W. C. BROUGHTON.

KNOCKDOWN CONCRETE BUILDING.

APPLICATION FILED APR. 25, 1912.

1,048,938.

Patented Dec. 31, 1912.

3 SHEETS—SHEET 1.

Fig. 2.

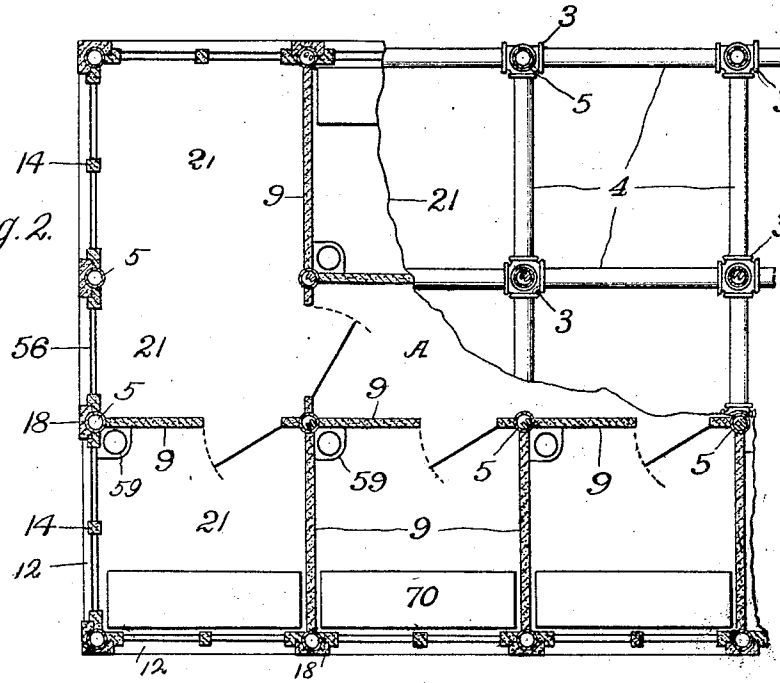
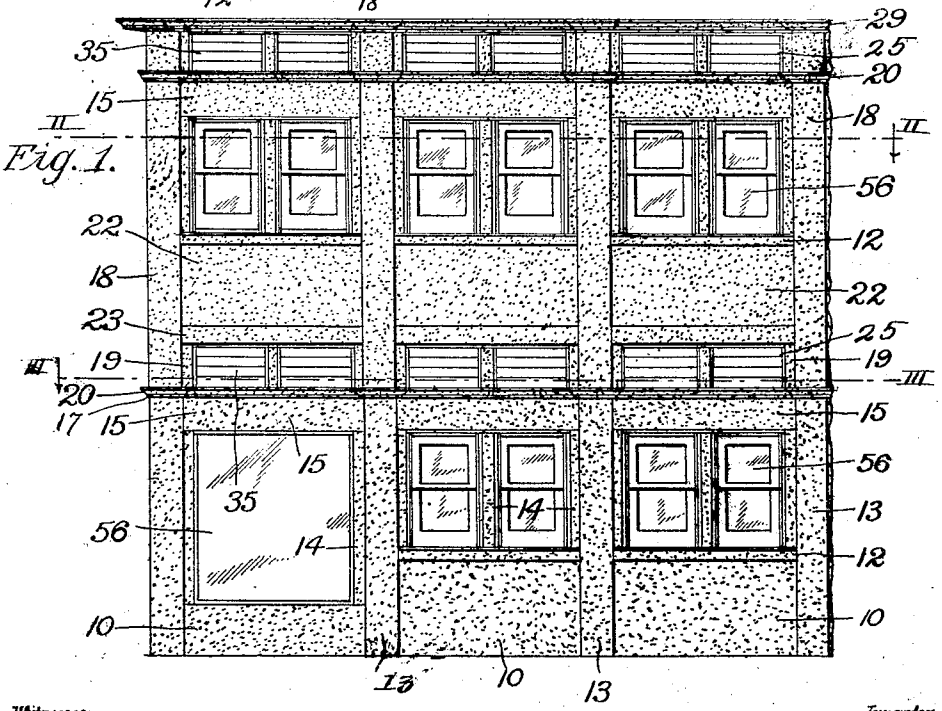


Fig. 1.



Witnesses:

R. E. Hamilton.

E. C. Lillian.

Inventor,

Walter C. Broughton,

By F. G. Fischer, Atty.

