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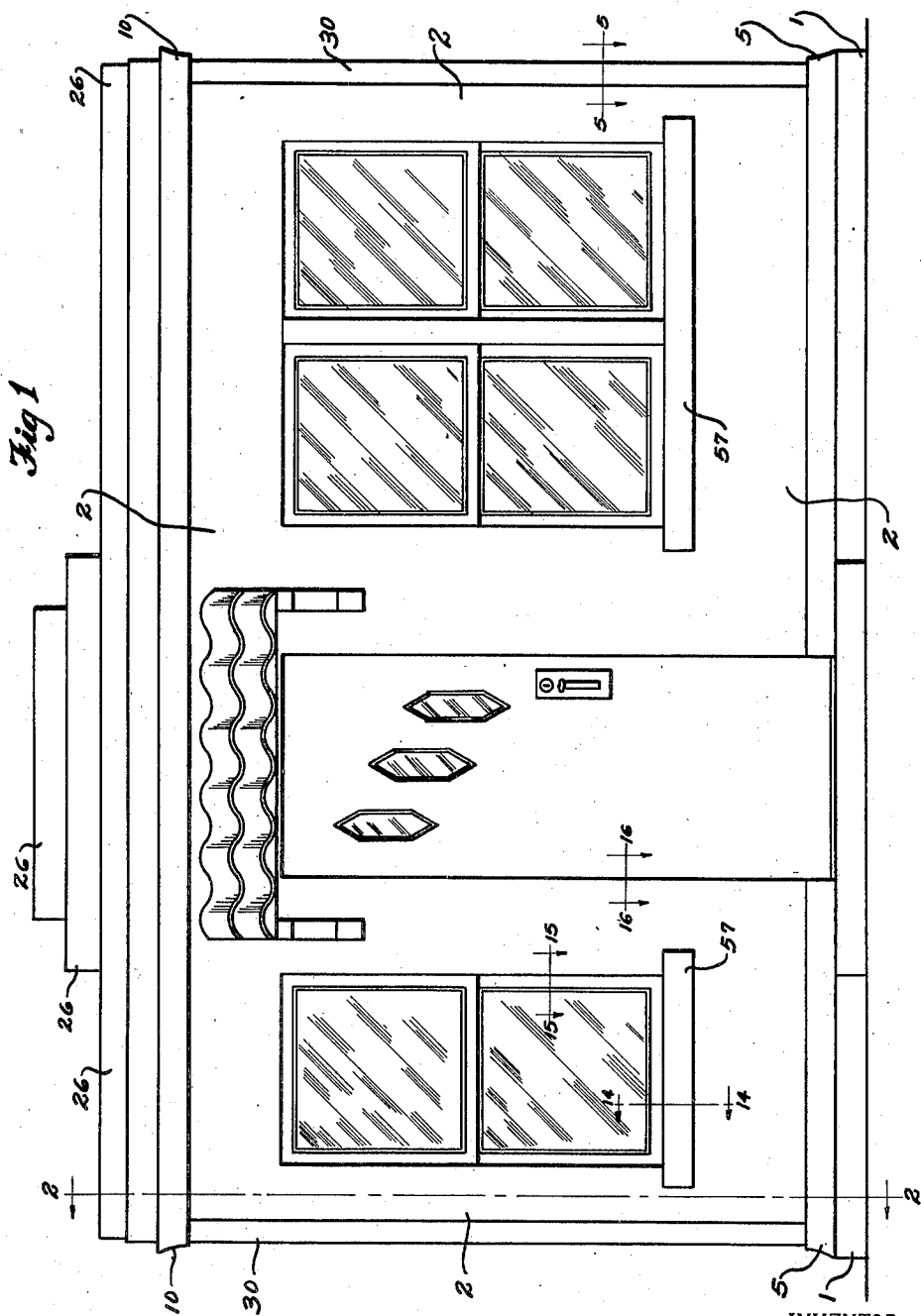
H. SMITH

