

May 9, 1933.

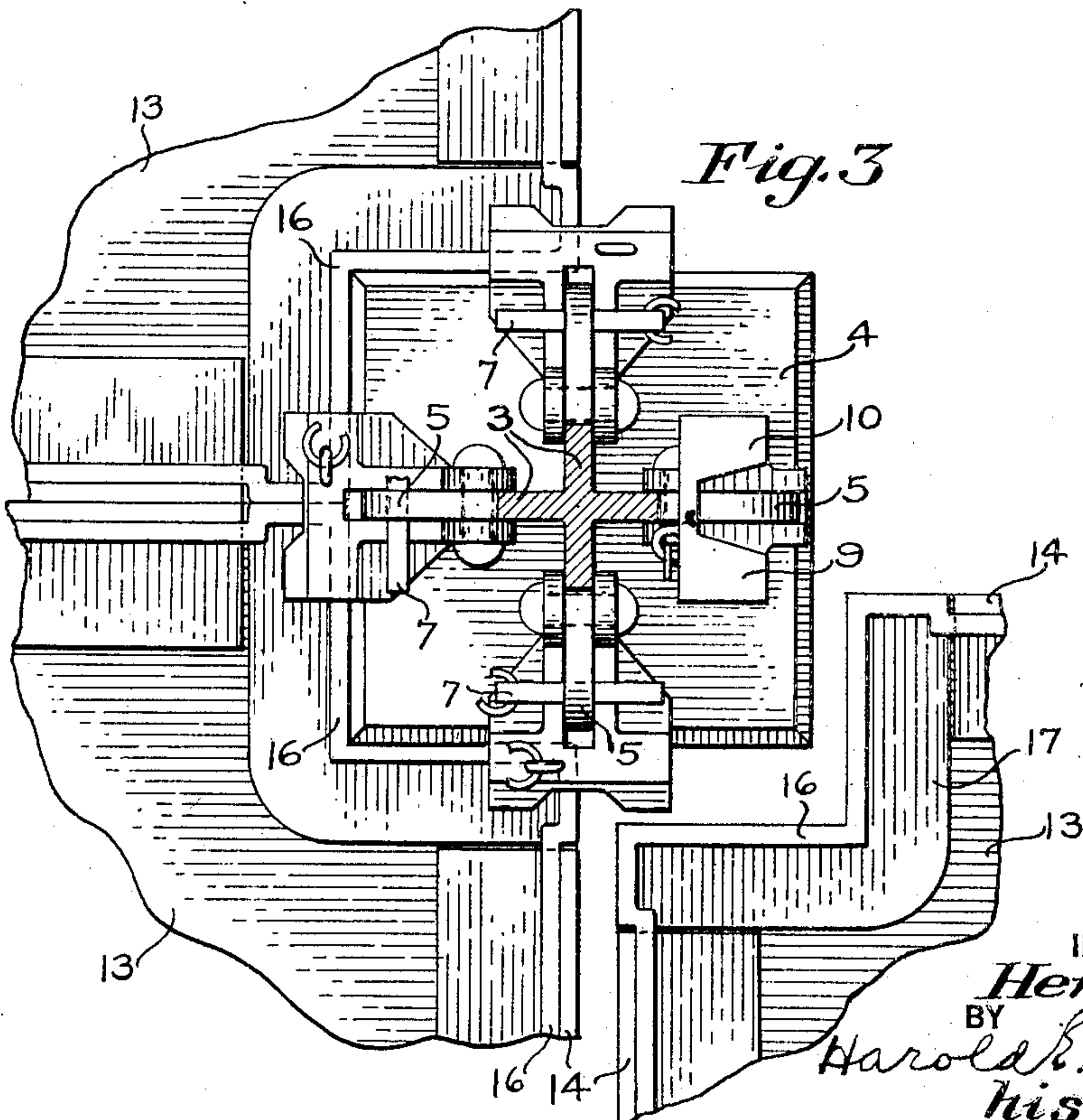
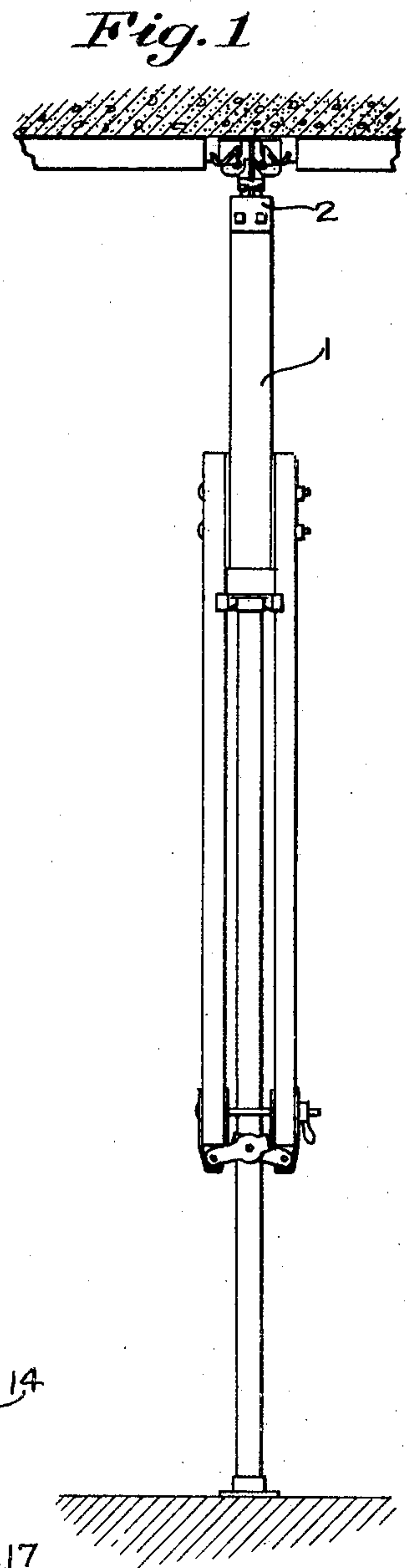
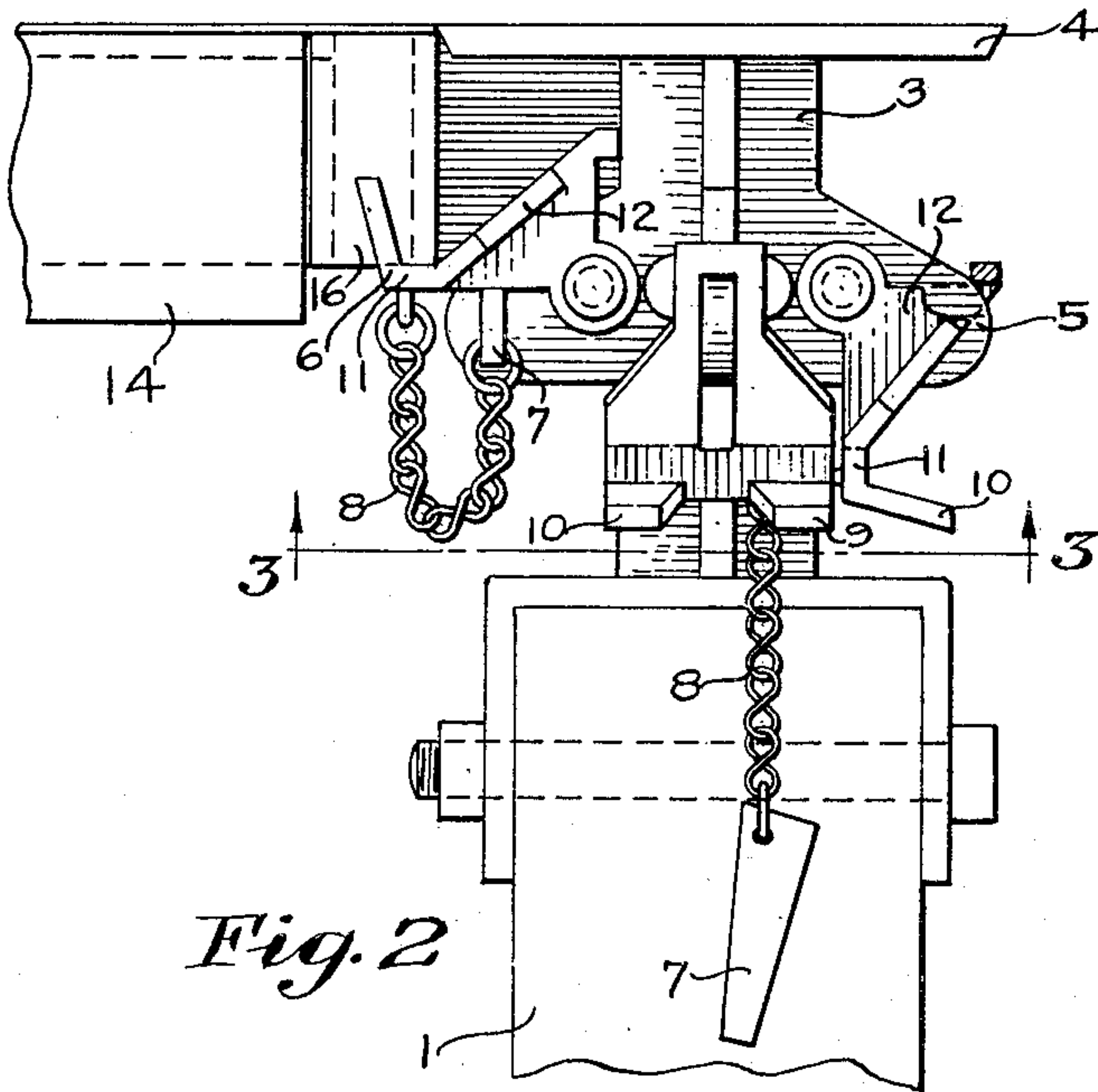
H. W. ROOS

1,907,877

APPARATUS FOR LAYING CONCRETE FLOORS

Filed April 1, 1929

3 Sheets-Sheet 1



INVENTOR
Henry W. Roos
BY *Harold B. Stonebraker*
his ATTORNEY

May 9, 1933.