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3 SHEETS—SHEET 2.

Fig. 3.

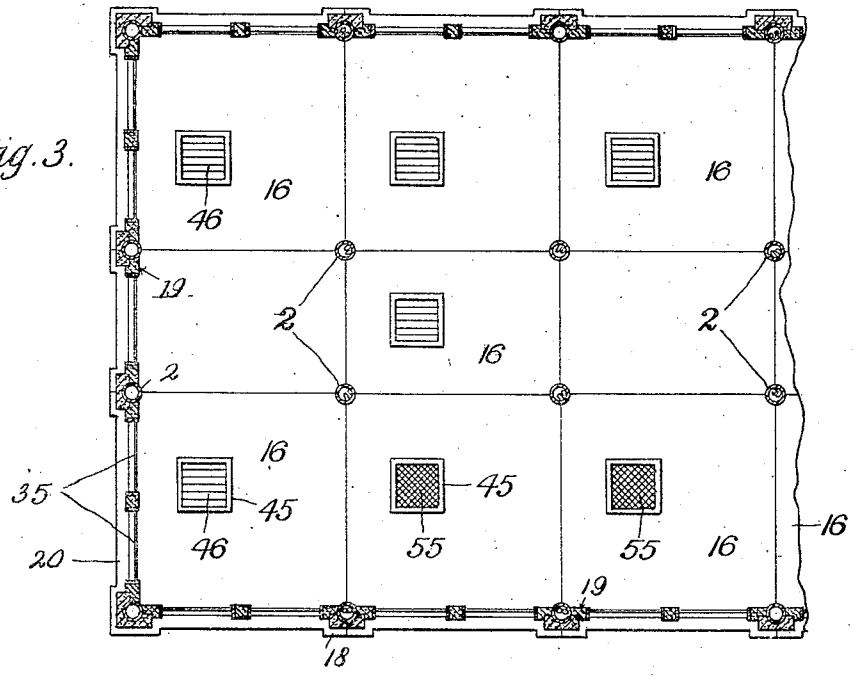
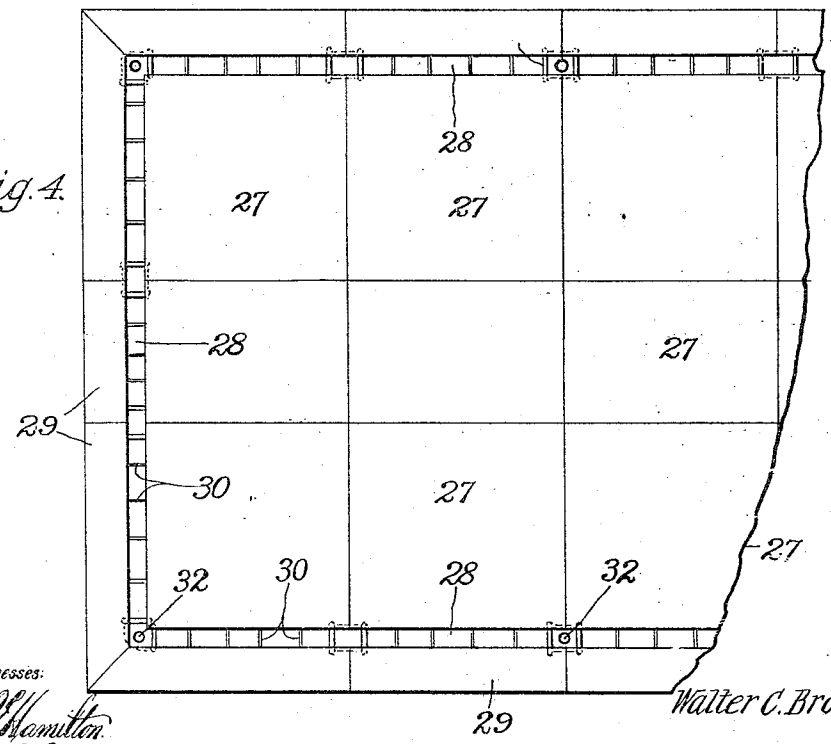


Fig. 4.



Witnesses:

R. H. Hamilton.

E. C. Allison,

Inventor

Walter C. Broughton,

By F. G. Fischer, Atty.

W. C. BROUGHTON.

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3 SHEETS—SHEET 3.

