

D. A. MILAM.
 DEVICE FOR BUILDING CONCRETE WALLS.

APPLICATION FILED APR. 1, 1905.

2 SHEETS—SHEET 1.

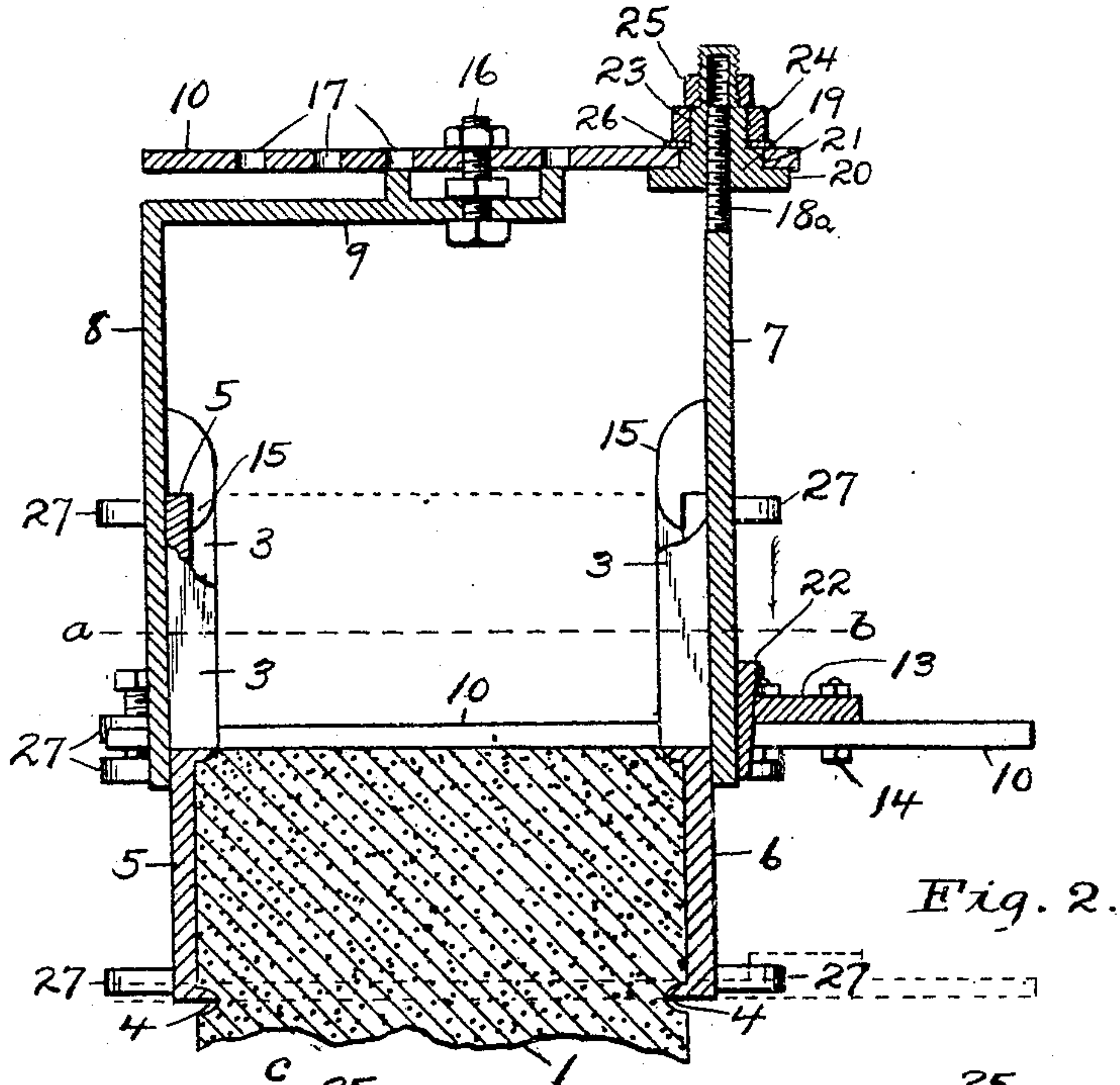


Fig. 2.