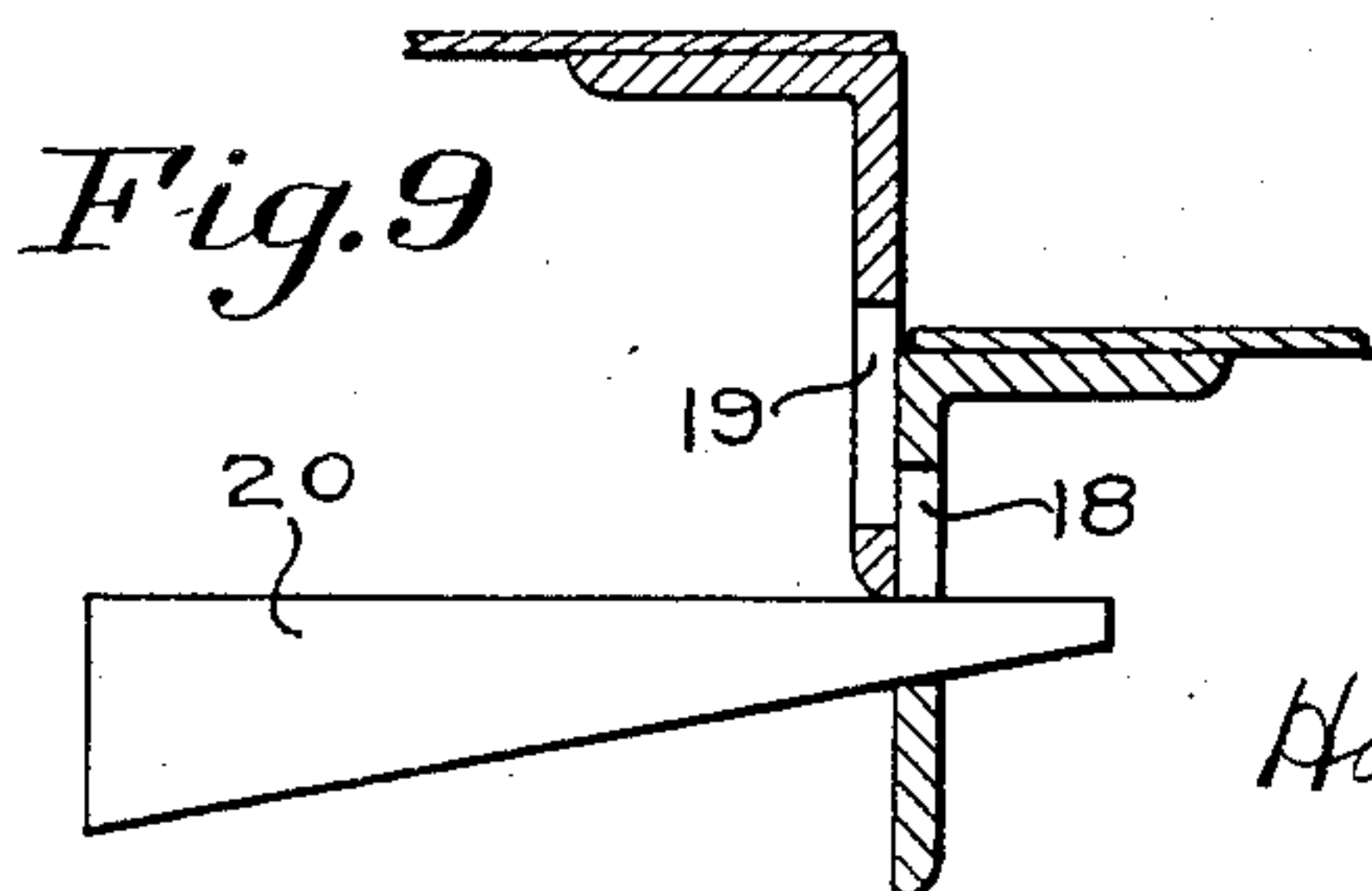
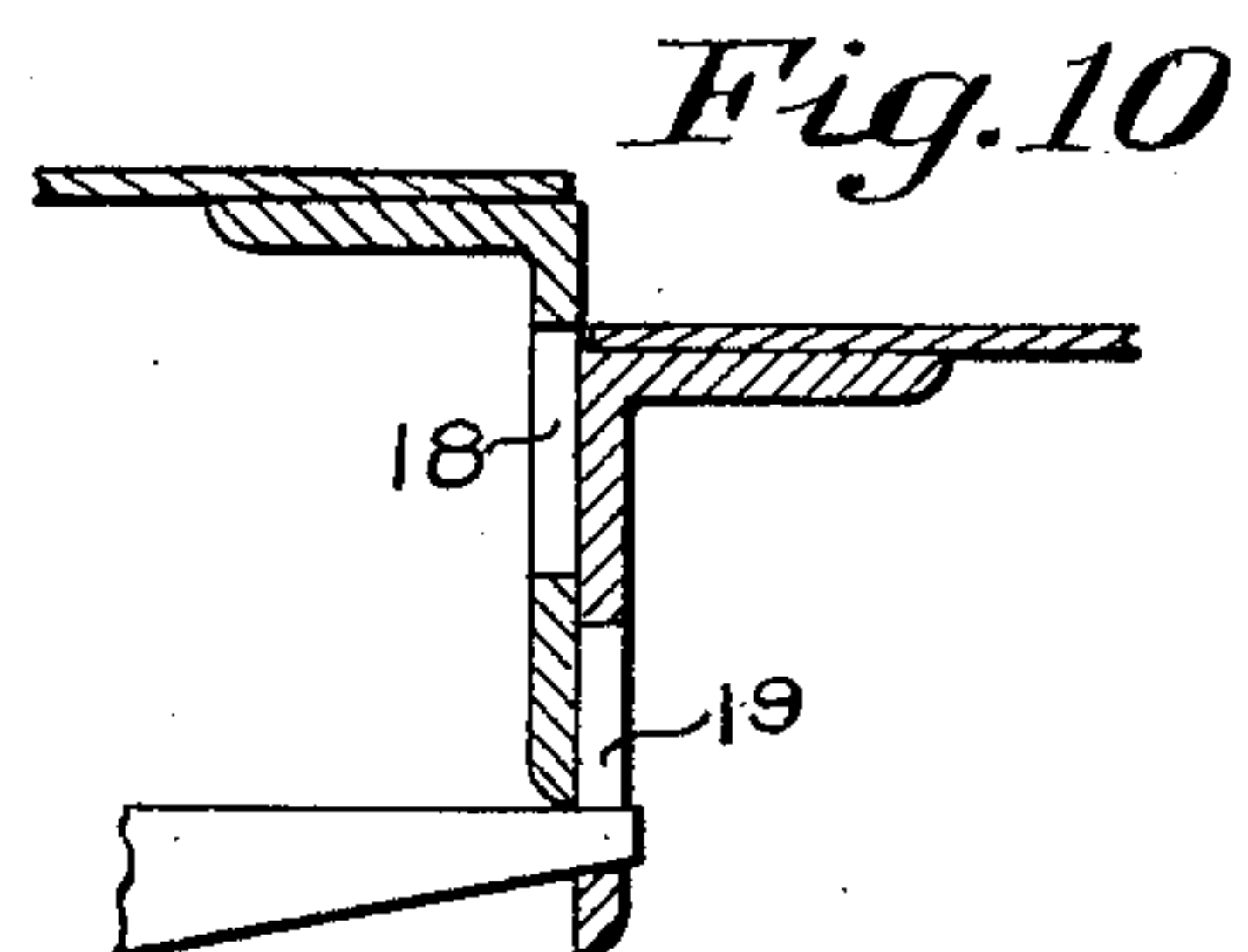
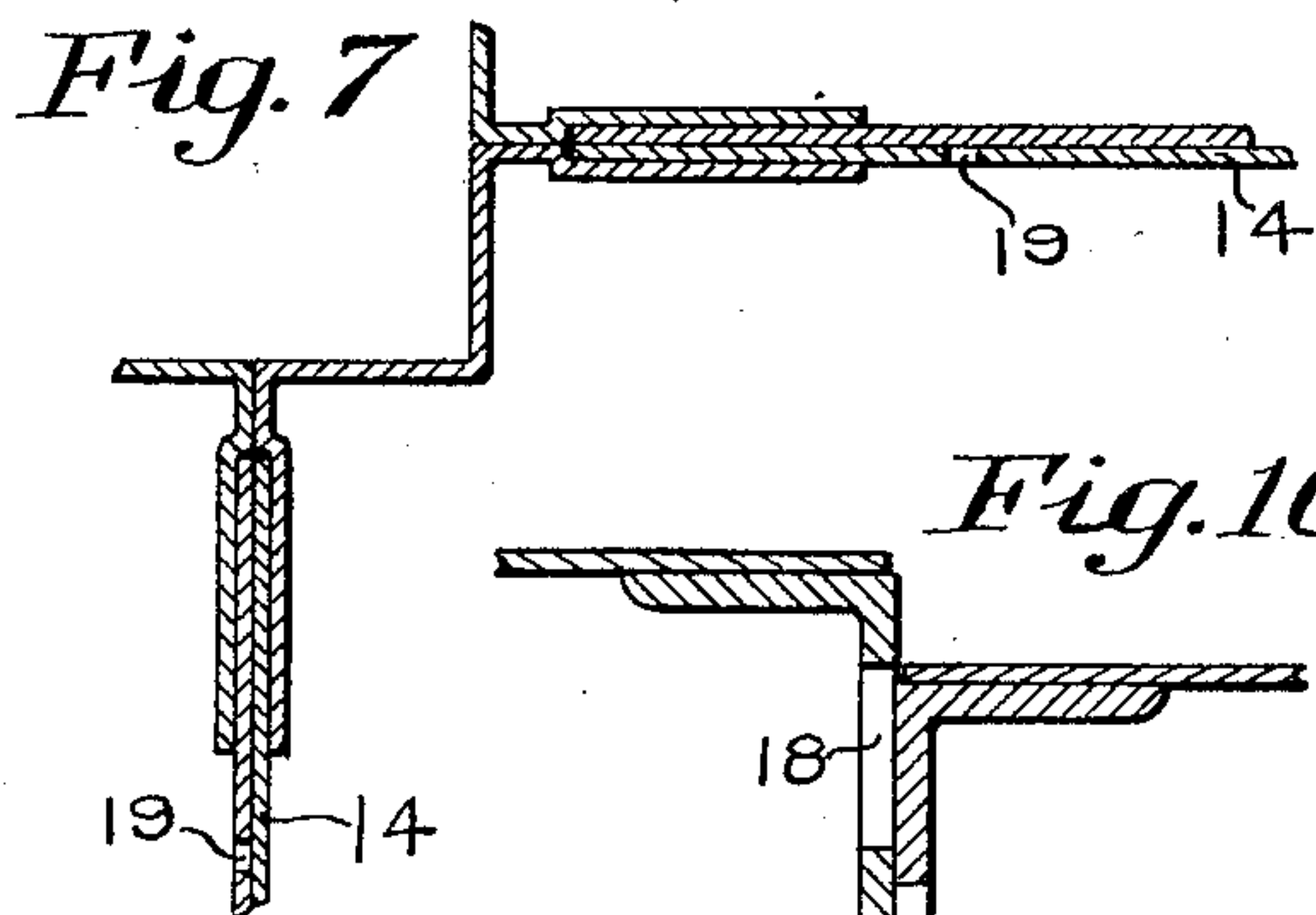
