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MR. ROBERT P. PORTER, a good authority on the subject, has been making a study of what he calls "municipal trading" in England. As every one knows, England has for some years been experimenting with socialist theories, but it is only recently that the world has begun to comprehend the disastrous effect of the experiments. The appearance of German, American and Belgian goods, not only in the markets which England once controlled, but in England itself, has served as a demonstration of the effect on British industry of supporting trades-union tyranny by the public force; but the matters in which the operation of socialistic schemes affected only the English themselves have not hitherto attracted much outside attention. Now, however, a curious light is thrown on the subject by a brief summary of a report of the Royal Statistical Society, which shows that municipalities in England have, within a few years, spent four hundred and fifty million dollars in establishing gas and electric-lighting plants, street-railways, and similar "public utilities," to use the socialist phrase, and that the return on the investment, even now, when most of the machinery is new, is less than one-half of one per cent a year. It is notorious, as has been shown recently in this country in the case of the Taunton electric-light plant, that municipalities, in their desire to show an income earned on their investment, spend as little as possible on repairs and renewals, thus virtually throwing away the principal for the sake of making their books show a net income for a few years; and it will not be long, probably, before the British tax-payers, who are paying interest on this four hundred and fifty million dollars, and must, sooner or later, pay the principal to those from whom they borrowed it, will find that they have nothing to show for the money. Obviously, unless the gas and electric-lighting service, or the operation of the street-car lines, is discontinued, the British tax-payers will then have to put their hands in their pockets for four hundred and fifty millions more, to be sunk in the same manner.

NOT only has municipal control of "public utilities" apparently started many flourishing communities in England on the road to bankruptcy, but it is a common complaint that the utilities themselves are far less satisfactorily managed by municipalities than by private parties. Where private lighting or street-railway companies, anxious to keep their customers and get new ones, compete in cheap and efficient service, and adopt at once any improvements in processes or machinery which will contribute to that end, the officers of a municipal corporation, having once incurred a large debt for the purchase and equipment of a plant, are usually unwilling, not to say unable, to raise an additional sum for improved outfit, and must get along with the old one as best they can, avoiding any expense for repairs, which might diminish the apparent return on the investment, and threaten their own popularity with the voters. Moreover, in England, under the socialistic

Acts of Parliament, any municipality is empowered to seize the plant of a private company furnishing lighting or transportation service within its territory, paying for it only at a certain valuation fixed by law, so that such a company, if it should, after years of trouble and expense, succeed in establishing a remunerative business, is in danger of seeing its property practically confiscated at any moment. It is hardly necessary to say that private capitalists do not care to risk money under such conditions, and the consequence is that England, which is carefully avoided by the promoters of lighting and transportation companies, is far behind the Continent in electric-light and street-car service.

THE appetite of small municipal politicians for speculating with public money under the protection of Acts of Parliament does not, however, appear to be diminished by the discouraging results of their efforts; and, instead of confining themselves to the comparatively safe field of lighting and transportation, they show a disposition to enter on more hazardous operations. Already, requests have been filed by town officers for authority to borrow money, on the credit of the tax-payers' property, for engaging in banking; in the maintenance of cold-storage warehouses; in the manufacture of gas and electrical fixtures, and even of saddlery; while golf-links, cricket-grounds and oyster-beds have for some time been managed as investments by municipalities. Naturally, a speculative business in which some one else is compelled by law to furnish the money and bear the losses affords an attractive amusement for town officials, but it is becoming evident that it involves loss and discouragement to private enterprise and industrial stagnation in the communities in which it prevails; and there is reason to believe that England is preparing for the world a conspicuous demonstration of the importance of the maxim which Mr. Porter quotes, that "whatever can be done by the voluntary agency of individuals should not be undertaken by the State."

THE situation in the iron mills has not changed much. It has long been evident that the power of the union leaders is broken, but they still keep up sporadic skirmishing, upsetting for a day or two the operations of a mill here and there, by calling out a few members of the working gangs. On the whole, this policy strengthens the mill managers, by disgusting the men who still remain loyal to the union, and who can hardly help resenting the plan of sacrificing them for the sake of "surprising" a mill manager, and getting a head-line in the newspapers. One of the most serious features of the whole affair is, as the *Evening Post* points out, that the Amalgamated Association, which is composed mainly of skilled and highly-paid workmen, who might be presumed to know the nature of a contract, had existing agreements of the most solemn kind with the managers of most of the mills, by which the men pledged themselves to accept for a certain length of time specified rates of wages and other conditions, to which the managers also agreed to conform; and that the strikes in these mills were deliberate violations of these contracts. It will be remembered that many of the men refused to break their agreements, and Mr. Shaffer was obliged to invent a subterfuge to quiet their consciences, by claiming that the change in ownership of the mills operated as a release of such contracts; but this did not prove satisfactory to the more sensible men, and it is probable that only the terrors of the union Inquisition were really effective in driving these men into striking. Now, however, as they have shown that they cannot be depended upon to keep to their agreements, it is obvious that no one will make any more agreements with them, while the only real use of trade organizations, so far as the men are concerned, is to enable the latter, by combination, to make contracts with their employers which, if not more advantageous for the better men than individual contracts would be, are usually more so for the inferior men, and, at least, enable both parties to count with reasonable certainty on the future.

THE highest court in England has rendered a decision in a trades-union case, expressing its judgment in words which deserve to be remembered. A certain wholesale butcher employed a man who did not belong to the Butchers'

Assistants' Association. The Association, which is, of course, simply a trades-union, demanded the dismissal of the man, and threatened to call out the other men, not only in the establishment of the offending employer, but in those of other wholesale butchers who took his part. This argument proving ineffectual, the Association then applied to the retail customers of their victim, and threatened to call out their men unless they ceased to deal with the offending party. Finally, by means best known to themselves, they induced the non-union man to give up his employment voluntarily. The butcher, who had stood by his man with true British courage, then brought suit against the union for conspiracy, claiming damages, and has now prevailed in successive courts to the highest, the House of Lords dismissing the appeal of the union from the judgment of the court below, on the ground that the proceedings of the union were not carried on to advance the interests of the workmen concerned, but solely to injure the plaintiff.

ST. LOUIS is suffering from an unusual prevalence of typhoid fever, and the municipal officials are trying to discover the cause of the trouble. As the people of the city drink, in diluted form, not only the sewage of Chicago, but that of Kansas City, which is discharged into the Missouri River about three hundred and fifty miles above St. Louis, it is interesting, though not, perhaps, material, so far as the St. Louis people are concerned, to find out which of the contributory cities furnishes the largest proportion of typhoid germs to their drinking water. Naturally, the Chicago experts are disposed to think that Kansas City is the source of the trouble, and point to the low water in the Missouri River as the main factor in concentrating the infection; while the representatives of Kansas City think that low water in the Illinois River may have a corresponding effect on the Chicago germs. Meanwhile, the disinterested observer will wonder how long the fertilizing wastes of Kansas City and Chicago will be permitted to be turned into the Mississippi, for the people of St. Louis to drink, at the very time that Kansas is suing Colorado for damages for borrowing a little of the water of the Arkansas River, and almost the whole West is crying out for the precious moisture which, if the waters of Chicago and Kansas City could have been properly applied, might have saved this year, in Kansas, Iowa and Missouri alone, enough money to pay a large part of the cost of utilization.

THE question of the purification of city sewage is one of perennial interest. On the whole, Berlin seems to be the place where irrigation is practised with the greatest success. With characteristic German thoroughness, assisted by German simplicity and directness of means for utilizing private property for the public good, the engineers of the Berlin irrigation system took possession, at the outset, of about twenty-eight thousand acres of land, suitably situated for their purpose, and laid out their filter-beds on a scale sufficient for a city of three times the population that they had to provide for. In this way, they have been able to extend their pipes, as required, without radical changes in the system, such as are unavoidable where land is purchased only as wanted, as has been the case with Paris. At present, about fifteen thousand acres are in use for irrigation, receiving sewage from a population of nearly two millions; so that the fields owned by the city will be sufficient for another century, at least. The system of irrigation is simple, but carefully executed. The sewage is distributed over the surface by small channels, while subsoil drains carry off the water, filtered by its passage through the ground, into the river. The whole territory is carefully farmed, nearly half of it being used for growing grain, while most of the rest is kept in grass. From the latter portion seven crops, on an average, are taken every year. The grains and small fruits also give an excellent yield, both quality and quantity being highly satisfactory. There is no typhoid fever in the villages on the estate, nor any special prevalence of other diseases; on the contrary, the conditions have been found so particularly salubrious that one, at least, of the more important health-establishments of the city has been moved out to the irrigation fields.

MEANWHILE, the bacterial-filtration system, which was adopted for treating a portion of the London sewage, in order to save the expense of land for broad irrigation, has not given the results expected from it. This system, al-

though it was practically invented in this country, was adopted in England with an enthusiasm which seems from the results to have been rather inconsiderate. In brief, the system consists in passing the sewage through gravel, or pulverized coke, which forms a favorable habitation for colonies of nitrifying bacteria, which are supposed to convert the putrescible portion of the sewage with great rapidity into inert substances. In practice, however, the bacteria do not always behave as they should, and it is found that a good deal of the London sewage runs off from the bacterial beds about as foul, so far as objectionable matter is concerned, as when it entered them.

PROFESSOR BLUNTSCHLI, of Zurich, who was one of the prize-winners in the competition for the buildings of the University of California, and, in that capacity, visited California, by way of New York, writes some interesting letters to the *Schweizerische Bauzeitung*, describing his journey. New York made a great impression on him, as it does on most foreigners, by the height of its "heaven-scratchers," as the Germans translate our word "sky-scrapers," the restless throng in its streets, and the magnificence of material in its newer buildings. Washington naturally seemed tame after New York, and the Capitol, which an English architect, who wrote an account of his travels in this country, recently spoke of as the most imposing public building in the world, seemed to Professor Bluntschli "rather dry and formal," and, in the interior, "cheerless and pale"; but he acknowledges that it looks better in a distant view, and that its situation gives it a fine effect. The Congressional Library he found richer in detail than the Capitol, and he was particularly charmed by the marble mosaic decoration of the vaulting of the ground floor, which, as he says, was new to him. The painting and sculpture of the building, which have made it famous in this country, he dismisses with the observation that the artists had a great opportunity; and he criticizes the main staircase as not only inconvenient, but unpleasant to the eye. The steps of the staircase are a little less than seven inches high, and a trifle over twelve inches wide, a proportion which, although perhaps capable of improvement, accords tolerably well with the ordinary idea of a monumental staircase, and it would be interesting to learn in what way Professor Bluntschli regards it as defective.

WE have asked our correspondent's permission to publish the private letter which will be found in another column, partly because to others it will seem a very interesting tale of hardship and pluck — while for the writer we will quote "*forsitan hæc olim meminisse juvabit*" — and partly because it has a bearing on our own affairs. Whatever the architects themselves may know of the matter, we feel very sure that the public at large is very far from suspecting how sorely the late hard times have borne upon architects and draughtsmen as a class, and to what desperate straits many of them were driven, first, in the attempt to keep up those appearances upon which their future well-doing absolutely depended, and, later, in the mere struggle to keep body and soul together. It is beyond question that during the hard times the architects and draughtsmen of the country were driven back into the position of purveyors of mere luxuries, and treated accordingly: that is, deprived of the opportunity to earn their own bread. Many a tale of distress and want, of sickness, starvation and desperation have we received from subscribers in one part or another of the country in reply to our temperate appeals for "a little something on account," so that our own bark might keep off the rocks, and, when their replies were coupled with the request that their names might be kept still on the list, it was only natural to draw still further on our store of human kindness, and pull closer by a hole or two the belt about our own operations. It was a crippling time for every one, but others did not have to make public confession of it as we did, when, week by week, we had to adapt our undertakings to a diminished income. Little by little, the architects who have suffered are finding their feet, and now and then we receive a welcome remittance from some subscriber we feared was totally submerged; but it is evident that our own losses must remain very heavy. We speak of the matter because there is a tendency, even on the part of our best friends, to complain that we have not lately done as much for our subscribers as we used to do, and it is our purpose to point out how illogical it is for the man who has caused another to go halt and lame to blame the latter for the misfortune inflicted by the complainant — however unintentionally.