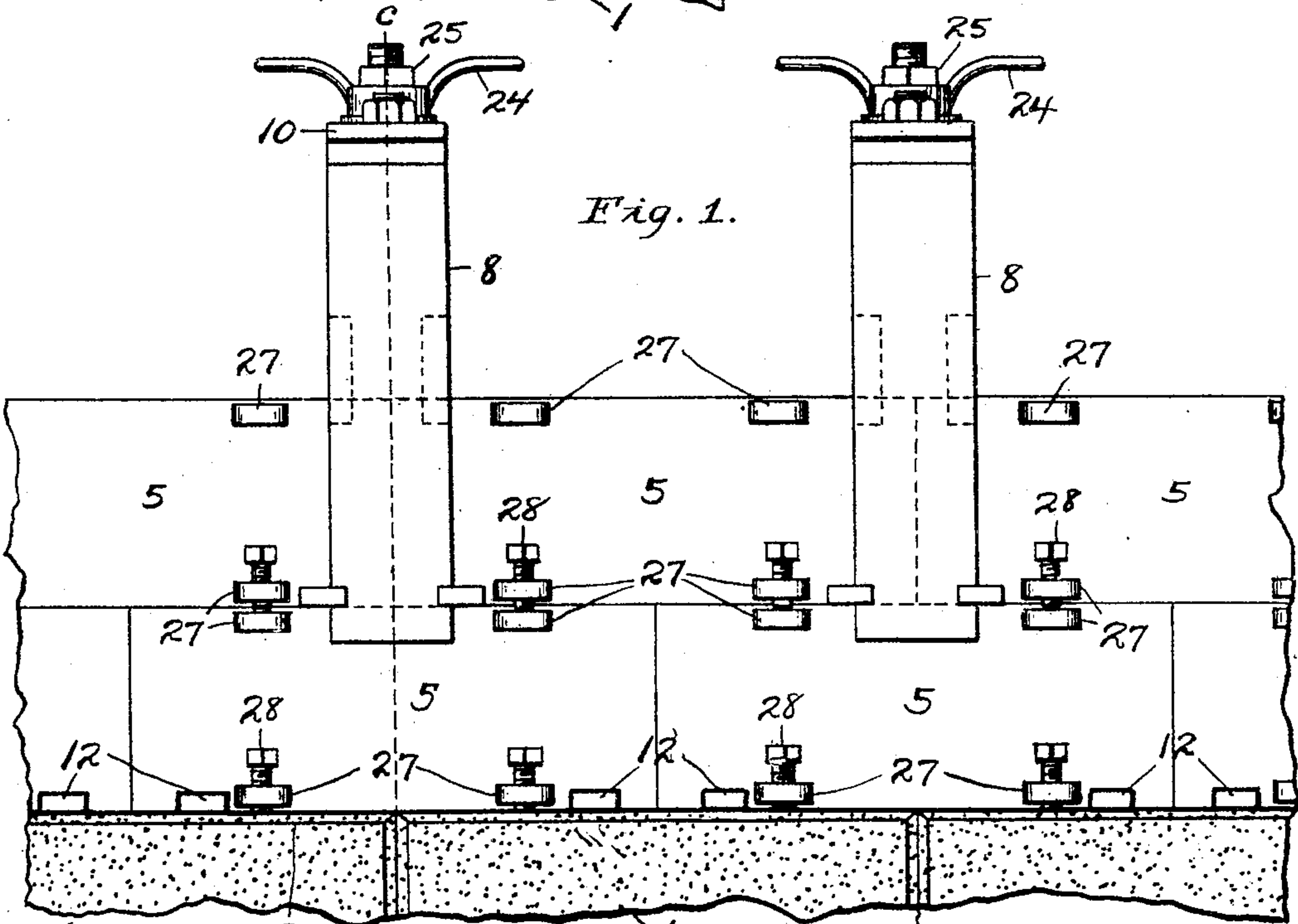
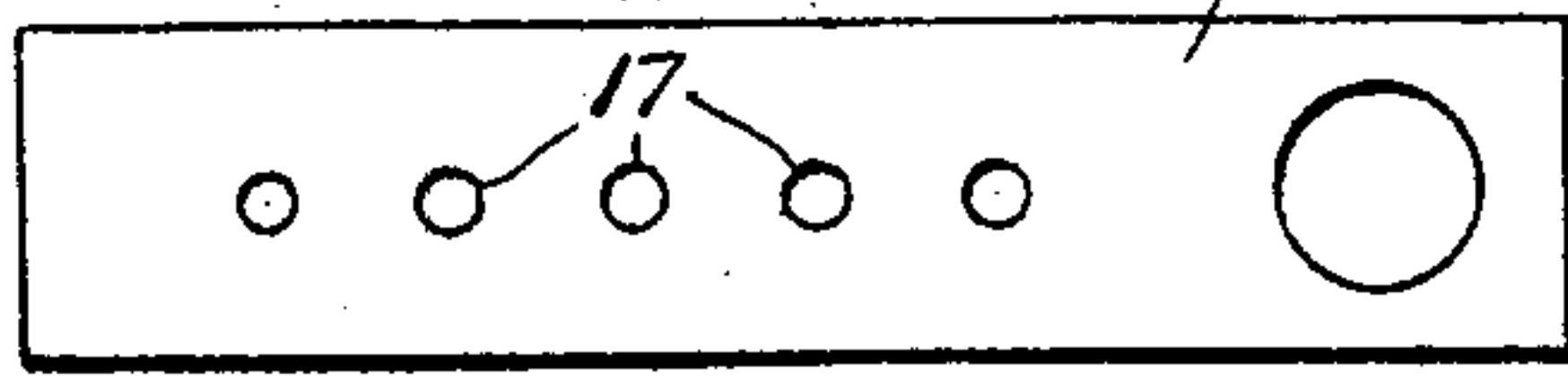


