

SCIENTIFIC AMERICAN

Building Monthly.

[Entered at the Post Office of New York, N. Y., as Second Class Matter. Copyright, 1908, by Munn & Co.]

Vol. XXXVII. No. 1.

NEW YORK, JANUARY, 1904.

Subscription, \$2.50 a Year.
Single Copies, 25 Cents.



MAIN ENTRANCE

"WHITE HALL," THE HOUSE OF H. M. FLAGLER, PALM BEACH, FLA.—See page 3.

MESSRS. CARRÈRE & HASTINGS, ARCHITECTS.

SCIENTIFIC AMERICAN BUILDING MONTHLY

ESTABLISHED 1885

\$2.50 a Year. Single Copies, 25 Cents

MUNN & CO., Editors and Proprietors
No. 361 Broadway, New York

NEW YORK, JANUARY, 1904.

CONTENTS

Monthly Comment: A New Idea in Adjoining Houses.—The Stuffy House.—Locality in City Development.—A Model Juvenile Asylum.—Some Secrets of Good Building	2
Some Home Builders and What They Did.....	2
Talks on Architecture, by BARR FERREE: "White Hall," the House of H. M. Flagler, Palm Beach, Fla.—ILLUSTRATED	3
A Residence at Mount Prospect Avenue, Newark, N. J.—ILLUSTRATED	16
Window Treatment.—ILLUSTRATED	16
Residence of William H. Sands, Esq., at Aiken, S. C.—ILLUSTRATED	16
Colors and Color Decoration	16
The Household: Cleaning Hints.—Walls and Tile Paper.—Bathroom Fixtures.—Palms in Winter.—The Smoking-Room	17
The Garden: Ornamental Gateways.—Roof Gardens for Private Houses.—To Keep Ferns in Winter	17
Heating Talk: Furnace Hints.—The Open Fire.....	18
A Residence at New Bedford, Mass.—ILLUSTRATED.	18
A Residence at New Bedford, Mass.—ILLUSTRATED.	18
Domestic Problems: Supporting a Family on Fifteen Cents a Day.—\$3,500 in New Jersey	18
Sanitation: Sanitary Characteristics of Made Ground.—Filthy Cellars.—Painting Brick Walls.—Bacterial Treatment of Sewage	19
Residence of Henry F. English, Esq., New Haven, Conn.—ILLUSTRATED	19
The Architect's Duties	19
Construction: Winter Bricklaying, by Stewart MacGregor.—Cement and Temperature	19
New Books: Stately Homes in America	20
A Residence at Chestnut Hill, Mass.—ILLUSTRATED.	20
A Pair of Houses on Lincoln Drive, Germantown, Pa.—ILLUSTRATED	20
The House: A Russian House	20
Legal Notes: Assignment of Lien.—Building on Another's Land.—Claim for Interest.—Contract with Architects.—Defective Plastering.—Employer or Subcontractor.—Employer and Employee, Liability for Injuries.—Superintending Construction, Action for Services	21
A House at Woodmere, L. I.—ILLUSTRATED.....	21
Satinwood Furniture	21
New Building Patents: Brick, Stone and Tile.—Carpentry.—Construction.—Elevators.—Fireproofing and Fire Extinguishment.—Hardware.—Heating and Ventilation.—Miscellaneous.—Plumbing.—Tools	21
Publishers' Department: Warm Air Generators (ILLUSTRATED).—Portable and Ready-Made Buildings (ILLUSTRATED).—Granite Roofing (ILLUSTRATED)	22

** The engravings presented in this issue are made from photographs taken specially for the SCIENTIFIC AMERICAN BUILDING MONTHLY.

MONTHLY COMMENT.

THERE is no severer test to friendship than to live with other people, unless it be where two or more families combine in joint-tenancy of a building and make their joint common habitation a purely friendly combination. Certain privacy, although not only of the extent that is desired, may be obtained in flat houses, and more than this is seldom desired. Two gentlemen residing in a Western city have, however, struck a new note for adjoining houses, by building a pair of dwellings exactly alike and close enough together to be connected by a high colonnade. Each house is absolutely free and independent, and one is no nearer the other than many suburban houses, but the architectural bond is a new and original feature of much interest. The Colonial style has been selected for architectural treatment, and each house has a large semicircular porch reaching through two stories, supported by Ionic columns. The colonnade is similar in design, and an extremely stately effect has been secured by this simple device.

THE stuffy house is perhaps as common a kind of dwelling as exists. The number of people afraid of fresh air is astonishing, and yet fresh air is one of the essentials of good living. Many people seem to think that the purpose of a window is to be kept closed; often enough it is so covered with curtains and shutters that the light even is hardly admitted. Yet, as a matter of fact, windows exist for two purposes—to admit light and to admit air. The light, of course, need not be glaring nor too abundant; common sense will regulate its quantity; but light can be obtained from no other source, and hence the value of the window as a light admitter is supreme. Its utility in providing fresh air is quite as certain and effective. The dwelling house can hardly be too much ventilated.

Every room should be thoroughly aired every day and kept sweet and clean by this simple method. It is not necessary to sit in cold, draughty rooms to secure this end; that is something quite different. But rooms must be aired constantly and sufficiently to keep the house in good condition. A stuffy house filled with concentrated odor of cooking and human beings is an abomination to be avoided above all things.

LOCALITY often appears to exercise an important influence on the success of a community without any apparent reason. The supremacy of New York among American cities is readily made clear by reason of its harbor, and the commercial advantages which have resulted from this its chief glory. Chicago's growth has been brought about by its situation on Lake Michigan and the tremendous railroad connections, but there does not appear to be any real reason why the latter should not have developed at some other point, having natural advantages greatly superior to those of the Western metropolis. The same thing is true of lesser communities. Cities will thrive in some place and not in others; towns in one situation will grow greater and greater, and no one knows the reason why. Individual energy on the part of the inhabitants does not always account for the mystery; natural advantages do not always explain it; undoubtedly there is a combination of circumstances that our economic philosophers have not yet made clear which accounts for the prosperity of communities, and which may be simple enough were the reasons really known.

THE new buildings and grounds now in process of construction for the New York Juvenile Asylum constitute one of the most interesting architectural undertakings proposed for early realization in the United States. The new project consists, in short, in the creation of a children's village for the exclusive use of the asylum, a village designed with due regard to the needs of the institution and in a very pleasing type of architecture. It is likely to prove, for some time to come, the model community in the neighborhood of New York. The asylum has long since outgrown its old quarters on Washington Heights, and the new community at Chauncey, on the New York and Putnam Railroad, about thirteen miles from One Hundred and Fifty-fifth Street, will offer the utmost contrast to the old ones. Separate buildings will be provided for separate needs; broad lawns, ample playgrounds, and a well conceived plan will add to the attractions of the place. The plans indicate a distinct advance in designing institutions of this sort.

The secret of success in building is care, taste, and knowledge. A building is a more or less permanent structure; one should be careful in what one does. Taste is essential in obtaining a good esthetic result; and one should always know what the result will be before beginning operations. Haphazard building is to be avoided above all things, and the more thought put into the structure, the greater the satisfaction to be derived from it.

SOME HOME BUILDERS AND WHAT THEY DID.

A PERIODICAL that boldly prints across its face the legend, "The Magazine with a million," meaning thereby a million edition, is clearly entitled to very great respect. An issue of a million copies of any publication can only be achieved in the case of extraordinary merit; at least, it is evident that very many people read it, and, no doubt, many persons look upon it as a shining light in the general darkness that envelops humanity.

A periodical of this description has, for some time past, been entertaining and instructing its readers with heart-to-heart autobiographies, dealing wholly with adventures met with in saving money for building homes. It is a theme of most abounding popular interest, since the merits of home owning have been preached most persistently by numerous prophets, and so constantly have its advantages been talked of that the mere rent-payer has come to be looked upon as a foolish, extravagant person, who does not know how to take care of himself.

The chapters referred to constitute the most considerable body of confessions on the subject of saving for the house that have ever been brought together. The whole country has been ransacked for examples, and very varied are the tales and experiences presented. No sum appears to have been too small on which to make a beginning; no financial difficulties seem ever to have deterred the determined house owner from accomplishing his set aim and purpose. No family misfortune, no trial of sickness or of death even, seems to have stood in the way of perfecting ownership, paying off debts, and getting the house. And, no doubt, as an evidence of good faith, most of the stories are embellished with portraits of the houses, so, it may be presumed, that those who doubt may have visual evidence before them.

The first impression created by these articles is the

extent of the home owning fever; it is confined to no one section of the country, but experiences are presented from widely separated points. The next point is the intense earnestness with which the goal has been sought. Nothing, apparently, has stood in the way of obtaining the coveted ownership. A single illustration will suffice, a particularly harrowing case of a woman whose husband earned \$7 per week, and who started with a cash capital of \$30 after six years of married life. They had a child of five. Various economies were made at the start; a hand sewing-machine was rented for \$3 per year, a garden planted, worked by the husband at night, the woman, meanwhile, sewing nightly until one A. M., getting up at five, and taking enough sleep on Sundays to leave her in good shape for the coming week(!!). The husband's salary in due time was increased to \$8 per week, the woman sewed more, and at the end of seven years \$935 had been paid for the house and it was free of debt. This account ends with the naive statement that the woman had been the petted child of rich parents, and did not know the value of money until after she was married. The history she has composed certainly suggests that her appreciation of its worth was afterward very great.

Was it worth it? That, of course, is a question that can only be answered by those who have gone through the fire. The hard hearted reader may instantly reply that it was not; that the pinching and scraping, the rigid economies, the joyless existence, the hard luck, the danger of loss were too great for the result obtained. And the objection would be a valid one were it not for the fact that the persons who underwent these experiences took up their burdens gladly and freely; they wanted to pinch and scrape and save; they were happy in skimping themselves because they had a reward in view that they fancied would amply compensate them for the trials they assumed.

This touches on the secret of the successes in these ventures: the burdens were willingly assumed and gladly borne; those who assumed them would not have been happy in any other mode of life. And the object sought was something real, with positive value possibly greater than the face value of the money saved. The incentive was considerable and quite sufficient to spur on the investor to the greatest possible efforts.

It is not, however, likely that the question of the value or the importance of owning a home will be settled by the publication of such experiences. When home ownership involves risks, economies, and even privations, it becomes a matter for individual settlement alone. One may, indeed, read and ponder over what others have done; one may be astonished at results, one may marvel at experiences, one may wish one could do likewise and still have neither the courage nor the hardihood to undertake like risks. It is a safe proposition that \$7 a week in wages is quite too little for any man to marry on, or to think of marrying on; but it is a proper rejoinder that people who would marry with such incomes are the very ones who might, with sufficient economy, come into home ownership through the hardest sort of hard work. Not every one could do it, and not every one rash enough to assume family burdens on such an income could even make the poorest of household ends meet; but the man and woman who, with no larger income, would put their shoulders to the wheel might, very likely, win out in the end.

Success is a most attractive result, and those who succeed in any sort of an undertaking are entitled to respect. No one can build and acquire ownership in a home on small wages without assuming very considerable risks. If the thing is carried through the venture has been successful, and apparently, the enterprise has succeeded. But home building on small incomes almost invariably necessitates assuming debts. Long periods of time are needed to pay off the charges; if the payments are long drawn out, the house, when free, is an old one and in itself may not be worth what it cost. The value of the property as property may have increased through external betterments or other conditions. Rent has, of course, been avoided, but there have been repair bills and expenses which had not been calculated at the beginning.

All this, however, counts as nothing when freedom from debt is obtained and the house is one's own. Every betterment put upon it is to one's own good. Every tree planted, every shrub raised, every window reglazed, every post repainted, every new piece of piping—everything, in fact, is one's own, and in the sense of possession and ownership is a salve for many buffetings and hardships—if one can stand the strain.

That, in the end, is the final test. One can not lightly assume the risks of house ownership, and the articles to which we have referred testify that only by the utmost exertion can people of small means—of the smallest means—finally hope to obtain this much to be desired end. Matrimony and house ownership are at least alike in this: that they are expensive undertakings; they have many compensative joys; and they are all right if they end right.

TALKS ON ARCHITECTURE

By BARR FERREE.

"WHITE HALL," THE HOUSE OF H. M. FLAGLER,
PALM BEACH, FLA.

I CAN imagine few things more delightful than a trip to Florida in the agreeable companionship of Mr. Thomas Hastings; the only more agreeable thing I can think of at this moment is to go somewhere else with him. Mr. Hastings is not only one of the most charming persons alive, but his architectural skill and his architectural knowledge—two qualities quite different and not always found combined in one man—are of a very unusual order. I need hardly say that I take it for his work, which, in conjunction with his associate, Mr. John M. Carrère, has had very wide geographical distribution, is well known to all art lovers and appreciators of the beautiful. It is quite sufficient to remark of Mr. Hastings that he is one of the few living architects in America who can be called truly artistic. Many architects, no doubt, wish to be considered artists; Mr. Hastings is an artist, whatever his personal views may be on the question.

A few years ago Palm Beach was unknown to most people. It is so no longer. The energies which opened up the resort places of Florida have made the name of Palm Beach a tolerably familiar one, and the extraordinary beauties of the place are destined to add to its fame. The Florida resorts are, at least, alike in this, that they are all beautiful. I need say no more than that Mr. Flagler has caused the erection of his great house in one of the most beautiful spots on the Florida coast. It is a spot to charm and delight, and the potency of its charm is well attested in the present instance by the building of this great home.

The Flagler mansion is a house built with an apparent disregard of cost. Like many great modern houses it is comparatively simple in its external treatment. It is eminently stately and serene in its general treatment, the great colonnade of the main front being the chief external adornment. But this is no ordinary colonnade; the columns are monumental in scale, and the five great arched openings behind them, and the large windows above, are direct expressions of internal splendor of dimensions which the front, and the whole of the exterior, so admirably express. For the house is large, of a scale of vastness so great as to place it almost by itself in the catalogue of great American country houses. It clearly stands in a class quite distinct from great houses in the North.

Architecturally considered, it is two stories in height, the attic story being largely placed in the roofs, which are long and low and sloping, and whose varying heights have been most cleverly utilized in giving variety to the silhouette. Like many of Mr. Hastings' designs, this dwelling is classic both in feeling and in detail; but the solemnity of the Roman Doric colonnade has been lightened as far as possible, and the house bears unmistakably the character of a great American country house, which, moreover, is most admirably adapted to its environment in the beautiful Florida landscape in which it has been placed.

I have alluded to the great size of the house; it is not necessary to say more on this point than to remark that the front is a hundred and seventy-five feet long, and the depth a hundred and fifty-five feet. Such dimensions would be intolerable in a Northern house; but they are none too great here, since the center of the dwelling is occupied by a great court,

about ninety feet by fifty feet—a court at once spacious enough to amply light all the rooms and passages that open upon it, useful enough to form a most agreeable place of recreation and retreat, and beautiful enough to form a most entrancing center to this magnificent home.

Adjectives, indeed, are apt to pile up mountainously in describing this splendid house. I have no intention of flattering Mr. Hastings by describing it as the finest thing of its kind; it is not necessary to go so far as that; and, as a matter of fact, not all the credit is his. The house was planned and built by Messrs. Carrère & Hastings. Their own part in the work as architects ceased with the entrance hall, the decorative furnishings of which, together with the whole of the rest of the interior, having been designed and executed by the decorative firm of Pottier & Stymus Co.

Probably no one enters the Flagler house without expecting to see architectural wonders within it. The

The handrails are beautiful examples of modern bronze work; before each ramp is a fine piece of old tapestry; a central window looks into the court. The walls are of white and green marble, and at each end the length is reduced somewhat by a screen of double columns standing one close behind the other, forming inner vestibules to the rooms that open from either end. The ceiling is richly carved and treated in gray with ornamentation in solid gold; in the center is a large circular painting by Benevenotti. The chairs, tables, and chests with which the hall is furnished were expressly made for this room, and are fine examples of costly workmanship. The bay trees standing by the window should not be forgotten, nor the standards with electric lights. The splendid marble floor is partly covered with superb rugs. The general treatment is Louis XVI.

From the hall one passes on the right to the drawing-room, and on the left to the library. These rooms complete the apartments opening on the front of the house, but their greater dimensions are on the sides. The library, like many libraries in the houses of the great, is not so much a storehouse for books as an agreeable room to read in if one is so inclined. Nothing is wanting to heighten the effect of delightful surroundings in this apartment. The style is Renaissance. The walls have a high wainscot of Circassian walnut, above which they are covered with red Spanish damask of two shades. The walnut mantelpiece between the windows is paneled with brass ornaments, and is richly gilt, the over mantel being filled with a fine life-sized portrait of Mr. Flagler. Comfortable and richly carved easy chairs, handsome desks and tables, ample bookcases, interesting paintings on the walls, add to the good cheer of the room.

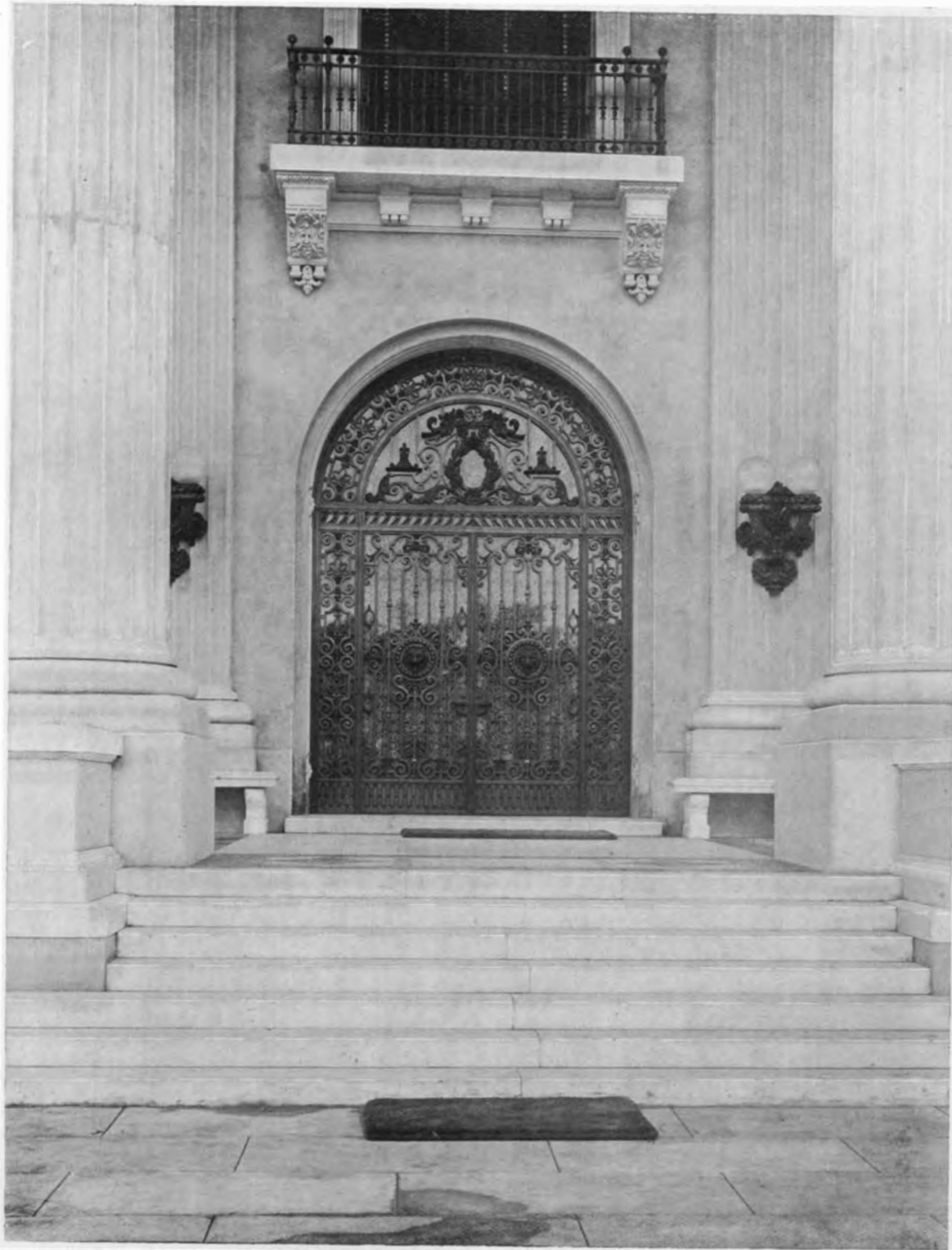
Then comes the art gallery and music room, an apartment of large size, admirably designed for the choice collection of paintings gathered by the cultured owner of the house. At one end is a large pipe organ, the room serving the double purpose of music room and art gallery. It is treated in old ivory and antique gold. In the center of the ceiling is a copy of the celebrated painting of "Aurora." It is lighted with jeweled crystal chandeliers.

The next room is the billiard-room, a quaint apartment in the Swiss style. The beamed ceiling is distinctly Teutonic in decorative feeling. It contains both billiard and pool tables. It has a simplicity and directness of effect in charming contrast with the more richly decorated apartments through which we have passed.

Retracing our steps and returning to the hall, we turn to the right and enter the grand salon, which occupies the space on this side of the house corresponding to the library. Like the hall, it is Louis XVI. in style, and is a sumptuous apartment in French gray, the walls paneled in gold and gray brocaded silk. It contains a beautiful mantel of white statuary marble; the ceiling has decorated medallions; the portieres are richly embroidered, and the elaborate pieces of furniture are veritable works of art.

Immediately adjoining it is the dining-room, which, as is to be expected in a house of this style and character, is most hospitable in size. The style is Francis I., and the color scheme is a rich green, and the walls have a paneled wainscot of satinwood below, and above are covered with a rich brocade. The elaborate mantelpiece supports a mirror enclosed within a rich frame. The beautiful ceiling is coffered in large squares with ornaments in high

(Concluded on page 16.)



THE BRONZE DOOR—"WHITE HALL," THE HOUSE OF H. M. FLAGLER,
PALM BEACH, FLA.

handsome bronze door at the main entrance certainly suggests that it guards art treasures; yet as they swing back to admit the visitor one pauses instinctively. One ordinarily enters a house expecting to find space circumscribed. One enters the Flagler house with a sense that here is space; the cramping must have been without. The hall is of astonishing size, filling the whole of the central front of the house, and, with the staircase, extending back to the inner court. No aid to splendor has been neglected here. There is size, and richness of parts, and beauty of decoration, and richness of color, and stateliness of furniture; it is a truly palatial vestibule to a most palatial home.

Directly before one, as one enters, is the double staircase of white statuary marble to the upper story. It occupies fully a half of the whole length of the hall, standing in a recess of its own, the beginning of the stairs being marked off with groups of four columns of polished American white and green marble, with a great marble vase before each group.

SCIENTIFIC AMERICAN

Building Monthly.



"WHITE HALL," PALM BEACH, FLA.—RESIDENCE OF HENRY M. FLAGLER, ESQ.

No. 219

JANUARY, 1904

MUNN & CO., PUBLISHERS NEW YORK

\$ 2.50 A YEAR

SINGLE COPIES 25 CTS

THIS ISSUE CONTAINS

"White Hall," the Estate of H. M. Flagler, Palm Beach, Fla.



A RESIDENCE AT MOUNT PROSPECT AVENUE, NEWARK, N. J.—See page 16.
MR. PHILIP HENRY WARD, ARCHITECT.

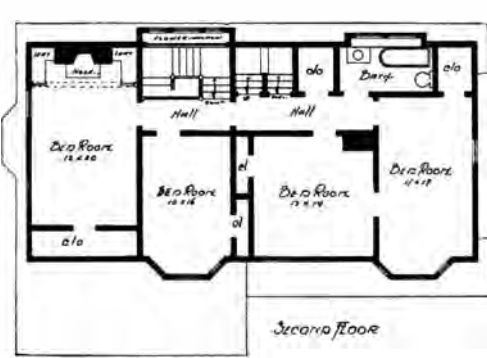


THE LIBRARY.

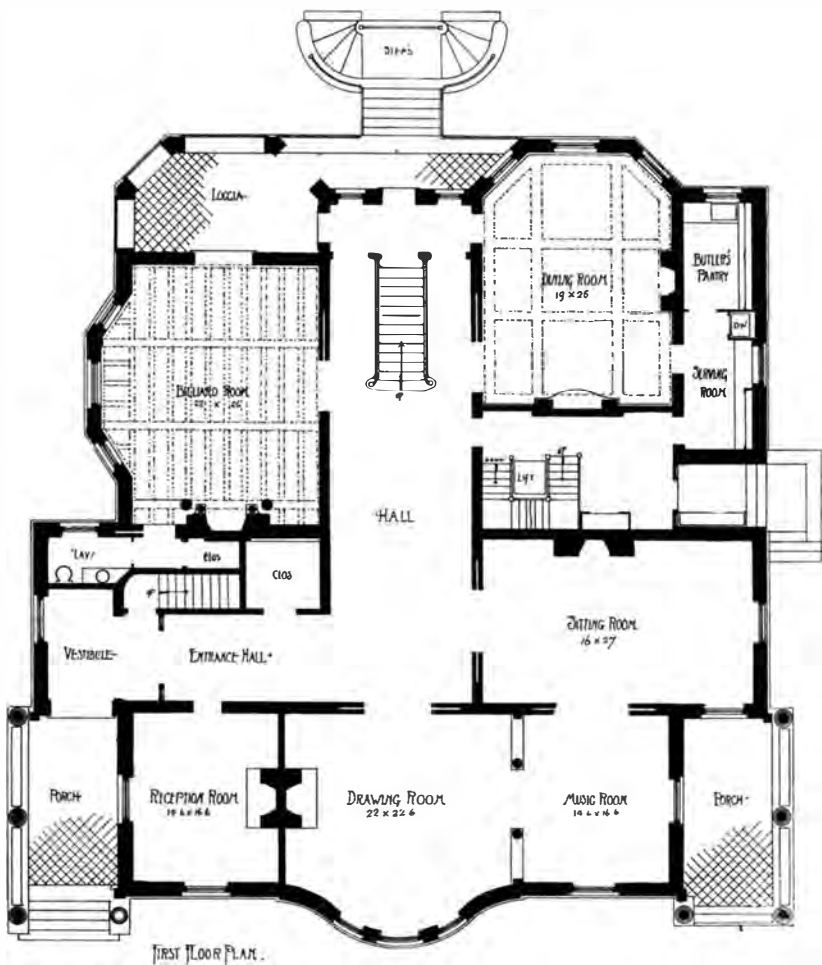


DINING-ROOM.