THE AMERICAN VIGNOLA.¹—II.

PART I.—THE FIVE ORDERS.

STYLES.

DIFFERENT systems of construction have prevailed among different races, some employing only the Beam and Column, some also the Arch and Vault. So in the choice of mouldings, also, some have adopted one set of forms, some another. The forms employed by the Greeks and Romans constitute what are called the Classical Styles; those used in the Middle Ages, the Byzantine, Romanesque and Gothic Styles. Some of the Gothic mouldings have special names, such as Bowtel, Scroll, etc.

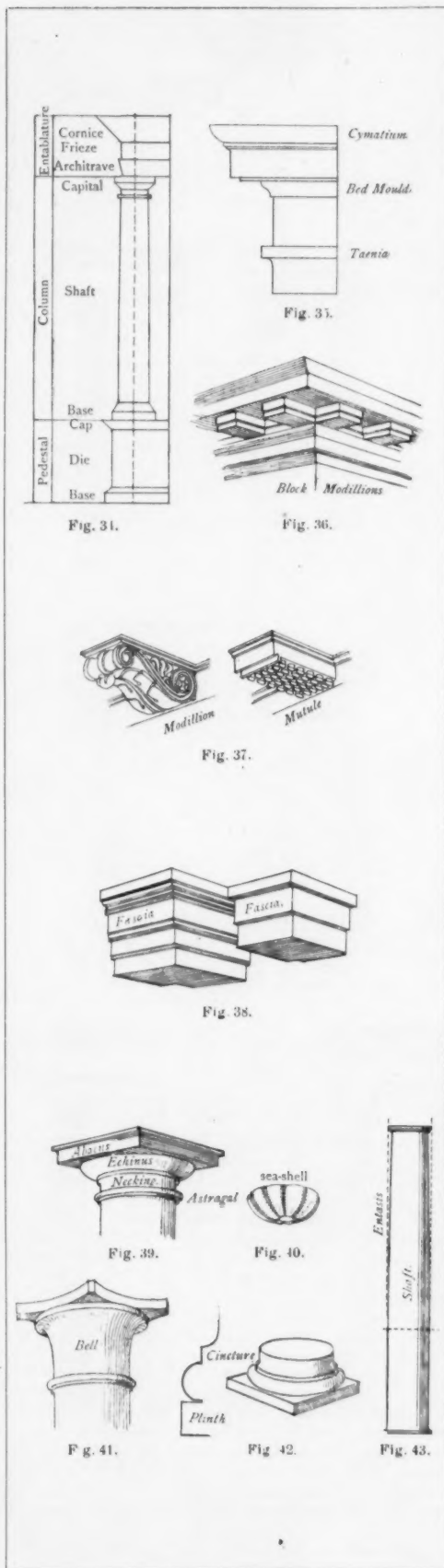
At the close of the Middle Ages, about four hundred years ago, the Classical styles were revived, as the Mediæval styles have been during the last hundred years. Both are now in use. The styles of Egypt, India and China are employed only occasionally and as a matter of curiosity.

THE ORDERS.

In the Classical styles, several varieties of Column and Entablature are in use. These are called the *Orders*. Each order (34) comprises a Column with Base, Shaft and Capital, with or without a Pedestal, with its Base, Die and Cap, and is crowned by an Entablature, consisting of Architrave, Frieze and Cornice. The Entablature is generally about one-fourth as high as the Column, and the Pedestal one-third, more or less.

The principal member of the Cornice is the Corona. Above the Corona the Cornice is regularly terminated by a member originally designed to serve as a gutter to receive the water running down the roof. It generally consists of a large Cyma Recta, though the Ovolo and the Cavetto are often used. It is called the *Cymatium*,² in spite of its large size, and whatever its shape.

The Corona (35) is supported by a Moulding or group of Mouldings, called the *Bed-mould*. A row of brackets, termed *Blocks* (36), *Mo-*



dillions, or *Mutules* (37), according to their shape, resting on the Bed-mould and supporting the soffit of the Corona, is often added. At the top of the Architrave is a projecting moulding, which, when square, is called a *Tenia*, and the face of the Architrave is often broken up into two or three Bands or *Fascias* (38).

The Abacus of the Capital also has a sort of bed-mould beneath it, which, when convex, is called an *Echinus* (39), from the sea-shell (40), which it resembles in shape. The little Frieze below it is then called the *Necking*. But if the bed-mould under the Abacus is concave, it dies into the necking like a large Congé, and the two together constitute the *Bell* of the Capital. The Abacus is square in plan, but the Echinus, or the Bell (41), below it is round, like the column.

At the top of the shaft is a member called the *Astragal*, consisting of a Bead, Fillet and Congé. It has a flat surface on top, as wide as the projection of the Congé. At the bottom of the shaft is another Congé, below which is a broad fillet called the *Cincture*. The Base generally has, below the base-mouldings, a plain member called the *Plinth*, which is square in plan like the Abacus (42).

The Shaft diminishes as it rises, the upper diameter being only five-sixths of the lower, and the outline is not straight, but curved. This curve, which is called the *Entasis* (43), or bending, as of a bow, generally begins one-third of the way up, the lower third being cylindrical. The Entasis is not to be confounded with the *Diminution*.

The Pedestal also generally has a Corona and Bed-mould, but no gutter, above the Die, and a Base-moulding and Plinth below it.

In the choice and use of mouldings, the tastes and fashions of the Greeks and Romans were quite contrary to those of their successors in the Middle Ages. The Ancients

roof would properly have a Cymatium, this being the place for a gutter, and that Cornices used as String Courses, half way up a wall, would naturally be without this member. But the significance of the Cymatium has frequently been overlooked, in ancient times and in modern. Many Greek temples have a Cymatium on the sloping-lines of the gable, where a gutter would be useless, and none along the Eaves, and in many modern buildings the cornices are crowned by large Cymatia in places where there are no roofs behind them.

¹ Continued from No. 1339, page 60.

² The word Cymatium thus has three meanings: 1. A small Cyma. 2. A small crowning member, of whatever shape, though it is most frequently a Cyma Reversa. 3. The upper member of a Cornice, occupying the place of a gutter, whatever its shape, though it is generally a large Cyma Recta. In Classical Architecture, the Cyma Recta seldom occurs, except at the top of the Cornice and at the bottom of the Pedestal.

³ It would seem as if a cornice which occurs at the top of a wall and carries the edge of a

preferred to use vertical and horizontal surfaces at right angles to each other, and seldom used an oblique line or an acute or obtuse angle, as the Gothic architects did. They also preferred the *Cyma Reversa*, seldom employing the *Cyma Recta*, which in the Middle Ages was rather the favorite. Moreover, as has been said, the Gothic architects, in decorating a corner or edge, often cut it away to get a moulding, but the ancients raised the moulding above the plane of the surface to which it was applied. In the composition and sequence of mouldings also, the Classical architects generally avoid repetition, alternating large and small, plain and curved, convex and concave. The convex and concave profiles seldom describe an arc of more than 180 degrees, and except in the case of the *Beak Moulding* and of the *Bead*, mouldings are always separated by *Fillets*. When a moulding is enriched, it is generally by carving ornamental forms (46) upon it which resemble its own profile. The Greeks frequently employed elliptical and hyperbolic profiles, while the Romans generally used arcs of circles.

Among the Greeks, the forms used by the *Doric* race, which inhabited Greece itself and had colonies in Sicily and Italy, were much unlike those of the *Ionic* race, which inhabited the western coast of Asia Minor, and whose art was greatly influenced by that of Assyria and Persia. Besides the *Ionic* (47) and *Doric* (48) styles, the Romans devised a third, which employed brackets, called *Modillions*, in the Cornice, and was much more elaborate than either of them; this they called the *Corinthian* (49). They used also a simpler *Doric* called the *Tuscan* (50), and a cross between the *Corinthian* and *Ionic* called the *Composite* (51). These are the *Five Orders*. The ancient examples vary much among themselves and differ in different places, and in modern times still further varieties are found in Italy, Spain, France, Germany and England. The best known and most admired forms for the Orders are those worked out by Giacomo Barozzi da Vignola in the sixteenth century from the study of ancient examples. The Orders that are shown in the large Plates almost exactly follow Vignola's rules.

VIGNOLA'S ORDERS.

Plate 2 shows the proportions of the Orders according to Vignola, in

terms of the lower diameter of the columns. These vary in height from six diameters to ten.

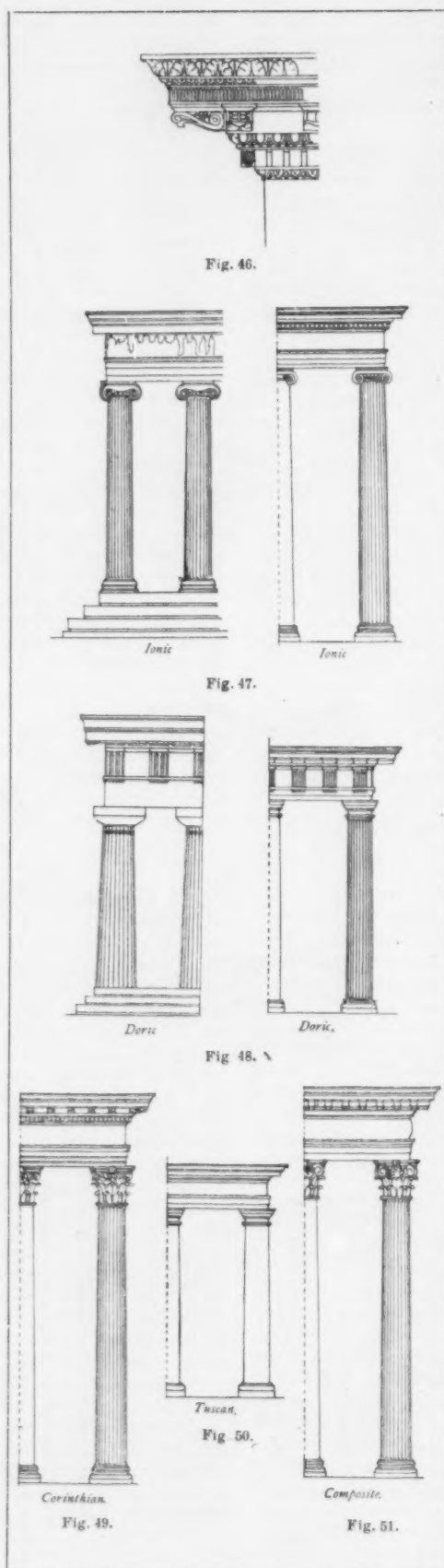
NOTE.—It is worth noting that, in ordinary handwriting, the T, for Tuscan, looks like a 7; D, for Doric, like an 8; I, for Ionic, like a 9; Co, for Corinthian and Composite, reminds one of 10.

The Entablature is in all of them ordinarily one-fourth the height of the column, but it is sometimes made as small as one-fifth. The projection of the Cornice is the same as its height, except in the *Doric* Order, where it is greater. The lower band of the Architrave is made to come in line with the upper face of the shaft.

