

R. B. HIGGINS.
ADJUSTABLE CONCRETE FORM.
APPLICATION FILED FEB. 9, 1910.

975,241.

Patented Nov. 8, 1910.

2 SHEETS—SHEET 1.

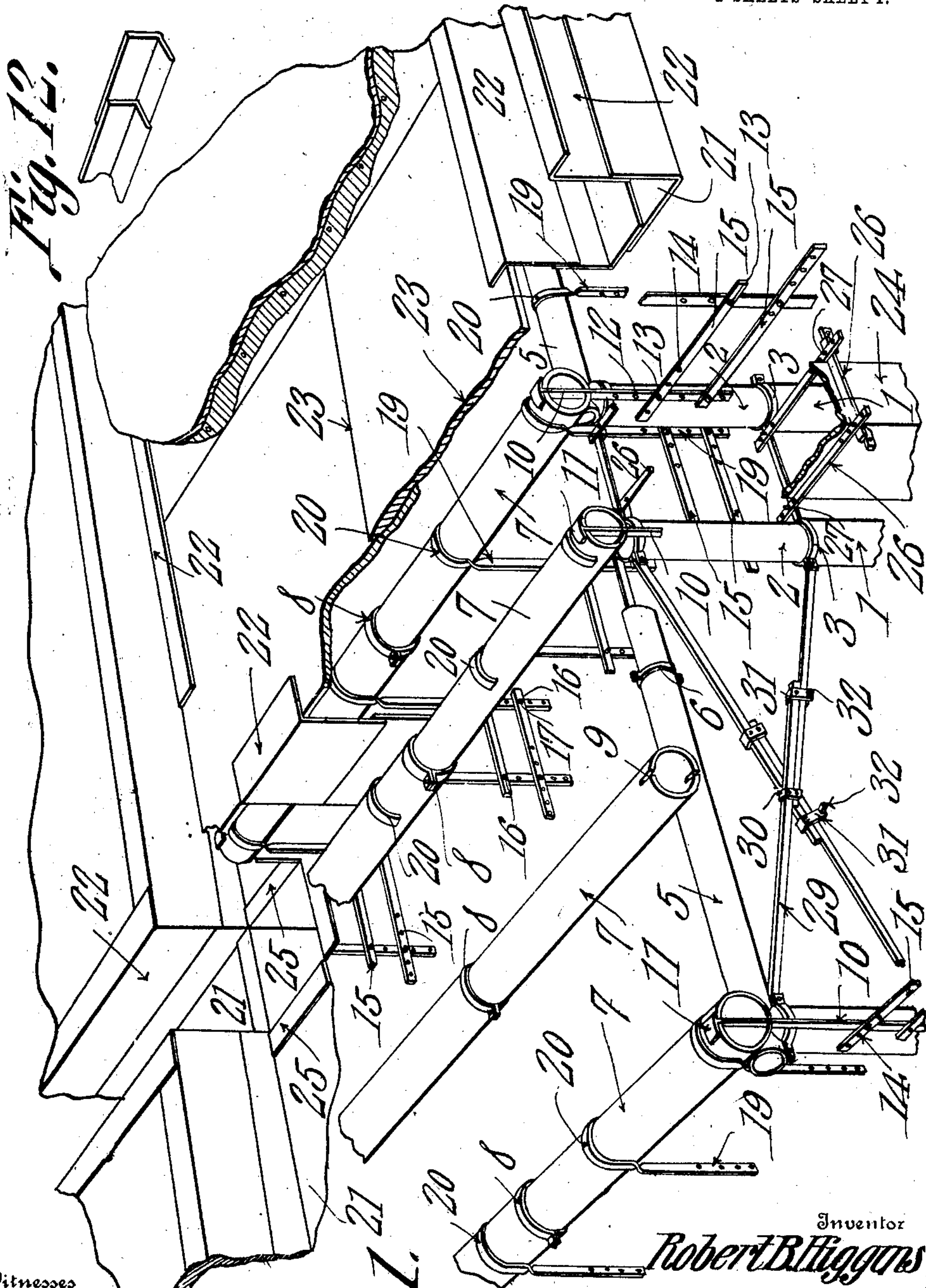


Fig. 12.