Fig. 1.

Witnesses: 2

R. L. Hamilton
K. M. Imboden

Fig. 7.



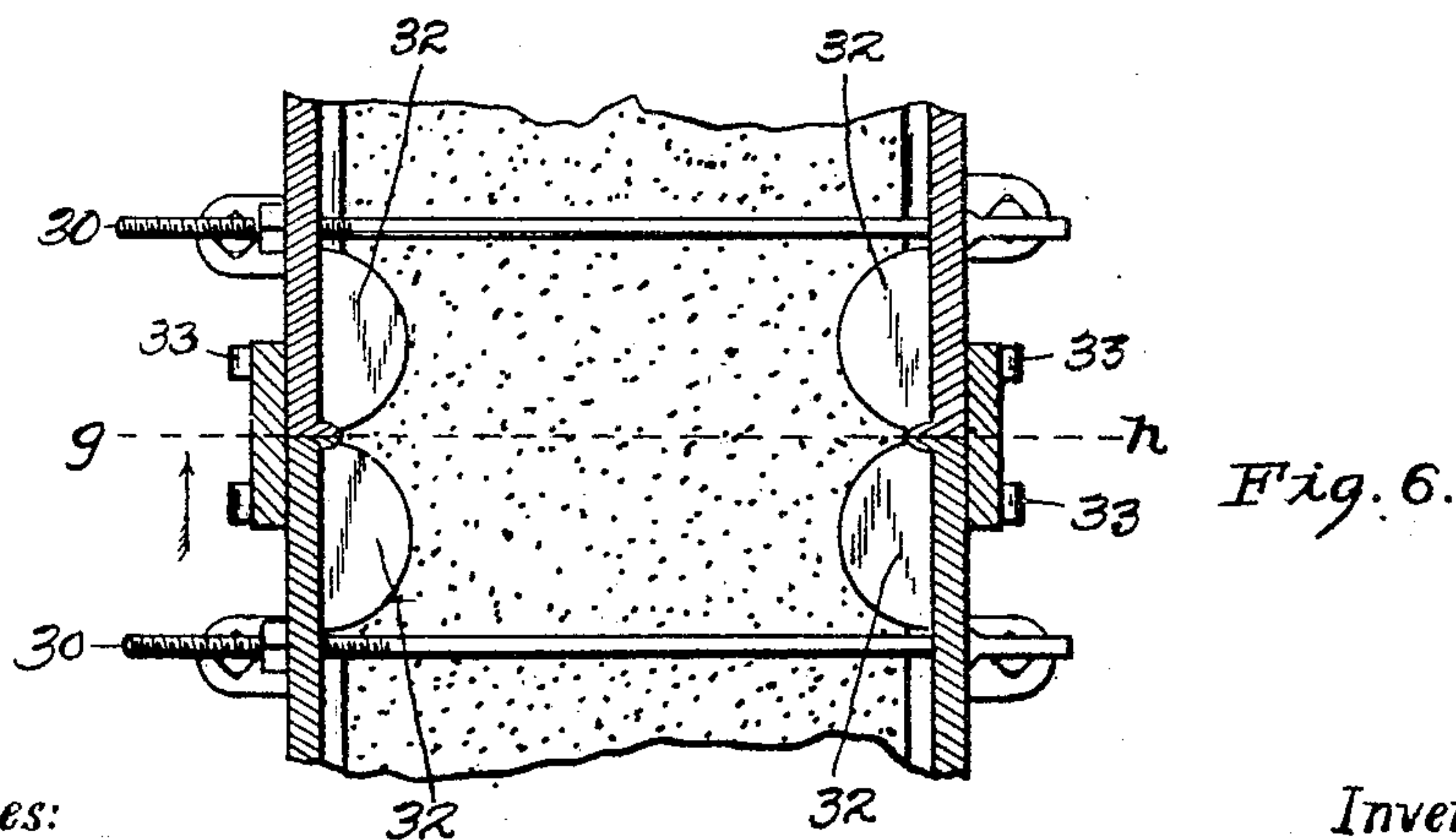
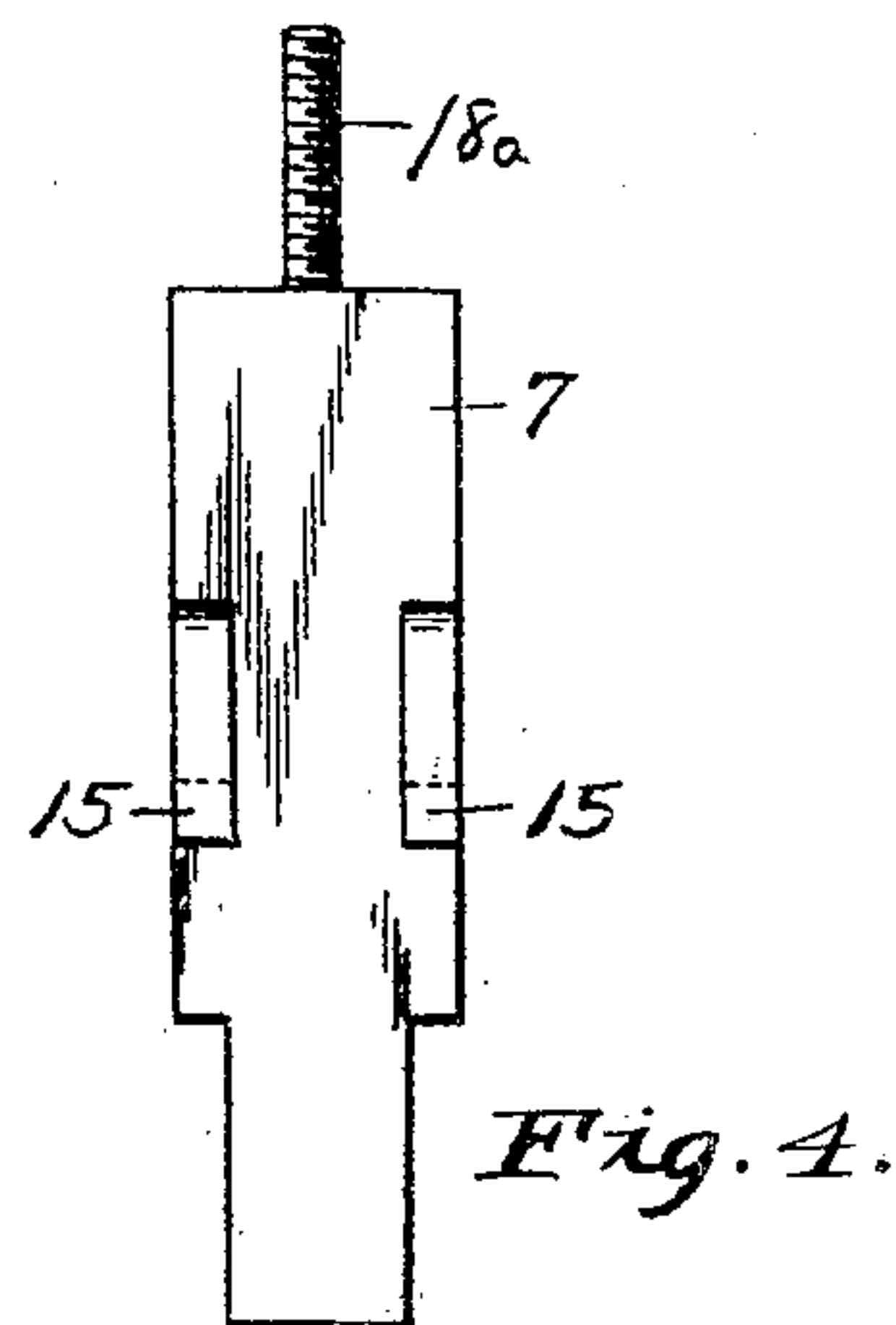