In the Greek Orders the Column is from five to ten diameters in height and the Entablature always about two diameters. In the Greek Orders, accordingly, the taller the Column, the lighter the entablature, relatively, but in the Roman Orders the taller the Column, the heavier the Entablature, actually. It follows that the weight of the Greek Entablature is proportioned to the diameter of the column, irrespective of its height; of the Roman to the height of the column, regardless of its diameter. The Romans put the least weight on the shortest and strongest supports. The Greek plan shows more regard to principles of construction, the Roman to principles of decorative composition.

Vignola used half of the lower diameter of the Column as his unit of measure, or *Module*. This he divided into twelve Parts for the Tuscan and Doric Orders, and into eighteen Minutes for the others, and he gives all the dimensions both of the larger members and of the mouldings in terms of Modules and Parts or Minutes, sometimes using even the quarter Minute, or $\frac{1}{48}$ of a Diameter. But it is equally practicable and more convenient to use the whole *Diameter* as a unit of measure, dividing it into Fourths and Sixths, and occasionally using an Eighth or a Twelfth.

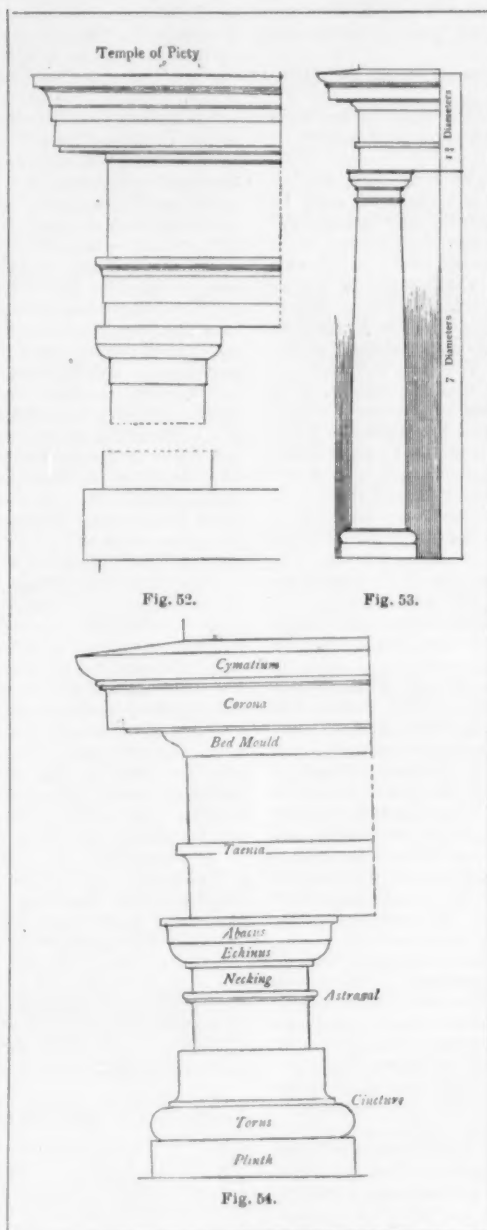
In the plates numbered from 3 to 8 the first two columns on the left show the vertical dimensions as given in Plate II. In the third column, these divisions are subdivided into equal parts, the fourth column giving a further division of the dimensions thus obtained. Most of these dimensions can be stated in terms of sixths or fourths of the Diameter, as appears in the tables. This analysis does not reach the smaller details, the shape and size of which must be



learned by observation. Indeed, all these forms should be made so familiar that they can be drawn accurately from memory, these arithmetical relations being used only to test the accuracy of the result, or to discover how much the proportions adopted in any given case differ from the regular type. For Vignola's Orders are to be regarded only as an admirable standard which may be safely adopted when there is no occasion to do anything else, but which is to be departed from and varied whenever there is any reason for doing so. Vignola obviously so regarded them. He did not himself adhere closely to his own rules, or generally adopt his Orders in his own work. His Doric and Ionic are to be found, however, in the Villa Caprarola.

THE TUSCAN ORDER.

The distinguishing characteristic of the Tuscan Order is simplicity. Any forms of Pedestal, Column and Entablature that show but few mouldings, and those plain, are considered to be Tuscan. Such are, in antiquity, those of the Temple of Piety (52) in Rome and the lower order of the Amphitheatre at Arles. Vignola's Tuscan Order (53) is marked by the use of the Ovolo in the Cymatium, and by the frequent employment of the Congé. The height of the Column is seven Diameters and that of the Entablature accordingly seven quarters, or one Diameter and three-quarters. The Base, Capital, Architrave and Frieze are each half a Diameter high, and the Cornice three-quarters. But this measurement includes not only the Base it-



self, but the Cincture at the foot of the Shaft. Dividing the Cornice into four parts, the Capital into three, and the Base into two, gives the principal horizontal divisions. The Bed-mould is a large Cyma Reversa. All the principal dimensions (54) can be expressed in terms of fourths and sixths of the lower Diameter of the Shaft.

The Abacus is seven-sixths of a Diameter across, not including the Fillet at the top, and it projects its own height from the face of the Architrave above, which is in line with the necking below.

TABLE OF THE TUSCAN ORDER.

$\frac{1}{2} D$	equals height of Plinth.
$\frac{1}{4} D$	height of Cornice.
"	projection of Cornice.
$\frac{1}{8} D$	height of Necking.
"	height of Echinus.
"	height of Abacus.
$\frac{1}{2} D = \frac{1}{2} D$	height of Base.
"	height of Capital.
"	height of Architrave.
"	height of Frieze.
$\frac{1}{2} D$	upper Diameter of Shaft.
$\frac{1}{2} D$	lower Diameter of Shaft.
$\frac{1}{2} D$	width of Abacus.
$\frac{1}{2} D$	width of Plinth.
$\frac{1}{2} D$	width of Taenia.
$\frac{1}{2} D$	height of Astragal.
"	projection of Astragal.

Vignola makes the width of the Plinth a little greater than this, and sets the Bed-mould up one-twelfth, making the Frieze wider and the Corona narrower.

W. R. WARE.

[To be continued.]

THE SECURITY OF ST. PAUL'S CATHEDRAL.

THE following official statement concerning the condition of St. Paul's has appeared in the *Times* from Mr. Somers Clarke:—

"Many reports have been circulated about the security of St. Paul's Cathedral which are not more remarkable for their conflicting nature than for their lack of authority. The public have been alarmed by statements about serious cracks in the fabric. These there are. They, expecting to see daylight shining through the walls, go away disappointed. Then we see comforting reports that there is really no cause for anxiety.

"The expectations of the one set of people are as unreasonable as the other reports are untrue.

"Never having seen any representative of the Press, information that has been attributed to me is wholly imaginary.

"It has been thought well that I should ask permission in your columns to make a statement as to what is the real condition of things, and this I will try to do as briefly as possible.

"Within the first hundred years after the structure of the cathedral was finished the immense weight resting on the foundations of the eight piers which carry the dome and on the foundations of its abutments caused those parts of the structure to sink a little.

"Most ingeniously spread out as are these foundations, so as to cover the largest possible area, the earth beneath them has consolidated rather more than under those parts of the fabric less heavily loaded.

"The settlement thus caused has broken the eight arches and the windows of the clerestory over them in the nave, the choir and the north and south transepts, where they abut on the dome piers.

"In the same way the very great weight of the western towers

has caused them to sink. In sinking they have cracked the west front in a vertical direction through the great door, the window above and the vaulted ceiling of the portico. They have also cracked through the wall of the chapel to the east.

"It is very rarely that one finds one of our cathedrals with towers or other heavy features wherein such parts have not been a cause of settlement.

"Such settlements are not necessarily a cause of serious insecurity, but it is obvious that by them the integrity of the edifice is more or less destroyed. Where the structure was intended to be tied together by continuous masonry the continuity is broken. Arches which should exercise their pressure in a definite direction begin to act in directions unforeseen.

"In buildings of pointed architecture such deformations are less serious in result than in those where round arches only are made use of. Pointed arches will undergo the most extraordinary distortions before they finally yield. The moment a round arch is broken or begins to spread the top flattens and its strength is jeopardized.

"Above a hundred years since the development of the before-mentioned settlements gave cause for anxiety a system of great iron ties was introduced into St. Paul's Cathedral. These are placed so as to tie back to the dome piers the fronts of the north and south transepts; to counteract, in fact, the want of continuity caused by the breaking through of the arches and window already referred to.

"But another movement was also observed, and ties were introduced to counteract it. The transept fronts were found to be settling away from the main fabric, and also themselves to be settling towards the east and west, this being demonstrated by a crack extending vertically through the windows.

"The damage in the south transept was greater than in the

north, and has since developed. This we can tell by observing the size of the joints between the stones, many of which, after the fashion of the time, were run in with lead, now quite loose and not filling the joints.

"Wren was well aware that the substratum on which the cathedral was to rest left much to be desired.

"The Mediæval builders, as a rule, troubled themselves very little about foundations. Wren took all precautions that were known or practicable in his time.

"Examining the site of his new cathedral, he found that, passing through the debris of old London, he came, at a depth of some 15 feet or 16 feet from the surface, to a layer of clay, or "pot earth," as he terms it. This varied from 6 feet to 4 feet in thickness. The pot earth rests on a stratum of sand (not at all solid) mixed with gravel stones, the lower part wet. Below this, and some 35 feet to 40 feet from the surface, lies the London clay. Wren thought it out of the question to carry all his foundations down to the London clay. He rejected piles, foreseeing that wells or other things might more or less drain off the water from over the clay, and knowing that, unless piles remain always under the same conditions, they must certainly rot. He thought best, by spreading the foundations, to float the cathedral on the bed of "pot earth," and thus he built, never dreaming of the desperate attacks the sandy substratum under the pot earth would have to sustain. Had this substratum been left intact in the structure on the lines of the chief settlement we now undisturbed, although there would, no doubt, have been some movement, there is no reason to apprehend that the movement would have continued.

"The very necessary increase of sanitation and of road improvement was probably the first serious attack on the substratum.

"The ground on which the cathedral stands slopes rapidly towards the south and the west. It is fairly level to the east and north. In all directions sewers were made and at various depths.

"It was proposed in 1832 to bring a sewer at some 30 feet below the surface through the churchyard on the south and east sides of the cathedral. Immediately the danger to the fabric that this would cause was pointed out, the Corporation of London, which has ever shown the greatest consideration for the cathedral, ordered the works to be stopped. The deep drain in these places has never been made. Unfortunately, it was carried up Godliman Street almost into the churchyard, and must have done not a little to drain the substratum, especially near the south-west tower. The level of this sewer is considerably below the bottom of the foundation of the cathedral walls.

"Some thirty years ago the Metropolitan District Railway was made under Queen Victoria Street, cutting a large gash along the southern slope of the hill on which the cathedral stands.

"The railway at its nearest point is but 530 feet away; that is, just about the length of the cathedral. The railway is, in fact, a huge trench cutting into the sandy stratum. The disturbance caused by making such a trench was very great. There cannot fail to have been a considerable change in the water-bearing conditions just above the London clay. A cutting once made the water will always follow it.

"Below the underground railway there has since been pierced the tube for the Waterloo and City Railway. How far this is down in the London clay I do not know.

"We find, then, that the southern slope of the hill on which the cathedral stands is fairly riddled with excavations of one sort and another. There are sewers, the underground railway, and a tube at a lower level.

"The most remote of the railways, or tubes, is but just 500 feet from the cathedral foundations.

"Those who have studied earth movements, the result of deep excavations, know that a great deal of dislocation takes place in a line diagonally right and left of the parts excavated. The fact that the underground railway is 500 feet off does not ensure that resultant earth movements do not come much nearer to the cathedral. During the last twenty years fresh indications of settlements have been showing themselves in the walls of the church. The movements are still in progress.

"Those most to be observed are on the south side. The worst are in the south transept. The way in which these have moved since the ties of one hundred years ago were inserted shows that the settlements are due not to the thrusting of arches in the fabric itself, but to the subsidence of the mass which at this place consists of a wall from 8 feet to 10 feet thick, 130 feet long, 130 feet high, and weighing between 12,000 and 13,000 tons.

