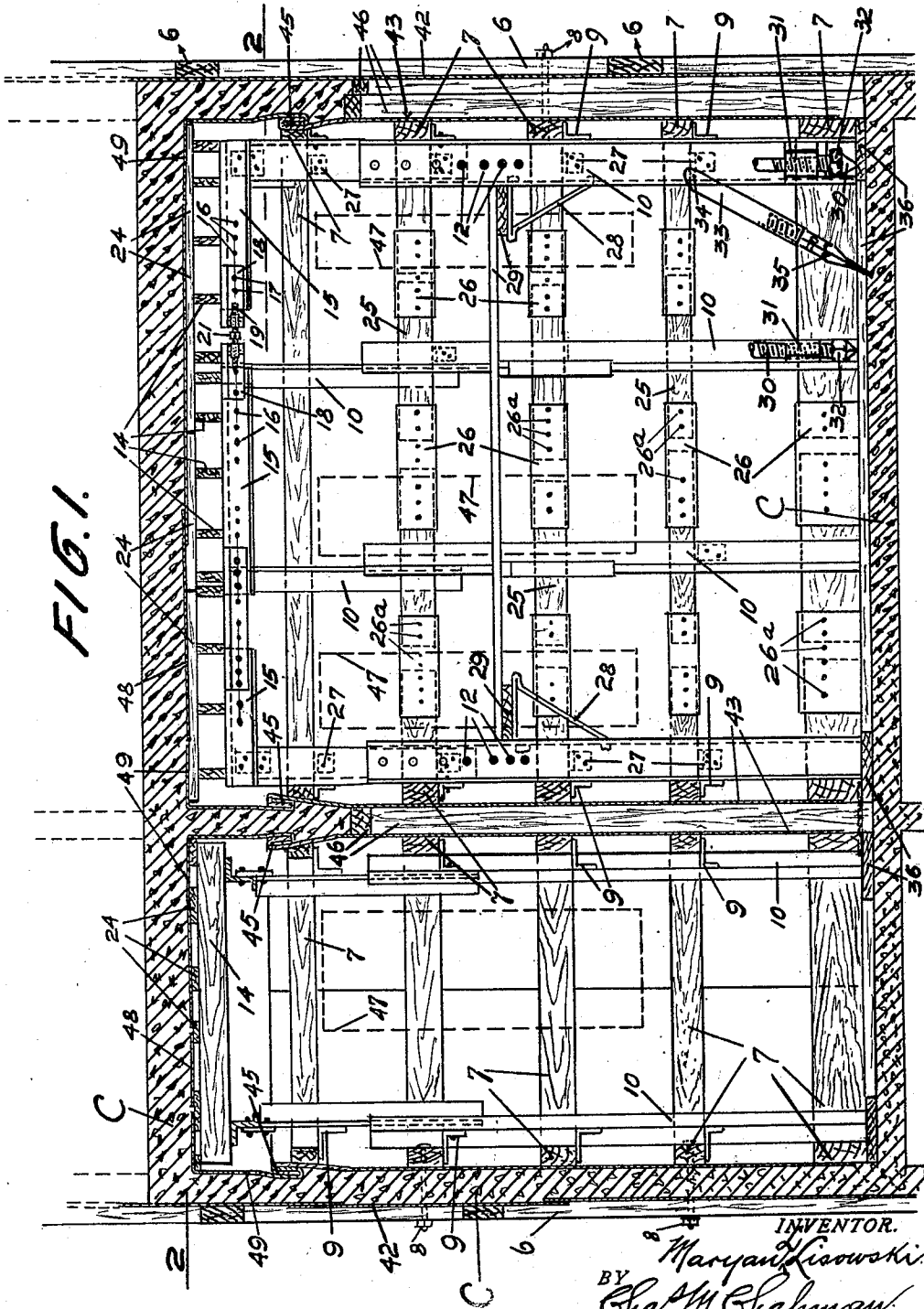


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METHOD AND APPARATUS FOR HOUSE CONSTRUCTION.
APPLICATION FILED SEPT. 8, 1919.

1,383,732.

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3 SHEETS—SHEET 1.