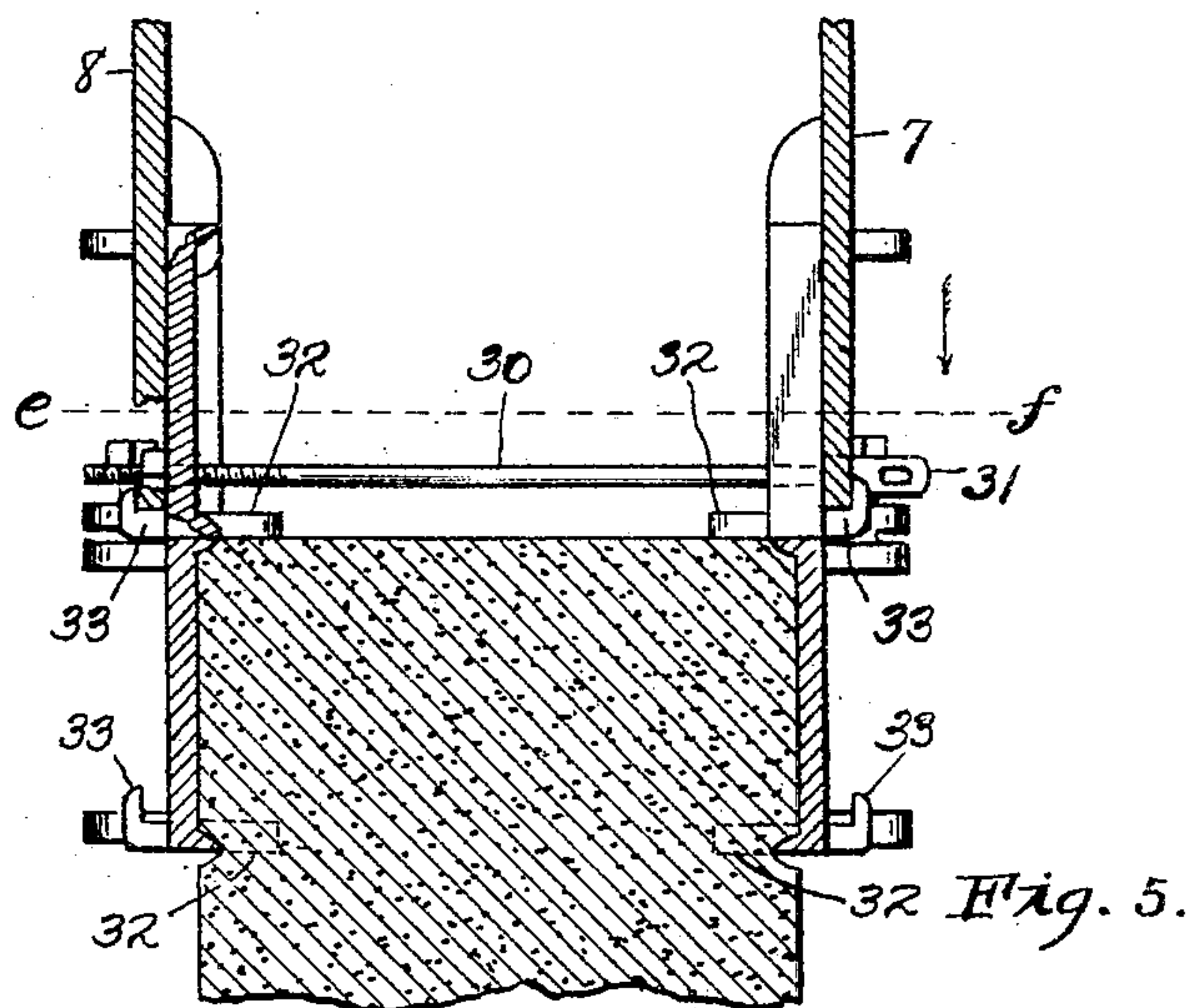
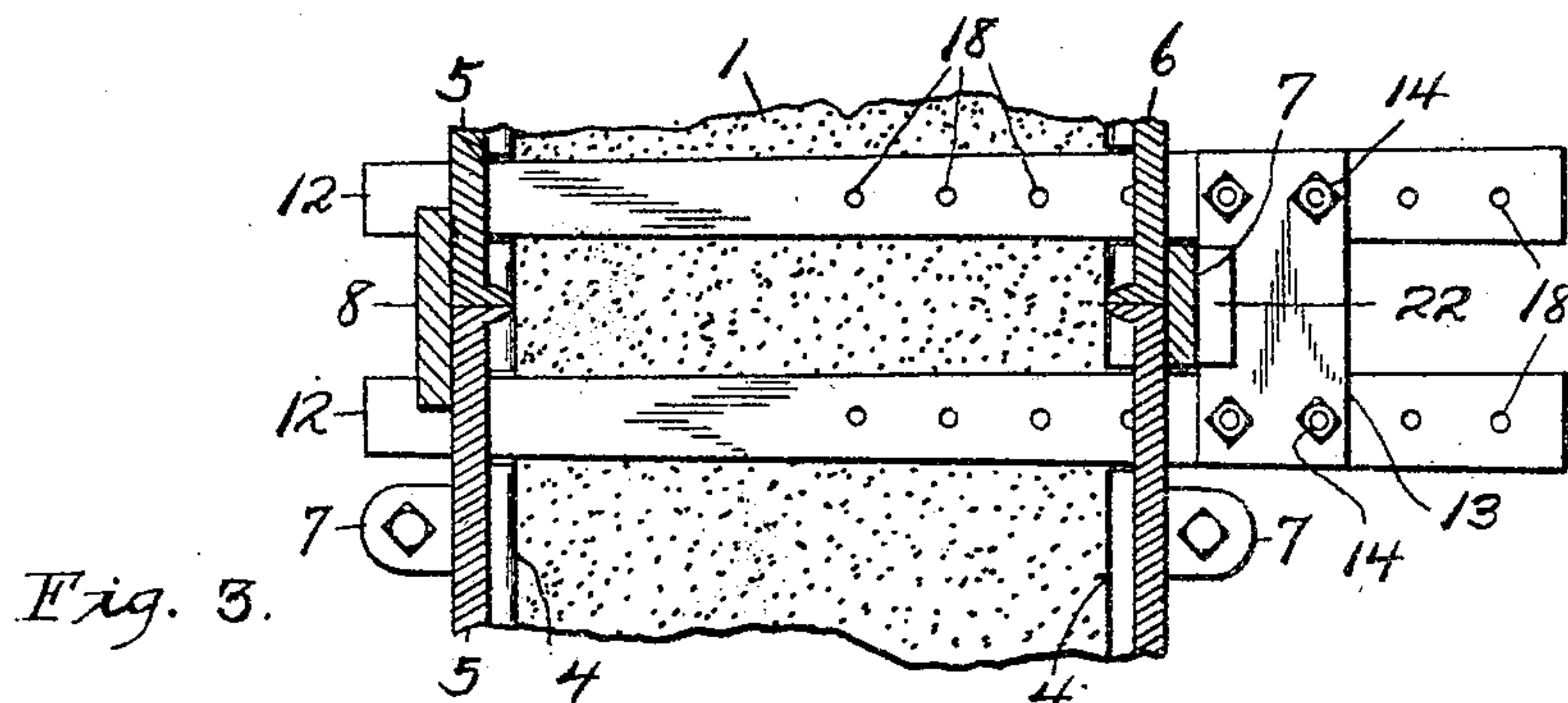
Inventor,