"The arch of the window-head is so broken that the great key-stone carved with a cherub had dropped more than 2 inches from its place. Before the repairs just completed it was quite loose, and was merely held by the pinch of some stones at the back and by the iron-work of the window. The wall has, in fact, split vertically through the doorway and window over it, sinking gently in two masses right and left.

"The coffered window-head we see from inside the church is quite out of shape, and the same dislocation in a less degree may be observed over the windows of the clerestory adjoining. The massive iron stanchions intended merely to resist the wind and to give rigidity to the lead glazing are now bent by the weight of the window-arches pressing upon them.

"It would be going into too much technical detail to state in your columns where there are other indications of movement. It is enough to say that they exist on the south side of the church, and we know that some of them have continued to develop during the last three years. They are still developing.

"If we suppose it possible that the subsoil be left from henceforward untouched, the settlements are of sufficient importance to make it necessary not only to watch them carefully, but to expend considerable sums (out of a very limited income) on their repair. During the last four years the Chapter has had to find the money for such works.

"But now comes the attack by the electric railways. One of these — the Victoria, City and Southern Electric Railway — proposes to come under the churchyard, taking a line between the cathedral and the great warehouses on the south. The centre line of the tube, or tunnel, would be about 40 feet from the south-west tower and 50 feet to 60 feet from the south transept.

"Another — the Piccadilly and City Railway — proposes to pass under Carter Lane — that is to say, under the first street immediately south of St. Paul's Churchyard.

"The centre line of this tunnel is at a distance of 170 feet both from the south-west tower and the south transept. It would be a little nearer to the cathedral than the width of the west front. It would be but 300 feet from the centre of the dome.

"We must not forget that the cathedral is already attacked on the north. Here is the tube of the Central London Railway, and this is but 460 feet from the centre of the dome.

"We know that this tunnel, passing, as it does, close to Bow Church, has already in the few short years since it was pierced caused the steeple to overhang 1 foot 9 inches towards itself. Bow Church tower is a mere toy compared with the enormous weight of St. Paul's. The area of one of the western towers of St. Paul's is just double the area of Bow Church tower.

"But the chief danger to the cathedral lies by no means only in piercing the tubes or in the vibration from passing trains. The tubes may be sunk ever so far down, the vibration may, and no doubt will, be very much reduced, but wherever the tube may be a tremendous hole must be made for the public to get at it. Then when the bottom is reached there are footways, cross-passages and all manner of subsidiary excavations. Who knows what underground streams may not be tapped in making these big shafts, or how much superincumbent weight may affect excavations?

"The Piccadilly and City Railway proposes to place its terminus under the space where Cannon Street is crossed by Queen Victoria Street. The tunnels in which is the terminus must necessarily be of considerable length, and can hardly fail to come within 600 feet of the cathedral.

"The great hole and excavations to the east are, however, not more dangerous than would be those to the west on the slope of Ludgate Hill, where a station is projected. There is already, on the north, the Post-office station of the Central London Railway.

"The results of these big excavations and disturbances would, very probably, not show themselves seriously in the fabric of the cathedral for a good many years; but what is, let us say, fifty years in the life of a great national monument, one of the most magnificent buildings in the world, and which, taken due care of, may last for one thousand years and more?" — *The Architect*.

STORY OF OLD ST. PAUL'S.

ST. PAUL'S, which is at present exciting attention, has had a checked story. Three times fire has brought it to the ground, and the cracks in the walls which are just now being talked about bring to mind the sight which good Samuel Pepys saw as he walked up Ludgate Hill two hundred and fifty years ago. "I stopped at St. Paul's," he says in his diary, "and did see a hideous sight of the walls of the church ready to fall, that I was in fear as long as I was in it." The "very sight of the stones falling from the top of the steeple do make me sea-sick," the famous diarist wrote again. We are not likely to see St. Paul's as Pepys saw it, but any peril in its condition is a legitimate cause of national anxiety.

Those who know their London can find few places so inspiring, that carry the mind back so far in history, as underneath the great dome. Christianity has been represented by a church on this site since Augustine brought the Gospel to England, and all through the centuries a national interest has been taken in the cathedral of St. Paul's. After the destruction by fire in the reign of the Conqueror, the new St. Paul's was built from the offerings of thousands of people, to whom the bishops granted special indulgences in return for their subscriptions. Then the spire was struck by lightning in the middle of the fifteenth century, and a hundred years later — in 1561 — the tall steeple became a ruin. "Divers persons, in time of the tempest, being in the fields near adjoining to the city, affirmed that they saw a long and spear-pointed flame of fire run through the top of the shaft of St. Paul's steeple," and it was natural that the journalists of that day should set down the calamity to the lightning. If a later writer is to be believed, however, a plumber afterwards confessed that the destruction was caused through his carelessness in leaving a pan of burning coal in the steeple while he went home to dinner.

A hundred thousand pounds was spent in restoring the cathedral, and the work was finished in time to allow the great Oliver to stable his horses there in comfort. Twenty years after the great fire burned St. Paul's once more to ashes. The ground was so hot, says Evelyn, that it burned the soles of his shoes. Half London had schemes for rebuilding the famous church. St. Paul's was still smouldering when Wren submitted his idea to the king, within two days of the conflagration. He had little hope. The cost, he said, "would frighten the age." But at last the work was begun, and the pulling down of the

ruin was for days one of the sights of the metropolis. The heaps of rubbish were so great that scaffolds had to be erected over them to save delay while the men were clearing it away, and when it became necessary to remove the high tower, the workmen quailed before the task of mounting 200 feet to cast it down, and gunpowder was resorted to.

A box containing eighteen pounds of powder was placed in a hole under the pier, and the explosion caused the tower to rise visibly, in the mass, for quite 9 inches before it fell. By an accident a piece of stone was shot into a room in which two women were at work, and this led to the prohibition of the use of powder. Wren provided an ingenious substitute in the form of an ancient battering-ram, with which he kept thirty men beating against the same part of one of the great walls for a whole day. On the second day the wall trembled at the top, and in a few hours the last ruin of old St. Paul's fell with a crash like an earthquake.

With it passed a strange phase of life in ancient London. For generations St. Paul's had been the rendezvous of all sorts and conditions of men. The benches at the door of the choir were the common resort of beggars and drunkards, and a large dunghill lay within one of the doors. The aisle through the centre of the cathedral was known as Paul's Walk, and Rotten Row is not more popular in our day than Paul's Walk was then. A dramatist has left us the picture. "At one time," he says, "in one and the same rank, yea, foot by foot and elbow by elbow, shall you see walking the knight, the gull, the gallant, the upstart, the gentleman, the clown, the captain, the apple-squire, the lawyer, the usurer, the citizen, the bank-root, the scholar, the beggar, the doctor, the idiot, the ruffian, the cheater, the Puritan, the cut-throat, the highwayman, the low-man, the true man, and the thief; of all trades and professions some; of all countries some. Thus, while Devotion kneels at her prayers, doth Profanity walk under her nose in contempt of religion."

Old St. Paul's, indeed, must have had within its walls a veritable city. More than twenty private houses were built at one time against the walls, and the owners of several of these cut doorways through into the church, parts of which they made use of as their own rooms. The very vaults were turned into private cellars, with doorways from the houses outside. Somewhere in the records of the cathedral is a report of a faithful verger who protested that "the shrouds and cloisters under the convocation-house are made a common lay-stall for boards, trunks, and chests, being let out unto trunk-makers, where, by means of their daily knocking and noise, the church is greatly disturbed." Thus it came about that one part of St. Paul's was used as a playhouse, that a baker baked his bread in an oven cut out of one of the buttresses, and that another of these privileged householders found a way from his house into the steeple, where he managed to set up a store-room. — *St. James's Gazette.*



[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

DESIGN FOR LYCEUM THEATRE, SAN FRANCISCO, CAL. MR. WILLIS POLK, ARCHITECT, SAN FRANCISCO, CAL.

COMPARISON OF THE ORDERS.

STABLE FOR ARCHER BROWN, ESQ., EAST ORANGE, N. J. MESSRS. LUDLOW & VALENTINE, ARCHITECTS, NEW YORK, N. Y.

THE exterior of the building is plastered with Portland-cement, of a light-gray tone, put on over expanded-metal lath. The roof is covered with cedar shingles, stained to a moss-green tone. The interior throughout is trimmed with yellow pine, finished with spar varnish. The stalls each have a cast-iron stall-pan, connected to the drainage-system. The basement accommodates two bowling-alleys, and the second story is finished for living-rooms for the coachman.

THE TUSCAN ORDER: TWO PLATES.

[The following named illustration may be found by reference to our advertising pages.]

TOURELLE, HALIFAX, ENG. MESSRS. BUTLER, WILSON & OGLESBY, ARCHITECTS.

This plate is copied from the *Architect*.

[Additional illustrations in the International Edition.]

DESIGN FOR A COUNTRY-HOUSE AND FORMAL GARDEN. MR. E. ELDON DEAN, ARCHITECT, NEW YORK, N. Y.

THE TRANSIT BUILDING, EAST 42D ST., NEW YORK, N. Y. MR. CHARLES A. RICH, ARCHITECT, NEW YORK, N. Y.

DOORWAY TO THE SAME.

DOORWAY: NO. 27 PINE ST., NEW YORK, N. Y. MESSRS. DE LEMOS & CORDES, ARCHITECTS, NEW YORK, N. Y.

THE OLD PALACE AND THE EMPEROR WILLIAM MONUMENT, BERLIN, PRUSSIA.

THE NEW CATHEDRAL, BERLIN, PRUSSIA. PROF. J. C. RASCH-DORFF, ARCHITECT.



[The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.]

A TALE OF HARDSHIP AND PLUCK.

July 26, 1901.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—The formal statement, enclosed with P. O. O., cannot adequately express my appreciation of the courtesy which has been extended to me by the American Architect and Building News Company. To properly express my appreciation, and what it has meant to me to have this courtesy week by week, weeks lengthening into months, and months into years, I believe will best be shown by rapidly sketching a few salient points of my experiences these past few years.

During the dull times recently passed, I had great difficulty in making collections, and shortly after the completion of the drawings for the largest building I had been commissioned to design, the only banks in the city in which it was located went under, and left my clients practically penniless, and, as a consequence, I had to make all the retrenchment possible. My residence being located ten and one-half miles from X—, I walked morning and evening to save the expenditure on car-fare, and, incidentally, take a "constitutional" at the same time; endeavoring during this time to secure a position as draughtsman, but without avail, and matters not improving, but rather the reverse, as I had experiences of this character to contend with: A prospective builder of a business-place to cost \$25,000, and ten houses to cost between \$1,000 and \$1,200, desired to know if I could make a lower bid than he had already secured, viz: \$125 for designing the lot. Such contemptible ignorance of the work involved did not give very much encouragement. However, I kept at it, always looking forward for better things, even if money was all going out and nothing coming in, and the larder not as well stocked as it would have been under other conditions.

The final effort I made was in the competition for the Y. M. C. A. Building, at X—, having to tackle it without any assistance and walk my daily journey of twenty-one miles. During the last week of the competition, I had to slip up on one trip, and work right through until the next evening, even if it did mean that I would lack my meagre crust of bread until I could reach home. It is possible that work has been done under worse circumstances and the worker live, but I have never read about it. On completion the drawings were handed in under a *nom de plume*, but, as usual, that does not mean much. There was a hitch in the committee—over a question of ethics in the work of committee. The secretary told me, about two months afterwards, that it would be probably some time ere it would be settled, but that I need not worry about it, for a majority of the committee were in favor of my design. On desiring to know how they knew my design from that of the other competitors, "Why, it is just like handwriting. We knew everybody's but one, and we concluded it was yours, for none of the others would have made a certain disposition."

