works.

"Further, that this same ordinance provide that the inspector be paid by the owner, or other person or persons erecting or constructing any of the above mentioned work.

"Also that the ordinance be amended so that all cement test reports required to be filed with the Board of Public Works be made out on blanks furnished by the building department, such reports to have thereto attached an affidavit setting forth that the person making the affidavit, personally made for the test or caused the same to be done under his direct supervision, and that it was made in conformity with the provisions of the ordinances of the city of Los Angeles, and in accordance with the provisions adopted by the American Society for Testing Materials. Or, in lieu of this latter provision, I would suggest that the ordinance make it mandatory that all cement used on reinforced concrete buildings and structures or other reinforced concrete work be made by the city cement tester, and that such charges be fixed for the making of these tests as will be necessary to recompense the city for the extra help that will be required.

"My reasons for these changes are that with the number of reinforced concrete jobs now going on in the city, and the number of inspectors that this department has for this kind of work, it is impossible to have an inspector on the job at all times when mixing and pouring is being done, and I am firmly of the opinion that it is very essential that no mixing or pouring should be done only when an inspector under the jurisdiction of the Board of Public Works is there to see that the proper proportions of cement, rock and gravel be in the mix, and record the date of pouring, as well as to ascertain if the proper amount of steel has first been put in for reinforcement.

"In reference to the second recommendation: As the ordinance is at the present time almost any one can do cement testing, and in some instances young men who are acting as night watchmen on jobs do the testing and they neither have the knowledge nor proper equipment for doing same, and the ordinance does not require that they make affidavit, so, therefore, no one assumes the responsibility for the correctness of the cement test report, and we in a measure have to accept the report of any one who will sign his name as a recognized cement tester, the ordinance not defining what a recognized cement tester is; and I believe that requiring oath to these reports or having the city do its own cement testing, will eliminate a great element of danger."

Praise for a Santa Cruz Architect

The urban architect, like the big city architect, has his "ups and downs." Usually it's the unpleasant things that the architect hears about himself but in this case the rule is reversed. Listen to this splendid eulogy from the Santa Cruz Sentinel:

D. Esty is some architect. That's the sum and substance of it, and there is no denying the fact. He found the Sentinel block to be composed of a group of buildings of varying types of architecture and of no type of architecture, mostly of the latter type. He was told to unify all those buildings into one structure, to fill in the gaps where there was no building, and transform it all into harmonious Mission architecture. He smiled, said little and went to work. He dreamed on the subject, in fact, had a series of nightmares, but as he said nothing and kept busy, his friends did not disturb him.

The Hotel Alexander block is now practically complete. Most of the carpenters and all of the plumbers have packed their kits and gone fishing, or to labor in pastures new. * * *

Europeans are wont to decry American buildings as resembling a row of drygoods boxes in design, showing no broken roof line, no variation from the typical dull uniformity of sky line. If there is merit in this sharp and general criticism, Mr. Esty has won a point in this regard. A good architect can sometimes build an entirely new building so that it is beautiful in its lines, but it takes an unusually good architect to create the desired results when he is limited to the lines of old buildings, already on the ground, which can only be altered with great difficulty.

The interior of the new building is as attractive as the exterior, and it is extremely convenient as well. A general criticism is that Mr. Esty has created the desired results.

Polk & Company Relieved at Sacramento

The following is from the Sacramento Bee:

At a conference of the City Board of Education, which was attended by Frederick Whitton of Willis Polk and Company of San Francisco, advisory architects to the Board, and J. J. Donovan of Oakland, who was awarded the contract for drawing the plans for the Oak Park School, the relations heretofore existing between the city and Willis Polk and Company were severed.

Donovan opened the meeting by asking that he be relieved from all association with the Willis Polk people, in connection with the plans for the Oak Park School. He announced his ability to draw plans without being subjected to unnecessary consultations with supervising architects.

Architect Whitton alleged Donovan had turned over the work of drawing plans for the Oak Park School to a subordinate. He waxed sarcastic in his remarks.

The Board unanimously agreed to relieve Whitton of any connection with the Oak Park School plans, whereupon Whitton presented the resignation of Willis Polk and Company as advisory architects to the Board in connection with other school plans. It was accepted.

Polk Goes Abroad

Willis Polk left San Francisco the latter part of June on a two months' tour which will take him to England, France and Spain as special Portola commissioner.

In Spain he will make a study of features which it is planned to embody in the fiesta. These include the reproduction of phases of Spanish life contemporary with Balboa, the discoverer of the Pacific, who is the central figure of the 1913 celebration.

Polk will go to the lakes of Killarney, which are now part of the estate of Arthur Vincent, who married Maud Bourn, daughter of William B. Bourn. He will inspect Muckross Abbey, recently bought by the Vincents, with a view to its restoration.