Witnesses

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Fig. 1.

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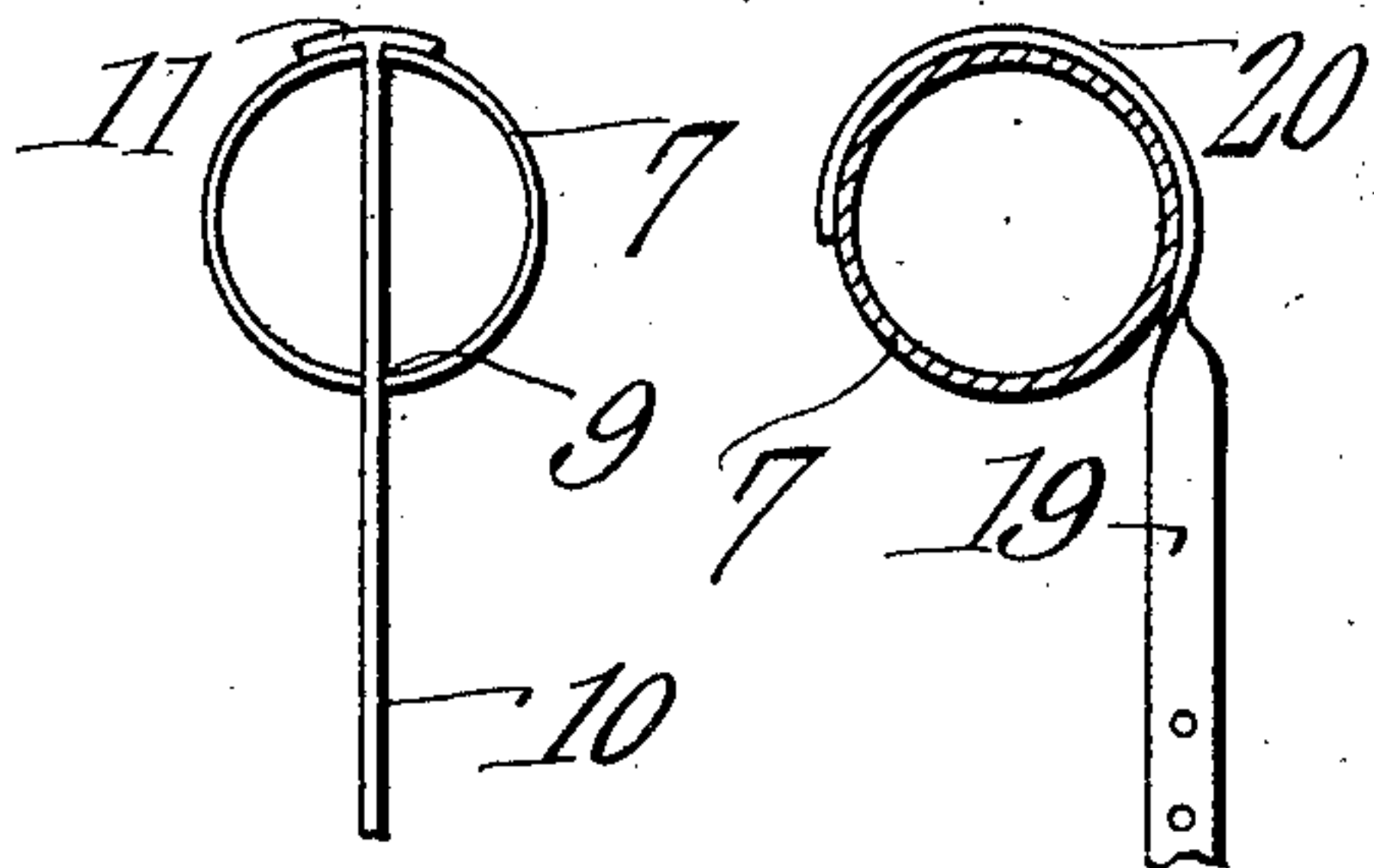


Fig. 2.