Well! that was in 1897, and it has not been built up to date.

My exchequer had now reached that point where I had to either sell my library for food or take the first opening that I could secure. I went into the employ of the — Steel Company as a laborer at 99 cents per diem; three weeks afterwards I was appointed weigh-master for one of the rolling-mills; a few months afterwards got the position of rodman with the Company's surveyor; from thence to the bridge and construction department draughting-room as a tracer; then junior draughtsman; then to local-work squad, gradually making a position for myself; and several weeks ago was appointed by the superintendent of the department to have charge of the architectural part in the designing of the new shops for the department, which feels, I can assure you, like coming into my own. During all these dark days, and all these struggles, there was always one bright spot. As sure as Monday morning came, the *American Architect* was forthcoming to cheer me on my way, and if your "advertisers" could only appreciate how to me it was like meeting old friends when I would open my copy and see the familiar names, they would certainly wake up a bit and "spread themselves out" on your advertising pages even more than they do.

I am looking forward to being in a position shortly to settle my account and subscribe for the "International Edition," and also to become a subscriber to the latest venture of the American Architect and Building News Company, "Topical Architecture," as I believe it will prove of great value as the years pass. I am judging from the *American Architect's* excellent series on "Apsidal Treatment." It has also been a source of regret to me that I have been, under my circumstances, unable to secure more than the first part of the "Georgian Period." I trust that you have been enabled through accessions to the subscription-list to go on with the publication, anticipating that I will be able to possess the complete — up-to-date — issue some near day.

Again thanking you for the gratifying courtesy which has been so opportunely given me, just when I needed encouragement, and for the confidence it implied in my integrity, believe me to be, my dear sir, your obedient servant,
X. Y. Z.

NOTES AND CLIPPINGS

CONTRACT FOR THE ERECTION OF A WIND-MILL. — In an action brought by Samuel A. Fisher against L. Adelaide Rendell Goodrich to recover the contract-price of a wind-mill and appurtenances, which the plaintiff alleged he had erected upon the premises of the defendant complete and in good working order, it appeared that Fisher submitted to Mrs. Goodrich a proposition to "furnish all material and labor to complete the wind-mill as we decided on," stating in detail the specifications of the work, and concluding, "I will guarantee work and all material to be first-class, and will complete the job as we talked it over for \$327.00." At the same time, and as a part of the offer, Fisher gave the defendant an itemized bill, or statement, of the amounts to be paid by her for the various parts of the windmill, amounting in the aggregate, including an item of \$33.50 for labor in erecting the mill, to the sum of \$327.00. When the mill was completed, Mrs. Goodrich refused to accept it because the tower was found to be not strong enough to support the tank. Fisher then commenced to take down the mill for the purpose of removing it, and on the following day was notified by the defendant to remove the mill and consider the contract terminated. The Second Appellate Division, in reversing judgment for the plaintiff, holds that the contract was a single and entire contract for the sale and delivery of a wind-mill, and not to furnish material and perform labor upon it for the defendant. In order to be entitled to recover any part of the contract-price, the Court says, the plaintiff was obliged to allege and prove the substantial completion of the wind-mill according to the terms of the contract. "The defect being of a material character," says Justice Sewell, for the Court, "the defendant had the right to terminate the contract, and to require the plaintiff to remove the mill, as not conforming to it, without regard to the intention of the plaintiff." It was, therefore, error for the Court to charge that if the plaintiff offered to substitute a new tower in the place of the one which had proved to be insufficient, and was unreasonably prevented from doing so, he was entitled to recover. — *N. Y. Times*.

A NOVEL REVIVAL OF THE APPRENTICE SYSTEM. — An innovation of far-reaching industrial importance has recently been made by the Baldwin Locomotive Works of Philadelphia. With the aim of turning out a class of technically skilful mechanics and mechanical-engineers, the Company has set up an apprenticeship system offering to boys and young men a chance to supplement their school-training with two, three or four years' experience in the Locomotive Works. The Baldwin apprentices are divided into three classes. The first is composed of grammar-school graduates, who serve four years — usually between the ages of 17 and 21 — at wages of 5, 7, 9 and 11 cents an hour, and receive a bonus of \$125 at the end of their period of service. They are obliged to attend night-school three evenings a week, and study geometry, algebra, drawing and perspective, in order to be thoroughly familiar with the technical language used throughout the shops. The Company, under contract to teach them the "art and mystery of a trade," provides that their work shall be changed with sufficient frequency to initiate each boy into all the details of his craft. The second class serve three years at 7, 9, and 11 cents an hour, and receive a bonus of \$100. The apprentices of this class are high-school graduates, but they, too, are obliged to take the technical studies of the night-school for a part of three years; and they, too, learn a trade. The third class — the graduates of technical schools and colleges — serve for two years, not as apprentices, but as employes, at 13 and 16 cents an hour. Their education, of course, is taken for granted. Only a few, obviously, will ultimately enter the works: if all became employes of the Company the system would be paralyzed in short order; but in full operation the school — for that is virtually what it is — will send out over a thousand finished mechanics every year. In twenty years this institution alone will have provided the community with twenty thousand of these skilled workmen. — *The World's Work*.

THE ASSYRIAN STORY OF THE CREATION. — Assyriologists are interested in the work being prepared by the authority of the trustees of the British Museum, respecting the unique series of baked-clay tablets and fragments from the ruins of Nineveh and Babylon, preserved in the Museum. The announcement, as made by the *Manchester Guardian*, says that from the enormous number of these tablets a selection has been made of the whole of the cuneiform texts relating to legends concerning the creation of the world, and the mythical origins and deeds of some of the earliest and most famous kings of Mesopotamia, with a view to the publication of the collected edition of these texts. Since George Smith, the distinguished cuneiform scholar, indicated, in 1876,

the remarkable resemblance between certain portions of the creation legend as narrated in the cuneiform texts on the tablets discovered by him at the mound of Konyunjik, at the ruins of Nineveh, and passages in the early chapters of Genesis, several renderings of them have appeared in English, French, and German, and interest in the subject has been world-wide. In America, in particular, the study has made great progress. Among the texts now to be published for the first time is the one relating to the creation used by Mr. Smith in his work, and after his death lost sight of for about twenty-five years, and only identified during the examination of the collection last year. — *P. A. H. in the N. Y. Evening Post*.

MONIER CYLINDERS FOR BRIDGE FOUNDATIONS. — Amongst the selected papers published in a recent issue of the minutes of Proceedings of the Institution of Civil Engineers is one by Mr. E. M. de Burgh, M. Inst. C.E., describing the use of cylinders of armored concrete for bridge foundations, which constitutes, we believe, a new departure in the development of the Monier system. Cast-iron cylinders, Mr. de Burgh states, have been very largely used in New South Wales for bridge foundations in salt water, but a great advance in the price of cast-iron led him to consider the possibility of replacing this material by armored concrete pipes, which was successfully accomplished at a great saving in cost — the Monier cylinders costing but 24s. per foot, in place of £3, the cost of cast-iron ones, although the conditions were not specially favorable to the former. The cylinders used were 4 feet in diameter outside, and were 2½ inches thick. They were constructed in lengths of 3 feet 7 inches, and were made up of one layer of steel wire-netting of 1½ mesh and No. 16-gauge wire, and two spirals of No. 8-gauge steel wire wound completely round the cylinder at a pitch 1 inch. A cast-iron cutting edge was provided. With a view to facilitating the connections of the different lengths longitudinally, steel bars, 1½ inches by ½ inch, were embedded in the concrete between the spirals, sockets being left at each end, so that the bars in successive lengths could be coupled up by a small fish-plate and steel wedges. The cylinders thus constructed were sunk through gravel, sand and clay to a depth of 36 feet below water-level. Mr. de Burgh states that were it necessary to use an air-lock there would not be the slightest difficulty in attaching it to the cylinders. — *Engineering*.

UNDERPINNING ST. PAUL'S. — Commenting on Mr. Somers Clarke's letter in the *Times*, which we reproduce this week, Mr. Charles Reilly writes to that journal insisting that St. Paul's may be made perfectly secure for a much less sum than might at first appear probable. He says: — "This security can be achieved by giving the building a foundation entirely beyond the influence of any underground enemy in the form of railway or sewer which may creep up to it. Such foundation exists here in the blue clay, and the real task seems to me to be the placing of the Cathedral upon it. Taking Mr. Clarke's figure of 35 feet for the depth of this clay, which agrees with my own experience in the City, I have roughly measured, from Britton's and Pugin's plans and sections, the quantity of underpinning required to accomplish this, and the cost amounts to about £220,000. To show that this is by no means an impossible task from a constructional point-of-view, I may say that I have recently done the same thing to the hall of one of the City Companies, within 50 feet of the Stock Exchange itself, a heavy building, and entailing a supposed risk which no builder would take on his own responsibility. In the building referred to, the intensity of load was the same as that given by Mr. Clarke, with the further difficulty of weights concentrated to the amount of 300 tons in isolated stone piers. These piers were safely underpinned to a depth of 50 feet without cracking the plastering in the rooms above. In the case of the Cathedral, the existence of the crypt enables such work to be carried out without interference with the use of the building."

DR. JOHNSON ON LANDSCAPE-GARDENING. — "He [Shenstone] began from this time to point his prospects, to diversify his surface, to entangle his walks, and to wind his waters; which he did with such judgment and such fancy, as made his little domain the envy of the great, and the admiration of the skilful; a place to be visited by travellers, and copied by designers. Whether to plant a walk in undulating curves, and to place a bench at every turn where there is an object to catch the view; to make water run where it will be heard, and to stagnate where it will be seen; to leave intervals where the eye will be pleased, and to thicken the plantation where there is something to be hidden, demands any great powers of mind, I will not inquire; perhaps a sullen and surly speculator may think such performances rather the sport than the business of human reason. But it must be at least confessed, that to embellish the form of nature is an innocent amusement, and some praise must be allowed by the most supercilious observer to him who does best what such multitudes are contending to do well." — *"Lives of the Poets."*

PROBABLE COST OF THE ST. LOUIS EXHIBITION. — To plan the architecture of the St. Louis fair, architects of this city, including Cass Gilbert and Carrère & Hastings, met yesterday with Isaac S. Taylor, Chairman of the Architects' Commission and Director of Works of the Exposition; C. Howard Walker, of Boston, and J. Knox Taylor, Supervising Architect of the Treasury Department, who will design the Government buildings. They have settled on the ground-plans for the Exposition. The site will include 640 acres of Forest Park and other land, making 1,100 acres in all. The style of architecture adopted is the Italian Renaissance freely treated. The architects expect to give out contracts amounting to \$7,000,000 or \$8,000,000 this fall. The city of St. Louis gives \$5,000,000, the subscription-fund now amounts to \$5,000,000; the State of Missouri has given \$1,000,000, the United States will give \$5,000,000, and will expend \$250,000 besides on the Government building. The entire cost of the Exposition will be about \$30,000,000. — *N. Y. Evening Post*.



DESIGNED BY THE ARCHITECTS AND BUILDERS OF THE

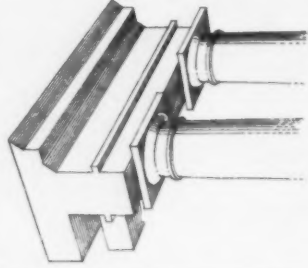
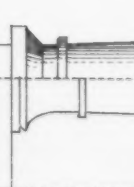
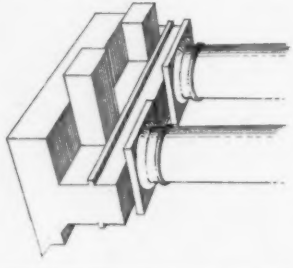
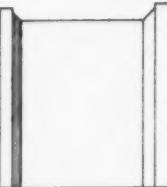
DESIGN FOR LYCEUM THEATRE.
WILLIS POLK, ARCHT.