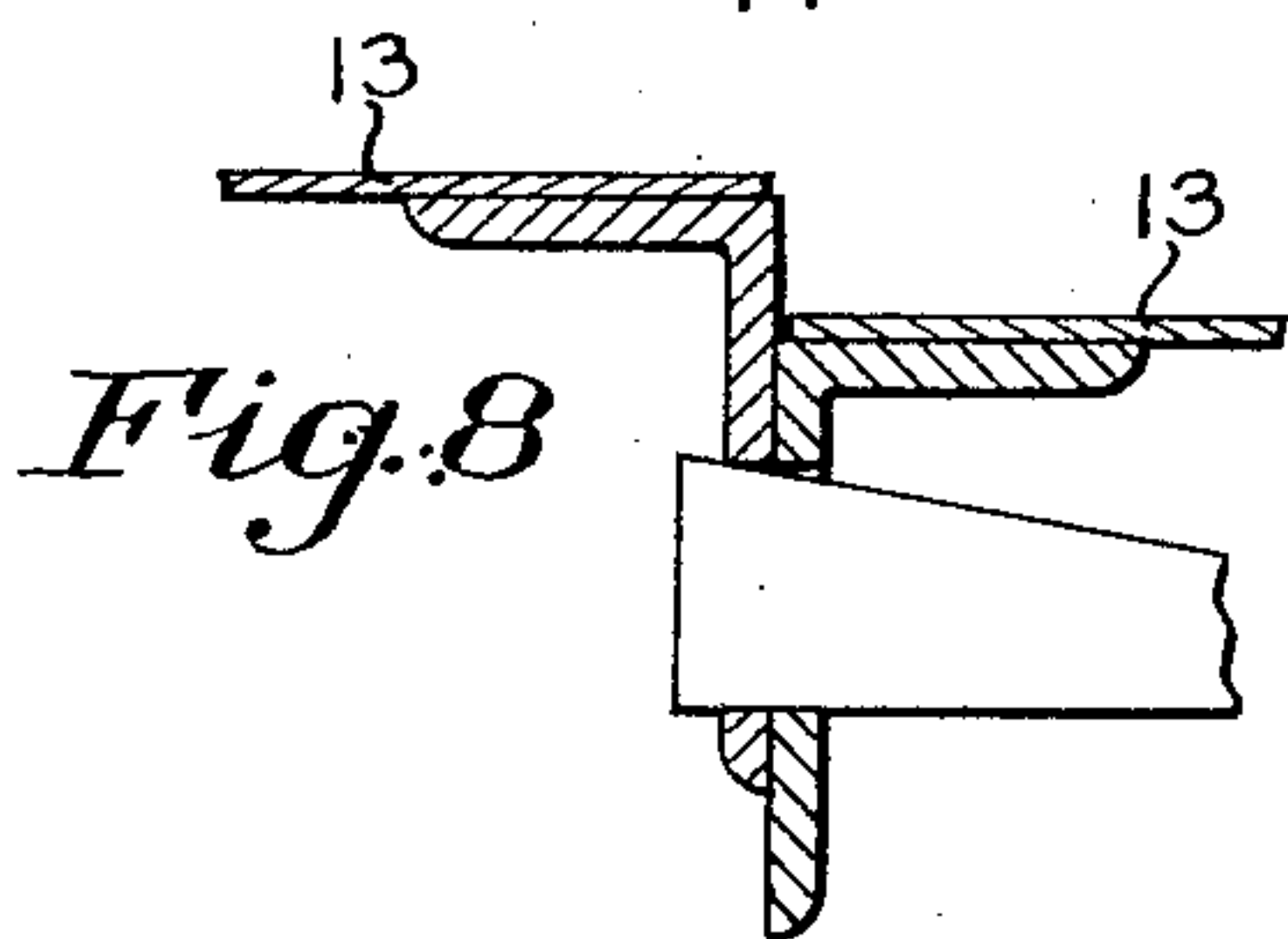
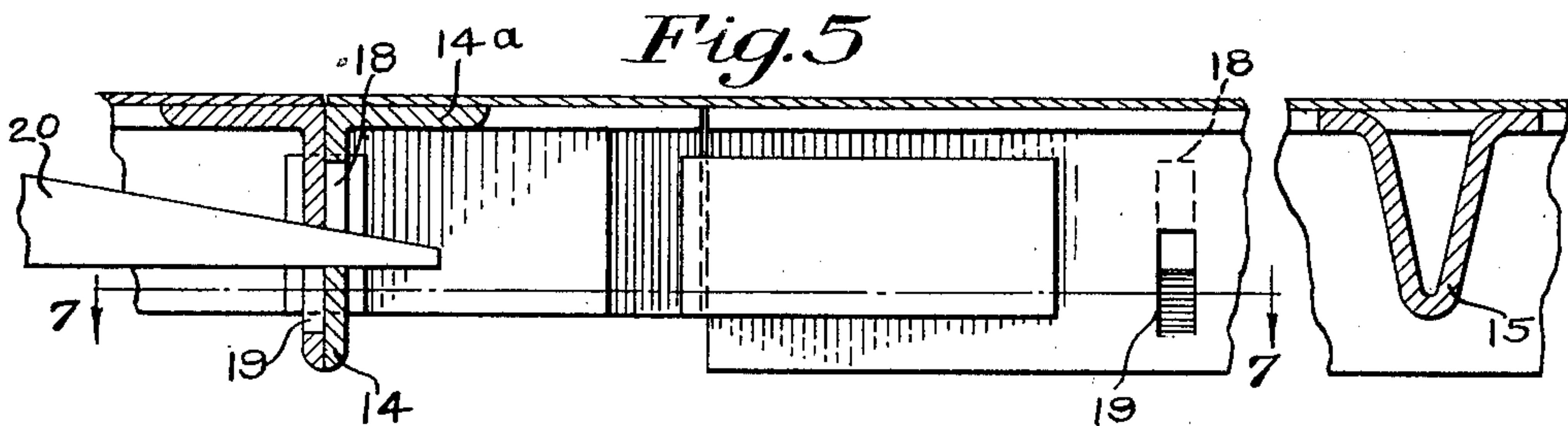
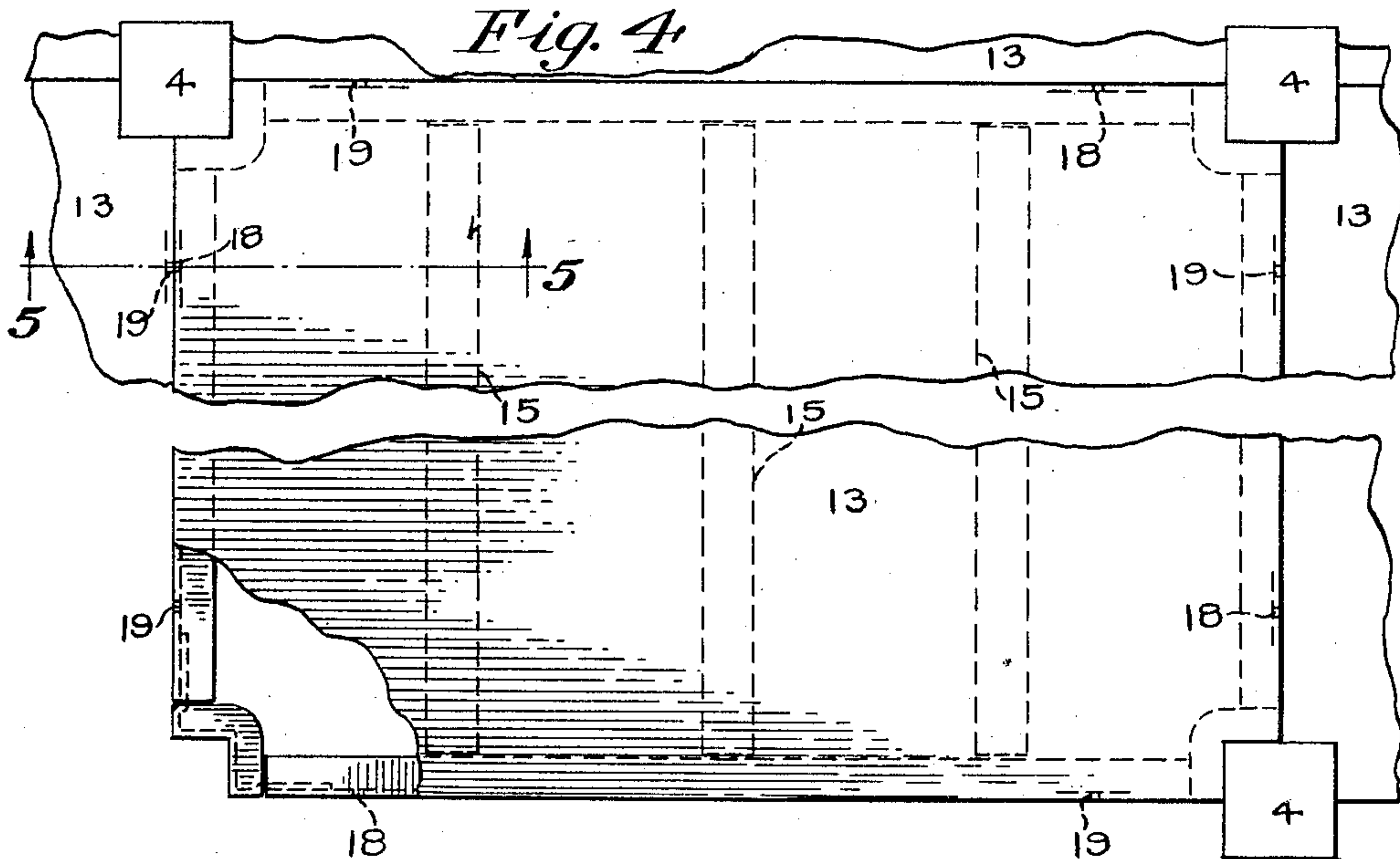
H. W. ROOS