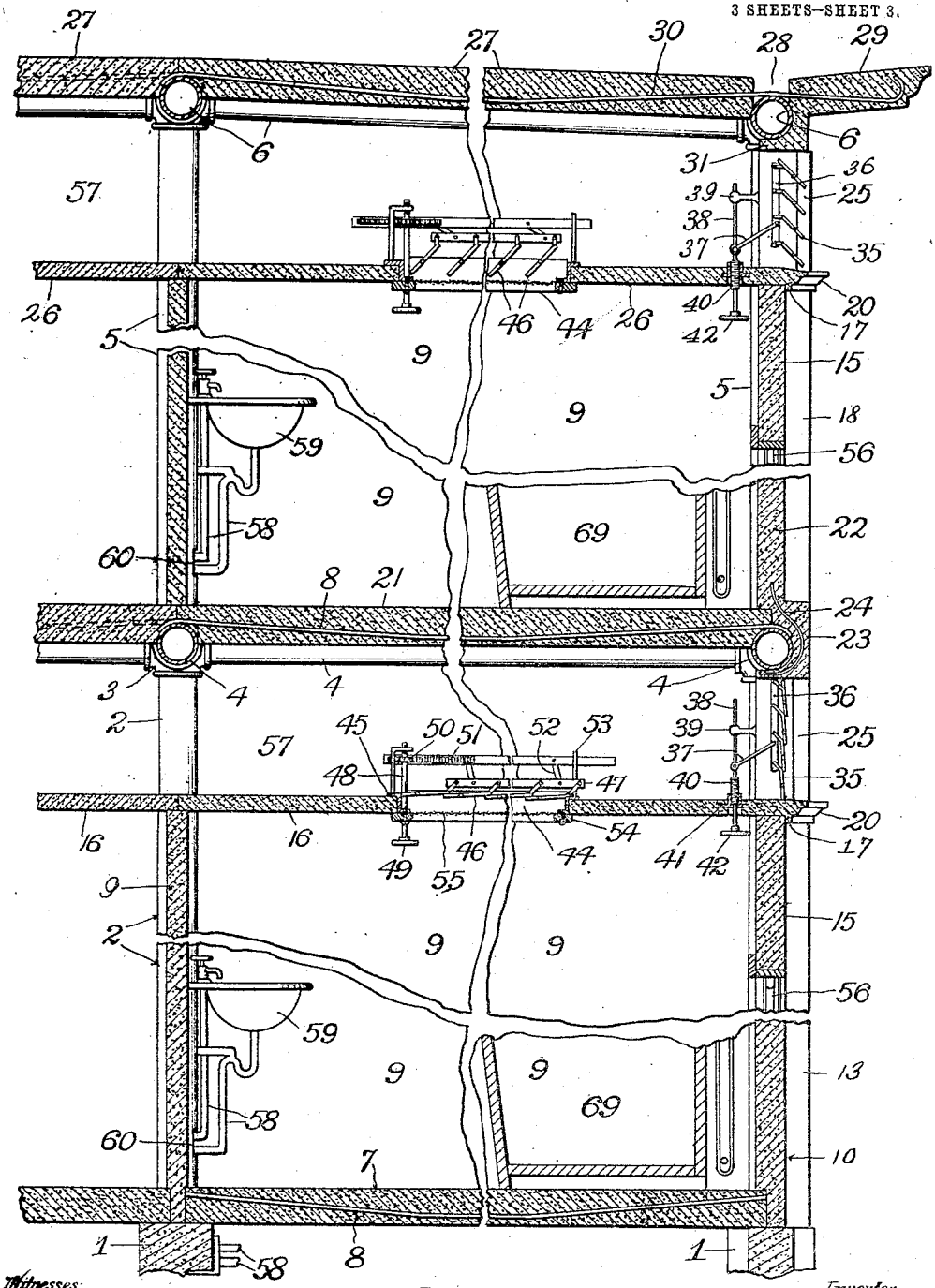

Fig. 5.

Witnesses:
R. Hamilton
E. C. Letson.

Inventor,
Walter C. Broughton,
By F. G. Fischer,
Atty.

UNITED STATES PATENT OFFICE.

WALTER C. BROUGHTON, OF KANSAS CITY, MISSOURI.

KNOCKDOWN CONCRETE BUILDING.

1,048,938. Specification of Letters Patent. Patented Dec. 31, 1912.

Application filed April 25, 1912. Serial No. 693,197.

To all whom it may concern:

Be it known that I, WALTER C. BROUGHTON, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Knockdown Concrete Buildings, of which the following is a specification.