2,116,003

BUILDING CONSTRUCTION

Filed Oct. 3, 1936

4 Sheets-Sheet 1



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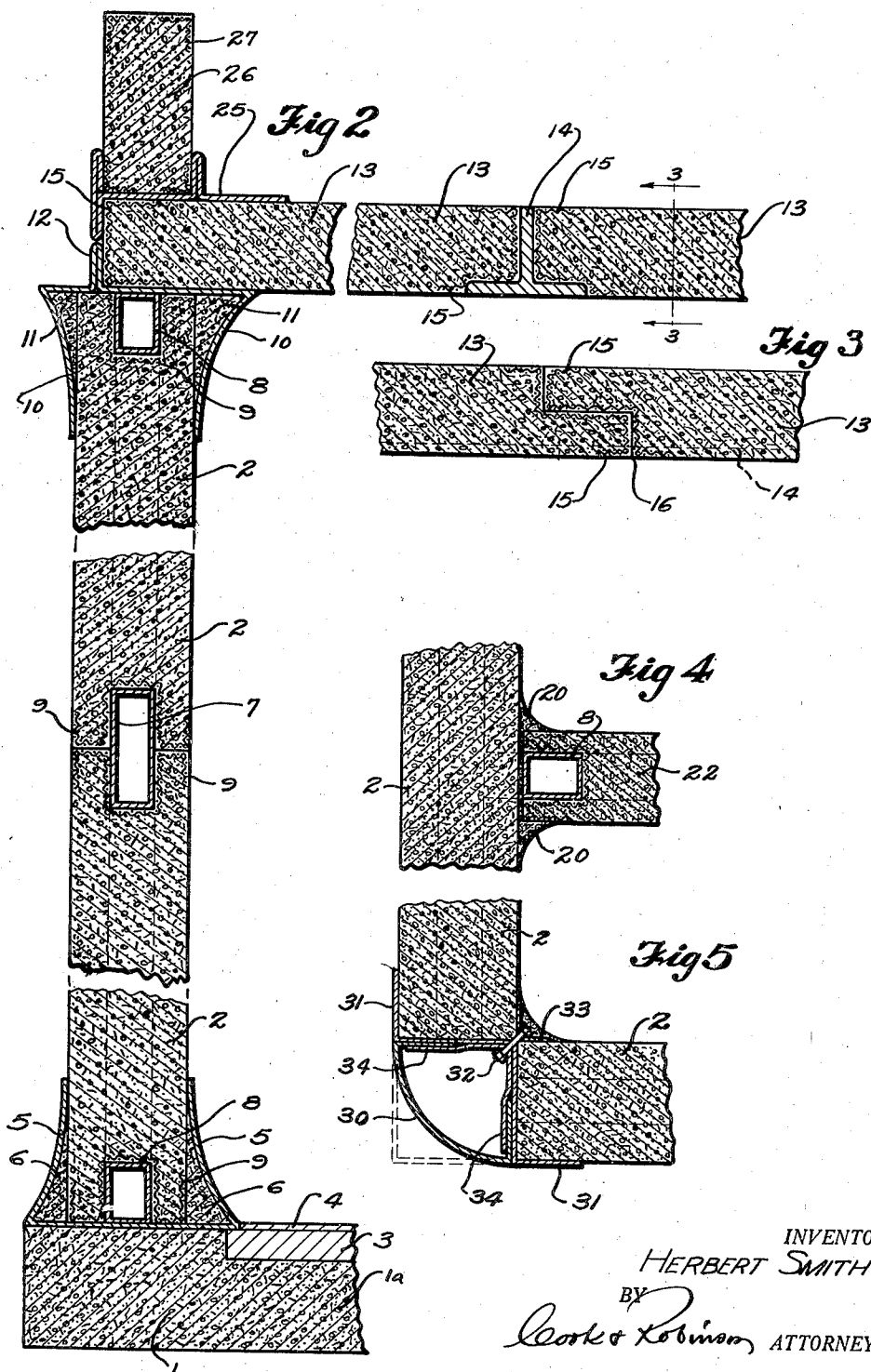
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4 Sheets-Sheet 2



