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CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA



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**Makes Concrete Impervious to Water
Prevents Discoloration and Efflorescence**

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

"MEDUSA" GIVES ABSOLUTELY PERMANENT RESULTS, WILL NOT AFFECT STRENGTH, SETTING OR COLOR OF PORTLAND CEMENT.

"WHITE STAINLESS PORTLAND CEMENT"

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The above cements are all pure white in color, can be used in the same manner as ordinary Portland, from which it differs in no respect except in color. To produce white concrete or white artificial stone, the cement should be mixed with white sand, white quartz, ground marble or ground white limestone. White Portland Cement is especially adapted for exterior finish of concrete buildings, concrete building blocks and interior decoration.

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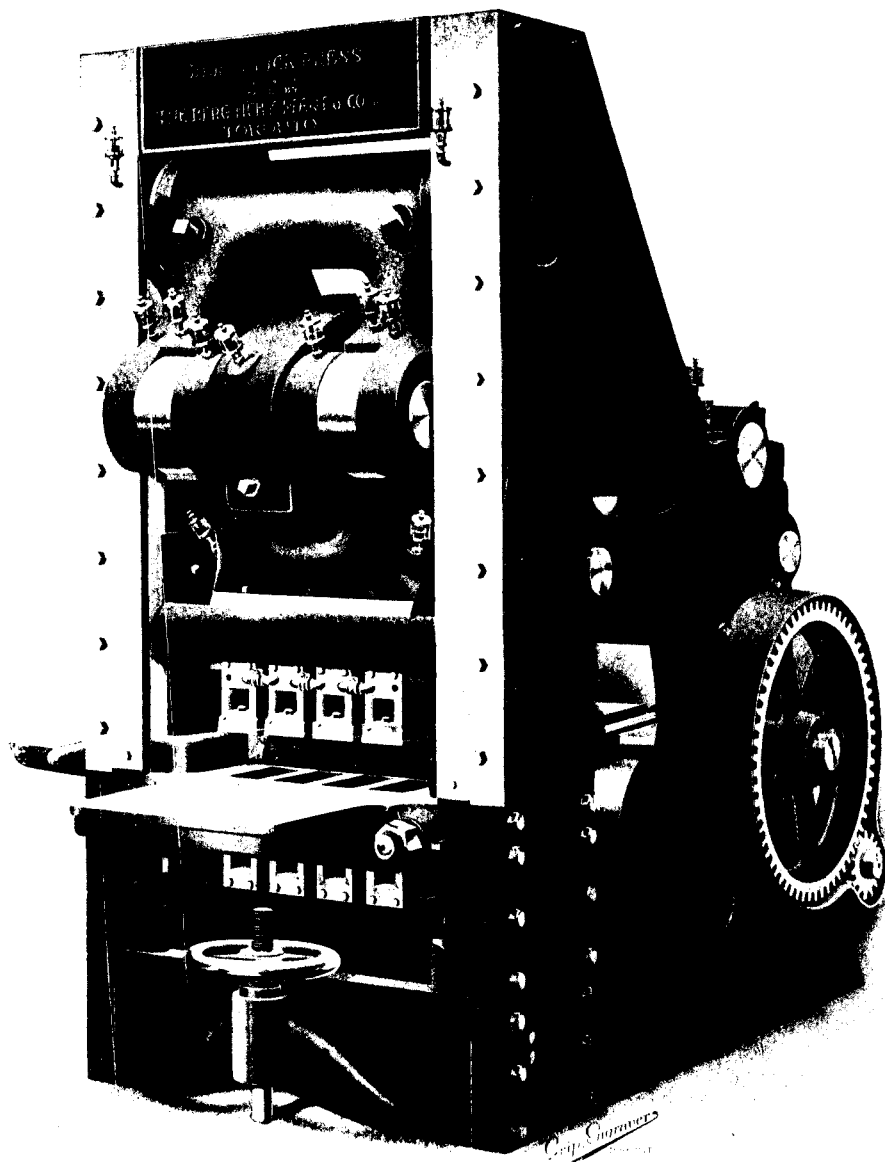
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HE improved mixer is equipped with a loading hopper which contains 1-2 yard of unmixed material. This loading hopper is operated by the engineer by means of lever and gate. While one batch is being mixed the laborers are not standing idle, but are busy filling the hopper, and upon the batch being discharged the gate is pulled and the contents of the hopper delivered into the mixer, allowing reloading to proceed almost uninterruptedly. This new feature combines all the advantages of a continuous and a batch mixer.

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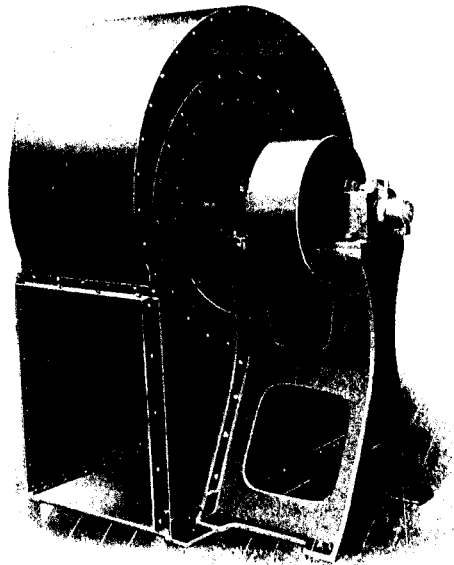
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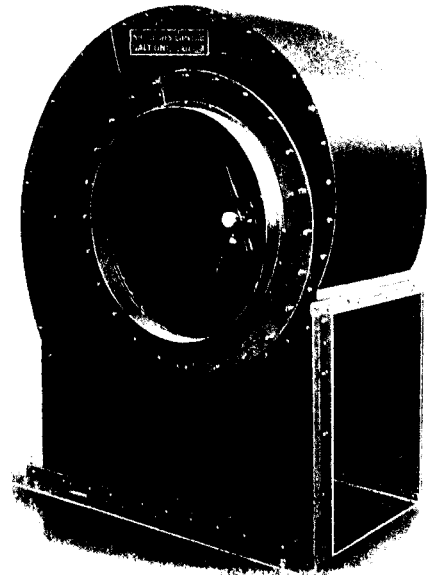
THE ÆOLOS FAN

(Pronounced E-O-LOS)

The
King
of
The
Winds



ÆOLOS FAN, pulley side, bottom discharge.



ÆOLOS FAN, inlet side, bottom discharge.

Canadian
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The ÆOLOS FAN WHEEL, differs from all others in design and construction; the blades are set at an angle peculiar to these fans only; they are so set that they take advantage of the natural flow of the air in its passage through the fan and simply assist it on its way. These blades are not curved or buckled in any way, but being perfectly straight and flat on their surface, offer the least possible resistance.

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Paripan Glossy gives a surface like glass, the Flat (dull), a delicate, dull silk-like effect—both perfectly washable.

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That it does not crack

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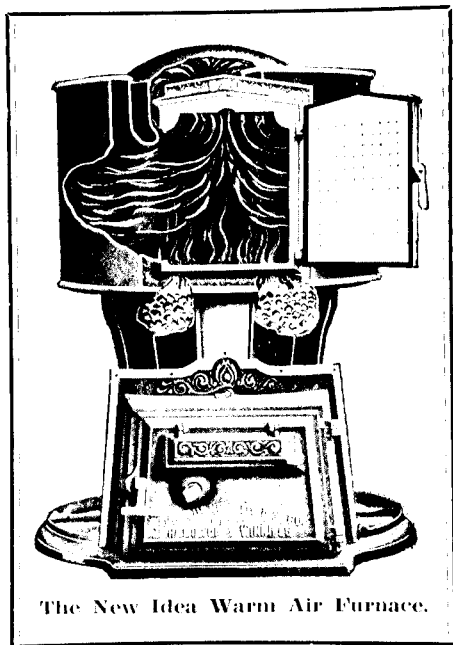
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The largest portion of the radiator is made of steel, because it radiates heat more quickly than cast iron. The combustion chamber, that portion of the furnace right over the firepot, is made extra strong and durable. It is also large enough to afford proper combustion. Wet blankets are sometimes used to fight fires, because they shut off the air and smother the fire, showing that perfect combustion requires lots of air, therefore the combustion chamber on the New Idea is made large and roomy. From the combustion chamber the fire travel enters the circular shaped radiator at the front and passes along either side to the back. Then the cold air which is entering at the bottom of the casing passes up in either side of this circular radiator, absorbing the heat from it through the quick radiating steel sides, thus utilizing the entire heat of the fuel. The correct combustion chamber permits of proper combustion and thorough burning of the fuel, the radiator keeps the heat from going up the chimney---thus the saving of fuel.

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Tarred Felt to the house is as oakum to the ship. However excellently the ship may be constructed, it is imperative that this last inexpensive step shall be taken to render it absolutely serviceable. So must the properly constructed house have its Tarred Felt lining. It prevents the little leaks that make the heating and ventilating system imperfect.

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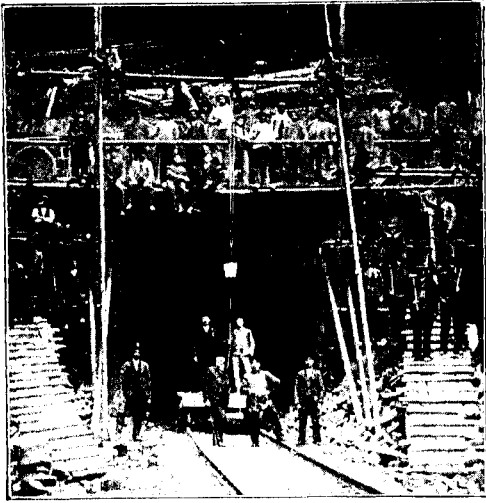
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Ruppertsberg Tunnel, 1 mile long, constructed by the German Government, waterproofed with Ceresit. (This is only one of the many tunnels which have been waterproofed with our material.)

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is a milky paste which is simply added to the water used in mixing concrete and mortar. With the water Ceresit penetrates to all parts of the concrete and mortar and assures a permanent water and damp-proof job.

No expert help required; no scientific and expensive mixing.

CERESIT is not an experiment, but has been used with complete success on hundreds of tanks, pits, foundations, dams and bridges. It has been employed by practically all Governments in the civilized world. MORE THAN 5,000,000 CUBIC FEET of concrete and mortar have been waterproofed with CERESIT in 1909. The use of

Ceresit is complete insurance against the penetration of moisture or dampness, even under a pressure of more than 70 pounds per square inch.

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**CERESIT WATERPROOFING CO., SOLE MANUFACTURERS
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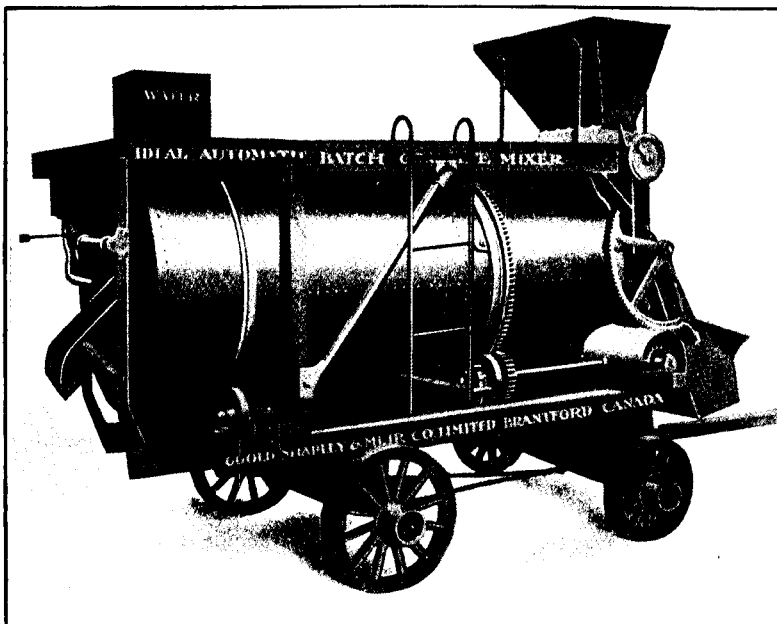
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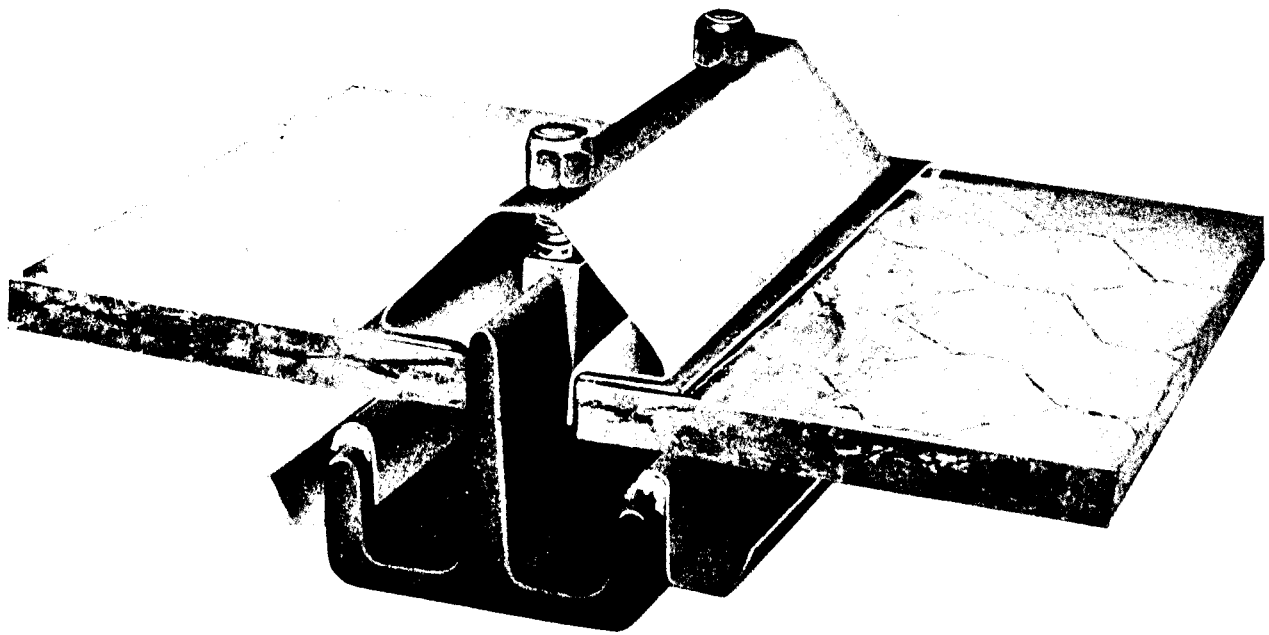
(FORMERLY KNOWN AS THE NATIONAL SYSTEM)

:: :: OF :: ::

STEEL PUTTYLESS GLAZING CONSTRUCTION

FOR

ROOF LIGHTING, SIDE LIGHTING and PIVOT SASH



STANDARD CROSS SECTION

Patented Aug. 25, 1903; Mar. 7, 1905, and Nov. 21, 1905. Other patents allowed and pending

For factories, Machine Shops, Foundries, Warehouses, Railway Terminals, Libraries, Dormitories, Halls, Museum Theatres, Etc., Etc., and Buildings of Every Kind.

DURABLE * WATER TIGHT * PERMITTING EXPANSION * NOT AFFECTED
BY VIBRATION * NO FILLING SUBSTANCE USED * NO BROKEN GLASS

MAXIMUM STRENGTH WITH MINIMUM WEIGHT AND THEREFORE LOWER COST is attained by the use of the REX Supporting Bar, which also provides enclosed gutters.

THE ASBESTOS FIBRE CANNOT DETERIORATE because thoroughly protected from moisture and grit.

THE GLASS IS SET SO THAT EACH LIGHT IS INDEPENDENT of every other, and, seated on a flexible and yielding bearing surface.

THE GLASS IS KEPT FREE FROM BINDING AND FROM COMING IN CONTACT WITH ANY RIGID PART by the vertical legs of the spring caps.

REX PUTTYLESS GLAZING is wholly free from the use of putty, roof cement or any other filling substance which binds the glass and causes breakage, and which cracks and disintegrates in time, thereby causing leakage.

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Largest General Engineering Works in the Dominion of Canada

IRON COLUMNS

" FENESTRA " WINDOWS ARE FIREPROOF

Maximum
Light
Ventilation
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and
Durability
at
Minimum
Expense



Our New
Catalog
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Full
Information

The above reproduction of a photograph (if we had no other evidence) proves that "Fenestra" Solid Steel Sash are indestructible by fire. These sash were perfectly intact after a fierce fire, during which the heavy glass melted and ran down the walls like water.

MANUFACTURED IN CANADA BY

Expanded Metal & Fireproofing Co., Limited,

Fraser Ave.,
TORONTO, CANADA

PEDLAR Truss Fabric

Will Transform Your Old Home into a Beautiful, Modern Residence—Proof against Fire, Wind, Damp and Cold

THE Stucco House marks the completion of an evolution destined in the near future to completely revolutionize building methods in Canada. The Stucco House has come to stay; for aside entirely from its architectural possibilities and the plastic way in which it lends itself to the building of the home beautiful, it possesses the added advantages of being proof against fire, wind, cold and damp. Even an earthquake cannot level a Stucco House.

To fully appreciate the marvellous possibilities of this wonderful building material, try a simple little experiment for yourself.

Take a small piece of plank, nail a small piece of metal lath to it, then cover the lath half an inch thick with mortar composed of Portland cement and sand in about the proportions used in making sidewalks.

Keep this in a damp place for a few weeks and you will find that to cut the mortar from the plank you will have to use a cold chisel.

The cement application has become an artificial stone but much tougher and more durable than any stone that nature has ever turned out.

Could anything be more simple? And the necessary materials in this evolution were merely cheap cement and cheap metal lath—two commodities both here and both so inexpensive that a few years will bring about a marvellous change in the appearance of town and country.

With some exceptions, the new houses will be made of wood or steel frames covered with metal lath and finished in the manner described.

While the covering will not be thick, it can be given the appearance of massiveness and stability according to the character of the house; the process lends itself to any architectural design.



The accompanying photograph is an actual illustration of where a Truss Fabric and cement helped to transform a homestead into a strikingly beautiful modern residence.

Not only is the initial cost low but the cost of frequent repainting and repairs is obliterated entirely. A Stucco House properly built will be warm in winter and cool in summer and—so long as a tight roof is maintained—will be indestructible by the elements as lapse of time only serves to make the cement harder and better.

The greatest benefits to come from this system will be in the covering of old frame houses and outbuildings which now, in every condition of dilapidation, offend the sight.

A few days' work of some plasterers, marks the disappearance of the old house, and means—in effect—the

creation of a new cut stone structure, up-to-date in appearance, practically everlasting and in many cases readily saleable at double the previous market value. If the work is done with a light-colored cement and a white sand, with a smooth finish which will not catch the dust and soot, the result will be most attractive. Much of the charm of European cities comes from the white stucco or cement covering so universally used. Pedlar Truss Fabric sells at 13c. and 15c. per sq. yard—painted. We recommend the painted fabric for its rust-resisting qualities.

If you will write and ask for it, I shall be glad to send you a sample of Pedlar Truss Fabric. Then you can see it—judge it for yourself. Just tell me you want my free booklet, "Overcoated Houses," and it will go to you by return mail—the sample with it.

Will you write me now?



G. A. Pedlar

Write for Sample and Free Booklet "OVERCOATED HOUSES" No. 53

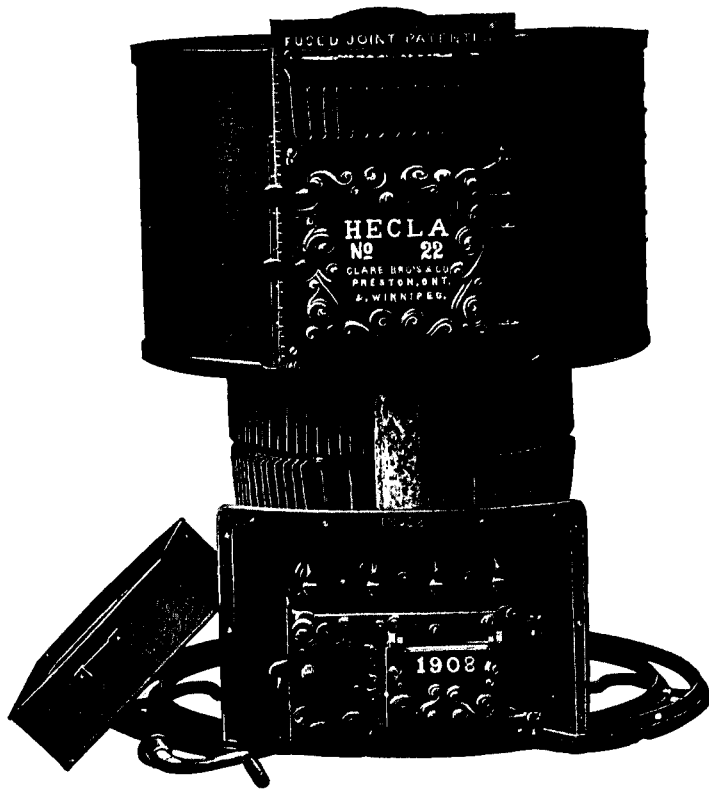
THE PEDLAR PEOPLE OF OSHAWA Established 1861

HALIFAX 16 Prince St.	ST. JOHN, N.B. 42-46 Prince William St.	QUEBEC 127 Rue du Pont	MONTREAL 321-3 Craig St.	OTTAWA 423 Sussex St.	TORONTO 111-113 Bay St.	LONDON 86 King St.	CHATHAM 200 King St. W.
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"HECLA" WARM AIR FURNACE

FOR COAL OR WOOD



The requisite for a successful Warm-Air Heating System is a good furnace; one that will not only supply an abundant quantity of pure warm air; but will, in addition, be economical in the consumption of fuel, easy to operate, safe from dust and smoke, and that will give the greatest length of service. Some cheap furnaces fulfill one or more of these conditions, but the furnace you want must fulfill all. That is what the HECLA does.

"HECLA" FEATURES

- Automatic Gas Damper prevents gas puffs.
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- Double Feed Door for convenience when burning wood.
- Damper Regulator enables you to operate the dampers without going to the basement.
- Dust Flue carries all the dust up the chimney.
- Water Pan in the best position for effective service.
- Large Ash Pan with handle.
- Double Tin and Asbestos Lined Case to prevent the loss of heat in the cellar.

STEEL RIBBED FIRE POTS
INDIVIDUAL GRATE BARS

PATENT FUSED JOINTS
CAST IRON COMBUSTION CHAMBER

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The Construction That Defied The San Francisco Fire

is illustrated in our CATALOGUE "D-1," which is sent upon request to Architects, Builders and Engineers.

Read what the American Artisan of May 12th, 1906, had to say of the "Prong-Lock Wireless Fire-Proofing System" as used in the Hayward Building illustrated herewith.



HAYWARD OR KOHL BUILDING, San Francisco, Cal., AFTER THE FIRE.

A SEVERE TEST

"The eyes of the building world are fastened upon San Francisco, and as investigations bring to light the degree of resistance offered by different methods of construction, much valuable information is being gained. The Hayward Building, an eleven-storey edifice of steel construction, is interesting the building crafts at the present time on account of its having passed unscathed through both the earthquake and fire which followed. It is estimated that it can be restored to its original condition for the trifling sum of from \$5,000 to \$8,000, although all its neighbors were shaken or burned to the ground. The Prong-Lock Wireless Fire-Proofing System was used in the Hayward Building. It is being specified by many of our leading architects and engineers."—*The American Artisan*, May 12th, 1906.

Copy of Architect's letter to the American manufacturers of Prong-Lock Wireless System:

SAN FRANCISCO, May 25, 1906.

Gentlemen,—I am in receipt of your communication of May 17, in which you ask for some trustworthy information concerning the results of the fire here in San Francisco, and more particularly in regard to the Kohl Building, or, as it was formerly called, the Hayward Building, of which I was the Architect.

I would state in this connection that the Kohl Building is furnished with double partitions of Prong-Lock Studs and Expanded Metal Lath on the lines of the corridors, while the dividing partitions between offices were 2 1/4" thick with Prong Studs and Expanded Metal Lathing. The interior finish of the building consists of metal-covered doors, and all casings, jambs, base, chair rails and picture moulds are finished with similar material. The floors of the building are of concrete over which we laid battleship linoleum.

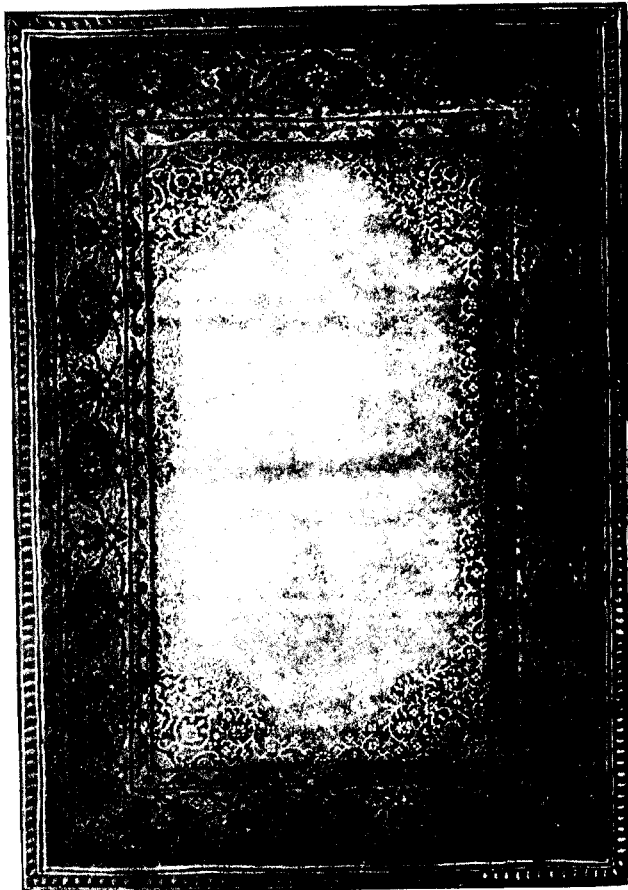
From this you will see that there is very little woodwork beyond office furniture to burn in the offices. The fire did not travel from floor to floor and room to room as readily as it did in wood finished buildings, with the result that there are rooms in the burnt floors that are wholly untouched, with the exception that the partitions of one that was gutted were destroyed for further use, and the communicating door badly warped and twisted. One room was completely destroyed, the tenant losing all his furniture and belongings, while the room adjoining, separated from the first by 2 1/4" partitions on your studding, with one of the metal covered doors between the two, was wholly untouched, a straw hat hanging in the locker next to the wall being not even scorched.

In my judgment the metal studs and lath partition is the only partition for the so-called fireproof building. The tile partitions, as far as I have noted them, have failed utterly to resist the earthquake and subsequent fire.

Yours very truly,
MEYERS & WARD.

We want every architect, engineer and contractor to have a copy of our Catalogue "D-1," showing the different types of fire-proof partitions, ceilings and walls, and we believe that every person interested in modern building will want to know the types of construction that successfully resisted the earthquake and fire at San Francisco.

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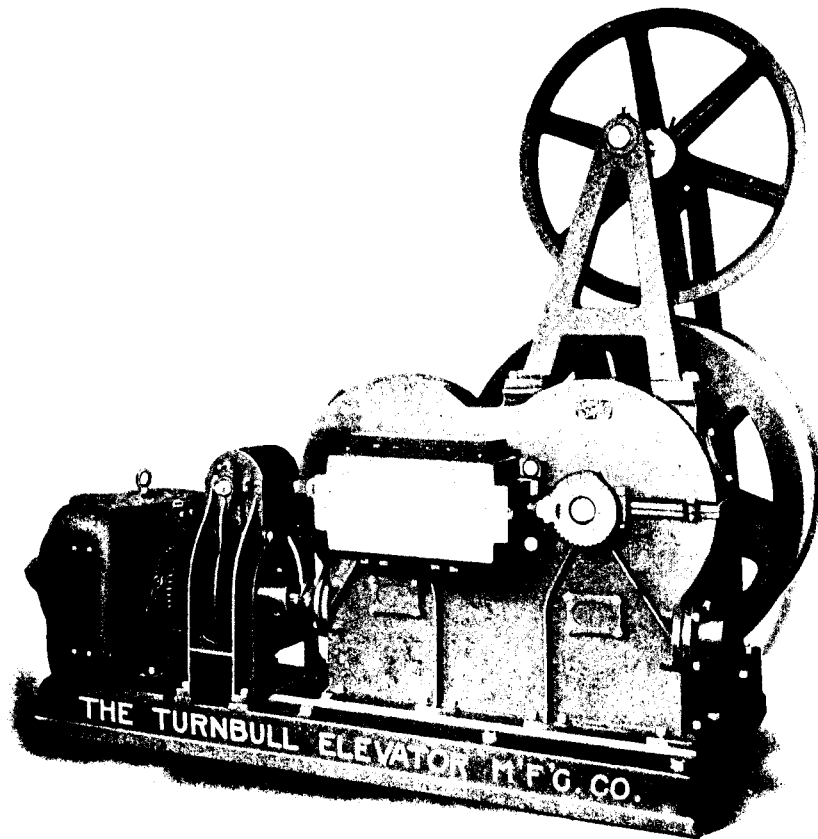
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Reliance Loan, King Street East.

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Continental Life, Bay and Richmond Streets.

Cuthbertson Building, Yonge Street, and numerous others.

The Turnbull Elevator Mfg. Co.

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Branches—22 St. John Street, Montreal

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NAPOLEON once said of his army, that "every private's knapsack carried a field marshal's baton."

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The many purposes for which cement has been employed within the past few years (in every branch of domestic, public and business architecture, as well as in every branch of civil and municipal engineering), establishes confirmatory evidence.

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tectural and engineering journals, is to view some of the most notable examples of contemporary building construction, *with cement as the basic structural material.*

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scientific engineering, as related to every form of modern construction.

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No fact is more obvious, however, than that the

success of concrete work depends very largely upon the *quality* of the cement used.

To be sure of absolute uniformity under all conditions, specify

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"the Canadian Standard,"

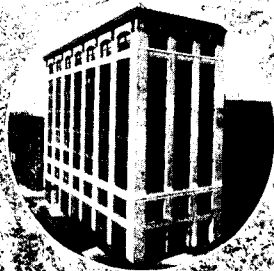
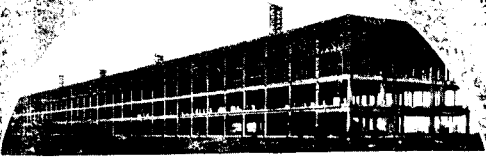
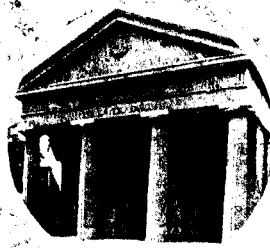
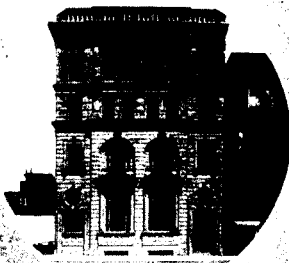
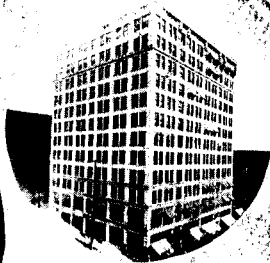
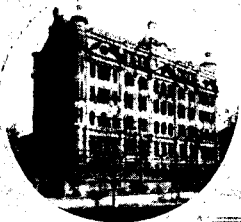
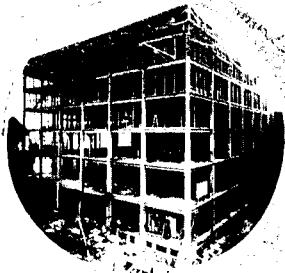
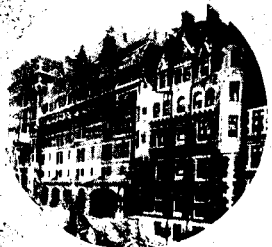
the brand that is always pure, always uniform and of one grade—the *highest*.

Architects and engineers will always find us ready to heartily co-operate with them, in meeting the specifications of any architectural or structural undertaking which may engage their attention.

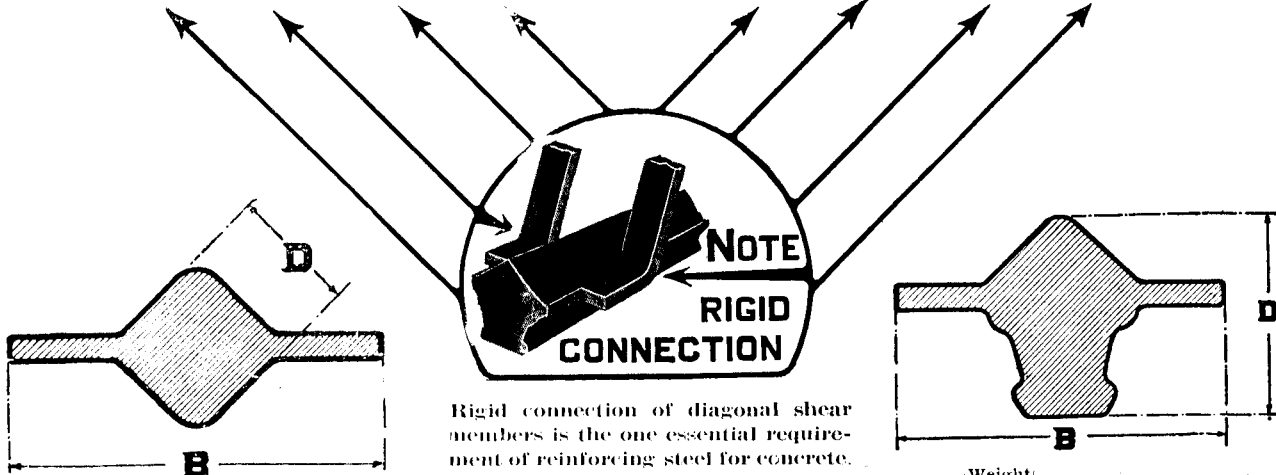
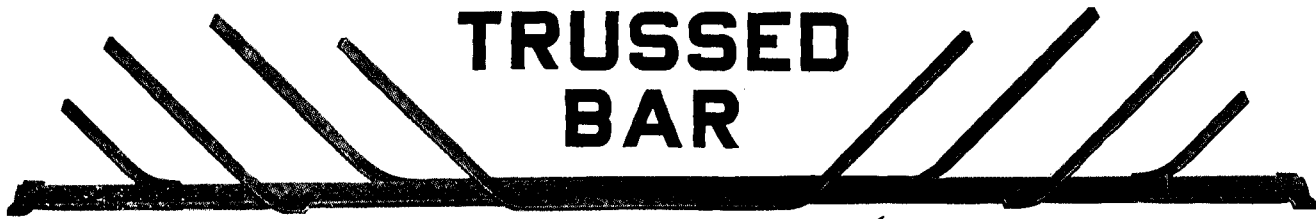


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Company,
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Montreal
Quebec



KAHN TRUSSED BAR



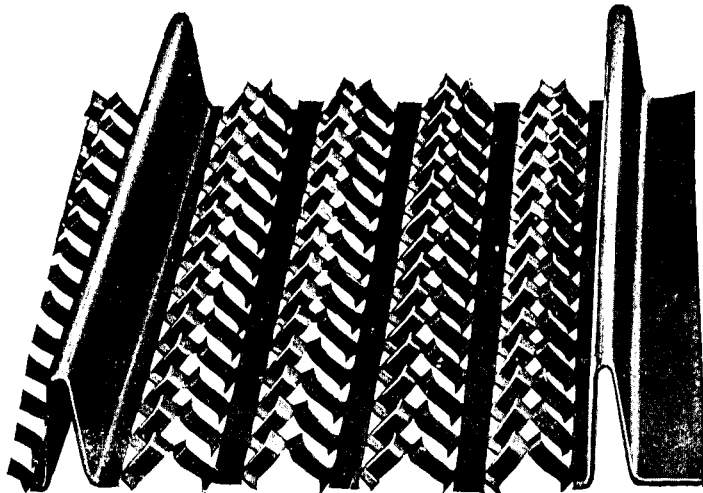
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RIGID CONNECTION

Rigid connection of diagonal shear members is the one essential requirement of reinforcing steel for concrete.

Kahn Trussed Bars are shipped cut to exact lengths—Bars up to 60 feet are carried in stock. Any desired length of diagonal or type of shearing can be furnished.

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1 1/2 x 1 1/2 in.	1.1 lbs	0.41 sq. in.	6 in., 8 in., 12
1 1/2 x 2 1/2 in.	2.7 lbs	0.79 sq. in.	12 in., 8 in., 18

D. & B.	Weight per lin. ft.	AREA	Length of Diagonals
1 1/2 x 2 1/2 in.	4.8 lbs	1.41 sq. in.	24, 18, 30, 36 inch
1 1/2 x 3 1/2 in.	6.8 lbs	2.00 sq. in.	24, 18, 30, 36 inch
2 x 3 1/2 in.	10.2 lb	3.00 sq. in.	30, 24, 36, 48 inch



HY-RIB.

Self-centering reinforcement for concrete floors and roofs.

A unit of lath and studs for Walls, Partitions and Ceilings.

Width of Hy-Rib sheets, 19 1/2 inches. Standard lengths, 6 ft., 8 ft., 10 ft., and 12 ft. Intermediate and shorter lengths as ordered.

Ribs of Hy-Rib are 13-16 inches high and 3 1/2 inches apart.

Hy-Rib is furnished in either flat or curved sheets. The shop-bending assures absolute accuracy of curve.

Cross sectional areas of Hy-Rib per foot of width: 28 gauge, .165 sq. in.; 26 in. gauge, .198 sq. in.; 24 gauge, .264 sq. in.

Above gauges carried in stock. Other gauges can be supplied within a reasonable time.

Catalogues of Kahn System products—Kahn Trussed Bars, Hy-Rib, Rib-Metal, Rib-Lath, Rib-Studs, Cup-Bars. Also catalogues describing tests, structures of every kind, and "Kahn System Standards"—the best handbook on reinforced concrete design.

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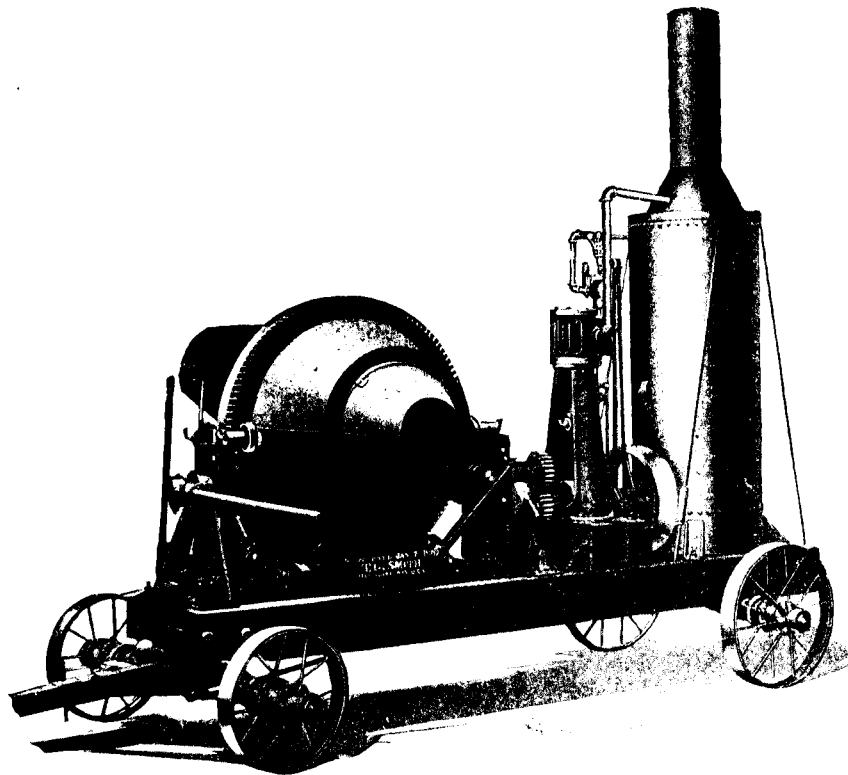
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Expanded from the best grade of medium open hearth steel.

FOR SLABS, FLOORS, ROOFS, WALLS, SEWERS AND CONDUITS.

A series of straight bars rigidly connected by cross ties formed from one sheet of steel. Rib-Metal provides maximum area of reinforcement in the direct line of strain. A rigid reinforcement that stays where it is placed. Rib-Metal is manufactured in seven sizes of mesh and in lengths up to 18 feet. Rib-Metal is furnished in either flat or curved sheets. The shop-bending assures absolute accuracy of curve.

Size No.	Width of Standard Sheet	Square Feet per Linear Foot of Standard Sheet	Area per Foot of Width
2	16 in.	1.33	.54 sq. in.
3	24 "	2.00	.36 "
4	32 "	2.67	.27 "
5	40 "	3.33	.216 "
6	48 "	4.00	.18 "
7	56 "	4.67	.154 "
8	64 "	5.33	.135 "



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Concrete
Mixers

The Strongest,
Fastest and Most
Thorough Mixers
on the Market.

Found on practically
every important contract
in Canada and the United
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KNOWN TO FAIL.