A RESIDENCE AT MOUNT PROSPECT AVENUE, NEWARK, N. J.—See page 16.
MR. PHILIP HENRY WARD, ARCHITECT.



TWO RESIDENCES AT NEW BEDFORD, MASS.—See page 18.
MR. NATHANIEL C. SMITH, ARCHITECT.



RESIDENCE OF HENRY F. ENGLISH, ESQ., NEW HAVEN, CONN.—See page 19.
MR. BRUCE PRICE, ARCHITECT.



FRONT VIEW.—WALK.

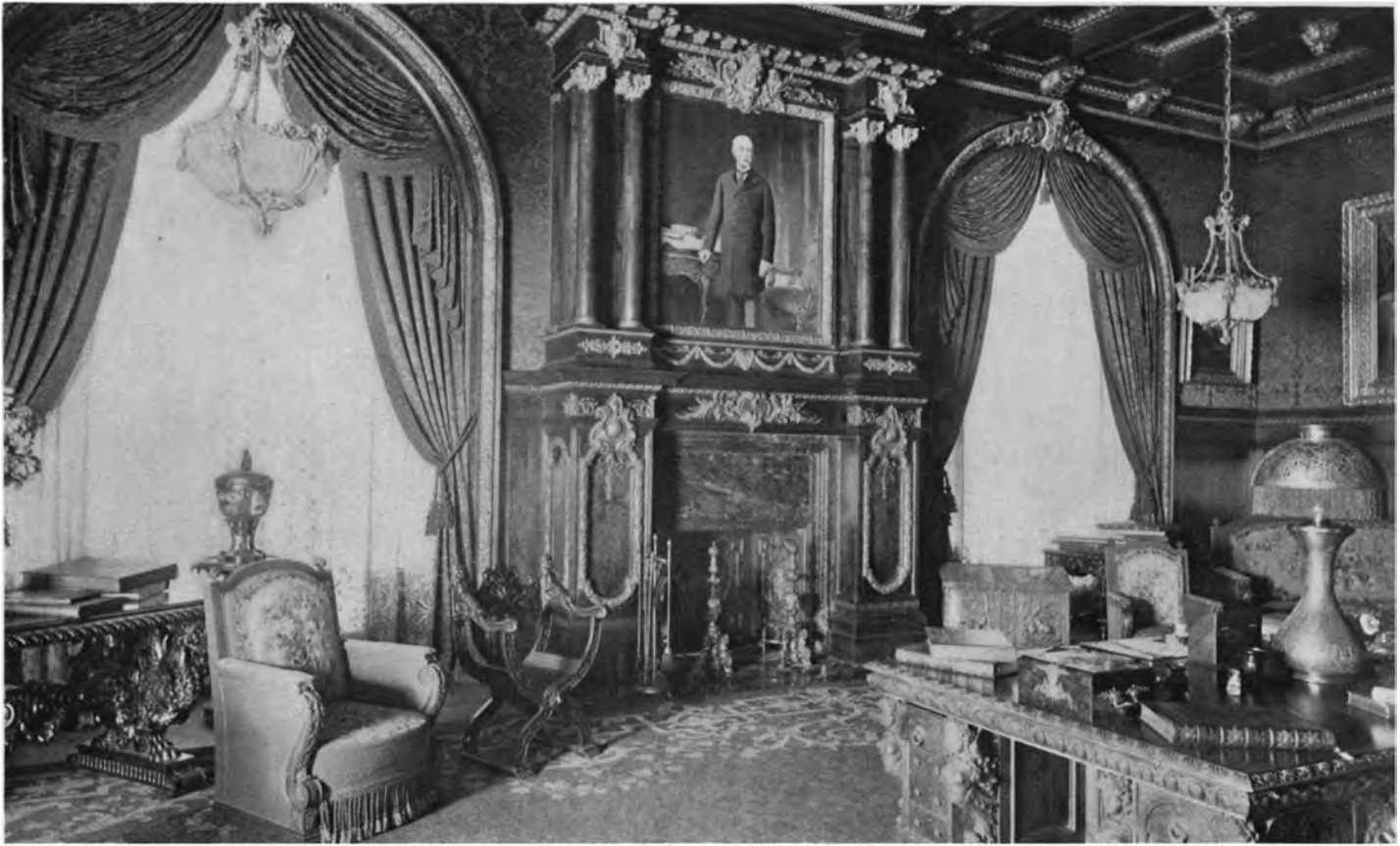


THE HALL.



GRAND STAIRWAY.

"WHITE HALL," THE HOUSE OF H. M. FLAGLER, PALM BEACH, FLA.—See page 3.
MESSRS. CARRERE & HASTINGS, ARCHITECTS.



LIBRARY.

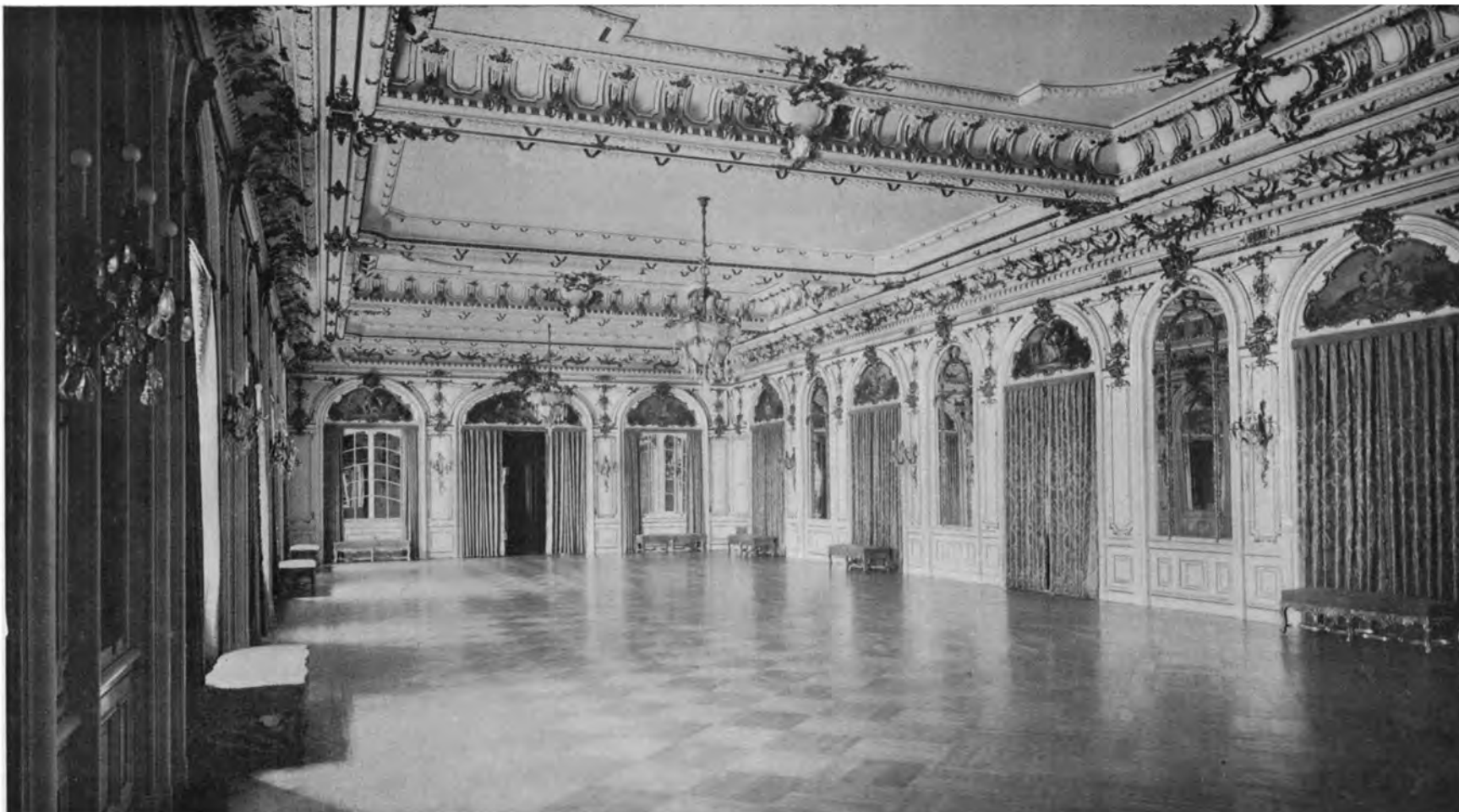


ROSE DU BARRY CHAMBER.—COLONIAL.



DINING-ROOM.

“WHITE HALL,” THE HOUSE OF H. M. FLAGLER, PALM BEACH, FLA.—See page 3.
MESSRS. CARRÈRE & HASTINGS, ARCHITECTS.



BALLROOM.



INNER COURT.



THE FOUNTAIN.



SOUTH SIDE.

"WHITE HALL," THE HOUSE OF H. M. FLAGLER, PALM BEACH, FLA.—See page 3.
MESSRS. CARRÈRE & HASTINGS, ARCHITECTS.



A RESIDENCE AT CHESTNUT HILL, MASS.—See page 20.
MR. HORACE S. FRAZER, ARCHITECT.



REAR VIEW.



FRONT VIEW.

A HOUSE AT WOODMERE, L. I.—See page 21.
MESSRS. ROSSITER & WRIGHT, ARCHITECTS.

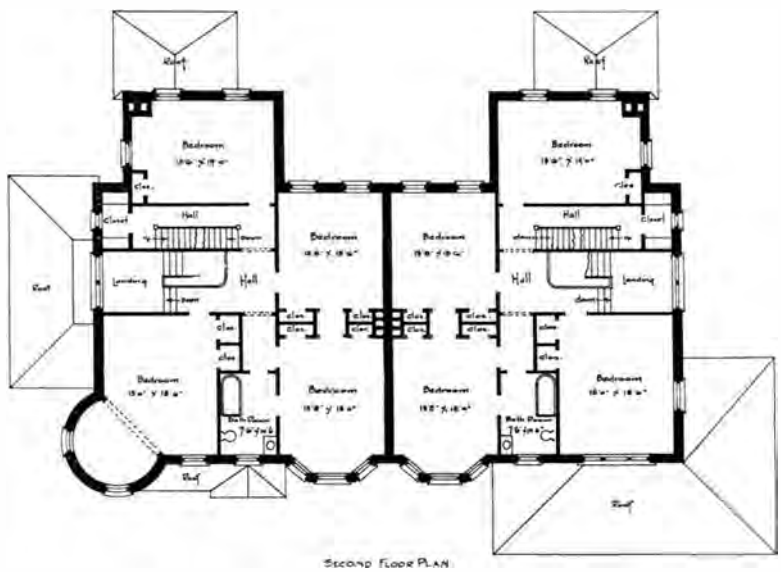
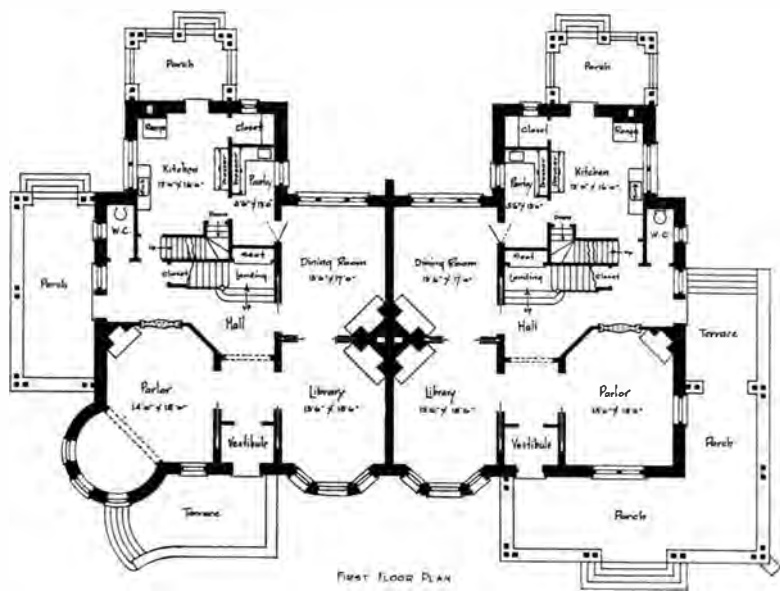


LIVING-ROOM.

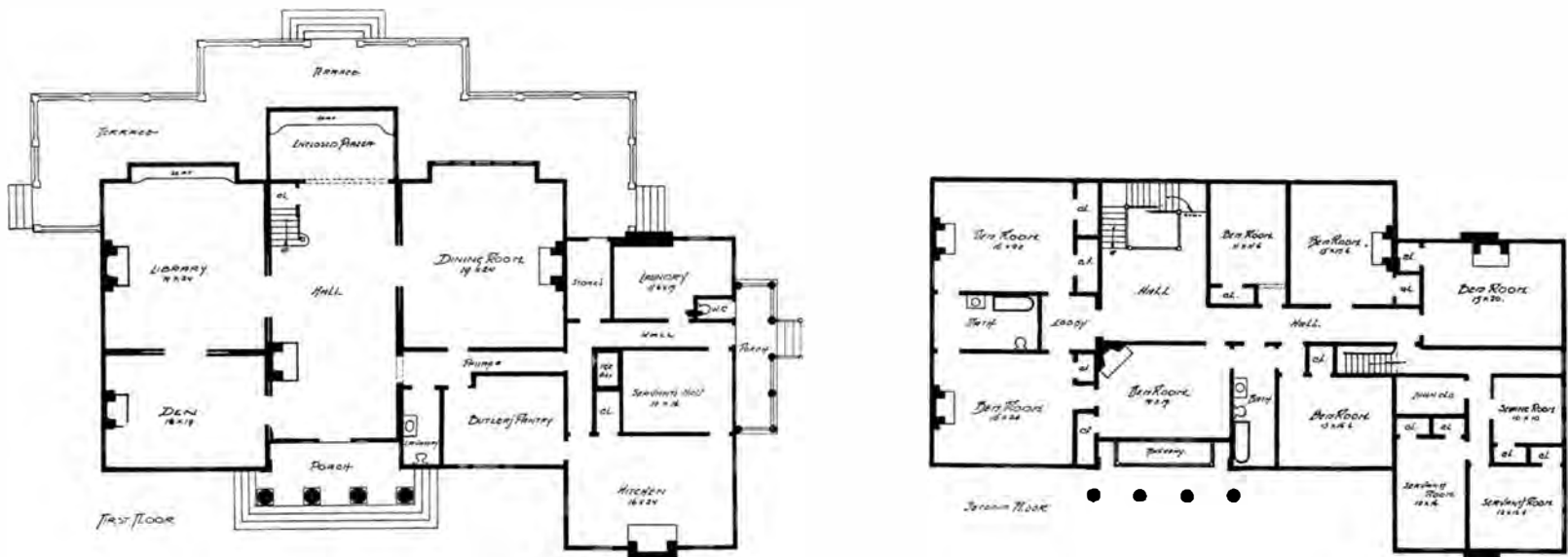


DINING-ROOM.

A HOUSE AT WOODMERE, L. I.—See page 21.
MESSRS. ROSSITER & WRIGHT, ARCHITECTS.



A PAIR OF HOUSES ON LINCOLN DRIVE, GERMANTOWN, PA.—See page 20.
MR. LAURENCE VISSCHER BOYD, ARCHITECT.



RESIDENCE OF WILLIAM H. SANDS, ESQ., AT AIKEN, S. C.—See page 16.
MESSRS. HOPPIN & KOEN, ARCHITECTS.

**"WHITE HALL," THE HOUSE OF H. M. FLAGLER,
PALM BEACH, FLA.**

(Concluded from page 3.)

relief, and is green and cream. The splendid sideboards, china closets, the chairs, the long dining table are entirely in keeping with the rich character given the room by its architectural setting, and were expressly made for this room. Adjoining it is a small breakfast room in ivory enamel; the ceiling ornamentation is tipped with gold; the furniture is mahogany with bronze mountings.

And then, beyond, is the kitchen, with pantries, serving rooms, storage rooms, and other dependencies filling an extension beyond the main building. In a corresponding space on the other side are two offices, one of which is set apart for Mr. Flagler's personal use.

The rear of the house—in the space on the further side of the court and corresponding to the hall—is filled with a ballroom. Very splendid and grand it is, as are all the great "show" rooms. The style is Louis XV., and the color scheme white and gold. Five great openings on either side form the motif; on one side they are windows; on the opposite side they are curtained doorways. The spaces between have round, arched panels filled with mirrors. The hangings and draperies are of Rose du Barry silk. The decorations are almost purely architectural, the doorways, windows, and mirror panels being encased within a wood paneling. The panels over the doors and windows are copies by Gatty, of Paris. The ceiling is treated in large rectangles, the alternate ones being the richer. The room is lighted by lights dependent from the ceiling, and by side lights. The furniture, as befits a ballroom, is confined to low stools and benches.

As for the bedrooms, which fill the upper story, I have neither the space nor, I may frankly add, the ability to describe them. Such gentle charm, such delicate variety, such delightful furnishings, such taste in wall coverings, in furniture, in arrangement, I rarely expect to see surpassed. The bedrooms, even of the master and mistress of a palace like this, are hardly to be ranked as show rooms. They are certainly not that in this house of great "show" rooms, nor are they the modest living apartments one sometimes associates with the idea of bedrooms. But they are ample, spacious apartments, exquisitely furnished, each given a real note of individuality, and each leaving nothing to be desired for comfort and convenience. Everything has been especially designed for its place, and each room is treated consistently in a definite period.

And the rest? Unlike a great country house in the North, this vast Southern palace has no outbuildings and subsidiary structures. One does not keep a stable of horses at Palm Beach, and one does not need elaborately planned and cultivated gardens to set off one's house, even if fabulous sums have been spent upon it, and no pains been spared to make it splendid without and sumptuous within. Plants and flowers, trees and shrubs, grow here unaided and with rare Southern profuseness and rapidity. The Southern life is not the Northern life, but surely every requisite of comfort and elegance has been brought together in this magnificent dwelling by the Southern water.

**A RESIDENCE AT MOUNT PROSPECT AVENUE,
NEWARK, N. J.**

On pages 4 and 5 will be found illustrations of a residence erected for F. W. T. Stiles, Esq., at Mount Prospect Avenue, Newark, N. J.

The building is of stucco and half-timber. The foundation is of stone with a low underpinning. The superstructure is of Portland cement with a stucco finish in a natural light gray color. The half-timber work and the entire woodwork is of hewn material, and is stained a dark brown color. The sashes are painted ivory white. The roof is covered with shingles and is stained a dull green color. The casement windows with leaded glass lights present an artistic effect.

Dimensions: Front, 38 ft.; side, 70 ft., exclusive of porte cochère. Height of ceilings: Cellar, 8 ft.; first story, 9 ft. 6 in.; second, 8 ft. 6 in.; third, 8 ft.

The hall is a central one, and is finished in a soft brown color, and has a paneled wainscoting six feet in height. The entrance hall is separated from the staircase hall by a beamed archway. The staircase rises from a broad landing, on which there is a nook provided with paneled seats, and an open fireplace, built of Roman brick with the facings and a hearth of the same, and a mantel. The library is treated in a similar manner, and has a bay window with a paneled seat, an ingle nook provided with an open fireplace with facings and hearth of Welsh tile and a mantel

shelf supported on brackets with strip panel work, showing the plaster between the same. On either side of the fireplace there are book cases built in, and also paneled seats.

The drawing-room is treated with white enamel, and contains two paneled seats, and an open fireplace furnished with white enamel tiling for the facings and hearth and mantel of Colonial style. The dining-room is finished in a dark soft brown color. The walls have a strip wainscoting, showing plaster panels. The ceiling is provided with strip panels. The fireplace has a hearth and facings of Welsh tile; the over-mantel is paneled the same as the wainscoting. The bay window has a paneled seat, and there is also a china closet built in, with leaded glass doors. The butler's pantry is trimmed with hard pine and is finished natural; it is provided with a sink, drawers, dressers, etc. The kitchen is trimmed with North Carolina pine finished with hard oil. It contains a hearth, with range, sink, pot closet, dresser, etc. The rear porch contains a refrigerator.

The second floor is finished with white enamel, and it contains four bedrooms, large well-fitted closets, dressing-room, and a bathroom, besides a servants' room and bath, provided with a private stairway to



WINDOW IN THE RESIDENCE OF J. W. GOODCHILD, ESQ.,
WYOMING, N. J.

kitchen. The bathroom has a tiled floor and a tiled wainscoting, and is furnished with porcelain fixtures and exposed nickelplated plumbing. The third floor contains two guest rooms, a trunk room, and a billiard room. The cemented cellar contains a furnace, laundry, fuel rooms, etc. Mr. Philip Henry Ward, architect, Walter G. E. Ward, associate, 800 Broad Street, Newark, N. J.

WINDOW TREATMENT.

Two examples of window treatment will be found on this page and on page 17.

The window on page 17 is from the house of F. H. Damors, Esq., New Bedford, Mass., and was designed by Mr. Nathaniel C. Smith, architect, New Bedford, Mass. It shows an exterior of a triple window, placed in an ample expanse of wall.

The window on this page is from the house of J. W. Goodchild, Esq., Wyoming, N. J., and was designed by Mr. J. W. Dow, architect, Wyoming, N. J. It shows the interior treatment of a similar window.

**RESIDENCE OF WILLIAM H. SANDS, ESQ.,
AT AIKEN, S. C.**

THE residence of William H. Sands, Esq., illustrated on page 15 is at Aiken, S. C. The building is of Colonial design, and its principal characteristic is the classic portico at the front which is supported on

Corinthian columns. The house has a brick underpinning, and the superstructure, of wood, is covered with matched sheathing, good building paper, and narrow clapboards, the whole of which is painted white. The roof is covered with shingles and is stained a dull green color. Dimensions: Front, 83 ft.; side, 36 ft., exclusive of piazza and porches. Height of ceilings: Cellar, 7 ft.; first story, 11 ft.; second, 10 ft.; third, 8 ft.

The plan shows a large central hall, which is provided with a paneled wainscoting, ceiling beams, an open fireplace furnished with a tiled hearth, brick facings, and mantel, and an ornamental staircase with a mahogany rail. The trim of this hall, as well as the entire house, is of white pine treated with white enamel. The den and library are treated similar, and each have open fireplaces, while the latter has a paneled wainscoting, ceiling beams, and seat. The dining-room has a similar treatment as the library, except that the wainscoting is six feet in height, and is furnished with a plate rack. The butler's pantry is fitted with drawers, dressers, sink, etc. The kitchen, servants' hall, and laundry are provided with all the best modern conveniences, and the trim of each is treated naturally. The second story contains seven bedrooms and two bathrooms, besides two servant rooms and bath, linen closet, and sewing-room. The bathrooms are furnished with tiled floor and wainscoting, and each is provided with porcelain fixtures and exposed nickelplated plumbing.

The third floor contains eight bedrooms, bathroom, and trunk room. Cellar, cemented, contains furnace and fuel rooms. Messrs. Hoppin & Koen, architects, 244 Fifth Avenue, New York.

COLORS AND COLOR DECORATION.

THE most valuable colors for decorative purposes are the ochres, which vary from a bright, though not vivid, yellow, to a color nearly approaching a tawny brown. The best ochre produces quiet tints in white and other colors, including a valuable green when combined with Prussian and other blue. In combination with vermilion, Indian, and Venetian red, it produces refined and quiet colors of great value. Most useful reds are light red, Indian, and Venetian red; these may be lightened to any degree with vermilion. The three reds produce good ground colors when mixed with white, white and yellow ochre, or white and black. Lake and vermilion produce a rich crimson. Of all blue pigments, blue ochre is the most permanent, and Prussian blue the most useful. Blue, combined with white, is of the utmost value in preparing permanent greens, and produces pleasant tones. Cobalt blue is highly commended for preparation of clear, bright blues. The finest smalt blue is durable and useful, being unaffected by lime. As a general rule, blues with a slightly greenish tint are more pleasant in decoration than those which incline to purple. Greens for decoration should, as a rule, be mixed with pigments. The ordinary greens of commerce can not be depended upon. Bright and shining greens should be sparingly introduced, being too hard and forcible, but all tones of suitable green may be found in autumnal foliage. Such greens are readily produced with Prussian blue and cobalt blue, and permanent yellow with the ochres, lemon yellow, and raw and burnt sienna. To compounds of these may be added Indian and Venetian reds,

Vandyke brown and burnt umber. All greens may be brightened with bright and lemon yellow. Lake, vermilion, Venetian, and Indian red are to be valued for the bright intensity of their colors. All colors of a decidedly neutral character prove tame and ineffective. Beads and chamfers in gold and black are always appropriate and telling in effect on panels. Lines of light or full colors should be sparingly used on borders, finials and crockets in flat paneling. In the painting of medieval times it is noticeable that pure colors are rare; these are most generally toned, and with admirable effect. The absence of the primaries is a rebuke to the writers on theory colors, who lay down the proportions in which they should appear, in a way to indicate that the presence of such colors is indispensable to rich decoration.