David A. Milam
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DEVICE FOR BUILDING CONCRETE WALLS.

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2 SHEETS—SHEET 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

DAVID A. MILAM, OF KANSAS CITY, MISSOURI.

DEVICE FOR BUILDING CONCRETE WALLS.

No. 803,703.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed April 1, 1905. Serial No. 253,267.

To all whom it may concern:

Be it known that I, DAVID A. MILAM, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Device for Building Concrete Walls, of which the following is a specification.

My invention relates to molds and auxiliary devices for use in building concrete walls, such as of buildings, and also concrete fences.

With my invention the concrete is not made into separate blocks.

With my invention the material is laid in continuous courses upon the wall and molded in that position.

One advantage of my invention is that it allows the material to be used in a wetter condition than is practicable with "block-machines," because I mold the material right on the wall, and my forms or molds do not have to be removed from the wall until the material has set, while for the block-machines the material has to be mixed dry enough for the block to stand up when removed from the machine, which has to be done immediately.

When a wall is built with my apparatus, it is much stronger than one composed of the ordinary molded blocks.

Another advantage of my invention is that gravel may safely be mixed with the sand and cement, whereas with a block-machine this cannot be done, because the gravel reduces the cohesion of the block, which falls apart or crumbles when taken from the machine. Furthermore, a solid or hollow wall can be constructed with my devices at less expense than a block and mortar wall.

In the accompanying drawings, Figure 1 is an elevation of a portion of my concrete mold, which is shown in position upon a wall the upper course of which is not yet made. Fig. 2 is a transverse section taken on line *c d* of Fig. 1, a part of one of the flanges being broken away. Fig. 3 is a sectional plan view taken on line *a b* of Fig. 2, showing the junctions of four of the mold-plates. Fig. 4 is a detached view of one of the inside uprights. Fig. 5 and Fig. 6 illustrate a modification, Fig. 5 being a vertical section taken on line *g h* of Fig. 6, and Fig. 6 being a sectional plan taken on line *e f* of Fig. 5. Fig. 7 is a plan view of a certain part detached from all other parts.