**KINNEAR STEEL
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HIGH CLASS MODERN INTERIOR HARDWOOD FINISH
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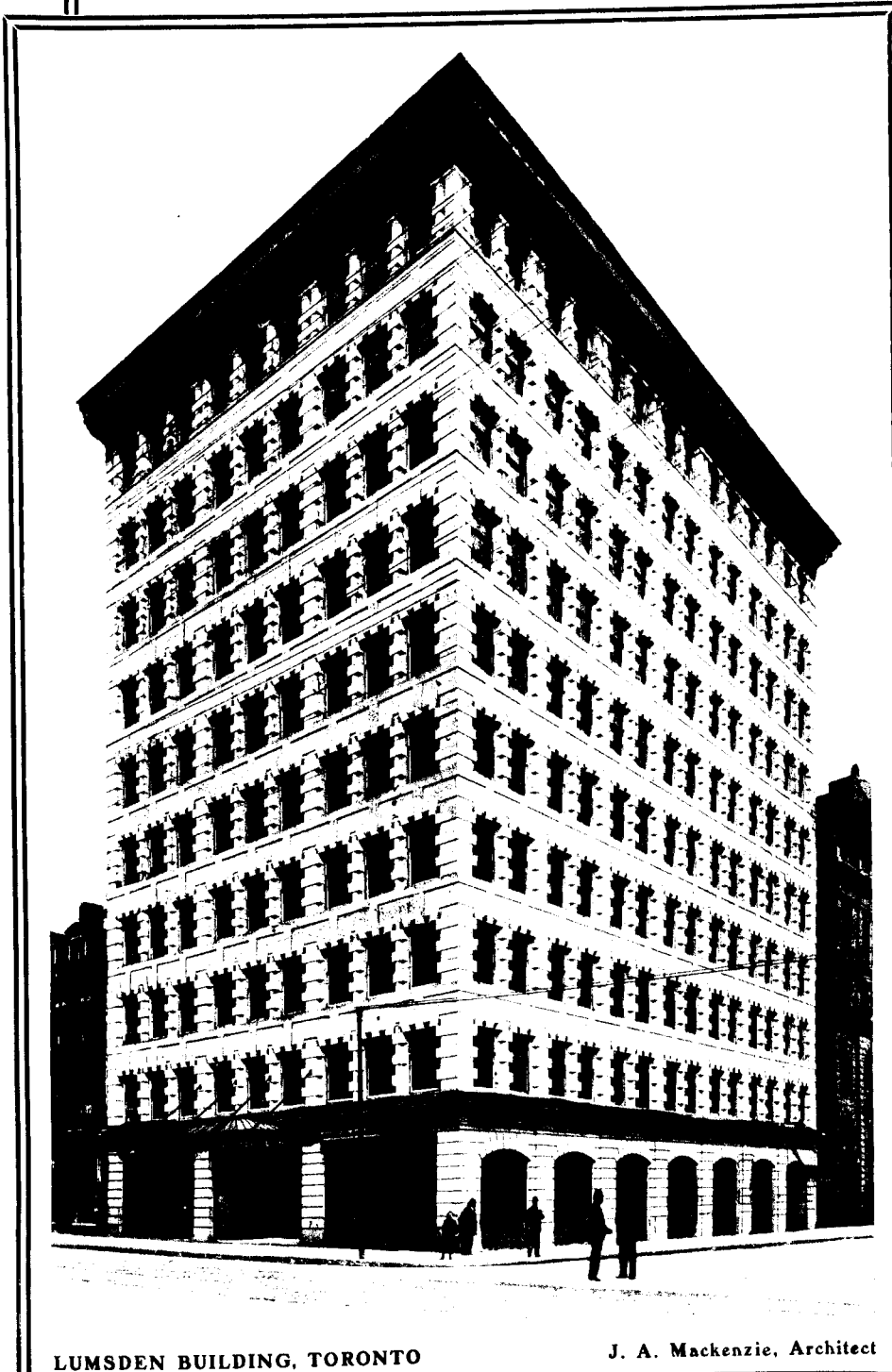
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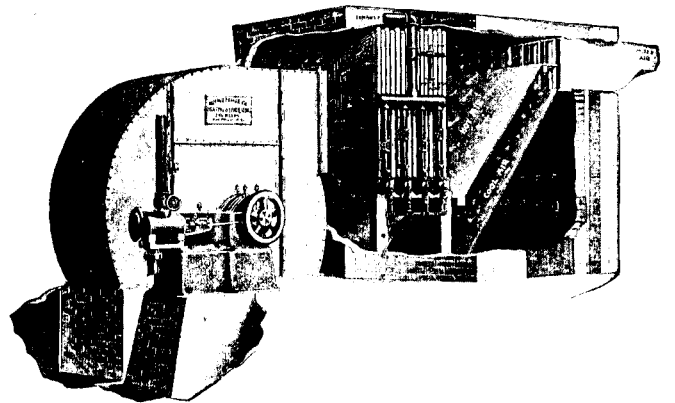


MACDONALD COLLEGE, ST. ANNS, P.Q.

Representative Buildings
in which
Buffalo Apparatus
is installed.



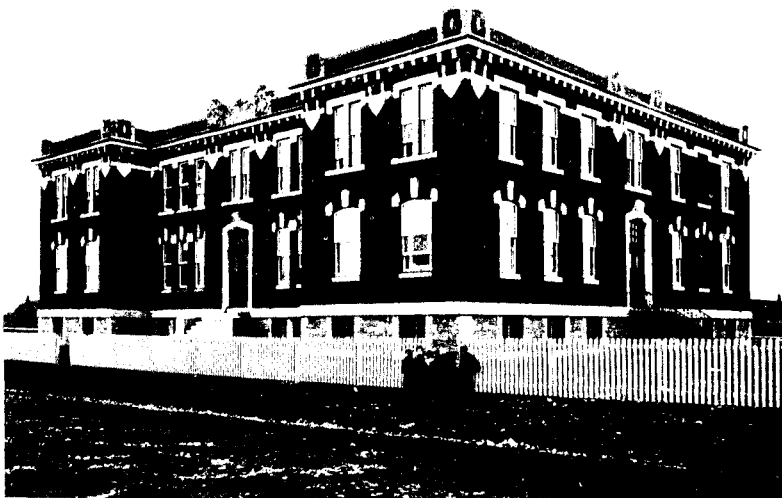
ENGINEERING BUILDING, MCGILL UNIVERSITY, MONTREAL.
Architect—Prof. Percy E. Nobbs.



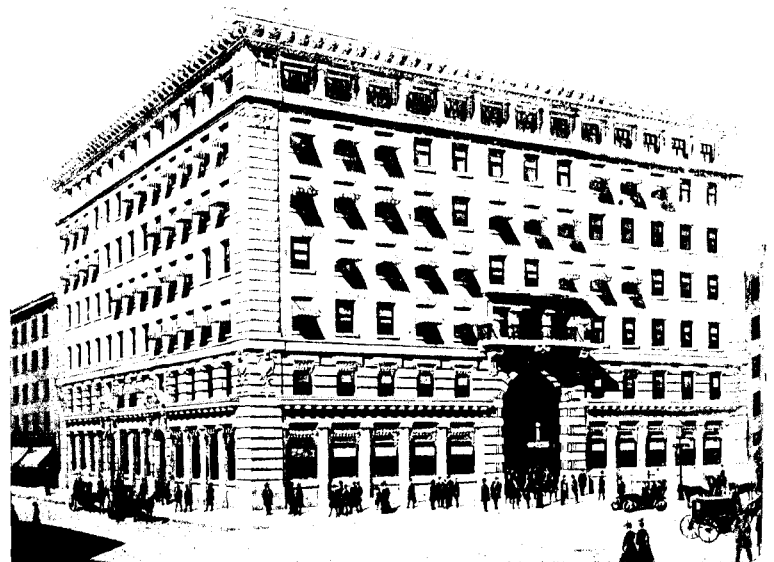
Three-quarter Housing Fan, left-hand top Horizontal Discharge, blowing Air through and underneath Heater into Brick Receiving Chamber.

Write for Catalog 197C

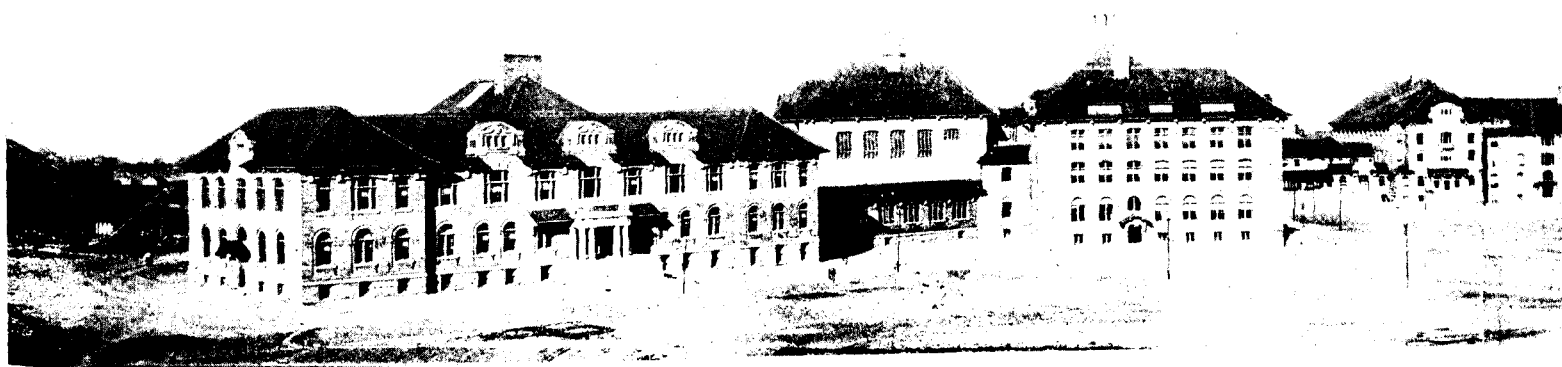
Canadian Buffalo F



EARL GREY'S SCHOOL, MONTREAL, QUE.
Architect—A. F. Dunlop.



GRAIN EXCHANGE, WINNIPEG, MAN.
Architects—Darling & Pearson.



Architects—Hutchison & Wood.

ARCHITECTURE AND ENGINEERING in this twentieth century are more closely allied than ever before. The Engineering profession, emerging from the utilitarian, finds its services required in all branches of the so-called fine arts and its ingenuity taxed for the development of details heretofore overlooked or slighted. It is fortunate that the distinct advance and wider application of mechanical heating, ventilating and air purifying methods has, under the influence of our foremost architects, physicians and others interested in the public health, kept step with the increasing need. That the need exists, there can be no doubt. Scientific analysis is not required to show the presence of impure air, dust and smoke. It is therefore an exception to find a public building, school or factory which has not suitable provision for mechanical ventilation, whether in connection with or in adjunct to the heating system. To the Engineer and to the Architect, who for our present purpose are practically the same, as well as to the factory owner and to the layman interested in this subject, we offer our experience and services.

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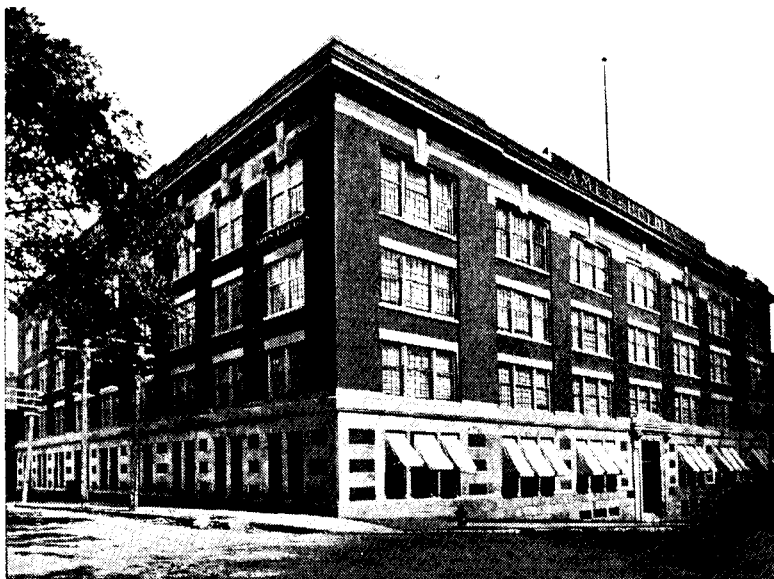
orge Co., Montreal



BANK OF COMMERCE, MONTREAL, QUE.
Architects—Darling & Pearson.



MAIN BUILDING, DOMINION PARLIAMENT, OTTAWA, ONT.
Architect—C. Fuller.



AMES HOLDEN BUILDING, MONTREAL, QUE.



Cattle Pens, Union Stock Yards, Toronto.

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Subway under 4 Tracks, C.P.R., Iberville St., Montreal.
 Reinforced Concrete Viaduct and Tunnel, Windsor Station, Montreal.
 Factory, Massena Mineral Filler, Massena, N.Y.
 Factory, Indestructible Fibre Co., Massena, N.Y.
 Warehouse, Montreal Steel Works, Montreal.
 Warehouse, McLaughlin Carriage Co., Montreal.
 Factory Addition, Canadian Rubber Company, Montreal.
 Warehouse and Stores, Canadian Rubber Company, Toronto, Ont.
 Office and Printing Building, Montreal Gazette.
 Office and Printing Building, Ottawa Free Press.
 Westmount Station, C.P.R., Montreal.
 Dale Church, Toronto, Ont.
 Sanitarium, Gravenhurst, Ont.
 Fireproof Bank, Caisse D'Economie, Quebec.
 Royal Exchange Concrete Office Building, Cobalt, Ont.
 Watkins Department Store, Hamilton, Ont.
 Mason & Risch Piano Showrooms, Toronto, Ont.
 Bottling Plant, Caledonia Springs, Ont.
 Flooring Mill, W. C. Edwards & Co., Ottawa, Ont.
 Sawmill, Power House, Etc., Bathurst Lumber Co., Bathurst, N.B.
 Brewery, Sudbury Brewing Co., Sudbury, Ont.
 Factory, McGregor-Banwell Fence Co., Walkerville, Ont.
 Dry Kilns, Knight Bros., Burke's Falls, Ont.
 Cattle Buildings, 8 acres roof area, Union Stock Yards, Toronto, Ont.
 Factory and Office, Burrell Rock Drill Co., Belleville, Ont.
 Sub-Station, Deloro, Ont., Seymour Power Company.
 Extension, Incinerator Plant, Westmount, Que.
 Factory, Peabody Limited, Walkerville, Ont.
 Factory, Canadian National Carbon Co., Toronto, Ont.
 Raymondville Paper Company, Norfolk, N.Y.
 Northern Aluminum Co., Shawinigan Falls, P.Q. (33,000 h.p.).

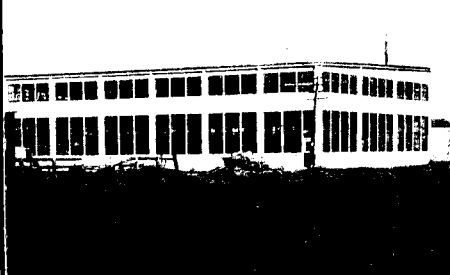
Peterboro' Waterworks Dam and Pumping Station.
 Sherbrooke Railway and Power Company, Dam and Power House, Sherbrooke, P.Q.
 6 $\frac{1}{2}$ Miles Sewerage System, Massena, N.Y.
 Sewers and Water Lines, St. Lawrence River Power Co., Massena, N.Y.
 Sections 3 and 4, St. Denis 4 ft. 6 in. Trunk Sewer (through rock), Montreal.
 Trunk Sewers, Preston, Ont.
 Trunk Sewers, Woodstock, Ont.
 Water Pipe Line, Hespeler, Ont.
 Concrete Conduit and Intake, Montreal Water Works.
 36-in. C. I. Intake and Concrete Pump Well, Can. Spool Cotton Co., Montreal.
 Conduits for Pipe Lines, Etc., Can. Spool Cotton Co., Montreal.
 Foundations, Paper Warehouse, Belgo Co., Shawinigan Falls, P.Q.
 Rock Excavation and Concrete Foundations, Chateau Frontenac, Quebec, P.Q.
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 90 Caissons 50 ft. below ground, Montreal General Hospital.
 Bridge Abutments, Moose Mountain Mines, Ont.
 2 Concrete Arch Bridges, Toronto, Ont.
 2 Concrete Arch Bridges, Norwich, Ont.
 London Isolation Hospital, London, Ont.
 Dominion Bank Building, Windsor, Ont.
 Household Science Building, Toronto, Ont.
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 Operating Quarries and Crushing Plant at Caughnawaga, P.Q., capacity 300 tons daily, delivering to Montreal by water.

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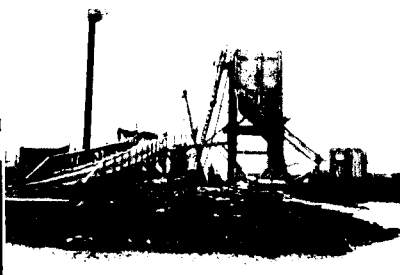
Traders Bank Building
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Engineers and Contractors

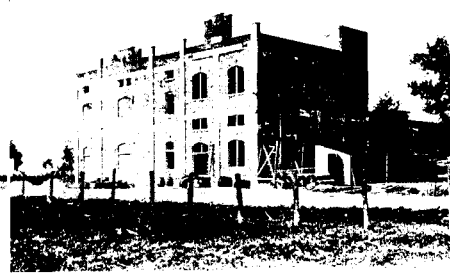
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The McGregor-Banwell Fence Co., Walkerville, Ont.



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A View of one of the Missisquoi Marble Quarries at Philipsburg, Quebec.

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The demand for our material, not only in Canada, but in the United States as well, has grown so much faster than our most sanguine expectations permitted us to hope, that we are again obliged to make very large additions to our plant.

We have recently completed a large addition to our plant, including twelve additional gang saws, as well as larger engines, and increased boiler capacity. These additions will give us greatly increased facilities and permit us to handle promptly a very much larger volume of business.

We appreciate the support we have had from a very large number of the leading Architectural offices, and we are using our utmost endeavors to merit it.

The Missisquoi Marble Co., Ltd.

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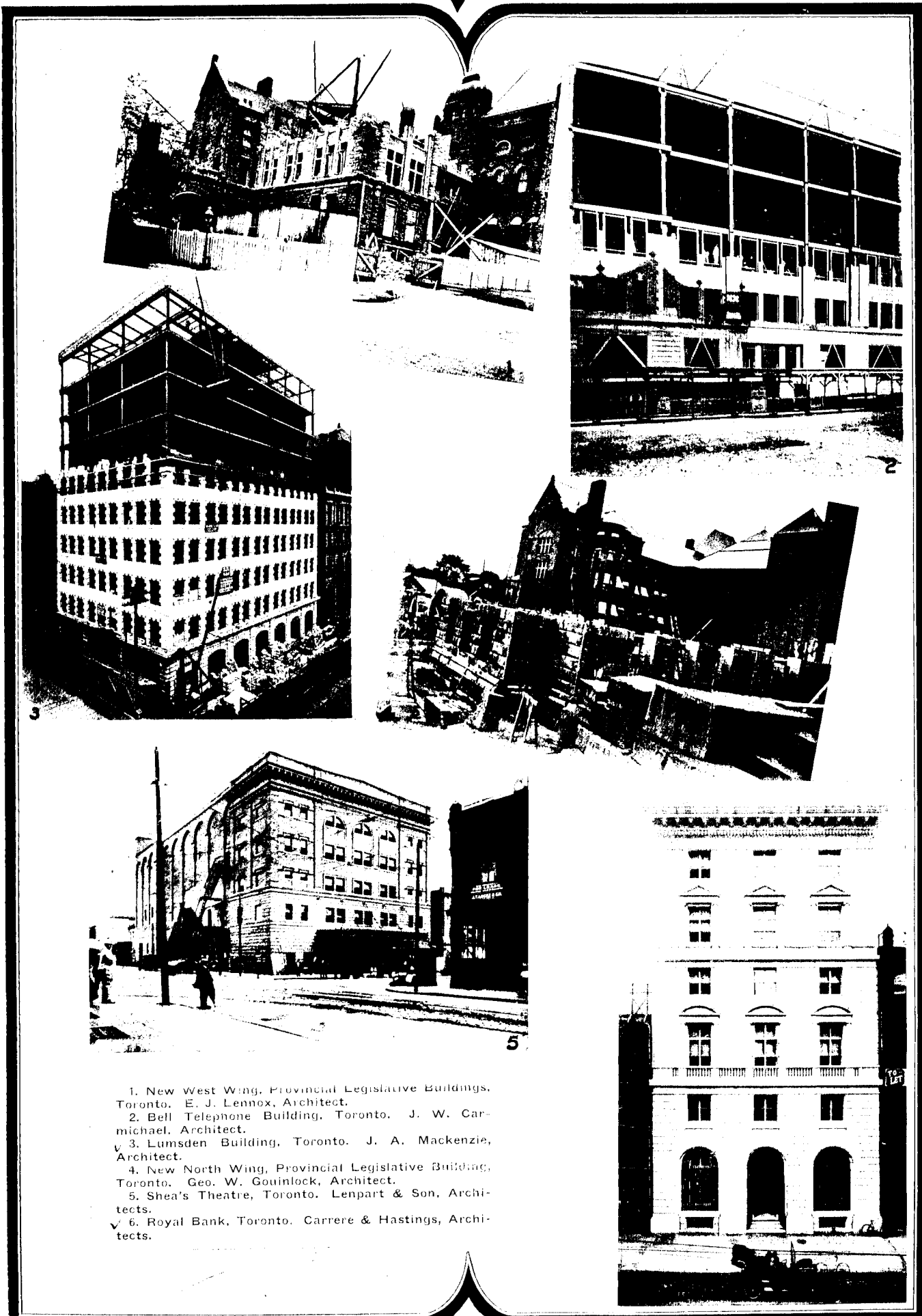
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 4. New North Wing, Provincial Legislative Building, Toronto. Geo. W. Gouinlock, Architect.
 5. Shea's Theatre, Toronto. Lenpart & Son, Architects.
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Combined with facility, safety and economy of construction, there is the satisfaction of knowing that you are using a product that has been proven **absolutely fireproof**.

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We have taken considerable pains to *standardize* elevator construction, as from our past experience we have repeatedly felt this would be of great benefit to the Architect, in that the cost of installation could be materially reduced and deliveries facilitated if standard sizes were adopted; at the outset it would enable the Architect in preparing his plans to provide the necessary accommodation instead of the troublesome necessity of altering plans later on. We, as manufacturers, could then make the parts in large quantities instead of a few at a time as is now rendered necessary owing to the innumerable varying conditions. This would also enable us to ship promptly from stock when required.

Copies of the layouts will be sent upon request.

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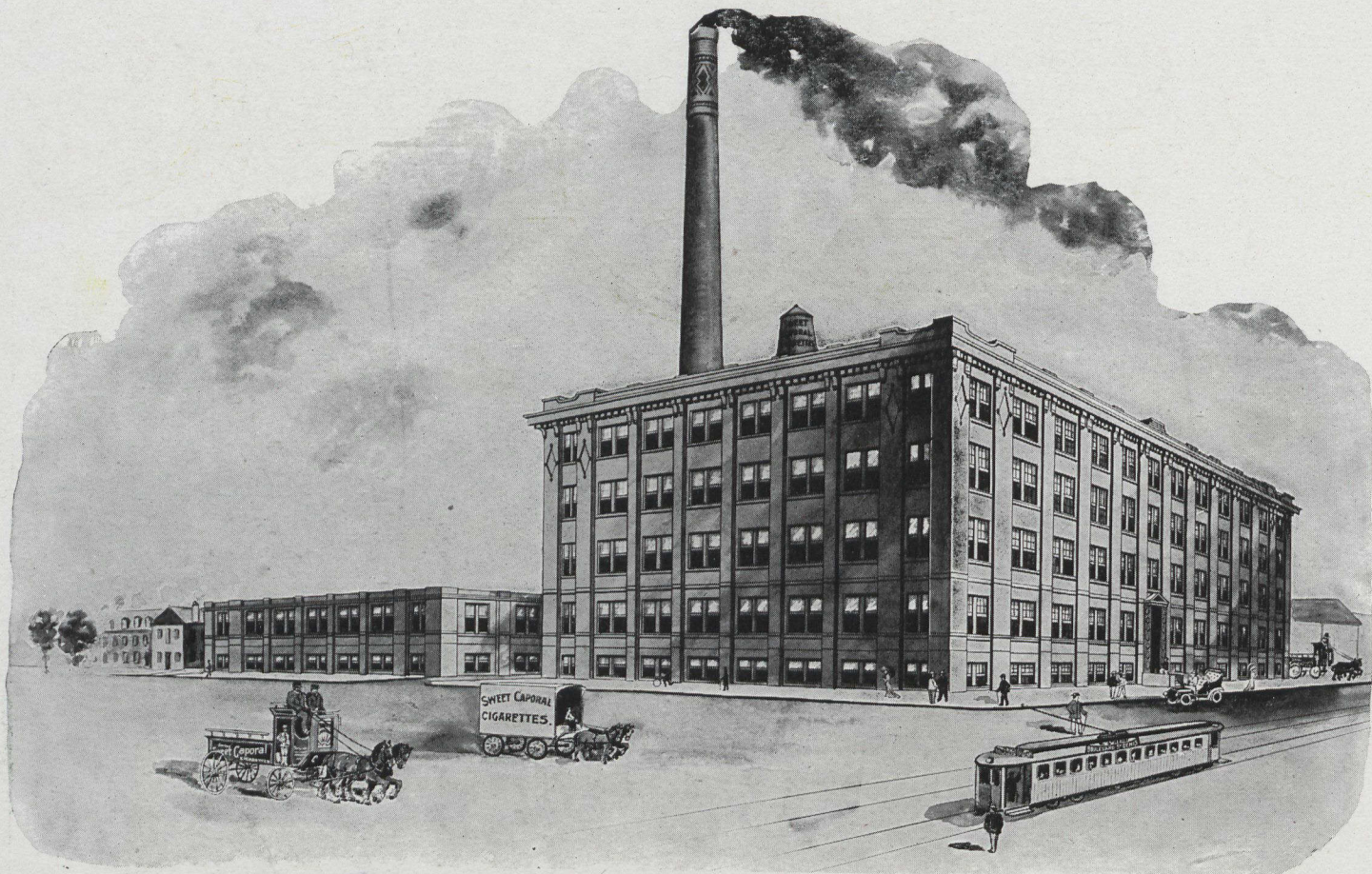


THE FEDERAL LIFE BUILDING, HAMILTON. C. MILLS, ARCHITECT. A. CLARK, PLUMBER. THIS BUILDING IS EQUIPPED THROUGHOUT WITH PLUMBING WARE MANUFACTURED BY THE STANDARD IDEAL COMPANY, PORT HOPE, CANADA.



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The Standard Ideal Company Ltd



THE AMERICAN TOBACCO COMPANY'S PLANT, MONTREAL, P.Q. HUTCHINSON & WOOD, ARCHITECTS. W. J. MCGUIRE, PLUMBER. THIS IS ONE OF THE MOST SANITARY FACTORY BUILDINGS IN CANADA, AND THE PLUMBING WARE THROUGHOUT IS THAT MANUFACTURED BY THE STANDARD IDEAL COMPANY OF PORT HOPE, CANADA.



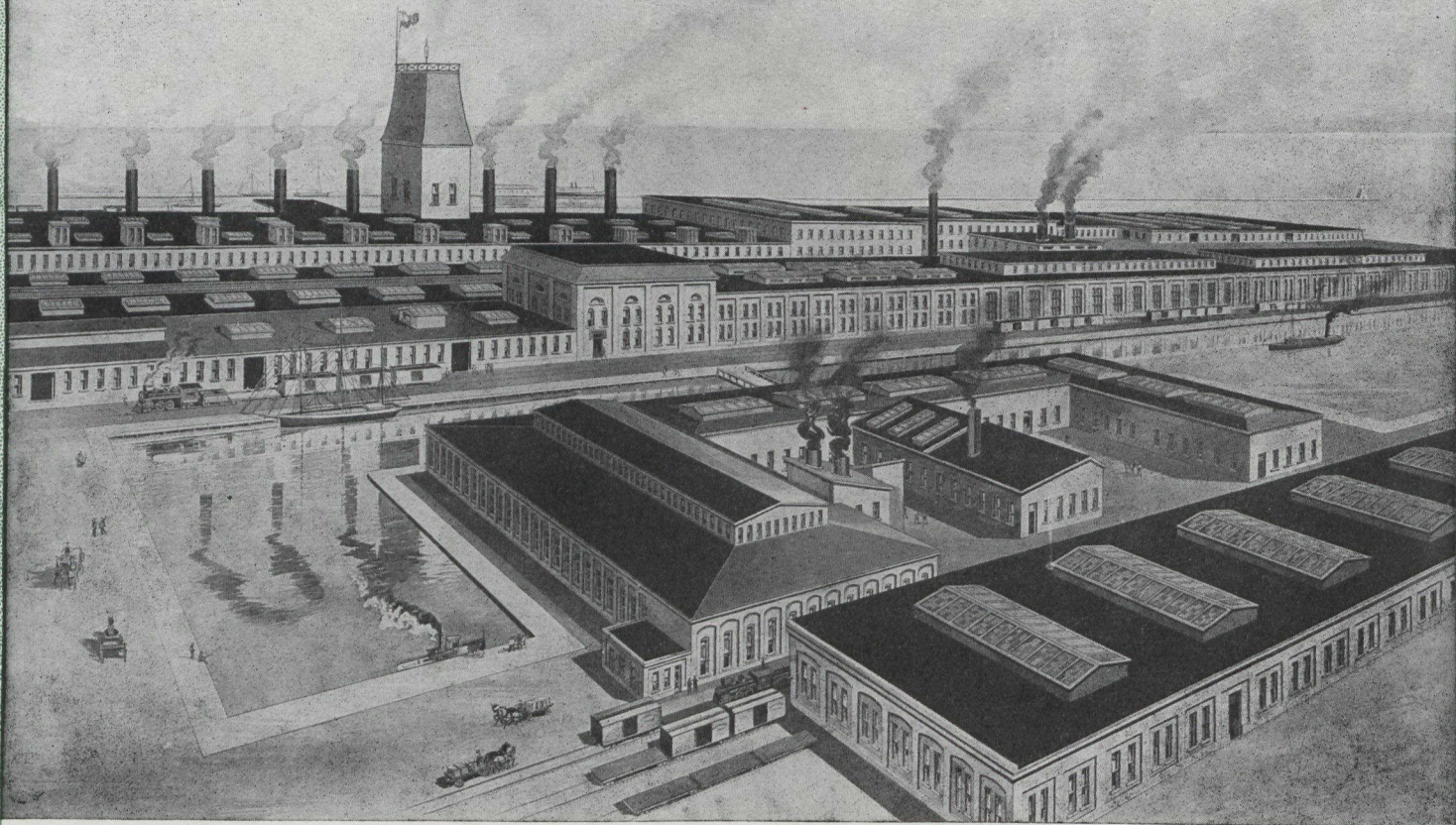
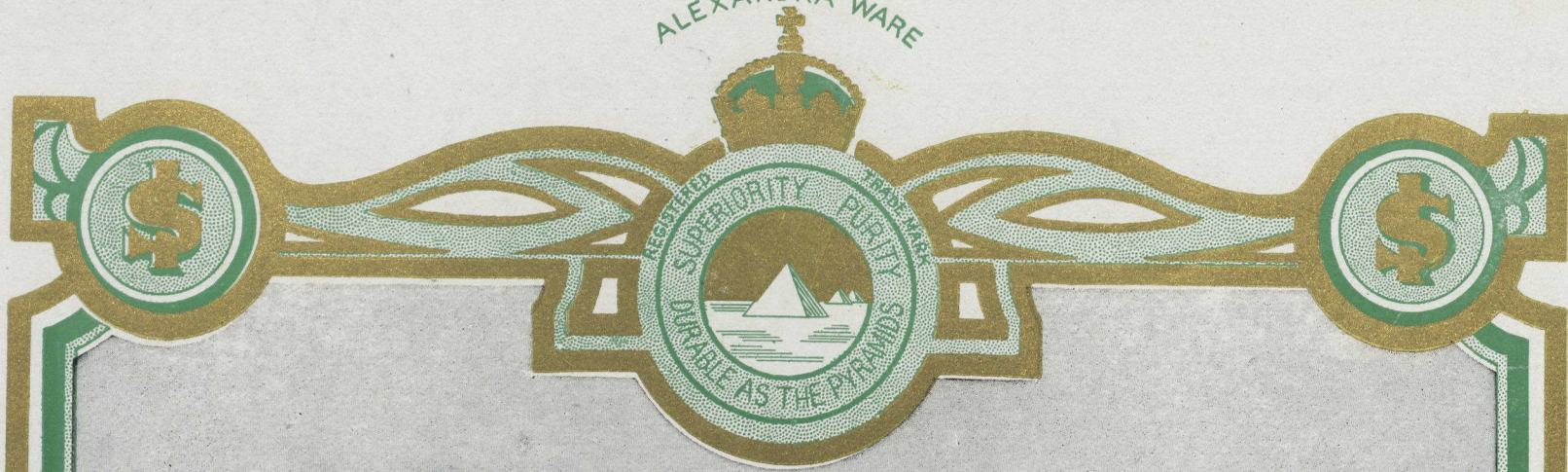
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CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL
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INTERESTS · OF · CANADA



Vol. 3

TORONTO, AUGUST, 1910.

No. 9

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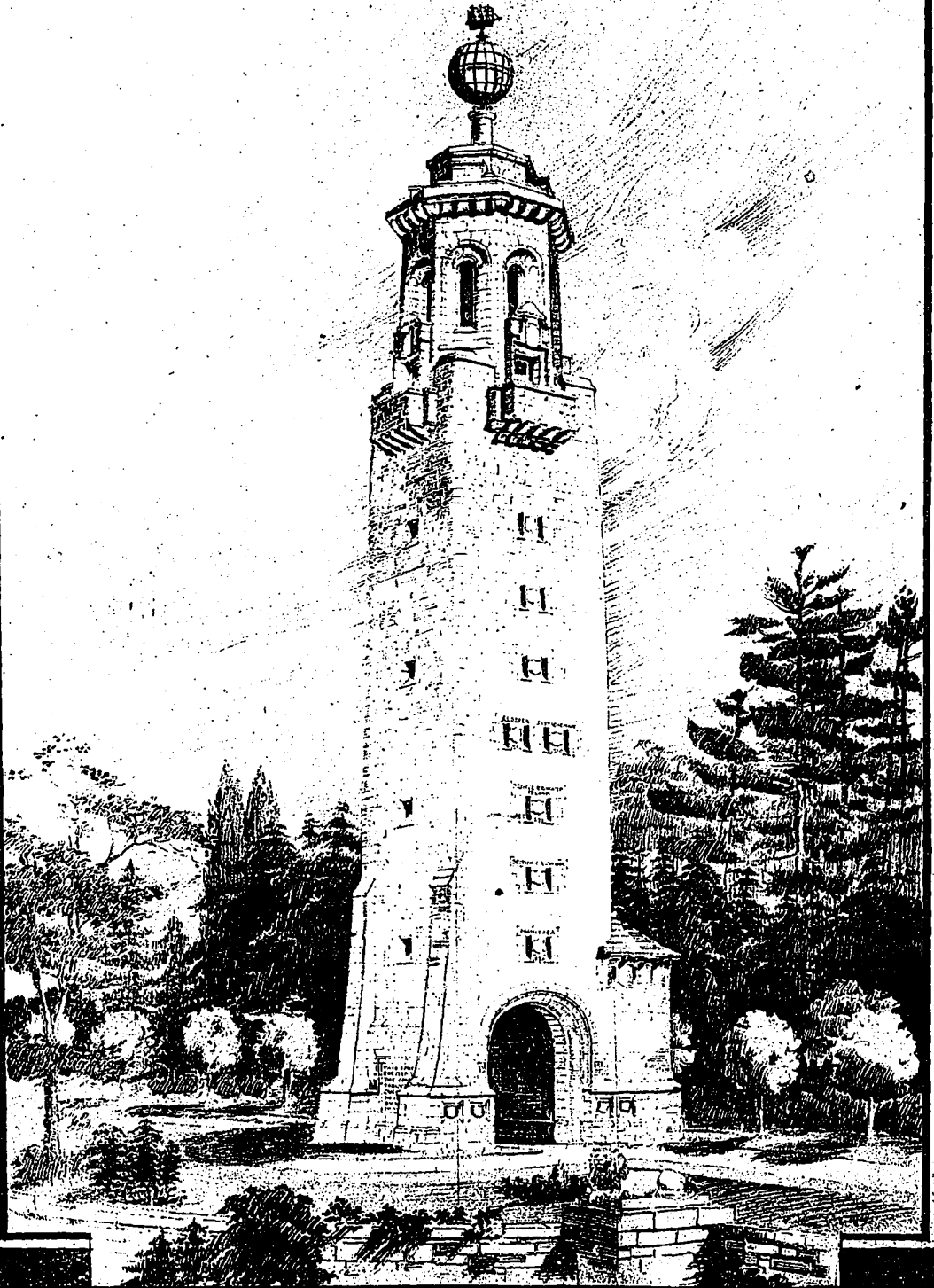
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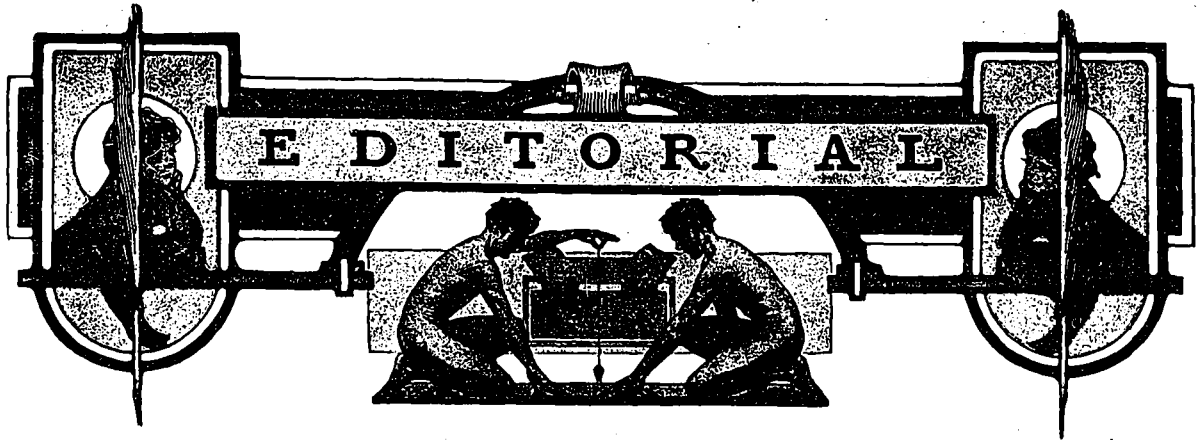
BRANCH OFFICES

MONTREAL—Board of Trade Building, LONDON, ENG.—Byron House, 85 Fleet St. E.C.

COMPETITIVE DESIGN FOR THE NATIONAL
MEMORIAL MONUMENT AT HALIFAX. N.S.



First Prize Design, Awarded Gold Medal in the R.A.I.C. Competition for a National Memorial Monument to be Erected on the North-West Arm, Halifax, N.S. N. S. Sharp, Toronto, Designer. (See Page 43).



Building Returns for June—Comparative Figures from Twenty-five Centres show the Situation to be Most Satisfactory—Average Gain for Month, 14 per cent.

ALTHOUGH SOMEWHAT LESS BRISK than the preceding months, building operations in June were carried out to an extent considerably in advance of the progress noted in the corresponding period of 1909. The returns on the whole are, to say the least, highly gratifying, showing as they do, an average increase of 14 per cent. for twenty-three centres reporting to CONSTRUCTION. These centres reflects more or less accurately the building situation in every locality from coast to coast. The ratio of gains to losses is a trifle better than two to one.

The West, in particular, made a most excellent showing, noting a cycle of unbroken gains, and reflecting a condition which is hardly short of remarkable, when one considers the pronounced activity of the immediate past and the settling back which usually accompanies the summer season. Again, Winnipeg, which has a gain of 17 per cent., has the largest total amount for permits issued of any city of the Dominion, having to her credit a total of \$2,406,600, as against \$2,042,850 in June, 1908. Brandon in the same province, is substantially ahead of her corresponding figures with an increase of 68 per cent., while Regina and Saskatoon, representing the condition in Saskatchewan, top their last year amounts to the extent of 109 per cent. and 26 per cent. respectively.

By far the most marked feature of the month in the Western section was the tremendous upturn in Vancouver, where an aggregate value for permits amounting to \$1,162,920 gives that city an advantage of 77 per cent. over the preceding corresponding period. Accompanying Vancouver report is the statement "that there is still every prospect that the remarkable progress of the present will keep up." Possibly as much can also be said for Victoria, whose gain of 152 per cent., although a somewhat smaller amount is noted, shows an even greater proportionate increase. In Alberta, Calgary, Lethbridge and Edmonton, in their respective advances of 183, 12 and 11 per cent., indicate the splendid progress which is being made in that province. Edmonton predicts a heavy total for July, while the past performances of Calgary and Lethbridge is possibly the best assurance of what to expect from those two places.

With Ontario, however, the fortunes of the month were less propitious. Five gains and five losses were noted. Ottawa and London experienced a falling off of 78 and 69 per cent. respectively, while Windsor and Kingston are behind to the extent of 36 per cent. and 71 per

cent. in order named. Another city also in the arrear is Fort William, although the loss (16 per cent.) in this case is directly chargeable to a carpenters' strike which greatly retarded operations for the best part of the month, and not to a less favorable condition than has existed heretofore. On the other hand, a substantial upward trend was in evidence elsewhere. Brantford, with a gain of 322 per cent., looms up with the highest percentage increase of any city on the list. Peterboro comes second in this respect by registering an advance of 228 per cent., while Hamilton manifests her rapidly expanding tendency by appending a gain 108 per cent. in excess of the amount tabulated in the same month of last year. Toronto, however, had the largest total by far, her amount of \$2,302,550 (15 per cent. gain) being the second largest total recorded in the Dominion. The comparative figures of all the above mentioned places bespeak a most sound and steady condition, as does also the gain noted in the case of Port Arthur, where a larger number of additional improvements give promise of early materialization

As regards the more Eastern section, Montreal more than held her own, while Sydney overreached last June's figures by an advance of 212 per cent., the third highest increase for the month. Montreal's total of \$1,585,254, as against \$1,103,885, representing a gain of 43 per cent., is a noteworthy one, especially so, in view of that city's uninterrupted progress, and the high amount it has recorded from month to month. St. John and Halifax, however, did not fare so well, the loss in either case being 34 per cent. and 67 per cent. in order named.

	Permits for June, 1910.	Permits for June, 1909.	Increase, Per cent.	Decrease, Per cent.
Brandon, Man.	87,950	52,235	68.3	.....
Brantford, Ont.	109,145	25,805	322.9	.....
Calgary, Alta.	573,846	202,710	183.1	.....
Edmonton, Alta.	233,670	201,290	11.1	.....
Fort William, Ont.	256,225	307,125	.....	16.5
Halifax, N.S.	21,885	66,820	.....	67.6
Hamilton, Ont.	301,885	144,945	108.3	.....
Kingston, Ont.	11,545	40,975	.....	71.8
Lethbridge, Alta.	92,005	82,170	12.0	.....
London, Ont.	38,586	127,639	.....	69.7
Montreal, Que.	1,585,254	1,103,855	43.6	.....
Ottawa, Ont.	302,250	1,400,725	.....	78.0
Peterboro, Ont.	145,470	44,322	228.2	.....
Port Arthur, Ont.	65,375	17,600	271.5	.....
Regina, Sask.	255,318	121,650	109.8	.....
St. John, N.B.	41,300	64,900	.....	34.8
Saskatoon, Sask.	194,400	153,085	26.9	.....
Sydney, N.S.	69,789	22,360	212.1	.....
Toronto, Ont.	2,302,550	2,001,545	15.0	.....
Victoria, B.C.	227,600	90,120	152.5	.....
Vancouver, B.C.	1,162,920	657,020	77.0	.....
Windsor, Ont.	31,075	48,550	.....	36.0
Winnipeg, Man.	2,406,600	2,042,850	17.8	.....
	\$10,516,408	\$9,220,306	14.0	.....

R.A.I.C. to Hold Third Annual Assembly at Winnipeg, August 25th, 26th and 27th. Big Attendance Expected. General Programme and Announcements.

THE THIRD ANNUAL ASSEMBLY of the Royal Architectural Institute of Canada, to be held at Winnipeg on August 25, promises to be, by far, the largest meeting yet held by this growing Dominion organization of architects.

At its inception the promoters of this institution, which will serve as a medium through which many problems confronting Canadian architects may be solved, met with many difficulties, most of which are well known to our readers, and have been discussed in these columns on several occasions. But thanks to level-headed, self-sacrificing, and patient work of its officers, these difficulties have all been overcome, and to-day every provincial association of architects in the Dominion is giving this, the mother organization, its heartiest support, both officially and individually.

A glance over some of the several annoying instances in which the professional rights and integrity of the architectural profession have been subjected to in Canada during the past year is the best evidence that can be set forth as proof of the fact, that to receive just recognition from the Dominion as well as the various Provincial Governments, and the lay public, it is absolutely essential that all the provincial associations should join in one affiliated body—that body is the "Royal Architectural Institute of Canada," and it is only fair to say for the president and its councillors of the past year that they have accomplished much more during 1910 than could have been anticipated at the time of their appointment to office.