In Paris he will confer with the Francis Carolans regarding changes to be made in their chateau near San Mateo.

Good-Looking vs. Serviceable Concrete Floors

Appearances are sometimes deceiving, even in concrete. A fine-looking concrete floor is not necessarily one that will wear well. A nice appearance is given to a concrete floor by the use of small particles of sand and pebbles in the finish coat; but these break down. For long service, the best floor is one made with the coarse material near the top. After a while the floor wears down to this coarse material, and then looks like a terrazzo floor. It is quality rather than the high polish that counts in concrete floors, and it is a pity more manufacturers do not realize this. It is very hard to get a good-wearing finish and a good-looking finish at the same time, unless careful attention is paid to the selection, proportioning, and placing of the coarse aggregate.

Two Sudden Deaths in Los Angeles

The sudden death of A. L. Stewart, Los Angeles manager for the Roebling Construction Company, was a great shock to his host of friends. Although only in the Southern California field since the first of the year, his sunny disposition and optimism had endeared him to many. Mr. Stewart was in the best of health up to within a few hours before his death. He leaves a wife and family, and was a brother of Percy Stewart of San Francisco, coast manager for the Roebling Company.

The news of the death of E. O. Simons was a severe shock to the Los Angeles building trade. He had been a sufferer for several years from Bright's disease, and for the past three months had been unable to attend to business. He was a member of the well-known firm of brick manufacturers—the Simons Brick Company—and with his brothers, Joe and Walter, conducted one of the largest clay product concerns in the west.

Turpentine from Yellow Pine

Turpentine from western yellow pine, says the Department of Agriculture, can be put to the same uses as that from the longleaf pine of the southeast, which furnishes the bulk of the turpentine of commerce. Western yellow pine forms enormous forests in the Rocky Mountain and Pacific Coast States, while the supply of longleaf is fast melting away. A product very similar to turpentine can be obtained also from pinon pine, another tree common in the southwest.

Careful tests made by the Department have shown that the yield of turpentine and rosin per season from western yellow pine in Arizona is only two-thirds that from the southeastern pine, the difference being due to fact that the season of flow in the west is about 25 weeks, and in the south about 33 weeks. During the Civil War, when turpentining operations in the south had virtually ceased, some operations were carried on in California to meet local needs. But with the return of the southern product to the California market, the western operations were abandoned.

The results of a chemical examination of the oils of western yellow, pinon, digger, sugar, and lodgepole pines which have just been published by the Forest Service in an official bulletin show the possibilities of the rosin and turpentine from western yellow and pinon pines as a supplement to the present supplies. Economic problems of markets, transportation, and labor remain to be solved. Information as to how the Forest Service secured the yields upon which the analyses were based is given in another bulletin on the possibilities of western pines as a source of naval stores.

Heating Systems

C. A. Dunham Company, Marshalltown, Ia., and Monadnock Building, San Francisco, state in a pamphlet recently issued that the Dunham Vacuo-Vapor System is a low pressure two-pipe vacuum system of steam heating, operating, it is claimed, automatically without the use of a vacuum pump.

It is stated that the Dunham System is suited to buildings of any size, as long as low-pressure steam is carried on the boilers.

The mechanical operation of this system is fully explained in the pamphlet referred to and illustrated by sections and other drawings that afford a comprehensive idea of the details of construction.

The pamphlet will be sent on request.

New State Building

A tentative design for one of the $1,500,000 buildings contemplated under the Capitol Extension scheme for which the people of Sacramento recently voted $700,000 bonds to purchase the site, has been prepared in the office of State Engineer Wilbur F. McClure.

The structure is designed to provide quarters for general offices, the State printing plant in the rear wings and the State Engineering Department, which has grown to extensive proportions, in the attic story. The other building, which is intended under the general scheme, to be practically a duplicate of the first in exterior appearance, will be for the State Library and Supreme and Appellate Courts.

Architecturally the building planned is to be in harmony with the present Capitol building, which it will adjoin on the west across Tenth street. It will be mounted on a terrace in keeping with the prevailing style of the Capitol grounds. On the ground it will occupy a space 300 feet across the front by 232 feet deep, leaving space between it and the streets for lawn. The building will be three stories in height with an attic.

The building will have a large court in the center to serve the double purpose of providing light and an entrance way for vehicles to the State Printing Office portion of the structure The State Printing Office, it is planned, will be housed in the wings.