1,907,877

APPARATUS FOR LAYING CONCRETE FLOORS

Filed April 1, 1929

3 Sheets-Sheet 2



INVENTOR
Henry W. Roos
BY *Harold E. Stonebraker*
his ATTORNEY

May 9, 1933.

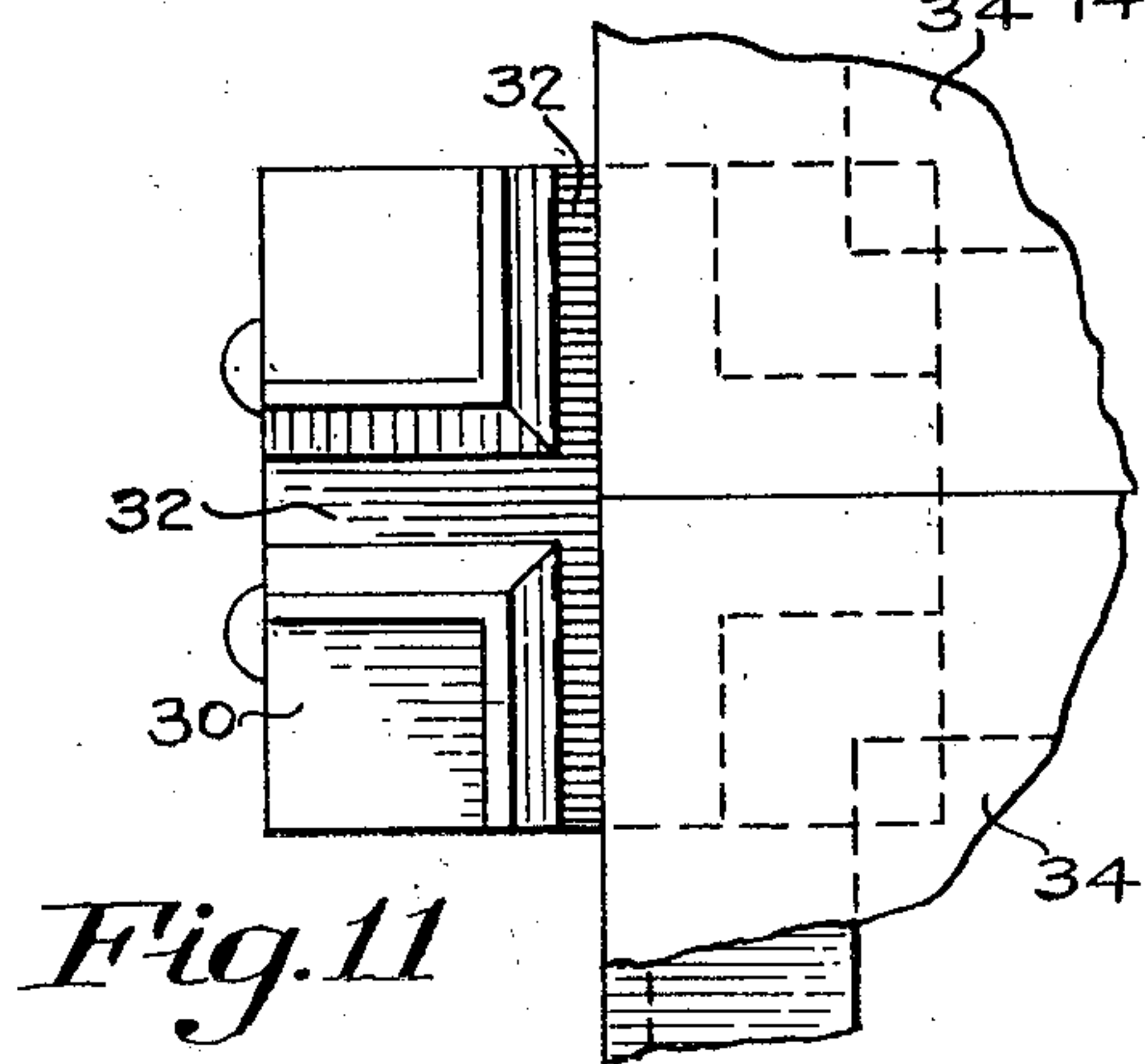
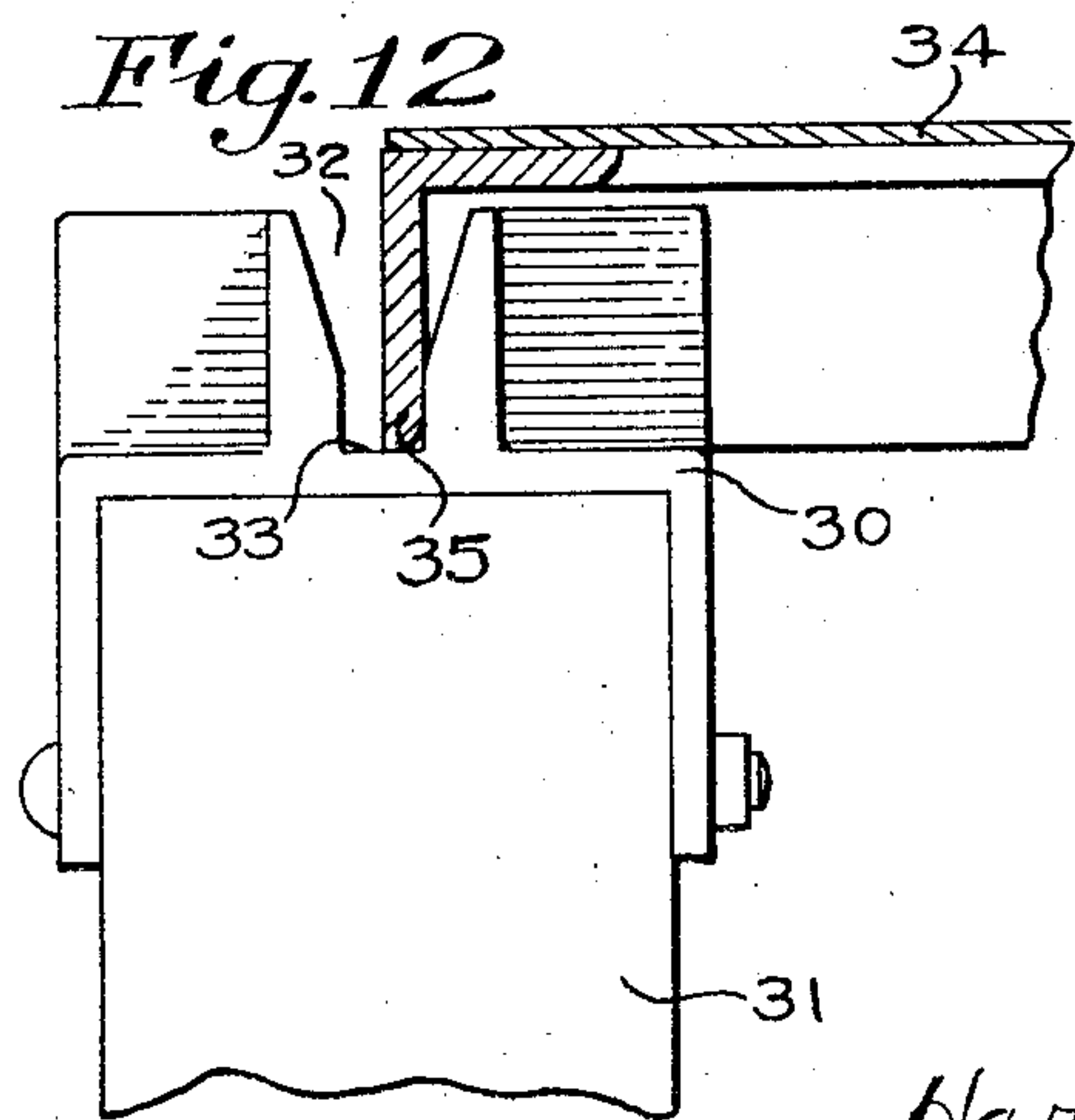
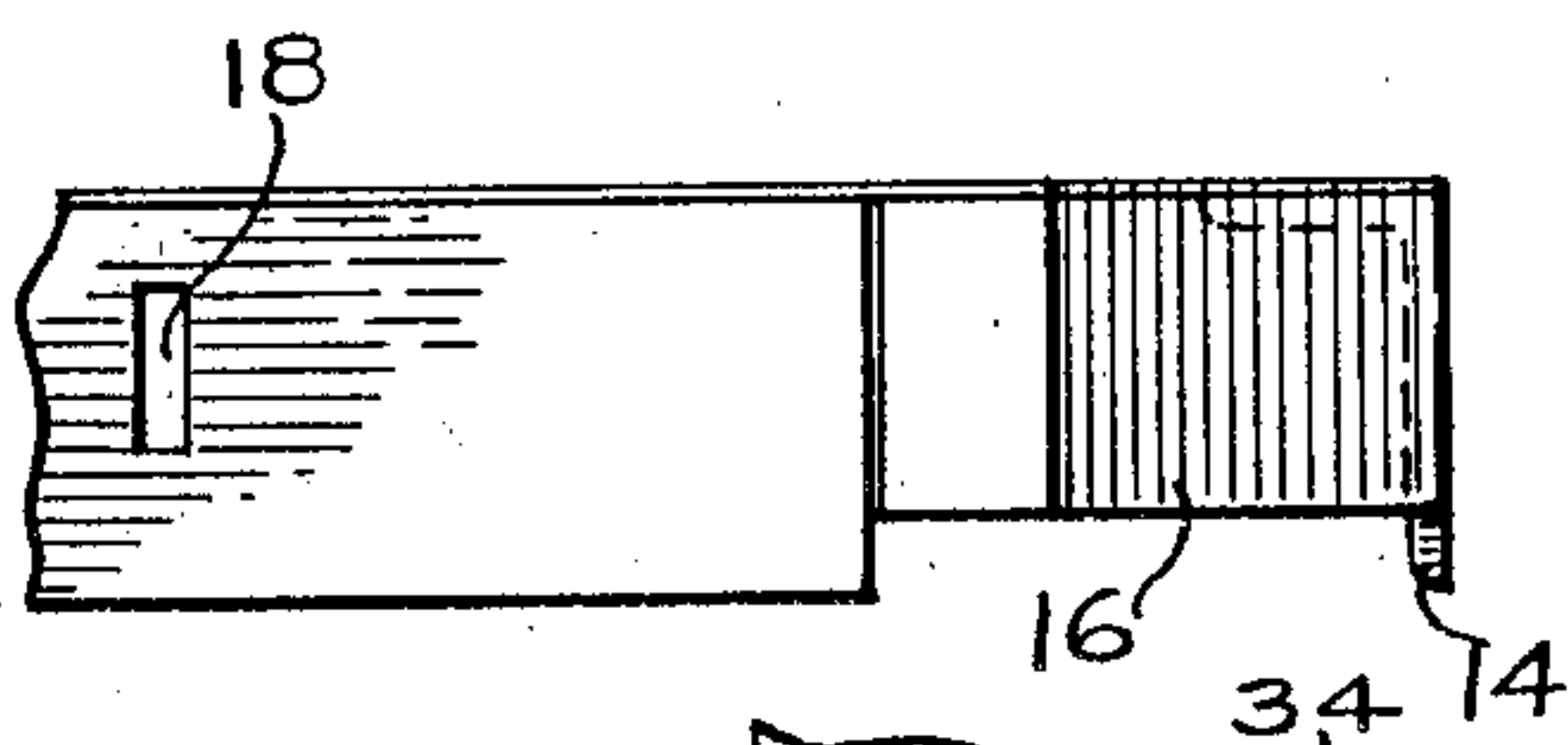