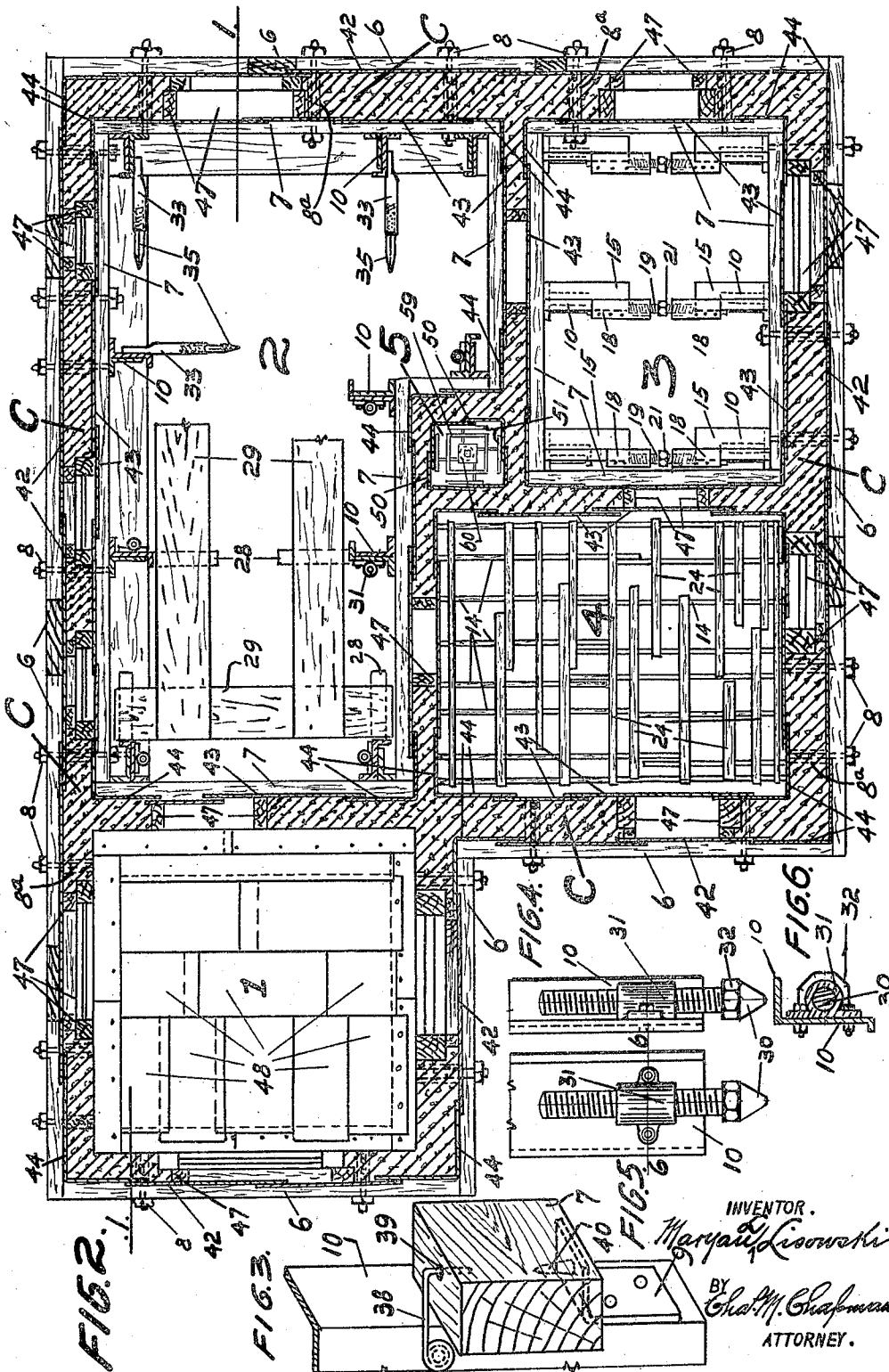


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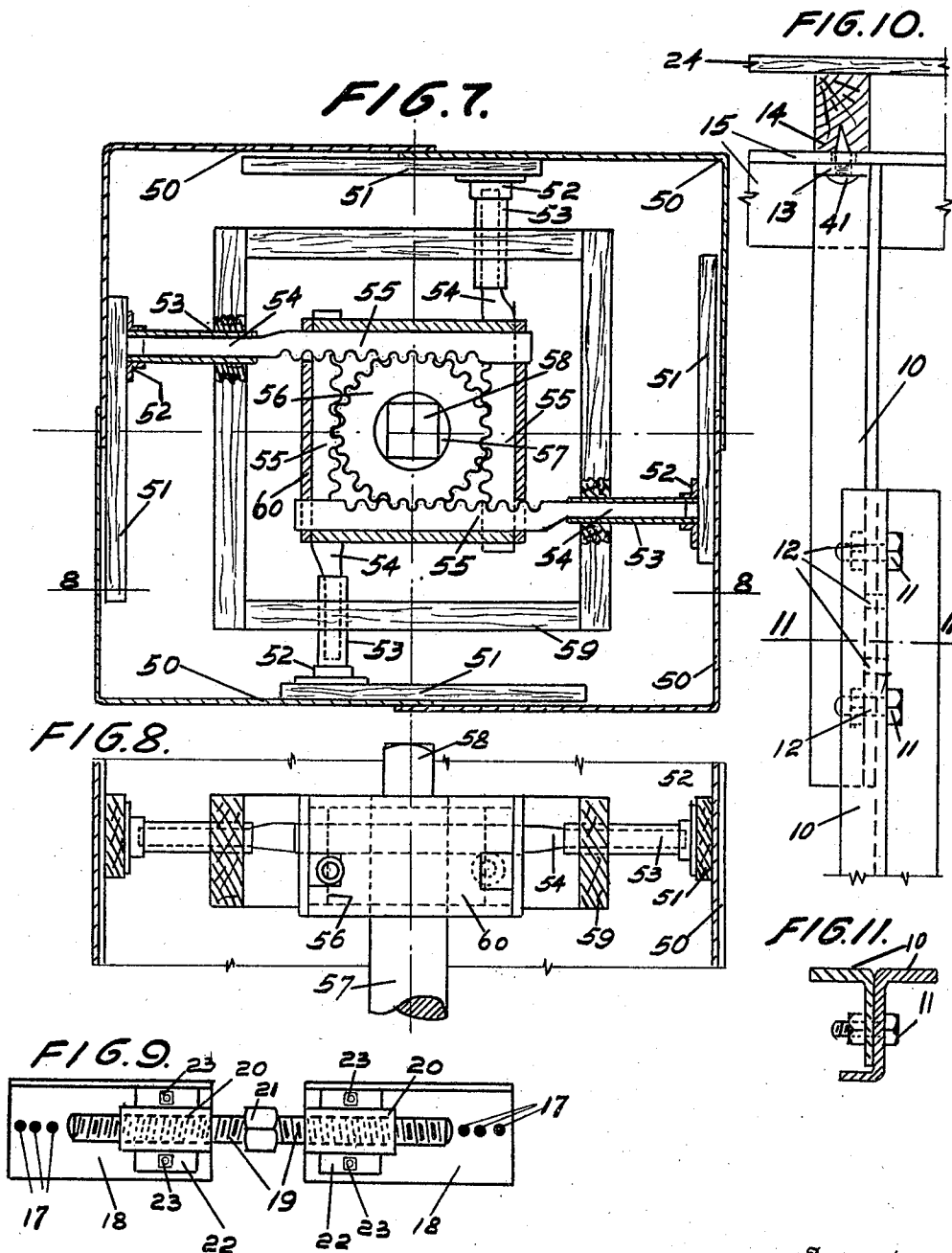


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3 SHEETS—SHEET 3.



Inventor:
M. L. Lisowski.
By his Attorney
Chas. M. Chapman.

UNITED STATES PATENT OFFICE.

MARYAN L. LISOWSKI, OF CRANFORD, NEW JERSEY, ASSIGNOR TO M. L. PATENTS CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

METHOD AND APPARATUS FOR HOUSE CONSTRUCTION.

1,383,732.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MARYAN L. LISOWSKI, a citizen of the United States, residing in Cranford, in the county of Union and State of New Jersey, have invented a new and useful Improvement in Methods and Apparatus for House Construction, of which the following is a description.

This invention has reference to the art of building structures of limpid cement, that is, cement so composed as to be susceptible of pouring, as distinguished from being shoveled or plastered, and which will rapidly harden or set during the process of construction or shortly after a given operation is completed. Particularly, the invention relates to apparatus for use in the construction of buildings for dwellings, stores, storage or other purposes.