The toning of colors is a very simple matter, but it requires system. The adoption of combination changes colors. Where the form of pattern undergoes repetition in stenciled ceilings, the band is the most satisfactory, as it helps to remove, in a considerable degree, the unavoidable hardness of such bands, and a quiet effect will be secured by bringing the counterchanged colors close to one another in intensity.

A good ground for dark oak is made of pure white lead, golden ochre and royal red. Deep orange chrome is sometimes used when a bright tone is desired. The graining color is made of burnt sienna, raw sienna, and Vandyke brown.—Canadian Architect.

The Household

CLEANING HINTS.

If linoleum is losing its freshness, says the Woman's Home Companion, it may be restored and made to last twice as long. Melt a little ordinary glue in a pint of water. At night have the linoleum clean and dry, go over it with a flannel cloth dipped in the glue water, and by morning it will have a fine, hard gloss. For dusting ceilings, walls, etc., use cotton-flannel bags with two very full ruffles on the sides and end, to cover the broom. These are also very useful on hardwood and painted floors. An excellent furniture polish is made of equal parts of raw linseed oil and gasoline. Cold tea, without soap, is good to remove stains from varnished wood. Soiled places on wall paper may be removed by applying a paste made of pipe clay and cold water.

WALLS AND TILE PAPER.

AMERICAN tile paper, which is now made so that it will wear as well as the English, is not "everlasting," as was at first supposed, says a daily paper. If it is varnished with a second coat after it has been hung on the walls it will bear washing with a sponge dipped in lukewarm water, but will not stand scrubbing or washing in boiling hot water, as some dealers have claimed. It should be revarnished after it has been washed, and rubbed until dry with a soft absorbent cloth. When the paper is hopelessly stained with smoke or steam, and it is found necessary to renew it, the wall must be first cleared of the old paper, and then sized over thoroughly before the new is put on, or the latter will not cling to the walls.

The old-fashioned whitewashed wall is one of the most wholesome as well as one of the cheapest for the kitchen. Where paper is used, however, a cheap quality, which may be yearly renewed, is generally selected in preference to anything more expensive.

Tile paper has the advantage of looking neater than the ordinary kind, as its varnished surface resists the dust as no dull surface paper ever can.

BATHROOM FIXTURES.

CONSTANT improvement is to be noted in the fixtures of the bathroom, remarks a contemporary. Housekeepers of experience welcome the introduction of glass to replace much of the nickel work of these fittings. To keep the metalwork of a bathroom bright necessitates much labor, and wherever glass can be substituted this care is greatly lessened. It is not so much the faucets and small fittings of the place that are difficult to keep unclouded, as the long stretches of nickel pipe that have been a part of plumbing up to the present time. Porcelain lavatories now, however, stand on porcelain legs, instead of nickel, and the new closet with a device for flushing which does away with the tank eliminates more stretches of nickel tubing. At last, too, the overflow arrangement from tubs and set bowls has been improved, the new style permitting the fixture to be easily removed and thoroughly cleansed. This is one of the most important advancements, as the overflow pipe that is still in common use has always been considered the most unsanitary feature of toilet plumbing. Pretty and thoroughly sanitary bathrooms may be fitted up without the expensive glazed tiling that everybody wants, but not all can afford. A bathroom with all woodwork finished in white enamel, the walls hung with a blue and white waterproof papering, the floor fitted with a linoleum, also in a tiled pattern, with porcelain tub and open plumbing, will be found

thoroughly satisfactory. If preferred, the walls and ceiling may be painted in white enamel, permitting them to be washed without injury. This finish for the bathroom is quite within the reach of the moderate purse, and with floor-runners of blue and white Turkish toweling that can be frequently laundered is as sanitary as expensive tile and marble.

PALMS IN WINTER.

THE majority of the large palms seen in the swell houses are rented for the season, replied a florist when questioned on the subject. Eight to twelve of them to a house. This means that they are left solely in the florist's care. I send a man to the house of my customers every day or so to water, wash, and look after the palms generally, and if for any reason a plant begins to droop it must immediately be replaced with a fresh one.

When the houses of my customers are closed for the summer, the plants are taken out and soon after they are crated and sent to Newport for change of air and scene. The palms in my establishment are pretty hard worked and never go out of commission, unless,



WINDOW IN THE RESIDENCE OF F. H. DAMORS, ESQ., NEW BEDFORD, MASS.

indeed, when one gets disabled through the carelessness of a servant by being frostbitten, or overheated from standing too close to a radiator. I have a good many palms in that condition stored away, which for commercial purposes will be valueless for four or five years, or until an entirely new growth of leaves is induced from the old root.

The Kentia, or umbrella palm, is one of the most popular, most beautiful, and most expensive; one six feet high would sell for \$75. Other favorite house varieties are Latania, or fan palm, and Phoenix.

THE SMOKING-ROOM.

CONSIDERABLE judgment, remarks a writer, is needed in the furnishing of a smoking-room to make its decoration, while pleasing to the eye, subservient to the main object and to render it thoroughly cozy. It must be purposeful in its arrangement, and yet not so wholly and avowedly consecrated to Mme. Nicotine as to suggest the exclusion of all but her votaries. Muslin window blinds are as much out of place in a smoking-room as chenille curtains, and while the general effect should be far from suggesting the idea of "bare necessities," it should be equally free from overcrowding.

The Garden

ORNAMENTAL GATEWAYS.

ORNAMENTAL gateways are coming to be one of the conspicuous features of the American country estates. The independent republicanism of the average American is not given to deferring to the wishes of others unless some obstruction is placed in the way of intruders. Curiosity helps also in inducing people to intrude where, if not wanted, they may also do some harm. Thus the gateway to the country estate has come to be an important feature. A lodge, near at hand, serves as an additional protection to costly lands which may be beautifully decorated. An ornamental gateway is an extremely happy introduction to one's estate, if it is designed in good style and in proper taste. An important point to remember is the scale of the gate. A large estate calls for a large gateway; a small estate must have a small one. The owners of large estates are not likely to commit error in matters of scale, but an extremely handsome entrance gateway, designed and built on a large scale, is a most incongruous entrance to small grounds.

ROOF GARDENS FOR PRIVATE HOUSES.

THE Hospital calls for the construction of glass-roofed rooms at the tops of private houses, where children may receive the benefits of open-air play free from the dust and dirt of the street. It says: The desirability of children passing a considerable portion of their time in the open air is manifest, while unfortunately it is equally manifest that in most cases town children can not obtain fresh air without inhaling the foulest of dust. Infinitely better would it be for a child to play about in its roof conservatory, as it could do for hours every day, than to take its perfunctory walk or be wheeled through the London streets at a level of only about thirty inches from the ground. We notice that at a recent meeting of the American Pediatric Society, Dr. Northrup reported that by his advice a sunroom had been built on the roof of a private house in New York, a playroom in which fresh air and sunlight can be enjoyed without dust and free from the dangers of the streets, and that the family for whom the structure was built had had the satisfaction of finding that their child, who had been very delicate, grew up strong and well.

But our suggestion is not merely to build a playroom on the roof, but to make this glass-covered room itself form the roof of the building.

TO KEEP FERNS IN WINTER.

You can keep ferns all winter, said a woman who has done so, to the representative of a contemporary. I always do, and when there comes on a spell of bad weather I give a tea party and drive away everybody's blues with my decorations. I make a centerpiece for my table, arrange the ferns in vases and jardinieres, pin them on the lace curtains, and make my room as cheerful as a summer woodland nook, and it doesn't cost anything, but is simply a matter of knowing how. Will I disclose my secret? Why, certainly! I pack the ferns in envelope boxes. I select the sword fern, or any having thick, green fronds, and I am careful to get all sizes and to pick them before the frost comes. I never pull them up by the roots, but cut the little seedy stalks with shears. Then I lay them smoothly in the box and pack them down closely, fill the box full, lay tissue paper over the top, put on the cover and tie it down. Upon reaching home I place the box in the cellar or on the bottom of the icebox, and the ferns within keep fresh for months.



Heating Talk

FURNACE HINTS.

It is well to have a thin bed of clean cinders on the grate, points out E. T. Child in the Engineering Review. On this put several crumpled newspapers, and then lay on kindling. About three or four bundles as sold in city stores should be plenty. After this is lighted, add a few shovelfuls of nut or stove coal, and keep all the drafts open. The small coal will ignite in a very few minutes, after which the egg or furnace coal should be added. When this is well lighted the chimney draft should be checked slightly, but not entirely, and the other drafts should be closed. The gas should be allowed to burn off for a few minutes, after which the chimney draft may be checked, and the fire left for the day.

Keep the fire pit full up to the level of the bottom of the firing door. This gives a larger bed of coal, and requires less attention than a thin fire. If the furnace is large enough to properly heat the house, it will need to be attended to but twice daily, except in the most severe weather, when it may be necessary to put on coal at noon. In the morning the drafts should be all opened for a few minutes after fresh coal has been added, and the grate should be shaken till live coals start to come through. Do not shake the grate too much. Do not let the fire burn up too hot when all the drafts are open. Check the chimney draft as soon as possible, and close it as soon as the gas is burned off.

In an indirect draft furnace this may be done more readily than in a direct draft type, as the main damper may be closed as soon as the fire is started up, and then the air check in the indirect pipe may be opened after the gas is burned off. The chimney draft should be kept closed as much as possible, and the air supply to the furnace should be regulated by the damper in the ash pit door. The smoke pipe should be practically cold.

At night, except in cold weather, it will not be necessary to shake the grate. Coal should be added, together with a few cinders, provided they are at hand, and the usual precautions should be observed regarding gas.

In the coldest weather the furnace should be shaken at least twice daily to keep the fire clean and bright. Do not let the bed of coal become thin in mild weather; this is a mistake. Keep the level of the top of the fire up to the bottom of the fire door, and regulate the heat by the depth of ashes on top of the grate. Do not shake too often, and when the fire is resting on a bed of ashes put on fresh coal and get it ignited before shaking.

Always keep the ashes cleaned out from under the grate. The cold air box should be kept wide open at all times except in coldest weather, when it may be about one-half closed, and the balance of the air drawn from the cellar, or, better, from a hall register connected to the cold air box.

The water tank in the air chamber of the furnace must be kept full of water, as moisture is very essential.

THE OPEN FIRE.

THE demand of the time, says a writer in the Metal Worker, is for ventilation, and this is necessary alike with furnaces and steam and hot water apparatus. Notwithstanding that the hot air furnace is deservedly popular through furnishing continually a supply of fresh air, there remains the fact that two things can not occupy the same space at the same time, and the foul air in the building must be removed before the fresh, warm air can enter. There can be no better device for removing the foul air than an open fire. Its strong, radiant heat is most agreeable to those who come in out of a chilly atmosphere. By keeping the chimney warm it acts as a strong exhaust and moves the air out of a building to make room for the fresher, warm air. The open fire type of stove acts to a double advantage where used in connection with steam and hot water heating apparatus with direct radiation, for with them no change of air is effected, and the open fire, by exhausting the air from the building, will draw in fresh air through cracks and crevices. If it be an indirect system it will act in the same manner as with a hot air furnace.

BEAUTIFUL writing-tables of Congo wood have foot high backs of beveled glass traced in an odd design by lines of the wood after the manner of leaded window panes.

A RESIDENCE AT NEW BEDFORD, MASS.

THE first illustration on page 6 presents a residence erected for Dr. E. H. Abbe at New Bedford, Mass.

The underpinning is built of blue stone laid ashlar with rockfaces. The building above, of wood, is covered on the exterior with shingles and is stained a soft brown color, and the trimmings and blinds are painted white. The roof is covered with shingles and is stained a dull green. Dimensions: Front, 34 ft. 2 in.; side, 40 ft. 6 in., not including piazza. Height of ceilings: Cellar, 7 ft.; first story, 9 ft.; second, 8 ft. 6 in.; third, 8 ft.

The interior throughout is trimmed with cypress, and the doors are finished natural and the trim is painted white. The entrance doors are of Dutch style. The reception-room, or hall, is provided with a staircase arranged with turned Colonial balusters and cherry rail, newels, etc. There is an open fireplace, built of Roman brick, with facings and a hearth of the same and a mantel of Colonial style. The living-room is provided with a bay window and seat, and an angle nook containing an open fireplace furnished with a tiled hearth and facings, and a mantel. On either side of fireplace there are paneled seats, over which there are book cases built in. The dining-room has a china closet built in, with leaded glass doors. The conservatory off this room is an attractive feature. The butler's pantry is fitted with sink, drawers, and cupboards. The kitchen is provided with a pantry, pot closet, sink, and a stairway to the cellar and to the second and third stories.

The second floor contains a square hall, four bedrooms, and a bathroom; the latter treated with white enameled walls and ceilings, and furnished with porcelain fixtures and exposed nickelplated plumbing. One of the bedrooms has an attractive nook with fireplace.

The third floor contains the servant quarters and ample storage room. The floors are laid with quartered oak in the living-rooms, Alabama pine in the service quarters, and spruce in the bedrooms. The hardware is of brass and the door knobs of old-fashioned glass. The cellar, cemented, contains a furnace, laundry, fuel rooms, and storage space. Cost \$4,100 complete. Mr. Nathaniel C. Smith, architect, New Bedford, Mass.

A RESIDENCE AT NEW BEDFORD, MASS.

THE second residence illustrated on page 6 was built for Dr. E. H. Abbe, at "Abbey Terrace," New Bedford, Mass. The underpinning is of rock-faced blue stone laid up ashlar. The building above is of wood, and the exterior is covered with matched sheathing, good building paper, and clapboarding. The entire house is painted Colonial yellow, and the trimmings are painted ivory white. The roof is covered with shingles and is stained a moss green. Dimensions: Front, 52 ft. 6 in.; side, 26 ft., exclusive of piazza. Height of ceilings: Cellar, 7 ft.; first story, 9 ft.; second, 8 ft. 6 in.; third, 8 ft.

The interior throughout is trimmed with white wood. The plan shows a central hall provided with an entrance door with stained glass windows on either side. The ornamental staircase is provided with a flower bay window on the second landing. The woodwork is painted ivory white. The staircase is treated similar, except the hand rail, which is of mahogany. The den is painted black, with red burlap walls. The living-room is treated with ivory white paint, and has a bay window with a paneled seat, and an angle nook provided with an open fireplace furnished with a tiled hearth and facings, and a Colonial mantel with columns and mirror. There are small windows on either side of fireplace, and also paneled seats, and the whole is separated by an archway.

The dining-room is furnished with a flower bay window, and it has a china closet, with leaded glass doors of Colonial style, in one corner, while in the opposite corner there is an open fireplace with tiled trimmings and mantel. The butler's pantry is fitted with bowl, dresser, drawers, etc. The kitchen is trimmed with yellow pine, and it has two pantries, sink, range, etc. The rear hall, stairway, and entry are located conveniently.

The second story is treated with white paint, and contains four bedrooms with large closets, linen closet, and a bathroom, the latter furnished with porcelain fixtures and exposed nickelplated plumbing. The principal bedroom is provided with an angle with fireplace and seats. The servant quarters and trunk room are located on the third floor. A cemented cellar contains furnace, laundry, fuel rooms, etc. Mr. Nathaniel C. Smith, architect, New Bedford, Mass.

NOTHING has done more to promote the advancement of architecture in this country of late years than the development of schools of architecture. The architectural societies help in this work also, but as their membership is exclusively professional, their influence is less directly felt by the outside public.



Domestic Problems

SUPPORTING A FAMILY ON FIFTEEN CENTS A DAY.

THE New York Herald makes a contribution to the question of household expenses in an account of a family who live in a flat of two small rooms in Long Island City. They pay no rent, and while the husband is supposed to receive good wages, the wife only receives fifteen cents from him daily. They are a Norwegian family with two children. The wife gives a pitiful account of their daily living. Almost immediately after our marriage, she said, my husband began limiting me to fifteen cents a day, and even after the little girl came and needed fresh milk and other things to keep her well he refused to increase the allowance.

I tried all sorts of cheap food to see which would be the most filling and the most lasting. There's nothing quite so good as beans, I've found, but we do get dreadful tired of them.

I buy soup beans—they can be cooked in so many different ways, though sometimes I take a notion to have plain white beans. The children are fond of onions, and they like them fried. Cooked that way they are very good to take the place of meat.

Soup beans cost six cents a quart, and one day I buy a quart of these, a loaf of bread for four cents, and five cents' worth of beer for my dinner; then the next day I buy onions instead of beans, which cost just the same a quart. This leaves me nothing for salt and pepper, so the only way I can get these necessities is to substitute oatmeal for the beans or onions once in a while. Oatmeal is cheaper than either, and goes a long way, though we get tired of it quicker than we do of the other fare. By buying it I have a few pennies left for salt and pepper.

We drink water for breakfast and supper, and when I have my mug of beer for dinner I give the children a sip, but they don't seem to care very much for it. I wish the little ones might have milk to drink instead; that always makes children healthy, at least people think it does. My Ida and Henry Bernard don't look thin and hungry, though; do they? Henry Bernard is teething; that's what makes him so pale, but he isn't cross, like most babies at his age.

The child in question was so dirty that his natural color could scarcely be distinguished underneath the layers of grime. His little body was round and his arms and legs were as chubby as those of a child reared in luxury. Though it was the noon hour, when most young mouths are ready and anxious to be filled, this small tot sat and toyed with a dish of oatmeal in a dilatory manner.

\$3,500 IN NEW JERSEY.

THE New York Sun has continued its studies in living on \$3,500 per year with experiences from various localities. A gentleman from New Jersey contributes his efforts to live on that sum. He has a house on a nicely paved street within five blocks of the water, with a garden and trees of his own, and estimates his yearly expenses as follows:

Rent	\$400
Food	750
Servant	180
Clothes	500
Railway fares	75
Light and heat	100
Insurance	290
Savings bank	210
Personal expenses	250
Club	100
Pew rent	50
Garden	75
Contingency fund	500
	<hr/>
	\$3,480

The contingency fund includes amusements, vacations, doctor's bills, although, he tells us, that, thanks to the good, fresh air and wholesome life of the suburbs, this is seldom, and such incidental outlay as is necessary from time to time. It includes also the cost of such entertaining as is done, which does not come within the ordinary household expenses.

If there are any unusual expenses to meet they economize on other items. The club item covers dues, tips, and such subscriptions. The personal expenses are his own. He takes a drink only occasionally and likes a pipe just as well as a cigar, or they might be heavier.



SANITARY CHARACTERISTICS OF MADE GROUND.

ARCHITECTS and house owners should be interested in learning the results of an investigation recently conducted by Dr. W. G. Savage and Mr. J. H. Sugden, bacteriologists for the Corporation of Cardiff, Wales, to determine to what extent made ground should be regarded as a menace to the health of the occupants of houses built thereon, and how far local authorities are justified in passing by-laws prohibiting the use of such ground as building sites. The following deductions are made, based on a long and careful examination: "The refuse as deposited contains a very large number of organisms, many of which are in the main different from those met with in ordinary soil. These made-soil organisms, as they may be called for convenience of reference, rapidly diminish in number under the conditions under which they are placed. This diminution goes on for the first two or three years. After two or three years, however, the ordinary soil organisms begin to invade this material, and apparently thrive abundantly in the rich organic material available to them. This causes a marked increase in the total number of organisms present in the soil, and the total number remains large, until in quite old soils a diminution is again met with. These soils begin to lose their special bacterial content after two or three years, and from that time begin to take on the characters of ordinary soil."

FILTHY CELLARS.

ARCHITECTS, says an exchange, are often called upon to make alterations in existing buildings. In so doing, a building must be measured from cellar to roof loft. In the pursuance of this duty the revelations of filthiness are astounding. The general public are entirely unaware of the poisonous conditions of stores and dwellings. In many instances the cellars have been the dump for every waste arising from families and from business, and it lies year after year in a neglected mass of rotten filthiness that is absolutely appalling. Not long since, a firm of furnace dealers were called upon to install a furnace in a building occupied by a confectionery—the condition of filth in the cellar was beyond belief. For years the cellar had been the dump and catchall of the business, and so extremely foul was the cellar that the men could only endure the work in such a spot for short intervals, and then had to retire to the open air for recuperation; the stench was indeed unendurable.

This is no isolated case, for while all cellars are not so vile as the one in question, yet it may truthfully be said that a vast majority are so filthy as to be veritable plague spots.

Just what remedy can be applied may be a debatable matter, but the Board of Health ought to rigorously inspect all cellars, at least twice a year, and see to it that they are cleaned out. A dirty cellar is a direct menace to all in the house above it, and partially so to the houses on each side.

PAINTING BRICK WALLS.

THE painting of brick walls, points out a contemporary, is mainly for the purpose of preservation, but the fact should not be forgotten that paint is an excellent preventive of dampness and that a house with well painted walls is drier and consequently healthier than one with the walls exposed. The best paints for this purpose, where the color is not an objection, are the natural ochre pigments united with zinc oxide. Whatever impairs the usefulness of a paint, by attacking its tenacity and waterproofing quality, is to be avoided.

BACTERIAL TREATMENT OF SEWAGE.

AN English writer, in discussing the bacterial treatment of sewage, points out that the anaërobic process is more in accordance with the teachings of nature, and possesses certain specific advantages, such as the averaging of the sewage flow, the greater ease with which regular periodic working of the filters can be obtained, the absence of trouble from loss of water capacity through deposition of solids, and the easier and cheaper cleansing, if necessary. The necessity for covering a septic tank seems desirable, since it prevents disturbance of the bacterially-active scum, avoids risk of nuisance, and enables use to be made of the gases evolved during the putrefactive process. As regarded the question of the best method of applying the primary effluent to the secondary beds, the author hesitated to express an opinion, since excellent results had been obtained by either method,

RESIDENCE OF HENRY F. ENGLISH, ESQ., NEW HAVEN, CONN.

If there is such a thing as a distinctive American style of architecture, all experts agree that it is to be found in the country home. American spirit seems to find more adequate expression in rural architecture than in the town buildings. In the residence built for Henry F. English, Esq., on Hillhouse Avenue, New Haven, Conn., and which is illustrated on page 7, a new departure has been made in this direction. The building is designed with Grecian detail throughout the exterior and interior, and the exterior walls throughout are built of Indiana limestone, while the roof is of a green copper. The mansion has an entrance-porch at one side, while the living-porch is placed at the other end; both have Ionic columns and Grecian balustrades. The floors are laid with tile mosaics. Dimensions: Front, 80 ft.; side, 80 ft.. Height of ceilings: Cellar, 9 ft.; first story, 11 ft.; second, 9 ft.; third, 8 ft. 6 in.

The interior theme is comfort, and the instant the threshold is crossed the entire effect is changed, for the severity of the exterior is quite in contrast with the homelike atmosphere of the interior. The vestibule has a floor laid with tile mosaic and walls of Vermont marble. The ceiling is of Grecian paneling. The imposing hall is trimmed with mahogany. It has a paneled wainscoting and a Grecian cornice, the space between being treated with a Pompeian red scheme. The principal feature is the large open staircase, which has massive carved newel posts, and rail falling down over the posts with the graceful ram's horn. The broad landing is provided with a stained glass window, which sheds a soft and pleasant light over the upper and lower halls. Beneath this landing are triple arches which form an exit to the rear porch and porte-cochère. The reception-room is treated in an artistic manner. The trim is handsomely carved, and is treated with ivory white with a highly polished surface. The walls are covered with silk and are painted in a floral design. The fireplace has a facing of Pavonazza marble and a carved mantel of special design.

The drawing and music rooms are treated in old ivory, and each is separated from the other by an archway supported on two Ionic columns. The fireplace is provided with Pavonazza marble facings, and a mantel of a particularly handsome design. The columns of the archway are reproduced in the mantel, and also in the brass dog irons. The walls are covered with a ribbed silk painted in a delicate manner. The floors are of white oak and are highly polished.

The sitting-room is trimmed with mahogany, and has a paneled wainscoting, book cases, and an open fireplace provided with Pavonazza marble facings and a massive carved mantel. The billiard-room is trimmed with white oak, and has a paneled wall with the spaces filled in with leather and covered with brass headed tacks in a Grecian design. The fireplace is separated by an archway supported on columns. The fireplace has a tiled hearth and facings, and is furnished with a Norman hood of oak supported on columns.

The dining-room is trimmed with mahogany, and has a high paneled wainscoting, ceiling beams, white oak floor, buffet, and an open fireplace with a tiled hearth and facings and mantel. The butler's pantry and serving-room are trimmed with white maple, and each is fitted up with all the best modern conveniences. The rear hall forms a side entrance, and it has a rear stairway and an elevator.