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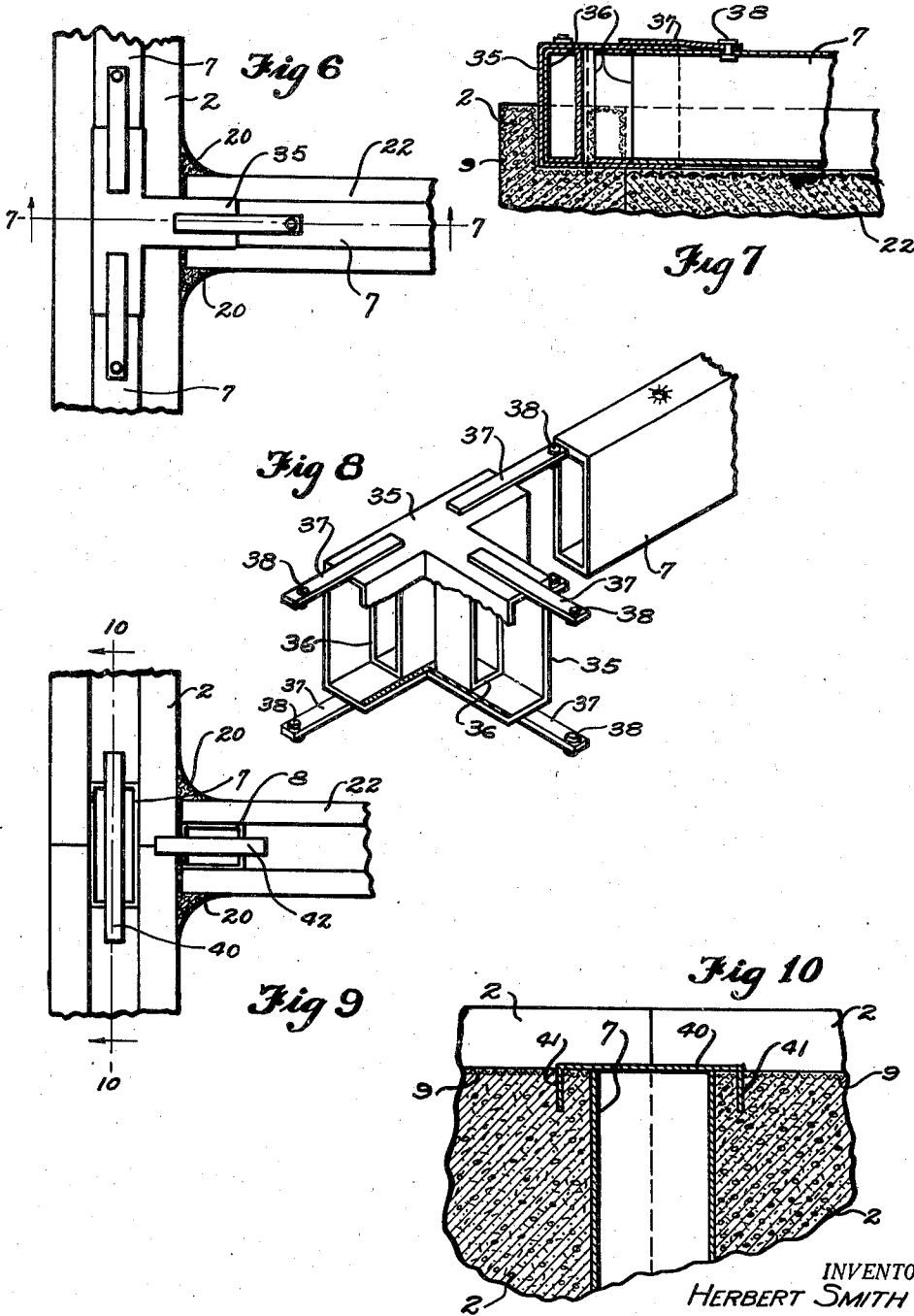
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BUILDING CONSTRUCTION