Referring first to Figs. 1, 2, and 3, 1 indicates a portion of a solid concrete wall which has been built by means of my invention. By

"solid" I mean not composed of blocks. The grooves 2 in the wall (seen in Fig. 1) are printed by the flanges 3 4 of the iron mold-plates 5, as shown in Figs. 2 and 3. These mold-plates I prefer to make of metal, owing to its greater durability and its immunity from warping and cracking. The dimensions of these plates correspond to the length and height of the blocks of which the wall is apparently composed. The vertical grooves 2 are printed by flanges 3 at the ends of the plates and the horizontal grooves 2 are printed by the longitudinal flanges 4.

The lower series of mold-plates 5 and 6 (shown in Figs. 1 and 2) inclose the last completed course of the wall. The upper series of mold-plates stands ready to receive the material for the next course. The lower series of mold-plates is purposely left on the wall for supporting the upper series, as clearly indicated in Figs. 1 and 2 and hereinafter described.

The window and door frames are set up on the wall in the usual manner, and the operators build up the mold entirely around the wall between said frames. In Fig. 1 the outer side of the wall is seen, and in Fig. 2 the outer side is at the left.

The mold-plates 5 6 are held in position by means of a series of inside uprights 7, outside uprights 8, upper connecting-bars 9 10, and lower connecting-bars 12. These lower bars are hereinafter called "seat-plates." One of them is shown in plan in Fig. 3. As shown, it is bifurcated and is preferably an assemblage of two parallel members connected by a separate cross-piece 13, secured thereto by bolts 14. To receive the seat-plates, openings are formed in the bottom of each mold-plate near the ends thereof. Thus when the mold-plates are set up with the seat-plates in position the latter serve to hold the ends of abutting mold-plates in contact. The seat-plates have also another function. As they rest upon the last-laid course of wall, they support the upper series of mold-plates, and a second set of seat-plates are employed for supporting a lower series of mold-plates, which are left on the wall until the second series above it has been placed.

Referring to Figs. 2 and 4, each inside upright 7 is provided with two hooks 15, which engage the upper edges of the mold-plates 6, and thereby prevent them from tipping inwardly. For the same purpose the outside uprights 8 are provided with hooks 15. (In-

indicated by dotted lines in Figs. 1 and 2.) The upper end of each outside upright 8 is cast integral with a transverse bar 9, on which are two lugs which form a bearing for an upper transverse bar 10. These bars are connected by a bolt 16. In the upper bar a plurality of bolt-holes 17 are provided for adjustment for walls of different thicknesses. The seat-plates 12 are also provided with a plurality of bolt-holes 18 to permit adjustment of the seat-plates to walls of different thicknesses. The inside uprights 7 are held firmly in position by means of wedges 22, (see Figs. 2 and 3,) which are driven into the spaces between the said uprights and the cross-pieces 13.

Each inside upright 7 is provided with an upwardly-extending screw 18^a. On this screw is loosely mounted a nut 19, having a flange or shoulder 20 and a smaller rounded portion 21. This portion loosely fits a circular opening in cross-bar 10. Above the rounded portion 21 the nut is squared at 23 to receive a handle or crank 24, and above this it is threaded to receive a nut 25, which holds the handle or crank 24 in position. When it is turned in one direction, the flange 20 lifts the end of bar 10, and thereby pushes out the top of the outside mold-plates 5. When turned the other way, the washer 26 pushes down the same end of bar 10, and thereby draws in the top of the outside mold-plates, the mold-plates being thus affected by one handle 24. Thus the face of the wall may be kept in plumb. The top and outside plates will not be vertically displaced by the operation of cranks 24, owing to the looseness of the nuts 20 on the screws 18^a and the weight of said plates.

For leveling the mold-plates longitudinally of the wall I employ lugs 27, cast on the outer faces of the mold-plates, as shown in Fig. 1. Preferably each plate has four such lugs. The lower lugs are provided with set-screws 28, and the upper lugs are imperforate and are adapted to support said screws. Wherever there may be a low place in the top of the wall, the mold-plates thereabove are elevated to the correct height by turning the screws 28 thereof.

For drawing the inner and the outer mold-plates together (transversely of the wall) I employ either the means shown in Fig. 2 or that shown in Fig. 5. That shown in Fig. 2 is preferred. The inner faces of the parallel members 12 of the seat-plate are provided with notches which engage the sides of the outer upright 8. Thus the seat-plates cannot be withdrawn from the wall until said uprights have been removed. Now in order to permit the use of the wedge 22 for drawing the outer and the inner plates together, I provide a sufficient space for a wedge between the inner upright 7 and the cross-piece 13 of the seat-plate 12. One of these wedges is shown in section in Fig. 2. The operation is obvious.