The following is a portion of the announcement, together with the programme of the assembly to be held at Winnipeg, and it is to be hoped that each individual architect, who finds it at all possible, will be present at this meeting; they will receive a hearty welcome from the West, and they will find Westerners exceptionally good hosts.

The Annual Meeting of the Royal Architectural Institute of Canada will be held in the Assembly Hall of the University of Manitoba, Winnipeg, Man., on Thursday and Friday, the 25th and 26th of August, 1910.

The Headquarters of the members during the annual meeting will be at the Royal Alexandra Hotel. Club privileges will be arranged for those members desiring same.

GENERAL PROGRAMME.

The general programme as laid out by the Council and the Local Committee of Arrangements comprises the following items:

Thursday, 25th August, 1910.

9.30 a.m.—Meeting of the Council at the Royal Alexandra Hotel.

10.30 a.m.—Inaugural session of the third general annual assembly in the Assembly Hall of the Manitoba University.

(a) Addresses by His Worship the Mayor of Winnipeg, the President of the Manitoba Association of Architects, the President of the Winnipeg Builders' Exchange. Response by Mr. F. S. Baker, F.R.I.B.A., President of the Royal Architectural Institute of Canada.

(b) Reading of the Minutes of the second general assembly, Toronto, 1909.

(c) Business arising out of the minutes.

(d) Nomination of scrutineers for the election of officers and Council.

(e) Report of the Council.

(f) Report of the hon. treasurer and auditors.

(g) Notices of motion.

(h) New business.

(i) Announcements respecting the Assembly.

2.30 p.m.—Business session.

(j) Federation of the various Canadian architectural bodies.

(k) Amendments to the charter.

(l) "The Architecture of the West," by Mr. Joseph Greenfield, M.A.A., F.R.A.I.C.

(m) "Architectural Jurisprudence," by Mr. Isaac Campbell, K.C.

8.00 p.m.—Reception tendered by the President and Council of the Manitoba Association of Architects to the members of the Royal Architectural Institute of Canada.

Friday, 26th August, 1910.

9.30 a.m.—Sight-seeing drive through Winnipeg and suburbs.

2.30 p.m.—Business session.

(n) "Federation of Foreign Architectural Societies," by Mr. Alcide Chausse, Licentiate R.I.B.A., M.R.S.A., F.R.A.I.C.

(o) (Subject of Prof. Nobbs' paper) by Prof. P. E. Nobbs, F.R.I.B.A., of McGill College, Montreal.

(p) Election of honorary and honorary corresponding members.

(q) General business.

(r) Report of scrutineers on election of the officers and Council.

(s) Election of two auditors.

(t) Place of next General Annual Assembly to be chosen.

(u) Unfinished business.

4.30 p.m.—Meeting of the Council.

8.00 p.m.—Annual dinner at the Royal Alexandra Hotel. Price of tickets, \$5.00. Tickets can be had from the hon. treasurer.

Saturday, 27th August, 1910.

An invitation has been accepted from the Garson Quarries for a special train to take the assembly to Tyndall to inspect their large quarries and to partake of a luncheon which they will provide.

An invitation has been made by the Winnipeg Builders' Exchange, offering to convey members to St. Andrew's Locks. Both of these excursions will occupy the greater part of the day.

Notice of Motion.—Notice is hereby given that at this meeting a member will move that the Council be given power to obtain amendments to the Charter of the Royal Architectural Institute of Canada, and to take the other steps necessary to alter the Constitution of the Royal Architectural Institute, to comply with the request in the joint resolution of all the Official Provincial Associations throughout Canada, to form the R.A.I.C. into a Federation of official Canadian architectural bodies. Among the principal amendments will be the changing of the name of the "Royal Architectural Institute of Canada" to the "Royal Institute of Canadian Architects," and the providing a class of membership for those members of the Royal Architectural Institute, who are not members of a Provincial Association, such as for instance "non-registered members."

Misconception of the Proper Conduct of Architectural Competitions by Lay Public Causes Much Dissatisfaction in the Profession.

MANY DIFFICULTIES seem to have arisen in the several architectural competitions that have recently been conducted in Canada. It seems that the lay public has absolutely no conception of the ethical rules governing programmes in architectural competitions, nor have they any idea of the proper procedure in the awarding of the prizes, nor do they understand that when an architect submits a design in a competition, he does it with a view of securing the commission, and not simply of winning the prize offered. For this reason, the conditions governing such competitions, the appointment of the assessors, and the methods adopted in the awarding of prizes, have caused no little bitterness among competing architects.

It is absolutely impossible to conduct a competition, where each individual competitor will be given, what he may consider an honorable and fair deal, if the conditions governing the competition are not correct, the assessor is not properly appointed and a properly qualified man, or the procedure of the awarding of prizes conducted in a manner consistent with good professional practice. This difficulty is one of the many that has to be straightened out, before the architect is permitted to do justice to his clients, himself and the profession generally.

It is our purpose in the near future to go thoroughly into this matter of architectural competitions, and we hope within the next few months to be able to deal with some of the difficulties that have arisen in the recent competitions we refer to. In the meantime, we shall be glad to hear from members of the profession who have suggestions to offer, as to the best ways and means of impressing upon the building public what an architectural competition really means.

CORRECTION.

ON PAGE 36 OF JUNE "CONSTRUCTION," in the advertisement of The Standard Ideal Co., a cut of the La Patrie Building, Montreal was reproduced, in connection with which the name of Mr. Pennault was erroneously mentioned as the architect, instead of Messrs. G. A. Monette and J. O. Turgeon, who were the associate architects for this building. We beg to say that this unfortunate mistake was purely the result of a typographical error, for it is generally known that these architects were responsible for the design of this, the finest newspaper building in Canada.

COMPETITION FOR MEMORIAL TOWER.—Awards Made in R.A.I.C. Competition for National Tower to be Erected on North-west Arm, Halifax.—Assessors' Report Says Designs Submitted Disappointing.

ANNOUNCEMENT of an architectural competition for a National Memorial Tower to commemorate the establishment of self-government in Canada, under the auspices of the Royal Architectural Institute of Canada, was made in the March number of CONSTRUCTION. This proposed tower was to be erected on the North West Arm at Halifax on an elevation of ninety feet above sea level.

Since it is purely a patriotic undertaking, no money prizes were named, but the R.A.I.C. offered a gold medal for the first prize, a silver medal for the second prize, and a bronze medal for the third prize design.

The competition was closed on the 25th of May. Twelve designs from different portions of Canada were submitted, and the prizes were awarded on July 25 by the assessors, Professors P. E. Nobbs, of McGill University, Montreal; F. Spence Baker, president of the R.A.I.C., and Mr. Frank Darling, of the firm of Darling & Pearson, Toronto.

In view of the fact that the season has been an exceedingly busy one for the architects, the number of designs submitted may be considered reasonably large.

We reproduce below the report of the assessors as submitted to the R.A.I.C.

2 LEADER LANE, JULY 25, 1910.

THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA,
5 BEAVER HALL SQUARE,
MONTREAL, CAN.

GENTLEMEN:

RE MEMORIAL TOWER, HALIFAX.

We have carefully examined the twelve sets of drawings submitted in competition for the proposed Memorial Tower at Halifax and cannot refrain from expressing the opinion that the result of the competition as exhibited by the above designs is very disappointing. With the exception of the design we have placed first, none of them seem to have succeeded in arriving at such a solution of the problem as comes anywhere near the idea that the promoters evidently had in mind.

The design placed second, though on the whole excellent, is after all merely an Italian Campanile—a foreign style that has nothing whatever to do with this country.

The design placed third lacks interest and fails in expressing its purpose.

Number one would require much more study before it could be adopted, and though the general idea might very well be kept, certain changes would, in our opinion, be essential before it could be considered satisfactory.

We have placed

1st, the design submitted by Mr. A. Sharp, Toronto.

2nd, that submitted by Mr. W. M. Brown, Halifax.

3rd, that by Mr. Jno. M. Lyle of Toronto.

We are, Gentlemen,

Yours obediently,

(Sgd.) P. E. NOBBS,
F. SPENCE BAKER,
FRANK DARLING.

In order that our readers may thoroughly acquaint themselves with the exact conditions governing the competition, we reproduce same here in full as announced in March CONSTRUCTION.

CONDITIONS OF COMPETITION.

It is proposed to erect a Tower commemorative of the Federation of the various Provinces whereby the Dominion of Canada came into existence, in 1867.

This Tower is to be erected on the North West Arm at Halifax, N.S.

The competition is open to Canadian architects and

draughtsmen who are British subjects, and will be conducted as follows, by the Royal Architectural Institute of Canada:

1st. The official Provincial Association in each Province will invite its members to submit competitive designs for the Tower.

2nd. Each Provincial Association will then select the three best designs from those submitted and forward them to the Royal Architectural Institute, which body will make a final selection from the plans so submitted. Members of the Royal Architectural Institute who reside in a Province where there is no organized Provincial Association of Architects, will send their designs direct to the Secretary of the Royal Architectural Institute before the 25th May, 1910. These drawings will be submitted to the Council of the Royal Architectural Institute, who will select three plans to go forward to the final competition as set forth in Condition 6.

3rd. Medals will be awarded by the Royal Architectural Institute suitably inscribed. To the author of the design placed first, a gold medal; author of the design placed second, a silver medal; author of the design placed third, a bronze medal.

4th. The author of the design placed first by the Royal Architectural Institute as the winner of the whole competition will be asked to prepare working drawings and specifications with sufficient details to carry out the work. It is felt that the patriotism of Canadian architects can be counted upon in this respect, the elimination of profit being in the nature of a contribution.

5th. The Tower is to be built of local ironstone rubble laid in cement mortar, cost per cubic foot, 50 cents. All dressed work, such as strings, quoins, etc., to be of granite, cost per cubic foot, \$3.

The height of the Tower to be not less than 100 feet. The walls to be solid rubble pointed inside and outside—no plastering. The floors to be fireproof. The stairs also to be of fireproof material.

The location is indicated on the panoramic view of the North West Arm at Halifax.

The cost of the building is not to exceed \$22,000.

6th. The drawings submitted in each Province will be submitted to a Board of Assessors composed of the President and two members of the Council of the Provincial Associations, who will select the three plans to go forward to the final competition, where the designs will be submitted to the final selection made by the Professor of Architecture at McGill University, Montreal; the Professor of Architecture at the University of Toronto, and the President of the Royal Architectural Institute.

7th. Any intending competitors wishing to ask any questions may do so by writing to the Secretary at any time previous to April 10, 1910. All questions thus received will be answered in one document, which will be sent to the Secretaries of the various Associations to whom Conditions of Competition have been supplied immediately following the date of the 10th April.

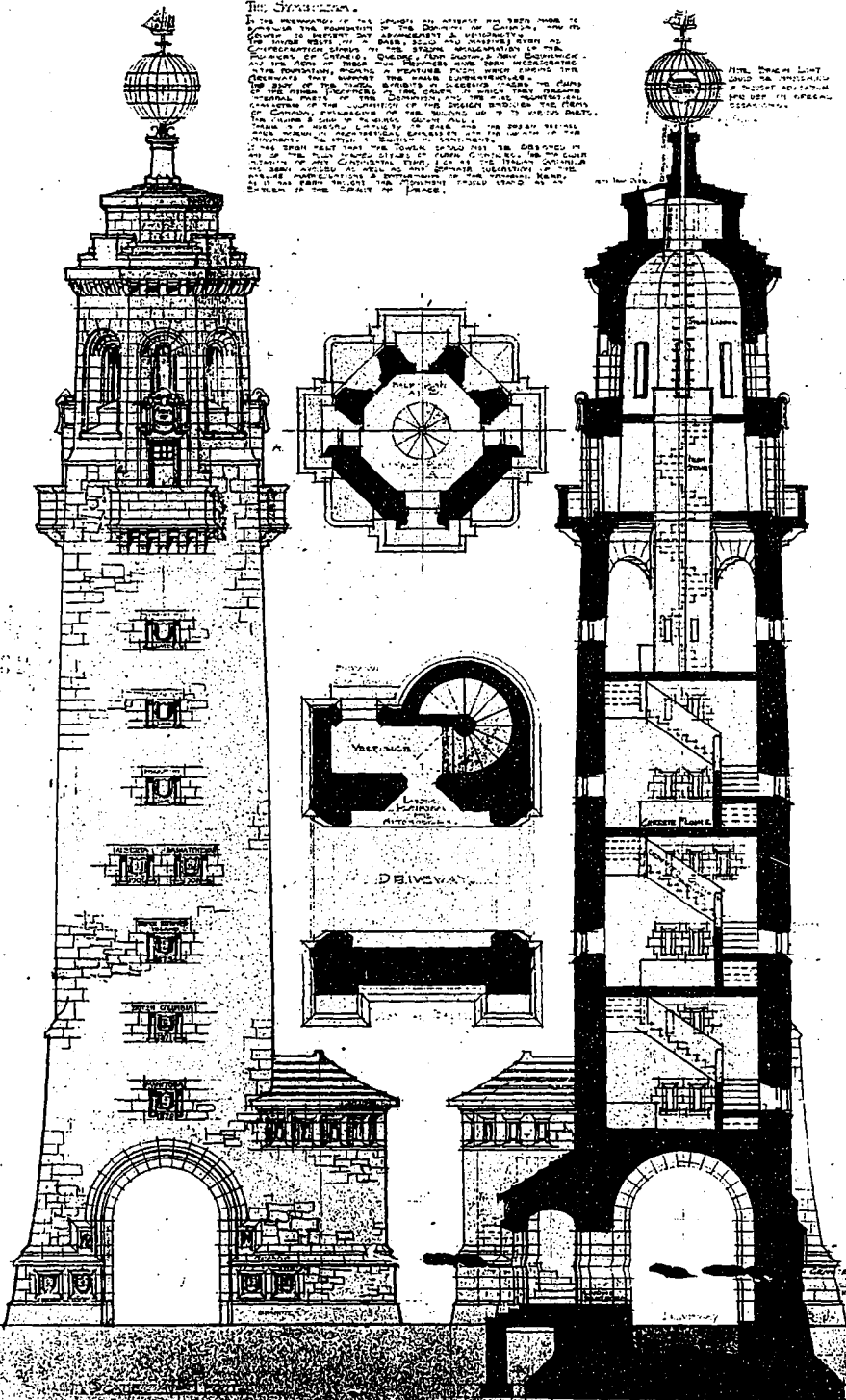
8th. The drawings in each Provincial Competition as mentioned in Condition 2 are to be handed to the Registrar or Secretary of the Association before the 25th of May, 1910, and the final award will be made as soon as possible thereafter. The drawings, which are to be made at the scale of $\frac{1}{4}$ inch to the foot, are to consist of two sheets, one showing the plan, elevations and sections, and the other a perspective view of the exterior of the building. The latter may be rendered in pencil, pen and ink, pastel, wash or water color, as the competitor may decide, but the perspective is not to be drawn at a smaller scale than $\frac{1}{4}$ inch to the foot.

COMPETITIVE DESIGN FOR THE NATIONAL MEMORIAL MONUMENT AT HALIFAX N.S.

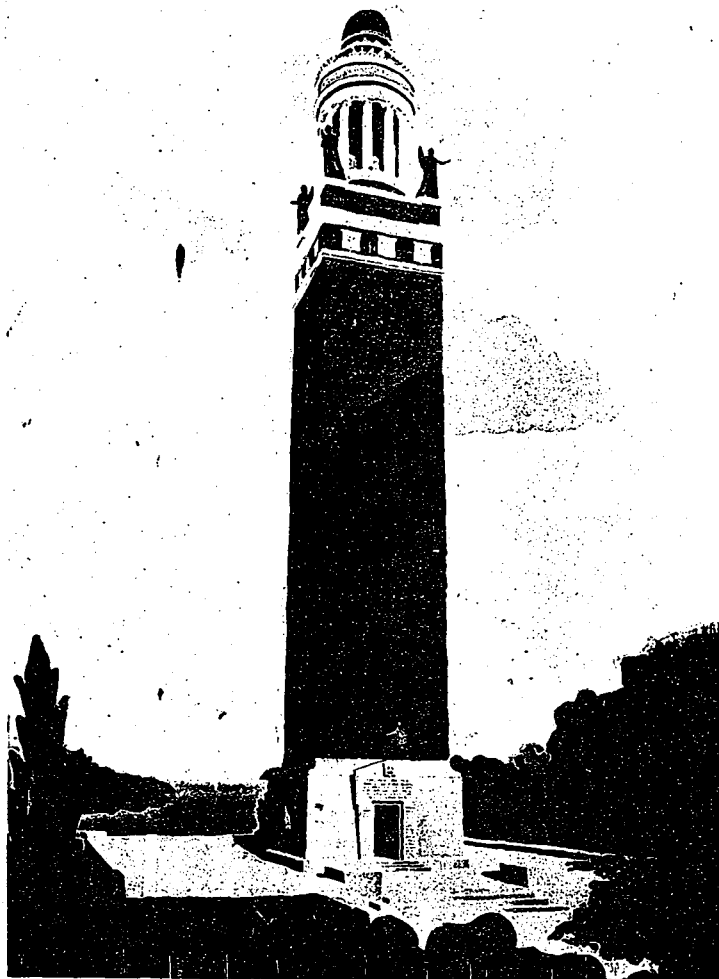
The Structure.

The monument is a tower of granite, 100 feet high, to be erected on the point of the North-West Arm, Halifax, N.S. The tower is to be a memorial to the brave men and women who died in the defence of the city of Halifax during the attack of the French privateers on the 16th of September, 1758. The tower is to be a memorial to the brave men and women who died in the defence of the city of Halifax during the attack of the French privateers on the 16th of September, 1758. The tower is to be a memorial to the brave men and women who died in the defence of the city of Halifax during the attack of the French privateers on the 16th of September, 1758.

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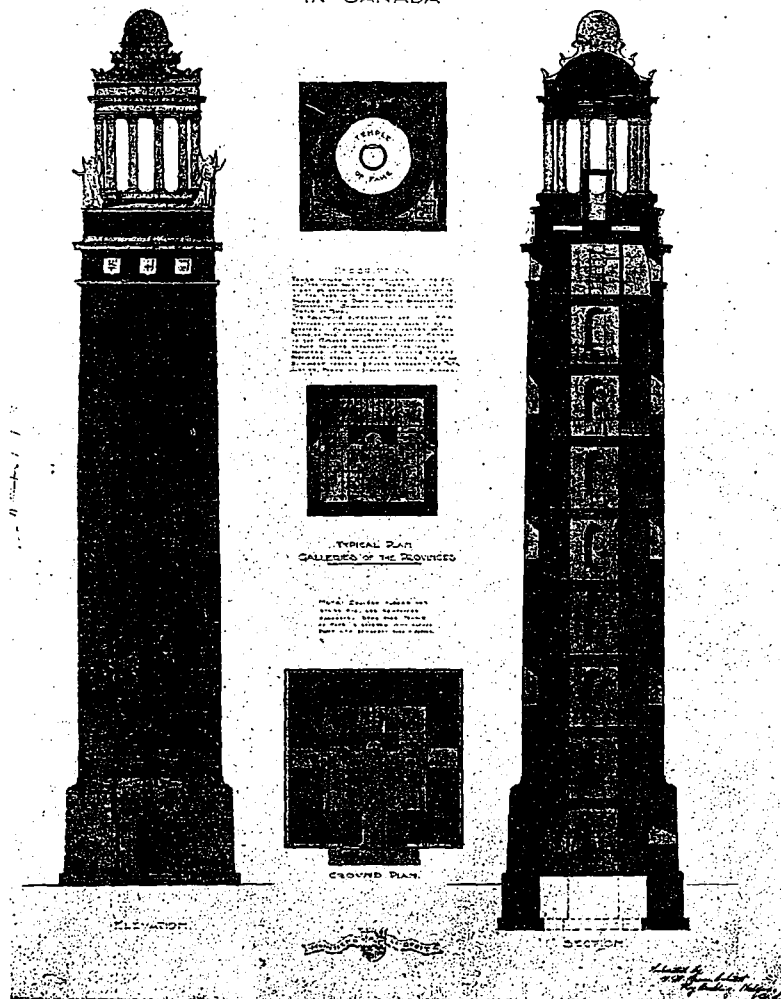


Elevation and Sectional View, Together with Ground Plan and Other Details of the First Prize Design, Awarded the Gold Medal in the R.A.I.C. Competition for the National Memorial Monument to be Erected on the North-West Arm, Halifax. N. S. Sharp, Toronto, Designer.

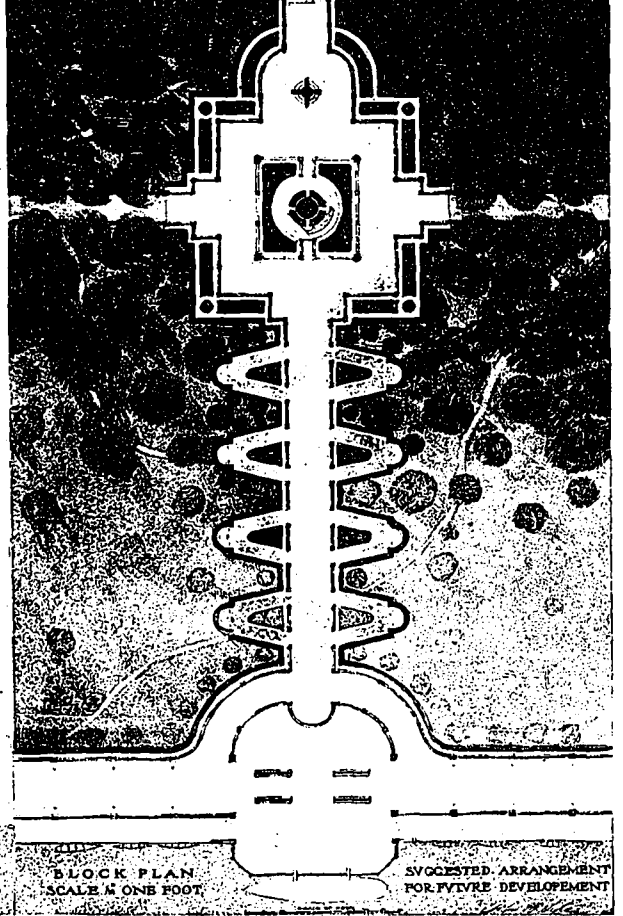
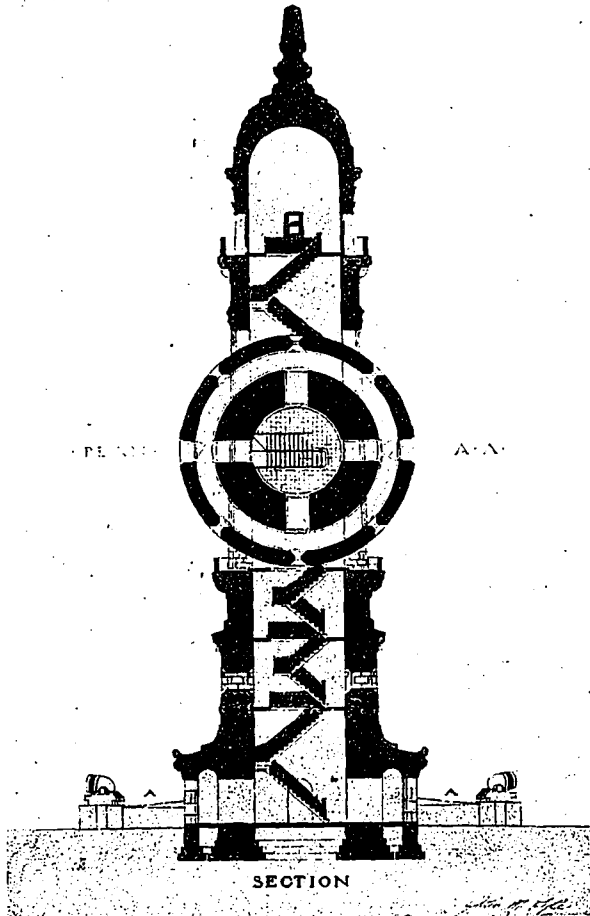
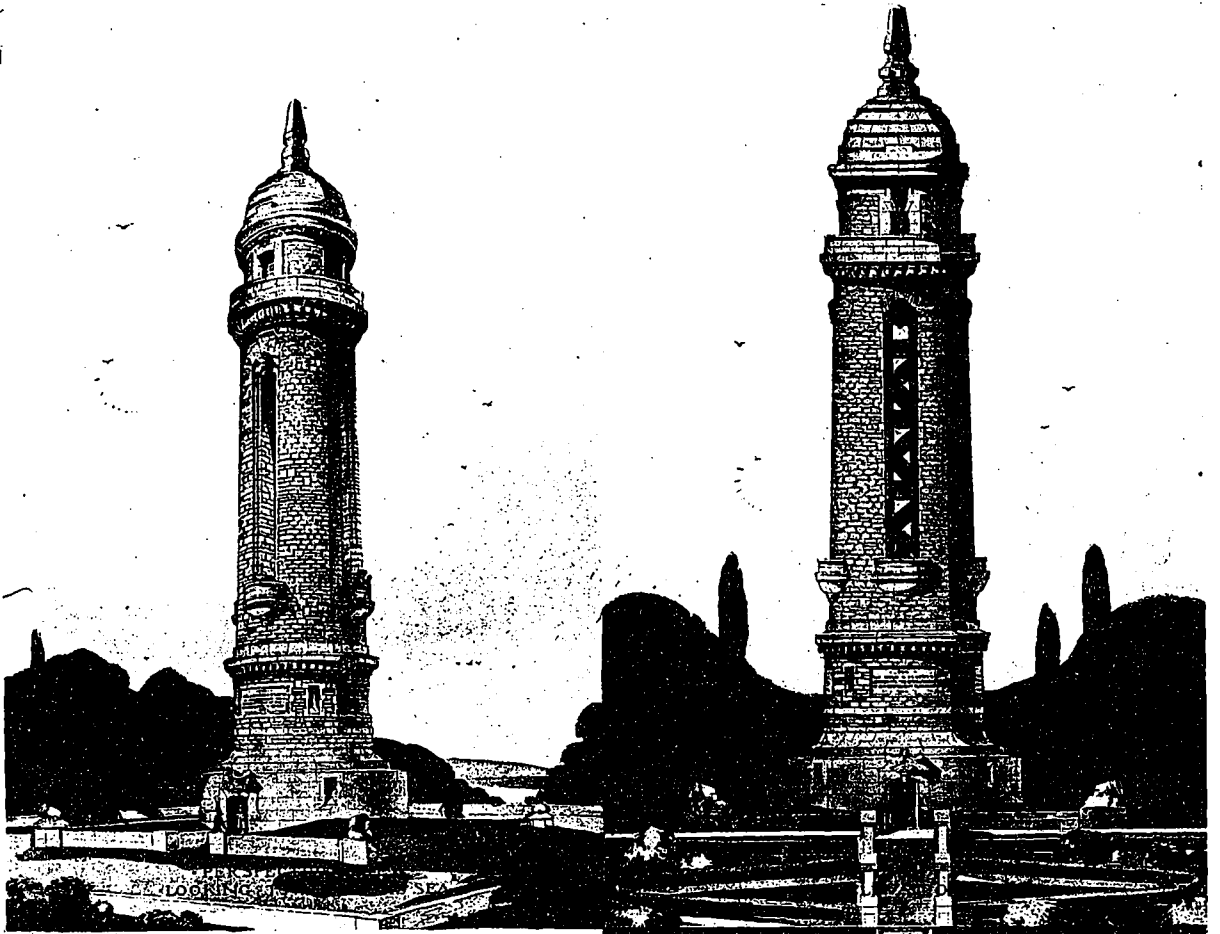


Second Prize Design, Awarded Silver Medal in the R.A.I.C. Competition for a National Memorial Monument to be Erected on the North-West Arm, Halifax. W. M. Brown, Halifax, Designer.

COMPETITIVE DESIGN FOR A TOWER
IN COMMEMORATION OF THE
ESTABLISHMENT OF SELF GOVERNMENT
IN CANADA



Elevation and Sectional View, Together with Ground Plan and Other Details of the Second Prize Design, Awarded the Silver Medal in the R.A.I.C. Competition for the National Memorial Monument to be Erected on the North-West Arm, Halifax. W. M. Brown, Halifax, Designer.



Third Prize Design, Awarded Bronze Medal in the R.A.I.C. Competition for a National Memorial Monument to be Erected on the North-West Arm, Halifax. John M. Lyle, Toronto, Designer.

CONSTRUCTION, AUGUST, 1910.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA



Ivan S. Macdonald, Editor and Manager

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CONTRIBUTIONS—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and duly returned.

Vol. 3 Toronto, August, 1910 No. 9

CURRENT TOPICS

AN INCREASE IN THE ANNUAL VALUE of the Egyptian cotton crop of between \$15,000,000 and \$20,000,000 is expected to result from the heightening of the Assouan Dam. The work, it is estimated, will occupy six years in all, and cost a huge sum, but the benefits to be derived from the improvement has a compensatory value, that will repay for the undertaking many times over.

* * *

A REPORT FROM STOCKHOLM says that the water falls of Sweden have been estimated to be able to supply 10,000,000 horse-power for at least nine months of the year. At the present time the Government owns 277 falls, and it is their intention to utilize as many as possible in the near future. The largest state owned electric plant, the energy of which has been calculated to be 80,000 horse power, is at Trohattan. Another situated at Porjjs Falls develops 50,000 horse power.

* * *

THE YEAR 1909 SHOWS an increase of 20 per cent. over 1908 in the production of Portland cement in the United States. Returns collected jointly by the Bureau of the Census and the Geological Survey show that between 61,300,000 and 62,000,000 barrels were produced in 1909. The value of this at an average rate of 85 cents per barrel is between \$52,105,000 and \$52,700,000. Although the price per barrel was very low during part of the summer of 1909, yet the average of 85 cents is the same as for 1908.

THE COMBINED IDEAS of the principal tramway managers of England are embodied in a new electric car brake which is about to be given a trial at Bradford. The new device was designed in pursuance to various suggestions offered to the manager of the street railway system operating at that place, who is also the joint inventor of the extensible axle now in use on the Bradford-Leeds tramway to overcome the sudden change in gauge that occurs in that line from 4 feet to 4 feet 8 inches.

* * *

THE ANCIENT CITY OF TARSUS, in Asia Minor, has recently been lighted by electricity, the power being taken from the rapidly flowing Cydnus River. About 1½ miles from the city an 80-horsepower turbine is made to drive a large dynamo, which furnishes sufficient power for 1,000 lamps of 16 candlepower each: 450 are now used to light the streets of the city and the remainder will be furnished to private consumers. It is proposed to extend the electric-lighting system to Adana and Mersine, the power to be likewise furnished by the Cydnus River and transmitted by wire to these places.

* * *

CARDIFF, BRISTOL AND OTHER TOWNS in England, according to Trade Commissioner W. A. McKinnon at Birmingham, have adopted for their electric railway service a device consisting of a patent frog similar to a spring pivot, by which a trolley pole can be automatically reversed at terminals. The car itself simply starts on the return journey, the pole going backwards for a few yards, when it is caught and carried outwards on a "Y," till it is at right angles with the track. From this position the forward movement of the car pulls it along the return arm of the "Y" and through another right angle back again to the straight wire, and the reverse is completed.

* * *

TO MEASURE THE HEAT generated by the hardening of Portland cement tests are being made in the Panama Canal zone by imbedding in the walls of the locks built at Gatun, six resistance thermometers. At different stages in the setting of the cement readings of the temperature are to be taken. The temperature increases rapidly from the time the concrete begins to crystalize until it reaches its final set. From the settling point the increase is slow but usually continues during the hardening process which may last several years. The results of these experiments will be likely to prove of great interest and may throw some light on expansion and contraction which is the bugbear of all cement users.

* * *

A NOTABLE ADDITION to the attractions that Florence holds out to the lover of architecture and others arts, says The ARCHITECT (London) has been made in the opening of the restored Davanzati Palace in the Via Porta Rossa. Built early in the fourteenth century by the Davizzi family, it at the close of the sixteenth century became the property of Bernardo Davanzati, a man of wealth, learning and ancient lineage. Like many other old Italian families, the Davanzati declined in wealth and influence, and came to an end with the suicide of the last representative, Carlo di Giuseppe. The house, already suffering from the poverty of its owners, fell into the abyss of a tenement dwelling. In 1904 Signor Volpi, the well-known art expert and dealer, bought the palace, and has since been steadily carrying out its rescue from desolation and restoration to a close approach to its former beauty. Frescoes and old woodwork have been brought to light, and Signor Volpi has furnished the palace again with un-restored furniture of its own date.

TRADE COMMISSIONER Harrison Watson, in a recent report states that maple flooring is being extensively used in the erection of public institutions, hotels, and similar buildings, and manufacturers who possess the capacity for a large and regular output ought to be able to find a profitable market for the material in the United Kingdom.

* * *

WHAT IS CLAIMED to be an absolute noise-proof room has been perfected by Prof. Zwaardemaker, of the Utrecht (Holland) University. Details of the construction of the chamber which precludes the transmission of either external or internal sound, have been communicated to the Amsterdam Royal Academy of Science. The walls of the room consist of six layers, alternately of wood, cork and sand. There are two spaces, one between the second and the third layer, and one between the fourth and the fifth, from which the air has been extracted. The inner walls are of porous stone covered with a kind of horsehair cloth known as trichopiese, a Belgian invention, which is sound-resisting and is widely used in Belgium in telephone booths. The walls are pierced by acoustically isolated leaden rods. The roof is composed of layers of lead, wood, asphalt, paper, seagrass and cork. The floor is of marble and is covered with a thickly woven Smyrna carpet. A tomb-like silence reigns within the compartment, which will be used for clinical studies only.

* * *

THERE WILL SOON be completed in New York City what is reasonably supposed to be the strongest and safest bank vault that man's ingenuity has yet devised. Bankers and probably safe breakers are manifesting great interest in this burglar proof construction. The huge door, eighteen inches in thickness, is built to withstand dynamite or any other form of high explosives. It is made of steel with a special concrete filling between the outside and inside walls, and imbedded in this concrete are jail rods. The door itself weighs twenty-five tons. Inside this outer door is another made of solid steel of one and a half inches thickness. The combination consists of a set of four time locks which will render it absolutely impossible to open the door at night by working the combination. The foundation of the vault is altogether separate from the foundation of the building containing it, and is so constructed as to positively prevent undertunneling. A system of lamps and mirrors beneath the floor around the four walls gives the watchman a clear view underneath the floor.

* * *

ONE OF THE MOST UNIQUE ABODES in the world is found in the home of S. Mobly, near Prairie Grove, Ark. For years Mobley, who is a member of the Farmer Union, and one of the best-known agriculturalists in his section of the state, has lived in a cave at the top of a mountain 1,700 feet high. Despite the fact that this home is somewhat unusual in location, it lacks little or nothing in the way of comfort and conveniences, its advantages in this respect including hot and cold water, electric fans, electric light and steam heat. It is 78 feet long by 25 feet wide and 32 feet high, and is described as being probably the most palatial cave in the universe. The walls are of beautiful granite, which has been handsomely polished. The ceiling is forty feet thick. The front of the cave is of glass and the floors are of hardwood. The flues of the cooking range pass out through the mouth of the cave and extend outward a distance of nearly forty feet. Moveable screens permit the increase and reduction of rooms at the pleasure of the occupants. A fine spring at the top of the mountain furnishes water through a private system of waterworks. This novel dwelling is reached by a beautiful road ascending the crest of the mountain by easy stages, and the grounds about the cave are kept in perfect condition.

SINCE THE APPLICATION of cement to so many lines of structural work, says a contemporary, there have been numerous designs created in connection with log houses. The development of the cement industry has enabled architects to form designs of modern descriptions of log residences for the country service, the beaches, the city estate, or wherever required. Some of the designs of logs in combination with concrete effects are exceedingly attractive in appearance. Other styles are plain. Some are made up with real rocks or pebbles for the rubble surfaces, while other types are executed with the imitation of rock and pebbles with cement material. Then there are cottages designed with rubble surfaces set off with broken bottle green glass. Some good effects have been secured with hardwood set in blocks, angles, sections, curves, and the like in the cement walls of the log frame cabins. There are many designs possible when wrought iron or steel sections, elbows, cornices, parts of frames, turns, etc., are utilized in conjunction with the rubble work, cement, and log work. Furthermore, models of attractive combination log and cement houses are made by introducing novelties in window sash, frames of heavy doors, metal doors, sheet iron or tile smoke stacks, novel-shaped windows, projecting ends of logs at the corners and kindred work. It is possible for the designer of cement products to make imitation concrete logs so well that you imagine that the artificial log is the genuine article. Some of the concrete workmen prefer to erect the log structure with logs made from moulded concrete. These logs are cast with the ends properly recessed for the jointing at the angle of the walls. The concrete log is often cast with the filling space ready made in such a way that the material forming that space readily interlocks with the material of the adjoining log.

* * *

IN ORDER TO NUMBER DRAWINGS in a convenient manner and make it easy to find any section or detail referred to on an assembled drawing or plan, Mr. I. W. Jones, engineer and designer of water power plants, Milton, N.H., has devised a system which is self-referencing. The various sheets for a given job are designated alphabetically, from A onward. When there are more than 26 sheets on one job, the twenty-seventh is called AA, the twenty-eighth AB, and so on. The different views, sketches and details on a sheet are designated numerically and the sheet letter attached to the number. For example, the third detail on sheet D would have as its title, No. 3—D. When sections are taken they are given titles which show the letter of the sheet on which they are detailed, and a number corresponding to the position on that sheet. If, for example, a certain cross-section line on one of the plans is marked 2—H, it means that the drawing of this section will be found on sheet H, and that it is the second section or detail on that sheet. All section lines are lettered at both ends and have arrows to show in what direction the section is taken. Moreover, if a piece of machinery indicated on a plan is marked "See Detail 9—M," it would mean that the detailed drawing of the object is No. 9 on sheet M. The scheme thus saves considerable time over one that is not self-referencing. Mr. Jones states that it has been found very satisfactory. Each job is given an individual number which consists of a combination of a consecutive job number for the year in which it was taken, and the last two figures of the year. For example, job number 1009, means that the job was the tenth one taken up in 1909, while the twenty-fifth started in that year would be numbered 2509. By this method both plans and files indicate at a glance when a given piece of work was taken up.—ENGINEERING RECORD.

NEW PREMISES, BANK OF MONTREAL, TORONTO.—Recently Erected Structure Which Shows an Interesting Use of Terra Cotta in Commercial Design.—Planned Exclusively for Banking Purposes.—Built Along Fireproof Lines.

NOTHING PERHAPS, more definitely marks the industrial and commercial-growth of the Dominion, or more fully bespeaks the nation's prosperity and strength than the extensions made by banking institutions in the erection of new home offices and branch houses. The activity in this respect during the past few years, has been such as to form one of the outstanding features of the building development throughout the country, and there are few cities or towns of any importance to-day which cannot boast of several representative structures of this particular class.

Toronto's most recent addition is the new premises of the Bank of Montreal, at the corner of Yonge and Queen streets, designed by Architects Darling and Pearson. It is a two story building of Renaissance style, which provides excellently appointed quarters for the institution whose name it bears, and office accommodations for the Royal Trust Company of Canada. The construction of the building is of steel and terra cotta, the exterior being carried out in an exceptionally splendid quality of English terra cotta, on a highly polished granite base. The arched treatment of the lower openings and the direct arrangement of the upper windows, together with the simple cornice and parapet, give the exterior a dignified and substantial character, without that over-cumbersome massiveness which at times is more disfiguring than dignifying.

The entrance is from Yonge street, though an effectively pannelled quarter cut oak doorway, having a three stone step rise from the sidewalk, and a simple, three - light, bronze electrolier on either side. This opens into the vestibule which has a vaulted ceiling and a two-color design marble floor. The walls here are dadoed in a reddish brown Tennessee marble to the height of six feet, and this treatment is repeated in the hall to the left where an elevator, enclosed in a verdigris bronze grille, and an iron staircase with marble treads and French pink Tennessee marble walls communicates with the second floor.

Access to the banking room is through swinging doors of glass set in oak frames. It is a well-lighted and well-ventilated interior of spacious dimensions. Richly pannelled high wainscoting and a light green tint plas-

tic treatment constitutes the wall scheme. The ceiling is arched and marked off into sections at the rise of the columns by heavy festooned plastic enrichments. To the right is the manager's office which can be entered either from the public space or banking department.

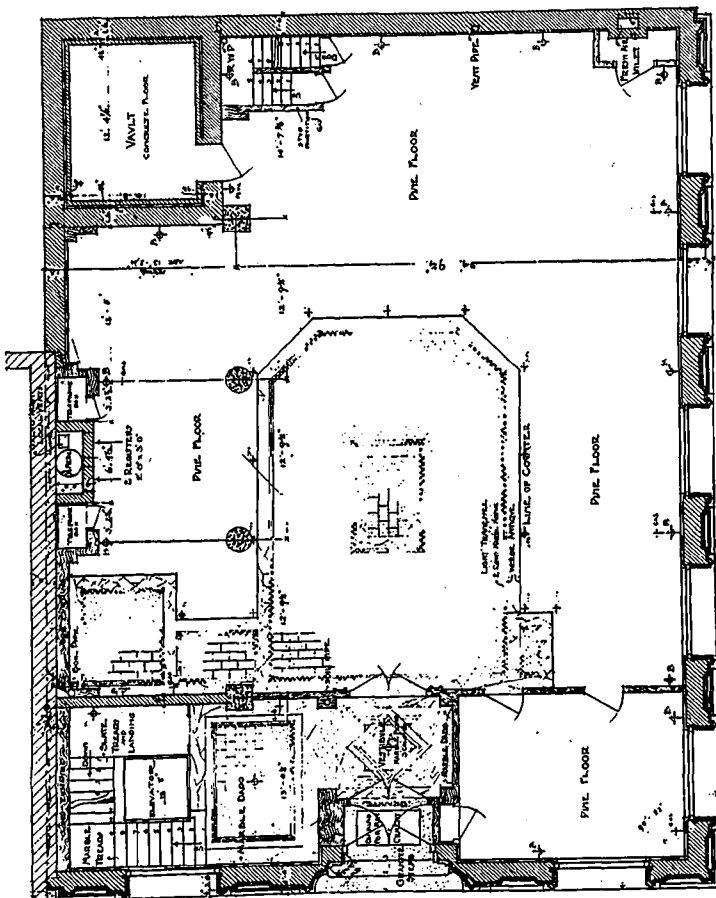
The floor in the public space is of gray Tennessee marble with a two-color dark border design conforming to the mahogany counter which encloses the central floor area on all sides. Ample light is obtained from the large well-placed window on the Queen street side, and from the ceiling lights of the inner court, which are designed to conform to the arches formed by the columns. Simple wall medallions and rich plastic capitals effectually relieve the directness and severity of the inner wall. Two conveniently placed telephone booths are situated on the side, and at the rear is the vault, approximately 10½ by 13 feet in floor area, which is equipped with a modern fireproof and burglarproof door and finished with a concrete floor. Adjoining the vault is a stair case to the basement and the upper floor. The upper floor is divided off into splendidly appointed offices entirely for the use of the Royal Trust Company. The building is equipped with a modern heating and ventilating plant, and all the wiring is installed in iron conduits, and executed according to the latest requirements of the Canadian Board of Fire Underwriters.