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4 Sheets-Sheet 3



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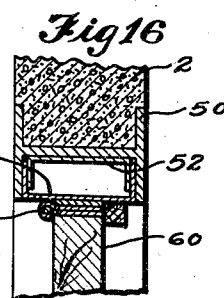
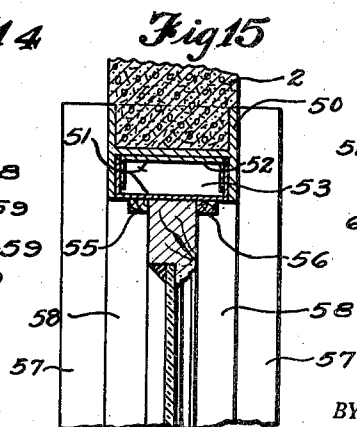
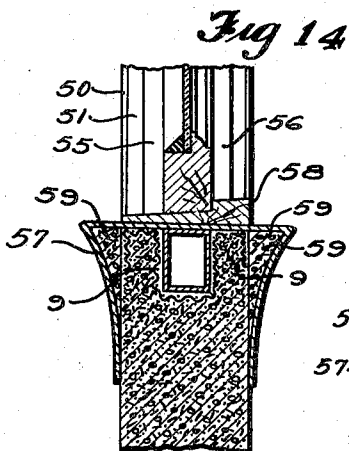
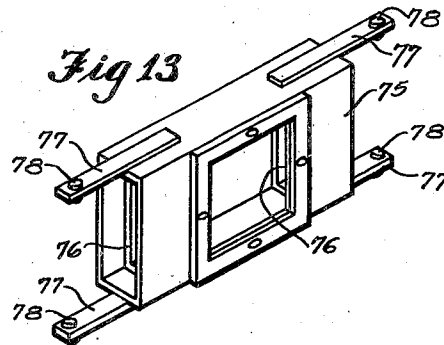
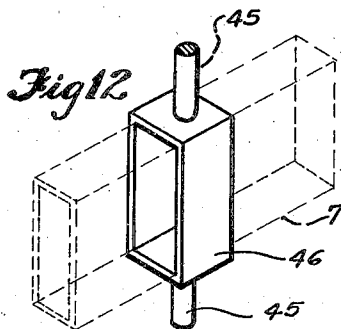
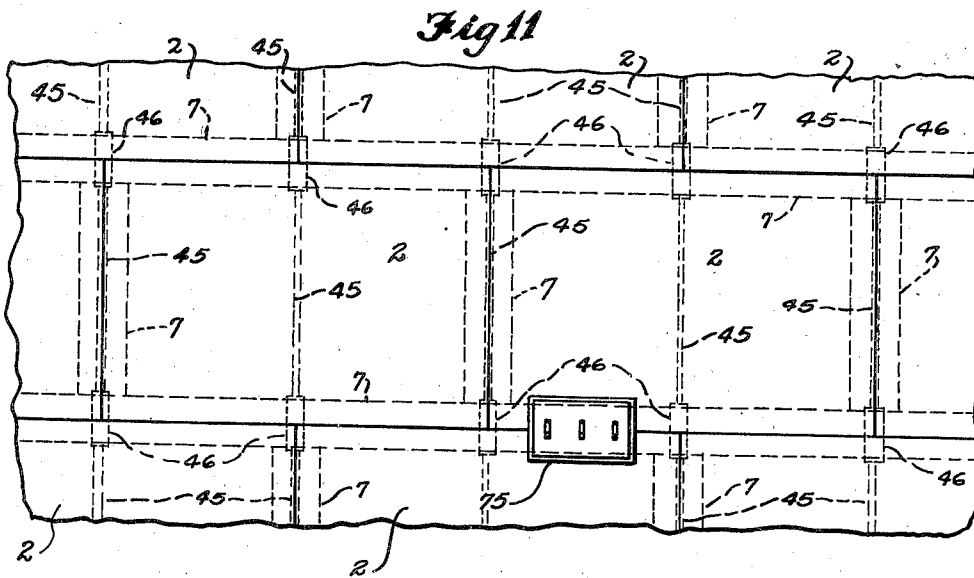
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2,116,003