UM THEATRE, SAN FRANCISCO, CAL.
 LLIS POLK, ARCHITECT.

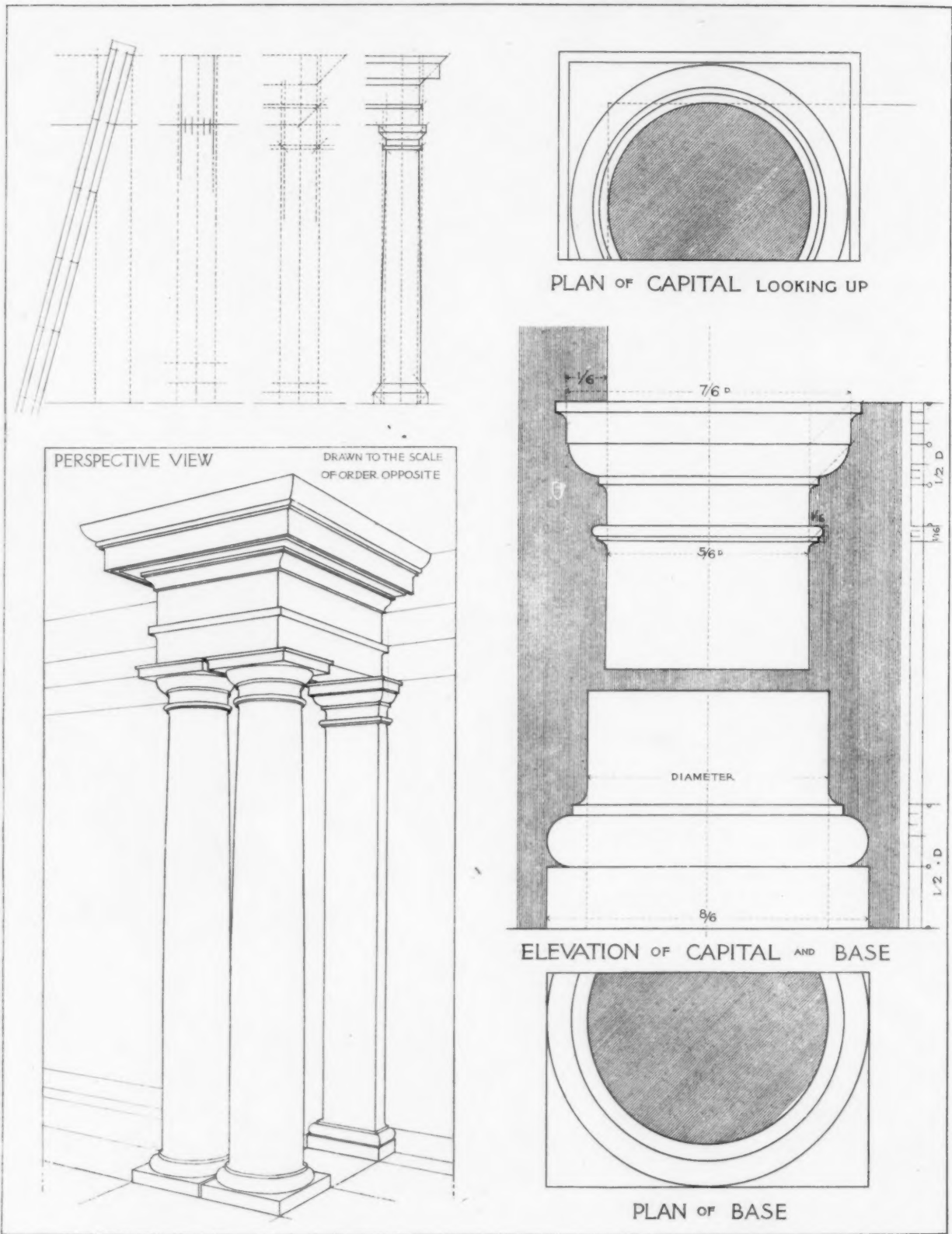
The American Architect
 Aug. 31, 1901.
 No. 1340.

COMPARISON OF THE ORDERS

TYPE OF ORDER	NAMES OF FEATURES					GREEK DORIC	TUSCAN		DORIC		IONIC		CORINTHIAN COMPOSITE		PERSPECTIVE VIEW	
	ENTABLATURE		CORNICE	FRIEZE	ARCHITRAVE		CAPITAL	2	3/4	1/2	3/4	2 1/4	7/8	1 1/2		2 1/2
						2		1 3/4	3/4	2	2 1/4	7/8		1	 FROM WITHOUT	
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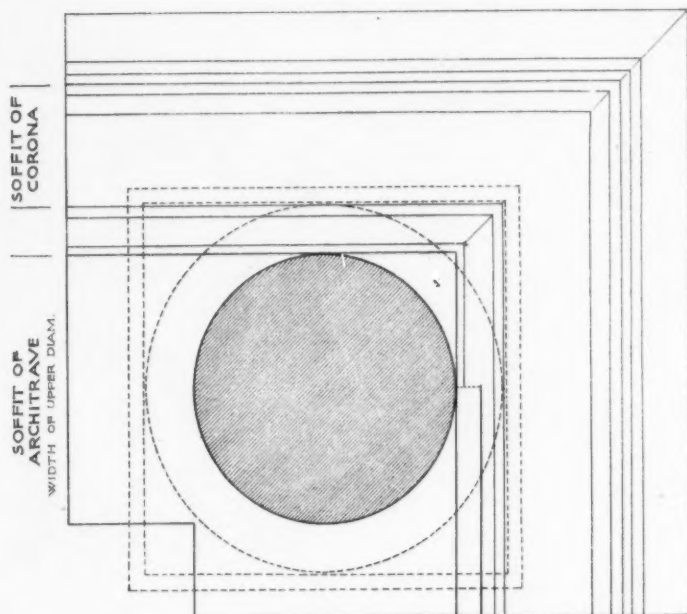
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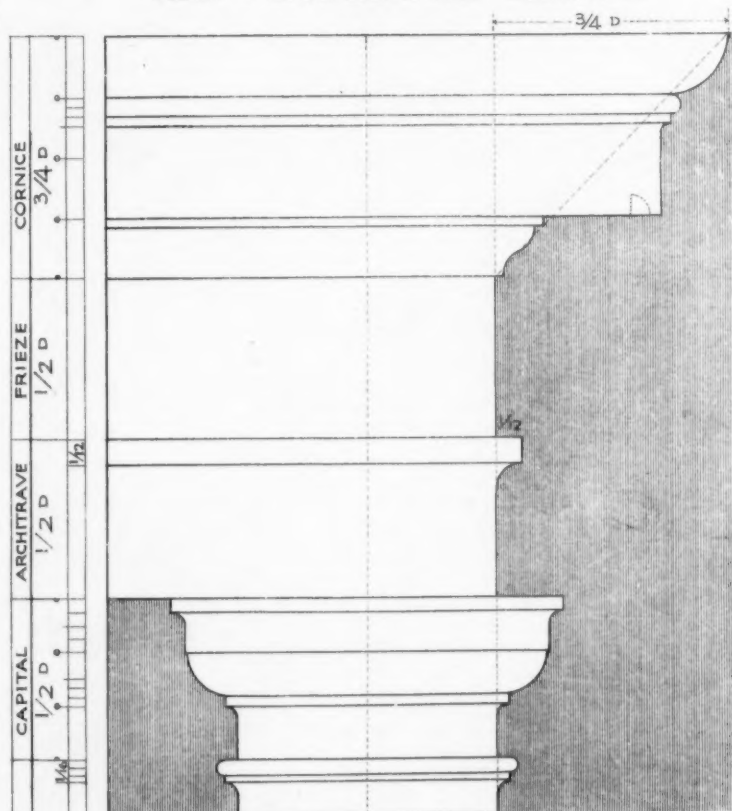
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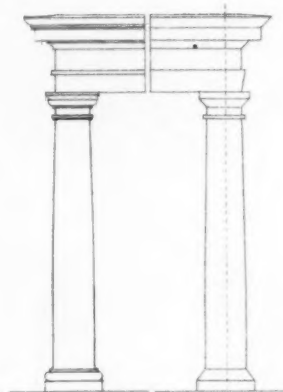
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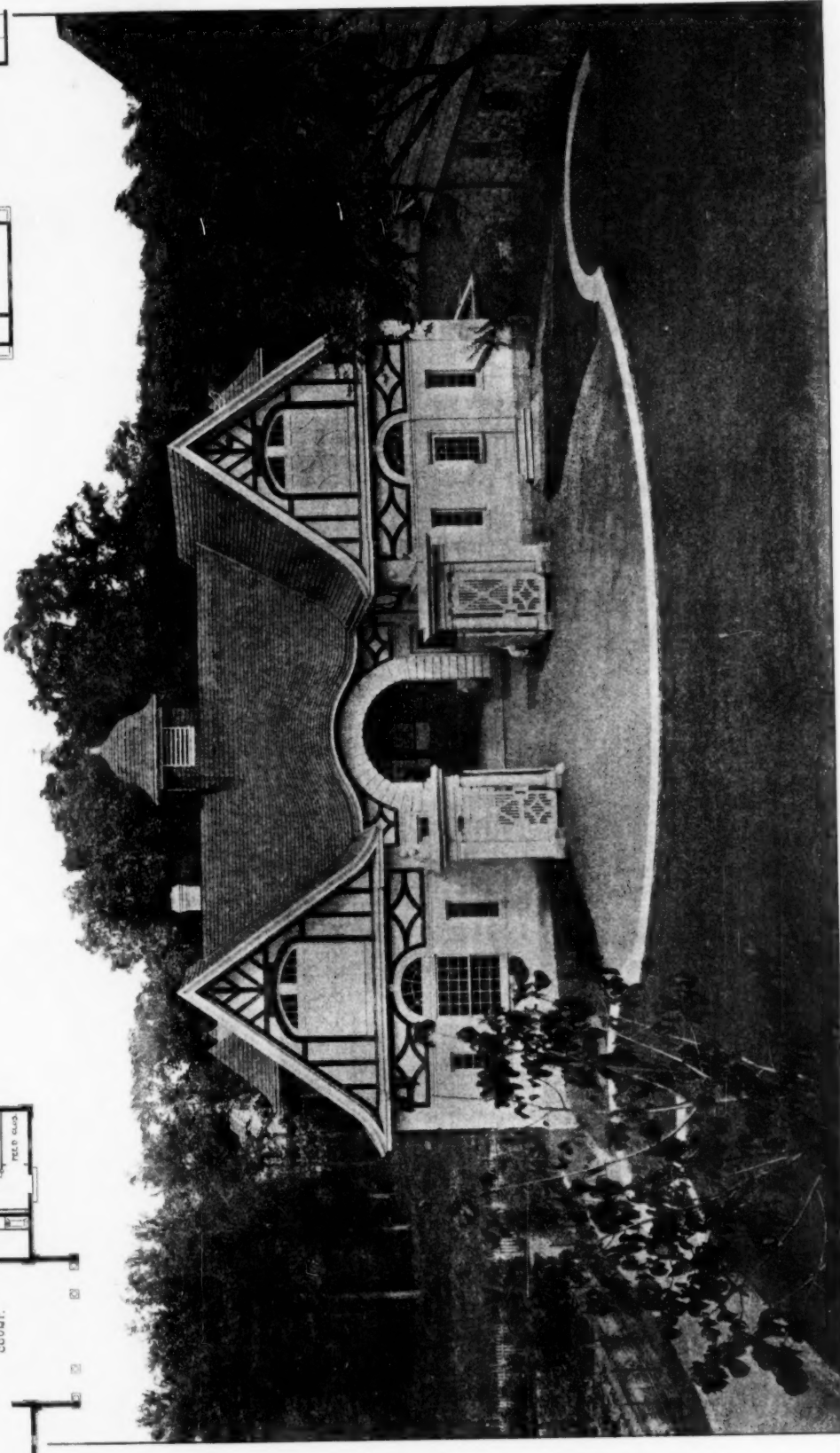
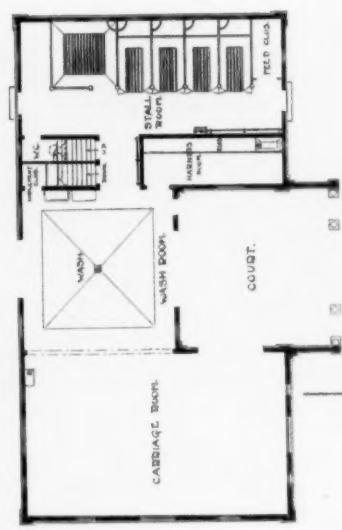
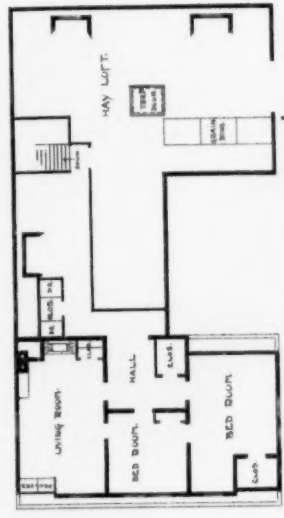