It is altogether an exceptionally well-considered structure either from the standpoint of investment, or as viewed architecturally and constructively.

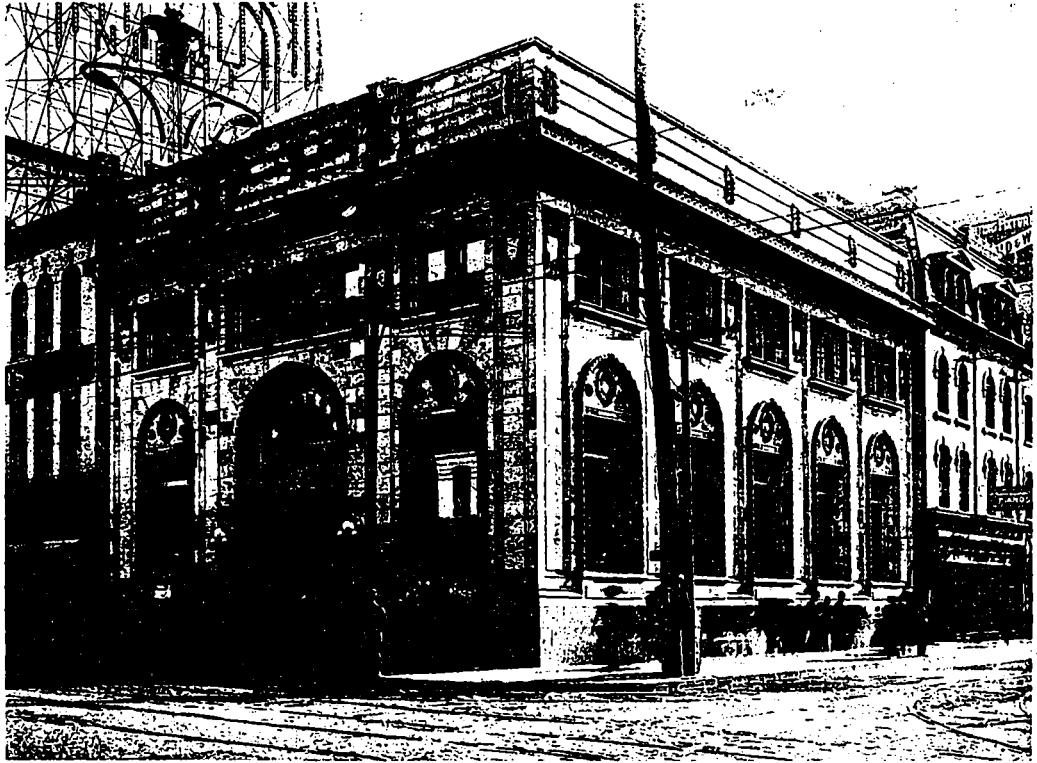
It admirably meets in every way the requirements of a building intended for banking purposes, and in no particular, is there a display of needless ornamentation, or evidence of uncalled for material waste.

The construction throughout is practically fireproof, all the structural steel members being fully protected at all parts by the terra cotta work.

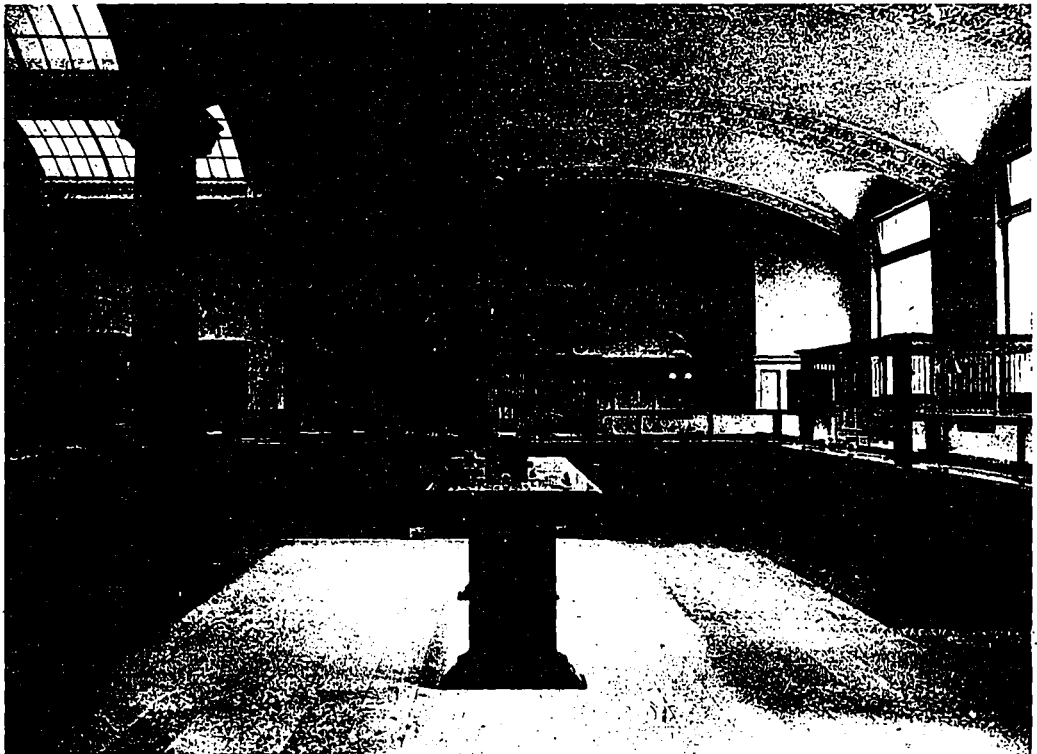
The various branches of the work were carried out by the following firms: Masonry, T. Cameron & Son; carpentry, J. C. Scott & Co., Limited; plaster work, Hoidge & Company; marble work, Hoidge Marble Company; fixtures, Canadian Office and School Furniture Co.; plumbing and heating, Toronto Furnace and Crematory Co.; wiring, Rice, Green & Company; electric fixtures, McDonald & Wilson,



Ground Floor, New Premises, Bank of Montreal, Yonge and Queen Streets, Toronto, Darling and Pearson, Architects.



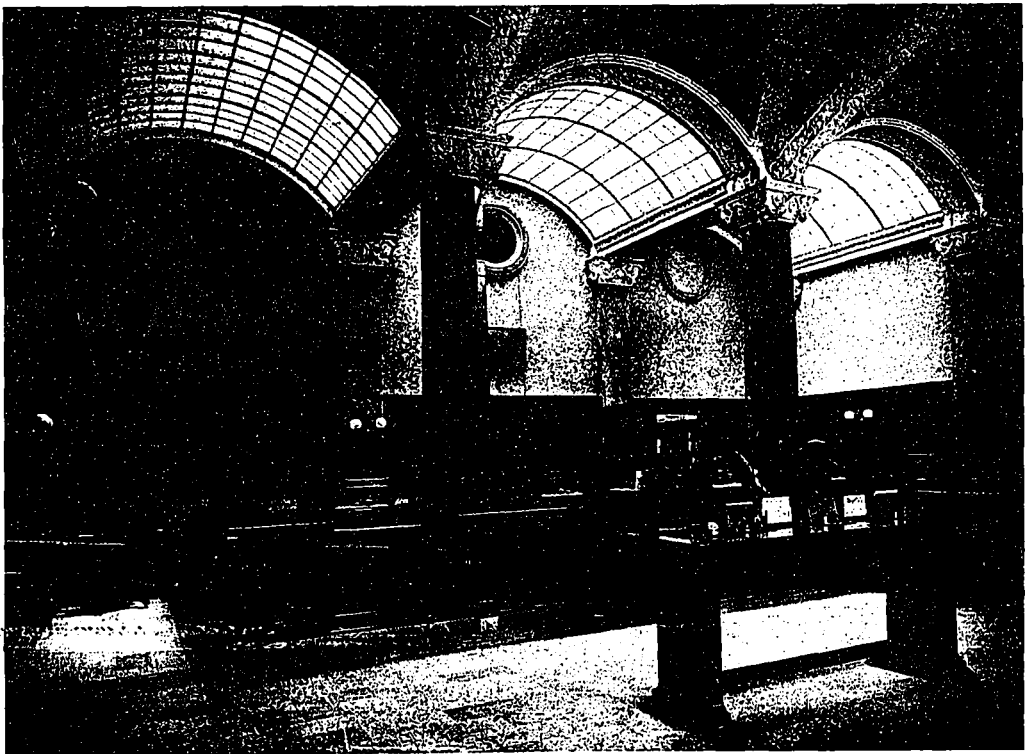
New Premises, Bank of Montreal, Yonge and Queen Streets, Toronto. A Recently Erected Building Which Shows an Interesting use of Terra Cotta in Commercial Design. Darling and Pearson, Architects.



View of Banking Room, Looking Toward the Rear, New Premises, Bank of Montreal, Queen and Yonge Streets, Toronto. Darling and Pearson, Architects.



View of Banking Room, Looking Towards the Entrance, New Premises, Bank of Montreal, Queen and Yonge Streets, Toronto. Darling and Pearson, Architects.



Banking Room, New Premises, Bank of Montreal, Queen and Yonge Streets, Toronto. Showing the Arched Skylights and the Treatment of Side Walls and Ceiling. Darling and Pearson, Architects.

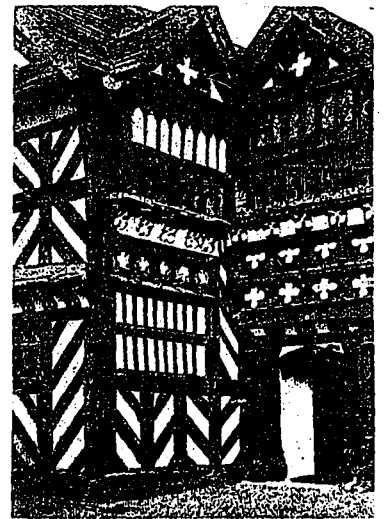
ANCIENT HOMESTEADS IN ENGLAND.—Quaint Half-Timbered Dwelling Structures Whose Erection Antedates the Fifteenth Century.—Built Without Preconceived Form as to External Treatment.—Remaining Examples of Early “Magpies.”

THE OAK-TIMBERED dwellings of our ancestors were coeval with the “Wooden walls of Old England,” and it is a regrettable fact that they are fast disappearing in the devastating march of modern improvement. Many of these quaint “magpies” date back to the commencement of the fourteenth century, at which time the districts in which they stand were covered by extensive forests, the wood from which, being the cheapest and handiest material available, was utilized in the construction of cottage and mansion. Nothing catches the eye of the traveler so readily as the beautiful chequered fronts of these ancient “magpies.” Bars vertical and horizontal, angles and curves mingle curiously, but always elegantly, with numerous gables breaking the skyline. In the cottage the chequer work is generally of simple and primitive design, but in the more pretentious buildings the external decoration is of the most varied and elaborate description. It is said that when these buildings were erected the builder had no preconceived plan for carrying out the work. This was more especially the case so far as the decoration of the exterior was concerned, which appears to have been elaborated as the building progressed; and to this fact the diversified methods of design may be attributed. The houses were invariably well and substantially built, and

wind, which have wrecked many a homestead, these old “magpies,” in the words of an occupant, “never flinched an inch.” They were, however, not constructed in a style suited to the requirements of the more luxuriant tastes of the twentieth century, and in numerous instances the descendants of ancient families have forsaken their ancestral homes, and built for themselves mansions in a more up-to-date style, leaving the old halls to be occupied as farmhouses. There are, however, exceptions to this, e.g., Bramhall, in Cheshire, which is still in occupation as a mansion.

Cheshire and Lancashire are prolific in these old “magpies,” the whole of the illustrations to this note, with one exception, being taken from these counties. It is an instructive

ancient family of Moreton. Latterly, however, the present descendants of the Moreton's have erected a modern mansion a short distance away from their ancestral home, and the latter is partially occupied as a



Moreton Old Hall.

farmhouse. Free access to the whole of the building is permitted, and refreshments are served to visitors in the spacious banqueting hall. Three sides of the building are now standing, surrounded by the moat which encloses about one acre of ground. The entrance is gained by a stone bridge on the south side, and through an ancient gateway to the courtyard. The scene here is one of great beauty, and cannot fail to impress the beholder with its antique architectural setting. Over the windows the following quaint inscriptions may be described:—

“God is al in al Thing.”

“Thies Windows Whire Made by William Moreton in the Yeaere of Our Lord MDLIX.”

“Richard Da'c, Carpe'der made Thies Windows by the Grace of God.”

From the courtyard entrance is gained the little chapel, which is only ten feet in length. At the east end of the chapel there is a lancet window, and texts are painted in black letter within the oaken panels of the walls. Service is still held within its sacred precincts four times a year, and the main building is surmounted by a bell-cot for summoning the retainers to service. In the upper part of the south front is the ballroom, entirely panelled with oak, in which Queen Elizabeth is



Bramhall Hall.

and fascinating quest for the architectural student to seek out these old homesteads and photograph or sketch them. Cheshire is one of the fairest counties in England, and the motorist or cyclist who wheels about its leafy lanes will find it a delightful experience. The adjoining county of Lancashire is too much given up to the cotton industry to permit of its highways and byways retaining their pristine beauty, but many of the historic old homesteads are easily accessible by train. Moreton Old Hall, situate on the southern borders of Cheshire, a few miles from Congleton, is considered one of the best examples of a half-timbered building in this country. Since its erection in 1540, up to recent times, it has been the home of the



Bramhall Hall.

they have withstood the ravages of time and tempest remarkably well, outliving many of the structures of later times. During violent gales of



The Priest's House, Prestbury.

said to have danced. On one of the windows of this ancient homestead some courtier in Elizabethan times scratched the following lines with his diamond:—

"Man can noe more know women's
mind by kaire,
Then by her shadov hide ye what
clothes shee weare.."

It is interesting to note that the present occupier of Moreton Old Hall is Mrs. Dale, a descendant of "Richard Dale, the carpe'der," who made the windows.

Bramhall Hall is situate on the outskirts of the village of Bramhall, a few miles from Stockport, with a station on the London and North-Western Railway. It is the ancestral home of the Davenports, who, up to recent times, have occupied it since the reign of Edward III. The interior is not usually shown to visitors, but a request to view the exterior is generally very courteously granted. There was formerly a right-of-way through a portion of the hall, and it is said that refreshments were provided for travelers free of charge. This laudable cus-



"The Palace," Ditchling, Sussex.

tom has unfortunately lapsed, but it is referred to in Harrison Ainsworth's "Rookwood." There are several picturesque cottages in the neighbourhood, one of which we illustrate.

Chester contains many examples of these half-timbered buildings, and we are able to reproduce a photograph of the reputed oldest house in that city.

In the south-eastern corner of Cheshire lies the quaint little village of Prestbury. Its Priest's House is a striking half-timbered building, dating back to the fourteenth century. During the troublous times of the Commonwealth, marriages were solemnized within this building, and the vicar preached to his congregation from the little balcony which will be observed from the centre of the building.

Kersal Cell, the doorway of which we give an illustration, is situated



The Oldest House in Chester.

on the outskirts of Manchester. It was formerly a religious house, but latterly has become famous as the birthplace of Dr. John Byrom, who wrote "Christians, Awake" within its walls. The hymn was first sung by the choristers from Manchester Parish Church as they stood around the old doorway shown in the photograph.

Of the remaining example from Ditchling, in Sussex, but little is recorded. It is known as "The Palace," and tradition states that it was once the residence of Anne of Cleves.—JOURNAL SOCIETY OF ARCHITECTS, LONDON.

ONE OF THE MOST remarkable engineering enterprizes of recent years has just been consummated in the erection of a bridge in the Jura mountains to carry the railroad across a ravine. The construction of the bridge, which consists of a single masonry arch, having an opening of 267 ft., is interestingly described in a recent issue of THE WORLD'S WORK



An Old Homestead, Bramhall.

AND PLAY: The first task was the preparation of the site on either bank for the abutments of the enormous arch. Simultaneously, the erection of temporary wooden towers from the bed of the gorge to carry the elaborate and heavy wooden centreing to support the masonry during its construction was taken in hand. This, in itself, was no mean task. First, substantial masonry plinths had to be prepared to support the wooden pylons, and this entailed the driving of piles into the river bed to secure the requisite solid foundations. The wooden piers were quickly raised to a height of about 133 ft. Three towers were necessary, one close to either bank, and the other in the centre of the gorge, and they were of massive construction to offer complete support to the enormous weight of the falsework and the masonry during its erection. The falsework entailed the use of 21,000 ft. of wood and thirty tons of iron and steel. The sides of the main arch are surmounted by smaller semi-circular arches which carry the road. The bridge cost \$72,000.



Kersal Cell, Manchester.



Bridge Street, Corner.



Bridge Street.

54



Greendale Road.



Greendale Road.

Studies in Domestic Design as Seen in Workmen Cottages at Port Sunlight, England, where the Garden Suburb and Town Planning Idea Has Been Adopted by a Philanthropic Manufacturing Concern in Providing Housing Accommodations Which Would Give its Employees Both Ideal Environments and the Advantages of Improved Social and Sanitary Conditions. These Houses Represent the Work of Different Architects, and They Give an Excellent Idea of the Variety and Beauty of the Cottages Found at Port Sunlight. The Quaintness of the Half-Timbered Cottages in Greendale Road Will Appeal to Many, as Will Also the Decorated Chimney Stacks and Carved Barge Board of the Bridge Street Houses, so Strongly Reminiscent of Tudor Architecture.



Cottages at Port Sunlight. An Eminently Successful Group Containing Seven Houses in Which the Plan of the Interior is Identical in Every Case. The Irregularity of the Frontage and Skylin: Lends a Pleasing Element of Variety, While the Two Entrance Porches Side by Side in the Projecting Bays Further Contribute this Way in Addition to Effecting Considerable Economy in Floor Space. Ernest Newton, F.R.I.B.A., Architect.

ENGLISH LOW-COST HOUSES.—The “Town Planning” and “Garden Suburb” Idea and Its Influence on Domestic Architecture.—Port Sunlight and Its Charming Cottages.—Examples of Residential Design in English Country Houses. By HUCH B. PHILPOTT

JUDGED BY ITS BEST examples, it can hardly be denied that English Architecture has now reached a very high level. But it may be objected that the best examples are not fairly representative of the whole, and that the illustrations which appear very frequently in our Architectural Journals may give the reader, more especially the foreign and colonial reader, a wrong impression of the general average of English building. There is truth in this objection, and it is well, perhaps, at the outset of an article like this, that it should be frankly admitted. In selecting examples to illustrate the trend of design in British domestic architecture, one naturally chooses good examples, even if these unfortunately happen to be in a minority. The reader would not be thankful for anything otherwise, as he presumably is on the lookout for suggestions which he may adapt to his own practice rather than for horrible examples of what to avoid.

To prevent misconception, then, it may be desirable to state that there is still an immense amount of house-building in England which is no cred-

it to the builders who carry it out, nor to the public taste which sanctions and encourages such work. Architects as a rule are not responsible for this poor quality of work. It is carried out by speculators and builders who are intent on saving architects' fees and all other expenses they possibly can. Their aim being to produce houses that attract the public eye, that appear to be cheap and consequently sell quickly, they develop suburban estates by cutting rectangular roads and building terraces or pairs of little houses, all exactly alike and none having more than the tiniest gardens so that the greatest possible number may be crowded on to the site. Questions of aspect are not considered, so that if the rooms on one side of the road chance to be right in respect of sunshine and light, the corresponding rooms in the exactly similar houses on the opposite side of the road will necessarily be wrong. “All modern conveniences” are a great feature of these houses, but they amount to nothing more substantial, as a rule, than a hot water supply to the bath room and an installation of electric bells—useful

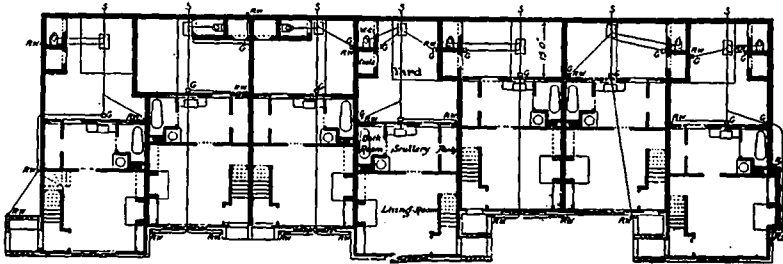
things in their way, but poor compensation for scamped brickwork, ill-fitting joinery and defective plumbing. With this type of building we are not, of course, here concerned, except to point out that it still exists in great quantities and is still being added to. The hopeful thing is that the corrupt mass of jerry-built structures is being steadily leavened by the work of architects and builders who are inspired by quite other ideals. The public is beginning to appreciate these ideals, and the movement is slowly but surely towards a better type of dwelling—simpler and less pretentious, with less ornament, but more sanitary, more restful, more convenient, and better fitted for the making not of a lodging only, but of a home.

Many circumstances, no doubt, have influenced this general improvement, but, as regards the smaller and cheaper houses, especially, there has been no more important factor than the determination of benevolent employers to see their work-people housed under the best possible conditions. Mr. W. H. Lever, M.P., at Port Sunlight, Cheshire, and Mr.

George Cadbury, at Bournville, near Birmingham, made provision for the housing of a large number of working class people—mainly their own employees with their families—under

careful regard to their relative positions one to another, to the open spaces and vistas which were provided and to the aspects of their living rooms. In fact, these workmen's

suburbs, and in one case, (Letchworth) a complete city on the same lines; and many private speculators recognizing the attractiveness and commercial utility of the idea have laid out estates more or less after the model provided by these two pioneer villages. Within the last year the fruitful idea of the considered laying out of a residential estate with regard to the general convenience and the seemliness and beauty of the whole, has received a great impetus by the passing of the Housing and Town Planning Act. Under this Act the municipalities may themselves accomplish much of the good work, which has hitherto been left to the reforming enterprise of private individual or groups of individuals. The municipalities may now control the development of estates by private speculators, so that the multiplication of ugly and unhealthy dwellings and the destruction of the amenities of the locality may be checked; and further they may themselves embark in the business of estate development, laying out new

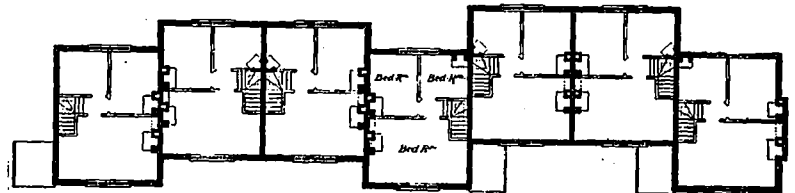


Ground Floor Plan of Group of Seven Cottages, Port Sunlight. This Plan Illustrates the Accommodations very Generally Provided in the Cottages or Smaller Houses. Ernest Newton, F.R.I.B.A., Architect.

conditions which had never before been approached for excellence. Neither Mr. Lever nor Mr. Cadbury wished their work in this direction to be regarded as philanthropic. They desired the houses to be let at a fair economic rental, and, as regards any loss they might have made by sinking capital in these concerns, they maintained that they were repaid by better industrial service of workers living under favorable housing conditions. This is not the place to speak of the social value of these experiments, but it may be stated in general terms that the evidence of the general death rate, and more particularly of the infant mortality rate, proves that life is vastly more healthy in these model communities than among people of similar social rank in the neighboring cities of Liverpool and Birmingham. Architecturally the standard of Port Sunlight and Bournville was very high, not only were the houses of individual excellence, but they were laid out on the site in a well considered plan with

dwellings were planned and built, under the direction of eminent architects, with the same care and thought that is habitually given only to houses designed for the habitation of the wealthy.

The outcome of these efforts was in each case a village of rare attractiveness and beauty, whether regard-



First Floor Plan, Group of Seven Cottages, Port Sunlight. Ernest Newton, Architect.

ed as a whole or in respect to its units. Naturally the system which had proved so great a success was adopted elsewhere. Other employers have provided model villages for their work people, public spirited housing reformers have begun by co-operating efforts to build villages,

suburbs, and—within certain limits—building upon them after the most approved modern methods.

The development of the "town planning" idea means a great deal for domestic architecture. The house which is to be built in a "garden city or a garden suburb" tends naturally towards a better style of architecture than that which obtains in the speculative builder's suburbs. The jewel which is to be set in a splendid setting naturally calls forth the artificer's best work. The house which is to form part of a dignified architectural scheme, which faces a public square or playing fields and has a garden at the rear, invites the best skill and attention of architect and builder. The house is not to be hemmed in by its neighbors, and its back elevation is not to be hidden from public view as a disgraceful thing; consequently to get the "all round" style of designing which makes all the elevations equally presentable. The houses in a model village or suburb are not, as a rule, built speculatively for sale; consequently the meretricious ornament which entices the uninstructed buyer and the shoddy workmanship and material which makes the low price possible are both absent from these houses.

Instead, they exhibit the more solid



Wood Street, Port Sunlight. In this Row of Cottages the Walls are of Brick, Rough-casted in the Upper Portion and Finished with Decorative Plaster Work in the Gables.



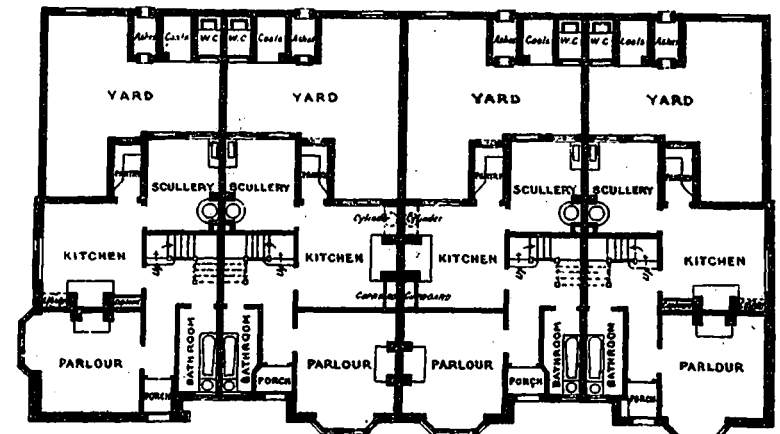
New Chester Road, Port Sunlight. Brick Walls Relieved with Stone Trimmings, Constitute the Outer Garb of this Interesting Series of Dwellings. The Gables, Executed in Dark and Light Brick, add a Decorative Touch, both Simple and Effective.

What for instance could be more pleasing to the eye and more satisfactory in every way than a group of cottages at Port Sunlight which is illustrated on page 55. The architect, Mr. Ernest Newton, F.R.I.B.A., holds a position of almost unrivalled distinction as a designer of country houses; but this group of seven cottages is as satisfactory architecturally as any of his more costly and seemingly more important work. Here we have a row of cottages exactly alike as regards their plan. To the ordinary builder this identity of plan would have been a fatal limitation, and he would have given us a row of mean-looking little houses with the same elevation repeated seven times. But here the architect, by absolutely simple devices, has triumphed over the necessary limitations and produced an architectural group upon which the eye rests with pleasure. Without exact symmetry he achieves a happy balance and proportion. The irregularity of the line of frontage and of the sky line gives a pleasing element of variety, and the placing of two entrance porches side by side in the projecting bays is a

and lasting advantages of convenient planning, the natural and straightforward use of materials, simplicity, good proportion and sound construction. So general is the connection between site planning on the best lines and sound building that the public are beginning to speak of the "garden city" style of architecture which exhibits the good qualities indicated above and is free from the worst vices of the jerry builder. Of course the term is illogical, but it is a tribute to the good work already done by architects and builders who have been concerned in the erection of the houses and cottages in the existing model villages and suburbs.

One delusion which these model schemes have almost completely dispelled is that good architecture is necessarily costly. Some of the most beautiful domestic architecture of recent years has been concerned with workmen's cottages costing about \$1,000 each, or even less. And some of our most eminent architects have

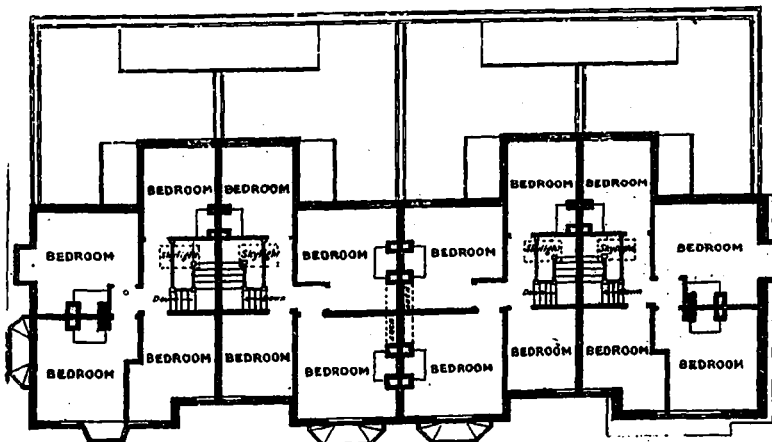
not disdained the work of designing such cottages, recognizing that the beauty of a cottage is as real and as



Typical Ground Floor Plan of Large Houses Known as "Parlor Cottages," at Port Sunlight. These Dwellings Differ from the Others in that They have a Parlor on the Ground Floor in Addition to a Kitchen and Scullery, hence the Name.

good a thing in its own way as the beauty of a palace.

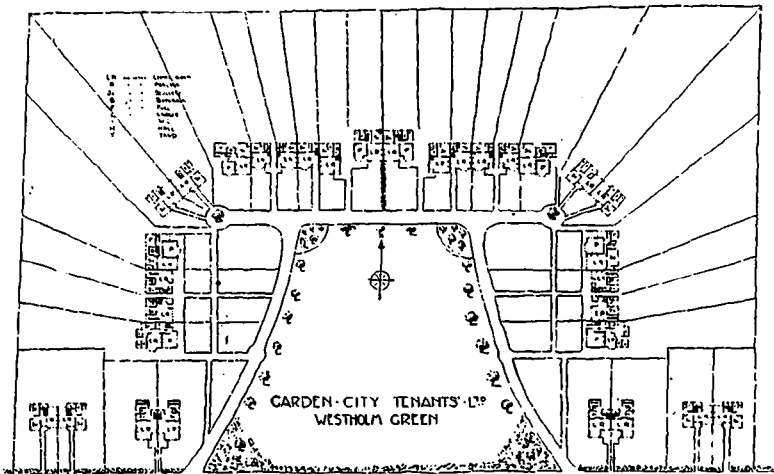
happy device which tends both to variety and the economy of space. These cottages have an appearance of considerable solidity, the lower parts being of stone; the walls above the first floor are tile-hung and the roofs are also tiled. The accommodation, as shown by the plans, is that which has been adopted very generally in the Port Sunlight cottages. It will be seen that the major part of the ground floor space is devoted to a large living-room, a much more sensible plan than cutting up the space to form two cramped sitting rooms, neither of which would be large enough to accommodate a family with comfort, not to speak of visitors—and one of which would probably be almost wasted by being kept as a "best parlor." A fair sized scullery with facilities for cooking is



Typical First Floor Plan, "Parlor Cottages," Port Sunlight.



Cottages at Westholm, Letchworth. These Houses were Built by a Co-operative Tenants' Society on a Self Supporting Basis. Note the Extreme Simplicity of the Elevations and Delightful Harmony of the General Scheme. Parker and Unwin, Architects.



Block Plan, Westholm, Letchworth, Showing Ground Scheme and the Manner in Which the Cottages are Grouped Around a Common Green.

provided, and the bathroom is also on the ground floor—an arrangement which, though it has some obvious inconveniences, makes for economy in plumbing work and leaves a little extra space, which is very valuable, on the bedroom floor. Three bedrooms are provided, the minimum allowance for a family having both sons and daughters.

The variety and beauty of the Port Sunlight cottages as a whole may be judged from the photographic illustrations on pages 54, 56 and 57. The examples are by different architects and exhibit considerable variety in the material employed as well as in design. The quaintness of the half-timber cottages in Greendale Road, with their projecting upper storeys, quite in the style of English Cottage architecture of the sixteenth century, will appeal strongly to many. The



Cottages at Westholm, Letchworth. In Most Cases, the Houses are Built of Brick and Covered with Roughcast Color-washed a Light Cream. The Facing Brickwork is of a Warm Red Color and the Roof is of Hand-made Sand-faced Tile Toned Down to be in Harmony with the Cheerful but Restful Appearance of the Walls.

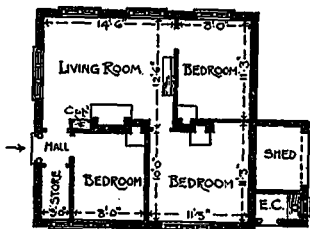
decorated chimney stacks and the carved barge boards of the Bridge Street houses are also strongly reminiscent of Tudor architecture. In the group of cottages in the New Chester Road we have a good example of brick buildings relieved with stone dressings; the simple decorative use of dark and light bricks in the gables will be noticed. The cot-

of course, are free to cultivate as they please.

Since Port Sunlight was built, many schemes for working-class dwellings have been carried out. But it may be doubted whether there is anywhere else in England, with the possible exception of Bournville, a collection of houses let at rentals within the reach of working-class tenants which can compare with these for beauty and general excellence. In explanation of this, it has to be remembered that the Port Sunlight scheme is heavily subsidized. Messrs. Lever Bros. expended \$1,750,000 on the purchase of the estate and the erection of the buildings upon it. On this capital they receive no interest or return whatever. The rent being fixed at a sum which covers only the cost of rates, taxes and maintenance. Naturally, if a similar rental to that paid by the Port Sunlight tenants has to provide for a sinking fund and interest on capital, the cottages must be on a less sumptuous scale. The cottages at Westholm, Letchworth which are also illustrated herewith, are examples of cottages built by a co-operative tenants' society on a self-supporting basis. It will be seen from the plan that they are grouped around a common green. Skirting the green is a carriage way from which the houses are set back about 40 feet, this space being laid out by each householder as flower garden or lawn. The elevations are of extreme simplicity. The houses generally are brick built,

covered with roughcast mostly color-washed a light cream; the facing brickwork is a warm red color; the roofing is of hand-made sandfaced tiles, which are toning down very well, and the general color effect is cheerful but harmonious and restful.

Apart from large housing schemes, there have been many successful essays in planning individual cottages or pairs of cottages which exhibit some architectural character, though their cost is reduced to the absolute minimum. A young architect who has done some useful work in this direction is Mr. J. Gordon Allen, A. R.I.B.A. Several of this designer's cottages are shown in the accompanying illustrations. These have been planned for the accommodation of agricultural laborers and other working men whose expenditure on rent must be kept very low. The first two examples (marked A. and B.) show the very cheapest cottages it is possible to build in England so as to conform with the building regulations prevailing in most rural districts. Each consists of a single story. The square plan and plain pyramidal roof of A. gives the form which encloses a maximum of area with a minimum of wall and roof surface. This cottage has been built in several districts for about \$650. The walls are of brick, covered with roughcast, or of concrete, which in some localities is found to be cheaper and the roof is tiled. B. is a very similar cottage costing just a little



PLAN

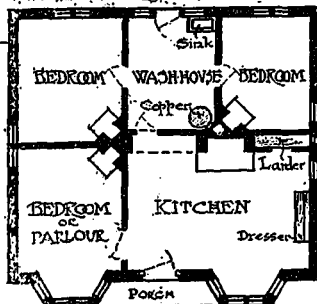
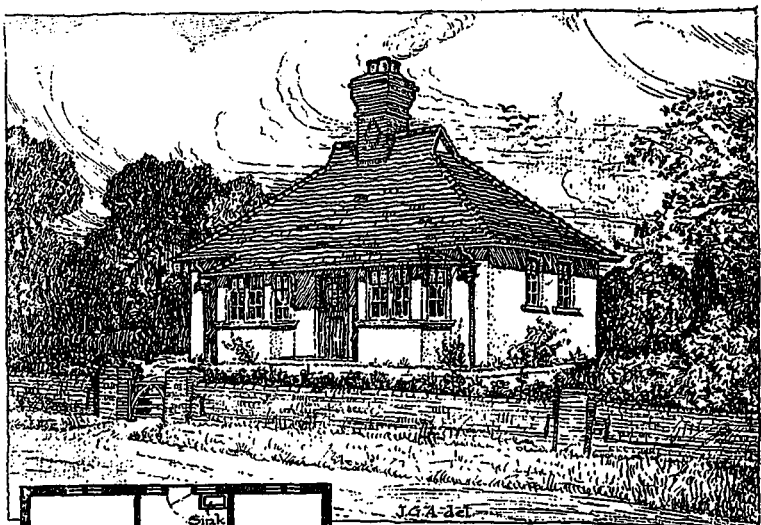


(A)—Cottage on Holmdale Road, Hampstead. J. Gordon Allen, Architect.

tages in Wood Street have brick walls, roughcast on the upper story, with decorative plaster work in the gables.

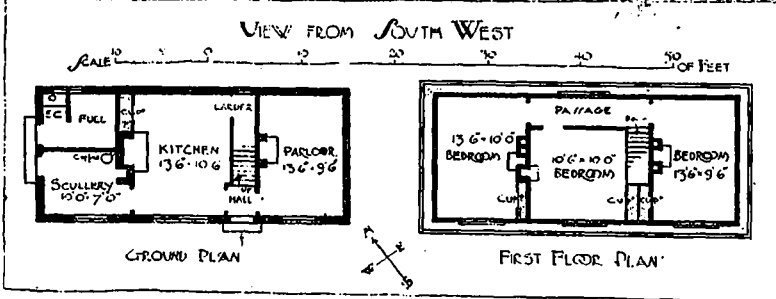
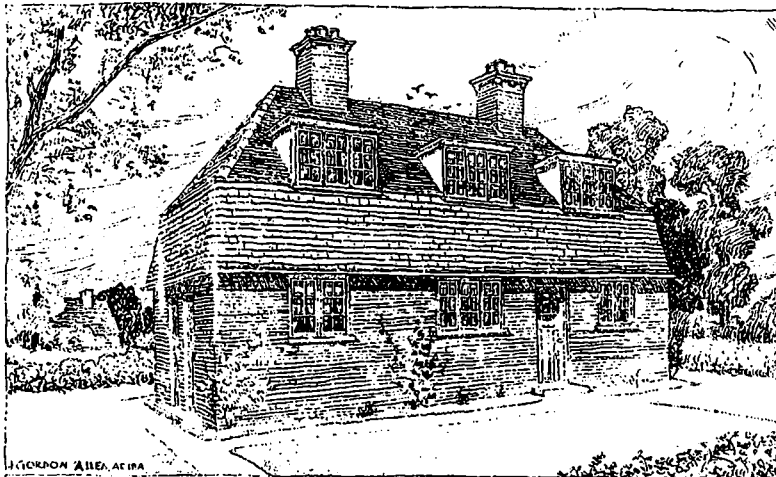
It is not necessary to give plans of these cottages in every case, since they nearly all conform to one or two types. The smaller houses are built on the same plan as Mr. Ernest Newton's cottages and the larger ones in general accordance with the plan by Messrs. Grayson & Ould, on page 57. These larger cottages, known as parlor cottages, differ from the others in having a parlor on the ground floor, in addition to a kitchen and a scullery, and an extra bedroom on the first floor. In some of these houses the scullery is fitted with a cooking range so that the kitchen may be used as a general living room.

The plans of these Port Sunlight cottages may suggest that very little garden ground is allowed to each tenant, but such is by no means the case. All the cottages have front gardens screening them from the road, and these are cared for by the owners of the estate, Messrs. Lever Bros., the object being, of course, to avoid unsightly patches due to an occasional ill-kept garden and to improve the general appearance of the village. And in addition to this, large areas immediately adjacent to each block of cottages are reserved for allotment gardens, which the tenants,



Surface of or of Concrete, with Tile Roof. \$650. J. Gordon Allen, Architect.

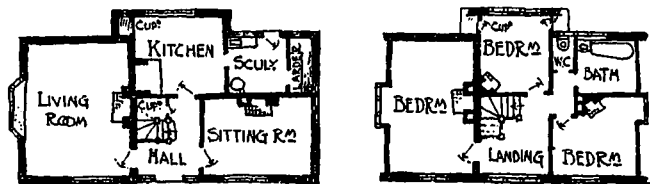
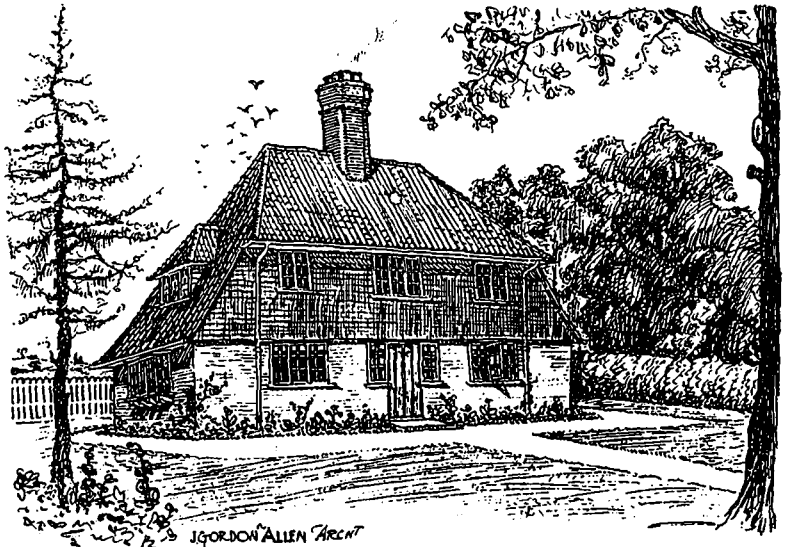
(B)—Small House, Dashmorden, Holmdale Road. Both this Dwelling and the Cottage Illustrated Above are Planned and Built to Provide Suitable Accommodations for the Agricultural Laborers and Workingmen at a Rental Charge which Comes Within Their Means. They are Especially Note-worthy in that They Show the Very Cheapest Cottages it is Possible to Build in England so as to Conform with the Building Regulations Prevailing in Most Rural Districts. This Type of Cottage Has Been Adopted in Several Districts, and the Construction is Either of Brick with Roughcast The Cost of Each House is Approximately



(C)—Two-Storey Cottage, Holmdale Road. Considering the Expenditure Involved, this House is a Most Excellently Planned and Substantially Built Structure. Economy in the Cost of Construction Was Made Possible by Restricting the 8-inch Brick Walls at the Second Floor Line and Enclosing the Upper Rooms in a Tile Roof of Mansard Design. This Type of House Can be Built in Most English Districts for \$950. J. Gordon Allen, Architect.