BUILDING CONSTRUCTION

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4 Sheets-Sheet 4



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2,116,003

BUILDING CONSTRUCTION

Herbert Smith, Seattle, Wash.

Application October 3, 1936, Serial No. 103,888

10 Claims. (Cl. 72-1)

This invention relates to building construction, and more particularly to buildings that are fabricated from precast members of a kind providing for the erection of buildings of various sizes, shapes and designs; the main wall forming elements in the present instance preferably being of a cementitious composition, containing a fibrous reinforcement material.

The object of this invention is to provide a building of the above kind that is relatively inexpensive, economical to use, and which may be easily and quickly assembled.

It is also an object of this invention to provide a construction that is substantially sound-proof, fireproof and affording natural insulation against heat and cold. Also a construction that lends itself to use therein of air conditioning in warm weather, and which may be heated in cold weather, at a minimum expense.

It is another object of this invention to provide precast or prefabricated units of standardized dimensions, thus to avoid construction waste.

In accomplishing these and further objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is an elevation of a building of simple design, illustrating a typical construction in accordance with the present invention.

Fig. 2 is a sectional view on the vertical line 2—2 in Fig. 1, showing in detail the wall construction.

Fig. 3 is a sectional detail on the line 3—3 in Fig. 2, showing construction and assembly of the ceiling blocks.

Fig. 4 is a sectional detail, illustrating the joining of a partition wall to an outside wall.

Fig. 5 is a sectional view as on the line 5—5 in Fig. 1, illustrating a corner construction.

Fig. 6 is a top, or plan view of a joint between the wall block units and the partition block units and the assembly therewith of metallic conduits.

Fig. 7 is a sectional view on line 7—7 in Fig. 6.

Fig. 8 is a perspective view of a T-connection used in the wall and partition assembly.

Fig. 9 is a top or plan view of a connection between the outside wall blocks and the partition wall blocks with the connecting channels removed.

Fig. 10 is a sectional view on the line 10—10 in Fig. 9.

Fig. 11 is an elevation of a section of the wall showing the interconnecting tie rods between the connecting channels.

Fig. 12 is a perspective view of a tie rod strap.

Fig. 13 is a perspective view of an outlet box used in the construction for electrical outlets and switches.

Fig. 14 is a sectional view of a window sill construction taken on the line 14—14 in Fig. 1.

Fig. 15 is a horizontal sectional view on the line 15—15 in Fig. 1.

Fig. 16 is a sectional view of a door jamb detail taken on the line 16—16 in Fig. 1.

Referring more in detail to the drawings—

In Fig. 1, I have illustrated a building of simple design that may be constructed from units embodied by the present invention. The size of the building, and its general design, as well as the particular applications and decorations, may be varied according to the desires of the builder, and it is understood that the present drawings are only to illustrate a typical construction.

It is intended that the outside walls and also the partition walls should be erected upon suitable concrete footings, as indicated at 1 in Figs. 1 and 2 and these may be integrally formed with a floor indicated at 1a, the top surface of which preferably would have an inlay of a softer composition, designated at 3, such as cork to relieve the hardness of the floor. This inlay would be overlaid with a covering 4 such as a rug, linoleum or similar composition floor covering material.

Disposed upon the footings, along the lines of the outside and partition walls, and corresponding to the base sills of the usual construction, are metallic saddles 5 fastened by bolts, or other suitable means whereby they are firmly held in place on the footings.