The second floor throughout is trimmed with white maple. It contains six bedrooms, three bathrooms, boudoir, dressing-room, etc. The fireplaces are furnished with tiled trimmings and mantels. The bathrooms are paved and wainscoted with tile and are furnished with porcelain fixtures and exposed nickelplated plumbing. The third floor contains the servant quarters and bath and trunk rooms. The cellar contains the kitchen, servants' hall, laundry, furnace, fuel room, etc. The late Mr. Bruce Price, of 1133 Broadway, New York, was the architect.

THE ARCHITECT'S DUTIES.

THE architect should be able to make examinations, and judge correctly of ground or clay upon which foundations are to be laid, computing the safe loads to be sustained, etc. Further, he must be able to know the climatic effect upon various building materials, and often he is called upon to decide values of improved property where it has been involved in litigation, and he is placed as an expert upon all matters relating to modes of construction and value of building materials and construction. The architect must have a practical knowledge of general law, and law of equity, that he may be able to protect his clients, as far as possible, in making his contracts. He is often called upon to decide points of equity in compliance with contracts between owner and contractor; so he should be one who is able to judge of values in material and construction, that he can justly decide between owner and contractor.



WINTER BRICKLAYING.

BY STEWART MACGREGOR.

(British Consul at Stockholm.)

A FEW years ago a series of experiments was carried out in Stockholm with a view to deciding the lowest temperature at which bricklaying might safely be carried on. Three different temperatures were decided on, namely: First, 23 degrees Fahrenheit; second, 14 degrees Fahrenheit; third, 6 degrees Fahrenheit. The bricks and mortar were, as to quality and conditions, such as are commonly used here. The walls thus erected during winter were allowed to stand till the following autumn, when they were torn down and the following results noted: Nos. 1 and 2. Perfectly satisfactory. The mortar was quite hard and sound, and had to be scraped from the bricks. No. 3. Unsatisfactory. The mortar did not adhere at all to the bricks, which lay loosely embedded in it. These results tend to prove that, without any special precaution as to material or labor, bricklaying can be carried on in Stockholm at a temperature as low as 14 degrees Fahrenheit.

For lower temperatures it is necessary to heat the sand and water used in making the mortar, and for this purpose very simple apparatus is employed. First, for the boiling of the water, all kinds of contrivances are to be seen in use, including primitive as well as modern boilers. Second, for heating the sand, the common arrangement consists of a circular iron tube 18 inches to 24 inches in diameter and 6 feet to 8 feet long. This is closed at one end with bricks or an iron plate. On the top at this end there is a chimney 8 feet to 10 feet high and 5 inches to 6 inches in diameter. The fuel, which is generally refuse wood from the building under erection, is fed at the open, or partially open, end of the cylinder. This cylinder is often formed of an old boiler tube or a piece of an old iron chimney, etc. For burning coal special grate and chimney arrangements would be necessary, but in no case need they be elaborate or expensive. After placing the cylinder on the ground the sand is heaped on and around it to a depth of 18 inches to 24 inches, and allowed to remain until it gets hot, when it is taken away from where it is hottest and replaced by fresh sand. The mortar should be made in a room where the temperature is kept well above freezing. This temperature should naturally be regulated according to the frost that has to be counteracted. Generally, the builders here make a room of this kind by roughly boarding in a part of the scaffolding, simplicity and cheapness being the prominent characteristics of all the arrangements.

When building in frosty weather the following precautions should be observed: (1) In laying the bricks care should be taken to avoid shifting them after they have once been set in the mortar. (2) Never use old or stale mortar, but arrange supply to correspond with demand. (3) It should be understood that the brick used here is of a light or porous character, which readily absorbs the moisture from the mortar. Hard pressed or calcined bricks and stonework generally are not suitable for building during frosty weather, but edgings or ornaments, etc., of such material can easily be dealt with by slightly warming them before bringing them into position. This can be done by keeping them a few days in a wooden shed heated by an open coke stove. In some cases it is found advisable to cover in with rough boarding the part of the wall where such stonework is extensive. In such cases a very small coke fire is found sufficient to keep the temperature high enough to prevent any damage to the mortar. (4) Plaster or cement work should not be done at or below freezing point unless proper heating arrangements are made.

To sum up shortly: (1) The bricks should be porous and perfectly dry, so that they may readily absorb the moisture in the mortar. (2) The water, sand, and bricks must all be heated.—Report to British Foreign Office.

CEMENT AND TEMPERATURE.

THE most common method of preventing the freezing of mortar is the use of a solution of common salt for mixing. The usual rule is to add one per cent. of salt to the water for every degree of temperature below freezing, using the minimum temperature to which the masonry will be subjected for the computation. The cold delays the setting of the cement, but there is no mechanical action from freezing, and the results of this method are usually quite satisfactory, the pointing of joints being the only additional operation expected.

New Books

STATELY HOMES IN AMERICA.

STATELY HOMES IN AMERICA FROM COLONIAL TIMES TO THE PRESENT DAY. By Harry W. Desmond and Herbert Croly. New York: D. Appleton & Co., 1903. Pp. 532. Price, \$7.50.

The stately house is a much older institution in America than is generally supposed. The early aristocracy of this country, like the aristocracy of the present day, found a fine house an agreeable mode of expressing their rank and possessions to an admiring public, and some of the most interesting houses we have owe their origin to their laudable ambition.

From an architect's standpoint the ambition is clearly laudable, since it has given them, in our own time, some of their most splendid opportunities, opportunities not only valuable to them in affording a means of expressing their talent and skill, but valuable also in offering large commissions. The stately home has become quite as much of an institution in building in America as it has long since been in England. Our great houses are not yet, except in some occasional instances, the massive piles they are in England; but in numbers, in cost, in architectural effect, in the qualities of stateliness, they form an impressive group of buildings whose interest, as a whole, is of a very considerable order.

It is such houses that the book written by Mr. Desmond and Mr. Croly is concerned with. It is a most notable production. The text is an admirably composed essay on the conditions attending the building of great houses in America; it deals with the men who built them; it treats of the economic conditions that have developed them; it sets forth clearly the circumstances that have made these houses what they are. It is not descriptive, for the abundant illustrations—some hundred and fifty full page illustrations—set forth the aspects of these dwellings more clearly than even the written text of these accomplished authors could possibly have done.

The book is, therefore, a model in architectural book making. It presents its subject in an interesting way, and in a way that clearly establishes on every page thorough mastery of their subjects by the writers. Architectural book making is no easy task, and few writers on architecture understand how to interest their readers. Architectural writing, as a rule, is either highly descriptive, and most detailed at that, or it is word-painting on a very extended scale. Both these errors have been avoided by the present writers, and they have shown a full appreciation of the first rule of rhetoric of having something to say, and saying it as well as they could.

Mr. Desmond and Mr. Croly do not undertake to present a history of great house building in America; in a quite literal sense their illustrations are apart from the text; but they follow the subject in a chronological order and in a general way, and one rises from their pages with a very clear notion of the vicissitudes which have attended the building of dwelling houses in America from the earliest time to the present. That, perhaps, is as much as the general reader cares to know, and if he absorbs that he has gained some useful knowledge which will stand him in good stead in contemplative journeys through our land.

The authors are more concerned with the architectural aspect of house building than with the accompaniments that go to make up the great estate. The stately house, as they understand it, is the stately house within the city and without; but they hardly take up the question of general estate buildings, and of household management and estate conducting they have, properly enough, nothing whatever to say. But they are not unmindful of the furnishings within, of the decoration or of the gardening without. They are not detailed in their statements, but their generalizations are founded on wide observation and with a keen appreciation of the relationship of cause and effect.

The illustrations, as has been said, are very abundant, and amply illustrate the subject. Not every house which can be termed stately is shown in these pages, but many of the more important great houses of America are illustrated here, and generally in several plates. The typography of the book is admirable. It is a worthy book on a theme that here finds worthy treatment.

Books, although intended to be read, are also decorative adjuncts of no small value.

A RESIDENCE AT CHESTNUT HILL, MASS.

ON page 11 will be found an illustration of a residence of Colonial treatment which has been erected for James D. Colt, Esq., at Chestnut Hill, Mass. The underpinning is built of rockfaced field stone laid at random. The superstructure, of wood, is covered with matched sheathing and then clapboarded. It is painted Colonial yellow with white trimmings. The roof is covered with shingles and left to weather finish. Dimensions: Front, 51 ft.; side, 62 ft., exclusive of piazza. Height of ceilings: Cellar, 7 ft.; first story, 10 ft.; second, 9 ft.; third, 8 ft. 6 in.

The hall, a central one, is trimmed with oak. It has a vestibule paneled with oak and provided with a tiled floor, and on either side of which there is a coat closet. The hall contains an ornamental staircase with a central run of Colonial character. Beneath the stairway there is a den, which is fitted in an attractive manner. The parlor is trimmed with white pine treated with ivory white paint, and has an open fireplace furnished with tiled facings and hearth and a Colonial mantel.

The living-room is treated in a similar manner, and has book cases built in, a paneled seat and an open fireplace. The dining-room is trimmed with oak, and has a bay window and an open fireplace with tiled facings and a hearth and a mantel. The china closet is fitted with drawers, dressers, sink, etc. The kitchen, servants' hall and its dependencies are fitted with all the best modern conveniences. The rear lobby is large enough to admit ice box.

The second floor is trimmed with white pine and is treated with white enamel paint, and contains a large open hall, containing an alcove with seat, three bedrooms, two bathrooms, large linen closet, besides two servant bedrooms and bath, with private hall and stairway over the kitchen extension. Three of the bedrooms have open fireplaces, and all of the rooms have well-fitted closets. The third floor contains three guest rooms and a trunk room. A cemented cellar contains the heating apparatus, fuel rooms, laundry, etc. Mr. Horace S. Frazer, architect, 8 Exchange Place, Boston, Mass.

A PAIR OF HOUSES ON LINCOLN DRIVE, GERMANTOWN, PA.

THE pair of houses which are illustrated on page 14 have been built on Lincoln Drive, Germantown, Pa. These houses vary from the usual design for double houses inasmuch as the result presents the appearance of one large house instead of two smaller ones. They are constructed of local stone varying in color, and laid with rough faces, and neatly pointed in cement. The roofs, porches, and dormers are covered with cedar shingles and left to weather finish. The sash and all trimmings are painted ivory white. Both houses being treated the same, one description will suffice.

The entire first floor, except the parlor, is trimmed with red oak and is stained antique brown. The vestibule is treated in a similar manner and has a tiled mosaic floor. The hall contains an ornamental staircase, on the landing of which there is a paneled seat. The parlor is trimmed with white pine, and is treated with white enamel paint, and contains an open fireplace with ornamental iron backs and jambs, ivory white tile facings and hearth, and a wood mantel finished with enamel white. The library and dining-room are separated one from the other by double sliding doors, and each is provided with open fireplaces built of Pompeian brick to the height of five feet with oak mantel. The kitchen and butler's pantry are fitted with the best modern conveniences, and each is trimmed with North Carolina pine.

The second story contains an open hall trimmed with oak and finished the same as the first story hall, and four bedrooms, which are trimmed with chestnut and finished natural. The bathroom has a floor of white vitrified tile with a Troy border, and the side walls tiled to a height of five feet with ivory white tile and moulded cop. The woodwork is treated with ivory white enamel. This bathroom is furnished with porcelain fixtures and exposed nickelplated plumbing.

The third floor contains three bedrooms, storeroom, and one large room suitable for a billiard-room. A cemented cellar contains the heating apparatus, fuel bins, laundry, storage, etc. The ceiling of cellar is plastered. Mr. Laurence Visscher Boyd, architect, Harrison Building, Fifteenth and Market Streets, Philadelphia, Pa.

A KITCHEN floor of yellow pine, says an authority, may be oiled with boiled linseed oil and turpentine, or clear oil, if time for drying can be allowed. The floor should be dry and smooth and the room free from dust before beginning. A thin coat of white shellac may first be applied as a filler.

The House

A RUSSIAN HOUSE.

It is of yellow brick, and is one-storied; it is built round a small garden that is square, says the London Globe. The tiny windows, with their dainty curtains, look out upon one of the most famous roads in Russia. The roof is of sheetiron, and is painted green; it slopes somewhat, but not so much as to prevent the eldest son of the family from dancing on it in moments of madness. Stabling forms one side of the square; another is used as an office, where a number of clerks in uniform and one or two young woman typewriters remain from morn till eve, from eve to close upon midnight, sipping tea, smoking cigarettes, and no doubt also making up accounts. Near the entrance an aged man sits during the summer on a bench outside, against the wall. He is the porter of the business part of the establishment, but his seat is close to the back gate, so that he can see all who enter the yard. One ruble, or two shillings and twopence, a week is allowed to the housekeeper for distribution among beggars, and it is rare that they call without receiving food. Admittance is given by a clumsy looking peasant, to whom a livery imparts neither elegance nor dignity. To right and left open the reception rooms, which are spacious, well lighted, but somewhat low, and elegantly furnished in the style of Western Europe. The dining-room possesses a fireplace and two monumental stoves, reaching almost to the ceiling, and so placed in the wall that they warm two rooms at the same time. It adjoins the buffet, and as the door of it is almost always open, the discussions of the servants may be heard by those who are sitting in the dining-room. The salon has no furniture, but mirrors with gilded frames, chairs upholstered with blue silk, a grand piano in one corner, and a gigantic candelabrum, with oil lamps that fling their light upon the parquered floor. There is a card-room, too, and the boudoir of the lady of the house, which is crowded with pictures and knickknacks and furniture. Scarcely a book in any of these apartments; scarcely a newspaper; the pictures are Italian, or are paintings of local artists, and represent Russian scenes.

What strikes a stranger after a short visit to this house is the utter want of privacy. For as the building is only one story high, it is obvious that to go from one end to the other it will be necessary to pass along a corridor, or to go through various rooms. Where the corridor exists, it is fairly wide, and in order to accommodate all the members of this very numerous household, certain portions have been separated by means of curtains, and are assigned as bedrooms to the maidservants. But, except for the father and mother of the family, no one is really much better off. The bedrooms are all at one corner of the building; the boys sleep in one, the daughters in the other, and in one of them a third of the room has been shut off by a screen for the governess. There are no keys in the locks.

Perhaps the most sacred place in the house is the bathroom. It is a small apartment, formed in the corridor by means of a wooden partition, and certainly containing nothing in the way of accommodation or furniture to justify the almost religious awe in which it is regarded by the family. No one, but members of the family and guests, is allowed to splash about in the steaming waters of the bath, which is continually being got ready by a servant with the aid of a thermometer.

The garden, which forms the square around which the house is built, is, of course, useless in winter, but in summer it is pleasant to sit under its high towering acacias, white with bloom, and to listen to the sound of water as it falls into the pool of the fountain, where goldfish are at play. Here, too, in the wooden veranda, the family dine during the summer heat. The change is not necessarily an agreeable one, for the gnats are so numerous that it is only possible to get relief from them by burning feathers on a tray somewhere near the table, but this, as often as not, drives the diners away as well. A lamp overhangs the table, and sometimes on summer evenings it is black with insects that cling to the globe in such numbers as to obscure the light.

Here, too, the wondering stranger will be able to note how little the idea of caste seems in some ways to have taken root in Russia. A beggar will appear at the table during luncheon and pour out his piteous tale, or the little son of one of the innumerable male servants will approach and play, and the members of the family, instead of sending him away, will call out to him.

Legal Notes

ASSIGNMENT OF LIEN.

UNDER Comp. Laws, Section 10,734, relative to mechanics' liens, provides "that all liens or claims for liens which may arise or accrue under the terms of this act shall be assignable." It is not necessary that the laborer or materialman first file a statement of his claim to make it assignable. *McAlister vs. Des Rochers et al.*, 93 N. W. Rep. (Mich.) 887.

BUILDING ON ANOTHER'S LAND.

A JUDGMENT or decree establishing a lien on a building alone, separate from the real estate, and ordering it sold to satisfy the lien, necessarily adjudicates the question of the nature of the improvement, and, in effect, decrees it to be personal property. *Shull et al. vs. Best et al.*, 93 N. W. Rep. (Neb.) 753.

CLAIM FOR INTEREST.

PLAINTIFFS, under contract for work done and materials furnished, were to be allowed a specific price for each item. *Held*, in an action to recover thereon, they were entitled to interest on the claim from the time of the demand for its payment. *Sweeny et al. vs. City of New York*, 66 N. E. Rep. (N. Y.) 101.

CONTRACT WITH ARCHITECTS.

ONE'S aid, whereby a firm of architects get a contract for work on a building, is sufficient consideration for the firm's agreement to pay him part of the commissions. *Lord et al. vs. Murchison et al.*, 80 N. Y. Supp. 321.

DEFECTIVE PLASTERING.

WHERE, in an action by an owner of a building against the contractor for damages caused by the falling of the plaster, the only allegations of the petition were that the material furnished was not good, and that the work was not performed in a workmanlike manner, plaintiff was not entitled to recover if the falling of the plaster was caused by the too rapid drying, even though the drying was occasioned by defendant's failure to properly close the doors and windows. *Tausig vs. Wind*, 71 S. W. Rep. (Mo.) 1095.

EMPLOYEE OR SUBCONTRACTOR.

ONE who contracts with a subcontractor to have the sole hauling, at a certain amount per hundredweight, of all the cement needed for the structure, not being bound to personal service, and the amount of work requiring assistants, is not an employee, but a subcontractor of the subcontractor, and therefore not within Rev. St. 1898, Sections 3314, 3315, giving a lien to a principal contractor, subcontractor, or employee of either who performs any work or labor for, in, or about the erection or construction. *Farmer vs. St. Croix Power Co.*, 93 N. W. Rep. (Wis.) 830.

EMPLOYER AND EMPLOYEE.—LIABILITY FOR INJURIES.

A CARPENTER employed by defendant placed a hammer on a cross-piece of a ladder, and, owing to some movement of the ladder, the hammer fell and injured another servant of defendant. *Held*, that the act of the carpenter in placing the hammer where he did could not be imputed as negligence to defendant, as contributing a defect or as creating a danger of which plaintiff should have been warned. *Fay vs. Wilmarth et al.*, 66 N. E. Rep. (Mass.) 410.

SUPERINTENDING CONSTRUCTION.—ACTION FOR SERVICES.

A COMPLAINT alleged that defendant had agreed to pay plaintiff a certain per cent. of the cost of a building in consideration of his superintending the construction, and the defense was that there was a contract to pay plaintiff a certain sum which had been paid. The court instructed that if the jury should find that plaintiff believed the contract was on a per cent. basis, and defendant believed it was for a certain sum, their minds had not come together so as to make a contract, and that, if no contract was made, they should award such sum as they should find plaintiff's services reasonably worth. *Held*, that the instruction was proper, as in effect telling the jury that if the parties did not come to an agreement there was no special contract. *Burton vs. Rosemary Mfg. Co.*, 43 S. E. Rep. (N. C.) 480.

A HOUSE AT WOODMERE, L. I.

ON pages 12 and 13 will be found illustrations of a house recently erected at Woodmere, Long Island, by the Woodmere Land Company, of which R. L. Burton, Esq., is the owner. Like all the Woodmere houses, much attention has been given in the developing of a perfect house, so far as it is possible to make a home complete, with artistic elevations, plenty of bright, cheerful rooms, good sized bedrooms, plenty of bathrooms, and a kitchen and its dependencies, with the servants' dining-hall on the first floor, and separate rooms and a bath for the servants in the second story.

The underpinning is built of red brick laid in red mortar. The exterior walls are lined with brick, thereby insuring a house with greater warmth for winter uses, and the framework is then covered diagonally with matched sheathing, building paper, and shingles, the latter stained a soft brown color. The trimmings are painted cream white, and the blinds are painted a light olive green. The roof is covered with shingles and left to weather finish. Dimensions: Front, 65 ft.; side, 66 ft., exclusive of porch. Height of ceilings: Cellar, 8 ft.; first story, 9 ft.; second, 9 ft.; third, 8 ft. 6 in.

The loggia at the front is paved with Dutch tile. The hall, which is central, is trimmed with white pine and is treated with ivory white paint. It has a colonnaded effect with a beamed ceiling. Part of the partition between the hall and dining-room is filled in with spindlework. The staircase, which is of an ornamental character, is recessed into a staircase hall, which is separated by an archway supported on columns and pilasters. The den, which is placed at the end of the hall, is provided with a tiled floor, etc. The living-room, of large dimensions, is also trimmed with white pine and is treated with white paint. This living-room has a large alcove, which is separated from the living-room by an archway, which is supported on Colonial columns with paneled bases, and provided with a paneled seat extending around the same. A French window, from the living-room, opens into the sun-parlor, which is enclosed with glass and is heated in winter. The fireplace is attractive with its hearth and facings of Dutch tile, red, and enclosing the entire breast up to the mantel shelf, which is supported on ornamental iron brackets. The dining-room has a plate rack, wooden cornice, and an open fireplace furnished with tiled facings and a hearth and a Colonial mantel. The butler's pantry is fitted with sink, drawers, dressers, and cupboards complete. The kitchen, servants' hall, and laundry are trimmed with ash, and are furnished with the best modern conveniences. The toilet room is conveniently located.

The second floor is trimmed with white pine treated with white paint. It contains a large open hall, sewing-room, five bedrooms, and two bathrooms; the latter are provided with tiled wainscotings and paved floor, and are furnished with porcelain fixtures and exposed nickelplated plumbing. The third floor is treated similar, and it contains two guest rooms and bath and two servant bedrooms and bath, and also a trunk room. The cellar, cemented, has a hot water heater, fuel rooms, etc. The house is provided with electric lights and bells and all the necessary fixtures to be found in a newly appointed house. Messrs. Rossiter & Wright, architects, 95 Liberty Street, New York City, N. Y.

SATINWOOD FURNITURE.

WE are promised a vogue of satinwood furniture the coming winter, says a contemporary, and nothing is daintier or more artistic for certain rooms—my lady's boudoir, a small drawing-room or a bijou reception-room.

In employing this delicate and beautiful wood the best eighteenth century models are most appropriate. One art furnisher is showing a collection of satinwood reproductions, remarkable not only for their refinement of form and beauty of style, but also for their perfection of workmanship and a notable adaptation to modern requirements of comfort. For bedroom furniture nothing can be so surpassingly lovely as the satinwood dressing table. Many of the other pieces are for drawing-room decoration, and they have the merit of harmonizing with either French or English eighteenth century treatments. There is no wood more exquisite in grain and texture, and none which lends itself more readily to painted ornament. In past times eminent artists have not disdained to employ their talents in this decorative work, and the modern workmen repeat faithfully and with spirit the choicer designs of Pergolesi or Angelica Kauffmann. Painted satinwood is not only an ornament in itself, but as time goes on it is likely to acquire a durable and increasing value.

In a new crematorium being built at Leeds, England, the actual cremating chamber will not at any time be visible to the mourners. When brought out of the chapel, the coffin will be placed on a movable chariot, and passed through an ante-lobby into the chamber, a curtain falling behind it as it does so.

New Building Patents

The following list of New Patents relating to Building and Sanitary Science is prepared expressly for the SCIENTIFIC AMERICAN BUILDING MONTHLY by MUNN & Co., Solicitors of American and foreign Patents. A PRINTED COPY of the specification and drawing of any patent in this list, or any patent in print issued since 1863, will be furnished from this office for 10 cents, if exact date or number is furnished. Remit to MUNN & Co., 361 Broadway, New York.

BRICK, STONE, AND TILE.

BUILDING BLOCK AND WALL. F. E. Kidder, Denver, Col. November 3 743,391
METAL ROOFING TILE. A. H. Memmler, Los Angeles, Cal. November 10 743,905
HOLLOW BUILDING BLOCK. H. L. Bynum, Brazil, Ind. November 17 744,480
TILE. J. M. Coffield, Bellaire, Ohio. November 24 745,000

CARPENTRY.

SLIDING AND SWINGING SASH WINDOW. G. Hayes, Mt. Vernon, N. Y. November 3 742,869
PIVOTED WINDOW. O. A. Essig, Canton, Ohio. November 24 744,733
ADJUSTABLE ROLLING WINDOW. J. C. Bowe, Indianapolis, Ind. November 24 744,953

CONSTRUCTION.

CONSTRUCTION OF CEILINGS OR FLOORS. H. Eggert, Berlin, Germany. November 3 742,849
METAL WINDOW FRAME. W. J. Klemm, Chicago, Ill. November 3 742,999
COMPOSITE STRUCTURAL MEMBER. J. Kahn, Detroit, Mich. November 3 743,086
BUILDING STRUCTURE. Ellinger and Kopczynski, Boston, Mass. November 3 743,262
COWL. W. J. Kayser, Greenbay, Wis. November 3 743,390
CONSTRUCTION OF COLUMNS OR POSTS. L. J. Sicke, New York, N. Y. November 10 743,765
REVOLVING METALLIC WINDOW. L. Christenson, New York, N. Y. November 10 743,828
BUILDING WALL CONSTRUCTION. M. Garvey, New York, N. Y. November 17 744,185
CONSTRUCTION OF WALLS. A. Lugino, Berlin, Germany. November 17 744,374
BUILDING STIRRUP. W. B. Gervais, Chicago, Ill. November 17 744,527
WOOD COLUMN. E. Koll, Chicago, Ill. November 17 744,566
BUILDING CONSTRUCTION. A. Menezarski, New York, N. Y. November 24 745,068
SKYLIGHT. J. Degenhardt, Cassel, Germany. November 24 745,310

ELEVATORS.