My invention relates to concrete buildings in which the floors, ceilings, walls and roofs may be cast complete at a factory and shipped out ready to be set up; and is especially adapted to the construction of fireproof hotels, apartment houses, etc.

The framework consists preferably of pipes coupled together to secure the walls, ceilings, floors and roof in place, a number of said pipes being also utilized to conceal the plumbing used in the building, and a number to conduct rain-water from the roof of the building.

Other features of the invention will hereinafter appear and in order that said invention may be fully understood, reference will now be made to the accompanying drawings, in which:

Figure 1 is a side elevation of a portion of a two-story apartment house. Fig. 2 is a sectional plan of the upper floor on line II—II of Fig. 1, a portion of the floor being broken away to expose the frame. Fig. 3 is a sectional plan on line III—III of Fig. 1, showing ventilating apertures in the ceiling but omitting ventilator mechanisms. Fig. 4 is a fragmentary plan of a roof and cornice, showing gutters, etc. Fig. 5 is a broken vertical section of a portion of the building.

In constructing a building in accordance with my invention, any suitable foundation 1 is built, a portion of one being shown on Fig. 5.

The frame of the building consists entirely of vertical and horizontal pipes with suitable couplings for joining the pipes at intersections.

The first story column pipes 2 are set in sockets, not shown, in the foundation, after the couplings 3 have been placed thereon; then said column pipes are connected by the horizontal pipes 4. The couplings are of the usual screw-threaded kind, with the exception hereinafter noted, and when setting up the frame the column and horizontal pipes must not be screwed tightly into them, but only halfway or less, the purpose of which will presently appear.

The second story column pipes 5 are continuations of the column pipes 2, and the horizontal pipes 6 are similarly loosely-connected thereto.

No horizontal pipes are necessary beneath the bottom floor.

The floor is cast in large slabs 7, each the size of an apartment, said slabs being reinforced in any approved manner. In the drawings, 8 designates reinforcing rods in the same.

The floor slabs are laid upon the foundation with spaces therebetween for the partitions 9, which also rest on the foundation, as shown on Fig. 5. Each partition is cast in a single panel of the dimensions of the wall of the rooms separated thereby.

In constructing the outer walls, I prefer to cast them in sections of well known architectural forms, as will be briefly described. Where windows are provided, the base panels 10, extend from foundation to bottom of the window sills 12. Between said panels are separately cast pilasters 13, which extend from foundation to ceiling. The window sills 12 are integral with the panels 10. The window jambs 14 are separately cast.

Referring to Fig. 2, it can be seen that the vertical edges of the wall and partition panels 10 and 9 respectively are concaved to fit the curvatures of the pipes upon which they abut. The first loose connecting of the pipe frame permits the insertion of all the said panels in position. When all have been inserted, the pipes are screwed into the couplings until all vertical pipes bear solidly against the walls and partitions, which are thus firmly held in place.

The lower ceiling is cast in slabs 16 having, preferably, the dimensions of the rooms they cover, and abutting over the partitions, as shown. Each ceiling slab 16 has a depending lip, flange or shoulder 17, which takes over the lintel 15 or outer wall, as the case may be, and each panel may have an exterior molding 20, as shown on Fig. 5.

In the case of the building here illustrated, the lower ceiling 16 is held down tightly in position by the second story pilasters 18 and by the ventilator jambs 19.

The upper floor slabs 21 are laid upon the pipes 4, and have marginal quarter concaves, as shown to fit said pipes.

The second story wall sections are constructed exactly like the lower sections, above described, if provided with window

openings, except that the lower sections 22 thereof are formed with a swell 23 on whose inner face is a half-round groove adapted to receive the pipe 4 paralleling it. A reinforce 24 is embedded in the thickened portion at intervals. The under face of said swell 23 forms the top of a series of air openings 25, presently referred to again.

The second story ceiling is cast in panels 26 and is laid in place in the same manner as shown and described. The manner of erecting the outer walls will be obvious without further description.

The roof is cast in slabs 27, which differ from the floor slabs in some respects, the former being cut short to provide gutters 28 and being inclined toward same, as shown on Fig. 5.

The cornice sections 29 are secured to the roof slabs by means of reinforce rods 30 which pass over and rest upon the outermost pipes 6. In placing these cornice sections 29, the rods 30 are bent upward sufficiently to let the flange 31 pass around and under the pipe, when by straightening the rods the cornice may be brought into final position. The pipe being thus clamped between the rods 30 and flange 31, the roof slabs will be positively held in position.