By the Way

Some Industrial Information Worth the While

Automatic Refrigeration

The successful accomplishment of a long sought result has been attained in an automatic system of refrigeration and ice-making now available to the builders and architects of the Pacific Coast. Heretofore the practical operating difficulties in the way of maintaining a refrigerating plant or system, where expert attendance was not feasible, have prevented any general use of this latest and most desirable comfort and convenience. Hotel and apartment house managers will readily appreciate the enhanced value added to their quarters by the reliable service of ice water systems, individual refrigerators, cold storage and ice making compartments, all positively and continuously maintained at any given desired temperature, absolutely independent of the caprice of any operator.

The Automatic Refrigerating Company, with offices in the Holbrook building, San Francisco, are offering such a system, which they guarantee to be absolutely automatic, clean and free of all troubles, and more economical in operation than any other. It is wholly automatic, and requires no attendance of any kind beyond the replenishing of the oil reservoir at infrequent intervals. It maintains at all times, day and night, the temperature or temperatures required. Any variation from the desired temperature starts or stops the machine automatically, according as such variation is above or below the required temperature. Thus the power consumption is kept to the very minimum necessary to do the work.

This system is equally well adapted to ice making; in fact it can be and is used for both refrigeration and ice making at the same time. Buildings equipped with this apparatus can always be assured of having available at all times an ample supply of ice water without the annoyance and inconvenience that accompanies transportation of ice to the various points needed.

The automatic system is designed to meet all the requirements of refrigeration, and in all cases will show large savings over a manually operated plant. The cost of operation compared with the cost of ice for the same duty is insignificant. The apparatus is made in various sized units, beginning with the "Baby Automatic" for household use, up to a capacity of 16 tons ice melting effect per 24 hours, thus meeting the requirements of all classes of users of refrigeration.

Dahlstrom Appoints Sales Manager

At a recent meeting of the Board of Directors of the Dahlstrom Metallic Door Company, executive offices and factories at Jamestown, N. Y., Mr. James R. Kimball was appointed sales manager with headquarters at Jamestown.

Previous to his connection with the Dahlstrom organization, Mr. Kimball was associated with the Art Metal Construction Company, also at Jamestown, for more than thirteen years, during which time he respectively filled the positions of district sales manager and special bank salesman.

Within the last few years Mr. Kimball designed and personally superivsed the sales of practically all the large bank installations made by the latter named concern.

Steel Office Furniture and Fixtures

The Van Dorn Iron Works, Cleveland, Ohio, are makers of metallic furniture, shelving and other fixtures, and in a recently issued catalogue have combined these various departments in sections from A to Z. This permits of a classification of office furniture for public buildings, steel shelving, filing cases and special equipments for large corporations, insurance offices and banks.

It is interesting to note the ingenuity with which metal has been made to serve the purposes of wood in interior equipment. The various designs have received a large measure of artistic attention and the catalog as arranged affords an opportunity for wide selection.

Some Present Day Architectural Difficulties

By a Cement Coating Expert.

A FRIEND of mine—a very prominent house owner, by the way—asked me the other day, "Why does the most intelligent architect demand absolutely the carrying out of his specifications from his builder, his plasterer, plumber, electrician, and balk at forcing his painter to 'toe the mark?' " I could not answer, for I had seen in the south an ignorant belligerent negro "put it all over" an architect who was known for his austere demeanor and absolute demands for his specifications being carried out to the letter.

One of the most interesting experiments in modern paint manufacture is the compounding of a material that will thoroughly incorporate with and at the same time form a coat impervious to moisture on cement, and yet, although there are many products of merit for this purpose on the market, how few are put on as they are found from the manufacturer. Of course, I must eliminate some material in paste form to be reduced with benzine, naptha, turpentine, etc. Now, my reason for bringing this up is two-fold—first, because there is a laxity among the architects to demand the entire carrying out of specifications regarding one of the most important parts of their creative work—the preservation and beautification of the "child of their brain;" and secondly, because there are many cement coatings that must not be tampered with, but put on as they are found in the container. With this preamble I shall attempt to place before the intelligent consideration of the architect a few points regarding one of the most revolutionary preservatives for cement, plaster and brick that has come before their notice for some time. To quote from the manufacturers:

"A protective coating should, by all means be applied to exterior concrete, plaster or stucco. Such materials are extremely porous—absorbing and exuding moisture with temperature and climatic variations. Salt petre is usually present, and this is made active by contact with water.

"Heat changes—inside and outside, are bound to bring this alkaline moisture to the surface, spoiling the appearance of both interior and exterior walls—to say nothing of the natural disintegration of the wall through such action or of the effect of dampness on sanitary conditions.

"Knowing of the presence of both moisture and alkalies in concrete, stucco and plaster, and that where used for exterior, chemical action, unless overcome would be practically continuous, we proceeded along perfectly natural and logical lines in arriving at our Ad-el-ite Waterproof Cement and Brick Coating.