SAFETY DEVICE FOR ELEVATORS. F. D. Potter, Linden, N. J. November 10 743,923
ELEVATOR. W. H. Hultgren, Philadelphia, Pa. November 17 744,346

FIREPROOFING AND FIRE EXTINGUISHMENT.

FIRE-RESISTING WINDOW. G. Hayes, Mount Vernon, N. Y. November 3 742,868
FIREPROOF GIRDER OR BEAM. W. N. Wight, New York, N. Y. November 3 742,943
FIREPROOF BUILDING STRUCTURE. W. Klinck, Philadelphia, Pa. November 3 743,000
FIREPROOF METAL WINDOW. Knisely and Klenem, Chicago, Ill. November 3 743,088
FIREPROOF CONSTRUCTION. H. L. Kubbernuss, St. Louis, Mo. November 3 743,295
FIRE CURTAIN. J. W. Reno, New York, N. Y. November 17 744,404

HARDWARE.

COMBINED LOCK AND LATCH. J. E. Keverline, Coalhull, Pa. November 3 742,875
WINDOW FASTENER. O. C. Little, Menasha, Wis. November 3 742,882
VENTILATING SASH LOCK, ETC. J. C. Blair, Newark, N. J. November 3 743,137
HINGE. A. C. Haycock, Sparkhill, Eng. November 3 743,279
ADJUSTABLE BURGLAR PROOF WINDOW FASTENER. N. S. Hillyard, St. Joseph, Mo. November 3 743,283
LOCK. L. Faust, Rockford, Ill. November 10 743,475
LATCH. S. S. Niles, Oakpark, Ill. November 10 743,545
LOCK. E. H. Dimock, Dorchester, Mass. November 10 743,695
LOCK AND LATCH. H. J. Voight, New Britain, Conn. November 17 744,134
SASH FASTENER. J. W. Buchanan, Asheville, N. C. November 17 744,473
SASH LOCK. W. B. Weaver, Lakeland, Fla. November 17 744,654
SASH FASTENER. E. W. Hasenpflug, East Cleveland, Ohio. November 24 744,755
SASH BALANCE. W. Berry, Chicago, Ill. November 17 744,995, 744,996

HEATING AND VENTILATION.

RADIATOR. W. C. Pease, South Eliot, Mo. November 10 743,749
VENTILATOR. E. P. Oliver, Boston, Mass. November 10 743,987
GAS RADIATOR. T. E. McNeill, New York, N. Y. November 24 744,787

MISCELLANEOUS.

KNOCKDOWN SCAFFOLDING. W. Harrison, Grand Rapids, Mich. November 17 744,194
SCAFFOLDING. C. B. Cummons, Charleston, Mo. November 24 745,094

PLUMBING.

WATER CLOSET. P. H. Hardin, Chicago, Ill. November 3 742,866
APPARATUS FOR FLUSHING AND VENTILATING URINALS. J. Le Reau, Windsor, Canada. November 10 743,528
FLUSHING TANK FOR WATER CLOSETS. E. G. Watrous, Chicago, Ill. November 17 744,139

TOOLS.

CARPENTERS' LEVEL AND QUADRANT. W. Potter, New York, N. Y. November 3 743,100
CARPENTERS' FRAMING SQUARE. W. B. Mahan, Springfield, Ill. November 10 743,900
PLUMB LEVEL. W. B. Bradshaw, Ennis, Texas. November 24 745,146



WARM-AIR GENERATORS.

A WELL accepted principle in heating is to warm a great volume of air by bringing it into actual contact with an extensive and properly heated surface. This is accomplished by sending the air in separate channels through corrugated cast iron flues or sections, which surround the fire. By sending the air into as many flues as there are sections, it is more thoroughly and evenly heated than by simply passing a body of air over, or next to, a hot surface. This is one of the



WARM AIR GENERATOR.

great advantages reached by the Kelsey system of heating, and the apparatus constructed for the purpose is shown herewith in sectional view. Three sections are removed, showing the inside and outside casings, cast-iron back pipes, etc. The outside casing is of galvanized iron and the upper half is lined with asbestos sheathing, and this, in turn, with tin. Between the inside and outside casing there is a space of three inches. This is an air chamber, and is open to the fresh air supply below, and to the hot air pipes above. The warm air is sent in separate currents through from nine to seventeen corrugated cast-iron flues which form the fire cylinder and combustion chamber. Each flue weighs seventy pounds, and has eight square feet of heating surface. These separate currents of warm air are forced to every part of a building. They move or rise rapidly, and there is no scorched or superheated air, but an abundance of fresh air—enough for heat and ventilation—is properly warmed. These warm air currents are positively controlled and sent in any direction, through long pipes or short ones, to every room in a house, whether in an exposed location or not. Even temperature easily maintained throughout a house is also healthful and economical heating, and is sufficient to lift a heater out of the class of ordinary furnaces. The Kelsey generator, in its ability to keep this even heating, is especially adapted for use in warming wide open interior construction of houses, such as parlors, libraries, halls, and staircases. The Kelsey is also provided with a hot water attachment, at a small cost, that will afford an ample supply of hot water for kitchens, bathrooms, laundry purposes, and conservatories. Its location is entirely under the feed-mouth door, and in position it forms part of the fire cylinder, so that it must be heated, with very little extra fuel cost. When reinforced by an extra pipe running out into the fire and return, it may be used for heating radiation in rooms that it may be impossible to connect with warm air heating pipes. All sizes of Kelsey generators are furnished with cast-iron back pipes. They will not rust out from the action of creosote and soot, as, for example, is the case with the galvanized pipes. There is no difference whatever in the internal construction of the Kelsey—they are made in one grade and quality. There are six sizes of the regular portable style: each size being numbered according to the diameter of the grate surface. In heating capacity the range is from five thousand to ninety thousand cubic feet. In addition to the regular portable form with single feed door, the Kelsey is made with a double feed door for admitting large chunks of wood, and has a wood-burning grate, which can be used when so desired. A handsome ornamental cast-iron front is also made for the portable heater, and this, in combination with the side wings, is used in a brick-set construction, which is frequently specified for schools or public buildings. This heater is adaptable to all new houses, churches, schools, halls, etc., while in process of construction, and to places where the ordinary hot-air system has been used. Generally the same flues can be used, and often one generator takes the place of two heaters. The battery form of placing two or more Kelsey heaters under one dome casing has been demonstrated to be a perfect system for heating and ventilating large resi-

dences. The advantages of this system are that the required quantity of pure warm air is supplied as it may be needed, and there is no waste of fuel, and the expense for operating and keeping in repair is reduced to a minimum. The Kelsey Heating Company has its main offices and works at Nos. 337-341 West Fayette Street, Syracuse, N. Y., with branch offices in New York and Chicago. The James Smart Manufacturing Co., Brockville, Ont., is sole maker for Canada.

PORTABLE AND READY-MADE BUILDINGS.

In no country has the art of rapidity in construction been so pronounced, in recent years, as in the United States. While most of the European and other nations adhere almost entirely to old-time methods in the erection of buildings, our architects and builders have made stupendous strides in the direction of quick construction of all types of structures. Fully in accord with the spirit of the times are all, or nearly all, of the building operations in this country, until now the speed with which buildings are put up is absolutely astounding.

In this connection we mention the Ducker Company, with its specialty of portable or sectional and ready-made houses, which places it in the front rank of quick builders. A visit to the factory of the Ducker Company affords an opportunity to examine the methods employed, which make it possible, almost, "to build in a day." There one will be shown a design of a house and how the structure is, practically, ready-made, everything being cut to length and fitted by machinery, the respective parts being kept separate in bundles, marked and ready for shipment. In this way upon the arrival of the material at the place desired, no time is lost in measuring, sawing, planing, or fitting, and the erection is accomplished as if by magic.

The business of the Ducker Company has received a great impetus in foreign countries, principally in Cuba, Central America, and South America, on account of the scarcity of skilled labor, machinery, etc., in those regions. One feature of the Ducker buildings which makes them especially attractive to dwellers in tropical climes is their demonstrated ability to withstand seismic disturbances without injury. It was



COUNTRY COTTAGE.

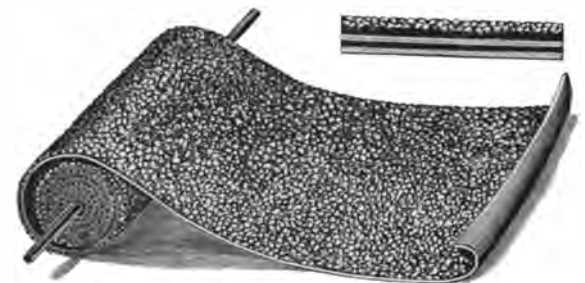
formerly thought that only buildings with abnormally thick walls would outlive shocks of earthquake, but the comparatively light, yet substantial and stable type of structures manufactured by the Ducker Co. has stood this supreme test in unanswerable fashion, as is shown by information we have received from the owner of a Ducker building erected in one of the West India Islands, in which he states, that he personally superintended its erection, was surprised at the facility with which it was possible to accomplish it, and delighted that the two or three slight shocks of earthquake experienced since the house was put up were felt less in it than in any building of native Spanish construction.

The company does not confine itself to the construction of any one style of building, but in its ordinary course of operation manufactures dwelling houses, hospitals, barracks, automobile houses, factories, railroad stations, schools, cottages, and churches. In the accompanying engraving a country cottage is shown, size 20 x 33 feet. Ducker's portable or sectional structures can be taken down and re-erected on another site at a nominal cost, by the local carpenter, or even unskilled labor. These patent sectional buildings may be erected without nail or screw—surely a system that is bound to secure the attention of all seekers after standards of excellence is a matter that is unsurpassed by any industry in world necessities. The system has been adopted by the United States Government as a model of superiority, and awarded a special medal by the Empress of Germany. The Ducker Company, No. 273 Broadway, New York, N. Y., will send, at request, an illustrated catalogue, giving full information about its portable building interest.

GRANITE ROOFING.

It may be safe to claim that a standard quality of roofing is not achieved unless it requires no recoating. This feature of durability exists in a material called "Perfected Granite Roofing," made of a composition into which pebbles, uniform in size, are pressed by the application of machinery. This quality of roofing is

manufactured to resist acid or chemical fumes, heat, cold, rain, snow, steam, and gas, and withal is so pliable that it may be laid on top of old shingles and made to conform so well that the roof will not be noticed underneath. The material sheds water rapidly and quickly dries. It will not run from roof or siding, stands a tropical sun, resists the hardest rains and the action of flames. The Eastern Granite Roofing Company of New York are the originators and manufacturers of this material. It has been adopted by many of the leading architects, builders, contractors, railroads, coal operators, and manufacturers as the standard ready roofing. This stone surfaced material, shown in the illustration, is scientifically made by skilled workmen on specially constructed machinery. It does not rust like tin, rot like shingles, nor crack like slate. Under all the varying conditions of the seasons it stands impervious. Once washed with rain, the water from this roofing is always untainted, and may be employed for factory, household, and drinking purposes. It is one of the most attractive roofings made, and appears equally well as a siding. For cottages and buildings where the roof is a supplementary beauty to the whole structure, it can be used in ornamental effect in place of shingles. For use on factories, barns, mills, mines, and sheds, it is most practical. Only a tinsmith can lay a tinroof, a carpenter put on shingles, but this accommodating material is shipped ready to be applied by any inexperienced workman quickly and properly by following the simple and thorough instructions furnished with each shipment of goods. Or any enterprising purchaser can lay it himself, and have the economic satisfaction that he has not paid for high-priced labor, railroad fares, and board for workmen while away from home. This waterproof roofing chars only under long continued subjection to intense heat, which makes it particularly desirable for buildings exposed to sparks from locomotives, chimneys, and foundries. In this connection we use the information sent us by the Harrisburg Manufacturing and Boiler Company, that the building on fire was a frame structure, and while the sheathing and rafters were very badly burned, yet the fire did not get through the granite roofing, thus enabling the control of the blaze. Had the roofing material burned rapidly, it would have been impossible to save the firm's buildings, as the fire had considerable headway before discovered. The White-Warner Company, of Taunton, also informs us that a fire occurred a few months ago in its foundry No. 1, and running parallel with it was foundry No. 2, which was saved, as it was covered with granite roofing placed right on top of the shingles, the latter not even scorched, and for good results was superior to the protection given by the tin shingles on the store house. Besides the adaptability of this roofing to cover over wood shingles, it can be put on over old tin, without removing this metal, simply by pounding down the standing joints on lock-joint tin. "Perfected Granite Roofing" has been in use nearly twenty years throughout the country and upon all kinds of structures, and it is known to be thoroughly efficient and durable, whether for the exacting requirements of the roofs of chemical works, bleacheries and dye works, or the lesser demands of the ordinary outhouse. In relation to the vast output of this company's roofing industry, we may state that forty-eight railroad companies are using the material continually. The stock yard buildings at East Buffalo, N. Y., using 400,000 square feet, the new railroad shops at Readsville, Mass., 260,000 square feet, and the Ham-

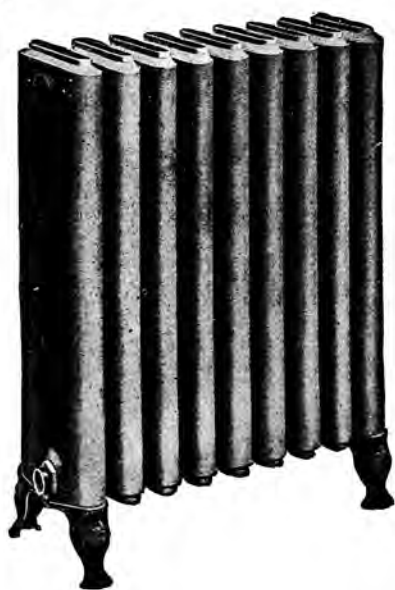


GRANITE ROOFING.

burg-American pier at Hoboken, N. J., 135,000 square feet of granite roofing, are mentioned to show a few of the large areas possible for the company to cover. One of the latest contracts completed by the company is the covering of the enormous new works of the Lake Shore and Michigan Southern Railroad at Collinwood, Ohio. Each roll of roofing contains 110 square feet, and is 41 feet 3 inches long and 32 inches wide. In laying, each roll covers 100 square feet of surface, allowing a uniform lap of 3 inches for horizontal joints. The weight per roll is 140 pounds. In order to facilitate the work of laying, the company supplies a special mop of a mailable size. The new and extensive works of the Eastern Granite Roofing Company is equipped throughout with the latest improved machinery, invented by its own experts. The address is the Irving Building, West Broadway and Chambers Street, New York, N. Y.

BRASS
BRONZE
COPPER
STEEL

RADIATORS



KINNEAR
TRADE MARK
HOOD

Kinnear Radiators

excel in artistic appearance, greatest heating surface in limited floor space, increased efficiency, and decreased weight.

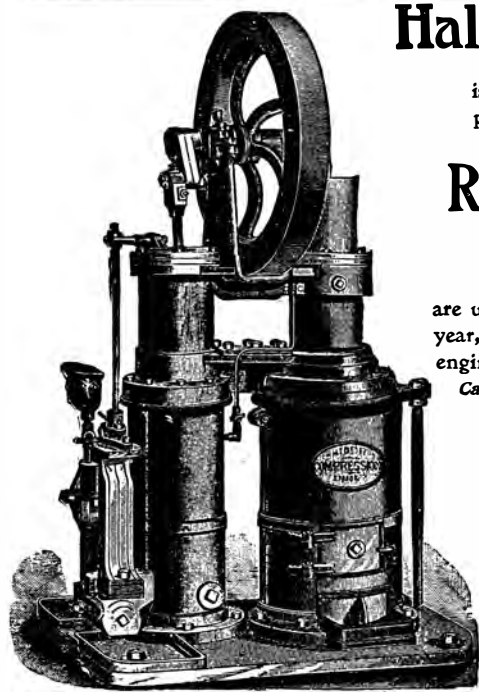
Durability Guaranteed

Beautiful electric finish to conform to any interior decoration.

WRITE FOR CATALOG No. 5.

Kinnear-Hood Steel Company

No. 141 Broadway, New York, N. Y.



Half Enough Water

is quite enough for some people, but most people want water every day. If

RIDER OR ERICSSON Hot Air Pumps

are used you can have water every day in the year, and your cook or stable boy is the only engineer needed. 25,000 in daily use.

Catalogue "E," on application to nearest store.

Rider-Ericsson Engine Co.,

35 Warren Street, NEW YORK.

40 Dearborn Street, CHICAGO.

239 Franklin Street, BOSTON.

40 N. 7th St., PHILADELPHIA.

692 Craig St., MONTREAL, P. Q.

22 Pitt St., SYDNEY, N. S. W.

Teniente-Rey 71, HAVANA, CUBA.

**Koll's
Patent
Lock**



**Joint
Staved
Columns**

are particularly well adapted for outdoor use. Many of the attractive residences shown in this and other publications are using columns furnished by us for Porch and Pergola work.

Our well equipped cabinet department permits us to furnish these columns and pilasters made of various hard woods for interior decoration as well.

They are made in all sizes from 5 in. to 42 in. diameter, and proportionate length.

Send for illustrated catalogue "A," showing the various styles of columns, caps and bases manufactured by us.

HARTMANN BROS. MFG. CO.,

MOUNT VERNON, N. Y., U. S. A.

New York Office: Townsend Building, 1123 Broadway.

Western Factory, HENRY SANDERS CO., 77 to 85 Weed Street, Chicago, Ill.

The Popular Fox Trimmers

Miter Machines

and
Dado Heads

Four
Sizes.

For
Mitering
Moulding

Four
Styles.

No. 3 Miter.

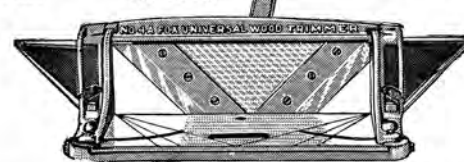
ANY TOOL
ON TRIAL.



Fox Trimmers will true up the ends of any piece of wood accurately and smooth on any angle instantly.

Every Builder should have one.

Ten Sizes.

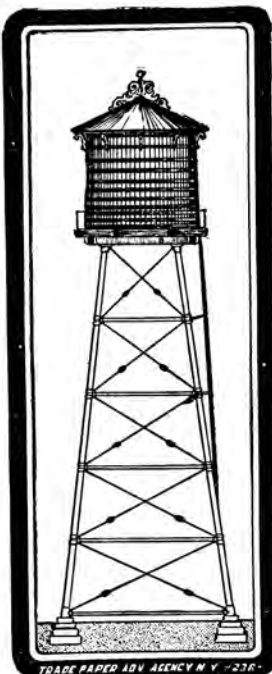


No. 1
Adjustable
Dado Head.

DADO HEADS IN
ANY DIAMETER
AND ANY CUT,
EITHER PLAIN
OR ADJUSTABLE.

Catalogues and Prices on request.

FOX MACHINE CO. 300 N. Front Street, GRAND RAPIDS, MICH.



"Absolutely safe and reliable. Ask your friends."

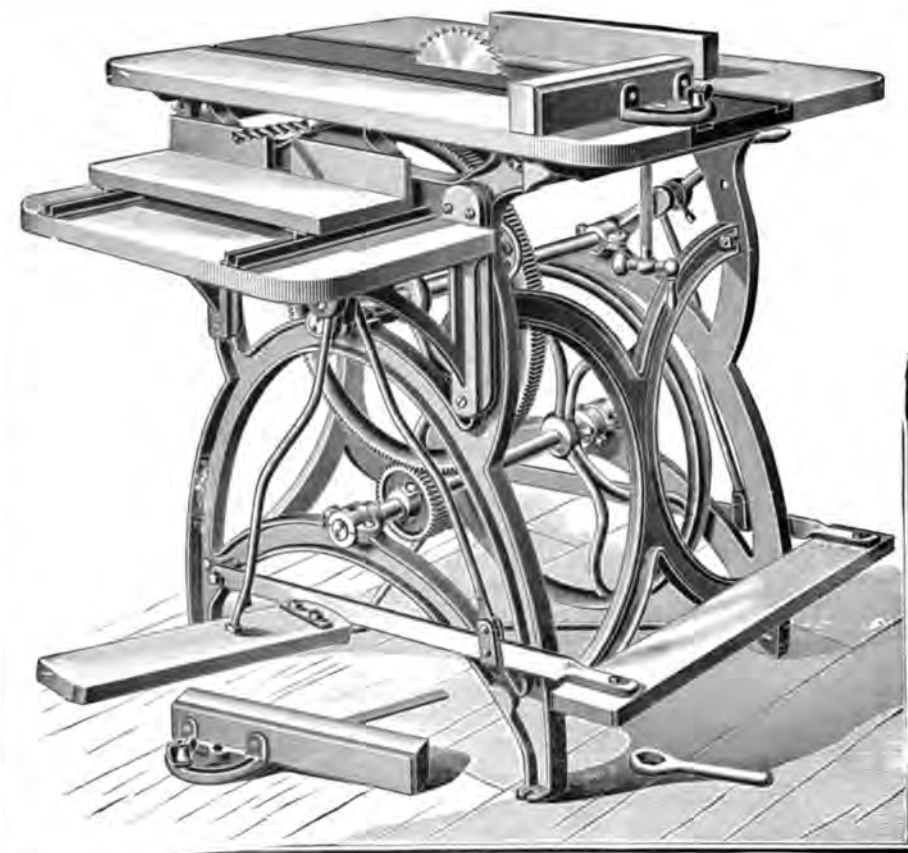
Fire must be Fought

from the minute it shows itself. For the best fire protection and water service, whether for residence, factory or small town, employ a **Caldwell Tank** on a **Caldwell Tower**. The reduction in insurance rates will more than pay original cost in a short time. The tank is tight and durable and the tower strong and sightly. Some of these outfits are in your vicinity. Let us refer you to them.

Send for our catalogue, price list and plans.

W. E. CALDWELL CO.,
LOUISVILLE, KY.

MARSTON'S HAND AND FOOT POWER CIRCULAR SAW



Iron Frame, 36 inches high.

CENTRE PART OF TOP IS MADE OF IRON ACCURATELY PLANED,
with grooves on each side of saw for gauges to slide in.

Steel shafts and best Rabbitt metal boxes
Gears are all machine-cut from solid iron.
Two 7-inch saws and two crank handles with each machine.

Boring table and side treadle.
Weight, complete, 350 lbs.
Send for catalogue.

J. M. Marston & Co., 199 Ruggles St., Boston, Mass.




Secure
Protection
and
Long Service
by using
our

Asphalt Roofing

SAVES REPAIRS. SAVES RECOATING.
SAVES RENEWING.

SEND FOR SAMPLES AND PAMPHLET.

STOWELL MFG. CO.
JERSEY CITY, N. J.



80 Page Illustrated Catalogue of
over 250 Designs of Superior
WEATHER VANES,
TOWER ORNAMENTS,
CHURCH CROSSES,
COPPER FINIALS, Etc.
Mailed to any address for 2-cent stamp
—half the postage.

T. W. JONES, Manufacturer,
18 Fletcher Street, New York.

HAND ELEVATORS FOR HARDWARE TRADE.

Send for catalogue.

THE STORM MANUFACTURING CO.,
NEWARK, N. J.

DUMB WAITERS

TYPEWRITERS

ALL MAKES \$15 TO \$75
GUARANTEED • CATALOGUE FREE
PHILA. TYPEWRITER EXCHANGE
PHILADELPHIA • PITTSBURG.



Reduce Insurance
by using

SMITH'S

Patent
Fireproof

Metal Wire-Glass Windows

SMITH-WARREN CO.
253 Broadway, New York

Automatic
Closing,
Sliding and
Revolving
Sashes.



PLANS READY TO BUILD FROM.

THE NATIONAL BUILDER a
monthly journal devoted to
practical building inter-
ests. Each number con-
tains one or more Archi-
tects' plans of a moderate-
priced structure, drawn to
a scale and ready to build
from, with a complete bill
of material and detailed
estimate. \$2. per year. Sample and Cat. free.

THE NATIONAL BUILDER,
296-298 Dearborn st. CHICAGO.



Gre-Solvent

HANDS DIRTY?

Gre-Solvent instantly dissolves and removes
machine grease, paint and ink. Miles ahead of
soap. Harmless. Antiseptic. By mail, prepaid,
15c. and 25c., stamps. Sample free to dealers.
Correspondence solicited.

THE UTILITY CO., 233 Greenwich St., New York.



OUR remarkable recent inventions enable us
to offer the public an intensely brilliant,
smokeless gas at much less cost than city
gas, better, safer and cheaper than electricity,
and costing but one-fourth as much as Acetylene.
Most durable and least expensive apparatus to
maintain in effective perpetual operation. Gives
services of lighting, cooking, and heating.
Fullest satisfaction guaranteed, and easy terms.
The very apparatus for suburban homes, institu-
tions, etc. We construct special apparatus also for
fuel gas for manufacturing, producing gas equiv-
alent to city gas at 50 cents per 1,000 cubic feet, and
made to respond to very large demands, also for
lighting towns, etc.

C. M. KEMP MFG. CO.,
BALTIMORE, MD.

Your Water Problem is Solved

IF YOU INSTALL A



STANDARD Pumping Engine

For Suburban Residents, Florists and Farmers,
Contractors and Builders.