The saddle 5 comprises a horizontal base wall 5a which lies flatly upon the footing, and opposite side walls 5b—5b extending upwardly and inwardly from the opposite longitudinal edges of the base wall. These side walls are of equal height and are spaced apart along their top edges a distance equal to the thickness of the wall forming blocks. The saddles also are reinforced within their inside longitudinal corners by concrete or other suitable material, as designated at 6, and these fillers 6 serve to rigidly support the walls in the saddles.

The side and partition walls of the building are constructed from precast blocks 2 arranged in superimposed horizontal courses, with the joints between blocks of one course staggered or offset from those of next adjacent courses. The blocks are rectangular and preferably longer than they are high, and all are of the same thick-

ness. Also, it is a feature of construction that all blocks are grooved along top and bottom edges and also along opposite end edges, and these grooves are of substantial depth and are rectangular in cross section as shown in Fig. 2, and the grooves of adjacent edges of blocks in a wall are in exact registration.

It is preferred also that the corners of all blocks 2 shall be reinforced by an embedded wire mesh 9 which mesh is embedded within the opposite side and base walls of the grooves 2a, as will be understood by reference to Figs. 2 and 14.

In the assembling of blocks 2 in courses in the building up of a wall, metallic, tubular splines 7 are fitted longitudinally within the aligned grooves 2a of the blocks. These tubular splines are rectangular in cross section and fit snugly inside the registering grooves of superimposed courses and thus act as key members whereby blocks of the courses are held firmly in alinement. The splines for the lower grooves of blocks of the lower wall course have a spline 8 that is flush with the lower surface of the block. Also, a similar spline 8 is applied to the top groove of the top course in order that there will be no projection beyond the block.

When a side wall has been built the height desired, a metal saddle 10 is applied over the top row of blocks. This saddle is similar to saddle 5 and along its corners is provided with cement seals 11 in the same manner as saddle 5 is sealed at 6. However, the base wall of the saddle 11 has an upstanding retaining flange 11a longitudinally thereof near its outer edge, inside of which flange the ceiling blocks 13 are laid.

Steel T-beams 14, spaced apart and parallel, are supported by the side walls to serve as the supports for the ceiling blocks, and the edges of these blocks are reinforced with a wire mesh as at 15, and rest at their edges on the lateral flanges of the inverted T-beams 14. The ceiling blocks also are constructed with a shoulder lap joint as at 16 in Fig. 3.

Applied upon the outer edge portions of the outside blocks 13 of the ceiling is a formed metal retaining strip, designated at 25. This comprises a flat base plate formed with two parallel upstanding flanges 25a and 25b, shown in Fig. 2, between which blocks 26 may be incorporated in the structure as a cornice, or in the construction of an upper story. It is preferred also that the edges of these blocks shall be reinforced by embedded wire mesh as at 27.

In the construction of an inside wall or partition, as designated at 22 in Fig. 4, a formed wire mesh saddle 20 is fastened vertically to the wall 2 and then to the adjoining edge of the partition wall. A plaster covering is finally applied to the inner walls and the wire mesh saddle 20 then serves to form a rounded corner as well as contributing strength to the structure to insure support of the wall.

A feature of construction is illustrated in Figs. 1 and 5, which adds ornamentation and facilitates construction. In the building of the outside walls, the blocks at the corners are not overlapped but are brought even at the inside corners. This provides a vertical, outwardly opening angle in the corner. Within each angle is inserted a shaped plate 31 fitted to the angle and having edge flanges 31' overlapping the outside surfaces of the walls. Also, there is an ornamental filler 30 fitted in the angle and held in place by an angular retaining strip 34 held in place by bolts 32 and having its opposite edges overlapped with

the edges of the piece 30, as noted in Fig. 5. The bolts 32 extend to the inside of the wall and have their head portions anchored in retainers 33 fitted to the wall angle. Also, in this corner is provided a formed wire mesh fastened to the wall blocks 2, adding strength to the structure and also serving as a metal lath for plastering a round inside corner.