Among the objects of my invention may be noted the following: to provide a system of means, devices or apparatus by which a cement building can be erected quickly, economically, and with facility; to provide means by which cement buildings, such as houses, apartments, warehouses, garages, etc., can be erected floor-by-floor by pouring, with all the necessary rooms, partitions, windows, doors, shafts, chimneys, etc., at practically a single operation; and to provide means, devices, and apparatus for carrying out my invention which involve comparatively low cost, afford great facility, and are capable of being used over and over again in the construction of successive parts of the same building, or in other buildings of the same kind, or of different kinds, or having different structural characteristics.

In order that my invention may be readily understood, I have provided drawings wherein:

Figure 1 is a vertical section of a building, or part of a building, taken substantially on the line 1—1 of Fig. 2, showing my method of construction and some of the devices and apparatus employed in carrying out the same;

Fig. 2 is a horizontal section of a building, or part thereof, taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view of a section of some of the devices used in carrying out my invention;

Fig. 4 is a side view of an adjusting device or foot-piece used by me;

Fig. 5 is a front view of the device of Fig. 4;

Fig. 6 is a sectional view on the line 6—6 of Fig. 5;

Fig. 7 is a sectional plan of a mechanism employed in the construction of shafts, chimneys, or other similar hollow structures;

Fig. 8 is a section on the line 8—8 of Fig. 7;

Fig. 9 is a plan view of a coupling for adjusting certain members of the framing used in constructing buildings;

Fig. 10 is an enlarged view showing adjustable members or supports; and

Fig. 11 is a section on the line 11—11 of Fig. 10.

Primarily, it should be understood that it has heretofore been proposed to make individual parts of various structures by pouring cement into forms or molds of desired shape, such as walls, conduits, casings, columns, ceilings, etc.; but, no practical attempt has been made to lay out and form or build, floor-by-floor, a building such as a dwelling house, apartment house or similar structure, requiring varied shapes of structural features including living-rooms, bed-rooms, bathrooms, shafts for light, heat, ventilation, dumbwaiters, and elevators. It has, however, been proposed to build a whole house at one time by pouring cement; but, this proposition has not been accompanied by a disclosure of any practical way, or devices, or mechanism by which to carry out the method suggested. According to my invention, a whole floor of a predetermined building can be projected or laid out and then formed or produced by pouring so-called limpid cement, the result being that a large building can be erected floor-by-floor in a short time, with great economy of labor, and saving of forms, material and apparatus.

Referring to the drawings, which show an embodiment of my invention and the method of producing a building, Fig. 2 shows a lay-out for an entire floor of a predetermined structure, such as a dwelling, and therein the various rooms are numbered 1, 2, 3, 4, and the shaft or chimney is indicated by 3. The lay-out for the various rooms, spaces, and features of construction thereof, such as windows, doors, etc., is produced by forms and timbers, as follows: Timbers or beams

6, forming the outer members of the casing, are bolted to timbers or beams 7, forming the inner members of the casing, the bolts being indicated by 8. The beams 6 are usually arranged at an angle to the beams 7, or obliquely to the wall to be erected. The bolts 8 are passed through sleeves or tubes 8^a so that the bolts can be readily withdrawn leaving the tubes embedded in the cement, see Fig. 2. Certain bolts, however, may be left embedded in the cement, without the tubes, enabling them to be utilized for various purposes in the structure. The beams 7 are arranged as close together as may be found necessary for strength and, in addition to being bolted to beams 6, are supported on brackets 9 carried by uprights 10. As will be seen, viewing Fig. 2, some of the inside beams 7 form the casing for adjacent rooms. The uprights (see Figs. 1 and 10) are, preferably, made in several sections 10 and adjustably connected by bolts 11, adapted to enter registering holes 12, in the several sections. Thus, the length of the uprights can be regulated to suit varying heights of ceiling on the successive floors. The upright members 10 may be made various shapes in cross-section; but, are, preferably, angles or L-shaped, as shown in Figs. 10 and 11, enabling them to fit snugly together and slide readily relatively. The members 10 may be of different lengths and may be in any number of sections. The upper sections are provided with overturned ends 13 enabling them to be secured to beams or joists 14 wherever such connection may be necessary. To support the beams or joists 14, angle-beams or members 15 are interposed between the joists 14 and ends 13 of the uprights 10, Figs. 1 and 10, thus forming part of the framing for the ceiling of the room being built and the floor of the room above. The angle-beams 15 may be adjustably connected by couplings or junction devices shown in detail in Fig. 9, and in place in Fig. 1, the beams having a series of holes 16 to register with holes 17 in the plates 18 of the junction devices. The plates 18 are preferably "angles" to provide strength, and the plates or members are connected adjustably by the right-and-left screw 19 working in threaded bosses 20 and manipulated by nut 21. The bosses 20 may be integral with plates 18 or may be formed on members 22 bolted at 23 to the plates. Thus the connection between beams or members 15 may be adjusted to suit conditions. The joists 14 support loose planking 24. Certain inside beams 25 may be rendered adjustable by sleeves or tubular members 26 connecting sections of said beams, thus enabling short beams to be utilized economically and to be fitted into various sizes of rooms. The adjustment may be made by inserting pins in registering apertures 26^a in the members 26