Fig. 3.

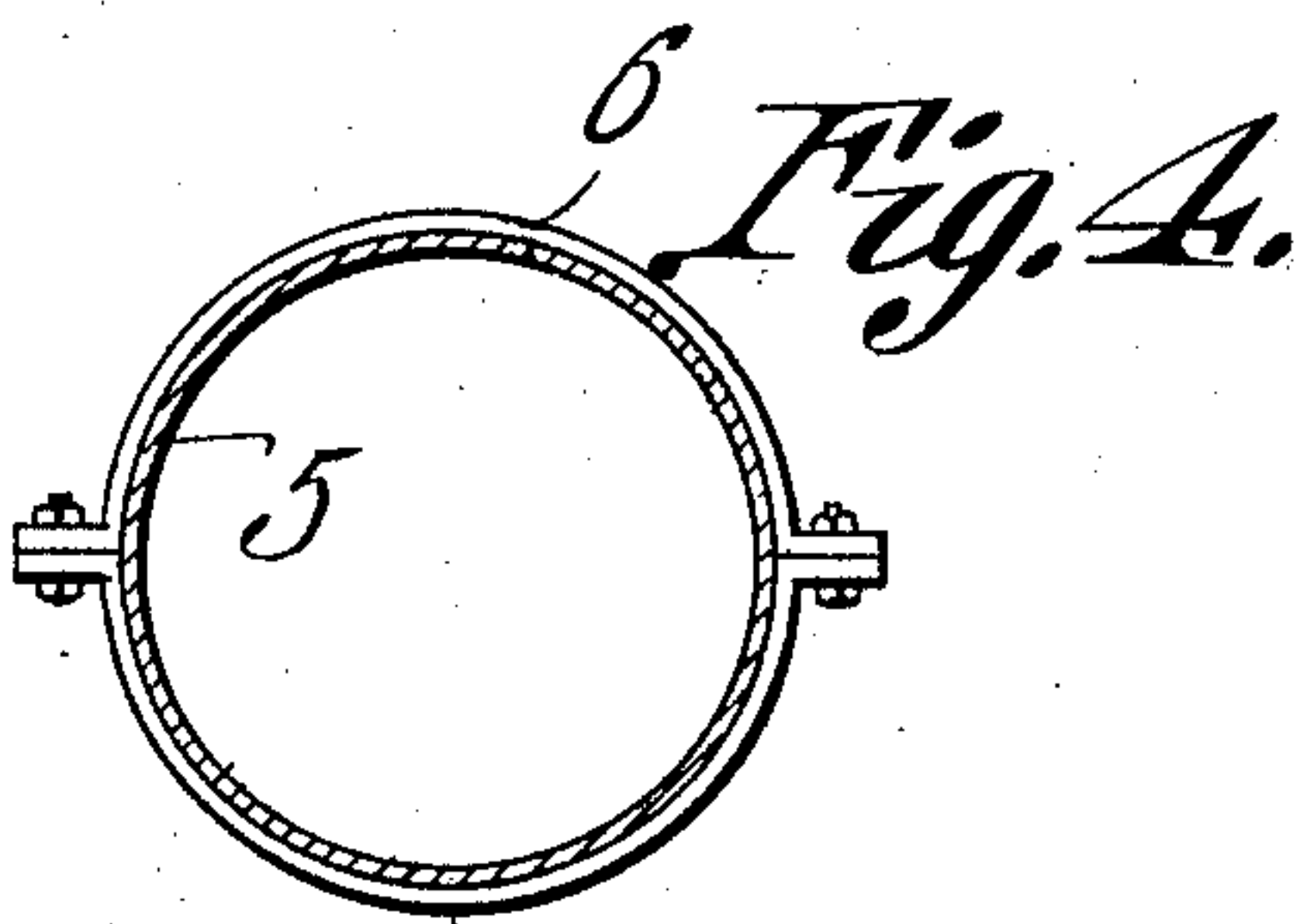


Fig. 4.