OUR GAS AND GASOLINE PUMPING ENGINES ARE SIMPLE AND
EASY TO OPERATE; THEY ARE DURABLE AND RELIABLE.
WE HAVE THEM IN SIZES TO MEET YOUR REQUIREMENTS.
Our Catalogue S, sent on application, will interest you.

The Standard Pump and Engine Co.
CLEVELAND, OHIO.

ESTABLISHED 1868

THE "HAYES"

METALLIC GLAZED STRUCTURES

SKYLIGHTS WINDOWS

71-8TH AVE. NEW YORK.

FIRE PROOF
WIRE-GLASS

METAL LATHINGS ETC.

DR. WEBB MITCHELL writes: "You have given me a gay evening, and I think that Van Dyke must have
enjoyed it as much as any of the—as yet—unguillotined."
CHARLES MAJOR writes: "Thanks for 'The Literary Guillotine.' It is interesting even to us who are guillo-
tined; as some one once said to his executioner: 'It is a pleasure to be beheaded by so fine a gentleman!'"

THE LITERARY GUILLOTINE

HALL CAINE - MARIE CORELLI
WINSTON CHURCHILL - BOOTH TARKINGTON
CHARLES MAJOR - IRVING BACHELLER
RICHARD HARDING DAVIS - JOHN KENDRICK BANGS
JAMES BRANDER MATTHEWS
MRS. HUMPHRY WARD
ELLA WHEELER WILCOX - SIR ALFRED AYSTON
BLISS CARMAN - EDWIN MARKHAM
HENRY JAMES - MARY BAKER G. EDDY

BY?

MARK TWAIN
OLIVER HERFORD
L.B. LOOMIS

JOHN LANE, THE BODLEY HEAD
NEW YORK & LONDON

"NEVER FLAHS." "CLEVER SATIRE." "FULL OF GOOD THINGS."
Decorative Cover, \$1.00 net.

Modern American Dwellings

WITH CONSTRUCTIVE DETAILS.

This is the largest and most complete volume of Perspective Views, Floor Plans,
Elevations and Constructive Details of Modern Homes now published.
It contains 37 selected designs of beautiful Modern Residences, illustrated by
full-page half-tone engravings of the completed buildings, and 127 full-page plates of
Elevations, Floor Plans and Constructive Details, all drawn to scale, and 40 pages of
descriptive text.

Price, \$2.00 Postpaid.

For sale by **MUNN & CO.,** 361 Broadway, New York City.

FOR YOUR DEN



Strive for Harmony


in the room arrangements and wall decora-
tions of your home. Made-to-order clocks
permit an exclusiveness and individuality
unattainable even by most careful pur-
chasing of the ready-made sort.

Send for Photographs

We manufacture the famous "Will-
lard Style" Clocks and can furnish
them in several styles of finish and
designs. For the asking we send photo-
graphs representing exact details of
construction.

Send us details of space for which clock is desired, with
brief description of accompanying room arrangement, pre-
dominating colors, etc., and we will submit photographs and
suggestions which will enable you to select the clock and
promptly and in thorough, practical and exclusive taste. We
give prompt attention to all your needs.

KILLAM & CO., 10 Portland Street, Pawtucket, R. I.



VOLT AMMETERS

Pocket size, but large enough for accuracy
and practical use. Various ranges for testing
batteries, electric light, telephone and other
circuits, etc. Also Voltmeters and Ammeters
for general measurements. Send for Circular.

L. M. PIGNOLET,
80 Cortlandt Street, New York, N. Y.

WE TRUST YOU

For Sixty Years

we have been Diamond Importers and Man-
ufacturing Jewelers. From a modest begin-
ning our business has developed into the
largest in the world. Our diamonds are the
finest imported, have a beautiful blue-white
color, and are sold on

Small Monthly Payments

We give with every purchase a certificate
guaranteeing quality and value. Our im-
mense business enables you to

Save from 15 to 25 per cent.

upon prices charged elsewhere.
All transactions are confidential.

WE TRUST YOU

because our business is based on faith in
the integrity of the people. Send for our
new Catalogue S. A. It contains a com-
plete description of all kinds of Diamond
Jewelry, with prices, and explains our

Easy Payment Plan

Estab-
lished
1843

You pay 50 per cent. down,
and 10 per cent. per month
until purchase is completed,
which is nine months, with-
out inconvenience.


J. M. LYON & CO.
63, 67 & 69 Nassau St. New York
U.S.A.

BUILDERS' GUIDE

By I. P. HICKS.

This is one of the most useful books for builders
and building mechanics that is published. It con-
tains a very practical system of estimating labor and
materials, showing how to figure in almost every de-
tail of building construction, including carpenters'
work, masonry, plastering, hardware, painting, etc.
A section is given to the geometrical measurement of
roof surfaces, with numerous illustrations and ex-
amples covering roof framing of every description.
The volume also contains a chapter on mitering,
planeers, moldings, etc., describing the making of
many troublesome joints. 160 pages, 114 illustra-
tions. Cloth, \$1.00.

For sale by **MUNN & CO.,** 361 Broadway, New York.



THE FRANKLIN DYNAMO

50 Watts, 10 Volts, 5 Amperes
3,000 to 4,000 revolutions. Sets of mate-
rials, finished parts, complete machines.
For amateur construction—very efficient.
Will drive a dental engine, sewing ma-
chine or small lathe; run as a generator,
will furnish current for six 6-candle
lamps. Parts, \$3.50, \$6.00, \$8.50. Com-
plete, \$13.50. Write for circular &

Parsell & Weed, 129-131 W. 31st St., N. Y.

PATENT PROTECTION

— IN —

Cuba, Porto Rico, and the Philippines.

Owners of United States Patents, Trade Marks
Prints and Labels may procure protection in the
Colonial possessions of the United States by effect-
ing registration in these countries.

The expense is very slight and the protection
required by such registration should be secured
without delay.

For terms and full information, address

MUNN & CO.,
PATENT SOLICITORS,
361 Broadway,
New York.
625 F Street
Washington, D. C.



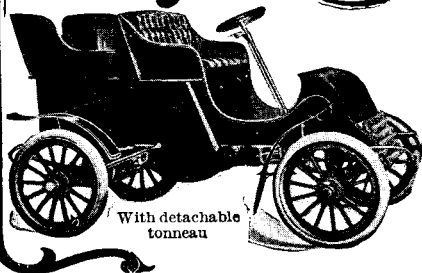
The Cadillac

The Automobile that Solves the Problem

Until the Cadillac was made, all automobile construction was more or less experimental. This machine is made on a new system developed from the experiences of all previous makers: the faults and weaknesses of the old methods have been avoided and a new ideal of motor travel developed that gives a perfect vehicle for comfort, speed, absolute safety, greatest durability, simplicity of operation, wide radius of travel, and reliability under all conditions of roads. You should not buy before examining this wonderful new machine. Price f. o. b. at factory, \$750.

The new tonneau attachment, at an extra cost of \$100, gives practically two motor vehicles in one, with a seating capacity of two or four, as required—a very graceful effect in either use. Write for illustrated booklet N.

CADILLAC AUTOMOBILE COMPANY,
Detroit, Mich.



ELECTRIC AUTOMOBILE.—Directions, with many illustrations, for making a complete machine from two bicycles are given in SUPPLEMENT No. 1195. The motor and battery are also treated in detail. Price 10 cents. For sale by Munn & Co. and all newsdealers.

TUBULAR DRIVING LAMP.

IT is the only perfect one.
IT will not blow or jar out.
IT gives a clear, white light.
IT is like an engine head-light.
IT throws the light straight ahead from 200 to 300 ft.
IT burns kerosene.
Send for book (free).

R. E. DIETZ CO., 60 Lighthouse Street, New York.
Mention this paper and get special discount.
—ESTABLISHED 1840.

D. and J. HANGERS

SLEEVE Absolutely the BEST.

Why? They are Mechanically Correct, Accurately Ground, Lightest, Nearest Dust and Water-Proof, Neatest in Appearance, and they are used by the best Manufacturers and ridden by the best Professionals and Amateurs of America.

Park City Mfg. Co., Inc., Chicago.

Presses for Sub-Press Work.

Five sizes. Sub-Presses and Tools to order.

Send for Catalogue.

BLAKE & JOHNSON,
P. O. Box 7, WATERBURY, CONN.

MILLS FOR ALL MATERIALS.

OUR BUSINESS IS TO MAKE MACHINERY FOR GRINDING GRAIN, CRUSHING ROCKS AND PULVERIZING ALL HARD SUBSTANCES. WE HANDLE ALL KINDS OF MATERIALS FROM COTTON-SEED TO ROOTS AND HERBS. BY AN UNEXCELLED PROCESS. IF YOU WANT ANY KIND OF A MILL OR GRINDING MACHINE. COME TO US AND YOU WILL GET THE BEST AND STILL SAVE MONEY.

DEAL WITH US ONCE AND YOU WON'T CHANGE.

SPROUT, WALDRON & CO.
MUNCY, PA.

Dr. Deimel Underwear

The Dr. Deimel Linen Underwear means warmth, protection, and health to every one—young and old—it is the best that money can buy.



Wear it this winter as a safeguard against the cold-catching habit.

For catalogue and samples of material address

The Deimel Linen-Mesh Co.,
Dept. J. 42-491 Broadway, N. Y.

SAN FRANCISCO, CAL., 111 Montgomery St.
WASHINGTON, D. C., 728 Fifteenth St., N. W.
BROOKLYN, 10 Fulton St.
MONTREAL, CAN., 2202 St. Catherine St.
LONDON, W. C., ENG., 83 Strand, (Hotel Cecil).

CRUDE ASBESTOS
DIRECT FROM MINES
PREPARED ASBESTOS FIBRE
for Manufacturers use
R. H. MARTIN,
OFFICE, ST. PAUL BUILDING
220 B'way, New York.

Modern American School Buildings

By WARREN RICHARD BRIGGS.

Size, 6x9 inches; 412 Pages and 89 Full-page Illustrations. Cloth, \$4.00.

This fine work is comprised in sixteen chapters. The first five chapters relate to "Appropriations," "Competitions," "Specialists," and "Commissions," following which the question of superintendence is considered, together with the ethics relating thereto. The chapters which follow treat of ready-made plans, entrance halls and staircases, windows and lighting, hat and cloak rooms, together with play rooms, heating and ventilation, sanitary arrangements and the hygienic construction of the Bridgeport High School Building. Chapters which cannot fail to especially interest a large class are those on "Suburban School Houses" and "Planning and Construction of School Houses." These cover something like 175 pages, and are illustrated by numerous engravings showing floor plans and elevations of buildings adapted for suburban and other sites. The designs show edifices ranging from a one room structure up to those appropriate for State Normal Schools.

For sale by MUNN & CO., Publishers, 361 Broadway, New York City.

A BOOK EVERY PROGRESSIVE BUILDER SHOULD HAVE.

Building Construction and Superintendence.

By F. E. KIDDER, C.E., Ph.D., Architect,
Author of "The Architects' and Builders' Pocket Book."

FOURTH EDITION.

Part I.—MASONS' WORK. 421 Pages. 250 Illustrations.

FROM AUTHOR'S PREFACE.

The primary object of the author in preparing this volume has been to present to the Student, Architect, and Builder a text book and guide to the materials used in Architectural Masonry and the most approved methods of doing the various kinds of work, and incidentally to point out some of the ways in which such work should not be done, and the too frequent methods of slighting the work.

One 8vo Vol., Cloth, Price, postpaid, \$4.00.

THIRD EDITION.

Part II.—CARPENTERS' WORK. 544 Pages. 524 Illustrations.

FROM AUTHOR'S PREFACE.

It has been the aim of the Author, in preparing this work, to furnish a series of books that shall be of practical value to all who have to do with building operations, and especially to architects, draughtsmen and builders. In this volume an attempt has been made to describe those materials and methods of construction that come within the ordinary province of the carpenter or are usually included in the carpenter's specifications.

One 8vo Vol., Cloth, Price, postpaid, \$4.00.

Sample pages on application. Each part independent and sold separately.

For Sale by MUNN & CO., 361 Broadway, New York.

The Watch of the Period



With ordinary care and usage—anywhere, at any time—

The Elgin Watch will never fail in its faithful performance of perfect timekeeping. Guaranteed against original defect.

Every Elgin Watch has "Elgin" engraved on the works. Booklet free.

ELGIN NATIONAL WATCH CO., Elgin, Illinois.

Ferry's

Seeds

are planted by farmer and gardener who has stopped experimenting. It pays to pay a little more for Ferry's and reap a great deal more at the harvest. All dealers. 1903 Seed Annual postpaid free to all applicants.
D. M. FERRY & CO.,
Detroit, Mich.

BICYCLE TIRE REPAIRING.—THE Mending of Single Tube Tires.—A practical article illustrating the method of inserting patches and plugs with pliers and pluggers, together with rubber band plugging and the use of puncture bands. 9 illustrations. Contained in SUPPLEMENT 1102. Price 10 cents. For sale by Munn & Co. and all newsdealers.



SCROLL SAWYER.

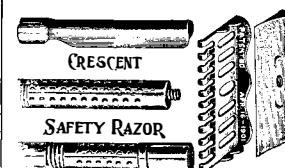
On receipt of 15 cents I will send, postpaid, the pattern of this Three-Shell Bracket, size 12x12, over 300 beautiful Miniature Designs for Scroll Sawing, and my ILLUSTRATED Catalogue of Scroll Saws, Lathes, Fancy Woods, Small Locks, Fancy Hinges, Catches, Clock Movements, etc.; or send 6 cents for Catalogue and Miniature Designs.

A. H. POMEROY,
Department B,
98 Asylum Street,
HARTFORD, CONN.

Quality-Simplicity-Practicability

These are the three important points studied in the manufacture of the widely celebrated

CRESCENT SAFETY RAZOR



The quality is as sured from the fact that the blade is forged from the finest English Razor Steel, tempered by an improved process. The simplicity is shown in the ease with which the blade can be adjusted for shaving or stropping. The practicability is that every part is interchangeable and mail for \$1.25.

SOUTHLINGTON CUTLERY CO., Southington, Ct., U. S. A.

KLIP-KLIP The Pocket Manicure



Trims, files, shapes and cleans, and keeps the nails in perfect condition. A complete manicure for man, woman or child. Silver steel, nickel-plated. Sent post paid on receipt of price if your dealer hasn't it 25c

KLIP-KLIP CO., 563 So. Clinton St. Rochester, N. Y.

MECHANICALLY TRUE.
Our machinery for correctly shaping and spacing the teeth of all kinds of gear is assuring work that is mechanically perfect. Cost much less than on the old principle. Send for free booklet. BUFFALO GEAR & PATTERN WORKS, Buffalo, N. Y.

Absolute Range Perfection

Sold for Cash or on Monthly Payments.

\$10 to \$20 Saved.

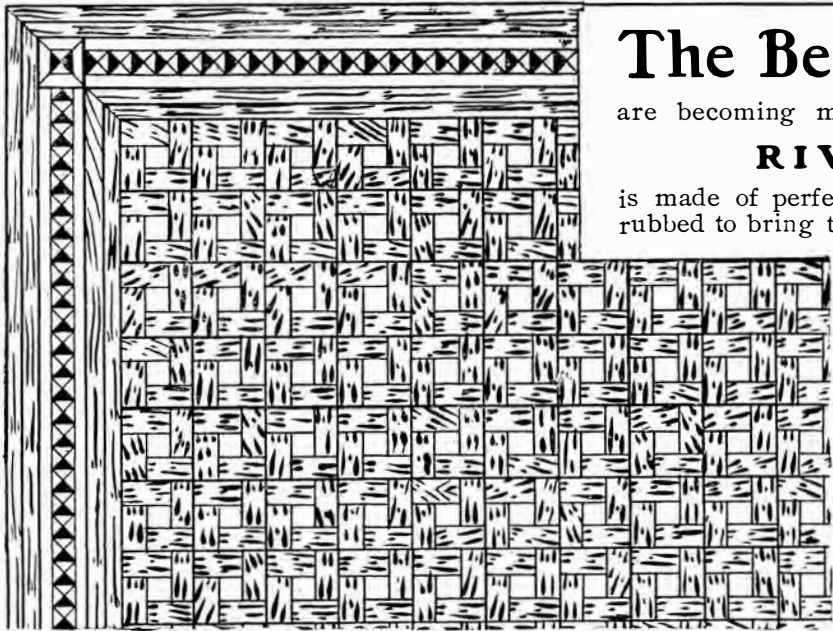
Freight paid east of the Mississippi River and north of the Tennessee Line; equalized beyond.

Your money refunded after 6 months' trial if

Clapp's Ideal Steel Range

is not 50 per cent. better than others. My superior location on Lake Erie, where iron, steel, coal, freights and skilled labor are cheaper and best, enables me to furnish a TOP NOTCH Steel Range at a clean saving of \$10 to \$20. Send for free catalogue of all styles and sizes, with or without reservoir, for city, town or country use.

CHESTER D. CLAPP, 688 Summit St., Toledo, O.
(Practical Stove and Range Man.)



OAK AND MAPLE FLOOR FOR BATHROOM.

The Beauties of Inlaid Hardwood Floors

are becoming more thoroughly appreciated by artistic architects and house owners.

RIVERTON PARQUET FLOORING

is made of perfect woods, carefully selected and dried, fitted to the smooth of an inch and rubbed to bring the beauty of the natural grain to its full perfection, with no cracks or seams to mar its elegance.

The extreme care used by us is repaid in the effectiveness and durability of our floors.

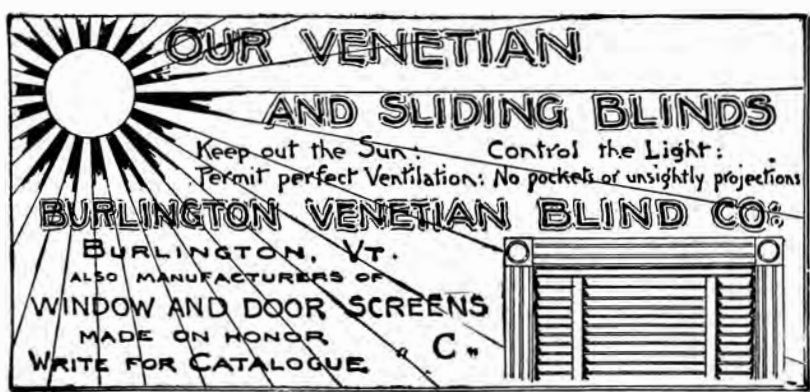
Riverton Parquet Floors are a better investment than any ordinary hardwood floor, because they are a source of supreme satisfaction to every owner who has them put in.

Exclusive and original designs will be furnished, and estimates made, for each particular room. This is one of our specialties.

Write us for information as to what others think of the **Riverton Parquet Floors** we have laid for them.

Responsible Agents can secure exclusive sale of these Floors by prompt action.

THE RIVERTON MANUFACTURING CO., Riverton, N. J.



The Perfect Light for Country Homes

You want a clear, steady, brilliant, odorless light in your home; one that costs little and requires practically no attention. The

Pilot Acetylene Gas Generator

10 to 1,000 lights, makes the only perfect light for country and suburban homes, clubs, seminaries and colleges. Complete equipments for country homes \$125.00 upwards.

Detailed information and positive proof of Acetylene superiority is contained in booklet, "After Sunset," sent on request.

Acetylene Apparatus Mfg. Co., 163 Michigan Ave., Chicago

BOOKS

Our large Catalogue of American and Foreign Scientific and Technical Books, embracing more than Fifty different subjects, and containing 116 pages, will be mailed, free, to any address in the world.

MUNN & CO., 361 Broadway, New York City.

Now Ready Bound Volume

OF THE

SCIENTIFIC AMERICAN BUILDING MONTHLY

VOLUME No. 36.

July to December, 1903.

A Monthly Magazine of Domestic Architecture
Sumptuously Illustrated.

272 Illustrations;

6 Covers in Tint;

132 Pages.

Price of Semi-Annual Volume
\$2.00 by mail.

SPECIAL FEATURES.

The Garden at Georgian Court:

Mr. George J. Gould's residence at Lakewood, N. J.

Harbor Hill:

The Clarence H. Mackay Estate at Roslyn, L. I.

Mr. Karl Bitter on the Sculpture for the St. Louis Exposition.

"The Orchard":

The Country Seat of Mr. James Lawrence Brees, at Southampton, L. I.

Mr. W. L. Stow's House at Roslyn, N. Y.

Mr. Charles H. Israels on the Apartment Hotel.

"Monthly Comment." Aims to help its readers to better building. The illustrations reproduce homes and other structures of the highest grade and of varying costs. It seeks to interest the architect, the house owner, the real estate promoter, the home maker, and the builder. It stands for the good and the true and the beautiful in art. Its "Talks with Architects" bring its readers in immediate touch with the leading architects of the day. Its descriptions of houses are brief but compact with information. Its departments constitute a "review of reviews" summary of current comment, suggestion and help in all matters relating to the construction of the home, its decoration, equipment, and use.

Editorial Articles: "Women and Architecture," "Fake Houses," "The Family and the House," "The Style of the House," "Building the House," "Originality in Design."

Departments: "The Household," "The Garden," "The Summer House," "Wall Papers," "Legal Notes," "The Houseboat," "Plumbing," "New Building Patents," "Lights and Lighting," "The Kitchen," "Furnishings," "Fire Protection," "Sanitation," "The Camp," "The Yacht," "The Flat," "Furniture," "New Books," "The Floor," "Stable Lore," "Decorations," "Heating Talk," "The Nursery." Publishers' Department.

SCIENTIFIC AMERICAN BUILDING MONTHLY contains each month fourteen large pages of original photographs and plans of dwellings, houses, gardens, country estates, and buildings of moderate price, together with a cover beautifully printed in tint. The illustrations are all made from photographs taken expressly for the Magazine and are printed with every advantage of the printer's art. The plans which accompany most of the illustrations present a complete synopsis of each subject and are a unique feature of this valuable Magazine. Careful and concise descriptions accompany each illustration. The illustrations include photographs of exteriors, interiors, and details, views of gardens and ornamental adjuncts to the house. No expense is spared to make this Magazine the leading periodical of its class and of the utmost practical value to its readers.

Price of semi-annual bound volume, \$2.00, mailed.
We also supply a bound volume containing all the numbers for 1903; price, \$3.50, by mail.

FOR SALE BY

MUNN & CO.,
361 Broadway, New York City,
AND ALL NEWSDEALERS.

SIMPLE CONSTRUCTION.



"THATCHER" Heaters have always been remarkable for their simplicity and great efficiency in construction. Fifty-two years' successful experience making these goods should reassure you as to our ability—to do things. You may depend upon us—for the best made.

FURNACES, RANGES, BOILERS.
Send for Catalog.

THATCHER FURNACE CO.,

Works: Newark, N. J. 240 Water St., New York.

Dumb Waiters and Hand Elevators

TRUNK LIFTS
INVALID LIFTS
CARRIAGE ELEVATORS
SIDEWALK ELEVATORS
FREIGHT ELEVATORS
HATCHWAY HOISTS

All of most improved design and construction.

Sedgwick Machine Works,
POUGHKEEPSIE, N. Y.

New York Salesroom: 110 Liberty St.

Catalogue on Application.
Estimates on Request.



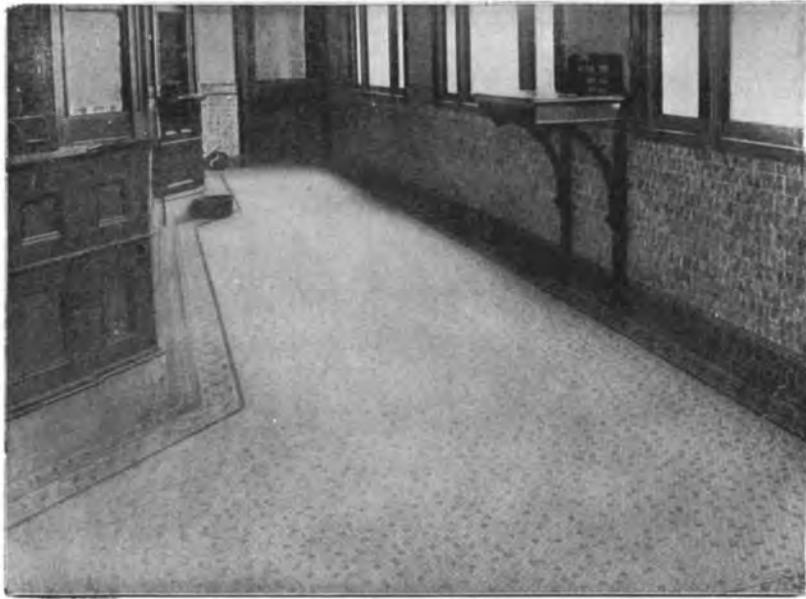
The Ingersoll Dollar Watch

THE two million people who buy **Ingersoll Watches** every year, buy them because they bear the strongest guarantee for accurate time made by any watchmakers, and because eight million people who have bought and carried them are loud in their praises.

If you want the best watch, ask any dealer for an **Ingersoll** and see that you get it. If you don't, send us a dollar and you will receive one by mail, prepaid.

Booklet FREE. Address Dept. 25.

ROBT. M. INGERSOLL & BRO., 67 Cortlandt St., N. Y.