To drain rain-water from the gutter 28, I provide (Fig. 4) holes 32 in alternate pipe couplings directly above the column pipes 5. At the bottom of the lower columns 2, orifices, not shown, are provided to discharge the water to a sewer.

On Fig. 2, a central hall space A is shown extending between two pairs of rooms and opening into another room at the end thereof.

57 designates an air space, which is provided between the ceiling and the floor above, or between the ceiling and the roof. These spaces communicate with the atmosphere at all sides of the building by means of the openings 25, seen on Figs. 1 and 5. Mounted in each of said openings is a manually-adjustable ventilator consisting, preferably, of a series of horizontal pivoted valves 35, each connected with a vertically-movable bar 36 pivotally-connected to a link-rod 37. Said rod is pivoted to a collar mounted on a vertically-movable rod 38 which passes through a guide 39 and has a threaded part 40, passing through a threaded bushing 41 in the ceiling and provided with a hand-wheel 42. By turning said hand-wheel, the threaded rod 38 is moved vertically and actuates link rod 37 and bar 36, which varies the angle of the valves 35, thereby governing the quantity of air that can pass through the ventilator. The valves are so inclined as to prevent the entrance of rain, and they may be entirely closed, if so desired.

In the ceiling of every apartment I provide a ventilation opening 44, Fig. 5. Set in each opening is a metal frame 45, which supports a manually adjustable ventilator consisting of pivoted valves 46, each pivotally connected with a bar 47, which may be actuated by any preferred device. That shown in the drawing (Fig. 5) consists of a vertical shaft 48 having a hand-wheel 49 on its lower and a pinion 50 on its upper end; a rack 51, movable by said pinion; links 52 connecting the rack to the bar 47, and guides 53 which compel the rack to move in a straight line. The operation will be readily understood.

Secured to the underside of the ventilator frame 45 is a screen frame 54. 55 designates a wire screen that is clamped between said frames and serves to exclude all flying insects from the rooms.

By slightly opening a window (56) an air current will be established between such window and the ceiling opening, through the space 57 and certain of the ventilators 25 and 35. If there is any breeze, whatever its direction, it will cause air to enter at some of the ventilators 25 and traverse the spaces 57, thereby creating favorable conditions for ventilation of the rooms below.

All service pipes may be installed in the column pipes 2 and 5, as shown on Fig. 5, in which 58 designates service pipes, 59 lavatories, and 60 openings cut in the columns to pass said pipes into a room.

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

1. In a concrete house, a frame including horizontal metal members, roof slabs supported on said members, a cornice having its inner side spaced from the adjacent sides of the roof slabs to form a gutter the bottom of which latter is constituted by the upper sides of said members, and reinforcing rods embedded in the roof slabs, resting on the horizontal members and having their free ends embedded in the cornice, the cornice having a horizontal flange that extends under said horizontal members in engagement therewith.

2. In a concrete structure, a frame composed of vertical pipes and horizontal pipes connected thereto, roof slabs supported on the horizontal pipes, and a cornice having its inner side space from the adjacent sides of the roof slabs to form a gutter the bottom of which latter is constituted by the upper portions of the horizontal pipes, said horizontal pipes having openings which communicate with the interiors thereof and with the gutter.

3. In a concrete structure, a frame including horizontal members, roof slabs supported on said members, a cornice having its inner side spaced from the adjacent sides of the roof slabs to form a gutter the

bottom of which latter is constituted by the upper sides of said members, and means to secure the cornice in position.

4. In a concrete structure, a frame including horizonal members, roof slabs supported on said members, a cornice having its inner side spaced from the adjacent sides of the roof slabs to form a gutter the bottom of which latter is constituted by the upper sides of said members, the cornice having a horizontal flange that extends under said horizontal members, and means to secure the cornice to said members.

5. In a concrete structure, a frame composed of vertical and horizontal pipes, floor slabs resting at their outer sides on said horizontal pipes, and lintels having enlarged lower portions shaped to engage under the horizontal pipes, over the outer and upper sides thereof and to seat on the outer corners of said floor slabs, and reinforcing rods embedded in the floor slabs and extending into the enlarged lower portions of the lintels.

In testimony whereof I affix my signature, in the presence of two witnesses.

WALTER C. BROUGHTON.

Witnesses:
F. G. FISCHER,
E. C. LILLIAN.