"We have produced a paint that assimilates moisture, that neutralizes alkali, and that carries with it a pigment to take care of decorative features.

"Ad-el-ite Waterproof Cement and Brick Coating may be applied even over damp concrete as with this paint moisture is used as an agent to bind to and impregnate it with the concrete, instead of permitting this moisture to react and cause the paint to peel or dust off.

"Having a perfect affinity for concrete and becoming part of the concrete itself, it seals the pores completely and is weatherproof.

"For residence, factory and office buildings it improves sanitation and presents an eternal newness. For decorative concrete, boulevard lamp posts, etc., it prevents cracking through freezing and widens the possibilities for color harmony.

"Concrete floors, unprotected, are unsightly. They are dusty and contribute to the dirt and grime that every factory, office, hotel, hospital and residence tries to eliminate. Ordinary paints are unsatisfactory, for they wear through, or chip or dust off.

"Ad-el-ite Waterproof Cement and Brick Coating, with its perfect affinity for concrete, thoroughly permeates it, binding the particles, even below the wearing surface, more securely together. It will wear as long as the concrete itself, for it actually becomes part of it.

"Ad-el-ite Waterproof Cement and Brick Coating gives to concrete the appearance of tile and will stand scouring without giving off any of its color. It is waterproof.

"We applied three coats of white to a portion of our factory floor and later scoured it with boiling water and common brown soap. Prior to this the floor had become more or less soiled by the rolling of trucks and the usual dirt that accumulates. The scrub brush quickly brought the floor to its pure white, without showing a trace of soil. Not a bit of color was removed, and despite the fact that the water used was boiling, the surface was still as hard as glass.

"Ad-el-ite Waterproof Cement and Brick Coating makes possible the more general use of concrete for floors where economy and, still, appearance are considered.

"There will be a wonderful saving for hospitals, where expensive tile is out of the question, for three coats of white Ad-el-ite Waterproof Cement and Brick Coating will give the appearance of tile; will look clean, sanitary, restful, inviting to the eye and will be in perfect accord with white enamel woodwork and walls—plumbing and fixtures. This is true also of hotel sleeping and bath rooms, of offices, of corridors, of laundry rooms in residences.

"We estimate for three-coat work, a covering capacity on floors of 150 square feet per gallon; 200 square feet-for two coat work. We recommend three-coat work only where conditions demand. Ordinarily two coats should be sufficient. The figures given are conservative, and are offered only for the purpose of estimating quantities of material required. No primer or first coater is required. We advise coats of the same material used just as it comes from the can."

Comyn-Mackall & Co., 310 California street, San Francisco, are the California distributors for Ad-el-ite. Jack Lawson, sales manager of the paint department, will answer any inquiries concerning Ad-el-ite, and will be pleased to explain to architects and others interested the merits of the product.

A Money Saving Vacuum Cleaner

The Tuec Company of Los Angeles recently has secured the contract to install a Tuec plant in the Marsh & Strong office building now under construction at Ninth and Main streets, Los Angeles.

This building, which was designed by Architect Fred R. Dorn, is of reinforced concrete and is twelve stories high. The installation has many unusual features, in fact, it is the first building in the United States to be so equipped.

Big office buildings, as a rule, are gone over in their entirety with the vacuum cleaner once or twice a month, a feather duster, broom and carpet sweeper filling in the interim.

This building, however, will be swept by air every night, not a carpet sweeper, broom, feather duster, radiator brush or counter brush being used in any of the offices, making it the most sanitary office building in the United States.

To all appearances this would seem rather an expensive proposition, but on the contrary the plant itself will save the owners considerable money in the course of a year.

The plant will be a ten horsepower motor and is the regular Standard 6 sweeper Tuec. There will be a separate set of tools on each floor and instead of employing men to do the cleaning with brooms and carpet sweepers, women will use the air. The building is so piped that 40 feet of hose is the extreme length used. Light, but durable, hose will be furnished and aluminum tools will be used. The building is piped with sufficient size pipe to allow the passage of hairpins, safety pins, toothpicks, matches, and cigar stubs.

The following table has been prepared by F. A. Clark, the Los Angeles sales manager, substantiating the claim that such a plant as described above will save the owner money:

$1,200.00	per year, two men at $50 a month each.
75.00	per year, carpet sweepers.
12.00	per year, corn brooms.
22.00	per year, long hair floor brushes.
8.00	per year, dust pans.
4.50	per year, radiator brushes.
4.50	per year, counter brushes.
$1,326.00	
100.00	per year, deducted for up-keep of tools and hose.
$1,226.00	
25.00	deducted per year for depreciation of machine.
$1,201.00	
200.00	interest on original investment at 5 per cent per year.
$1,001.00	actual money saved per year. Which is the interest on $20,020 at 5 per cent per year.