and beams 25,—see Fig. 1. The adjustable beams or members 25 are supported upon brackets 27 carried by the uprights 10.

Platforms may be erected on the uprights 10 for workmen, or other purposes, by brackets 28 on which planks 29 may be laid. The uprights are supported and prevented from slipping by adjustable feet 30 composed of pointed screws, threaded into bosses 31 at the bottom of one of the members 10, see Figs. 1 and 4 to 6. The feet also enable the uprights to be raised or lowered, as occasion demands, by manipulating the screw with a wrench applied to the angular head 32. The uprights 10 are also braced and rigidly held by brace-bars 33 pivoted at 34 to the members 10 and formed with a threaded socket in which works a pointed foot 35 capable of being manipulated by a wrench applied to its angular body. Base boards 36 are employed for the purpose of keeping the framing level and even all around, see Fig. 1, and the beams 6 and 7 retain the form-members in place and from buckling, bulging or sagging. In order to prevent the beams 7 from falling or being knocked or jarred off the brackets 9, hooks 38, Fig. 3, are pivoted to the adjacent uprights 10 so that they may swing into position to enter apertures 39 in the beams 7. Temporary fasteners, in the form of tacks or short nails 40 may secure the beams 7 to the brackets 9; and likewise the joists 14 may be secured to the uprights 10, as shown at 41, Fig. 10.

When the framing described has been erected, the form-plates are set in place, as shown in Figs. 1 and 2, wherein outside form-plates 42 are shown in overlapping relation and providing a complete outer wall for holding the cement. Then the inner form-plates 43 are set in place and are arranged in overlapping relation. At the corners, or angles, of the various rooms or structural features thereof, angular form-plates 44 are used both inside and outside; and on the vertical walls inside the framing certain of the form-plates are interlocked with each other by a joint 45 which enables the plates to be shifted laterally, as desired, to enable door-frames, window-frames, etc., to be adjusted or set in place, or for any other purpose desired. The joint 45 enables certain of the vertical form-plates to be hung in proper position and retained in place. The door-frames are shown at 46, Fig. 1, and window-frames at 47, Fig. 2, and, in Fig. 1, the outline of the window-frames is shown in dotted lines.

I have thus described the means by which the framing is erected and the casing for the cement is produced and in so doing have set forth the various devices and apparatus employed in making the walls, partitions, division walls, ceiling and floor of fabrics, together with certain of their characteristic

features; but, it should be understood that, in order to avoid confusion in the drawings, I have shown the various apparatus, and devices used in conjunction, in detail only in certain parts of the drawings. That is to say, in Fig. 2, ceiling plating or forms 48 are shown in place in room 1; in room 4 the plating 48 is omitted to show the planking 24 and adjustable joists 14; in room 3 the uprights 10 and beams 7 are shown, together with the means by which (Fig. 9) the beams may be adjustably held; in room 2 the uprights 10 are shown with the means for holding the same rigidly, and brackets 28 with planks 29 are also partially shown; and in Fig. 1 ceiling corner-plates 49 are shown, angular in form, interlocking with the inner plates 43, the angular form of the ceiling corner-plates operating to support the inner plates 43, as shown.