Trent Tile Company

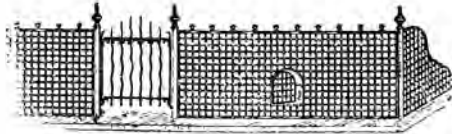
OFFICE AND WORKS: TRENTON, N. J., U. S. A.

ANNEXED illustration is an interior view of Peoples' Bank, Union, S. C. Wainscoting tiled with our Non-Crazing Color No. 280, the cap and base in color No. 260; the effect obtained being "Malachite." Floor laid with our Non-Absorbent Ceramic Mosaics. If you are considering the wainscot question, write us before you select the material.

Our new Non-Crazing Glazes are made in many colors and shades, and are richer in decorative features than the rarest onyx or Marbles. While they are more beautiful than onyx or marble, they cost less, and are unsurpassed in wearing properties. The Palace of the Alhambra, erected centuries ago, is an example of magnificent tile work, the beauties of which are as great to-day as when completed. History discloses no example of marble work that is its equal in any respect. Query: *Why use marble?*

We make tile of all kinds and for all purposes.
Make special designs without charge.

J. E. BOLLES Iron and Wire Works



Bank Railings, Elevator Enclosures and Cars, Grilles, Fire Escapes, Iron Fencing, Balcony Railings, etc.

DETROIT, MICH, U. S. A.

Send for Catalogue S, and mention line of business.

DIXON'S SILICA GRAPHITE PAINT

FOR TIN OR SHINGLE ROOFS AND IRON WORK. Tin roofs well painted have not required repainting for over 15 years. IT IS ABSOLUTELY WITHOUT AN EQUAL.

If you need any paint it will pay you to send for circular.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

Don't Experiment

—BUY—

FISK TIRES

FISK RUBBER COMPANY, Chicopee Falls, Mass.

SECOND EDITION. SPECIFICATIONS

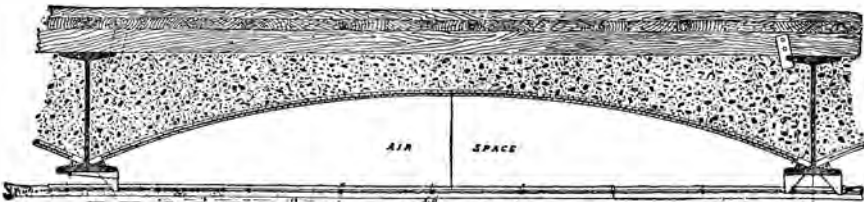
A Practical System for Writing Specifications for Buildings.

By W. FRANK BOWER, Architect.

One volume, 540 pages, 9x12 inches, bound in dark green buckram, lettered in aluminum. Circular and sample pages on application. Price, postpaid, \$5.00. For sale by

MUNN & CO., 361 Broadway, New York.

The Roebling System of Fire-Proofing.



Highest efficiency in fire and water tests of the New York Building Department, and now the recognized STANDARD OF FIRE-PROOF CONSTRUCTION.

THE ROEBLING CONSTRUCTION COMPANY,
121 Liberty Street, New York.

SEND FOR CATALOGUE.

A Quarter of a Century

of unfailing service



proves the
ABSOLUTE RELIABILITY

of the

Remington
TYPEWRITER

WYCKOFF, SEAMANS & BENEDICT
327 Broadway, New York

AGENTS WANTED FOR FINE TOOLS IN EVERY SHOP.
WRITE FOR CATALOGUE AND AGENCY.
C. H. BESLY & CO.
CHICAGO, ILL. U.S.A.

NOW READY. Modern Machine Shop Tools.

Their Construction, Operation and Manipulation, Including both Hand and Machine Tools.

By W. H. VANDERVOORT, M. E.
Large 8vo. 576 Pages. 673 Illustrations. Bound in Cloth.

PRICE, \$4.00.

An entirely new and fully illustrated work, treating the subject of Modern Machine Shop Tools in a concise and comprehensive manner. Special care has been taken to eliminate all matter not strictly pertaining to the subject, thus making it possible to give the reader complete information pertaining to machine shop tools and methods in a single volume at a moderate price.

The work is logically arranged, the various hand and machine tools being grouped into classes, and description of each is given in proportion to their relative importance. The illustrations represent the very latest tools and methods, all of which are clearly described. Each tool is considered from the following points:

FIRST—Its construction, with hints as to its manufacture.
SECOND—Its operation, proper manipulation and care.

THIRD—Numerous examples of work performed. Full descriptive circulars of above will be mailed free on application.

MUNN & CO., Publishers, 361 Broadway, N. Y.

The Typewriter Exchange

1½ Barclay St., NEW YORK
124 La Salle St., CHICAGO
38 Bromfield St., BOSTON
817 Wyandotte St., KANSAS CITY, MO.
209 North 9th St., ST. LOUIS, MO.
536 California St., SAN FRANCISCO, CAL.
We will save you from 10 to 50% on Typewriters of all makes. Send for Catalogue



PATENTS THE WEALTH OF NATIONS PATENTS

APATENT gives you an exclusive right to your invention for a term of seventeen years. You can sell, lease, mortgage it, assign portions of it, and grant licenses to manufacture under it. Our Patent system is responsible for much of our industrial progress and our success in competing in the markets of the world. The value of a successful Patent is in no degree commensurate with the almost nominal cost of obtaining it. In order to obtain a Patent it is necessary to employ a Patent Attorney to prepare the specifications and draw the claims. This is a special branch of the legal profession which can only be conducted successfully by experts. For nearly sixty years we have acted as solicitors for thousands of clients in all parts of the world. Our vast experience enables us to prepare and prosecute Patent cases and Trade Marks at a minimum of expense. Our work is of one quality and the rates are the same to rich and poor. Our unbiased opinion freely given. We are happy to consult with you in person or by letter as to the probable patentability of your invention.

Hand-Book on Patents, Trade Marks, Etc., Sent FREE on Application.

MUNN & CO., Solicitors of Patents,

BRANCH OFFICE:

625 F Street, Washington, D. C.

MAIN OFFICE:

361 BROADWAY, NEW YORK.

To those Intending Building.

To insure a perfect and permanent finish on all natural interior woodwork the use of the

Wheeler Patent Wood Filler

is essential.

Breinig's Lithogen Silicate Paint

is a paint that will outlast lead and oil, and is especially adapted for buildings exposed to salt air.

Architects and owners, in their own interests, should see their specifications carried out in full, and examine bills for the articles specified before accepting work as satisfactory.

References—The leading architects throughout the United States.

Sole manufacturers of the above articles,

THE BRIDGEPORT WOOD FINISHING CO.,
NEW MILFORD, CONN.

NEW YORK: 55 Fulton Street. CHICAGO: 70 W. Lake Street.
PHILADELPHIA: 231 Dock Street.

Microscopes

for every purpose. Our instruments are found in all the best laboratories of the country.

CATALOGUE FREE

Projection Apparatus

for scientific work. Superior in accuracy and convenience.

Bausch & Lomb Optical Co.
Rochester, N. Y.

NEW YORK BOSTON CHICAGO

YOU ARE EASY

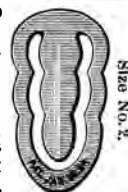
If you need a carpenter to help you repair your roof with Warren's Natural Asphalt Stone Surfaced Roofing

Has 2 inch lap edge. The best and most serviceable prepared roofing on the market. It is durable, fire-proof, and does not require painting. Comes ready to lay in rolls containing 108 sq. ft.

Warren Chemical & Mfg. Co., 172 Broadway, New York

THE EUREKA CLIP

The most useful article ever invented for the purpose. Indispensable to Lawyers, Editors, Students, Bankers, Insurance Companies and business men generally. Book marker and paper clip. Does not mutilate the paper. Can be used repeatedly. In boxes of 100 for 25c. To be had of all booksellers, stationers and notion dealers, or by mail on receipt of price. Sample card, by mail, free. Manufactured by Consolidated Safety Pin Co., Box 21, Bloomfield, N. J.



Our Pen-Carbon Letter Book

Copies Letters While You Write

Use your own paper. Any pen, any ink, no press

Government Officials, Colonists, Farmers, will find it invaluable.

Every man who writes letters should write for prices if his stationer does not keep it. We manufacture "Ditmars" Typewriter Ribbons and Carbon Paper.

PEN-CARBON MANIFOLD CO., Dept. 1,
145-7-9 Centre St., New York, U.S.A.

Progressive Carpentry

The New 1900 Edition, Greatly Enlarged.

By D. H. MELOY Architect.

89 Pages, 5½ x 7½ in., Cloth Bound.

PRICE, \$1.00 Postpaid.

Few of the many manuals for carpenters, treating on frame construction, are as practical and useful to the young mechanic as PROGRESSIVE CARPENTRY, of which this enlarged edition is now published.

It contains new methods for laying out every variety of roof-frame work; all kinds of octagon work; new methods of obtaining bevels for splayed work; the lengths and bevels of any brace; the length of the hypotenuse of any square, by the use of the mitre rule; and a variety of other valuable information, all clearly illustrated by means of full-page diagrams.

By these methods any kind of work can be laid out perfectly by an ordinary mechanic who has not even a knowledge of drawing or mathematics.

FOR SALE BY

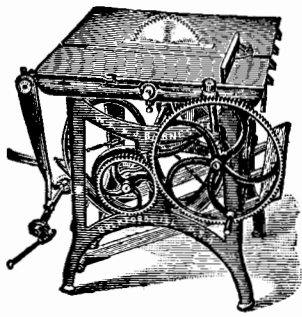
MUNN & CO., 361 Broadway, New York.

Architectural Drawing for Mechanics

This is another elementary text book on drawing prepared by a practical writer. The subject is treated in the simplest manner to the exclusion of problems not comprehensible to building mechanics who have had no technical training. The examples which are given as lessons in drawing embrace a wide range of work, the aim of the author having been to select only such figures for practice as are likely to meet the wants of working mechanics. Illustrated. Oblong. Cloth, \$1.00. For sale by MUNN & CO., 361 Broadway, New York.

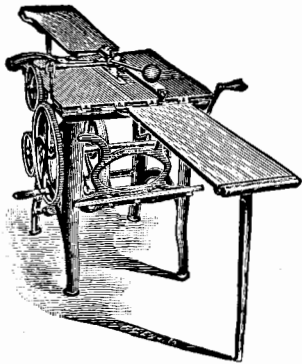
BARNES Foot and Hand Power MACHINERY

FOR CARPENTERS AND BUILDERS.



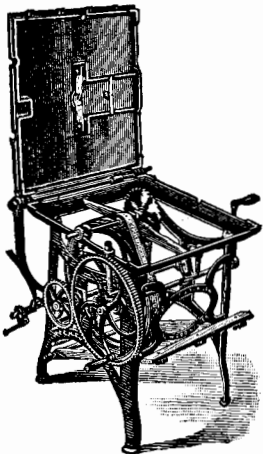
I. For Cross-Cutting.

SOLID
IRON TABLE
PLANED
PERFECTLY
TRUE.



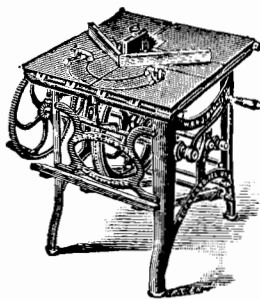
II. For Ripping.

Our New Foot and Hand Power Circular Saw No. 4—the strongest, most powerful, and in every way the best machine of its kind ever made. For ripping, cross-cutting, boring, grooving, dadoing and rabbeting.



IV. Showing Construction.

ARRANGED
WITH COUNTERSHAFT
IF PREFERRED.



III. With Mitre Gauge.

Send for our New Catalogue.

ESTABLISHED 1872.

W. F. & JOHN BARNES CO.

567 Ruby Street, Rockford, Ill.

Something New!

A washable and perfectly sanitary wall covering. Plain colors in oil admirably adapted to ceiling and fresco work. Hides cracks and plaster stains. Waterproof, vermin-proof, applied to the wall like paper, and inexpensive. For sale by the Dry Goods Trade and Oil Cloth Dealers.



Standard Table Oil Cloth Co.,
320 Broadway, New York City.

Bound Volumes of the Scientific American Building Monthly

The publishers of the *Scientific American Building Monthly* have, in response to many requests, bound a considerable number of annual and semi-annual volumes, and they furnish an unrivaled collection of elevations, plans, and details, including a large number of plates in color. The volumes are uniformly bound and almost a complete set can be supplied. The semi-annual volumes are \$2 each and the annual volumes are \$3.50 each. Only those listed can be supplied, with the exception of a number of the volumes preceding Volume IX. These can be furnished to parties who are desirous of completing sets, and we will send them free to purchasers of entire sets until the edition is exhausted.

Volume IX., January to June, 1890, price \$2, has twelve colored plates, fifty-six illustrations of houses with their plans, and fifteen pages of details drawn to scale. The houses vary in price from \$1,200 to \$7,000.

Volume X., July to December, 1890, price \$2, has twelve colored plates beautifully executed, fifty half-tone engravings of houses in both city and country, and there are fourteen plates of details. Several small churches are also illustrated. The houses vary in price from \$900 to \$5,000 and over.

Volume XI., January to June, 1891, price \$2. The volume contains twelve colored plates of great merit. There are sixty elevations of houses, churches, stables, carriage-houses, accompanied by several plans. One house in this number cost only \$695.03; the other houses range in price up to \$10,000.

Volume XIII., January to June, 1892, price \$2. As in the case with the other volumes, there are twelve colored plates; sixty-two houses varying in price from \$2,800 to \$25,000, and a number of chapels and churches, and also one schoolhouse. This is a particularly interesting volume.

Volume XIV., July to December, 1892, price \$2. The twelve colored plates of this issue are very attractive. There are fifty-seven elevations of houses, churches, and stables, each accompanied by a plan giving the sizes of the rooms. Some city residences are illustrated. One of the houses illustrated cost \$1,000 and one \$1,650, and the other houses vary in price.

Volume XV., January to June, 1893, price \$2. Twelve colored plates form an interesting feature of this volume. There are fifty illustrations and plans of houses, churches, stables, etc. The houses are of all prices, ranging from those which are comparatively inexpensive to elaborate residences costing several thousand dollars.

Volume XVI., July to December, 1893, price \$2. There are fifty-two engravings of houses, churches, etc., and each is accompanied by a plan. Some of the houses in this volume are as low in price as \$600. The thousand dollar workingman's home at the World's Fair is also included in this volume.

Volume XVII., January to June, 1894, price \$2. In addition to the twelve colored plates, there are sixty views of attractive houses from \$2,000 up.

Volume XIX., January to June, 1895, price \$2. It has the six highly artistic covers bound in. There are sixty-six engravings of houses of all prices, from \$2,000 up. One of the most attractive volumes in the series. Two churches are also included in the volume.

Volume XX., July to December, 1895, price \$2. It contains six colored covers, seventy photographic illustrations of exceedingly fine houses, a couple of churches, a stable and a windmill.

Volume XXI., January to June, inclusive, 1896, price \$2. There are six colored covers, ninety-two engravings made from photographs of houses taken specially for the purpose. The illustrations include churches, libraries, and other buildings.

Volume XXII., July to December, 1896, price \$2. It includes six artistic covers showing the actual appearance of the houses as regards color. There are also one hundred and one exterior and interior views of modern houses, from \$1,950 up. City houses, churches, mausoleums, etc., are also included.

Volume XXIII., January to June, 1897, price \$2. In addition to the six colored plates there are one hundred and seven interior and exterior views of the latest types of houses by prominent architects. The miscellaneous matter includes a village hall, several libraries, a gate lodge, schools, hospital, etc.

Volume XXIV., July to December, 1897, price \$2. It includes six attractive colored plates. There are one hundred and four photographic illustrations of houses, including many interiors. A considerable number of public buildings are also illustrated.

Volume XXVI., July to December, 1898, price \$2. Nearly a hundred large scale illustrations of the exteriors and interiors of modern houses will be found in this volume. There are also clubhouses, gate-lodges, etc. There are many examples of foreign architecture scattered through the book, and sculpture is not neglected.

Volume XXIX., January to June, 1900, price \$2. Six colored plates and one hundred and eighteen views of houses and interiors. Italian gardens, Spanish Missions, etc., form interesting and beautiful illustrations.

Volume XXX., July to December, 1900, price \$2. The colored plates are particularly fine, and the half-tone illustrations of houses and interiors are very artistic. The literary contents and the drawings of details add to the value of this volume.

Volume XXXI., January to June, 1901, price \$2. The six covers are in a new two-tone process of great beauty. There are over one hundred views of houses. With the March number begins the new departments: "Monthly Comment," "Talks with Architects," "Book Notices," "New Building Patents," "With our Correspondents," "Legal Notes," etc., making it the most readable and valuable architectural periodical published.

Volume XXXII., July to December, 1901, price \$2. Six covers in tint and more than two hundred illustrations of houses, interiors, details, gardens, etc. The editorial discussions, notes, comments, departments, and "Talks with Architects" cover a wide range of topics and make this volume of permanent interest and value.

Volume XXXIII., January to June, 1902, price \$2. Six covers in tint and more than two hundred illustrations with plans form the illustrative features of this volume. Six well-known architects contribute timely "Talks" on important architectural problems of the day. The editorial and literary departments are up to the highest standard of usefulness and interest.

Volume XXXV., January to June, 1903, price \$2. Six tinted covers and two hundred and seventy-five illustrations. The well selected and varied illustrations, the ample descriptive text, the numerous practical notes, the "Talks with Architects," and the vigorous editorial discussions of current themes in architecture make this a particularly attractive volume.

Volume XXXVI., July to December, 1903, price \$2. Six tinted covers and two hundred and seventy-two illustrations, many of unusual size. Special attention has been given in this volume to large American estates. The variety of contents continues to make the *BUILDING MONTHLY* the most valuable periodical of its kind.

Annual Volumes, \$3.50 Postpaid.

1890 contains Volumes IX. and X.	
1891 " " XI. and XII.	
1892 " " XIII. and XIV.	
1893 " " XV. and XVI.	
1895 " " XIX. and XX.	
1896 " " XXI. and XXII.	
1901 " " XXXI. and XXXII.	
1903 " " XXXV. and XXXVI.	

MUNN & CO., Publishers, - 361 Broadway, New York City.

How to Make a Weatherproof Roof.

The manufacture of M F and U. S. Eagle N M (new method) Roofing Ternes is explained and described in our booklet, "**A Fifty Year Roof**," which we will send free to any address—even on a postcard request. This book also contains practical directions for making a weatherproof roof, and many formulas and tables of value to architects, roofers, builders and contractors.

MF Roofing Ternes

were more than half a century the best roofing material made in the world. Lately we have developed from it the wonderful

U.S. Eagle NM

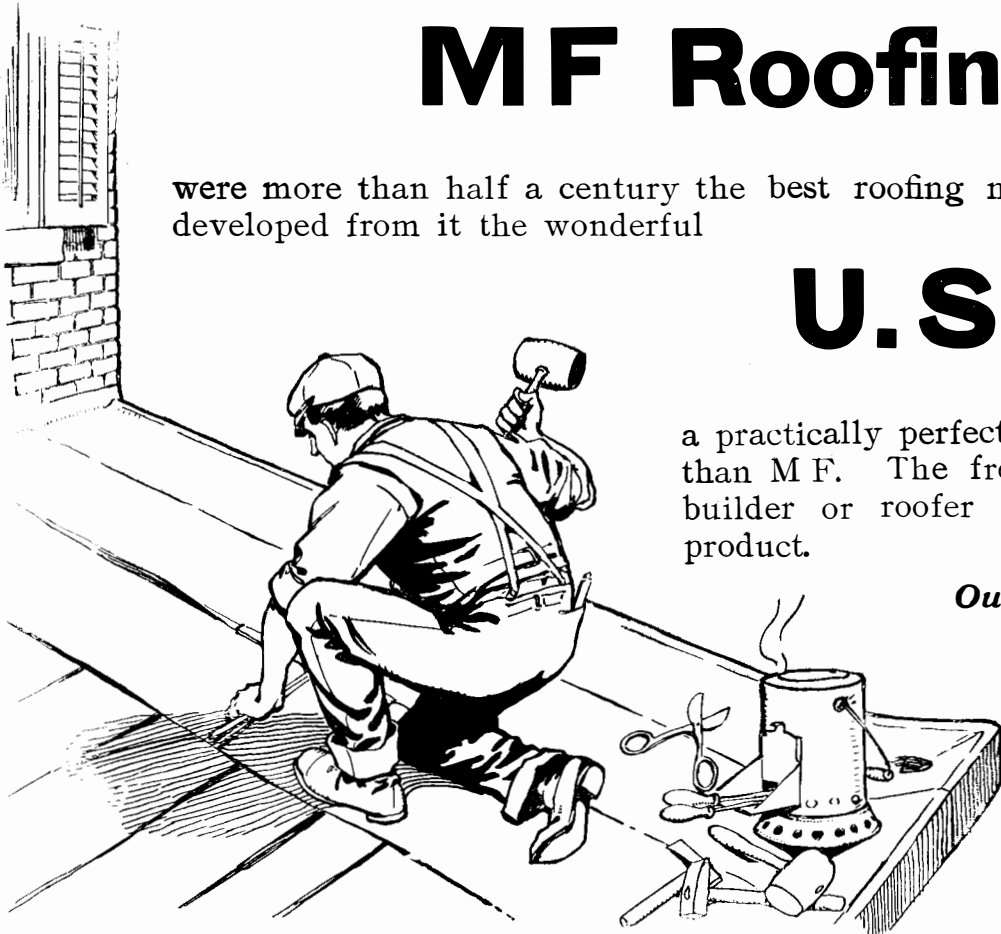
(New Method)

a practically perfect terne, which will give even better service than M F. The free sample we send any architect, contractor, builder or roofer will demonstrate the value of this new product.

Our products are for sale by all first-class wholesale metal houses.

W. C. CRONEMEYER, Agent,
Carnegie Building, Pittsburg, Pa.

American Tin Plate Company,
Battery Park Building, New York.



TWO BEST LATHS IN THE WORLD.

CUP.

Both Self Furring.

TROUGH.



Sykes Metal Lath & Roofing Co. NILES, OHIO.

The Study of Science

Is fascinating to all those who engage in it. All students are naturally enthusiastic on the subject, and eagerly read whatever literature concerning it that they can secure. In the *Scientific American* they have an up-to-date Library and Book of Reference on all scientific subjects. It is a weekly publication devoted to the interests of scientists, engineers, mechanics, electricians, manufacturers, inventors, chemists, students, etc., and contains educational information even for those who are far advanced in the various sciences. No other publication in the world gives so much authentic information for all classes. It is the world's stand, and authority on all matters pertaining to science.

Send Check, Draft, Postal Order, or Express Money Order to
MUNN & CO., Publishers, 361 Broadway, New York.

"The Clinching Argument"

is an illustrated catalog that will interest any one concerned in roofing materials.

CORTRIGHT METAL ROOFING CO.
Philadelphia and Chicago.

One Man with the "Union" Combination Saw

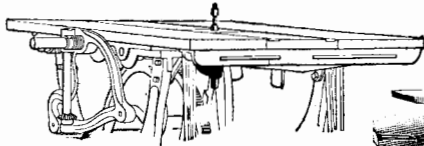
can do the work of four men using hand tools, can do it with ease, can do it better. Consider the amount saved—three men's wages—and compare with the cost of the "Union" Saw—in a short time the machine will pay for itself, and then the wages saved will go into your pocket.

EVERY MACHINE is carefully tested before leaving factory. We guarantee entire satisfaction, and they may be returned at our expense if, after ten days' trial, you prefer your money back.

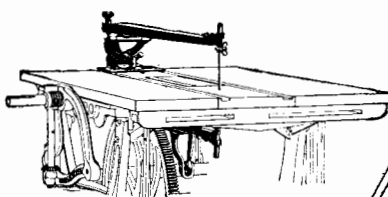
SUITABLE FOR ripping up to 3 1/2 inches thick, also for cross-cutting, mitring, rabbeting, grooving, dadoing, edging-up, and, with extra attachments, boring, scroll-sawing, edge-moulding, beading, etc.

Ask for Catalog "A" fully describing our complete line of Wood-Working Machinery.

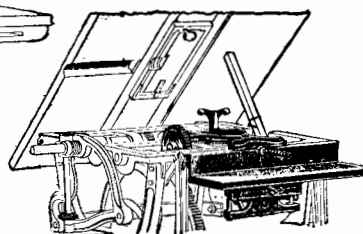
THE SENECA FALLS MFG. CO.
267 Water St., Seneca Falls, N. Y., U. S. A.



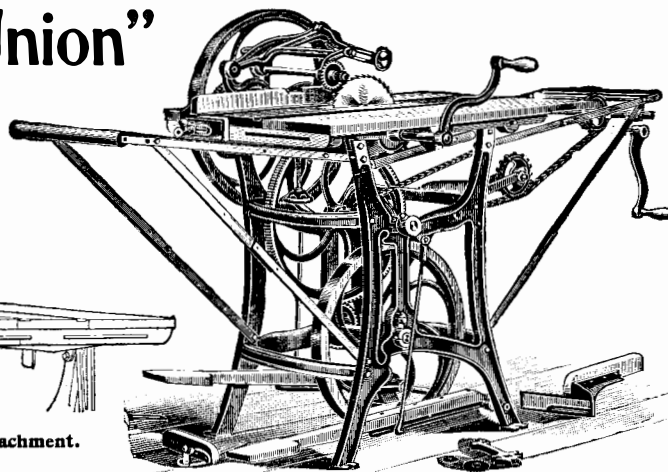
"Union" Moulding Attachment.