The above estimates are very conservative, especially the equipment. The average office building of three or four hundred rooms is not gone over entirely with the vacuum cleaner more than three times a month.

City Hall Steel Contract

A contract for furnishing and fabricating the San Francisco City Hall steel has been awarded to the United States Steel Products Company on their bid of $476,283, which was the lowest of the figures received. In awarding the contract the Board of Works followed the charter to the letter and has acted on the advice of the city attorney. Strong opposition to the award of the steel contract to an Eastern firm was raised by both the Home Industry League and representatives of Union Labor.

Cabot's Color Chart

Samuel Cabot, Inc., of Boston, manufacturers of creosote shingle stains, sheathing and deadening quilt, etc., have gotten out a unique lithographed color chart reproducing as closely as possible by the printer's art the beauty of the coloring effects of Cabot's creosote shingle stains. The chart consists of a 2-story and attic residence printed on four sheets which are so cut that by manipulating the divided leaves sixty-four different combinations of color can be made of such variety as to be helpful in selecting a pleasing color scheme for a house of any style or shape.

Cabot's creosote shingle stains were invented in 1882 and have been in constant use for more than thirty years, having become the standard in shingle stains because of their soft, rich, velvety coloring effects and the lasting wood preserving qualities. The colors used are the strongest and most expensive pigments, ground to the finest possible condition in pure linseed oil and finally suspended in a vehicle of pure creosote refined in the company's own stills. The stains have the very important merit of reducing the inflammability of wood, containing no kerosene or other cheapening material.

Although made originally for shingles the Cabot's stains are now used for all other kinds of exterior woodwork, particularly for the rough and dressed siding of bungalows and country camps and cottages where the soft transparent coloring effects are infinitely more appropriate and harmonious than the opaque heavy coloring that paint makes. On the trimmings and half timber work of stucco houses their effect is most artistic, where paint in many cases absolutely spoils the effect desired. In treating shingles the stains can be applied either by dipping them two-thirds their length before they are laid, or with a brush like paint after they are laid; two and three-quarters gallons will dip one thousand shingles, and a gallon of stain will cover one hundred square feet of rough shingles or other lumber, two coats, and about twice as much dressed lumber. No special skill is required to apply the stains. The color chart and samples of cedar shingle stained with Cabot's materials, with catalogues and full information, may be obtained on request to Samuel Cabot, Inc., Boston, or from their Coast representatives, Waterhouse & Price, of San Francisco, and the P. H. Mathews Paint House, Los Angeles.

Wright is Right on Building Arbitrations

A second edition of "Wright on Building Arbitrations," is at hand fresh from the press, and the manual in its enlarged form will undoubtedly prove very helpful to those for whom it was specially written. First — It forcibly illustrates the advantages of arbitration over suits at law for the adjustment of building and technical disputes, and secondly, it shows in detail the duties of building arbitrators,—what to do, and what to avoid in conducting technical arbitrations. "Building Arbitrations," is not a law book in any sense of the word, nor is it intended to be sold as such. The aim of Mr. Wright has been to compile and codify the facts pertaining to the principles of arbitration in a common sense and convenient form and in this aim the author has been most successful. The manual is reasonable at $1. Address the author, 571 California street, San Francisco.

Peerless Ironing Board Adds to Rental Value of an Apartment

Architects find that by using the Peerless Ironing Board in 2 and 3-room apartments, there is a better rental value to the building.

The Peerless Ironing Board is built in a cabinet which is furnished complete, including doors with hinges and latches, the large ironing board, which is removable from the cabinet, the small sleeve board, the sides and back of the cabinet and the shelf at the top.

The cabinet fits into a rough opening in an ordinary 4-inch wall 72 inches high by 14 inches wide.

The cabinet sets in the wall and is cased up the same as a door or window and occupies no space when not in use.

A shelf is placed at the top of the cabinet making a convenient place for irons, etc., keeping them always near at hand to the place where they are needed.

The possibility of being knocked over is eliminated at the Peerless when in position for use is rigid and firm. It will carry the weight of a full grown person when extended in position for use.

The small sleeve board is unique in furnishing a convenience that is seldom found in the home. For the ironing of waists and pressing of coats of all kinds it is of great value. It can be used in connection with the large board, or the large board can be lifted entirely out of the cabinet and the sleeve board used independently.

The Peerless Ironing Board is indispensible to the modern home of whatever type.

The Peerless Ironing Board will add as much to the ease of rental as any modern convenience.

It is a convenience that is immediately recognized as a necessity by every housewife or builder who sees it.

It has been commended by every architect who has seen or specified it and by every builder who has installed it.