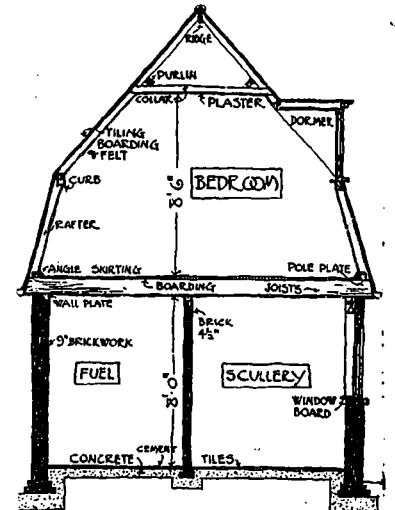
more than A. The plan is again square, and not an inch of space is sacrificed for passageways. The next example, C. is a two-story cottage with rather more accommodation. The method of construction, which the sectional sketch makes clear, is exceedingly economical. The ground floor walls are of brick 9 inches thick, but there is no brickwork above the ground floor ceiling, the bedrooms being in a tiled roof of Mansard form. Thanks to this saving of brickwork, a cottage of this plan could be built in most English districts for about \$950. D. is a cottage of superior type designed rather for a week-end or holiday retreat for fairly well to do people than for a workman's dwelling. The walls are of brick, those above the ground floor level being tile-hung, and the roof is covered with pantiles. All the flues have been gathered together to form one central stack—a method of treatment which is at once economical and satisfying to the eye. In the example E. which is illustrated by a bird's-eye view and a back elevation, the single bold chimney stack will again be noted. Here is a pair of cottages costing about \$2,500 for the pair. The accommodation is shown by the plan. No separate provision has been made for a bathroom, but a bath of the tip-up variety is fixed in the scullery. Roughcast is used on the external walls with a brick plinth

up to the sill level, and the roof is tiled.



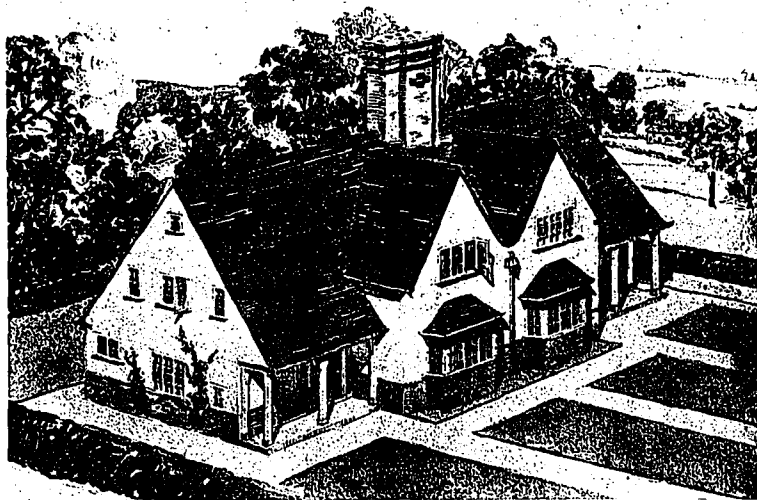
(D)—A Cottage of Superior Type, Designed for a Week-End or Holiday Retreat Rather than a Workman's Dwelling. The Walls Above the Brickwork of the First Storey are Tile Hung, the Roof Being Covered with Pantiles. J. Gordon Allen, Architect.

A pair of cottages very similar in cost and in accommodation provided, is that by Messrs. Speir & Bevan, which has been built at St. Lythams, near Cardiff. In this case one big living room is preferred to two smaller ones and there is a separate bathroom leading from the scullery. These are country cottages and the



Transverse Section, Two-Storey Cottage, Holmdale Road.

drainage is to a cesspool, the water supply being from rainwater stored in a brick tank at the rear of the house. The walls are of 9 inch brick rough-casted on the outside; the floors of the living and bedroom are



(E)—Plan of Cottages, Holmstead Road, Hampstead, Which Cost About \$2,500 to Build. In this Structure Roughcast is Used on the External Walls, the Roof Being of Tile. Note the Balance of the Design and the Single Bold Chimney. J. Gordon Allen, Architect.

of wood and those of the scullery and offices are bricks laid flat. The roof is of green slates on timber. The cost of the pair of cottages was \$2,400, this sum including builder's profit and the cost of the stone wall in front.

A great deal of the residential accommodation in most towns consists of semi-detached villas ranged in straight lines with but little space between the pairs. The subject imposes obvious limitations on the architect, but there have been lately many not unsuccessful attempts to give architectural character to houses of this type. Mr. J. Gordon Allen has built a number of villas on the outskirts of Harrow from the plan shown, which seems to be a very popular one. Considerable variety is given to the elevation and pleasing effects are produced by the use of red brick, rough-cast and tiles in different combinations. The party wall in these houses is carried 15 inches above the roof, and parapet

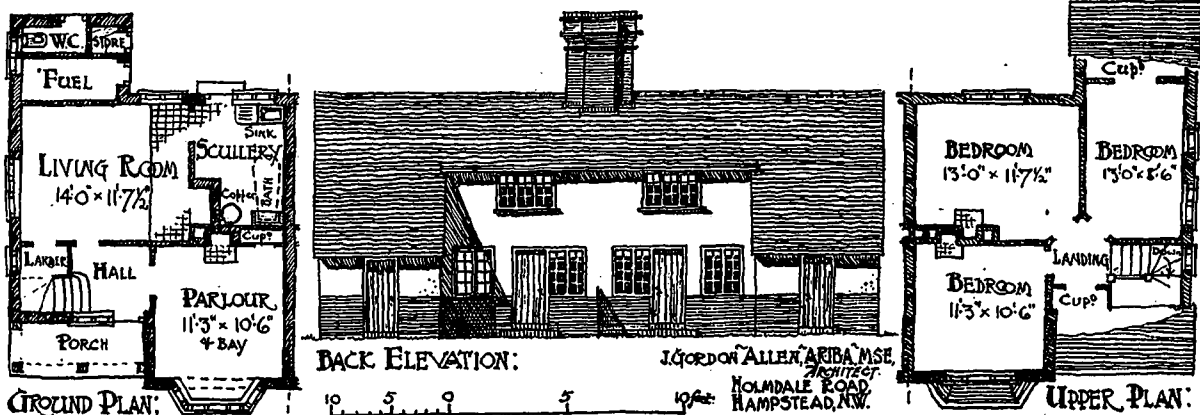
walls are provided in two of the houses illustrated, not because they improve the design or are structurally necessary, but because they are demanded by the local authority. This is an instance of what is a cause of frequent annoyance and expense to architects and building owners in England—the needless rigidity and unintelligent application of building by-laws. The gain in appearance when the roof is unbroken by the party wall may be judged from the illustration of the almost similar houses erected by Mr. Allen in the Hampstead Garden Suburb, where this particular regulation is not in force. These houses have been found very economical to build; by bringing the roof down right over the porches the brickwork between the bays is reduced to a minimum. The cost of the Hampstead pair was \$4,700. The walls in this example are of brick and rough-cast; the chimney stacks are of red brick and the roof is covered with red tiles.

Parts of the bay windows are decorated with a simple design stamped in plaster. The posts and beams in the porches are of hard wood left in its natural state without paint or stain.

A rather larger pair of semi-detached villas is the example from the Shellbeach Estate, Isle of Sheppy, Kent. In this case the architects, Messrs. Rosser & Annan, have provided a couple of bedrooms and a boxroom on the second floor. The cost of the pair of houses was \$6,700. As regards materials, England is again witnessing the popular combination of red brick and roughcast for the external walls with red tiles for the roof. The rough cast is lime whitened. The external woodwork is painted green and the internal woodwork enamelled white.

The photograph of part of a terrace of small houses at East Sheen by Mr. F. Endell Rosser is introduced to illustrate an interesting treatment of an end house in a group and a rather successful attempt to give a certain interest to a utilitarian piece of work which affords the architect very little scope.

The Garden Suburb or Town Planning idea is influencing the villas of the middle classes as well as the cottages of the workmen. On the outskirts of London and of other cities, estates are being developed as a whole with a proper limitation of the number of houses to the acre and a provision of open spaces and gardens, which contrasts most favorably with the old method of cutting up the ground into building plots, and selling these to any builder with freedom to use them as he might choose. At Parklangley, Beckenham, which is twelve miles or so out of London, a beautifully wooded estate of about 700 acres is now being converted into a purely residential suburb. The roads are being laid out by Mr. Reginald C. Fry, on a plan which makes provision for an extensive golf course, a cricket field and tennis courts, preserves to a very great extent the natural beauties of the neighborhood and gives ample garden space to every house. The houses



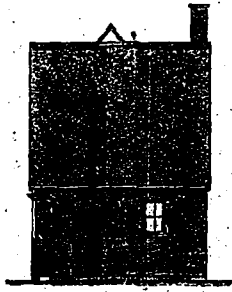
Rear Elevation and Floor Plans of Same House. J. Gordon Allen, Architect.



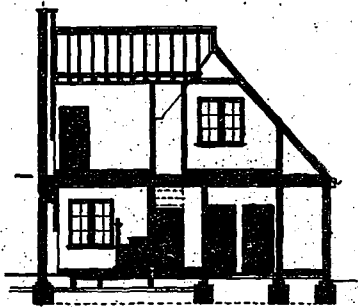
Front Elevation



Back Elevation



End Elevation



Section A-A



Section B-B

A PAIR of COTTAGES :
At ST LYTHANS GLAM!
For John Cory J.P. D.L.

Sheir & Seaman - Architects - Cardiff

Scale - eight feet to an inch



Ground Plan



First Floor Plan

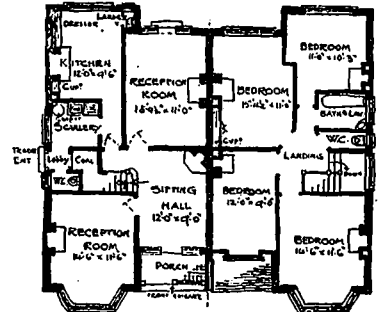


Fair of Cottages at St. Lythans, near Cardiff. These Homelike Little Dwellings Cost \$2,400, including the Builder's Profit and the Cost of the Stone Wall in Front. The Walls are of 9-Inch Brick, Roughcasted on the Outside, and the Roof is of Green Slate Carried on Timbers. Speir and Beavan, Architects.

which have so far been built, are nearly all detached. All have been designed by capable architects—no two houses on the estate being exactly alike—and they are thoroughly well built. The two examples given are from Mr. Fry's designs, and are typical of the size and style which most generally prevails. In the first example shown there are a fair sized central hall with two large reception rooms and a small study on

the ground floor and five bedrooms on the first floor. The small loggia with the balcony above makes a pleasant feature. The walls are of brick—the plinth being of red facing bricks the rest up to the first floor level and the entrance bay distempered in cream color and the upper portion tile hung. The roof is covered with red tiles and the arch over the entrance is formed with tiles placed edgewise. Most of the exterior wood-

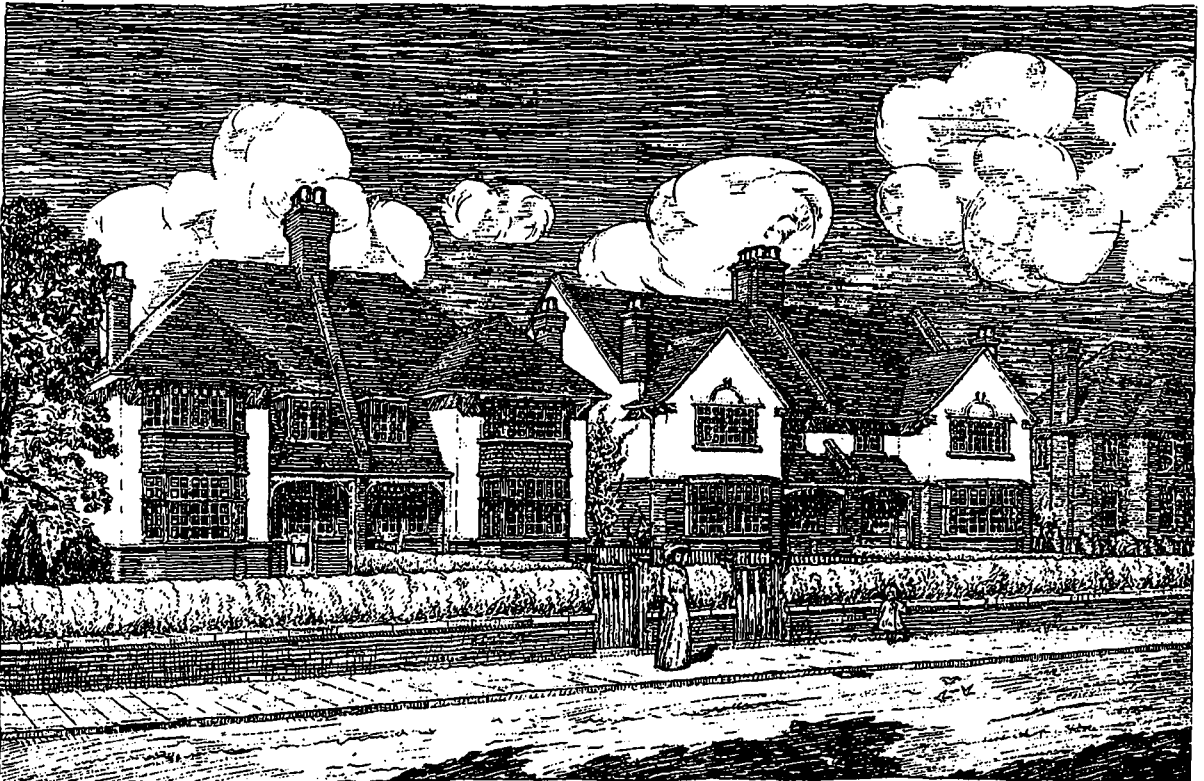
work is painted green, but some of the upper windows have white woodwork. The second example illustrates a house of similar size, but in this case a larger space is given to the hall and there is no study. The walls in this case are of brick rough-cast from the plinth upwards, the roof is tiled and part of the bay window has tile hanging. The outside woodwork is painted white. As the photograph shows, this house is built right in the wood, the policy of the owners of the estate being to destroy no trees needlessly but to leave the incoming householder to decide



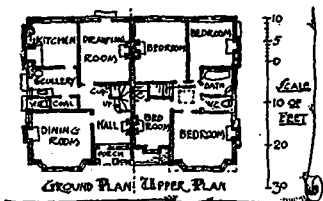
Typical Floor Plan, Semi-Detached Villa at Harrows. J. Gordon Allen, Architect

how much or how little of the sylvan surroundings of his house he will have in his garden.

A rather larger house than the others included in the illustration is the house at Wimbledon, by Mr. Ernest Newton, F.R.I.B.A. This is



Semi-Detached Villas at Harrow. These Houses are of Interest in that they are Representative of a Number of Two-Family Dwellings, Having the Same Internal Arrangement, which Exhibit Considerable Variety in their Exterior Lines, Together with Pleasing Effects in Brick Work, Roughcast and Tiles in Different Combinations. J. Gordon Allen, Architect.



A PAIR OF HOUSES
in Hampstead Way
HAMPSTEAD GARDEN SUBURB
 J. GORDON ALLEN • ARCHITECT •
 HOLMVALE ROAD • HAMPSTEAD • N.W. •

Pair of Houses in Hampstead Garden Suburb. In this Structure the Extension of the Roof Line Down Over the Porches Materially Lessened the Cost of Construction by the Reducing of Brickwork between the Bays to a Minimum. The External Composition is: White Stuccoed Brick Walls with Red Brick Chimney Stacks and Tile Roof. The Post and Beams in the Porches are of Hardwood Left in the Natural State and Unpainted or Unstained. J. Gordon Allen, Architect.

an example of the English suburban house of the best type—or perhaps it should be described as a country house as it would be equally suitable for a rural district. The quiet dignity of this formal style, based on Renaissance rather than on Tudor models is always impressive when handled, as in this case, with refinement and good taste. The walls are of brick, rough-cast throughout, except at the crestings of the chimney stacks. The window shutters, which are painted green, give a pleasing touch of color to the elevations. The roof is covered with red tiles. The columns supporting the central bay are of stone.

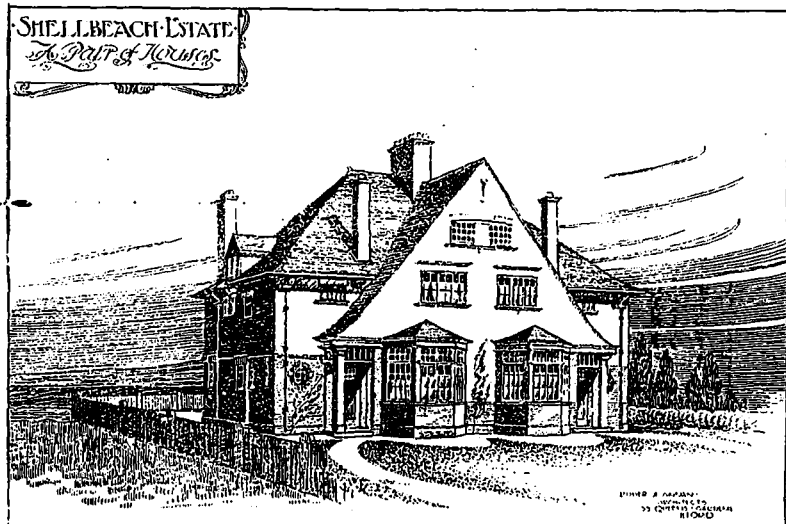
It is in the country house that English domestic architecture is seen at its best. Indeed there are points of view from which it might be said that the very best architecture of the day is to be seen in the country houses. It may seem absurd to compare such work with great undertakings, like the building of a cathedral or a city hall, but it is probably true that in their own way, which is not the way of grandeur and magnificence, but of simple homely charm, the country houses of England, both great and small, come nearer to perfection than any other class of building that is being erected to-day. Studying how best to meet the needs of a simple but refined family life, using local materials without affectation or striving after effect, free from the cramping influence of a nar-

row site or the too close proximity to neighbors, the architect who plans a country house has a happy task and succeeds, if he be a man of taste and skill, in enhancing rather than marring the beauty of the countryside. Let us briefly consider two or three typical examples of the smaller country house of to-day.

The house at Brixham, South Devon, by Mr. W. Curtis Green, F.R.I.B. A., reflects in its stern simplicity the ruggedness of the Devon cliffs and moorland. Built in a stone country, it is naturally and rightly a stone

house. A brick, or half timber house, whatever its actual merits, would lose all its charm if placed on the cliffs at Brixham. The little house built of stone quarried on the site, seems to form part of the landscape. The stone walls are roughcast externally. The house is roofed with Delabole rag slates.

The second example by the same architect shows a group of buildings for a small holding at West St. Mary, Cornwall. The buildings are of an extremely simple and inexpensive character, costing only \$4,860 com-

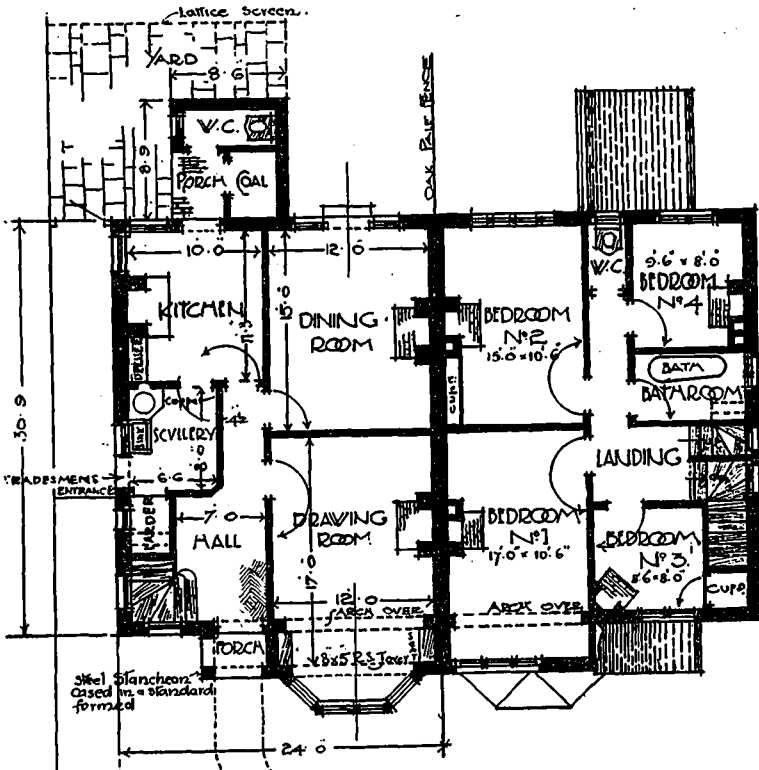


Pair of Semi-Detached Villas on the Shellbach Estate, Isle of Sheppy, Kent. Rosser and Annan, Architects.

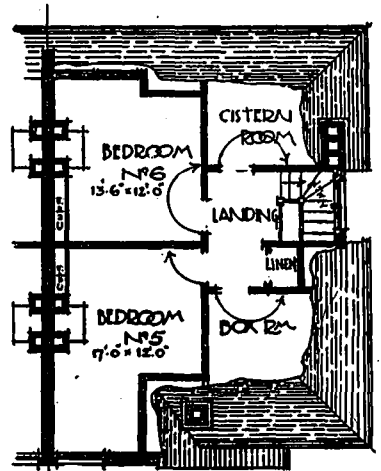
plete—the house \$2,050, cottage, \$900 and the stables \$1,300. The house being for a country doctor, is planned accordingly, with a waiting room for patients and a consulting room. The simply constructed porch with its fixed seat will be noted. The walls for the most part are of brick rough-cast, but part of the stables is weather

The little house at Horsted Keynes in Sussex is a charming and characteristic example of the work of Messrs. Barry, Parker & Raymond Unwin. These architects have long advocated, and wherever possible have practised the provision by the architect of the furniture and decoration as well as of the actual fabric

necessarily costly is demonstrated by the present example. A great portion of the furniture was included in



Ground and First Floor Plan, Semi-Detached Villas, Shellbach Estate, Isle of Sheppey, Kent. Rosser and Annan, Architects.



Attic Plan, Semi-Detached Villas, Shellbach Estate, Isle of Sheppey, Kent. Rosser and Annan, Architects.

boarded and tarred. The roofs throughout are of Delabole rag slates, the traditional roofing material of this part of England.

of the house, in order that jarring notes may be avoided and a sense of harmony and completeness may be produced. That this method is not

the original builder's contract, and the house with its suitably and simply designed furniture has been completed much more cheaply than it would be possible to build a house, giving similar accommodation, and furnish it out of cabinet makers' showrooms. The house and furniture have cost considerably under \$4,000. The saving chiefly results, perhaps, from the fact that when designing the house and furniture together, the architect can contrive the furniture to fit the house and the house to fit the furniture, and can take advantage of every little economy which can be effected by adapting the one to the other.

The peculiar form of the plan of this house calls for a word of comment. The house was to be built in a beautiful existing orchard. The form which the plan took was determined chiefly by the fact that the fine view down the orchard and away over the country beyond was towards the Northeast, the direction in which the ground sloped rapidly, so that the living room and the hall and the three principal bedrooms must be contrived to command this view, while at the same time the living room must be so designed that if the sun shone at any time of the day on any day in the year, it shone into this room. The verandah must also face in a north easterly direction, not only because the view and the orchard stretched out in that direction, but because this was the side away from the highroad, but it must not have a feeling of being quite away from all possibility of a feeling of sunniness. Therefore all that could be done was to have French casements opening on to it fully glazed, and the screen on the opposite side of the hall from these French doors also with much glass



Terrace of Houses at East Sheen. Note the Treatment of the End House and the Interest Imparted to a Group of Dwellings which Afforded the Designer but Little Scope. F. Endell Rosser, Architect.

in it, so that anyone sitting on the verandah might at any rate be conscious of any sunshine there might be on the southwest side of the house.

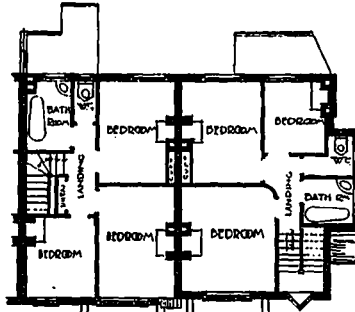
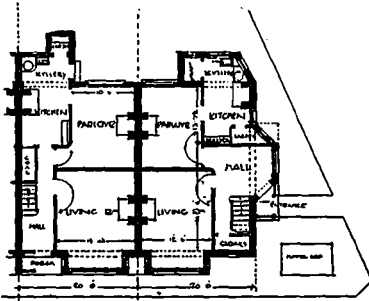
The form of the plan was also partly determined by the importance

cast, lime whitened, the roofs are tiled and the woodwork both of the house and the adjacent trellis is painted white.

Very different in appearance is the somewhat larger house by Mr. Hor-

photograph of the garden front. The roofs are covered with red tiles and there is a little tile hanging round the dormers and elsewhere. The picturesque charm of the exterior with its many angles, its diversified roofs and its tall, straight chimneystacks will be appreciated from the photographic views. Internally also there are interesting features. The dining room with its roomy angle, its simple, well-designed mantel-piece and furniture illustrates the principle to which reference has already been made of designing the principal fittings and furniture to suit the house. The treatment of this dining room, though so admirable in its effect, is quite inexpensive. The wood used is pine which is stained brown and wax polished, the stain used being that known as Solignum.

A good many country houses and cottages, especially those intended mainly for holiday use, are being built on the bungalow principal. The small bungalow at Seaford, a seaside resort on the south coast, is a typical example. The architect is Mr. E. B.



Ground and First Floor Plan, Terrace of Houses at East Sheen. F. Endell Rossiter, Architect.

of placing the house in the orchard in such a way that the fewest possible number of the trees need be cut down. A little difficulty in planning resulted from the necessity of getting four bedrooms over the ground floor accommodation which was needed.

As regards materials, the house is built with brick and rough-cast with a tile roof and tile hanging on overhanging parts. There is a little tile work also at the garden entrance. Internally everything is severely simple; no applied decoration is introduced, the effect being gained by the straightforward use of ordinary building materials. The walls are left without paper and the brickwork is left undisguised at the fireplaces, being relieved in one case with tiles laid edgewise and in another case with hammered metal.

More usual in plan is the simple little white house at Bromborough, Cheshire, by Mr. P. Morley Horder, F.R.I.B.A. Here we have a fairly regular plan providing a hall with two good sitting rooms on the ground floor and four bedrooms above. As the sizes are not indicated on the plan, it will be useful to give the principal ones here: the hall is 9 feet 3 inches by 8 feet; the drawing room is 16 feet by 12 feet, with an angle 10 feet 3 inches by 3 feet 6 inches; and a bay 3 feet 1 1/2 inches deep, and the dining room is 14 feet by 12 feet excluding the bay. The walls of this house are of brick covered on the whole of the exterior with rough-

der built at Walton Heath, Surrey. This is an admirable example of brick building. Grey stock bricks are used with red dressings and the wall throughout has a pleasantly varied texture due to the accidental varieties of coloring in the bricks—a feature which some builders are at pains to avoid by having bricks chosen for

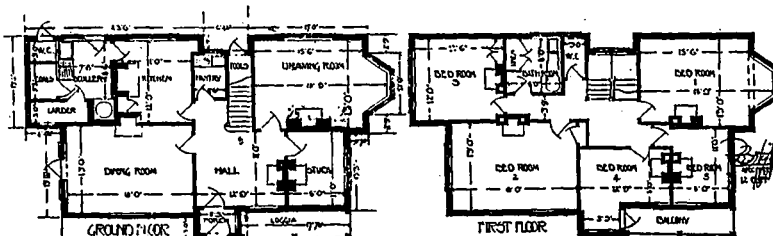


House at Parklangley, Beckenham. One of the Type of Houses Now Being Built According to the Garden Suburb and Town Planning Idea, on a Wooded Estate, About Twelve Miles from London, for Families of the Middle Class. Reginald Fry, Architect.

evenness of color, but which really gives an astonishing degree of life and interest to a brick building. Further interest and variety are given to this house by the courses of tiles laid flat, which can be clearly seen in the

Lamb, M.S.A. A quaint feature of this little bungalow is the large common room, which is open to the roof and has a small gallery over the porch, access to which is obtained from the ground floor by a stair in step-ladder form in the corner of the bathroom.

A sketch is also given of a larger seaside house by the same architect, erected at Studland Bay, Dorset. In both these houses the walls are of brick rough-casted, the roofs are covered with red sand-faced tiles and there are red chimney-pots. In the bungalow the common room and verandah are paved with red bricks.



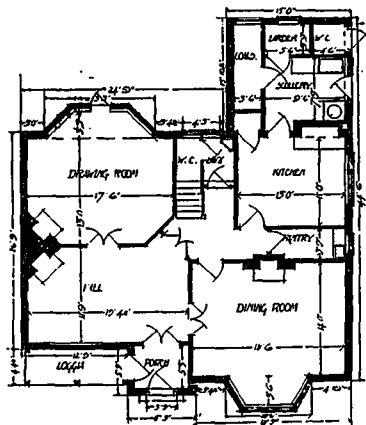
Ground and Upper Floor Plan, House at Parklangley, Beckenham. Reginald Fry, Architect.



House at Parklangley Beckenham. Another Example of the Residential Work at that Place. In the Development of this Estate, it is the Policy of the Owners to Destroy No Trees Needlessly, but to Leave it to the Incoming Householder as Regards the Growths and Shrubbery of the Premises. Reginald Fry, Architect.

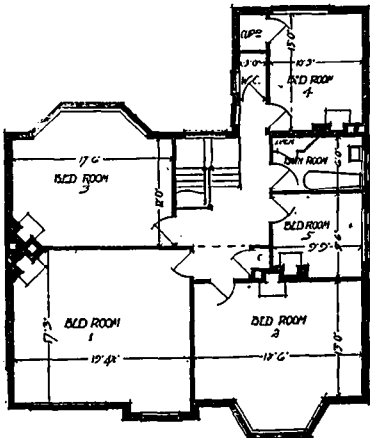
SUBURBAN DEVELOPMENT IN ENGLAND.

THE SUBURBS and the dwellers therein have often been the subjects



Ground Floor Plan, Above House. Reginald C. Fry, Architect.

of satire. The self-conscious respectability, the snobbishness, the limita-



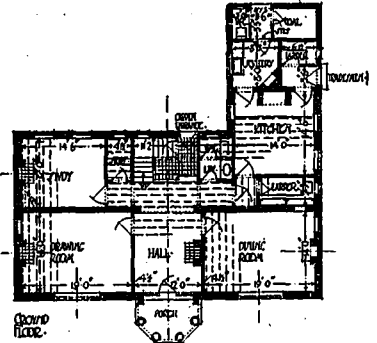
First Floor Plan, Above House, Reginald C. Fry, Architect.

tion of outlook, which are supposed to characterize the dwellers in subur-

bia, have been pilloried again and again by the novelist and the essayist. Very likely the people have often been rather absurd and have deserved the ridicule directed against them; but what admits of no doubt at all is that they have been doomed for two or three generations to live in very absurd houses.

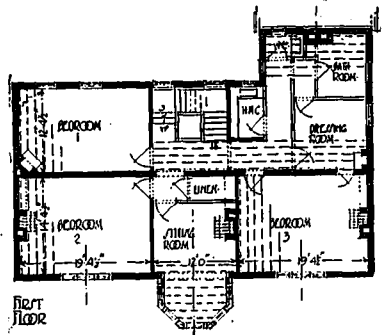
The suburban villa of the early and middle Victoria period was often well built, but it was generally badly planned, with many dark corners and an entire absence of arrangements for minimizing household work, while from the point of view of aesthetic interest, the utmost it commonly achieved was the negative virtue of not possessing offensive ornamentation. More often than not, however, some attempt was made, with the most distressing results, to introduce artistic features. Every-

where the public is tired of these villas. The basement kitchens and the great number of stairs are ana-



Ground Floor Plan, House at Wimbledon Ernest Newton, F.R.I.B.A., Architect.

thema to the housewife, and the general air of dullness is found depressing by all the family. In the inner suburbs of London and most other great cities, the "to let" boards speak eloquently of the way in which the popularity of this type of house has waned.



First Floor Plan, House at Wimbledon. Ernest Newton, F.R.I.B.A., Architect.

The newer suburbs, which lie a little further from the centres of the cities, are now having their turn of popularity. Their general bright-

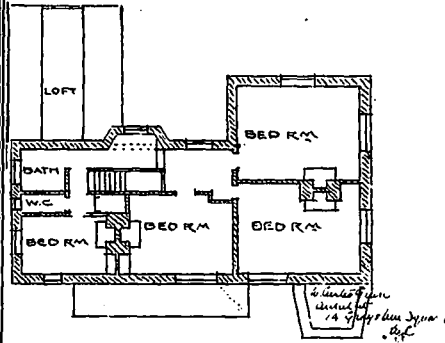
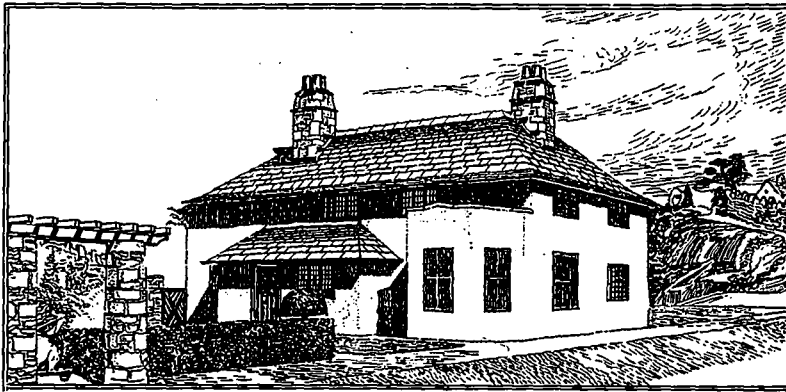


House at Wimbledon. A Large Suburban Country House with Formal Elevations and Dignified Lines. Ernest Newton, F.R.I.B.A., Architect.

ness, the more convenient planning of the houses, the provision of such

of young married people, and which often beguile even elderly folk into

warp, the plaster falls from the ceilings, the electric bells fail to ring,



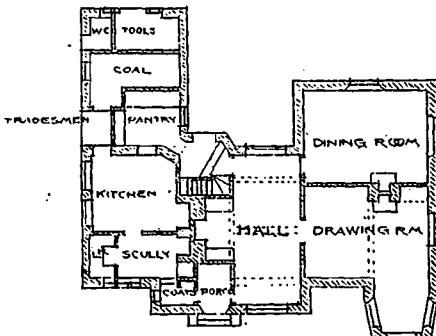
House at Brixham, South Devon. An Interestingly Designed Home Which Reflects the Ruggedness of the Cliffs and Moorland of its Vicinity. W. Curtis Green, F.R.I.B.A., Architect.

First Floor Plan, House at Brixham.

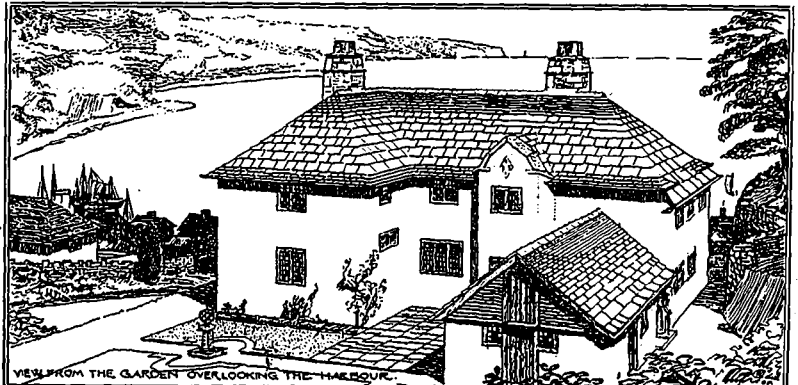
conveniences as bathrooms, tiled sculleries, electric bells and wiring

"moving." But the change is not always a change for the better. Too

and the householder discovers that the house which was such a source of



Ground Floor Plan, House at Brixham.

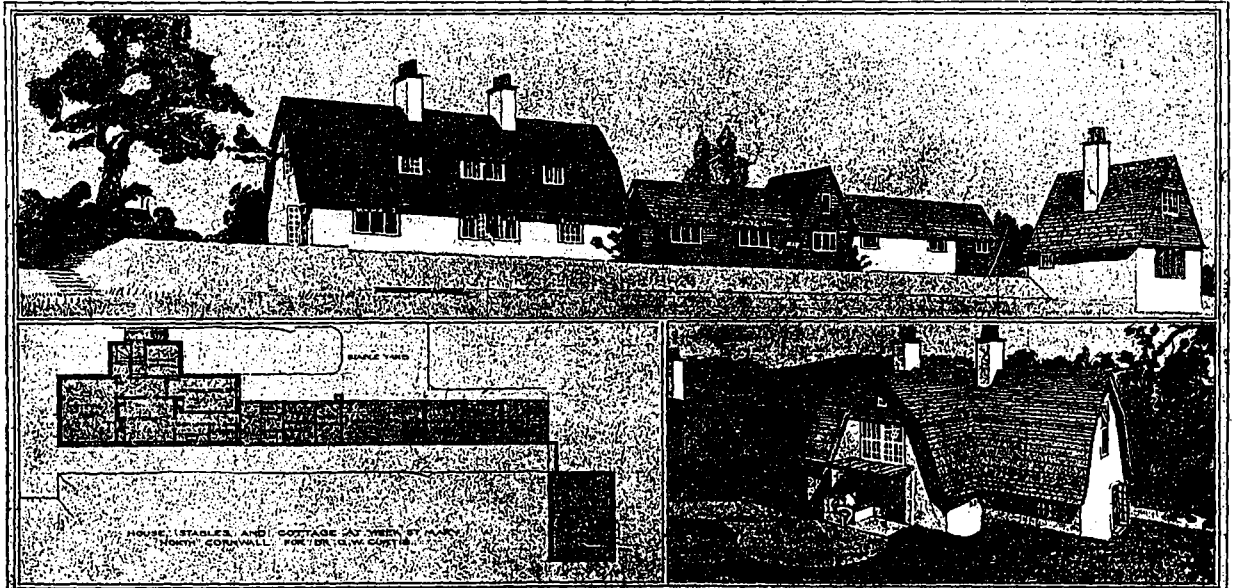


Rear View, House at Brixham. This House is Built of Stone Quarried on the Site. The External Treatment is Roughcast and the Roof is of Delabole Rag Slates. W. Curtis Green, F.R.I.B.A., Architect.

for lights, modern economical fires and cooking ranges—these are features which always win the suffrages

often it happens that after a few years cracks appear in the walls, the doors and other woodwork shrink

pride and joy when he first acquired it has become a cause of constant worry, expense, and dissatisfaction.



Group of Buildings for Small Holding at West St. Mary. These Structures are of an Extremely Simple and Inexpensive Character Costing only \$4,860 Complete; the House, \$2,650; Cottage, \$900, and the Stables, \$1,300. The Walls for the Most Part are of Brick Roughcast, but Part of the Stables is Weather Boarded and Tarred. The Roofs Throughout are of Delabole Rag Slates. A Noteworthy Feature is the Simply Constructed orch with its Fixed Seat. W. Curtis Green, F.R.I.B.A., Architect.



House at Horsted Keynes. A Charming Little Dwelling Built, Including the Cost of its Specially Designed Furniture, at a Sum Considerably Under \$4,000. Parker and Unwin, Architects.

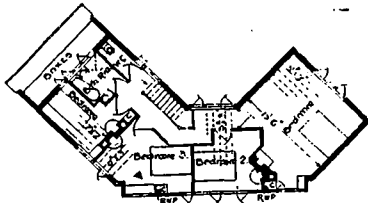


Rear Entrance to Hall, House at Horsted Keynes. Parker and Unwin, Architects

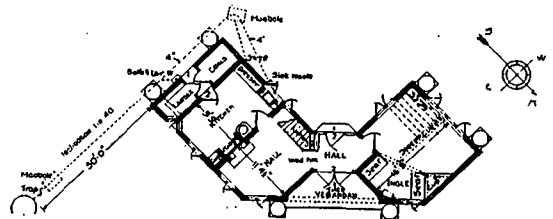
At this stage he inquires into the merits of "garden suburbs," which represent the latest stage in the development of suburban life. Perhaps some even more satisfactory system of housing may be evolved in the future, but for the present the so-called

rich man may have his country house and his town house or flat, the very poor may have to be content with a few rooms in block dwellings, but for the middle-class man who travels to the city every day, the "garden suburb" quite fits the case.

demonstrated the immense advantages of laying out a residential estate as a whole, with proper regard to open spaces, aspects and vistas, and the relations of the houses to each other. These schemes were mainly concerned with the housing of working-class people. Mr. Ebenezer Howard went further and show-



First Floor Plan, House at Horsted Keynes. Parker and Unwin, Architects.



Ground Floor Plan, House at Horsted Keynes. Parker and Unwin, Architects

garden suburb undoubtedly represents the high-water mark of housing arrangements for the middle class section of our urban population. The

The genealogy of the model suburb idea is interesting. Mr. W. H. Lever, M.P., at Port Sunlight, and Mr. George Cadbury, at Bournville,

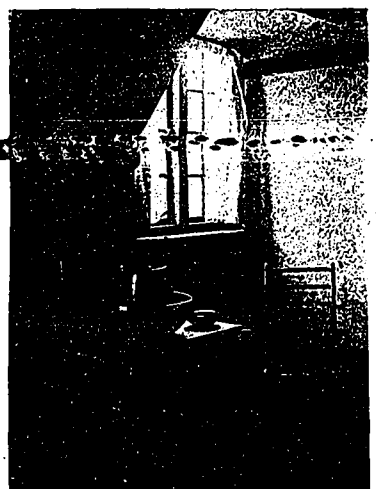
ed how a complete town, with all its varied industries and social activities, and its mixture of social classes, might be planned and built on similar



Glimpse of Main Hall, House at Horsted Keynes. Parker and Unwin, Architects.



Detail of Rear Entrance to Hall, House at Horsted Keynes. Parker and Unwin Architects.



Corner in Bed Room, House at Horsted Keynes. Parker and Unwin, Architects.



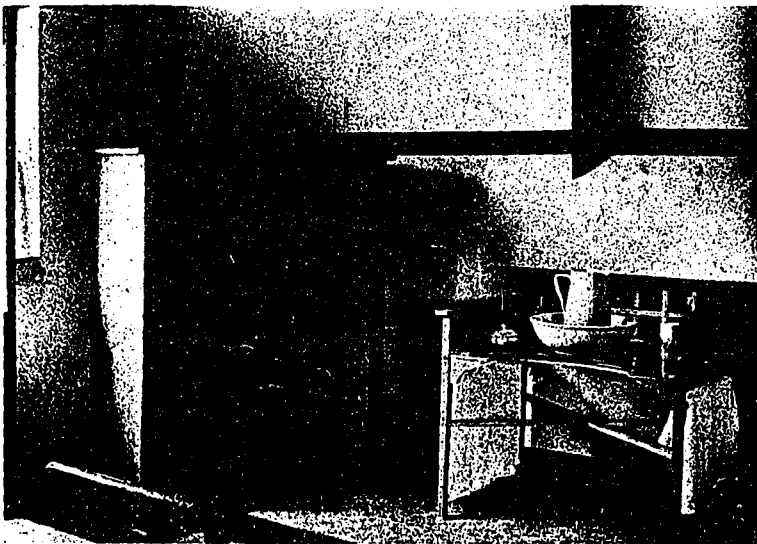
Fire Place, Main Hall, House at Horsted Keynes. Parker and Unwin, Architects.

lines. His ideas are now in process of being materialized at Letchworth. Mrs. Barnett and others applied the idea to suburban life, and the Hampstead Garden Suburb is the result. All these movements were in the nature of social reforms rather than of commercial speculations. The next step was for the commercial speculator to take up the idea and prove its practicability from a business point of view. That is now being done, with greater or less success, in several places.

One of the most ambitious and extensive of the new schemes which have been launched to meet the demand for the new type of suburban life is to be seen in the south-eastern environs of London. At Parklangley, near Beckenham, an estate of about 700 acres is being developed on commercial lines as a purely residential suburb. A very clever scheme



Ingle Nook, House at Horsted Keynes. Parker and Unwin, Architects.