Metal T-joiners 35 are used as required to join the horizontal splines 7 in an outside wall with those of a partition wall, as illustrated in Figs. 6, 7, and 8. These connectors consist of T-formed tubular keys with legs large enough for telescopic assembly with adjacent splines, and provided with shoulders 36 to limit the extent to which the assembled parts may be telescoped. Metal locking straps 37 are fixed to the legs of the T-joiners 35, and each has a downwardly depending catch pin or button 38 adapted to extend through a formed hole 38a in the adjacent spline, thereby to form a permanent connection between the two. This connection joins the parts securely together, contributing largely to the strength of the structure as a whole. Figs. 6 and 7 clearly illustrate this connection, and Fig. 8 shows the details of the structure of a T-joiner.

In the vertical grooves between the two wall blocks 2, and between the partition 22 and the wall itself, respectively, vertical splines 7 and 8 are used, as seen in Figs. 9 and 10. In these disclosures the T-connectors 35 are not used, but a connection across the top of each spline is used and this comprises a strap iron 40, which has downwardly formed, depending points 41, which are extended into the wall blocks 2, as shown in Fig. 10. Likewise, a connecting strap 42 is used to join the partition block 22 to the side wall, as seen in Fig. 9.

Fig. 11 shows a small section of a wall in elevation, illustrating particularly the wall blocks 2, the horizontal and vertical splines 7 and 8, and a switch box outlet 75, as in the enlarged detail shown in Fig. 13, and discloses a method of tying these horizontal splines 7 together by a system of tie rods 45. These tie rods 45 are secured to the horizontal splines 7 by a close fitting collar or strap 46. The tie rods 45 may extend through the vertical splines 7, through preformed holes in the blocks 2, or may be used in both places as shown in Fig. 11, as in such cases as are necessary, such as a long wall with no partition to strengthen or support it.

The switch or service outlet box 75 is constructed somewhat similar to the T-joiner 35, as shown in Fig. 13, being open at its ends and having the shoulder 76 to limit the extent to which a spline 7 may be inserted therein and also having a locking strap 77 and a catch pin or button 78 functioning in the same manner as in the T-joiner 35. Switch or service outlets may be installed as a section inserted in a key and a decorative face plate 79 used, as is the general practise.

In the window construction, as seen in Figs. 14 and 15, sections of metal I-beam material is employed as the frame structure, with the building blocks 2 fitted between longitudinal flanges of the beams. Panels 51 are fitted between the inner flanges and these are held by spring retaining clip 52, as seen in Fig. 15. This provides housings each forming a well 53 for window cords and weights, as are necessary. The window sash 54 is held by affixing the conventional guide strips 55 and 56 to the panels 51. An inverted metal saddle 57 is used as a base for the window sill 58; this

saddle being of the same general design as the wall base saddle 5, and also there is a cement seal 59 to complete its construction.

The door frame construction is similar to the window frame construction, using an I-beam 50, panel 51 and spring retaining clip 52, and mounting the door 50 upon the hinges 61.

Wood beams or timber, such as the common 2" x 4" timber used in general construction, may also be used in this type of construction, in place of the metal spline 7. However, it should be understood that enough of the metal splines 7 are to be used to accommodate the necessary wiring and plumbing of the building, and that the balance of the joints be made with wood. The use of wood, just described, will necessitate no change in any of the details of the other parts of this invention, and is herein included as a feature of this invention because it contributes considerably to the economy of construction.

The exterior of the building may be surfaced with a paint or with a stucco composition, or any other desirable surface. The interior of the building may be surfaced with the usual thin coating or plaster or otherwise decorated as desired.