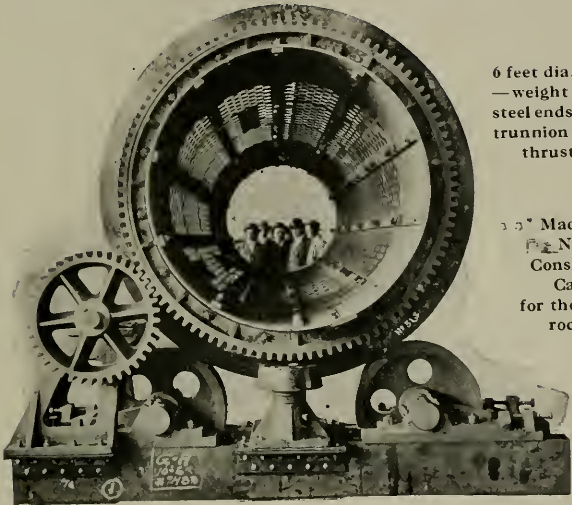
It can be installed in an old building as easily as in a new.

Full particulars and price list will be mailed free to any address. Peerless Ironing Board Co., 933 Phelan Building, San Francisco.

Something About Metal Roofing

Of late years much thought and many experiments have been devoted to attempts to produce a metal roofing with maximum resistance to corrosion by either weather or atmospheric conditions. There is always a great deal of interest shown in any improvement that will secure the desired result, and in experiments conducted with this end in view. In this connection a very interesting paper was recently read before the American Chemical Society at their annual meeting held recently at Milwaukee, Wis., by Dr. D. M. Buck, Chief Chemist of the American Sheet and Tin Plate Company of Pittsburgh, Pa.

Some Screen?



6 feet dia. — 24 feet long — weight 22 tons. Cast steel ends and removable trunnion rings, hardened thrust roller, etc.

Made for the Natomas Consolidated of California for their Fair Oaks rock plant.

A Revolving Screen of any style, when built by M. & G. is **just right** in every respect — design, capacity, efficiency and price —

WHY?

Because the experience of **years** is behind the job — **that's why.**

Meese & Gottfried Company

ENGINEERS AND MANUFACTURERS

TRANSMISSION, ELEVATING, CONVEYING AND SCREENING MACHINERY

SAN FRANCISCO
55 Main St.

SEATTLE
558 First Ave. South

PORTLAND
67-69 Front St.

VANCOUVER, B. C.
Pacific Building

HOQUIAM
Lamb Machinery Co.

LOS ANGELES
130 N. Los Angeles St.

Mr. Buck gave full details of some instructive experiments, extending over a number of years, that were made with metal roofing sheets made from ordinary steel, and also sheets to which copper had been added. The exhaustive treatment was conducted with extreme care in a practical manner, leaving nothing to chance or conjecture, so that the results obtained are authentic and dependable. The object was to establish the relative value of small amounts of copper in metal roofing when exposed to natural corrosion under varied atmospheric conditions.

Actual service tests were made in the Pennsylvania Coke regions, where the air is impregnated with sulphuric acid and other corrosive fumes. On the sea coast, where the air is charged with sodium chloride, and in a rural section where the air is pure and free from added corrosive agents. At each location a skeleton wooden building was erected and roofed with corrugated metal sheets containing different proportions of copper. The sheets were not protected by paint or any other coating except, of course, the thin film of oxide always present on an annealed sheet. Accelerated acid tests were also made on segments taken from the same sheets. Caution was taken so as to insure that the findings were definite and convincing.

Excellent results were obtained, which showed conslusively that in every instance the roofing which contains copper lasts much longer and gives far better service than sheets without copper. The difference in the atmosphere at the various testing stations produced interesting data of much value in deciding the correct amount of copper to be used. After long research and much experimenting the American Sheet and Tin Plate Company has, in view of the success of the new treatment, adopted copper bearing steel exclusively for roofing tin. This represents a very important step forward in the tin roofing business. Copper bearing steel can also be furnished in both black and galvanized sheets.

Mr. Buck's instructive address, liberally illustrated with photographs of the tests and with valuable tables, has been published in book form. The information given on this new departure in the making of metal roofing and siding will be of much value to builders and others who are interested in securing more durable roofing tin and sheets for roofing and siding purposes. A copy of the book can be secured by addressing the American Sheet and Tin Plate Company, Frick Building, Pittsburgh, Pa.

"Movies" Will Show Huge Palace Under Construction

Miles Brothers have placed an automatic moving picture camera on the roof of the Service Building of the Panama-Pacific International Exposition, for the purpose of recording the construction of the Machinery Palace, the largest building of its kind ever erected on the Pacific Coast. The camera will take a set of pictures every five minutes, showing the advance in the building operations. The record will show ninety-six pictures for each working day.