The arms of the seat-plates are tapered, as shown, so that they can be drawn out of the wall without breaking or cracking the material. The seat-plates are left in the wall until the second course of material above them has been laid. The holes left in the wall after the removal of said parts may be partially filled up or "pointed." However, the seat-plates may be dispensed with and different means employed for drawing together and supporting the mold-plates. (See Figs. 5 and 6 for an illustration of such means.)

The outer and the inner mold-plates are provided with bolt-holes. Before the material is placed between them bolts 30 are passed through said holes and the nuts run up as tight as necessary. These bolts are provided with eyes 31, by which they may easily be pulled out of the wall when no longer required.

It will be observed in Fig. 5 that the inner faces of the mold-plates are provided with horizontally-disposed lugs 32. Said lugs of the lower series are sunk in the wall, as indicated, whereby the lower series of mold-plates are prepared to support the weight and pressure of the upper series with their fastening and adjusting devices.

As there are no seat-plates to support the uprights 7 and 8 the mold-plates are provided with brackets 33, which serve this purpose, as shown in Fig. 5. Preferably these brackets are located at the bottom of the mold-plates.

It is of course understood that hollow walls can be built by means of the devices already described by employing suitable cores. Any preferred form of core may be used in connection with this apparatus.

Within the scope of the appended claims I do not limit myself to the details of construction shown in the drawings, as various changes might be made without departing from the spirit of my invention.

In the claims I wish the word "concrete" to be understood in its broadest sense.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is -

1. In a device for the purpose named, a pair of abutting outside mold-plates, a pair of abutting inside mold-plates, an outside and an inside upright, covering respectively the junctions of the outside and the inside mold-plates, a bifurcated seat-plate lying transversely in or upon a wall, one end thereof engaging the outside upright, and being adapted to be removed from the wall in the direction of its length, and a cross-bar connecting the upper end of the outside upright to the upper end of the inside upright; substantially as described.

2. In a device for the purpose named, a lower series of mold-plates, an upper series of similar superposed mold-plates, each mold-

plate being provided with two outwardly-projecting lugs near its lower edge, set-screws arranged head upwardly in said ears, two outwardly-projecting lugs near the top of each mold-plate, said screws of the upper series being adapted to engage the upper lugs of the lower series, for leveling the mold-plates longitudinally of the wall; substantially as described.

3. In a device for the purpose named, the combination of an outer and an inner upright, a cross-bar rigidly secured to the upper end of the outer upright, a second cross-bar adjustably secured to said cross-bar, a screw projecting upwardly from the top of the inner upright, a flanged nut mounted on said screw, a handle fixed on said nut and spaced above the flange, the last-named cross-bar being engaged between the flange and the handle, and hook-lugs secured to the inner faces of said uprights for engaging the upper edges of the mold-plates; substantially as described.

4. In a device for the purpose named, a plurality of outside mold-plates, a plurality of inside mold-plates, the lower edges of said plates being provided with recesses, and a bifurcated seat-plate adapted to be inserted through said recesses for holding said plates in contact longitudinally.

5. In a device for the purpose named, a plurality of outside mold-plates, a plurality of inside mold-plates, the lower edges of said plates being provided with recesses, a bifurcated seat-plate passing through said recesses and embedded in the material of the wall, said seat-plate having two inwardly-directed notches in its ends, an upright 8 having its lower end held by said notches, an inside upright passing between the arms of the seat-

plate in contact with the junction of two inside mold-plates, and a wedge inserted between the last-named upright and the body of the seat-plate, for the purpose specified.

6. In a device for the purpose named, a plurality of inside mold-plates, a plurality of outside mold-plates, an upright contacting with the junction of two inside plates, said last-named upright having a transverse bar secured to its upper end across the mold, an upper transverse bar adjustably secured thereto, said upper bar having a circular opening therein, an upwardly-extending screw projecting from the first-named upright, a nut 19 mounted thereon, a portion of said nut lying within said opening, said nut having a shoulder upon which said upper bar rests, a nut screwed upon said nut 19, above said bar, and means for turning said nut 19, for the purpose specified.

7. In a device for the purpose named, the inside uprights, provided with the hooks 15, in combination with the abutting mold-plates, said hooks engaging the upper edges of said plates, for the purpose specified.

8. In a device for the purpose named, a pair of tapered keying members 12, each provided with a longitudinal row of bolt-holes, and a cross-piece connecting said members together adjacent one end thereof; the outer ends of the keying members being provided with notches for the reception of an upright staying member; substantially as described.

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

DAVID A. MILAM.

Witnesses:

K. M. IMBODEN,

R. E. HAMILTON.