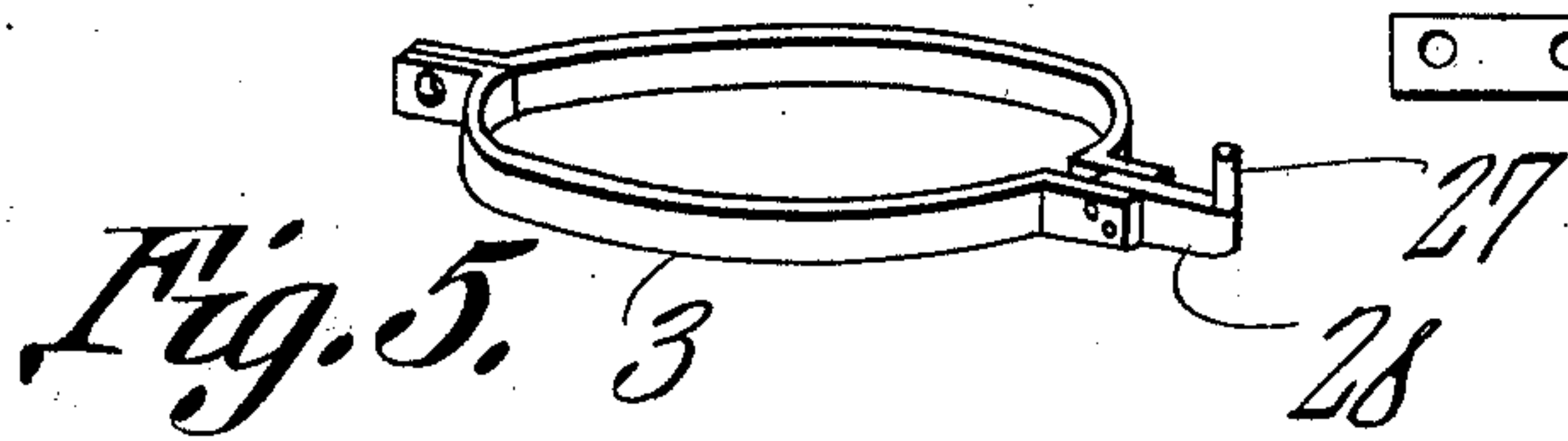


Fig. 5.