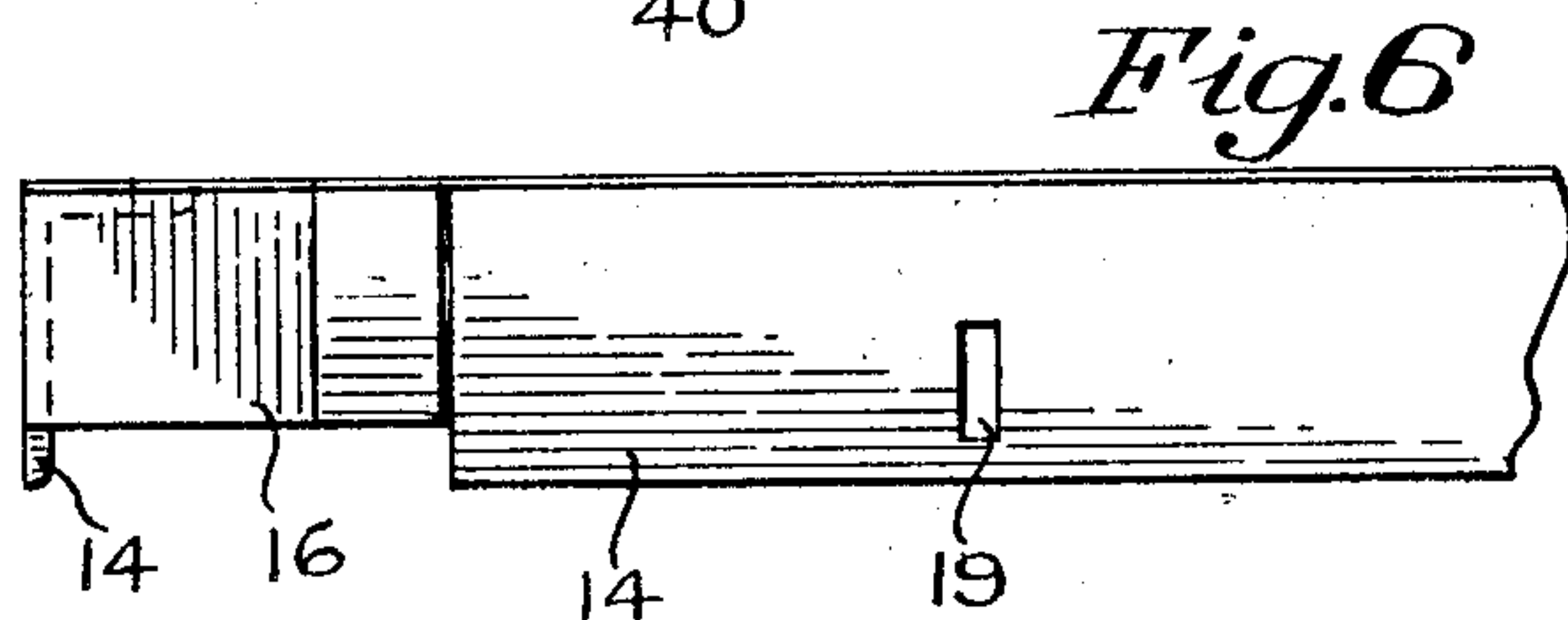
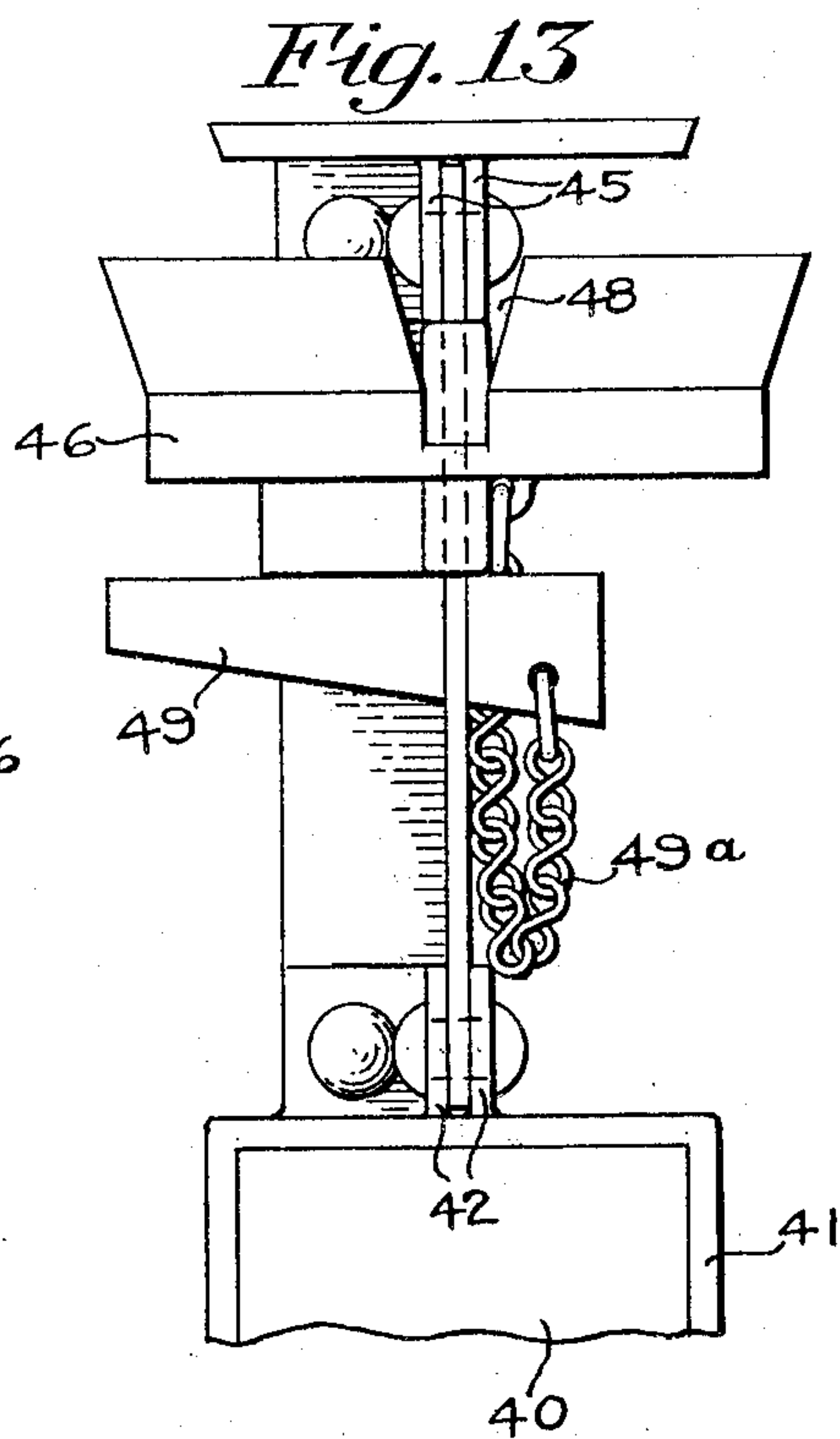
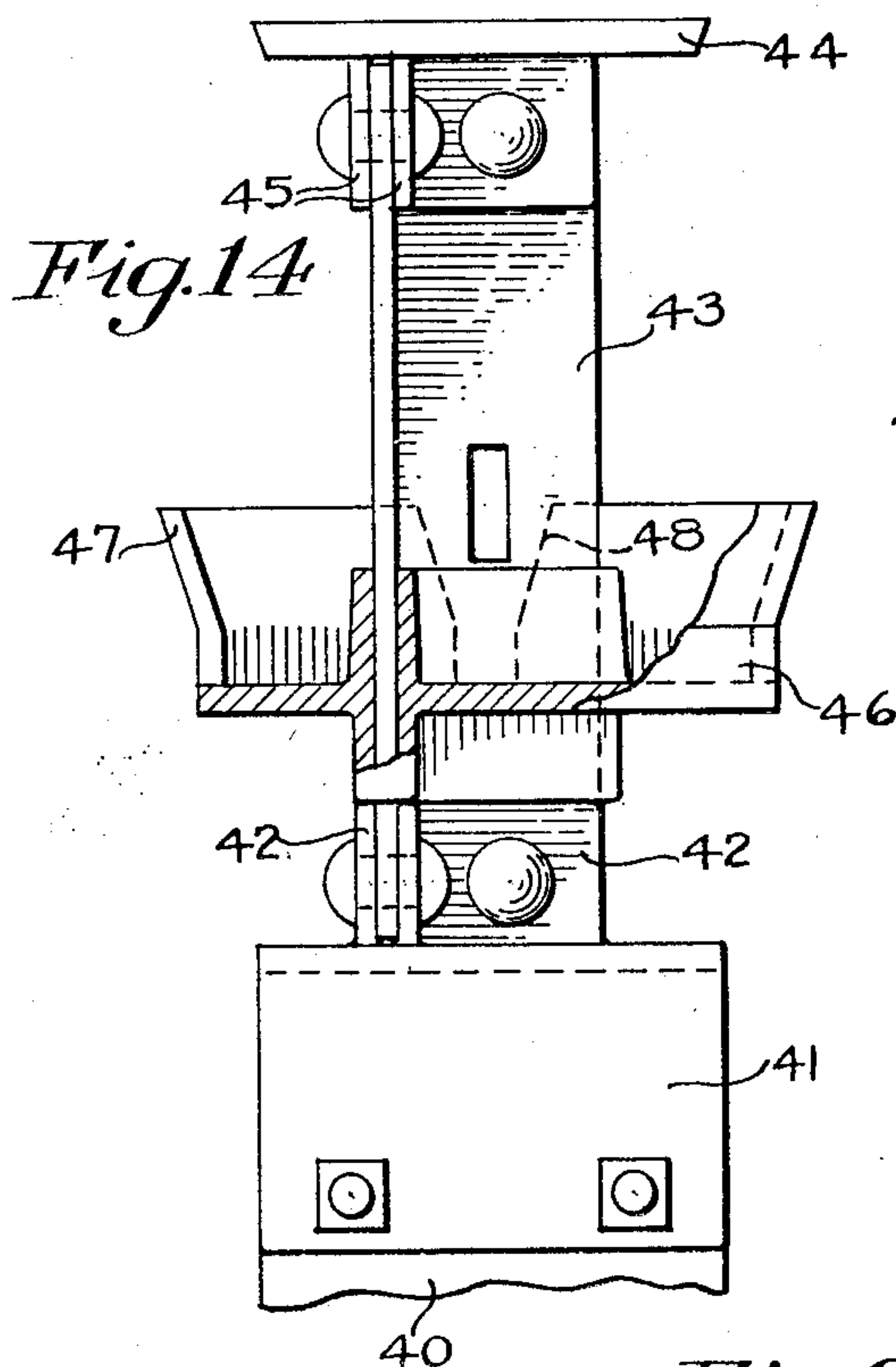
H. W. ROOS