In Figs. 7 and 8, I have shown means for forming shafting, chimneys, dumb-waiter shafts, and similar hollow structures, and have also shown the same in a desired position in Fig. 2. In the figures, 50 indicates overlapping, angular form-plates arranged so as to produce the required shaft, the plates being held in position by planks 51 acting as a backing for the circular heads 52 on socket-bars 53 in which work the smooth ends 54 of rack-bars 55, in mesh with a gear 56, carried by a shaft 57, having an angular terminal 58 at one end for engagement of a crank or wrench, as may be convenient. Socket-bars 53 are guided in and supported by a rectangular frame 59, and rack-bars 55 are guided in and supported by a rectangular frame 60. The shaft 57 will be suitably held at its lower end so as to hold the gear 56, which, in turn, will maintain the racks and sockets up to their work. Thus a shaft or chimney form may be set up for construction in any portion of the building, said form coöperating with form-plates of adjacent walls to produce the mold or casing into which the cement is poured.

Having thus described the details of the mechanism, devices, and members employed in carrying out my invention, the latter will be readily understood from the following: Regardless of the form of the building or its many permanent structural characteristics or features, the inside framing of the various rooms is first set up, including the uprights, angle-beams and joists, the workmen operating, when necessary, from the platforms; then the outside framing is set up. The form-plates are then applied and are bolted together and to the framing members. The door and window-frames are set in place where required, and the entire structure is ready to have the cement C poured between the form-plates which is readily accomplished by suitable mechanism, the cement readily flowing to all parts of the struc-

ture because of the absence of obstructing angles. This feature is important. Moreover, since but one floor at a time is molded and hardened, the hydraulic pressure on the molds is inconsequential, this being an important factor since no bulging or distorting of the molds can occur, and the cement will harden as rapidly as a floor is completed and will become a foundation for the next succeeding floor to be constructed. Succeeding floors may be constructed in the manner above described and use may be made of the same framing and forms over and over again.

It will be understood that structural iron, iron beams, wire, wire-mesh, rods, etc., may be used anywhere in the structure as may be desired, to form reinforcements or make connections if found necessary. The framing and form-plates can readily be removed after the cement is set, the knocking down operation being begun by removing all bolts and mechanical devices.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. Apparatus for use in building frame-work for cement structures comprising a plurality of form plates for ceiling and side walls; beams for supporting the ceiling and side wall plates; angle beams and junction devices for supporting the ceiling beams; uprights for supporting the angle beams and side wall beams; and telescoping beams mounted upon the uprights and bracing the side wall beams.

2. Apparatus for use in building the frame-work for cement structures comprising a plurality of interlocking form plates for the side wall structure; a plurality of overlapping form plates for the ceiling; ceiling and side wall beams coöperating with the overlapping and interlocking plates respectively; uprights and means for coöperating therewith for supporting the overlapping and interlocking plates; and means carried by the uprights for bracing the latter.

3. Apparatus for use in building the frame-work for cement structures comprising a plurality of interlocking form plates for the side wall structure; a plurality of overlapping form plates for the ceiling; ceiling and side wall beams coöperating with the overlapping and interlocking plates respectively; uprights and means coöperating therewith for supporting the overlapping and interlocking plates; means pivotally mounted upon the uprights for bracing the same; and adjustable foot-pieces mounted upon the uprights.

4. Apparatus for use in building the frame-work for cement structures comprising an upright composed of a plurality of members; means for securing said members adjustably together; means carried by the

members for supporting a plurality of beams; an adjustable foot carried by one of the members of the upright; a brace-bar pivotally mounted upon the member carrying the foot, said brace-bar having a pointed member; and means for adjusting the same on the brace-bar.

5. Apparatus for use in building the frame-work for cement structures comprising a plurality of vertically adjustable uprights; a plurality of horizontally adjustable angle-beams connecting the several uprights at their upper ends; a plurality of telescoping, horizontally adjustable brace beams also connecting said uprights; and means for removably mounting the brace beams upon the uprights.

6. Apparatus for use in building the

frame-work for cement structures comprising a plurality of uprights; angle-beams connecting said uprights at their upper ends; brace beams connecting said uprights between their ends; means for adjusting the uprights vertically; means for adjusting the angle-beams longitudinally; and means for adjusting the side beams longitudinally.

7. Apparatus for use in building the frame-work for cement structures comprising a plurality of uprights; supporting brackets secured to said uprights; beams connecting the uprights adapted to be supported by the brackets; and hooks pivotally mounted on the uprights adapted to enter apertures in the beams for retaining the latter on the brackets.

MARYAN L. LISOWSKI.