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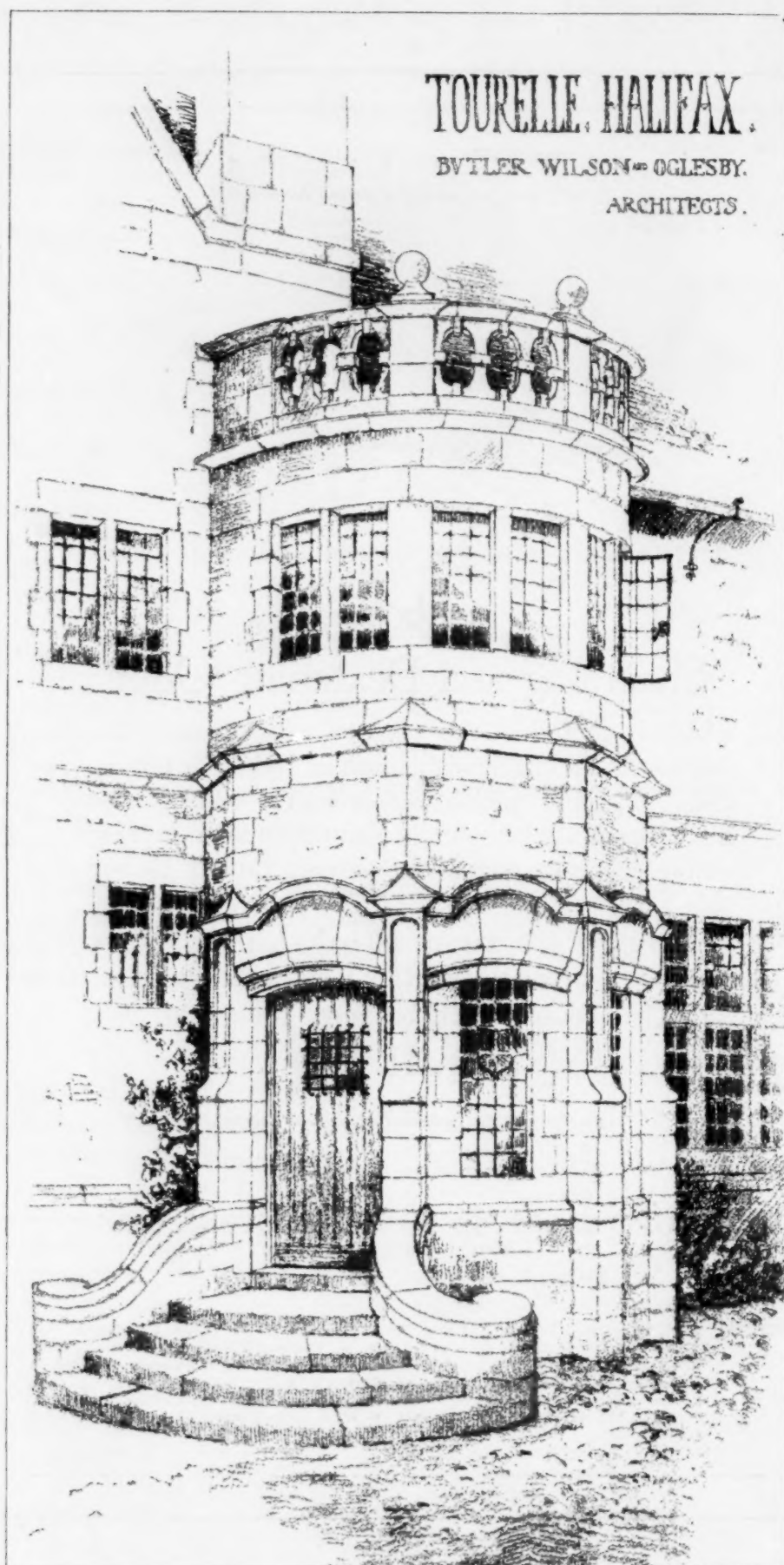
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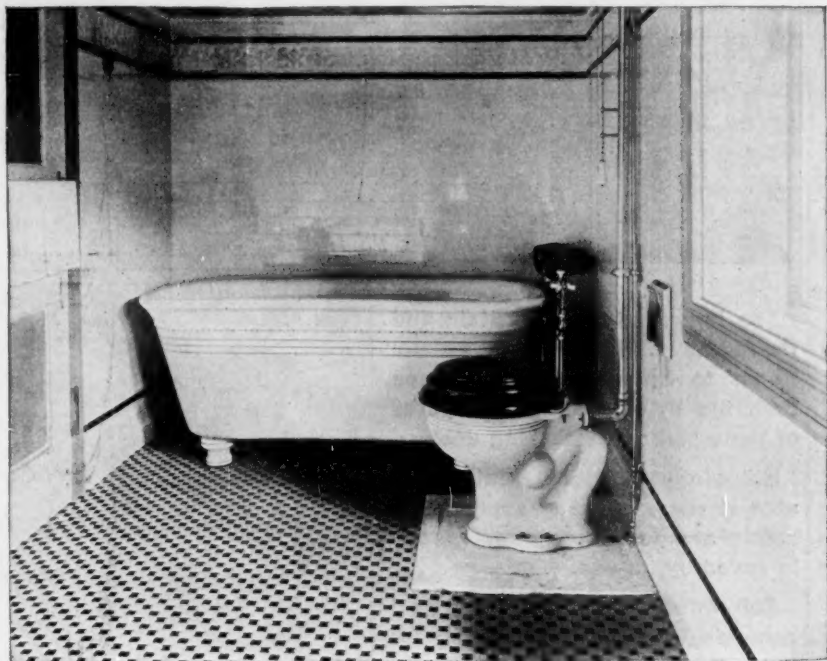


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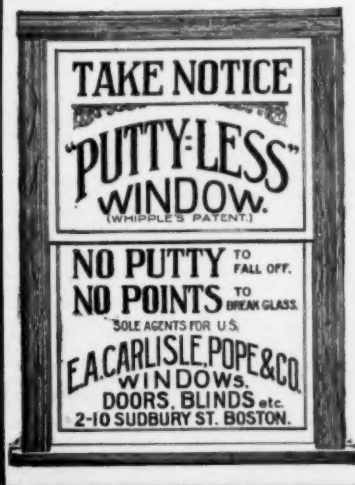
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BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

Kansas City, Mo.—J. C. Braecklein, 339 Junction Building, has completed plans for a \$15,000 brick Jewish synagogue.

Lawrenceville, Pa.—It is stated that J. W. Campbell, 814 Penn Building, Pittsburgh, has prepared plans for a brick and stone church to be erected for the Baptist congregation; estimated cost, \$20,000.

Longview, Tex.—The James Riely Gordon Co., architects, Dallas, have prepared plans for a new brick church to cost \$12,000. For information, write to Mr. G. A. Kelly, president.

Marysville, Miss.—A \$12,000 jail is to be erected here.

Meridian, Miss.—The Supervisors have accepted the plans of Krouse & Hutchinson for the Lauderdale County jail, to cost about \$35,000.

Morganton, N. C.—It is stated that the First National Bank will erect a new brick building.

Morgantown, Va.—Elmer F. Jacobs has prepared plans for a four-story \$15,000 block for the Acme Publishing Co.

New Martinsville, W. Va.—Plans have been prepared by W. Chamberlin & Co., Birmingham, Ala., for a Presbyterian church, costing \$60,000. Rev. A. D. Light, pastor.

New York, N. Y.—The Park Board have formally awarded the contract for the construction of the new public library at 40th to 42d St. and 5th Ave., to Norcross Bros. for \$2,865,706.

The Knights of Columbus Building Co., of which Francis Sullivan, 25 Broad St., is the managing director, will erect here an eight-story brick and stone club-house, on a plot 100' x 125', on 6th St., near Columbus Ave., from plans by L. & J. Brandt, 1270 Amsterdam Ave. The building will have accommodations for from 60 to 80 lodges. The building will cost, exclusive of the land, about \$200,000. The working drawings are now being made.

Oklahoma City, Okla.—The James Riely Gordon Co., architects, Dallas, Tex., have prepared plans for the new Presbyterian Church, brick, steam-heating, art-glass, electric-wiring, etc., to cost \$14,000.

Paris, Tex.—The James Riely Gordon Co., architects, of Dallas, have prepared plans for a residence for Mrs. Williams, to cost \$5,500.

Philadelphia, Pa.—Wilson Bros. & Co. are sketching designs for the proposed mausoleum and museum to be built in accordance with the request of the late Dr. Thomas W. Evans.

The Philadelphia Society for Organizing Charity has bought from Charles Sylvester for a nominal consideration the buildings 1715 to 1723 Naudain St. They will be demolished to make way for the new four-story Wayfarer's Lodge.

Contractors Doyle & Doak have been given a permit to remodel the Girard Bank Building, at a cost of \$100,000. The front will not be altered, but the entire interior will be torn out and refitted for banking and office purposes. Another story will be added and a circular dome put on.

Pittsburgh, Pa.—Plans have been completed by Reiger & Currier, Smith Building, for a patrol station on Perry St., Allegheny, to cost \$15,000.

Pittston, Pa.—Mr. T. W. Davis, General Secretary of the Y. M. C. A., under date of August 21, writes us that no site has been purchased nor architect selected for a new building yet. The item in our issue of August 17 incorrectly stated cost of building and name of B. A. Crowther as architect.

Port Jervis, N. Y.—The plans by Ackerman & Ross, 156 Fifth Ave., New York, have been accepted for the new two-story brick library building.

Port Washington, L. I., N. Y.—Augustus N. Allen, 35 E. 58th St., New York City, has prepared plans for Mr. Howard Gould of buildings to be erected at this place including (1) a fireproof stable, 60' x 650', of Indiana limestone construction, to cost \$600,000. (2) A cow-barn of local stone, 40' x 400', costing \$450,000. (3) Dairy, 36' x 30', of stone, \$10,000. (4) Laundry and farm-house, 34' x 76', \$20,000. (5) Three stone lodges, costing \$34,000. (6) Henney comprising six stone buildings, 500 feet in length, \$35,000. (7) Sheep-fold, 20' x 100', \$5,000.