1,907,877

APPARATUS FOR LAYING CONCRETE FLOORS

Filed April 1, 1929

3 Sheets-Sheet 3



INVENTOR
Henry W. Roos
BY
Harold E. Stonebraker
his ATTORNEY

UNITED STATES PATENT OFFICE

HENRY W. ROOS, OF CINCINNATI, OHIO

APPARATUS FOR LAYING CONCRETE FLOORS

Application filed April 1, 1929. Serial No. 351,532.

This invention relates to apparatus for constructing concrete floors, and the principal object of the invention is the provision of novel apparatus of this kind whereby concrete floors may be laid more quickly and more economically than with apparatus previously employed.

Another object of the invention is to provide an apparatus of this kind with interlocking shores and pans which will draw or cam adjacent pans into abutting relation with each other.

A further object of the invention is the provision of shores with means for supporting the pans for the concrete, which means permits the removal of the pans without the removal of the shores on which the newly laid floor is supported.

Another object of the invention is the provision of a novel pan which is light in weight, to be used for the support of the concrete slab, the pan being simple in construction and which may be readily removed from beneath the newly laid floor.

To these and other ends the invention consists in the construction and arrangements of parts that will appear from the following description when read in conjunction with the accompanying drawings, the novel features being pointed out in the claims following the specification.

In the drawings:

Figure 1 is a side elevation of a shore having a shore head and pans supported thereon, constructed according to one embodiment of the invention, a portion of the floor appearing in section;

Figure 2 is an enlarged side elevation of the shore head and a pan supported thereon;

Figure 3 is a section on the line 3—3 of Figure 2 looking in the direction of the arrow;

Figure 4 is a fragmentary plan view of a pan constructed according to one embodiment of the invention;

Figure 5 is an enlarged section on the line 5—5 of Figure 4 looking in the direction of the arrows;

Figure 6 is a side elevation of one of the pans;

Figure 7 is a section on the line 7—7 of Figure 5 looking in the direction of the arrow;

Figures 8, 9 and 10 are detail views illustrating the removal of a pan;

Figure 11 is a plan view of a shore head illustrating a modified form of the apparatus;

Figure 12 is a side view of the same showing a pan partially in section and the manner of supporting it on the shore head;

Figure 13 is a side elevation of a shore head illustrating still another embodiment of the invention, and

Figure 14 is a front elevation of the same, partially in section.

In laying concrete floors by apparatus previously employed, it has been the practice to support the pans, panels or boards, or whatever is exposed directly to the concrete, on joists or girders of some kind, and these joists or girders were supported on shores. By this invention, the pans which are directly exposed to the concrete are supported directly on shores, thereby eliminating joists and girders and greatly simplifying the work.

Three methods of providing the forms for the floor are illustrated. In one, the shore heads are provided with movable pan supports so constructed as to allow for the removal of the pans without disturbing the shores. In another, the corners of the pans rest directly on the shore heads, interlocking means being provided to maintain the edges of adjacent pans in close contact with each other. By this system, the shores must be taken down in order to remove the pans, an operation which sometimes endangers the green concrete, however a considerable advance over the old method of joists and panels. By the third method, a slidable pan support is mounted on the shore head and suitable means employed for locking it in operative position. Four pans are supported at their corners around the head on the support, all of which are released when

the support is moved to inoperative position.

The old method of forming floors by the use of girders, joists, etc., to support pans or panels, necessitated the use of a large number and variety of parts and the removal of the shores, to reuse the materials. This method was slow and very expensive, and the present invention, by the use of specially constructed pans and shore heads, provides a simple means for quickly and accurately spacing the shores and pans in tile-like fashion and thereby quickly constructing the forms for a concrete floor.

Referring more particularly to the drawings and Figures 1 to 10, 1 is a shore of usual or preferred construction, and mounted on the shore is a shore head 2 preferably constructed of metal and having laterally extending flanges or fins 3 arranged about its center at substantially right angles to each other and secured to the shore by any suitable means, such as bolts, as shown.

At its upper end, the head terminates in a horizontal plate or platform 4. Intermediate their lengths, the flanges 3 are enlarged to form ears 5, and pivotally mounted on each of the ears is a pan support in the form of a dog or bracket 6. Normally when not in use the pan support assumes the position shown at the right in Figure 2 under the action of the force of gravity. When in use, however, it is raised to the horizontal position, shown at the left of said figure, in which position it may be locked or secured by means of a key or wedge 7, adapted to be inserted through a slot or opening provided therefore in the ear in such position that the dog is supported thereon. The dog or bracket is so constructed that it will be exactly at the right height to receive the pans when the wedge is driven tight.

The wedges 7 are preferably secured to the head or pan support by means of a cord or chain 8 as shown, so that they may always be conveniently ready for use. When in operative position, the dog or bracket extends substantially horizontally outward from its pivot and at its outer end has two upwardly and outwardly inclined fingers 9 and 10 forming a substantially V-shaped opening between them. At the base of the fingers, the dog has a short horizontal portion 11, and inside this horizontal portion, it has an inwardly and upwardly inclined portion 12.

Each of the shore heads has four of these pan supports equidistantly arranged intermediate its corners, and each of the supports receives two pans, one on each of the fingers 9 and 10. Referring to Figure 4, it will be noted that the pans 13 are rectangular or square in form, preferably constructed of sheet material, and have the corners cut

away to fit around the platform 4 and engage two fingers 9 and 10 on adjacent pan supports. Four pans are thus supported at their corners on each shore head, which forms with them a substantially continuous surface on which the concrete for the floor is spread, as indicated in Figure 1.

The pans 13 may be of any preferred or suitable size or shape, preferably constructed of sheet iron, and are provided with downwardly extending flanges 14 around their outer edges having the horizontal portions 14^a extending inwardly beneath the outer edges of the pan, and may be further reinforced by the rods, angles or bars 15 secured to the under surface of the pans by any suitable or preferred means, as by electric or gas welding.

While three of these reinforcing bars are illustrated in the drawings, it will be understood that a greater or lesser number may be employed without departing from the spirit or scope of the invention. Each of the cut-out portions of the corners of the pans are provided with brackets or hangers 16 arranged inside the flanges 14 to which they may be secured by any suitable means, as by welding. These brackets are provided with inwardly arranged horizontal flanges 17 resting against the under surface of the pan to which it may be secured by welding if desired.

In using the apparatus, the usual pillars or column heads are set up and the shores arranged in position, and the pan supports locked or fastened in supporting position by means of the wedges. The pans are then dropped in from above, each corner of the pan engaging and resting on one of the shores. It will be noted that this method absolutely overcomes any difficulty in spacing the shores, since any improper spacing is indicated as soon as the pans engage the shore heads.

The V-shaped openings in the pan supports are made of proper width to receive two flanges of the corner brackets and space and hold together the edges of adjacent pans in both directions. The parts are so proportioned that the surfaces of the pans all lie in the same plane and in the plane of the platform on the shore head. The dropping of the flanges 16 into the V-shaped openings formed by the fingers 9 and 10 of the dog or bracket 6 spaces the shores and pans and cams them together, thus making the entire floor form-tight and causing all parts to lie in the same plane. The whole apparatus automatically spaces itself both vertically and horizontally.

When the floor has been poured, it is generally desirable to remove the pans for use in pouring the next floor as soon as possible. To take down the shores on which the pans and floor are supported endangers the newly

laid or green concrete. With the herein described apparatus it is unnecessary to take down the shores to remove the pans, but any pan can be released from its supports independently of all others by removing the wedges from the pan supports at each of its four corners. Since the corner of each pan rests on two supports, two supports on each of the four heads will be released. This operation does not release the neighboring pans, since each corner rests on two supports, only one of which is released. It is not an easy matter, however, to remove the pan, particularly the first one from beneath the concrete, even after the supporting members are released. This is due to the fact that the concrete not only has a tendency to wedge the pans together but they may also adhere more or less to the concrete, and means have been provided for forcibly removing the pans from the concrete.