Corner of Bedroom, House at Horsted Keynes. Parker and Unwin, Architects.

for a shopping centre will form part of the new suburb. The site of the new suburb is one of extraordinary natural beauty, and in its development the utmost care is being taken to preserve as much of this beauty as is possible. A large part of the estate is reserved for a golf course, and wherever possible the trees are preserved. The roads are so laid out that many of the fine old trees will border the footpath or lend added charm to the private gardens; in one case a row of trees is kept in the middle of the road, which is widened at this point so that there may be ample room for the traffic on either side. Many of the houses are being built right in the wood, only sufficient clearance being made to allow room for the building; it will be for the incoming tenants to decide how much of the sylvan surroundings they will keep in their gardens. In the principal roads the foot

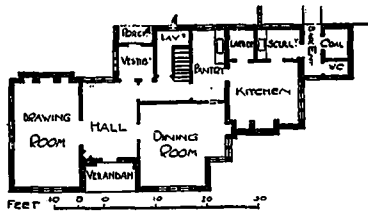
path is edged with shrubs and flowers, which are protected by low, dark-green railings. Even in so small a detail as the lamp posts an effort is made to give character and beauty to the estate.

The houses so far erected are good examples of medium-priced detached residences, exhibiting the convenient and spacious planning which distinguishes the best modern domestic architecture. They show great variety of style—perhaps more variety than is ideally desirable—but they are designed to meet many tastes, though it is fair to add that the architects have not allowed their desire to please a client to override their sense of what is architecturally fitting. Mr. Reginald C. Fry is the consulting architect, who has laid out the estate, and exercises a general control over the development. Many of the houses have been designed by him; others are by Mr. Edgar Underwood, Mes-



House at Walton Heath, Surrey. This House is Most Substantially Built an. Ideal in Situation. Its Many Angles, Diversified Roofs and Tall Straight Chimneys Result in a Picturesque Charm Seldom Found in Houses of Such Large Dimenals. P. Morley Horder, F.R.I.B.A., Architect.

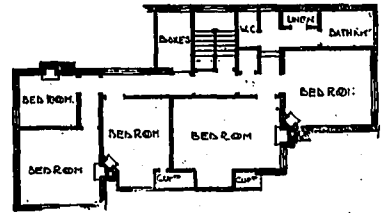
srs. Durrans and Groves, and Mr. Sothern Dexter. The houses are well built, and good material is used. The joinery is all made on the estate, in a workshop which is equipped with up-to-date machinery. The estate so far has made rapid progress, and there is every reason to believe that the progress will continue. It meets



Ground Floor Plan, House at Walton Heath.

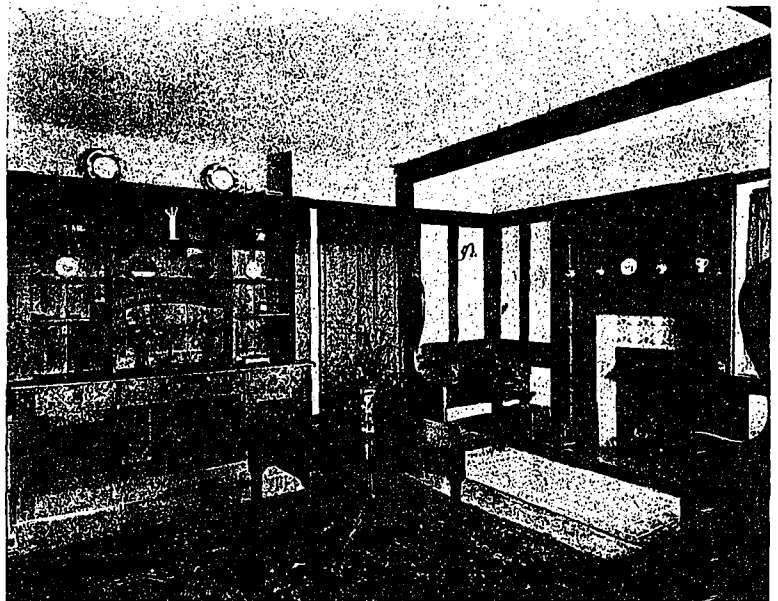
a real need, and it is altogether desirable, for the encouragement of others who may be disposed to develop estates on the same enlightened principle, that it should receive an adequate degree of public support.

We yield to none in our admiration for these schemes of social betterment as those at Letchworth and at Hampstead. But we do not regard this Parklangley scheme with any less interest because it is mere busi-



First Floor Plan, House at Walton Heath

ness. It will be a hopeful augury for the future of domestic architecture in England if it can be shown that the old, bad system of suburban de-



Dining Room, House at Walton Heath. The Treatment of This Interior is Both Effective and Inexpensive. The Entire Scheme of Woodwork and Furniture is Executed in Pine Stained Brown and Wax Polished. P. Morley Horder, F.R.I.B.A., Architect.



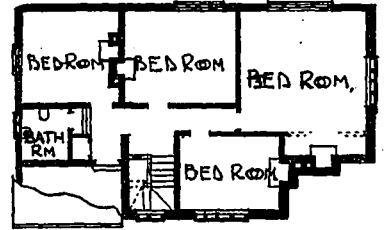
Rear View, House at Walton Heath. Accidental Varieties in the Coloring of the Grey Brick, Together with Flat Laid Tile Courses and the Red Tile Roof, Make the External Composition of this House Unusually Attractive. P. Morley Horder, F.R.I.B.A., Architect.

velopment—the making of long, unlovely streets of ill-built houses of identical design—can give place to something more intelligent, more healthful, and more beautiful; and that this can be done, not as the outcome of a philanthropic experiment, or a municipally subsidized effort in “town planning,” but as a matter of ordinary commercial business.—ILLUSTRATED CARPENTER AND BUILDER.

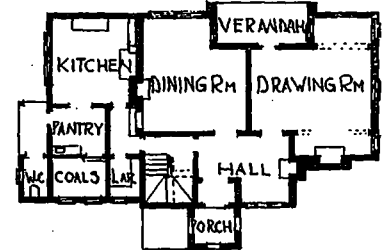
A **NOTABLE ADDITION** to the attractions that Florence holds out to the lover of architecture and other arts, says THE ARCHITECT (London) has been made in the opening of the restored Davanzati Palace in the Via Porta Rossa. Built early in the fourteenth century by the Davizzi family, it, at the close of the sixteenth century became the property of Bernardo Davanzati a man of wealth, learning and ancient lineage. Like many



House at Bromborough, Cheshire. A Most Commendable Little Structure Whose Charm and Beauty lie in the Simplicity of its Design and Color Scheme. The Walls are of Brick, Roughcasted and Limewhitened, and the Roof is of Tile. P. Morley Holder, F.R.I.B.A., Architect.

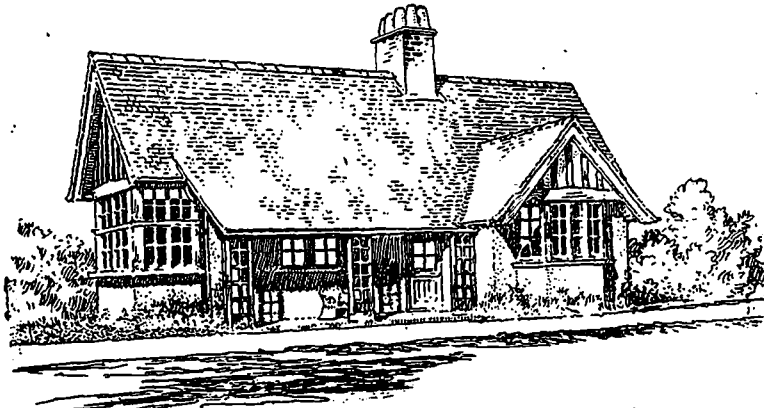


First floor Plan, House at Bromborough. P. Morley Holder, Architect.

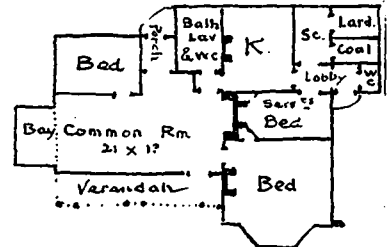


Ground Floor Plan, House at Bromborough. P. Morley Holder, Architect.

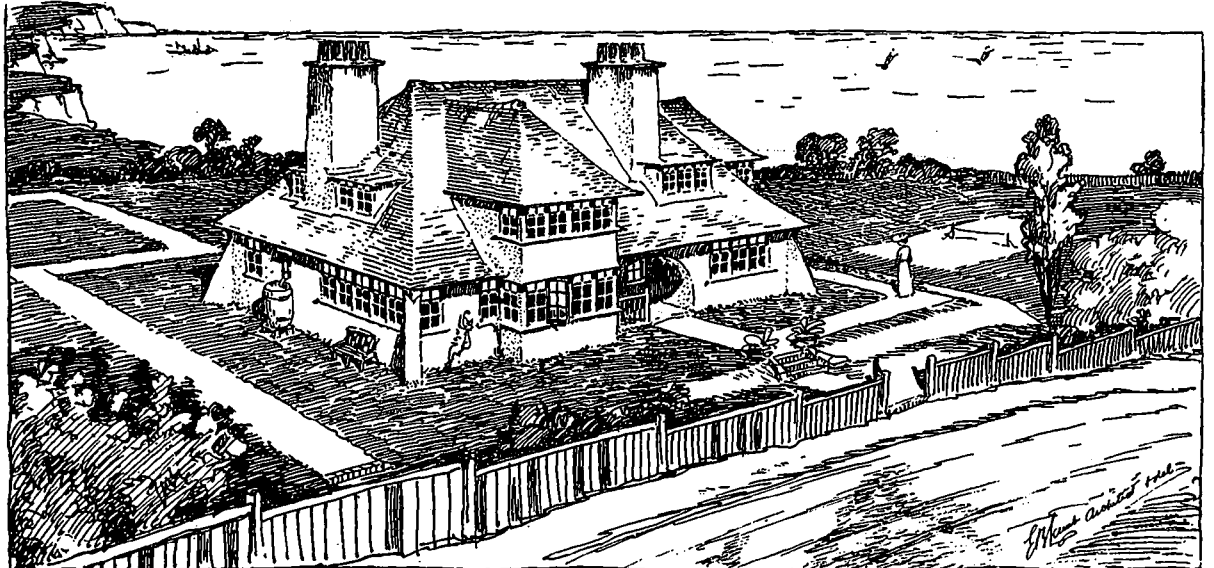
other old Italian families, the Davanzati declined in wealth and influence, an dcame to an end with the suicide of the last representative, Carlo di



Small Bungalow at Seaford. A Feature of This Little House is a Large Living Room Which Opens to the Roof and Has a Small Gallery over the Porch. E. B. Lamb, M.S.A., Architect.



Floor Plan, Small Bungalow at Seaford. E. B. Lamb, M.S.A., Architect.



Seaside House at Studland Bay, Dorset. Note the Window Arrangement, so Appropriate to the Locatcn. E. B. Lamb, M.S.A., Architect.

Giuseppe. The house, already suffering from the poverty of its owners, fell into the abyss of a tenement dwelling. In 1904 Signor Volpi, the well-known art expert and dealer bought the palace, and has since been steadily carrying out its rescue from desolation and restoration to a close approach to its former beauty. Frescoes and old woodwork have been brought to light, and Signor Volpi has furnished the palace again with unrestored furniture of its own date.

CONSTRUCTIONAL STEELWORK.*—Its Application and Advantages in the Erection of Modern Buildings.—The Relation of the Architect and Engineer, and the Importance of Complete Shop Drawings and Rigid Inspection.

By S. BYLANDER

THE PREPARATION OF THE PLANS for a building where the skeleton consists of steelwork as compared with a building where the loads are carried on walls or piers differs considerably.

I intend in this lecture to deal with the general principle of steel construction as far as it may interest the architect, and will not extensively go into the question of strictly theoretical methods for the calculation of the various members in a structure.

Steel is becoming a more and more important material in building construction. As the sizes of the buildings are increased and fireproof construction adopted, steel construction can be used with advantage. Heavy brick walls are substituted with steel stanchions, and rolled-steel beams are used instead of wooden joists, thereby saving rentable space, and by the use of fireproof floors the danger of ruinous fire materially reduced.

When steel work constitutes the skeleton of the structure, it is obvious that the application of this material should be given careful attention. The architect must therefore make himself well acquainted with the principles of steel construction, or be in frequent consultation with an engineer competent in steelwork design. It is entirely wrong to prepare the final architectural design independent of the steel construction, and ask a contractor or engineer to design steelwork to suit the layout of the different floors.

Steel, and its Advantages.

Steel should be employed to its greatest advantage, and not merely as a substitute for brick or stone, as is often the case; for instance, where large rooms are required in the lower storeys while in the upper storeys are placed heavy division walls and brick stacks, and where positions of the columns vary in the different storeys. Economy is, after all, the essential thing to aim at, consistent, of course, with suitable planning and good architecture. The object of the design should be to obtain the best results for the minimum amount of money, and this can only be obtained when the building materials are employed to their greatest advantages. It is obvious that the steelwork, brickwork and stonework must be designed simultaneously in order that no material should be wasted. The first consideration the designer has to take into account is the factor of safety and the loads which should be used in the calculations for the different members. One sometimes hears very strange opinions about the expression "factor of safety." If a specification requires that the steelwork shall be designed for a factor of safety of four, this does not necessarily mean that every member is four times as strong as that required to carry the specified load. Often a structure cannot carry more than twice a specified load, on account of the imperfect loading, material and workmanship, although it is designed for a factor of safety of four. The factor of safety is intended to cover unknown quantities which are not considered in the calculations. Good practice is to use a safe stress for steel equal to one-quarter of the ultimate strength of the material, or seven and a half tons per square inch if the ultimate strength of the material is thirty tons per square inch. As the elastic limit of medium steel is about fifteen tons per square inch, the actual factor of safety will be two. The construction of the steelwork must be adapted to suit the particular class of building for which it is required.

Buildings may be classified as follows: Apartment houses, hotel, office buildings, public buildings, warehouses, factories. The general lay-out of steelwork for

a building is primarily dependent upon the size of rooms and type of floor construction; secondly, upon loads to be carried and requirements as to decorations. The spacing of columns should be uniform if possible in order to permit repetition of sections and details.

The actual live load is not used in the calculations, but the corresponding dead load, which would cause the same stress in the steel as the actual live load.

This dead load is usually referred to as "superimposed load," and varies from 70 lb. to 120 lb. per square foot for apartment houses, hotels, and office buildings, and from 150 lb. to 400 lb. per square foot for warehouses and factories. To the above loads should be added the weight of the floor itself (including steel girders and beams), which is about 100 lb. per square-foot for an average concrete floor. The dead load of floor must be carefully calculated in each particular case.

Steel may be used in a building for the following reasons:—(1) By necessity; (2) for economy; (3) for fire-proofing.

Reason for its Use.

Steel may have to be used in buildings where the design will not permit of the use of only brick and stone work on account of large rooms, great loads, architectural features, or planning requirements. It is used by reason of economy where steel is found to be cheaper than other material, or where floor space saved by using steel columns instead of brick wall or piers will more than compensate for the extra cost of steel compared with the cost of brick. Steel beams and concrete is substituted for wooden joist floors and roofs in order to obtain a more fire-proof construction, often to a considerable increase in the first cost of the building. However the fireproof building may be more profitable to the owner than the old wooden construction when the reduced insurance premiums and the increased rigidity and stability are taken into consideration. No doubt fireproof construction will soon be adopted generally for large towns, and I will, therefore, in this paper deal only with that kind of construction.

In addition to the before-mentioned reasons for using steel in buildings there are others more or less important, according to conditions or circumstances:

1. Rapidity of construction.
2. Possibility of changing the arrangement of rooms after the carcass of the building is completed.
3. Increased stability and rigidity; uniform distribution of loads on foundations to prevent unequal settlement.

Rapidity of construction is generally a question of economy. By speedy completion of the building, interest on the capital is saved. Possibility of changing the arrangement of rooms saves cutting away brick walls and putting in steel girders to suit the client's requirements. Such alterations of rooms may in many cases increase the rateable value of the building. A steel-framed building where steel is properly covered with protective material is, I believe, the most durable fireproof building that can be produced at a reasonable cost.

Let us compare the setting out and construction of a brick building and a steel-frame building.

The setting out of a brick building need not be very accurate as to dimensions. The builders can set out the walls and foundations to the architect's plans and eleva-

* Paper read at a recent meeting of the Society of Architects, London, England.

tion drawn correct to scale, but not necessarily dimensioned. The accurate dimensions of the site are often not ascertained before the old building is taken down and the builder is ready to start work building the walls. A little variation between the dimensions scaled from the drawings and the actual dimensions of the site will not present any great difficulties or cause delay or additional cost. The dimensions can simply be agreed upon between the builder's foreman and the architect's representative on the site. It is neither necessary to have particulars of details when starting the work, as cutting away of little brickwork is not accompanied by any great difficulty should it be found at a later date that some alterations were necessary on account of some of the detail drawings not being ready when the work was commenced. In the case of a steel structure, however, it is most essential that the drawings are completely worked out beforehand and all details made. Ventilation, heating, drainage, lighting arrangements, etc., should be set out beforehand, and the general lay-out and steel plans made to suit the different requirements.

Method of Carrying Out Work.

Economy is the essential thing to aim at, and generally speaking steel is being used in buildings because it admits of cheaper construction than other materials and at the same time ensures a reliable structure. By the use of steel the rental floor space is increased considerably; it also permits the use of large spans and less pillars, thereby enabling the future tenants to arrange the rooms according to their requirements. Buildings can be quickly erected and completed, thus saving interest on capital. In order to obtain true economy, however, it is necessary that the planning and designing, and also the method of carrying out the work, should be systematical and in accord with the general principles which I will deal with hereunder.

The steelwork plans should be ready several months before work can be started on site to allow for the time required for the manufacture of the steelwork at the mills; also it should be borne in mind that the steel can be obtained at a smaller cost if ample time is allowed for the steel contractor. It is advisable to order the full quantity of each section in one lot, and get the pieces cut to exact lengths at the mills. Considerable waste occurs if the shop has to draw material from stock. To take material from stock should only be permitted when very quick deliveries are absolutely essential. Generally speaking, complete dimensioned shop drawings should be made in the office in preference to setting out the rivets, connections and details by workmen in the shop. It is, of course, necessary for the engineer in charge of making the detail drawings that he must have a well-trained staff of draughtsmen who are thoroughly familiar with shop work, as the draughtsmen are called upon to do such work as the template worker would otherwise do according to the old practice. Positions of every rivet should be shown on the detail drawings, and nothing should be left to the judgment of the workmen in the shops. More reliance can be placed upon drawings which have been checked than upon setting out in the shop, which setting out is not usually checked.

Shop Drawings and Inspection.

Another advantage of having complete shop drawings is that every piece can be inspected and compared with the detail drawing, and errors in shop work can more easily be detected than if the work is set out in the shop without shop drawings. Every piece can be made complete to the detail drawing without fitting the different pieces together, and still they must fit perfectly when erected. The essential thing to remember in steel construction is that there should not be any alterations of the steelwork on the site.

It is a very serious proposition to make alterations to the steel design during progress of manufacture, and still more during erection. Not only will it incur delay and

additional cost, but also less satisfactory work. Alteration work cannot as a rule be so well-made as is possible if the original design was carried out. Records are difficult to keep, and inspection is unreliable. If all drawings are properly worked out and completed before work is started, the possibility of alterations is materially reduced. We will not follow the progress of manufacture of the steel from the date the steelwork drawings are ready and handed to the steel contractor.

The first thing the contractor has to do is to issue orders for rolling of the material. An inspector will be appointed by the architect or engineer to inspect the quality of material at the place of manufacture. The inspector will be at the mills when the material is rolled. He will be present when the chemical and physical tests are made, and make records of the results of the tests, and order additional tests to be made if the material does not run evenly. The inspector will reject and order such material to be removed which will not meet the requirements of the specification, and stamp and approve such which is satisfactory.

The approved rolled material is stamped with the inspector's mark of approval of quality of material. Any piece coming from the rolls is stamped with the blow or melt number, and this number is referred to on the test-sheet reports. The material in one and the same blow is usually the same, as great care should always be taken to have the melted metal well mixed before it is put into the ingots. Every piece is also marked with an identification number given on the detail drawings. This number is used for reference when consulting the drawings in the shop or when locating in which place the piece is to be erected on site. After being rolled and straightened the material is placed in the stockyard until required in the shop. As a rule the material cannot be rolled in the order it is required in the shop, but in such order as the rolls go in according to the rolling programme for the rolling mill. Weeks and often months may elapse before same section is rolled again. It is often, therefore, advisable to roll the beams for the roof at the same time as for the lower floors when same section is used. In the shop, however, the material is usually fabricated in the order as it is required on the site. The inspector is kept well informed as to the dates of rolling and manufacture, so that he can be present and inspect as required and as the work proceeds.

Shop Work.

From the stockyard the material is brought to the working shop, and skilled workmen mark on the position of the holes, lines of cutting, etc., on the steel pieces direct with or without template. The number of the shop drawing and number of job is often painted on the piece before it leaves the working shop in order to assist the checker and inspector. Therefrom the marked material is brought to the drilling shop. In the case of built-up sections, as, for instance, a column composed of angles and plates, all the angles and plates are not marked and drilled separately, but only a few holes are first drilled; the different plates and angles are then bolted temporarily together and the whole thickness of metal is drilled through at the same time, thus saving time and assuring greater accuracy and all holes being true. Several drilling machines can be used for one member at the same time. Burrs are removed after the drilling, and the ready-drilled piece is sent to the assembly shop. Some pieces are milled or ground to fit; the different pieces forming one member are temporarily bolted together and sent to the rivetting shop. During assembly the detail drawings are consulted and dimensions checked. When the pieces are rivetted they are sent to the milling machines if any part has to be machined, such as ends of columns or bearing plates on girders. Before assembling some surfaces must be painted, as after assembly they are inaccessible. Open holes which are to be filled with rivets in the field are marked by the assembler so that such holes shall not be filled in by rivets in the shop. Holes in small pieces and brackets are generally punched and rimmed after assembling, but main members

are drilled. Before the finished steelwork is painted it is examined by the inspector and all dimensions are checked. Ends of compression members which are machined must be examined, and it is ascertained if the ends are square to the axis of the member. If all measurements are correct and the workmanship is satisfactory, the inspector stamps the piece with his shop inspection mark.

The material will now receive its shop coat of paint or oil before shipment.

Any piece or bundle of pieces must not be shipped unless having the following marks applied:—(1) Blow or melt number; (2) identification number; (3) mark of mill inspection; (4) mark of shop inspection; (5) shipping mark.

When painting the material before shipment all marks made in the shop are extinguished (except those above stated). A small circle or triangle with white paint is made around the marks previously indented by stamps. The shipping mark and the identification mark is applied by paint in large and distinct letters or figures. Sometimes pieces for different parts of the building are painted in different colors, or a spot or ring of a distinguishing color is applied to facilitate selection of the material at erection. If the above described methods are used little or no difficulties will arise at erection, and no risk is taken of material arriving at the site incorrect. The inspector makes remarks on his copy of the shop drawing when approving any piece at the time when his stamp of approval is applied. He has also to see that the material is shipped in the right order as required on the site. After completing inspection for each lot he makes up a proper list of material. The works do likewise, and the two lists are compared and checked. Several days before a shipment is made the shipping statement is written out in detail, and instructions are issued for shipment or transport of the material to the site. As the material passes out of the works it is weighed, and the inspector records the weight and counts the pieces weighed and sees if they are in agreement with the advice of shipment. The weighing machine should be checked at regular intervals by an independent party to assure that it registers the correct weight. The shipping statement, advice and invoice is now sent to the contractor as the material is shipped if the contractor only buys the material but executes his own erection.

Transportation.

According to requirements the steel is transported on van, railway car or barge, or by ship. Considerable damage to the material may occur during transport if proper precautions are not taken against careless handling when loading or unloading, so that small pieces are not bent or crushed by large or heavy pieces placed on top. Delay, mixing up of the different consignments, is a source of great inconvenience and prevents speedy and methodical erection.

The material is usually brought alongside the building on vans, and is hoisted by the erection cranes to a place on the building near to where it is to be erected, or sometimes directly placed in its final place. The different pieces are first temporarily bolted together and afterwards set to correct level and made plumb, after which all holes are filled with rivets. The steelwork is painted immediately after erection, and if more than one field coat is applied different colors of paint should be used. Floors and walls are built and fireproofing applied. The erection of the steelwork should be two storeys ahead of the floors. The floors should be put in one storey ahead of the walls as may be convenient. In cases where walls partly support the floors or girders the walls must, of course, be built the same time as the steel is erected. In order to prevent accidents to workmen below, the floors should be put in close to the steel erection, or the floor framing should be boarded over to prevent any tools or material falling on the men below. At the same time the different trades should be kept separate so as not to interfere with the rapid progress of the work. When the carcass is complete

and the roof is on, heating, ventilation, etc., are installed, partitions built and joinery and finishing completed. In the carrying out of a large job it is not always satisfactory to put the responsibility on to different parties for designing, detailing, manufacture, inspection and erection, as no one particular system is followed.

In my opinion one man should be responsible for the systematic carrying out of the work.

The engineer responsible should bear in mind that no work is satisfactory unless the following requirements are fulfilled:—(1) Economic and safe design; (2) good material and workmanship; (3) correct work as to dimensions; (4) prompt deliveries; (5) proper erection.

Satisfactory design can only be obtained by making a special study of the conditions and prepare accurate drawings and calculations. Good material can be assured by tests and inspection. Correct work can be obtained by systematic working and supervision. Prompt delivery is dependent on each portion of the work being ready in schedule time. Careful watching of each department is necessary, particularly at the early stages of the work. It is wrong to suppose that after a good design and specification are made the responsible engineer's work is done. A good specification is of equal little use without inspection as a clever design without proper shop drawings. The practice of taking a few test pieces from a job and sending them to a testing firm is not reliable, and is more deceiving than convincing. It may be that the test piece selected will show good results, while material in other parts of the structure is bad. The material should be tested at the mills during the progress of manufacture.

As I have previously said, satisfactory results can be obtained by the use of steel for buildings if the architect and engineer work hand in hand and the work is carried out systematically in all details.

When preparing plans and calculations for a building the work should proceed in the following order:

1. The specification drawn up for stresses and loads.
2. The principal members for the structure to be calculated, and it should be ascertained whether the setting out of the columns and girders is economical and reasonable, and, if necessary, such modifications made as will improve the construction.
3. When the architectural plans are completed the engineer will calculate all the loads of floors, walls, etc., make stress sheets for each member, after which a set of plans is made and the required sizes given. The sizes of the steelwork thus obtained are drawn to scale on the architectural plans, and, where necessary, the engineer will modify the sections to suit architectural requirements; after which the architectural plans are practically completed, the shop drawings made, and the contract placed with the steel contractor.

CONCRETE CEMENT BLACKBOARDS will, in all probability, very soon take the place of slate, plastic board, and other materials now being used. For several years blackboard men have been confronted with the problem of how a black plastic board could be troweled smooth without producing a glossy surface. A liquid concrete finish has been found that will produce a better blackboard than slate. The foundation is concrete which may be laid on brick or metallic lath, and over this, after it hardens, is spread a layer of cement which, of course, bonds with the foundation. The result is a board which is eminently more satisfactory than slate which, up to the present time, has been most satisfactory. The cement presents a dull finish which reflects no light rays, consequently presenting no glazed appearance to the eye when viewed from any angle whatever. There are no troublesome joints or seams and the smooth surface offers little resistance to the crayon, therefore using less chalk, and making a minimum of noise. The material will stand comparatively hard usage without breaking or cracking, but in case a piece should be broken it may easily be removed and the board repaired with little trouble and cost.



Garden Front, Residence of Miller Lash, Toronto. A Home of Georgian Character, Expressed in Red Brick Walls With White Mortar Joints and Grey Stone Trimmings. Sproatt and Rolph, Architects.



Main Hall, Residence of Miller Lash, Lowther Avenue, Toronto. This Interior is in Character with the General Style of the House. The Plan is Square and Roomy, and the Walls to a Height of Five Feet are paneled in Oak, Stained a Rich Brown, in Keeping with the Other Woodwork. Sproatt and Rolph, Architects.

RESIDENCE OF MR. MILLER LASH, TORONTO.—A Noteworthy Home in Georgian Character Which is Interesting Both In Its Architectural Treatment and Setting.—Plan Provides for a Compact, Systematic Arrangement with Excellently Placed Minor Conveniences.

LIMITATIONS AS REGARDS SITE have in the majority of cases in the past beset with difficulties the composition of town and city residences. In the last few years, however, one is beginning to witness a most welcome change in this respect. Larger grounds than those which have hitherto been the vogue are, in many instances, now being provided, and architects are given a greater opportunity to produce a class of dwelling structures that are more creditable to both their own efforts and the community in which they are situated.

In the residence of Mr. Miller Lash, Lowther avenue, Toronto, shown herewith, the exterior view illustrates a home that is noteworthy both in its architectural treatment and setting. The grounds are not only of sufficient size to allow for an ample driveway to the main entrance at the side, and a large south terrace, but also to give the house considerable open space on all sides. That a spacious site of this kind should obtain in connection with a residence of Georgian character is important, as no matter how thoroughly a house of this type might be considered otherwise, it usually suffers a decided disadvantage when cramped on a lot totally restricted in width and depth.

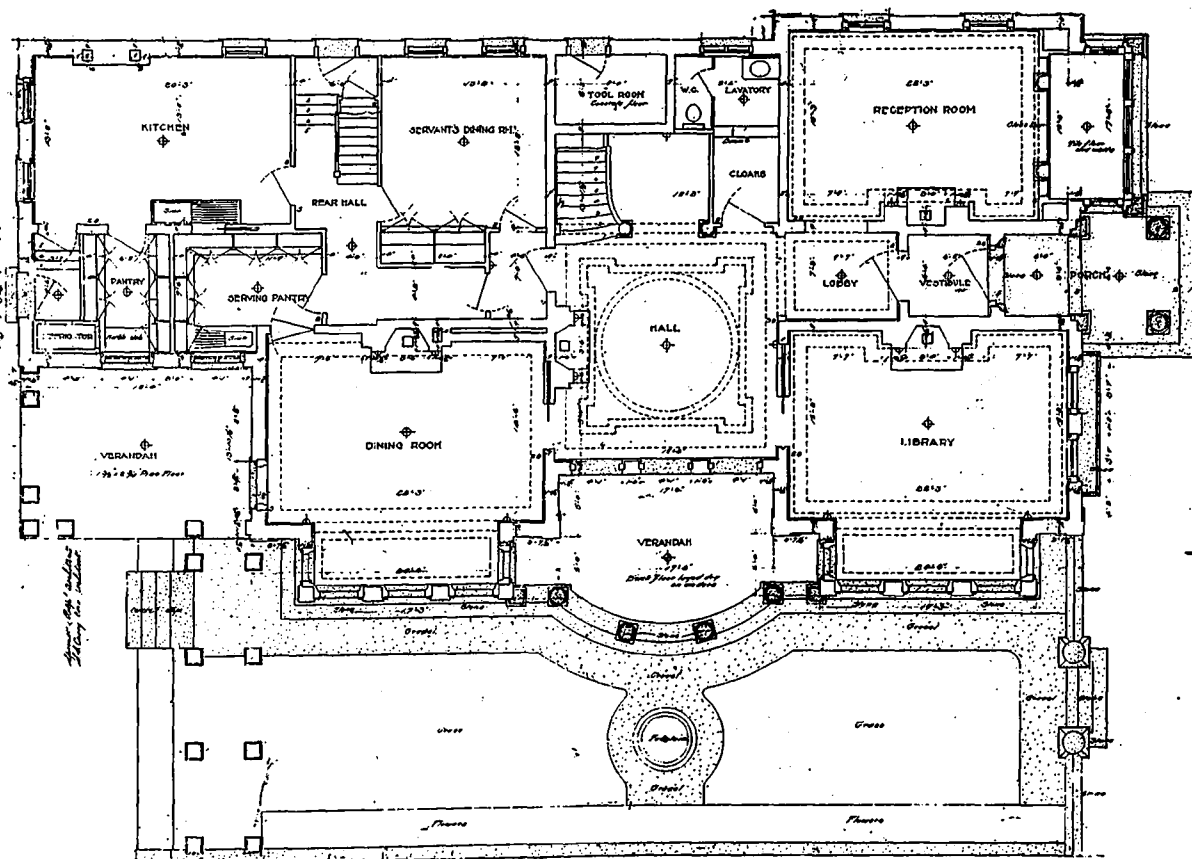
The exterior composition of this house is red brick with white mortar joints and grey stone trimmings, the principle features of the design being the portico opening at the centre of the terrace, and the verandah at the side of the dining room with its adjoining pergola extending out into the garden.

The plan of the interior forms a compact, systematic arrangement, which gives all the main rooms light from at least two sides. The hall, which is centrally located and square and roomy in plan, is reached either from the lobby and vestibule of the main entrance, or through the portico from the terrace. This interior is in keeping with the exterior style of the house. The walls are panelled to a height of five feet in oak, stained a rich brown, and the upper portion is finished in a plaster treatment with an enriched ceiling cornice. A feature of interest is the alcove formed by the arrangement of the stairs, which provides a convenient place for the pianoforte.

To the right of the hall is the library, and to the left the dining room. In both of these rooms the oak paneling is carried up to the cornice, and simplicity of treatment has been observed, an effort being made to retain dignity of materials in moulding a mantel shelf, and to avoid unrest by treating both rooms alike with minor changes in mantel and fixtures.

The reception room, which is entered from the lobby of the main entrance, is finished in white enamel and wall plaster treatment, and with the hall is more in character with the exterior treatment of the house. A noteworthy appointment here is the large Georgian mantel piece, carried out in white enamel and marble, appropriate to the decorative scheme employed.

Throughout the floor, the plan provides for a number of minor conveniences. A spacious cloak room with an adjoining lavatory opens off the hall, while a room for



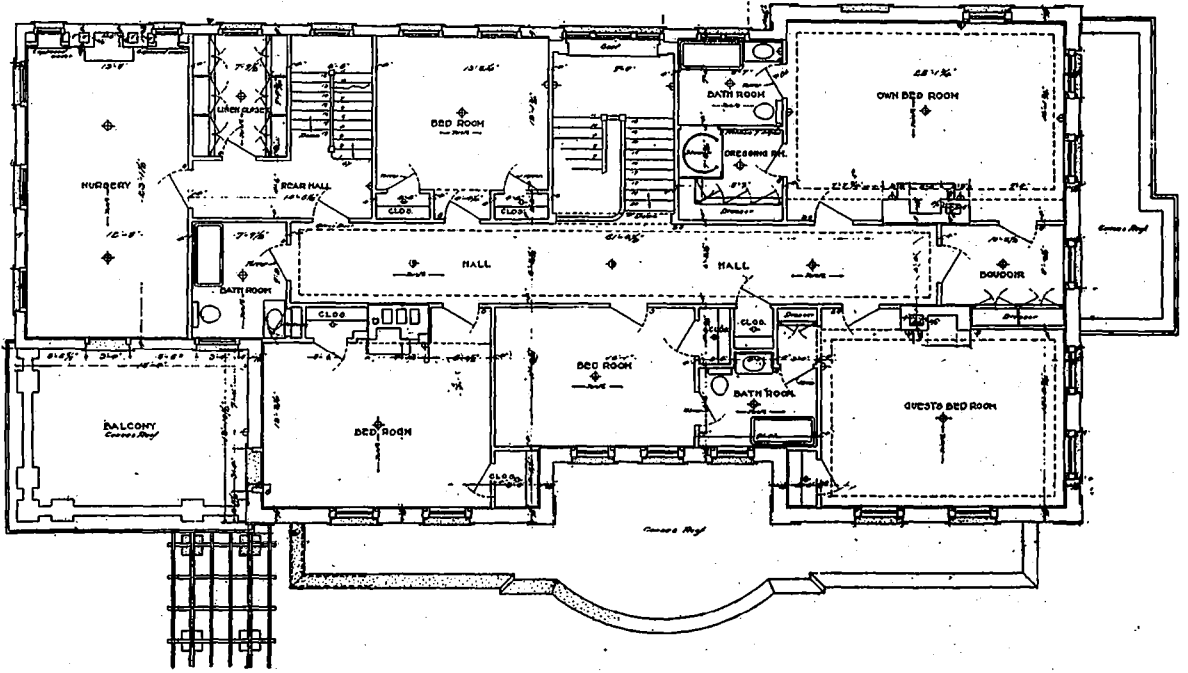
Ground Floor Plan, Residence of Miller Lash, Lowther Avenue, Toronto. Sproatt and Rolph, Architects.



Library, Residence of Miller Lash, Lowther Avenue, Toronto. Here the Oak Pannelling is Carried Up to the Cornice, and Simplicity in Treatment has been Observed, an Effort Being Made to Retain Dignity of Materials as in the Mouldings and Mantel Shelf. Sproatt and Rolph, Architects.



Dining Room, Residence of Miller Lash, Lowther Avenue, Toronto. This Interior is Similar in Character to the Library, the Object Being to Avoid Unrest by Treating Both Rooms Alike, with Minor Changes in Mantel and Fixtures. Sproatt and Rolph, Architects.



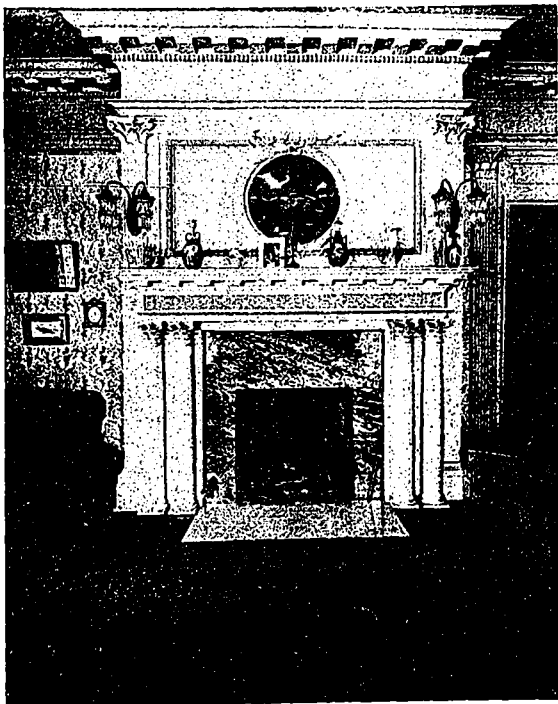
First Floor Plan, Residence of Miller Lash, Lowther Avenue, Toronto. Sproatt and Rolph, Architects.

tool and garden implements is situated in the space at the rear of the stair case. Other features are found in the splendid series of built-in devices in the pantries and other rooms of the service portion, which is kept well within itself and apart from the living rooms, the kitchen and servant dining room being separated from each other by the service stairs.

On the first floor the rooms are arranged on either side of a central hall, extending practically through from one end to the other. All rooms are arranged to be convenient to the bath room, and the main sleeping chambers and the nursery have large open fire places.

The house was designed by and erected under the supervision of Architects Sproatt & Rolph, Toronto.

THE CINDER CONCRETE WALLS of the building used in subjecting floor constructions to fire tests at Columbia University were erected two years ago and have been subjected to five fire tests of 4 hours each, during which the average temperature has been 1700 deg. Fahr. At the end of each four-hour test a stream of water at 60-lb. nozzle pressure was played back and forth over the ceiling for 10 minutes while the ceiling and walls were red hot. After this severe treatment, Prof. Ira H. Woolson states in "Insurance Engineering," the walls are practically as good to-day as they were when new, except that the rear wall has been scored by the water to a depth of from 1/2 to 1 in. for 2 or 3 ft. near the top. This wall gets the direct stream for a portion of the time and always receives the deflected stream from the ceiling. He believes that the structure is good for an indefinite number of tests, the only repairs necessary being an occasional plastering to renew the wall surface washed away. A duplicate of this building torn down some years ago sustained seven four-hour tests at 1700 deg. before its removal. At that time the walls were as good as those in the present structure. Professor Woolson is of the opinion that within reasonable limits the percentage of coal and the amount of fine material in such cinders have very little if any effect upon their fire resisting qualities. He believes that sifting and washing the cinders would be a useless expense and injurious to the cinders as aggregate for concrete. The pieces of coal which came next to the surface of these walls have been burned to an ash, but remain in place and act as a non-conductor of heat. Plenty of particles of pure coal can be found in the walls less than 2 in. beneath the surface.



Mantel Piece, Reception Room, Residence of Miller Lash, Toronto. This Room is Finished in White Enamel and Wall Plaster Treatment, and With the Hall is More in Character With the Exterior of the House. Sproatt and Rolph, Architects.

THE WESTERN BRANCH of an important railroad has decided to replace their wooden snow sheds by structures made from concrete. These roads have decided that wooden construction will not do on account of the avalanches and immense snowslides which so frequently occur. The cement buildings will be of such strength and solidity that they will be practically indestructible.

TOWN PLANNING.—The Art of Designing Buildings and Laying Out Streets and Public Grounds So As to Produce a Harmonious Scheme.—Examples of Town Planning in England and Germany.—Essentially a Co-Operative Art. By RAYMOND UNWIN

QUEDITOR'S NOTE.—The planning of a town in advance of its development, so that the buildings, road system, and public spaces form integral parts of a consistent scheme, affords a study which well merits the attention and consideration of the architectural profession and municipal authorities in Canada. Germany and other continental countries have made marked progress in this direction, and England, both prior to, and following the passage of the "Town Planning Act," as evidenced in Bourville, Port Sunlight, Letchworth and Hampstead—has carried out a number of important projects that clearly demonstrate the advantages which result, when by a carefully preconceived plan and co-operative effort, an endeavor is made to have the individual buildings contribute to the harmony and success of the total effect. In Canada and the United States nothing as yet of this character has been attempted, and even certain Latin-American countries where the respective governments are at least trying to establish a more improved and wholesome condition in the homes of their working class, show more initiative and progress in this respect. However, as regards the Dominion, the adoption of the "Town Planning Idea" is not altogether improbable. Assuredly, the time is most opportune, and as a young country with new towns and districts continually taking shape, it seems only necessary for an awakening to the advantages of the scheme, before definite steps in this direction are taken. The views of Mr. Raymond Unwin on this subject given before the Society of Architects, London, which are published in this instance, we believe will prove of interest to the readers of "Construction." Mr. Unwin is one of England's foremost architects, and an eminent authority on town planning; and his book on this subject, setting forth his experiences and observations, is possibly the most complete work of its kind issued. Mr. Unwin has the faculty of couching his views in a simple and comprehensive manner, and his remarks in this connection will be found both highly entertaining and instructive.

upon our profession especially to remember, that the whole is greater than the part. We must begin to think in streets, in districts, and in whole cities, and henceforth to regard our buildings not so much as isolated efforts, but as units in a larger whole. Town Planning, though in this country almost an unknown and forgotten art today, has been practised in all ages and in many parts of the world, and town plans, when examined will be found to show an almost infinite degree of variety and individuality. What one may perhaps call the modern period of Town Planning has already passed through several phases of development in other countries, noticeably in Germany, where during the last fifty years there have developed different styles, characteristic of different periods, showing a growth analogous to the different styles and periods we are familiar with in architecture. As an example of the earlier style as applied to an entirely new town, I call attention to the plan of Dalny, which shows evidence of a study of some of the exercises in ideal Town Planning, such as those of Vasari-il Giovane and Scamozzi, at the end of the 16th century, or of Roland Levirloys at the end of the 18th century, with the irregular geometrical plans characteristic alike of Haussmann's work in Paris, and of the German work in the middle of the 19th century. This plan is of special interest, as showing the care that was taken in surveying the ground before, the plan was made; not only do we find careful contour levels, but also wind and weather diagrams, the prevailing winds and the aspects having both been taken into account in determining the direction of the main roads.