The camera is operated with a delicate mechanical device which takes the picture at unvarying intervals without requiring the slightest attention. It is protected from the sun and rain by a large hood, but has an all inclusive view of the new building. When the building is completed these pictures will be developed and when shown the spectator will watch the structure completed without the tap of a hammer and in an incredibly short time.

Store Fronts

The Kawneer Manufacturing Company, with general offices at Niles, Mich., has recently issued an exceptionally well-prepared and complete catalogue on Kawneer Store fronts. The object of the booklet is stated to be to explain exactly what Kaw-

(Continued on page 136.)

THE UNITED STATES METAL PRODUCTS CO. OF THE PACIFIC COAST

This is the name taken by some of the pioneers in Pacific Coast manufacturing and the company promises to do much toward better building construction—*fireproof building*.

For many years, the San Francisco Cornice Company has been one of the recognized progressive manufacturing institutions of California, and their products have kept pace with the advance in building from the days of hand power to this day of automatic machine power—always just enough in the lead to blaze the way and increase the results of Home Industry. This concern forms the basis of the new corporation.

P. W. and O. B. Dreusike who developed the San Francisco Cornice Company are pioneers in the sheet metal business. They have kept in touch with the best eastern methods, were first to manufacture kalamein doors and finish on the coast, and, through co-operation with the largest concern of its kind in the country, the United States Metal Products Company of New York, have been able to meet the demand for the highest type of sheet metal construction—the safest form of door construction, and one that renders a building otherwise fireproof, *absolutely so*, the Hollow Steel Door.

The Hollow Steel Door has a history. Its distant relative is a clumsy, unsightly, wood-covered-with-tin contrivance which was used only because it would stand heat. The next improvement was a wood frame covered with stamped panels, bound at the edges with strap iron. Next we have the kalamein construction in its various forms, and finally, the absolutely fireproof, sound proof, welded, artistically finished Hollow Steel Door. This is now a product of the coast.

It has been said that the ideal window was yet to be created. This window is now a fact and will be specialized by this company. Furthermore, it is a Pacific Coast invention. The Simplex Metal Window, after being perfected in San Francisco, has been tried out, favorably criticized by some of the most practical manufacturers and architects of the country, and will be promoted by the United States Metal Products Company of the Pacific Coast.

This new corporation will manufacture all forms of metal door and window construction, steel sash, Van Kannel revolving doors, steel lockers, elevator doors, bronze entrance doors, and will act as agents for the well known steel rolling door manufacturers—the James G. Wilson Manufacturing Company of New York. With well equipped factories at San Francisco and Los Angeles, further extension planned for at Portland and agents at other points east as far as Salt Lake City, the concern perpetuates the existence of its predecessors with a unique organization.

The principle offices of the new company are located in the Underwood Building, 525 Market street, San Francisco. B. L. Wilcox, who has had a thorough architectural training, supported by many years of manufacturing and salesmanship experience, and who came to the coast after the fire, having much part in the re-building of San Francisco, is connected in the capacity of Vice-President and Sales Manager.

The attention of architects, contractors and owners is directed to the display of metal products that are to be seen at their office and agencies.

SAN FRANCISCO BRANCH FOR STANDARD VARNISH WORKS

The Standard Varnish Works of New York, London, and Chicago, have opened a branch at No. 113 Front street, San Francisco, where in addition to their well known brands of varnishes and Satinette they will carry a full line of their popular Kleartone Stains.

The editor recently had the pleasure of viewing at their Front street office, some large panel samples finished with Kleartone Stains and any architect desiring something exceptionally fine would do well to call and view this display, feeling assured that they will be repaid for their trouble. The Holland Blue, Silver Gray, Pollard Oak, and Bog Oak, are especially unique.

Mr. F. T. McHenry, who has been so long on the Pacific Coast representing the interests of the Standard Varnish Works, is in charge of the San Francisco branch.

Washed Gravel Pit Owned by Pratt Building Material Co.

This gravel pit on Austin Creek, Sonoma County, is producing the cleanest washed gravel in California. The **Pratt Building Material Co.**, C. T. Pratt, President, main office, Examiner-Hearst Building, ship sand, rock and gravel from fifteen pits in ten California Counties. They are now shipping from new pits in Contra Costa County (sand and gravel), Yolo County (gravel) and sand on the Northern Electric R. R.

(Continued from page 134.)

neer is, how it is constructed and its installation, and what it would do after installation.

Full size details are shown wherever possible, which indicate a sturdy, yet compact, construction of each member. Particular emphasis is laid upon the fact that Kawneer is complete, not simply a corner and division bar, but built from sidewalk to lintel.