Racine, Wis.—Frost & Granger, Chicago, Ill., are preparing plans for a \$50,000 brick, stone and terra-cotta passenger station for the Chicago & North-western Railway Co.

San Antonio, Tex.—The James Riely Gordon Co., architects, and Harvey L. Page, associate, have prepared plans and specifications for the new Travis Park M. E. Church, stone, steam-heating, art-glass, marble, etc., to cost \$25,000.

The James Riely Gordon Co., architects, and Harvey L. Page, associate, have prepared plans for

BUILDING INTELLIGENCE.

(Advance Rumors Continued.)

a residence for Hon. Le Roy G. Denman of the Supreme Court on Laurel Heights, frame Colonial, hardwood, art-glass, plumbing, heating, etc., to cost \$30,000.

Sewickley, Pa.—Reports state that the Y. M. C. A. will erect a \$25,000 building on the Beaver Road.

Sharon, Pa.—It is rumored that a 10-room school will be erected, at a cost of about \$40,000.

Shepherdstown, W. Va.—It is stated that S. G. Westenhauer, of Martinsburg, has received the contract for erecting the college here for about \$35,000.

Shreveport, La.—The James Riely Gordon Co., architects, and A. J. Armstrong, associate, have prepared plans for the City Hotel building, four stories, elevators, electric-lights, marble, plate-glass, hard plaster, kitchen outfits, etc., to cost \$30,000.

The James Riely Gordon Co., architects, and A. J. Armstrong, associate, of Dallas, Tex., have awarded the contract for the superstructure of the First National Bank to Sonnenfeld & Emmins, contractors, for \$108,000, exclusive of the fixtures, elevators, fittings, etc.

The James Riely Gordon Co., architects, and A. J. Armstrong, associate, of Dallas, Tex., have prepared plans for the Soudy office-building, pressed brick and stone, electric-lights, plumbing, steam-heating, skylights, etc., to cost \$24,000.

South Bend, Ind.—A new high-school building will be erected by the Board of Education on W. Washington St., at a cost of \$75,000.

South Framingham, Mass.—E. R. Maynard, 226 Tremont St., Boston, has prepared plans for a frame opera-house, 60' x 100', with seating capacity of 1,000 persons. The lot is 75' x 100' on Kendall St.

St. Louis, Mo.—It is reported that the Board of Trustees will expend \$400,000 in improvements at St. Luke's Hospital.

St. Mary's, W. Va.—Report states that a \$60,000 court-house will be built by Pleasants County.

Thompsonville, Conn.—Plans have been completed by Messrs. Chickering & O'Connell, Springfield, Mass., for United Presbyterian Church. Building will contain auditorium, 46' x 60', and an ell will be added at rear to contain lecture and Sunday-school room, 26' x 46', parlor, dining-room and library.

Warren, Pa.—It is stated that a \$15,000 brick church will be erected by the First Lutheran Church congregation. Jos. Fox, superintendent.

Jacob Meyer's Sons, Philadelphia, have secured the contract for the construction of the new Warren Savings Bank, to be erected from designs by Architects Bailey & Truscott. The building will cost approximately, \$50,000.

Wausau, Wis.—Press report states that John Andrews has received the contract for erecting the Wausau Club-house, at \$74,769.

Wellington, O.—It is stated that Col. Myron T. Herrick, of Cleveland, will erect a \$15,000 library building at this place.

APARTMENT-HOUSES.

Pittsburgh, Pa.—Mathilda St. and Liberty Ave., four-story bk. store & flat; \$20,000; o., Jos. Geyer, 3940 Liberty Ave.; b., Calhoun & Miller; a., S. W. McCloskey.

Salt Lake City, Utah.—State and Brigham Sts., six-story bk. & st. apart.; \$175,000; o., Mrs. E. F. Holmes; a., S. C. Falkenberg, Hammond Building, Detroit, Mich.

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Banger, Me.—2½-st'y fr. dwell., 50' x 60', pitch roof, steam; \$15,000; o., N. M. Jones, Lincoln; a., Wilfred E. Mansur; not let.

Cincinnati, O.—Fairfield Ave., bet. Westminster & Dexter Sts., 2½-st'y bk. dwell., pitch roof; \$15,000; o., Dr. J. M. Crawford; e., James Griffith & Sons; a., Des Jardins & Hayward.

Grandin Ave., nr. Madison Ave., 2½-st'y bk. dwell.; \$13,000; o., C. L. Harrison; e., Jas. Griffith & Son; a., Elzner & Anderson.

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construction and completion of the Capitol Building and for other purposes, invite the architects of Pennsylvania to submit plans and specifications for the construction, building and completion of the State Capitol at Harrisburg, including a power, light and heat plant of sufficient capacity to satisfactorily supply the needs of said building, as provided by the said Act of Assembly. The building must be of sufficient size to provide ample accommodations for the executive and departmental branches of the State Government as well as the General Assembly, its officers and employees and to anticipate the future needs of the State. A certain amount of work having already been done, competitors are restricted in a measure to certain outlines of exterior and interior, of all of which facts they will hereby take notice.

The entire cost of the building complete, including all decorations, power, light and heat plant, the removal of the two departmental buildings now occupied by the Secretary of Internal Affairs and the Secretary of Agriculture, as provided by the said Act of Assembly, architect's fees and the expenses of the Commission shall not exceed the sum of \$4,000,000 as under no circumstances will extras be considered, nor will the Commission ask for any additional appropriation. The building is to be completed in all its parts, ready for occupancy on or before the first day of January, 1906, unless the condition of the Treasury justifies its earlier completion. No plans and specifications from architects resident outside of the State will be received, as the law provides that the architect selected must be a resident of Pennsylvania. The exterior or outer walls of the building are to be of granite of the best quality, and in so far as practicable the interior decoration, finish and style of the Congressional Library at Washington will be taken as a type, scheme or model by the Commission in passing upon the plans and specifications submitted.

All plans and specifications must be sealed and filed with the Secretary in the office of the Commission at Harrisburg on or before the 30th day of November, 1901, at 12 o'clock noon, at which hour they will be opened by the Commission.

The architect, who shall be the author of the plans and specifications adopted by the Commission, will be selected as architect to supervise the construction and completion of the building, the removal of the departmental buildings referred to and the installation of the power, light and heat plant, and shall receive in full compensation for his services a commission in accordance with the schedules of commissions adopted and recommended by the American Institute of Architects for full professional services.

The five architects presenting plans and specifications considered next best in the opinion of the Commission will each receive the sum of \$1,000.

All drawings shall be one-sixteenth scale. No limit is placed upon the number of designs to be

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COMPETITIONS.

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The present buildings are open to the inspection of competing architects. Information as to space for the different departments can be obtained upon inquiry of the heads thereof. The right to reject any and all plans and specifications is reserved. By order of the Commission, EDGAR C. GERWIG, secretary. 1340

PROPOSALS.

POWER-HOUSE AND EQUIPMENT.
[At new Capitol for the State of Minnesota.]

ST. PAUL, MINN., August 6, 1901.

Sealed proposals in duplicate will be received at the office of the Board of State Capitol Commissioners, No. 512 Endicott Building, St. Paul, Minn., until 12 o'clock noon on the 24th day of September, 1901, for all labor and material required for the mechanical equipment and power-house for the new State capitol building at St. Paul, Minn., including power house and tunnel, boilers and mechanical appliances, electric generator plant, electric wiring, plumbing, heating and ventilating, and

PROPOSALS.

elevators in accordance with the drawings and specifications, which may be seen at the office of the Board and at the architect's offices on and after August 6, 1901. Copies of said drawings and specifications may be obtained from Cass Gilbert, architect, No. 521 Endicott Building, St. Paul, Minn., or Room 704 Constable Building, 111 Fifth Ave., New York City, upon payment of the cost of such reproductions, and a deposit of \$100, such deposit to be returned to the bidder upon return of the drawings and specifications. Each bid must be accompanied by a certified check for a sum not less than \$5,000, payable to the order of said Board, as a guarantee of good faith. The right is reserved to reject any and all bids and to waive any defect or informality in any bid, if it be deemed in the interest of the State to do so. Proposals received after the time stated will be returned to the bidders. Proposals must be made on printed forms which will be furnished by the Board and must be enclosed in envelopes, sealed and marked "Proposals for mechanical equipment and power-house for new Minnesota State capitol at St. Paul," and addressed to the Board of State Capitol Commissioners. For the Board of State Capitol Commissioners, CHANNING SEABURY, Vice-president. 1340

CHURCH.

[At Thivener, O.]

The Christian Church congregation will receive bids until September 12 for rebuilding their church recently destroyed by fire. 1340

PROPOSALS.

LIBRARY.

[At Jacksonville, Ill.]

Bids will be received until September 10 by G. E. Doying for constructing the proposed library according to plans on file at the following offices: Patton & Miller, 115 Monroe St., Chicago; I. C. Coleman, 232 W. State St., Jacksonville. W. E. VEITCH, chairman of building committee. 1340

HOSPITAL.

[At West Point, N. Y.]

Sealed proposals, in triplicate, will be received here until 12 M., September 23, 1901, for the construction of south wing to Cadet Hospital, West Point, N. Y., as per plans in this office. U. S. reserves right to reject any or all proposals, or any part thereof. Address Q. M., U. S. M. A. 1341

ASYLUMS.

[At Huntington, W. Va.]

It is stated that until October 2 bids for construction are desired for two buildings costing approximately \$50,000 and \$30,000 to be erected on grounds of West Virginia Asylum for Incurables. Address HARRISON ALBRIGHT, architect, Charleston, W. Va. 1341

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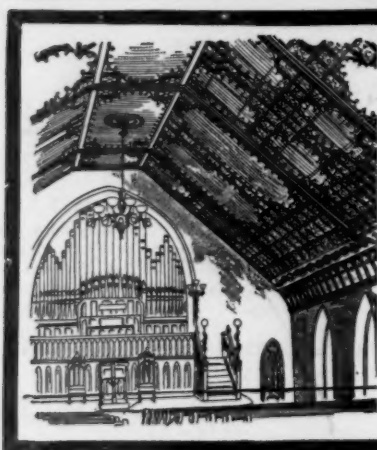
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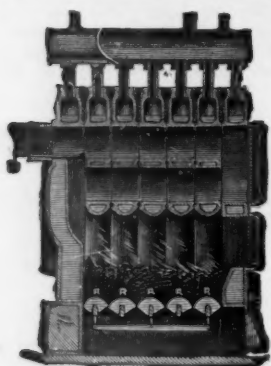
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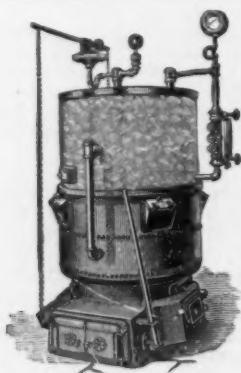
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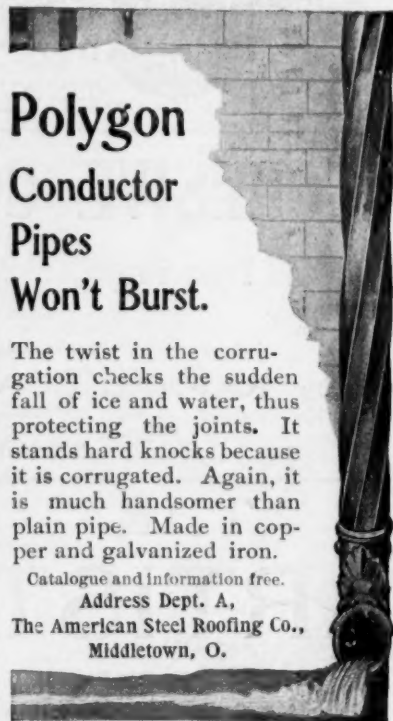
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