In the plan of Cologne, we see town planning applied to the more common case of the extension of an existing town. This plan illustrates also the change in the character of German town planning. In the centre may be seen the irregular street lines, characteristic of the medieval town, with a few more modern roads resulting from improvement schemes. In the zone immediately outside this area, which was set at liberty by the extension of the fortification lines during the last century, we see the geometrical type of planning, very like much of that which can be found on the plan of Paris. Cologne has again outgrown its line of fortifications, and, moreover, the change in the character of warfare has rendered them obsolete, and the town is now developing suburbs all round. These it will be seen are being planned by the municipality far ahead of the development, but the geometrical pattern work has been displaced by more flowing lines, showing a marked reaction from the rigidity of the former manner. This may fairly be taken to indicate the intermediate German style and period of German town planning work. It is very interesting to compare the old plan of Paris with the modern plan, and to see the extent to which Haussmann's geometrical planning has displaced the medieval irregular street lines of which Paris once entirely consisted.

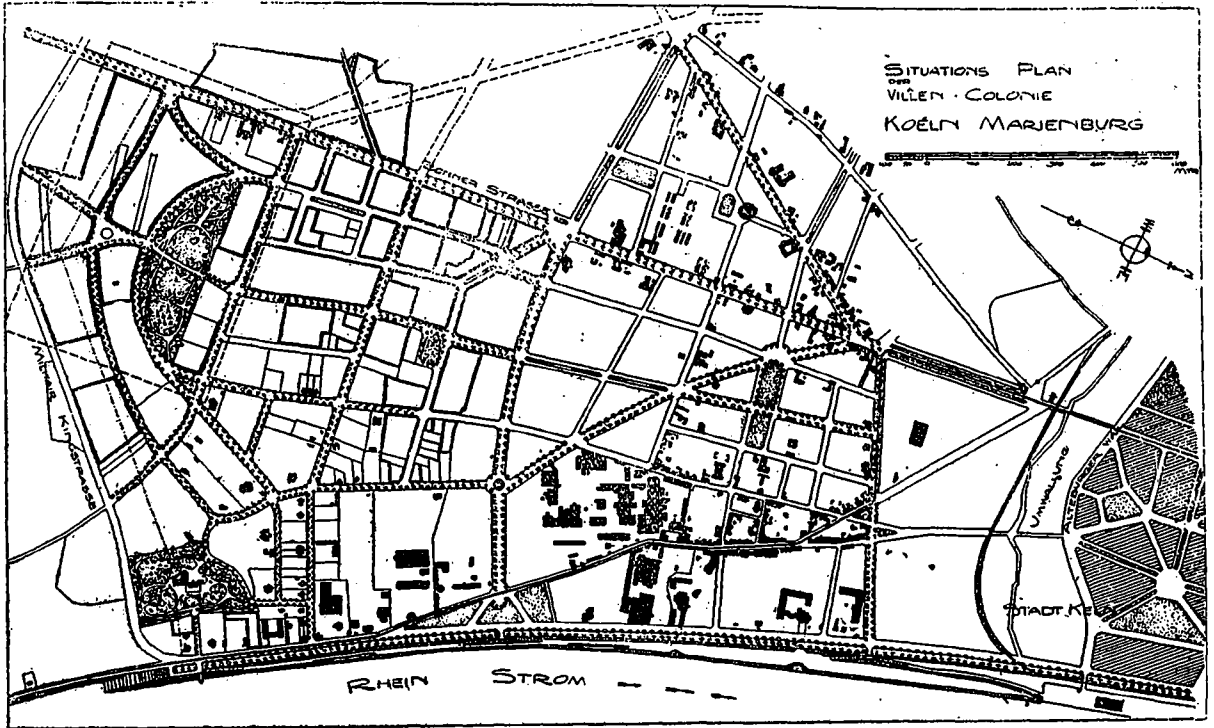
—The influence of Camillo Sitte in Germany, Austria, and the central European countries generally has resulted in a further development of the curvilinear and irregular style. He advocated a careful study of medieval town plans, and put forward the theory that these plans were the result of conscious design on the part of a people thoroughly imbued with artistic instinct and tradition; and he deduced some rules and many suggestions as to the causes of the wonderful picturesqueness of medieval towns and cities. The plan for the extension of the little town of Kufstein is one of the best examples I know of the most modern style of German work, in which the town planner concentrates his main attention on the build-



Raymond Unwin.

IT WAS SAID OF CECIL RHODES that he thought in continents. The passing of the Town Planning Bill in England throws upon the architectural profession of this country the duty to expand the scale of its thinking somewhat in the same way. For the last generation or two, in this country at any rate, the architect has centred his thought upon the individual building

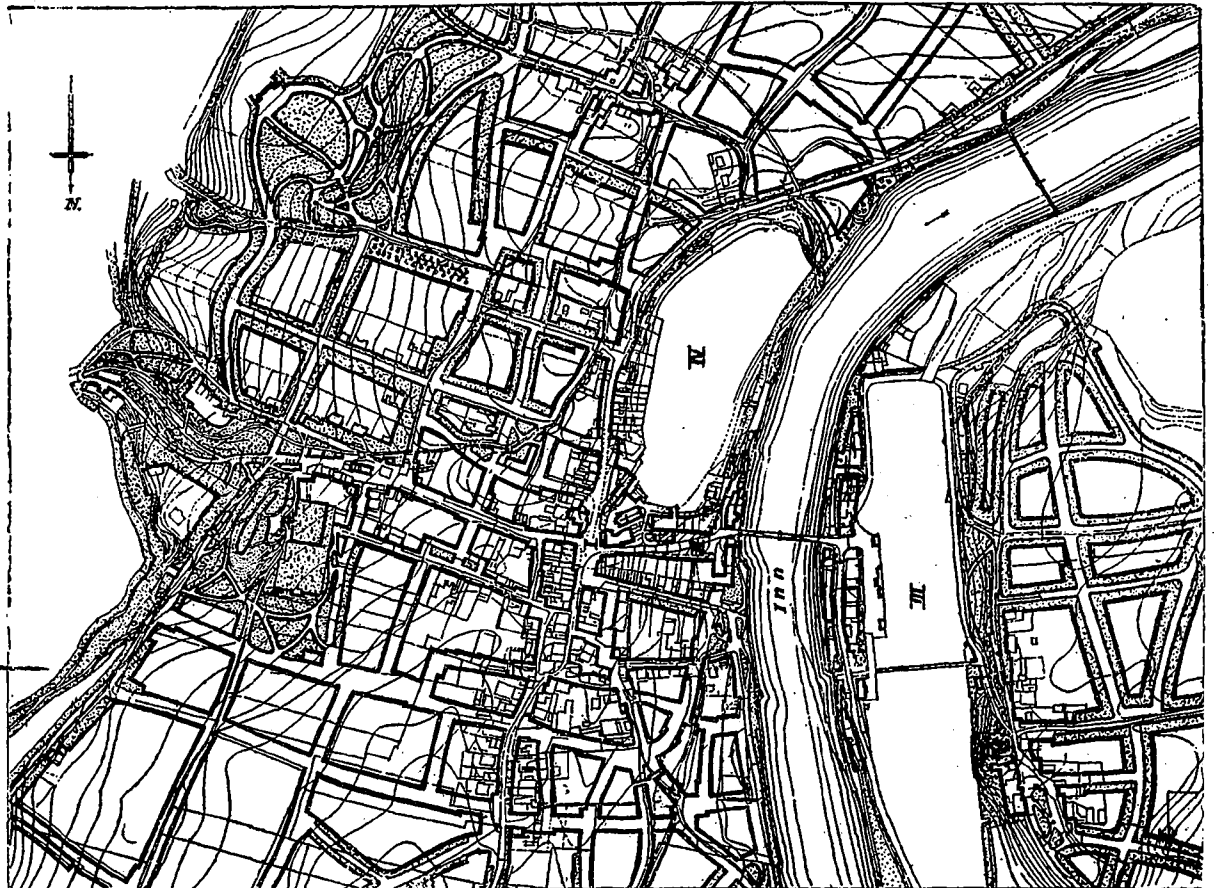
which he was commissioned to design, and his total inability to influence the surroundings has led him to a large extent to ignore them. The Town Planning movement, culminating, as it has just done in the passing of an Act conferring powers upon municipal bodies to lay out the plans of their towns in advance, and to make at any rate a beginning of treating their towns as large units to be considered as a whole with some foresight, calls



Part of the Town Plan of Cologne, Showing the Old Line of Fortifications, and the Lay-Out of One of the Southern Suburbs.

ing up of picturesque street pictures. Every street, every junction, and indeed, one may say every view in this plan has been carefully thought out, so that when the buildings

arise on the building lines laid down, they may group together in the picturesque manner characteristic of medieval cities. It will be found also, that although in no



General Building Plans for the Town of Kufstein, by Herr Lasne, Architect. 1—Ober Standplatz. 2—Unter-Standplatz. 3—Railway Area. 4—Festa Geroldseck.

direction are there long, unbroken streets, nevertheless, the lines of the roads are so contrived that it is possible to get about the town in all directions, without inconvenience. At the same time, it would not be very easy to plan an extensive tramway system for such a town.

The plan of Marienburg is a very good example of a combination of the two styles of planning. We see certain straight thoroughfares giving a sense of framework to the town plan, while the details are filled in with the irregular streets, planned to produce picturesque groups of buildings so characteristic of the modern German school.

Signs are not wanting that there will shortly be in Germany considerable reaction against the extreme irregularity, and the excessive striving after the picturesque which has marked their recent work. Here in England, we are about to take up this new art of town design. It behooves us to study very carefully all that has been done before. We have the great advantage of being able, if we will, to profit by the extensive experiments in different styles of work that have been carried out on the Continent, during the last fifty years. We have in this country scraps of two traditions in town planning. There is the very regular and symmetrical work characteristic of the Renaissance period, when, for a while, large schemes were grasped and sometimes carried out, as we may see in many parts of London, notably, in the squares lying between Holborn and the Euston road, and in part of the district round Regent's Park. In addition, we find in Bournemouth, Buxton, Eastbourne, and some other towns, that have grown up mainly on the property of one great land owner, town plans worked out under the influence of the landscape school of gardeners, consisting of flowing so-called natural lines, but generally speaking lacking in any large grasp or any sense of wholeness in the completed plan. I think it is of the greatest importance that we should, in this country, not make up our minds too hurriedly, as to one style or the other, until we have pretty thoroughly grasped the advantages of both, and the reasons which have led to the adoption of one or the other. I cannot help thinking, that we have here, as so often, the elements of a new synthesis, and hoping that it may be within our power to evolve in this country a style of town planning which shall show alike a due appreciation of the beauties of our usually irregular and undulating sites, and of that other beauty which springs from ordered and regular design. The problem before us really is how to weld together into one harmonious whole the undulating surface and irregular features of our country and the definite lines and ordered arrangement characteristic of good design. And, with a view to further illustrating this, I would like to contrast for you two cities.

The first is the peasants' city of Rothenburg, a unique example of unspoiled mediæval picturesqueness, the character of which springs not from the possession of supremely beautiful buildings, but from the fact that in the whole of the town there is hardly one that does not show a simple, comely beauty. The plan is interesting as showing how the form of the town has been influenced by the nature of the ground, the line along the west side following the crest of the high ground on the edge of the deep ravine, which has been worn out by the winding Tauber, a small river, the musical murmuring of which, as heard all along this side of the town on a quiet evening, adds not a little to the charm of the place. It is a characteristic mediæval plan marked by an entire want of symmetry and regularity, subordinated to the double line of fortifications, one dating from the 13th and the other from the 14th century, beyond the outline of which, except for a small settlement adjacent to the railway station, the town has never developed. But, while lacking that symmetry and order which goes to make up a pattern on paper, none the less this plan has in it many of the far more important elements of a good town design. It has, in a marked degree, both scale and frame-

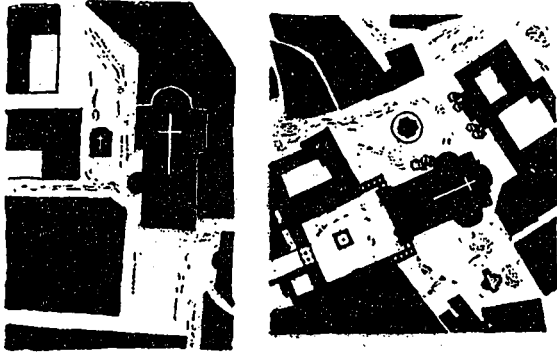
work. Its market place with the group of smaller *places* linking it up with the great Church, the Rathhaus, and the Herrngasse, the great street in which the patricians of the town once lived, form together a centre finely dominating the town, while the roads leading to the main gateways are also marked out in importance by their comparative width and directness. I must not omit to mention the delightful absence of that region of untidy allotments, derelict building sites and rubbish heaps which forms a girdle round nearly all our growing towns to-day; the way in which the unspoiled country comes right up to the wall of the town, inside which the crowded, I must admit, in many cases over-crowded city commences, has a very fine effect, and one which suggests to us whether there may not be found for our modern suburbs some means of defining and limiting their areas adapted to our modern conditions of life as the town wall was adapted to those of our forefathers.

Before passing from this beautiful little city, which, more than any other I know, carries one back to the time when all building work was governed by a simple instinctively appreciated tradition which seems to have made it as natural to build beautifully as our modern life has seemed at times to make it natural to do the reverse. I would like to emphasize the unity of effect which has resulted from the following of that tradition. Almost every building in the town, including the Rathhaus and the Church, is roofed with the beautiful hand-made Rothenburg tile of a quiet brown color, here and there brightened with touches of brilliant red where the tile has cleansed itself, as such tiles will. The buildings are either built of stone, the prevailing tones of which are cream and light brown, or more frequently are plastered and treated with lime-wash of very similar tones. Bits of bright green and grey occur in the woodwork, the whole producing a unity of effect which is quite astonishing to anybody accustomed to the hopeless jumble of materials, colors, styles and forms which characterize the modern town or suburb. And yet, there is no lack of variety, for while the general form of the town, the multiple gables and picturesque groups of turrets and pinnacles give it an essentially Gothic character much of the detail is distinctly Renaissance.

Let us contrast with Rothenburg the city of Karlsruhe which owes its origin to the Margrave Charles William of Baden-Turlach, who transferred his residence thither in 1715, at which date the plan of the town was made. It is now the capital of the Grand Duchy of Baden, and the Ducal Palace forms the central feature of the town. A tower ingeniously built out on a wing stands on the centre point from which a series of streets radiate to all parts of the town, so planned that this tower is the terminal feature in one direction along all these streets. On the other side, there is an extensive forest, through which straight alleys have been cut, radiating from this tower in like manner. The Market Place is formed on the axis line of the town, which coincides with the central radiating street. Before the Schloss is a large fan-shaped garden *place* having the front of the Schloss at the apex with stable buildings, barracks, residences, and a theatre, forming the radiating flanks, while round the circular arc is built up a colonnaded crescent of houses, cut at intervals by the narrow radiating streets. Beyond this crescent, a circular road links up all the radiating streets, while at right-angles to the axial line at the north end of the Market Place runs a wide, straight thoroughfare from east to west, connecting with various diagonal streets, and completing the general framework of the town. This road leads directly to the district of Muhiburg, and to the docks of Rheinhafen, which put the town in communication with the much used water course of the Rhine. Sufficient of the early 18th century buildings remain to enable one to form a fairly good idea of the effect that would have been produced if the town had been entirely built up at that period. It would be difficult to imagine a greater contrast than that between the style of this town and

that of Rothenburg. The straight, formal lines of the streets, the geometrically shaped *places*, the axial treatment of the Market Place, the regular, horizontal sky lines, and the entire absence of gables, with the symmetrical and regular treatment of the facades, all emphasize this difference, and yet, there is the same feeling of unity of effect, the same sense of scale and framework leading up to a definite town centre that marked the more picturesque and irregular Rothenburg.

Much skill was shown in the treatment of the many acute and obtuse angled corner buildings, a very good



Ravena.

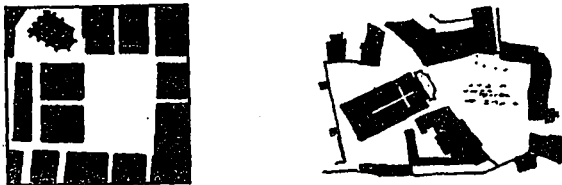
Salburg.

effect being frequently obtained by very simple means. We cannot fail to notice how such a regular treatment suffers when the style is departed from, and buildings of different heights and different characters break in upon the orderly arrangement, and, I think, we should take warning, and before embarking upon any system which depends for its success on the complete maintenance of very regular lines, make fairly sure that we can see our way to maintain these.

The site of Karlsruhe is a level plain, having apparently nothing of natural undulation or feature within the area of the town, which needed to be much considered by the planner, so that probably in this case the unusual degree of formality of treatment was justified by the conditions. The faults of the plan are the excessive and monotonous insistence of the somewhat uninteresting tower of the Schloss, the large number of acute angled corners and the uncomfortable shape of many of the *places*, road junctions, and building plots formed.

Its virtues are the definite leading up to a centre, and the interest which each part derives from being a portion of a definite scheme, the easy communication from point to point, and the simplicity of the general framework, which is easily grasped.

Bearing in mind the comparison we have made of the formal 18th century city with the informal 14th century one, let us pass to consider in greater detail some of the



Dresden, Market-Place.

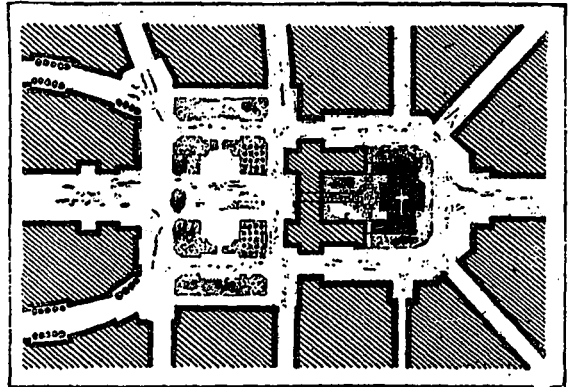
Pisa.

component parts. We have seen that both plans are alike characterized by an extensive use of *places* of various size and forms. The special characteristic of the medieval *place* is the sense of enclosure and the completed frame of buildings which is produced; the shape is indefinite. In the Market Place at Nuremberg, for example, although at first sight there appear to be many roads leading in to the place, and forming breaks in the buildings,

it is remarkable how the arrangement of these does, in reality, leave the framework of buildings unbroken. Either the roads are curved slightly after they leave the Square, or their direction is broken, or they are made to pass out at right angles to the line of vision so that it would hardly be possible to stand in any part of the Square and get a long, unbroken vista out of it. Contrast with this the modern Max Josef Platz, Munich, where the long, straight vista at the side of the theatre breaks up the frame of the buildings and gradually destroys any sense of enclosure in this part of the *place*. The Piazza del Campo at Sienna is another instance of a place of quite irregular form on plan, in which so far as its shape and arrangement are the result of conscious design, the aim appears to have been mainly to secure the sense of enclosure, and an unbroken frame of buildings. This, of course, was easy with the narrow streets common in medieval times, in which a very slight deviation from the straight line is enough to close the vista. The Market Place at Stuttgart is an example of this. We have only to imagine two modern 50 ft. streets replacing the narrow ones to realize how, unless they were very rapidly deviated from the straight, the sense of enclosure in that *place*, would be entirely destroyed.

In Renaissance *places*, quite different effects were aimed at, regularity and symmetry of shape and architectural treatment are in them the prominent features, and the sense of enclosure is sometimes wanting.

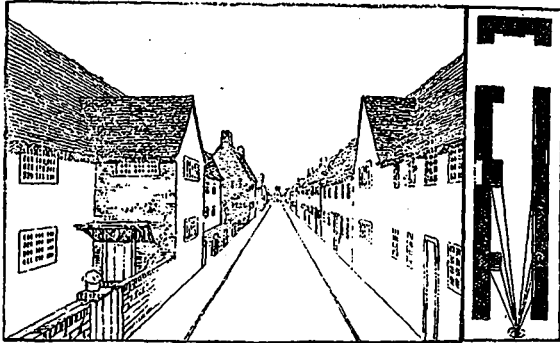
The importance of linking up the buildings and producing to some extent a continuity of frame, was, however, apparently recognized in the laying out of the fine



Town Square of Letchworth.

group of Renaissance *places* at Nancy. Where the angles or ends would otherwise have been open, they have been to some extent screened by wrought-iron railings, masses of foliage and semi-circular loggie or arched gateways. But the importance of enclosure and linking up of the buildings has not always been recognized in the planning of architectural *places*, particularly those resulting from, what I may perhaps call, axial treatment. It is not of course the only desirable effect to be produced in a *place*, but there is a peculiar sense of completeness and unity and a suggestion of quiet and repose which results from this treatment which it is most desirable to maintain in many *places*. The Amalienborg Platz at Copenhagen is a very fine instance of an architecturally treated *place* in which no attempt is made to secure this element of definite enclosure in the *place* itself. A monument stands on the intersection of the centre lines of the two cross roads, and the four palaces which face diagonally upon the *place* are each completed by lower wing buildings affording something of the gateway treatment to the roads themselves, and giving a fine sense of unity to the whole effect. But in reality, this *place* may be regarded rather as the glorified treatment of a street junction than a *place* in the sense in which we have been using the word hitherto.

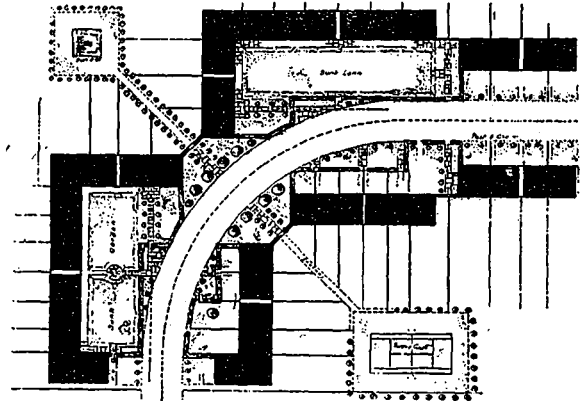
The Karolinen Platz at Munich is another example of the treatment of a multiple road junction, with a central feature on the axis of the various roads, and with definite architectural treatment of the corners, but lacking any



Plan and Sketch of Street, Showing on One Side the Uninteresting Vanishing Perspective of the Unbroken Building Line, and on the Other the More Picturesque Result of Breaks.

sense of enclosure. In such places one is not tempted to loiter; they are apt to be distinctly draughty. From these, one naturally passes to consider places formed mainly for the purpose of facilitating traffic. Many examples of these may be found in Paris; at points where several roads converge there is usually formed some open space to facilitate the circulation of traffic, and to secure some degree of architectural treatment to the corners of the various streets. The Place de L'Etoile is the largest of these. The whole question of the circulation of traffic, and the best way of reducing the inconvenience which must always arise in busy streets, where several streams of traffic pass in and out or across the main lines, is too large for me to touch upon to-night, and I can only just say, in passing, that there are two widely different views held on the matter. The German School of Modern Town Planners believe that as far as possible multiple road junctions should be avoided, and each branch street

is better brought singly into the main street. They consider that many single junctions disturb the flow of traffic less than a fewer number of multiple junctions. On the other hand, the French School of Town Planners consider it advisable to give long, straight, unbroken streets, converging at certain points where the traffic can rearrange itself all at one point, and pass off in many directions; and in some cases, as in the Place de l'Etoile, it has been suggested that the best way of dealing with the traffic, is to keep it always moving round the centre point in one direction, which, although, it obliges a certain portion of the traffic to take a rather longer route, avoids the lengthy stoppages of first one stream and then



Group of Buildings Designed to Maintain Square Roof Lines on a Curving Road.

the other which are otherwise necessary at crowded crossings.

In connection with the new St. Paul's Bridge, which will throw a considerable stream of north and south traffic across the already somewhat congested stream of east to west traffic, at the junction of Newgate street and Cheap-side, the authorities should consider whether it would not



Imaginary Sketch of Village Scene, Where the Buildings are Square With Each Other on a Curved Road.

be worth while to test the circulatory system here. If it were found possible to open out this corner somewhat, there are the makings of quite a good *place*, and the lines of three, at any rate, of the roads, and of a fourth behind the Post Office, if this could be opened up, would strike the *place* like the arms of a turbine, which would render the circulating system peculiarly easy. A carefully made test as to the usefulness of the system would be very valuable at this moment, when we are about to enter upon a town planning period in this country.

But, not the least interesting type of *place* is one which we may call the garden *place*, because it is the one which is likely perhaps to be of most use to us in the planning of town extensions, the part of town planning for which alone powers are given under the new Town Planning Act.

The Schloss Platz, Stuttgart, may be taken as a good example of this type, and, in passing, we may use the example also to indicate in some degree the style of garden treatment suitable to *places*. In the first place, to eliminate the central garden from the plan of the place, one can readily appreciate in the mind's eye how the simple masses of foliage left add to the dignity of the *place*. On the other hand, with the garden portion included, I think it will be agreed that much of the breadth has been destroyed by the way in which the garden space has been frittered away and worried with fountains, bandstands, and geometrically patterned beds of variegated flowers. Here is altogether too much treatment, and in forms which although, no doubt, on paper they would make very pretty patterns, do not when seen in reality from the point of view of the ordinary spectator reveal much but undue fussiness. I am convinced that the breaking up of *places* with architectural balustrades, fountains, bandstands, etc., in the great majority of cases is a mistake. Such features have their place, but they should never be allowed to interfere with the general breadth and simplicity of effect which is so necessary, and which forms so much more dignified a foreground for the buildings surrounding the *place*. A plain sweep of grass, crossed perhaps by paved footways where necessary for pedestrians, following the simplest possible lines, with avenues or masses of tree foliage, when properly placed, is generally an effective treatment, and the money spent in so-called architectural embellishments would be usually better devoted to masking one of the street entrances with a gateway arch.

Where there is difference in level in the *place*, broad terraces with balustraded walls enabling portions of the ground to be levelled, may add greatly to the effect. But, in garden *places*, as in gardens, it is necessary to be very clear as to the effect that is to be aimed at, and to be very cautious about introducing any mere embellishments which do not form part of a scheme definitely thought out to enhance that particular effect. Indeed, it is not only in the treatment of places, but in the whole work of town planning that we need to guard against being carried away by the prettiness of our paper plan. While the importance of definite design and orderly treatment is undoubtedly great, it is equally true that only by building up in imagination the pictures as they will appear to the beholder walking about in the streets, can we test our different proposals. Very often things which may look simple and uninteresting on paper will be much finer in effect than other arrangements showing a much prettier paper pattern. If I have devoted perhaps an undue proportion of my limited time to the *place*, it is because I wish to emphasize specially the importance of introducing a sense of scale and proportion in town plans, and because, I believe, that a wise use of the *place* will, more than anything else, perhaps, help us to do this. We need a centre point to our design, nay, I would rather say we need many centre points; for it is not by jumbling together many materials and styles of building that we shall produce satisfactory variety in the large areas which modern towns cover, but rather by the careful selection

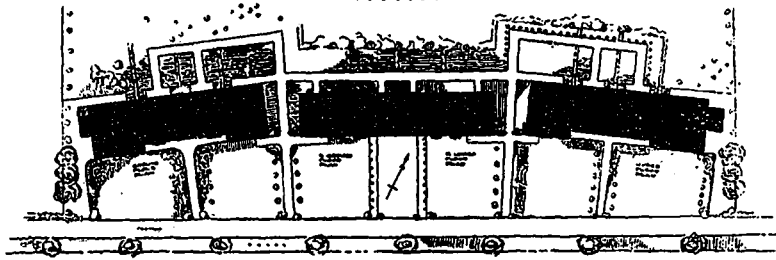
of suitable centre points to each town, each district, each parish, and almost to each building site, or estate. Around these centre points the plan may be grouped, in relation to them the roads would be laid out, and the widths and treatment of them to some extent graded. Around them may be gathered the local public buildings. These centre points in turn may become the pride of the inhabitants, and may tend both to give expression to, and to foster local civic spirit and enthusiasm.

For important centres where the scale seems to need something larger than can wisely be adopted for a single *place*, the useful size of which is limited, within fairly narrow lines, we may well take some suggestion from the groups of *places* which are characteristic of so many continental towns and which may be planned, as for example, at Salzburg, so that not only does the group form a much larger whole and afford opportunities for seeing the cathedral to the best advantage from many points of view, but from no point of view is it seen without its due background and frame, in that naked isolation which we are so apt to choose for our public buildings. In large, gardened *places*, where the scale of the whole would tend to dwarf the buildings, the judicious use of masses of trees may have much the effect of breaking up the larger *place* into groups of *places*, partially enclosed by the mass of foliage, and in this way the proportion between the buildings and this limited *place* area may be the one that will be felt.

In Salzburg, the *places* are irregular in shape, but the same principles may govern us in planning regular and architecturally treated *places*.

For the town square at Letchworth, such an arrangement has been adopted, where a large garden square seemed most appropriate for the centre of a garden city, while groups of smaller *places* surround the main public buildings, and the streets are arranged to command a view of these.

Much that has been said of *places* will apply to streets also. The building up of street pictures is indeed a fascinating art, giving scope for endless variety of treatment. When it is desired to provide a route from one point to another, and no obstacle exists, nor do the contours of the ground suggest any deviation, the obvious course would seem to be to adopt the straight line. The advantages of the straight street are that it lends itself to the production of vistas, that where suitable terminal buildings can be provided at distances not too great, these buildings can be very well seen, also the straight street affords convenient building sites, and all the many conduits, tramways, etc., which form part of the engineering work of a modern town street, are more easily laid in straight lines. The disadvantage of the straight street is that it is liable to become monotonous. The Rue Soufflot, in Paris, leading up to the Pantheon, is a good example, in which the terminal feature is of sufficient importance and interest. The length of the street is not very great, and the whole forms a dignified and beautiful street picture. But where a considerable terminal feature is lacking, and where the length of the street is great, the long converging lines of windows, cornices, etc., become not only uninteresting, but wearisome. When looking down a straight street, the buildings on either side for a short distance are seen at a sufficient angle for the features to be appreciated, and to be interesting; but very soon, owing to the acuteness of the angle of vision, all the features, such as windows and doors, cease to be seen sufficiently clearly to have any interest, and become mere lines of shadow. Where a cross street occurs, a small portion of this vanishing perspective is replaced by part of the side elevation of the corner building furthest from the beholder. A little point of interest is at once introduced. In the diagram given, this point is emphasized by the different treatment of the two sides of the street, and it will at once be seen that by a judicious breaking of the building line, it is possible to fill the picture with the side elevations of buildings seen nearly



Garden City, Letchworth. A Group Composed of Three Blocks of Cottages Built in Station Road.

square with the line of vision, so that the features are sufficiently well seen to afford interest and variety. In this way, by the introduction of suitable recesses or forecourts, which afford an opportunity for planting trees, it is possible to build up quite interesting and picturesque views on a straight street, and to avoid any large amount of the picture being filled with the converging lines of the vanishing perspective. In the case of suburban roads, where the houses stand far apart in proportion to their height, the street view may with advantage be limited at intervals by bringing some of the buildings close up to the road line, and in this way the street pictures will be greatly improved, not only by the limitation in the distance, but by the framing in of the view.

The advantages of the curved street are that it can be more readily adapted to the usually undulating surface of our sites, and that there naturally springs up along it an ever varying street picture. I cannot illustrate this better than by calling attention to the famous Oxford High street, beginning from Magdalen Bridge, and terminating with the fine treatment of the Carfax Corner, carried out by Mr. Hare, when the increasing traffic necessitated the removal of the nave of the church. It will be noticed in this study how

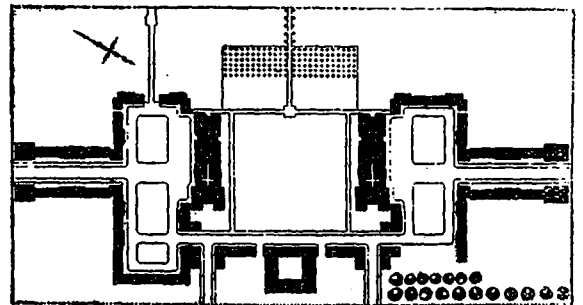


Hampstead Garden Suburb. Sketch Showing Group of Houses Round a Green.

the concave side of the street is the one that chiefly adds interest and variety to the picture, and the curved street is apt to lose on its convex side in proportion to the gain on the concave. If we examine a view of the Regent Street Quadrant, we shall see how rapidly the convex side of the street vanishes out of the picture.

Comparing this with the concave side, we shall see how the buildings on this side of the street are seen at a sufficiently wide angle for the interest of the features to be maintained right up the vanishing point, and we may also judge of the fine effect which may be produced by a continuous horizontal treatment of a fairly regular curve. But it must not be supposed that a beautiful result necessarily follows from a curved street. There must be sufficient unity of effect and emphasis at the right points. Let me contrast a view of Holborn looking eastward, where we have a jumble of unrelated buildings and the minimum of unity, and where the curve of the street in the distance is marked by no feature of sufficient scale or interest to dominate the picture, with the K arolinen Strasse in Augsburg, where with much true variety of treatment in the buildings, a very much greater unity of effect is attained and where the Perlach Tower, and the Rathaus beyond form a dominating feature just at the right point in the view.

I think we may say then that there is ample place in our town plans both for curved and straight streets, but their use should be governed by some definite purpose, and some definite effect in each should be aimed at so that we may neither carelessly continue our straight lines regardless of contours, nor

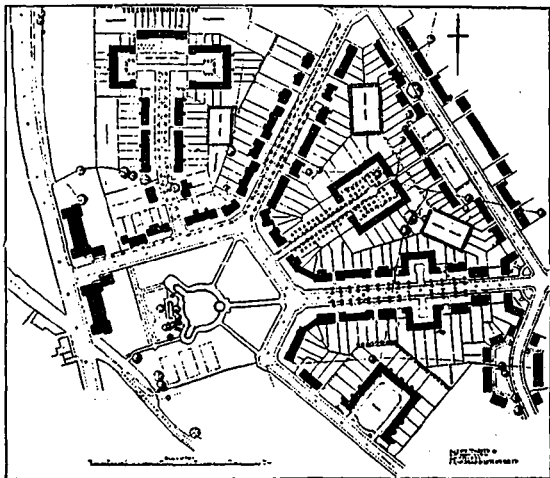


Hampstead Garden Suburb. Central Place.

imagine that we shall get a good effect by adopting aimless wiggles, merely for the purpose of avoiding straightness.

In the actual planning of our roads and streets, we cannot think only of the architectural effect to be produced. Rather, we must first think of the utilitarian purpose that the street has to serve, and find in each case such a treatment as will within the prescribed limits afford an opportunity for beautiful architectural expression of these particular requirements. While working on paper, we must always be thinking in the solid, for it is the massing and grouping of the buildings which we see and which affect our picture much more than the actual street lines; and it may often be possible to adopt quite independent lines for the buildings from those which are necessary for the road lines of the street. So important is it to consider the grouping of the buildings that after having determined in a general way the directions which roads must take to provide the necessary facilities for traffic, and to satisfy the engineering requirements, it will usually be found helpful to block out the design in buildings rather than in road lines; because within the very often fairly wide limits which would satisfy the practical requirements, the exact form may be determined wholly on architectural grounds. On residential roads much greater freedom of treatment is possible than in those solidly built up, and particularly those devoted to shop-

ping and other business purposes, and in residential roads we encounter new difficulties, partly owing to the great width between the buildings, and partly owing to the



Part of Hampstead Garden Suburb, Developed by the Hampstead Tenants, Limited, and Laid Out for Cottages.

tendency to employ detached or semi-detached units, each different from the others, producing a generally scattered effect in the areas devoted to larger houses, and to the equally monotonous plan of building long rows of smaller houses, all alike, and all alike uninteresting, in the streets devoted to smaller dwellings.

Under the new Town Planning Act, it is in the ever-growing residential areas around our towns that the chief opportunity will be afforded. Centres of considerable magnitude and having buildings of fair importance will need to be provided, where whole new suburbs are growing up on the outskirts of towns; and to these the principles which we have been gleaning from the examples of different styles and periods will be as applicable as they are to those central portions of towns which are not affected by the new Act. But in all streets alike, whether residential or otherwise, we need to consider the total effect first, and the individual buildings as units contributing to that total effect. Much may be done by the careful designing of the building line to give to each street some definite character and unity, and this may be further emphasized by the adoption of definite building materials for definite streets or areas, a common roofing material being of itself enough to give a considerable degree of

greater degree of grouping of buildings. In streets of cottages and small villas one of the difficulties arises from the fact that the unit is so small and becomes so wearisome owing to the degree of repetition. A great improvement can be made where instead of rows of houses all alike, a number can be designed as a definite group, and this may be carried further, and three or more of such groups may be designed so that they form together a still larger group. Thus, it becomes possible within limits easily practicable to create units in the street of sufficient size and importance to dominate the picture, although, still composed of individual cottages each complete in itself, and with comparatively little variation in the plan and general arrangement. Such a larger group of three small groups of cottages built at Letchworth is here illustrated.

With what a sense of pleasure and relief anyone wandering among the dreary ugliness that abounds in the neighborhood of Southwark street, comes suddenly upon the little group of almshouses at the corner of Holland street. These are as simple almost as the cheapest rows of cottages built, as they are of London stocks, relieved only by coigns; but it is the grouping of these almshouses around the simple grass court which takes approximately a cruciform shape that is so pleasing and affords such a contrast to the surrounding rows. Surely we may from such groups of tenements as these derive much suggestion for the treatment of residential buildings and roads. In these days, when the main thoroughfares are rendered



Top of Asmun's Place, Hampstead Garden Suburb, with Children's Playground in Foreground.

dusty, noisy, and smelly by much motor traffic, it is eminently desirable that houses should be built just off the main street, and deriving inspiration from our college quadrangles, the groups of almshouses, or the closes of our cathedral cities we may, I think, add greatly to the pleasure of life in our suburbs and to the interest of our suburban roads.

A few photographs and plans illustrating the attempts that are being made at the Hampstead Garden Suburb, to work out a few of the problems connected with the grouping of buildings, the treatment of street junctions and corners, and the development of pictures in straight streets may be of interest, and will serve also, I think, to illustrate the way in which it has been found practicable there, mainly by means of suggestion, with here and there, of course, some necessary insistence, to secure a high degree of co-operation among many architects, all thinking first of the total effect, and of their own individual buildings as forming part of that total.

I want to suggest to you that fine city building which is after all the end and aim of the art of town planning is essentially a co-operative art, and indeed, I believe, the art of architecture itself is very much more a co-operative art than many people seem to think. It is more and more necessary to bring to bear upon even our individual build-



Hampstead Way. Some of the First Houses Built on the Estate of the Hampstead Tenants, Limited.

unity to a district. In the planting of streets also additional emphasis can be laid on the particular treatment adopted.

The tendency, which is becoming so marked, for areas to be developed by enlightened Garden Suburb Trusts or by Co-partnership Societies, will afford opportunity for a

ings types of skill and ability seldom all united in one man, and our offices are really much in the nature of guilds turning out work which is the result of a high degree of co-operation between the principal and the assistants working with him. In the same manner, fine city building can only result from a high degree of co-operation between all the architects working on the individual buildings. Something may be done on limited areas and on private estates, as at Bedford Park or Hampstead, for example, to produce unity of effect by bringing all the buildings under the controlling influence of the ideas of one man, whose attention is centred on the whole effect, rather than on the individual buildings, but these are, after all, makeshift methods. Art is not a thing easily to be controlled, and unity of effect in a whole town can only be expected when the whole of its architects are joined together by some common aim, some common appreciation of the whole effect which is being worked up to. This may seem much to expect from the present chaotic and individualistic condition of the architectural profession; but I cannot help hoping that the opportunities afforded almost for the first time in this country by the Town Planning Act, enabling us to consider as a whole, and to guide and to control the development of our towns along definite and well thought out lines planned with the due consideration for architectural effect, will so stimulate in all of us an enthusiasm for the beauty of the whole, that it will become as natural to think first of the whole, and to see our buildings in the true perspective as parts of a great street picture, as it has been natural under the conditions which have held sway in this country for so many years, for our attention to be concentrated exclusively on our own work. This is the right, the ideal form of compulsion, the compulsion exercised upon each one of us by our zeal for some ideal which shall be shared by the whole guild of architects. We should do all that is possible in our own practice, and in the education of those who are coming forward to help us and take our places in due course, to foster this spirit, because it is only by the development of this compulsion from within that we shall be able to justify ourselves in resisting some form of compulsion from without.

Did time allow, I might suggest many other ways in which town planning is a co-operative art; notably, we shall need the help of the engineer, the surveyor, and even of the sociologist and archaeologist, if we are to guide the development of our towns into lines which shall at once carry on their best traditions, maintain that unique character which gives to each its individuality, and provide adequately, for all the needs of a healthy and wholesome city life. If our type of training is worth anything, it should particularly fit the architect to absorb all that is beautiful and valuable in the past, and deriving from it inspiration, to develop by the exercise of a trained imagination town extensions, which shall harmonize alike with past beauty and present needs. I have taken many of my illustrations from foreign towns, because I am anxious that we should learn from many sources, but may I remind you with the last slide, that we have in this country still left unspoilt some of the most beautiful dwelling places to be found anywhere, where the work of man, and the beauty of nature is wonderfully harmonized; that we have, indeed, rich tradition upon which to build.

A SEPTIC TANK FOR A COUNTRY RESIDENCE.—A Practical, Sanitary Method for the Disposal of Sewage.—By J. J. Cosgrove.

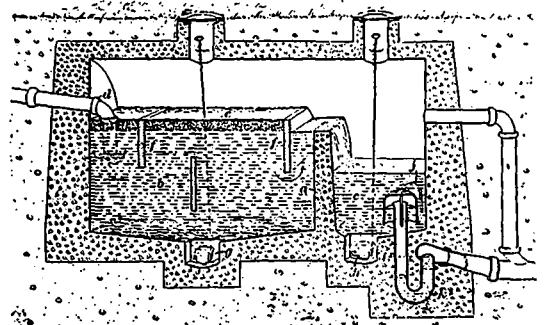
NO GREATER DIFFICULTY more frequently confronts the architect in planning suburban and country homes than that of sewage disposal. When no regular system is installed this problem is of special importance, and it is imperative that the greatest attention should be paid to it.

The following type of septic tank is one of the most

simple as well as efficient that can be used for this work. The walls and floor of the tank should be constructed of a dense concrete, that is to say that proper care be taken in choosing the proper aggregates and mixture.

In the sketch *a*, is a wall which divides the tank into two compartments, of which *b* is the tank proper; *c* represents the collecting and discharge chamber; *d* is the point from which the sewage enters the tank. It will be noticed that this discharge pipe turns down and is submerged, which is to prevent the sewage from disturbing the scum upon the surface represented by letter *e*. One of the baffle boards, *f*, deflects the flow of sewage towards the bottom of the tank, while the other, which extends down about three feet below the surface of the liquid, prevents the surface scum from being washed over with the effluent and insures the discharge from the tank being taken from near the centre level, where the sewage is most clear. When baffle boards are used they should be spaced about ten feet apart. The board nearest the inlet should project a few inches above the line of flow and to within two and one-half feet of the bottom of the tank.