It is not believed that the claims should be limited in scope to the details herein disclosed, but that they should be given an interpretation commensurate with the spirit and scope of the invention disclosed.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is—

1. In a building of the character described, a wall comprising building blocks arranged in superimposed courses and formed with a vertical duct substantially throughout its height; said blocks being provided in the top and lower surfaces with outwardly opening channels lengthwise of the blocks, and a tubular spline fitted in the channels of blocks in adjacent courses as an interlock and opening into the said vertical duct.

2. In a building of the character described, a wall comprising building blocks arranged in superimposed courses and provided in the end surfaces and top and lower surfaces with outwardly opening channels, a tubular spline fitted in the latter channels of blocks in adjacent courses as an interlock and extending to the ends of the wall, means tying the splines of adjacent courses together and extending within the vertical channels in the end surfaces of the blocks.

3. In a building of the character described, a wall comprising building blocks arranged in superimposed courses and provided in the top and lower surfaces with outwardly opening channels lengthwise of the blocks, a spline fitted in the channels of blocks in adjacent courses as an interlock, and means connecting the splines of adjacent courses; said means comprising collars fitted about the splines and rods connecting the collars and extending within the vertical joints between blocks of the courses.

4. In a building of the character described, having outside walls joined in angular relationship and forming vertical, outwardly opening corner ducts throughout the height of the wall, closures applied over the said ducts; said walls comprising blocks arranged in superimposed courses, each block having channels longitudinally thereof in its top and bottom surfaces, tubular

splines fitted in the channels of blocks in adjacent courses and opening into said corner ducts.

5. A building having a vertical corner duct and having walls forming said corner comprising blocks arranged in horizontal, superimposed courses; each block having longitudinal channels in top and bottom surfaces, tubular splines fitted in registering channels of blocks in adjacent courses as interlocks for the courses and opening at their ends into said corner duct for the insertion or removal of wires, or the like, said corner duct having a closure member removable for giving access to the open ends of said splines.

6. In a building having walls thereof joined in angular relationship; each wall comprising blocks in horizontal courses, and provided with longitudinal channels in their top and bottom surfaces, tubular splines fitted in registering channels of blocks of adjacent courses, and opening at their ends to the ends of the walls at their junction, and a closure member removably applied to the ends of said walls at the junction to cover said open ends of the splines and forming a vertical duct common to all splines.

7. In a building, side walls and partition walls joined thereto; each of said walls comprising blocks in superimposed courses; the blocks being provided with channels longitudinally of top, bottom and side edges, splines fitted in said channels between courses, and connectors for said splines applied at the junction of the walls and connecting the splines of corresponding courses in the partition and side walls; said connectors being of T-form and adapted to telescopically receive the spline members of the walls, and means for connecting the telescopically joined parts.

8. A building having outside and partition walls, comprising blocks laid in courses and each block having channels along top and bottom edges, tubular splines fitted in the channels of adjacent courses to form interlocks, and extending to the ends of the walls; said building having vertical ducts at the corners with which the splines of the corner forming walls communicate, and said splines of the outside walls having communication with splines of corresponding courses in the partition walls.

9. In a building, a foundation, a saddle disposed upon the foundation and fixed thereto, and a vertical wall forming member seated along its lower edge in said saddle; said saddle comprising a base plate upon which the wall member rests and extending to opposite sides of the wall and having upwardly and inwardly curved opposite side portions fitted at their upper edges to the vertical wall and a filler of cementitious material filling the spaces between the side portions of the saddle and the wall.

10. In a building, a foundation, a saddle disposed thereon and fixed in place, a wall resting in the saddle, an inverted saddle applied to the wall over the top edge thereof; each of said saddles comprising a flat base plate extended beyond the sides of the wall and having integral, inwardly curved side portions engaging at their edges with the faces of the wall, and a filler of cementitious material filling the spaces between the wall and the side plates of the saddles; said inverted saddle having an upstanding rib formed thereon lengthwise of the wall as a retaining abutment for a floor slab.

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