A large number of store fronts are shown and detailed drawings of store-front construction furnished, giving full size sections of members in a manner rendering them of exceptional value to architects confronted with the problem of constructing modern shop or store fronts.

The booklet commends itself both by reason of the material it contains and the exceptional manner of its presentation. It will be sent to architects upon request.

Wearproof and Waterproof Concrete

A material which will harden concrete to an extent that it will produce floor surfaces to withstand any amount of heavy trucking without cracking, checking, wearing or dusting has attracted the attention of local engineers and architects.

The material "Metalcrete" is malleable iron ground to the consistency of cement and chemically treated so as to cause an immediate oxidization on coming in contact with moisture. When mixed with cement the expansion of the metals fill the voids and pores of the concrete rendering it impervious to wear and water.

A test of the wearing quality of Metalcrete has been made by Engineer Edward L Soule, who specified the material for a truck-way in the Pacific Coast Syrup Company's plant at Sansome and Pacific streets. The floor was laid by Bluxome & Co in July, 1912, and when inspected a few days ago was found to be in perfect condition, showing no signs of wear whatever. As the gangway, where the test was made, receives an unusual amount of heavy wear the results are considered the more remarkable.

Several engineers and architects who are interested in the test have expressed themselves to be well pleased and glad to know of a material which will prevent dusting, checking and cracking of concrete floors.

As the expanding metals hermetically seal the voids and pores of concrete they prevent seepage of moisture through it rendering it absolutely water tight. Metalcrete will therefore make a water tight basement and has been used in the East extensively for this purpose, as well as waterproofing subways, dams, reservoirs and swimming tanks.

Another feature of Metalcrete is that it will create a perfect bond between old and new concrete. For retopping or patching worn out concrete Metalcrete creates a perfect bond and there is no danger of the new topping or patch chipping or breaking loose from the base. It is also valuable for bonding the old and new concrete when an addition is to be built on an old building.

Several buildings, which are about to be erected, have Metalcrete embodied in their specification and it is believed by those interested in the test that when the local architects become thoroughly familiar with this material there will not be a building erected without Metalcrete specified throughout the entire floor surface and basement.

The cost of Metalcrete is very little in comparison with results and it is easily applied. Specifications are in Sweet's Catalog, pages 84 and 85. For further information phone the California distributor, Allen M Olinger, Kearny 270, 24 California street, San Francisco.

Bestwall

FIRE-PROOF **SOUND PROOF**

The use of "BESTWALL" Eliminates Lath-Stains, Cracks and Practically all Danger from Crossed Wires

A Plaster Wall that is Proof against Heat and Cold

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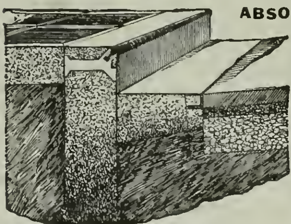

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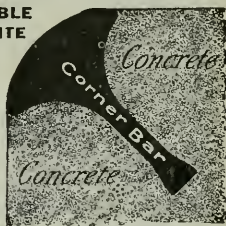

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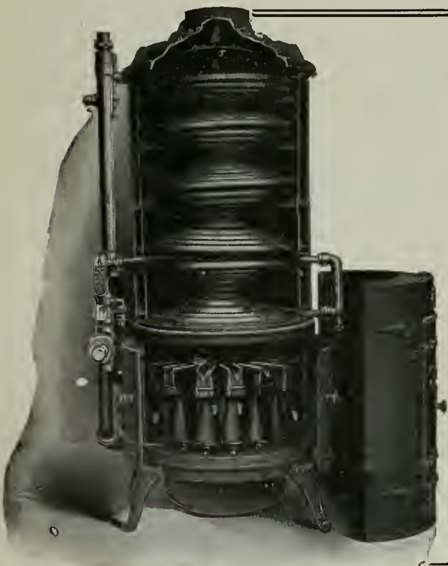

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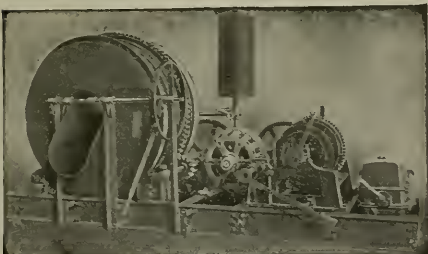

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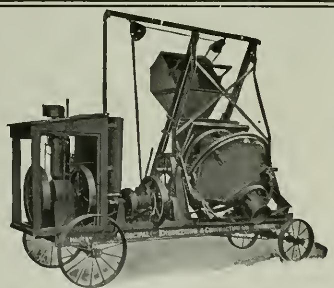

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