The middle board should be set with its upper edge some 18 inches below the surface and its lower edge some 18 inches above the bottom of the tank. The scum board near the outlet should extend a few inches above high water level, and the bottom edge should be midway



A Septic Tank of Concrete for Sewerage Disposal in Suburban or Country Districts.

between the surface of sewage and the bottom of the tank.

A valve sludge pipe, *g*, provides the means for draining off sludge from the tank without putting the tank out of service. It will be observed that the floor of the tank slopes towards this outlet. When the effluent is discharged into a stream, the tank *c* may be omitted. When the effluent is treated by filtration, as effluents should invariably be, the dosing chamber *c* should be so proportioned to the filter beds that one dose will properly flood the filter area. The floor of the dosing chamber is made sloping towards the centre, where is located the valved outlet, *h*, which should be cross-connected to the discharge to the filter beds, and to a sewer outfall, so that the effluent can be discharged direct at the place of disposal, or supplied continuously to the filter beds during repairs to the automatic siphon. The wall which separates the dosing chamber and the septic compartments should be made sufficiently strong to hold back the liquid in the septic tank and to withstand the varying strains caused by slowly filling and quickly emptying the dosing compartment.

The siphon apparatus shown operates as follows: When sewage overflows the wall, *a*, into the dosing chamber, it rises in the bell of the siphon and overflows into the trap, which it seals, thus confining the air in the space, *i*, which forms the long leg, thus forcing the water down on one side and up on the other, as shown in the illustration until the compressed air in *i* is just about to escape under the bend that forms the dip of the trap. Any further flow of liquid into the dosing chamber will then increase

the pressure in *i* so that the confined air can escape from the trap, carrying with it some of the water; as the air escapes from *i* the space fills with water from the dosing chamber, thus filling the long leg of the siphon, which at once is thrown into operation and aspirates the contents from the dosing chamber. When the effluent in the dosing chamber is lowered to the level of the mouth of the air pipe, *j*, the siphonage is slowly broken by the admission of air through the pipe. Besides serving as a vent to break the siphon, *j*, permits the air to escape from the space, *i*, when the sewage is flowing in to fill the dip of the trap. The depth of liquid in the dosing chamber, that will cause the automatic siphon to discharge, depends on and can be gauged by the depth of water in the short leg, *k*, of the trap. An overflow pipe is provided to carry off the effluent in case that the siphon becomes obstructed. This overflow pipe serves also as a vent pipe through which air can circulate from the outlets at the filter beds or other place of disposal up to and through the perforated covers of the manholes.

STUCCO HOUSES.—By A. G. Cutting . . .

IT IS A VERY commendable fact that rapid advancement has been made by all connected with building operations toward better and improved constructions, but even now there are details of certain types of residences that are not given the attention they demand. We refer to the stucco house. A number of years ago stucco was quite generally used in certain localities, but owing to failures of the material to withstand the action of the elements and through other causes, this type of construction was almost entirely abandoned. During the last few years, however, there has been a very marked tendency by the building public to take up this class of construction again. Therefore, this word of caution.

Architects are very partial to stucco exterior, and if it is properly mixed and applied, will come up to their expectations in every way. So much depends on the selection of the material, proper mixing and proper application, that only skilled mechanics who are familiar with this class of work should be employed.

We have had opportunities to inspect some stucco residences in the past few years, and have found that many of them are unsightly, due to cracks, discolorations caused by improper application, and lack of proper ingredients, etc.

There was one residence in particular where there were a great many horizontal cracks in the stucco running almost the entire length of one side of the building. These cracks were about two feet apart and were very pronounced. The whole area of sides and ends was very unsightly. After a very careful investigation it was found that in nearly every instance where cracks had developed, they were at a point where the wire lath was lapped, and in many places less than $\frac{1}{4}$ -in. thickness of stucco was over these laps. In some instances, by cutting out the cracks, it was found that the metal lath was not even tacked solidly in place, and yet the stucco work in general was condemned by a number of parties on the results obtained on this one building. It was quite apparent that the trouble was not due to any fault of the material, but in this particular instance was due entirely to the application of the wire lath and stucco. In addition to the large cracks at the laps of the wire lath, there were a number of hair cracks throughout the entire area, which apparently were caused by too much trowelling of the concrete mass, and as was found by investigation there was a coating or frosting of Portland cement on some of the areas, and the cracks penetrated just through this frosting. Other areas were entirely smooth and cracks had not developed.

In another case regular lime mortar plaster without any Portland cement was used for the scratch coat. The second and finishing coat consisted of a poor mixture of

Portland cement and sand. The finish coat was only about $\frac{1}{4}$ -in. thick. Moisture penetrated through the finish coat, and the mortar composing the scratch coat being subjected to continued moisture disintegrated, and the stucco came off in sheets.

The third case was very similar to the second, although wood lath was used instead of wire lath on a small building near the shore. The scratch coat material consisted of regular interior plaster, and the second coat consisted of Portland cement, asbestos rock and asbestos fibre. The second coat was very thin and the damp salt air and moisture penetrated through to the first coat. The lath became swelled and the stucco came off in sheets. The stucco on this work was condemned and was laid at the door of the asbestos and Portland cement. Upon investigating the matter thoroughly, it was readily proven that the entire trouble was due to the nature of the lath and the materials entering into the first coat.

In the past stucco has been applied in two coats, the total thickness being about $\frac{1}{2}$ -in. to $\frac{3}{4}$ -in. Past experience is teaching us, however, that 1-in. is by far better, and if the material is applied in this thickness, house owners and architects should not have reason to regret the use of this material.

Another point of considerable importance is the color. A uniform color is rather difficult to obtain on smooth surfaces particularly, but it can be obtained if proper attention is given to the selection and mixing of the ingredients and it is properly applied. When Portland cement and sand are used it is very essential that the sand should be absolutely free from any organic materials which have a tendency to discolor. It is also of vast importance that the ingredients be mixed very accurately and carefully and that a sufficient amount be mixed at one time to cover certain areas exposed to the same lights and shadows. For example, the work should not be left in an uncompleted condition half-way between windows or half way down the side walls, for just as certain as this is done, there will be a streak showing where the latter work was started. If it is necessary to do a certain given area at two operations, care should be used so that the materials are properly blended and the stucco floated or trowelled to correspond exactly to that already done. By using a little care on details of this kind the ultimate results will be much more satisfactory.

Portland cement and sand as a stucco mixture has been used with fair success where work has been carefully supervised, but there has been such a lack of proper attention to the mixing and application that there have been some very bad failures. The use of asbestos rock and fibre to take the place of sand is meeting with considerable success. The asbestos fibres have a tendency to hold the water, which is used to mix the concrete mass longer, thus giving the Portland cement ample opportunity to become properly set, and in this way stucco mixtures are possible that are more uniform in color and less liable to crack as the fibre also furnishes additional bond.

There is one point which is frequently lost sight of, that is, it is possible to manufacture or make concrete slabs that are free from cracks and that can be exposed to the elements for an indefinite period without discoloration. Therefore, should cracks develop in a well-constructed stucco work it can be invariably traced to settling of the building or the shrinking of the frame. By insisting upon thicker stucco walls, the liability of the stucco cracking is reduced to a minimum.

The price of lumber is readily advancing, and the desire for fireproof exteriors, especially in the suburban districts as well as artistic effects that may be obtained from stucco, are creating a universal demand for this type of construction, and while the initial cost may be slightly more, it is such a small part of the total outlay and such an important part of the structure that the best is the cheapest in the end.

FIREPROOF ASBESTOS ROOFING

CONSTANTLY INCREASING fire losses on this continent have induced engineers interested in fire protection to seek with renewed zeal for all practical methods of lessening the danger of ignition and spread of flames. As a result of this, tile, vitrified facings, terra cotta, concrete construction, and various fireproof roofing materials have been brought forward. For factories, barns, etc., being at the mercy of burning sparks, and embers, that the roof be fireproof is of initial importance. One of the best roofing materials manufactured, is the J-M Asbestos roofing which is being extensively used on factories and large buildings. It is so fireproof that it will withstand the flame of a blow torch for an hour, without injury in any way. This roofing is manufactured from the two minerals, Asbestos and Asphalt. The two general characteristics of asbestos are its fibrous structure and in its incombustibility. It is found generally in association with a form of rock called serpentine, which is blasted, and treated mechanically so as to obtain the long tough fibres of asbestos. These fibres are made into sheets like felt, and are treated by thoroughly saturating them with genuine Trinidad Lake Asphalt, well known as a most permanent water proofing material. These sheets are then firmly cemented together with this asphalt, making one homogeneous mass. This practically constitutes a compound which as to its combustibility is the same as stone, because of its all-mineral nature, but at the same time it is fairly pliant and may be cut without difficulty. It offers a building protection against fire, water, wind, and weather, as naturally it cannot rot, rust, melt, run, or crack, and it does not require painting to preserve it. J-M Asbestos roofing is manufactured by the H. W. Jones-Manville Co., of 100 William st., New York. A copy of a very handsomely illustrated catalogue describing this roofing will be mailed by the manufacturers to anyone interested.

NEW MACHINERY INSTALLED

WHILE WIRE CLOTH has the advantage over perforated metal for sieving purposes, yet in many cases the rough or uneven surface of the former has been a great disadvantage. In some cases this has been overcome to some extent by passing the cloth between heavy rolls so as to flatten the crowns of the wire. The B. Greening Wire Co., Limited, of Hamilton, manufacturers of all descriptions of wire work, some little time ago installed rolls to take care of medium weight wire screens with the expectations that the result would increase the value of their product. That the innovation was a success was quickly and satisfactorily proved by largely increased orders for that particular product. This has caused the firm to instal a set of extra large rolls to operate on heavy and extra heavy wire cloth. These rolls are without doubt the heaviest to be found in any wire cloth the completion of a wire weaving plant that is equal to that of any concern in the world. The B. Greening Wire Co., Limited, of Hamilton, would be pleased to answer plant on the continent, and the installation of them marks enquiries concerning wire cloth, wire rope, or wire work of any description.

FIREPROOF SASH

THE EFFORTS of the architect or engineer have al- obtain the requisite strength with the minimum material. ways been directed toward designing construction to CONSTRUCTION, AUGUST, 1910.

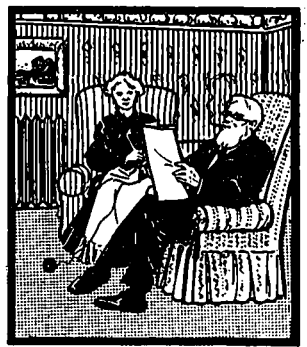
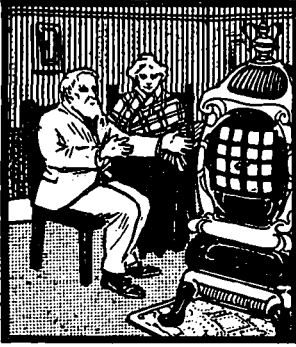
In the case of steel or iron window sash this truth is apparent. "Fenestra" steel sash are made from a special grade of steel of a very high tensile strength and at the same time of sufficient toughness to stand the fabrication necessary to allow the cross-bar and section to pass through. The fabricating required for the "Fenestra" construction removes only about 10 per cent. of the material, and that from the centre, the result being a much stronger but lighter joint. This "Fenestra" sash lends itself to any one of the many schemes of ventilation, extending from the whole window or any part thereof as is considered necessary for ventilating. The moveable part may be hinged at top or bottom, at either side or at centre pivots on the sides, and may be arranged to open inward or outward. The sash is fully completed before it leaves the factory, and is ready to be set in the masonry. With ventilated sash, the ventilators are kept in position by wooden wedges and twine. These wedges are to be left in position as long as possible, while the sash is being glazed, as they insure the maintenance of the proper position of the ventilators. "Fenestra" sash are manufactured by the Expanded Metal and Fireproofing Company of Toronto. This progressive firm has recently issued a catalogue, describing this fireproof sash, and illustrating a number of large structures throughout Canada which are equipped with "Fenestra."

WOOD PRESERVATIVES

WHAT IS CONSIDERED to be one of the most satisfactory wood preservatives of the past and present is the production from coal-tar. An old method was to use plain coal-tar, but it was found that the pitch of the tar closed up the pores of the wood, therefore, the oil was extracted by distillation and generally used for the preservation of the lumber. At the present time some millions of gallons are used per annum on railway ties and other wood products which are constantly exposed to the weather. One of the best known preservatives, a product of coal-tar is solignum. The base used for solignum is the last oil taken from the coal-tar, which is not volatile, and this means absorption by the wood instead of by the atmosphere. The great difficulty in the use of such an oil has been to retain the valuable wood preserving qualities and get a satisfactory permanent color effect—this has been overcome by the makers of solignum, Messrs. Major & Co., Ltd., Hull, England, who guarantee their product and their permanent color effects. Mr. F. Sturgeon, the agent, 34 Yonge street, Toronto, has just returned from his Western trip and reports an enormous increase in the turnover of solignum, which offers even a larger field than the East for their product. Solignum has been used on the finest of residences and buildings throughout the civilized world, and includes among its latest and best, the library of Victoria College, one of the many fine buildings for which Messrs. Sproutt & Rolph were the architects.

DICTIONARY OF HEATING

DICTIONARY OF HEATING is the name given an attractive little booklet recently issued by the Taylor-Forbes Company, Limited, of Guelph, Ontario, manufacturers of modern heating systems. This interesting little book has been compiled with the object of presenting in a brief form a little necessary knowledge on the subject of heating. All the terms familiar to Heating Engineers and the names of the various parts of heating apparatus, are, as far as possible, arranged alphabetically. The



The Heating System That Heats in the Modern Way

There is no more important feature of a building than its heating apparatus.

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If you would be certain that the houses you design are to give the utmost satisfaction to builder and occupant, get acquainted with the special merits of

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We want you to make a careful, critical examination of the Daisy Hot Water Boiler. We want you to go into every detail of its construction and get full information about its exclusive features and the tests it has stood.

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explanation or definition of each term is given in a concise, simple form so that it may be easily understood, and all severely technical features of the subject such as are involved in dealing with the heating values of different grades of coal and other fuel, or the extent of radiation required for given areas, are omitted. The main object of the Dictionary is to explain the economic and other advantages of Hot Water or Low Pressure Steam Heating. Under the heading of "Sprinkler Tank Heating" an illustrated explanation is given of the method used to prevent the freezing of a sprinkler system in a large building. The Taylor-Forbes Company are to be complimented on issuing a booklet of this class which does not take the form of a catalogue, but rather a reference book of handy information relative to modern heating systems.

CALCUTTA'S MAMMOTH STEEL TANK.

A DEFINITE CONCEPTION of the Calcutta's mammoth water tank, which has been briefly referred to before in these columns, may be obtained from the accompanying data regarding its construction and capacity: The foundation of this huge structure which is now nearing completion is 340 by 340 feet, and the top 321 by 321 feet. The tank is 16 feet in depth, with a capacity of nearly 10,000,000 gallons, and rests on columns grouped in fours; each group will support 800 tons, including their own weight. The columns rest on shoes set in concrete 2 feet 6 inches deep, this being the depth of the concrete floor underlying the whole—the foundation supporting the great structure upon which the tank rests.

The tank will supply 100,000,000 gallons per day, without undue loss of head in meeting any emergency demands. The average ordinary supply will be 40,000,000 gallons a day. At present Calcutta is taking about 28,000,000 gallons of filtered and 20,000,000 gallons of unfiltered water per day.

The steel used in the structure was imported from Luxemburg and England. The Luxemburg steel is composed of broad flange beams, such as not made in England, and comprises about 40 per cent. of the total material used. The small structural steel and plates comes from England. The beams were all cut to length before shipment from England, but the drilling of the rivet holes was done on the job. The plates were cut to lengths and the holes drilled in England. The average cost of the steel used in the structure was about \$63.40 per ton, and the freight \$4.86 per ton. The cost of the structure will be about \$475,000.

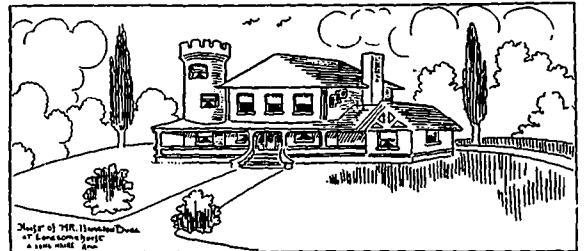
The tank is only supplementary to the waterworks, yet it will add not only to the water facilities of the city, but it will provide a pressure in case of fire that may save many times the cost of the structure.

A FEATURE OF THE DWELLING HOUSES in small Italian towns is the roof composition. The roofs are constructed of stone slabs, which seems to confer a simple beauty even on the most humble buildings. Owing to the absence of coursing, they have a curious appearance of having been thrown promiscuously on the roof, and though they lie closer than they appear to, there must be some method in the construction that the searching snows of winter may be excluded. These roofs possibly excel in texture and beauty of color, the stone roof of the Cotswolds, and to anyone looking down from the Sacro Mount upon the huddled homes of Varallo, the little town seems clothed in mouse-colored velvet, with an occasional patch of tiling to add a splash of color.

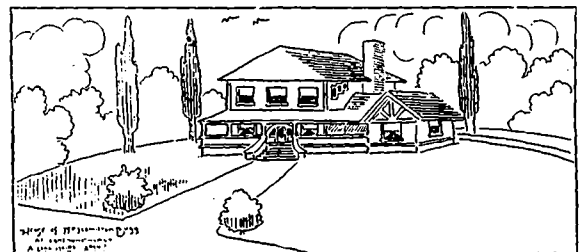
A SUCCESSFUL SOUND-PROOF WALL has just been completed in New York City. The second and third floors of one house contained noisy machinery, and the upper floors of the next house were occupied by apartments. On account of the din of the machinery the flat dwellers applied to the landlord to relieve the disturbance. The wall was accordingly constructed, of hollow terra cotta fireproofing blocks, stuffed with mineral wool. The mineral wool serves in conjunction with the hollow chamber, in which it is contained, as a muffler, excluding practically all sound.

THE FOLLOWING IS A RECIPE given by a well-known authority, for preparing caustic potash lye for removing old paint from iron: Dissolve 2 pounds of potash in a bucket of water, add about 1½ pounds of slaked lime and stir it well. With a mop apply this mixture to the paint, and after a few minutes it may be easily removed by scraping. As rapidly as the old paint is scraped off rinse the iron with fresh water and dry it. This will leave the iron clean and bright.

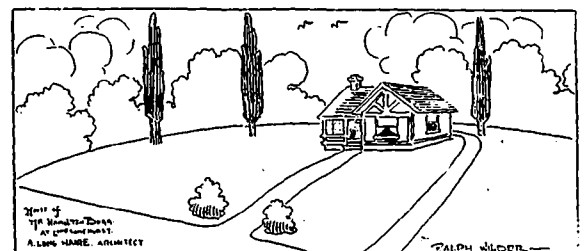
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May 10, 1910. Dear Haire,—I note what you say about high prices; but we must have a house. How much would it cost if the left end was left off? Yours, Ham. Bugg.



July 9, 1910. Dear Haire,—My wife thinks this is "just too cute"! As our lot is only 20 feet wide, perhaps it will be better to have a small house, so let's go ahead. Would it cost much more to have another tree? Yours, Ham.

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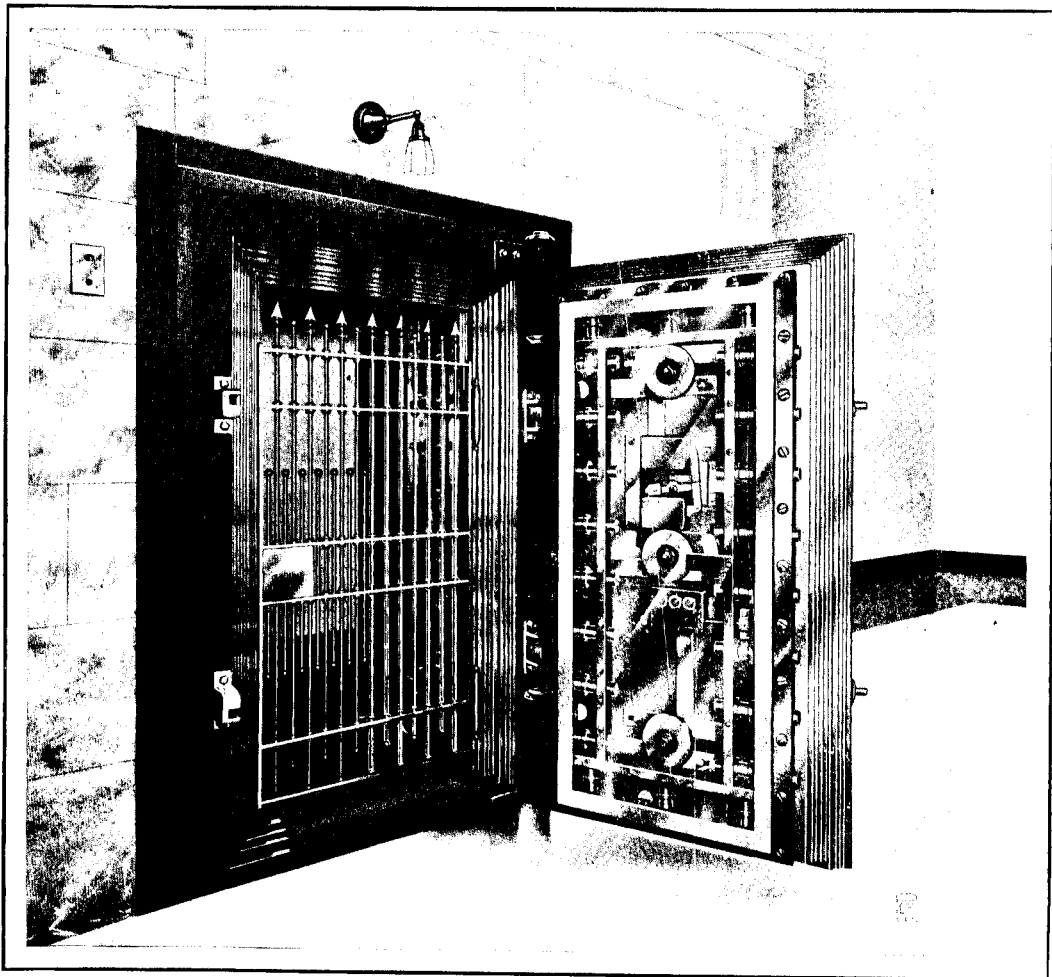


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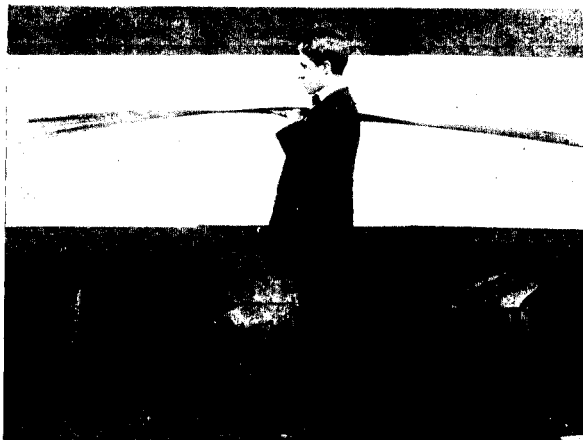
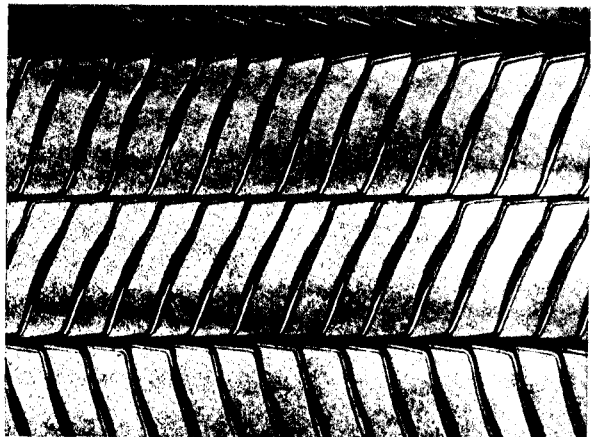
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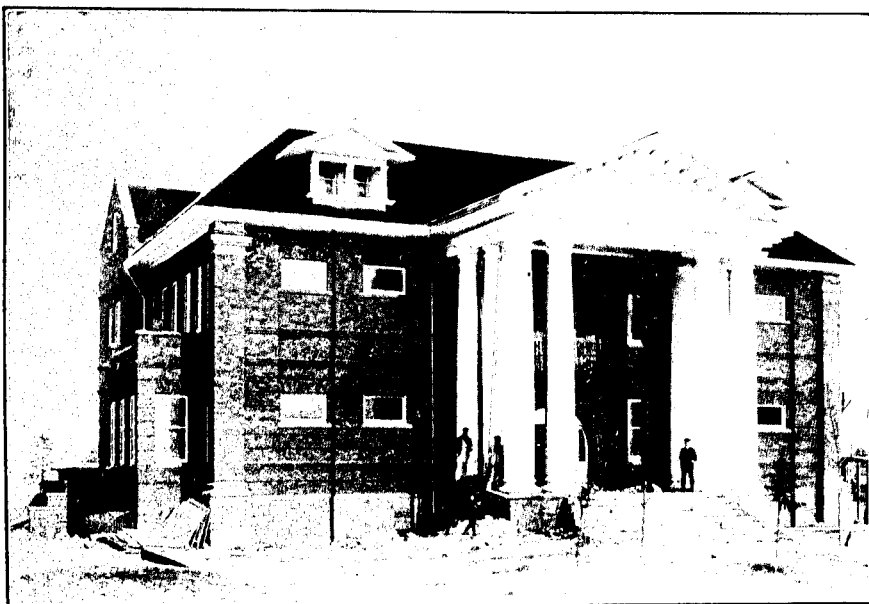
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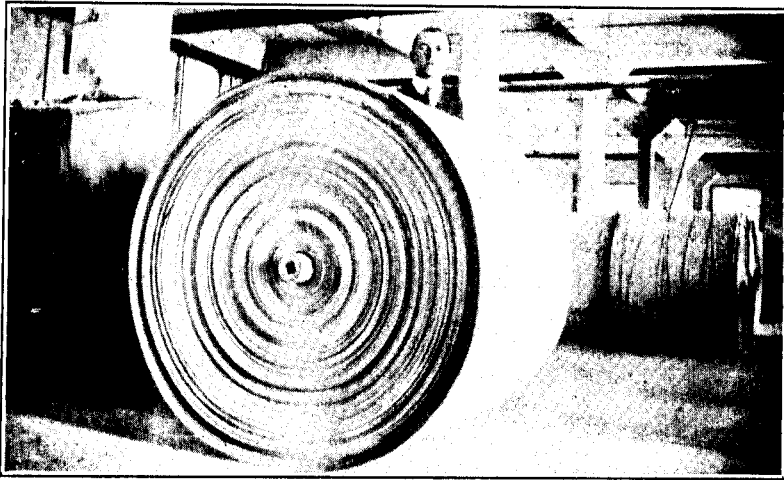
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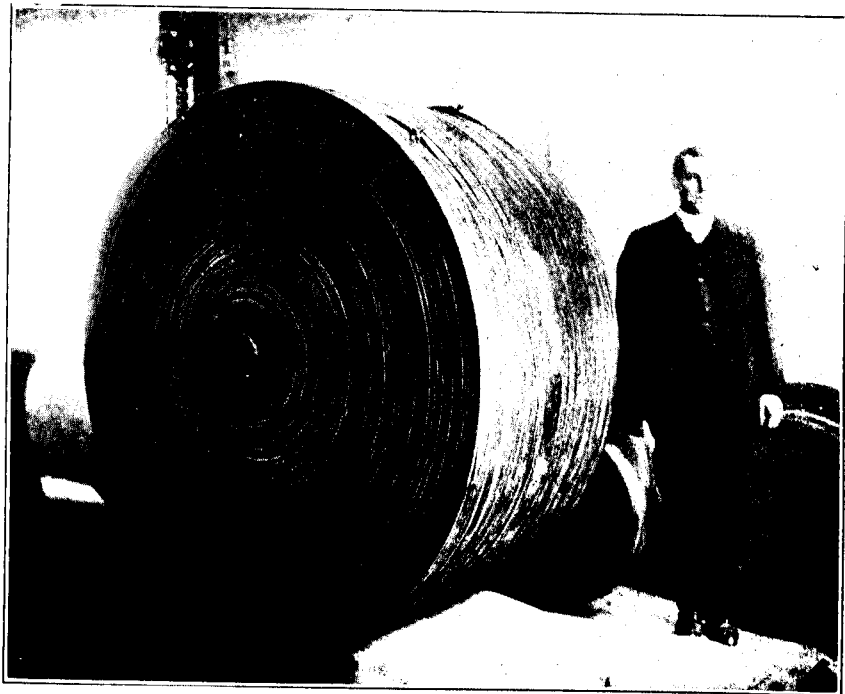


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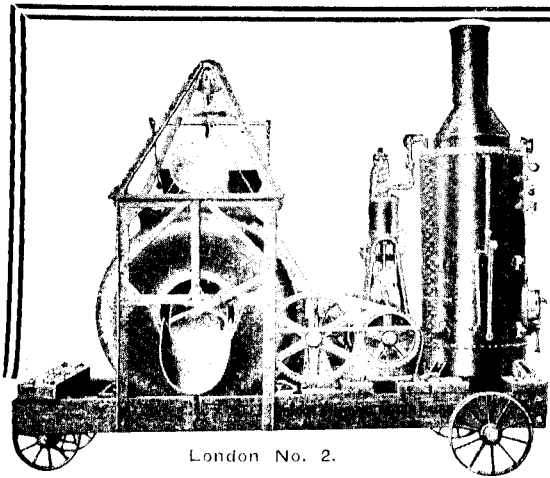


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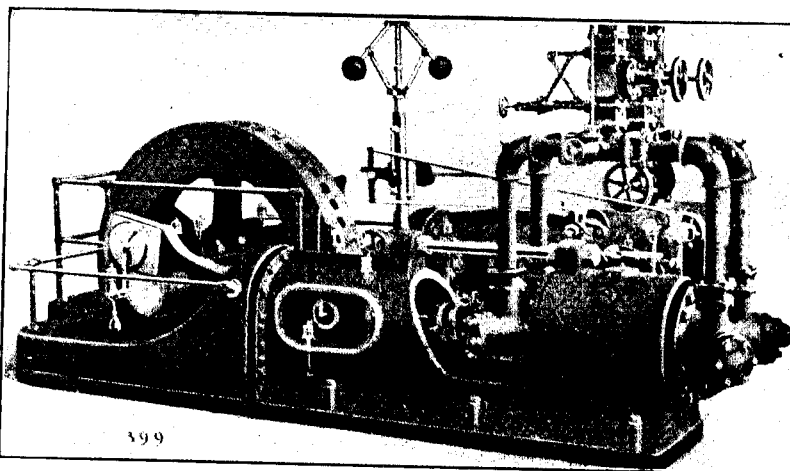
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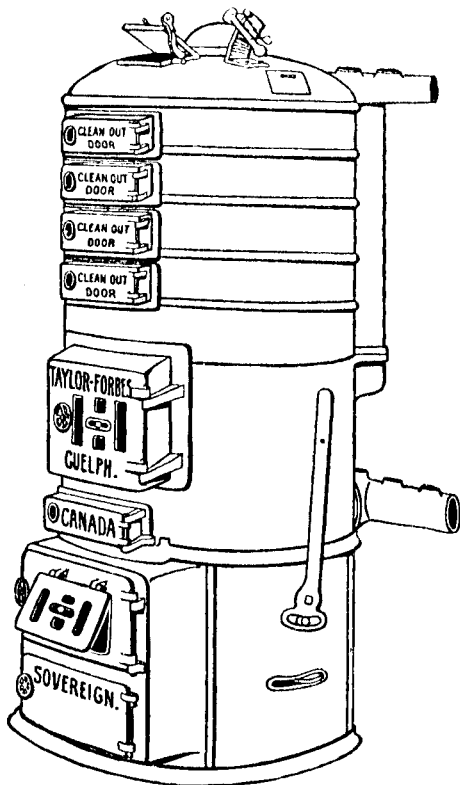
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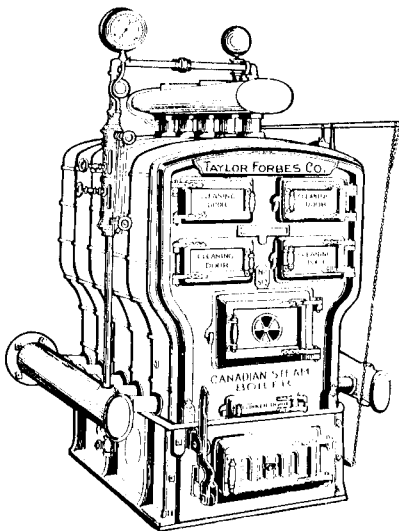
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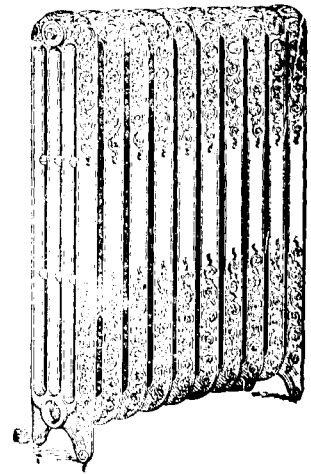
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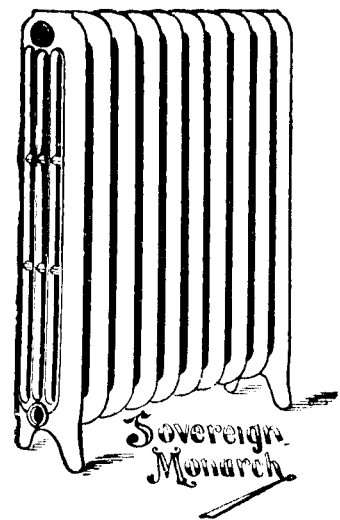
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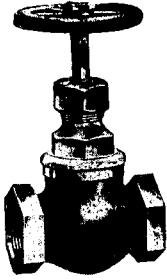
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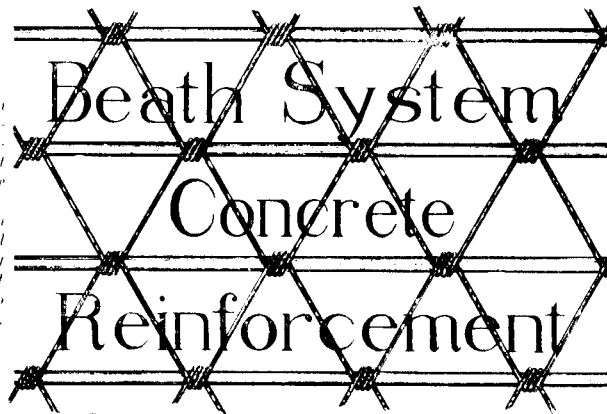
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- Most perfect mechanical bond.
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- Higher elastic limits with the same quality of steel due to cold drawing.
- Every ounce of steel tested, as it cannot be cold drawn without showing defects, if any.
- Diagonal cross wires distribute stresses due to concentrated load over a greater area.
- The only design of fabric reinforcement where cross or diagonal wires assist longitudinal or tension members in carrying the load.
- Supplied black or galvanized, but black is recommended owing to its better bond in concrete.

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Number and Gauge of Wires, Areas per Foot, Width and Weights per 100 Square Feet.

Styles Marked * Usually Carried in Stock.

Style No.	No. of Wires Each Long.	Gauge of Wire Each Long.	Gauge of Cross Wires	Sectional Area Sq. In.	Sectional Area Cross Wires.	Cross Sectional Area per ft. width.	Approximate Weight per 100 sq. ft.
4	1	6	14	.087	.025	.102	43
5	1	8	14	.062	.025	.077	34
6	1	10	14	.043	.025	.058	24
7	1	12	14	.026	.025	.041	17
23	1	12	14	.026	.038	.064	26
24	1	12	14	.026	.038	.064	26
25	1	12	14	.026	.038	.064	26
26	1	12	14	.026	.038	.064	26
27	1	12	14	.026	.038	.064	26
28	1	12	14	.026	.038	.064	26
29	1	12	14	.026	.038	.064	26
30	1	12	14	.026	.038	.064	26
31	1	12	14	.026	.038	.064	26
32	1	12	14	.026	.038	.064	26
33	1	12	14	.026	.038	.064	26
34	1	12	14	.026	.038	.064	26
35	1	12	14	.026	.038	.064	26
36	1	12	14	.026	.038	.064	26
37	1	12	14	.026	.038	.064	26
38	1	12	14	.026	.038	.064	26
39	1	12	14	.026	.038	.064	26
40	1	12	14	.026	.038	.064	26
41	1	12	14	.026	.038	.064	26
42	1	12	14	.026	.038	.064	26
43	1	12	14	.026	.038	.064	26

Special Sizes on Application.
LENGTH OF ROLLS: 150-ft., 300-ft., and 600-ft.
WIDTHS: 18-in., 22-in., 30-in., 34-in., 42-in., 46-in., 54-in., and 58-in.

**LONGITUDINALS SPACED 4-INCH CENTERS,
CROSS WIRES SPACED 2-INCH CENTERS.**

Number and Gauge of Wires, Areas per Foot, Width and Weights per 100 Square Feet.

Styles Marked * Usually Carried in Stock.

Style No.	No. of Wires Each Long.	Gauge of Wire Each Long.	Gauge of Cross Wires.	Sectional Area Sq. In.	Sectional Area Cross Wires Sq. in	Cross Sectional Area per ft. width.	Approximate Weight per 100 sq. ft.
4-A	1	6	14	.087	.050	.137	53
5-A	1	8	14	.062	.050	.112	44
6-A	1	10	14	.043	.050	.093	37
7-A	1	12	14	.026	.050	.071	28
23-A	1	12	14	.026	.062	.088	35
24-A	1	12	14	.026	.062	.088	35
25-A	1	12	14	.026	.062	.088	35
26-A	1	12	14	.026	.062	.088	35
27-A	1	12	14	.026	.062	.088	35
28-A	1	12	14	.026	.062	.088	35
29-A	1	12	14	.026	.062	.088	35
30-A	1	12	14	.026	.062	.088	35
31-A	1	12	14	.026	.062	.088	35
32-A	1	12	14	.026	.062	.088	35
33-A	1	12	14	.026	.062	.088	35
34-A	1	12	14	.026	.062	.088	35
35-A	1	12	14	.026	.062	.088	35
36-A	1	12	14	.026	.062	.088	35
37-A	1	12	14	.026	.062	.088	35
38-A	1	12	14	.026	.062	.088	35
39-A	1	12	14	.026	.062	.088	35
40-A	1	12	14	.026	.062	.088	35
41-A	1	12	14	.026	.062	.088	35
42-A	1	12	14	.026	.062	.088	35
43-A	1	12	14	.026	.062	.088	35

Special Sizes on Application.
LENGTH OF ROLLS: 150-ft., 300-ft., and 600-ft.
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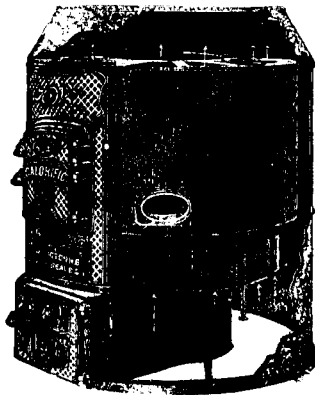
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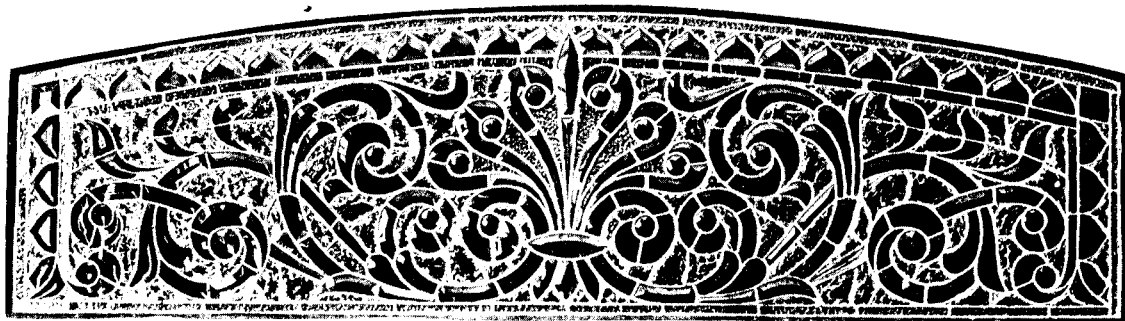
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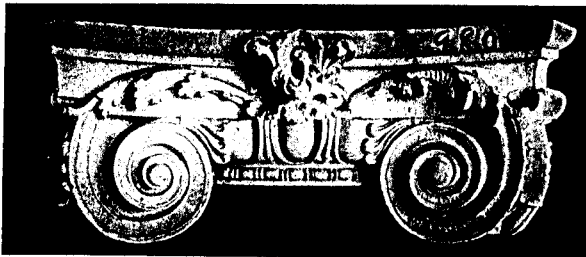
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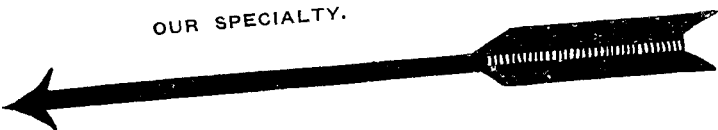
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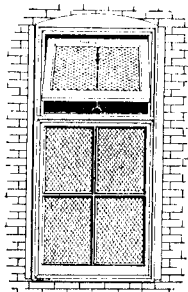
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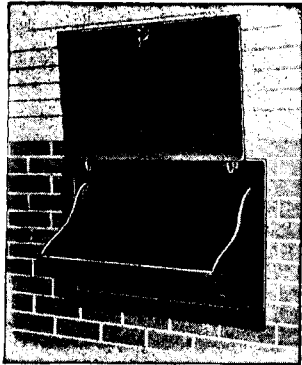
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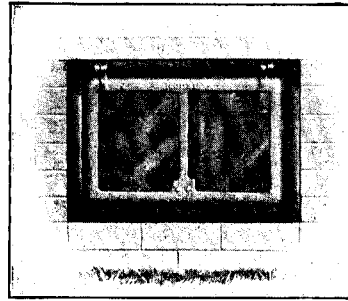
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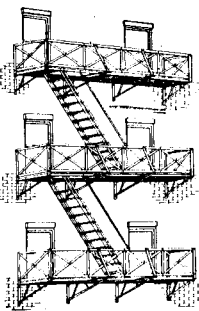
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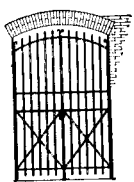
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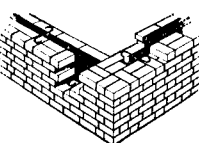
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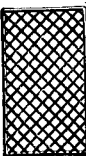
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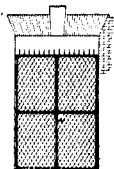
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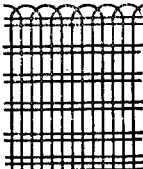
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