"Union" Scroll Saw Attachment.



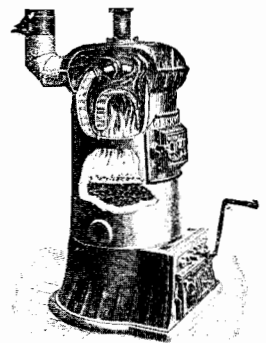
"Union" Boring Attachment.



No. 5 "Union" Combination Self-Feed Rip and Cross-Cut Saw.

Modern Homes

are heated by the Glenwood Hot Water Heater.



It is cast in one piece. It has no joint or water connection to leak or burn out. The grate is strong and easy to shake—and all the little details of care and management are handily arranged. Write for catalogue. Weir Stove Co., Taunton, Mass.

GLENWOOD

Blue Print Making

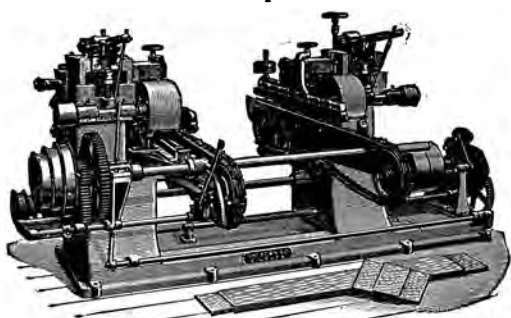
This pamphlet contains two practical articles on making blueprints, together with other matter relating to the process. Each of the articles is complete in itself, giving solutions for coating paper, together with directions for making prints of various kinds. The construction of the printing frame is also illustrated and described. 28 pages, 25 cents. For sale by MUNN & CO., 361 Broadway, New York.

STRUCTURAL IRON.
ORNAMENTAL
CAST AND WROUGHT IRON.
JAIL CELL WORK.
FENCES AND RAILINGS.

**Catalogue of above furnished, and Prices
quoted on application.**

We were the first to bring this class of tenoners to their present state of mechanical perfection, and, by the great improvement of placing cut-off saws in front, we have been enabled to hold the lead ever since we put them on the market.

**Woodworking
Machinery
of every
description.
Single Tools
or Entire
Outfits.**



**Prices,
descriptive
matter and
full information
submitted
on
application.**

New Catalogue Free. **No. 10 NEW PATENT DOUBLE TENONER.**
[Patented July 19, 1892 ; June 5, 1900.]

Will work 6 to 78 inches between shoulders of tenons; and for material 20 inches wide and 7 inches thick. Can also be used as a double cut-off saw. Easily operated; all adjustments quickly made; improved feed.

J. A. FAY & ECAN CO. 209-229 W. Front St.
CINCINNATI, O.



MALLORY'S
STANDARD
Shutter Worker.

New and improved patterns and designs.
Opens and closes the blinds without raising
the window.
Automatically locks the blinds in any posi-
tion desired.
Made of gray and malleable iron. The best
and most durable blind hinge. Incomparable
for strength, durability and power. Can be ap-
plied to any window, house or brick, stone or
frame. *Send for Illustrated Circular.* If your
hardware dealer does not keep them, send
direct to

MALLORY MANUFACTURING CO., FLEMINGTON, NEW JERSEY.



PARQUET FLOORS,
Wood Mosaic,
Wood Carpets,
Rug Borders.

 Send stamp for Book of Designs.

E. B. MOORE & CO.,
48 & 50 Randolph St.,
CHICAGO, ILL.

and every . . .
photographic
requisite. . .

Read **"Anthony's**
Photographic
Bulletin."
 SAMPLE COPY,
 25 CENTS.

THE ANTHONY & SCOVILL CO.
122-124 Fifth Ave., New York.

NEW AND ENLARGED EDITION OF

52 Plates and 120 Illustrations in the text.

By F. E. KIDDER, Architect.

This book contains a large number of plans and perspectives of churches of varying cost. Besides this there is much concise and practical information relating to planning and seating; details of Construction, Heating and Ventilation, Acoustics, etc.

One oblong quarto vol., Cloth, price, **\$3.00**

FOR SALE BY

MUNN & CO., 361 BROADWAY,
NEW YORK CITY.

INTO
 Reservoirs
 Residences
 Stock Farms
 etc., up to a
 height of 100
 feet.

Thirty barrels an hour, one barrel every two minutes, is the average achievement of the National Junior $1\frac{1}{2}$ h. p. Engine. Done without difficulty, quietly, and cleanly. It pays to have a National Junior working for you. Catalogue R, on water supply for city and country homes, sent upon request.

NATIONAL ENGINEERING COMPANY
SAGINAW, MICH.



Wells, Oil and Gas Wells drilled by contract to any depth from 50 to 3000 feet. We also manufacture and furnish everything required to drill and complete same. Portable Horse Power and Mounted Steam Drilling Machines for 100 to 1200 feet. Write us stating exactly what is required and send for illustrated catalogue. Address

PIERCE WELL ENGINEERING AND SUPPLY CO.
136 LIBERTY STREET, NEW YORK, U. S. A.

BOOKS Our large Catalogue of American and Foreign Scientific and Technical Books, embracing more than Fifty different subjects, and containing 116 pages, will be mailed, free, to any address in the world.

MUNN & CO., 361 Broadway, New York.

ARCHITECTS SPECIFY, CONTRACTORS AND OWNERS APPROVE.

TRY OUR INTERLOCKING JOINT CONSTRUCTION.

PLANS OR MEASUREMENTS NECESSARY TO DETERMINE COST.

The KINNEAR & GAGER CO.
WRITE FOR CATALOGUE- **Columbus, O. U. S. A.**

ALPHABETICAL INDEX TO ADVERTISERS.


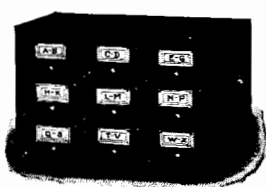
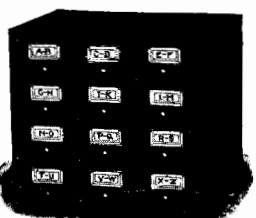
[illegible]

That has stood the test of ten years' wear and retained its durability, permanent High Gloss, and has not Checked or Cracked on : : : : Interior Woodwork, Plastered Walls, Brick and Metals.

Zanzibolio Floor Finish

Is the only transparent floor finish that does not **crack, mar, or show scratches**, and dries thoroughly, tough and hard. Applied same as varnish.

THE THOMSON WOOD FINISHING CO., *Inventors and
Sole Makers.*
Enamel and Wood Filler Manufacturers, Office, 115 N. Fourth St., PHILADELPHIA, PA.

Berger's

STEEL

**OFFICE,
BANK,
LIBRARY**

Furniture and Filing Devices

"guards your interests" and preserves the peace in your establishment by protecting all papers and documents from fire, water, mice, rats, germs, dust, damp, etc. It is the strenuous, stylish, up-to-date "armor plate of modern business." Our catalogue will repay your attention.

THE BERGER MFG. CO., Canton, Ohio.
Largest Makers of Sheet Metal Work in the World.

BRANCHES:
NEW YORK OFFICE, 210 East 23d Street. PHILADELPHIA OFFICE, 1215 Filbert Street.
BOSTON OFFICE, 176 Federal Street. ST. LOUIS OFFICE, 623 North Main Street.

If You Want to Know

about a white lead that is permanent—that will not change color, and that will produce clear, sharp tints, write to us about

Picher Sublimed White Lead

a permanent basic oxy-sulphate that has been on the market for years, and has given absolute satisfaction. You can have our book about this lead and other interesting literature for the asking.

PICHER LEAD COMPANY,
100 WILLIAM STREET, NEW YORK. Works: Joplin, Missouri. TACOMA BUILDING, CHICAGO.

Classified List of Advertisers Published in the Present Number of the Scientific American Building Monthly.


Change of copy for advertisements should reach us not later than 5th of month to appear in issue following.

Acetylene Gas Generators. Acetylene Apparatus Manufacturing Co.iv	Ceilings, Steel. Berger Manufacturing Co.ix J. H. Eller & Co.ii Kinnear & Gager Co.v ii	Electric Clamps. Batavia Clamp Co.cover iii	Granite Roofing. Eastern Granite Roofing Co.ix
Architectural Patterns. New York Pattern and Model Co.cover ii	Ceramic Mosaic Floors. Trent Tile Co.v	Elevator Enclosures and Cabs. J. E. Bolles Iron and Wire Works.v	Grates and Mantels. Wm. M. Taylor Mantel & Grate Co.cover iv
Asphalt Roofing. Stowell Manufacturing Co.ij	Clocks. Killam & Co.ii	Enamel Paint. Thomson Wood Finishing Co.viii	Greenhouses. Lord & Burnham Co.cover ii
Architects. The National Builder.ii	Cloth Wall Covering. Standard Table Oil Cloth Co.vi	Engines, Gas and Gasoline. Charter Gas Engine Co.cover ii	Grille Work. J. E. Bolles Iron and Wire Works.v Champion Iron Co.vii Foster-Munger Co.cover iv Louis F. Gunther.cover iv
Architects' and Surveyors' Supplies. F. Weber & Co.cover iii	Columns. Hartmann Bros. Manufacturing Co.i	Fence Posts and Fences. Champion Iron Co.viii	Gutter Hangers. Berger Bros.cover iv Berger Manufacturing Co.ix
Architectural Brass and Metal Work Designs. J. E. Bolles Iron and Wire Works.v	Concrete Illuminating Tile and Vault Lights. T. H. Brooks & Co.cover iv	Fences and Railings. Bolles Iron & Wire Works.v Champion Iron Co.viii Hartmann Bros. Manufacturing Co.i Van Dorn Iron Works Co.cover iii	Hand Sawing Machines. W. F. & J. Barnes Co.vi
Architectural Iron Work. Champion Iron Co.viii	Cornices, Iron, Copper and Steel. Berger Manufacturing Co.ix	Filters. Berkefeld Filter Co.cover iv T. Linke & Co.cover iv	Hardware. Stanley Works.cover ii
Architectural Wood Turning. Standard Wood Turning Co.cover iv	Corrugated Iron for Roofing, Siding and Ceiling. Berger Manufacturing Co.ix	Fire Escapes and Ladders. J. E. Bolles Iron and Wire Works.v	Hardwood Floors. Riverton Manufacturing Co.iv
Artists' Materials. F. Weber & Co.cover iii	Door Hangers. J. E. Bolles Iron and Wire Works.v McCabe Hanger Mfg. Co.cover iv	Fireproofing. International Fence and Fireproofing Co.cover iv	Heating Apparatus. Andrews Heating Co.cover iv Gorton & Lidgerwood Co.cover iv Kelsey Heating Co.ix Kinnear-Hood Steel Co.cover ii Lord & Burnham Co.cover ii Weir Stove Co.vii
Balusters, Stair Rails, Etc. Champion Iron Co.viii The Standard Wood Turning Co.cover iv	Doors, Fire-proof. Kinnear Mfg. Co.ix	Floor Finish. Thomson Wood Finishing Co.viii	Hinges. Stanley Works.cover ii
Bank and Office Railings. J. E. Bolles Iron and Wire Works.v	Doors, Steel Rolling. Kinnear Mfg. Co.ix	Floor Polish. Butcher Polish Co.cover iv	Hot Air Pumping Engines. Rider-Ericsson Engine Co.i
Blinds, Sliding and Folding. Burlington Blind Co.iv Phoenix Sliding Blind Co.cover iv	Doors, Windows, and Blinds. Foster-Munger Co.cover iv	Foot and Hand Power Machinery. W. F. & J. Barnes Co.vi J. M. Marston & Co.i Seneca Falls Mfg. Co.vii	Hotbed Sash. Lord & Burnham Co.cover ii
Boilers. Lord & Burnham Co.cover i	Drawing Instruments, Etc. F. Weber & Co.cover iii	Furnaces. Thatcher Furnace Co.iv	Interlocking Rubber Tiling. New York Belting & Packing Co.cover iii
Boilers (Copper Ranges). Gorton & Lidgerwood Co.cover iv	Dumb Waiters and Elevators. Sedgwick Machine Works.iv Storm Manufacturing Co.ii	Galvanized Iron and Steel Sheets. U. S. Electro Galvanizing Co.cover iii	Iron and Wire Work. J. E. Bolles Iron and Wire Works.v
Booksellers and Publishers. Munn & Co.vi	Dynamos. Parsell & Weed.ii	Gas and Gasoline Engines. Charter Gas Engine Co.cover ii	Iron Shutters and Doors. Berger Manufacturing Co.ix J. E. Bolles Iron and Wire Works.v Champion Iron Co.viii
Boring Machines. J. A. Fay & Egan Co.viii Fox Machine Co.i	Eaves Troughs. Berger Bros.cover iv Berger Manufacturing Co.ix	Gas Heaters. Suvio Heat and Light Co.cover ii	Iron Store Fronts. Champion Iron Co.viii
Butts and Hinges. The Stanley Works.cover ii		Gas Machines. C. M. Kemp Mfg. Co.ii	Jail and Prison Work. Champion Iron Co.viii
Carpenters' and Builders' Machinery. J. A. Fay & Egan Co.viii		Glacier, Window Decoration. G. Quaille.cover iv	
Carvings. Louis F. Gunther.cover iv			
Cast Iron Work. Champion Iron Co.viii			

Made their mark
Dixon's Pencils

Write for illustrated booklet W free.

JOSEPH DIXON CRUCIBLE CO.,
Jersey City, N. J.



WHAT IS Schapirograph?
THE DUPLICATOR that cleanly multiplies anything written with pen or type-writer, also music, drawings, etc. One original gives 150 copies BLACK ink in 15 minutes. AVOIDS: sennell, washing, delays, and expensive supplies. Price, complete, cap-size outfit, \$8.00. Lasts years. Sent on 5 DAYS' FREE TRIAL without deposit.
THE S. A. SCHAPIROGRAPH CO., 265 Broadway, New York.

KINNEAR

STEEL ROLLING DOORS

SHUTTERS PARTITIONS

DURABLE ORNAMENTAL

Royal Warehouses, Antwerp, Belgium, fitted with Kinnear Doors.

PROTECTION FROM FIRE IS DESIRED. EASILY OPERATED

Write for CATALOGUE "L"

THE KINNEAR MFG. CO.
COLUMBUS OHIO

BOSTON
85 WATER ST.

CHICAGO
112 CLARK ST.

PHILADELPHIA
1011 CHESTNUT ST.

NASON STEAM TRAPS

Have stood the test of SIXTY YEARS

They are Guaranteed for the removal of condensation without loss of steam under all conditions and pressures. There are no complicated lever valves and ball floats—only one valve and that cannot leak. Send for catalogue.

All "NASON" Traps have on their covers

NASON MANUFACTURING CO.
73 Beekman Street, New York, U. S. A.

THE EASTERN GRANITE ROOFING CO.
1555 1903 IRVING BUILDING, NEW YORK.

ORIGINATORS OF
PERFECTED GRANITE ROOFING
WHICH HAS BEEN ADOPTED BY THE
LEADING RAILROADS, MANUFACTURERS, ARCHITECTS AND BUILDERS
AS THE STANDARD READY ROOFING.

WRITE FOR TESTIMONIALS, PHOTO PAMPHLET AND SAMPLES

SEA GRIT — GRANITE COMPOSITION
WOOL FELT — GRANITE COMPOSITION

Samples
Free.



No Screws
or Nails.

The Grand Rapids All-Steel Sash Pulleys

are more generally used than any other pulley in the world. They are the strongest, lightest, finest appearing, and most economical of all. The old rough cast-iron goods are hard to mortise, and break easily. The cord often wedges in the cast pulley. THE GRAND RAPIDS ALL-STEEL absolutely prevents the wedging of the cord. The steel wheel is polished. The cord cannot get off the wheel groove.

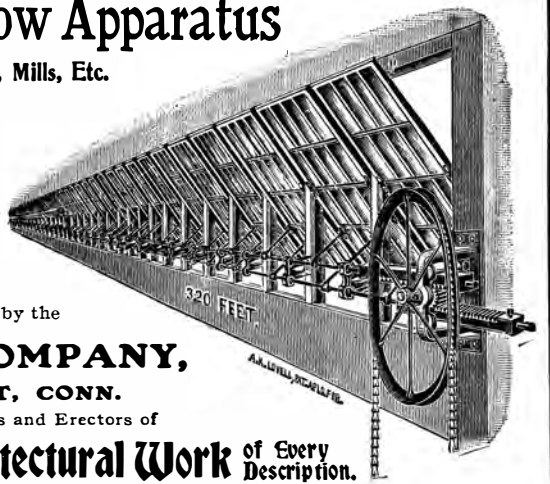
Warranted to Carry the Heaviest Windows. All Sizes and Finishes.

Grand Rapids Hardware Company,
MAKERS
No. 17 PEARL STREET, GRAND RAPIDS, MICH.

The Lovell Window Apparatus

For Factories, Foundries, Mills, Etc.

A line of sash 500 feet long can be operated from one station if desired. Adapted to any kind of sash.



Manufactured and erected only by the

G. DROUVÉ COMPANY,
BRIDGEPORT, CONN.

Manufacturers and Erectors of

Sheet Metal Architectural Work of Every Description.



Work Erected in all parts of the Country.

Satisfaction Guaranteed. Estimates cheerfully furnished.

SEND FOR CATALOGUE.



CLASSIFIED ADVERTISERS.—Continued from page ix

Lathing (Steel Fireproof). Roebbling Construction Co.....v	Radiators. Kinnear-Hood Steel Co.....i	Shutter Workers. Mallory Manufacturing Co.....vii	Tools and Foot Power Machinery. W. F. & J. Barnes Co.....vi J. M. Marston & Co.....i Seneca Falls Mfg. Co.....vii
Lead, White. 1 1/2 inch Lead Co.....ix	Railings and Fences. J. E. Bolles Iron and Wire Works.....v Champion Iron Co.....viii Van Dorn Iron Works Co.....cover iii	Sidewalk Lights. T. H. Brooks & Co.....cover iv Champion Iron Co.....viii	Towers and Tanks. W. E. Caldwell Co.....i
Lead and Zinc. New Jersey Zinc Co.....cover ii	Reversible Windows. George Hayes Co.....iv	Skylights. G. Drouvé Co.....x	Typewriters. Philadelphia Typewriter Exchange.....ii Typewriter Exchange.....v Wyckoff, Seamans & Benedict.....v
Machinery—Wood Working. J. A. Fay & Egan Co.....viii	Ridging. Berger Manufacturing Co.....ix	Sliding Blinds and Screens. Burlington Blind Co.....iv Phoenix Sliding Blind Co.....cover iv	Vault Doors. J. E. Bolles Iron and Wire Works.....v
Mantels—Iron, Slate and Wood. Wm. M. Taylor Mantel & Grate Co.....cover iv	Rock Face Siding. Berger Manufacturing Co.....ix	Spring Hinges. Stover Mfg. Co.....cover iv	Ventilators. Berger Bros.....cover iv G. Drouvé Co.....x
Metal Wire-Glass Windows. Smith-Warren Co.....ii	Roofing, Asbestos. H. W. Johns Mfg. Co.....cover ii	Stable Fittings and Fixtures. J. E. Bolles Iron and Wire Works.....v Champion Iron Co.....viii	Wall Covering, Cloth. Standard Table Oil Cloth Co.....vi
Metallic Lathing, Etc. Roebbling Construction Co.....v Sykes Metal Lath & Roofing Co.....vii	Roofing, Asphalt. Stowell Manufacturing Co.....ii	Stamped Steel Ceilings. H. S. Northrop.....cover ii	Water Conductors. Berger Bros.....cover iv
Metallic Roofing Tiles and Shingles. Berger Manufacturing Co.....ix Cortright Metal Roofing Co.....vii Sykes Metal Lath & Roofing Co.....vii	Roofing, Ruberoid. Standard Paint Co.....cover ii	Stairs, Rails, Balusters, Etc. Champion Iron Co.....viii Standard Wood Turning Co.....cover iv	Weather Vanes. Champion Iron Co.....viii T. W. Jones.....cover iii
Mineral Wool. United States Mineral Wool Co.....cover iii	Roofing Tin. American Tin Plate Co.....vii Berger Manufacturing Co.....ix Cortright Metallic Roofing Co.....vii	Steam Traps. Nason Manufacturing Co.....ix	Window Pulleys. Grant Pulley & Hardware Co.....cover iii
Paints. Bridgeport Wood Finishing Co.....v Joseph Dixon Crucible Co.....v and ix Standard Paint Co.....cover ii	Rug Borders. E. B. Moore & Co.....viii	Steel and Iron Roofing. Berger Manufacturing Co.....ix	Wire Guards. J. E. Bolles Iron and Wire Works.....v Champion Iron Co.....viii
Park Settees and Chairs. J. E. Bolles Iron and Wire Works.....v	Sash, Door and Blind Machinery. J. A. Fay & Egan Co.....viii Foster-Munger Co.....cover iv	Steel Brick. Berger Manufacturing Co.....ix	Wire Lathing. Roebbling Construction Co.....v
Parquetry Floors. Interior Hardwood Co.....cover iv E. B. Moore & Co.....viii Riverton Manufacturing Co.....iv	Sash Locks. H. B. Ives & Co.....cover ii	Steel Butts. Stanley Works.....cover ii	Wire Office Railings. J. E. Bolles Iron and Wire Works.....v Champion Iron Co.....viii
Patents. Munn & Co.....ix	Sash Operating Device. Lord & Burnham Co.....cover ii	Steel Ceilings. Berger Manufacturing Co.....ix	Wire Signs. J. E. Bolles Iron and Wire Works.....v
Pencils, Pens, Etc. J. Dixon Crucible Co.....v and ix	Sash Pulleys and Attachments. Fox Machine Co.....i Grand Rapids Hardware Co.....x	Steel Sash Pulleys. Grand Rapids Hardware Co.....x	Wood Carpet. Interior Hardwood Co.....cover iv E. B. Moore & Co.....viii
Photographic Outfits. The Anthony & Scovill Co.....viii	Saws. Seneca Falls Mfg. Co.....vii	Steel Shutters. Berger Manufacturing Co.....ix Kinnear Mfg. Co.....ix	Wood Filler. Bridgeport Wood Finishing Co.....v
Planing Mill Machinery. J. A. Fay & Egan Co.....viii	Scroll Saws and Tools. W. F. & J. Barnes Co.....vi J. A. Fay & Egan Co.....viii Seneca Falls Mfg. Co.....vii	Thermometers, Etc. Bristol Co.....cover iv	Wood Finishing. Thomson Wood Finishing Co.....viii
Porcelain Enameled Ware. Standard Sanitary Mfg. Co.....cover		Tiles. Trent Tile Co.....v New York Belting & Packing Co.....cover iii	Woodworking Machinery. W. F. & J. Barnes Co.....vi J. A. Fay & Egan Co.....viii Fox Machine Co.....i Seneca Falls Mfg. Co.....vii
Posts, Corner. J. W. Coulson & Co.....x			
Pumping Engines. National Engineering Co.....viii Rider-Ericsson Engine Co.....i Standard Pump and Engine Co.....ii			

The Kelsey Warm Air Generator



For HOME, CHURCH
AND SCHOOL HEATING

Warms Air by the Best Method.

Sends it in separate currents through from nine to seventeen corrugated cast iron flues which form the combustion chamber. Each flue weighs 70 lbs. and has 8 square feet of heating surface, which gives the "Kelsey" double the weight and heating surfaces than those of any other apparatus having same size grate. These separate currents of warm air are positively forced to every part of a building.

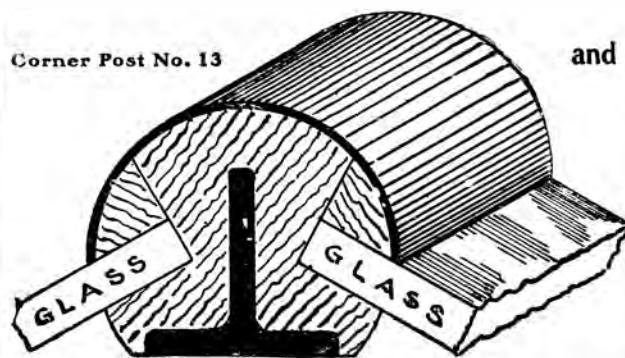
23,000 Sold.

Send for Booklets: "KELSEY HEATING" and "WHAT THE USERS SAY."

KELSEY HEATING CO., Syracuse, N. Y.
New York Office, 156 Fifth Avenue.

Coulson Patent Corner Posts

Corner Post No. 13



and TRANSOM
BARS

are being specified by the leading architects throughout the country.

For New or Remodeled Store Fronts.

Greatest Strength for Holding Costly Glass Safely.

U. S. Patent, February 13, 1900. Canada Patent, March 19, 1900.
U. S. Patent, November 19, 1901. U. S. Patent, April 15, 1902.
OTHER PATENTS PENDING.

WE OVERCOME THE EXPANSION AND CONTRACTION IN THE OLD STYLE FRONT.

WRITE FOR DESCRIPTIVE CATALOGUE.

J. W. COULSON & CO., 90 North Third St., Columbus, Ohio.