To this end, the flanges 14 on each side of the pans are provided with slots or openings 18 and 19, one adjacent each end of the flange near the corner brackets, the openings 18 and 19 being spaced the same distances from the corners of the pans so that the openings of adjacent pans will have the same vertical alinement. Horizontally, the slots 19 are lower than the slots 18, so that they are offset with reference to each other on adjacent pans. By alternating the slots 18 and 19 around the pans, the slots 19 of one pan will always come adjacent and in vertical alinement with slots 18 of adjacent pans, and its slots 18 will come adjacent and in vertical alinement with slots 19 of the adjacent pans. The removal of a pan, after the corner supports have been released, is illustrated in Figures 5, 7, 8 and 9 of the drawings.

Figure 5 shows the position of the pan just after the supports have been released. In this position, a tool in the form of a wedge 20 may be inserted through the registering portions of the slots 18 and 19 and forced inwardly until the released pan is moved to the Figure 8 position. It will be understood that each corner of the pan may be simultaneously operated upon in the same manner. When the Figure 8 position is reached, the slots are in both horizontal and vertical alinement, but the slots 19 of the pan being operated on have moved to the Figure 10 position and project below the flanges of the adjacent pans. The wedges are now removed from the original set of openings and inserted in the adjacent slots 19 where they engage the bottom of the slots and the flanges of the adjacent pans.

By driving the wedges to their limits, the pan is moved to the position of Figure 9, in which the slots 18 of the pan operated on project below the flanges of the adjacent pans. The wedges are again removed from

the slots 19 and reinserted in the slots 18, and the pan again moved downwardly until it nearly reaches the bottom of the adjacent flanges, from which position it is readily removed. The remaining pans may be removed in the same manner, although they are not wedged in so tightly since they have an opportunity to expand after one of the pans is removed.

Referring now to the modified form illustrated in Figures 11 and 12 of the drawings, 30 is a shore head preferably constructed of metal and adapted to be secured to the top of a shore 31 of usual or preferred construction, by any suitable means as by bolts, as shown.

The top of the head 30 is provided with grooves or channels 32 arranged substantially at right angles to each other and meeting at the center of the head. The walls of these grooves incline inwardly and downwardly from the top of the head and terminate in a bottom wall 33, so that the grooves are wider at the top or mouth than at the bottom. The bottom walls of these grooves all lie in substantially the same plane which is substantially parallel with the plane of the top of the head.

The pans 34 to be supported in this shore head may be constructed as previously described, are substantially rectangular in form, and have depending flanges 35 about their outer edges secured thereto by welding or other suitable means. The faces of these flanges are arranged at substantially right angles to the surface of the pan, and the flanges are guided into place by the inclination of the side walls of the grooves 32.

In laying the pans, each is supported on four heads, one head being arranged at each corner and the flanges at the corners are inserted in the grooves 32. The corners of four pans meet at substantially the center of each head, the flanges of adjacent pans being inserted in the same groove to abut each other. The grooves are substantially the width of the thickness of the two flanges so that the flanges, in cooperating with the tapered side walls of the grooves, cam or wedge the adjacent pans into close contact with each other to form a continuous plane surface on which the concrete for the floors is spread.

It will be noted that when one pan is positioned on the shores, the adjacent shores are located and the adjacent pans are automatically cammed into close contact with each other. It will also be noted that with this head, the pans cannot be removed until the shores are taken down.

In the form of the invention illustrated in Figures 13 and 14, a shore head, preferably constructed of metal, is mounted on a shore 40 by means of a bracket 41. This bracket is preferably constructed of metal and se-

cured to the shore by any suitable means, as by bolts. This bracket has an L-shaped socket formed of parallel flanges 42 in which a riser or post 43 is supported in vertical position. The part 43 is L-shaped to correspond to the form of the socket in which it is secured by bolts or other suitable means. It extends a short distance above the top of its support and at its upper end supports a platform 44 having a plane upper surface and depending flanges 45 by which it is secured to the riser by means of bolts or other preferred means.

Slidably mounted on the post 43 is a pan support 46, having an L-shaped central opening through which the post extends. This pan support is preferably square in form and may be constructed of metal in a single piece, preferably by casting.

The outer walls 47 of the pan support incline inwardly and downwardly, and intermediate the ends of each side there is formed a V-shaped opening 48. Each corner of the support is adapted to carry one corner of one of the pans 13, the corner flange being received in the adjacent openings 48, the inclined walls of which serve to cam or wedge the adjacent pans into close contact with each other and with the platform at the top of the shore to form a close and continuous surface. Means are provided for locking or securing the pan support in the elevated operative position shown in the drawings, said means comprising, in the present instance, a wedge shaped support 49 adapted to be inserted in a slot or opening provided therefor in the post 43. The parts are so proportioned that when the wedge is driven in to the limit of its movement, the surfaces of the pans will lie in substantially the same plane with the surface of the platform 44. When the wedge is removed the support is permitted to move downwardly on the post. If desired, the wedges may be attached to the heads by the chains 49^a for convenience.

It will be understood that four pans engage each of the pan supports, and that in setting up the forms, when the first shore is properly located, the proper spacing of the adjacent shores is indicated by the engagement of the pans therewith. When the concrete has been poured, the supports may be released from under the pans and the pans removed without disturbing the shores on which the concrete is supported, as in the first form described above.

While only three particular embodiments of the invention have been described herein, it is not confined to the particular structure shown and described, but this application is intended to cover such changes or departures as may come within the intent of the improvements or the scope of the following claims.

I claim:

1. An apparatus for laying concrete floors, comprising a shore head having a plurality of flanges arranged radially to each other in planes intersecting each other centrally of the head, and a pan support pivotally mounted on each of said flanges.
2. An apparatus for laying concrete floors, comprising a plurality of shores, a plurality of pans substantially rectangular in form and adapted to be releasably supported on the shores to form a substantially continuous plane surface therewith, depending flanges on the outer edges of the pans having openings offset but registering with similar openings in the flanges of adjacent pans whereby a pan released from its supports may be removed while the adjacent pans are supported in normal position.
3. An apparatus for laying concrete floors comprising a shore having a substantially rectangular top, means for supporting a plurality of pans on said shore each in engagement with two sides of said top, said means being movable to disengage one of said pans independently of the others.
4. An apparatus for laying concrete floors comprising a shore having a substantially rectangular top, a plurality of pan supports movably mounted on said shore and arranged to correspond to the sides of said top and each adapted to engage a pair of adjacent pans, and separate means for releasably retaining each of said supports in operative position.
5. An apparatus for laying concrete floors comprising a shore having a substantially rectangular plane surface at its upper extremity, a pan support movable on the shore to and from an operative position, means on said support for engaging a plurality of pans and supporting them in engagement with three adjacent sides of said upper extremity, a second pan support movable on said shore to and from an operative position, means on said second support for engaging a plurality of other pans and supporting them in engagement with the remaining side of said upper extremity, and separately releasable means for retaining said supports in operative position.
6. Apparatus for laying concrete floors comprising a shore having a substantially rectangular top arranged in a horizontal plane, a pan supporting bracket pivoted on said shore to move to and from operative position thereon, means on said bracket for camming a pair of pans in one direction into engagement with a side of said rectangular top, other means on said bracket for camming said pans into engagement with the adjacent sides of said top, and means for retaining said bracket in operative position.
7. An apparatus for laying concrete floors comprising a shore having a substantially

rectangular top arranged in a horizontal plane, flanges arranged substantially perpendicular to each other extending downwardly from said top and corresponding to the sides of said top, a pan engaging bracket pivoted on each of said flanges, means on each of said brackets for engaging a pair of pans and camming them in two directions toward and into engagement with said top, and means for retaining said brackets in operative position.

8. An apparatus for laying concrete floors comprising a plurality of shores, a plurality of pans detachably supported thereon, means on said shores for camming the adjacent pans into close engagement with each other and with the shores to form a substantially continuous plane surface, and depending flanges on the outer edges of the pans, said flanges on adjacent pans being arranged in close contact with each other and provided with cooperating means whereby a detached pan may be ejected from between the flanges of adjacent pans.

9. An apparatus for laying concrete floors comprising a shore head having a plurality of flanges thereon arranged in substantially vertical planes, a pan support pivotally mounted on each of said flanges and each arranged to swing from a substantially horizontal pan engaging position to a substantially vertical inoperative position, and releasable means cooperating with said flanges for retaining said pan supports in operative position.

10. An apparatus for laying concrete floors comprising a shore having a horizontal top, a pan support pivoted on the shore and movable from an operative position substantially parallel with the plane of said top and projecting outwardly therefrom, downwardly and inwardly to an inoperative position beneath the top, and releasable means for retaining said pan support in operative position.

In witness whereof, I have hereunto signed my name.

HENRY W. ROOS.