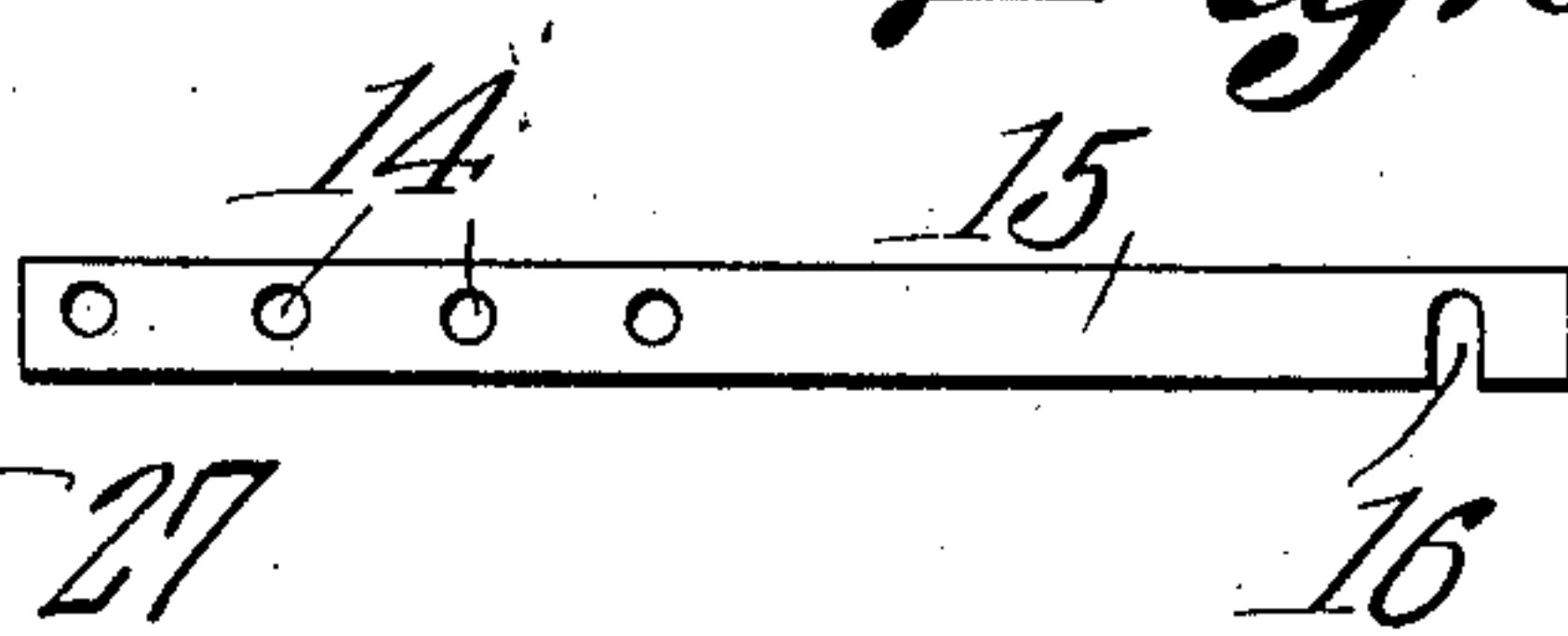


Fig. 6.

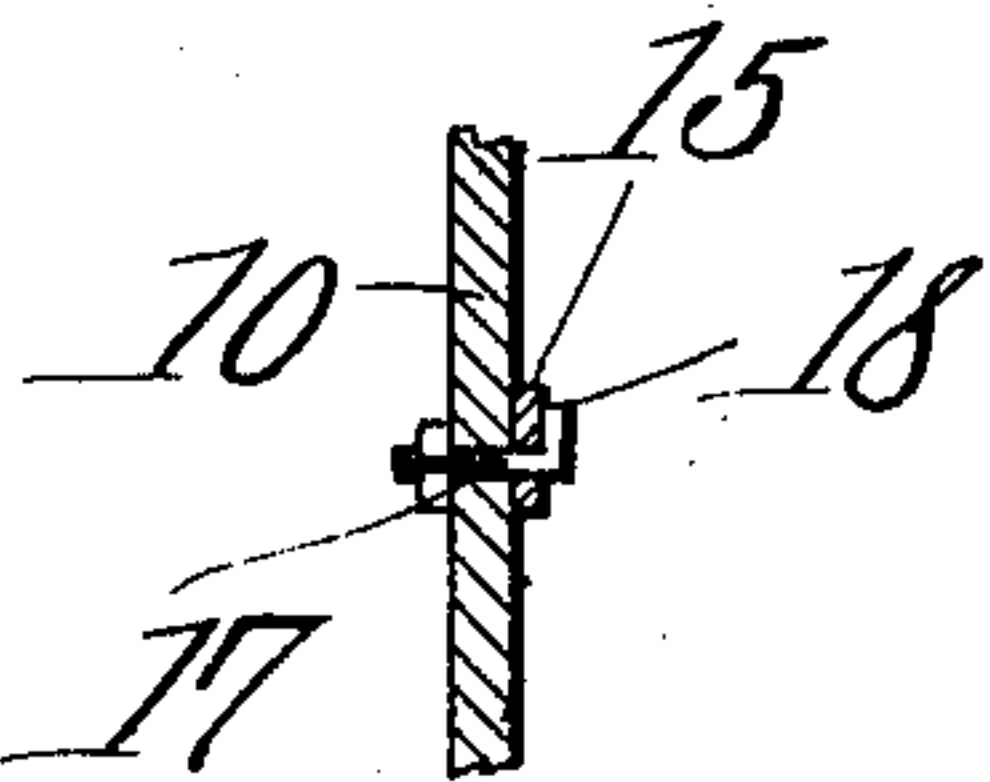


Fig. 7.

Fig. 8.

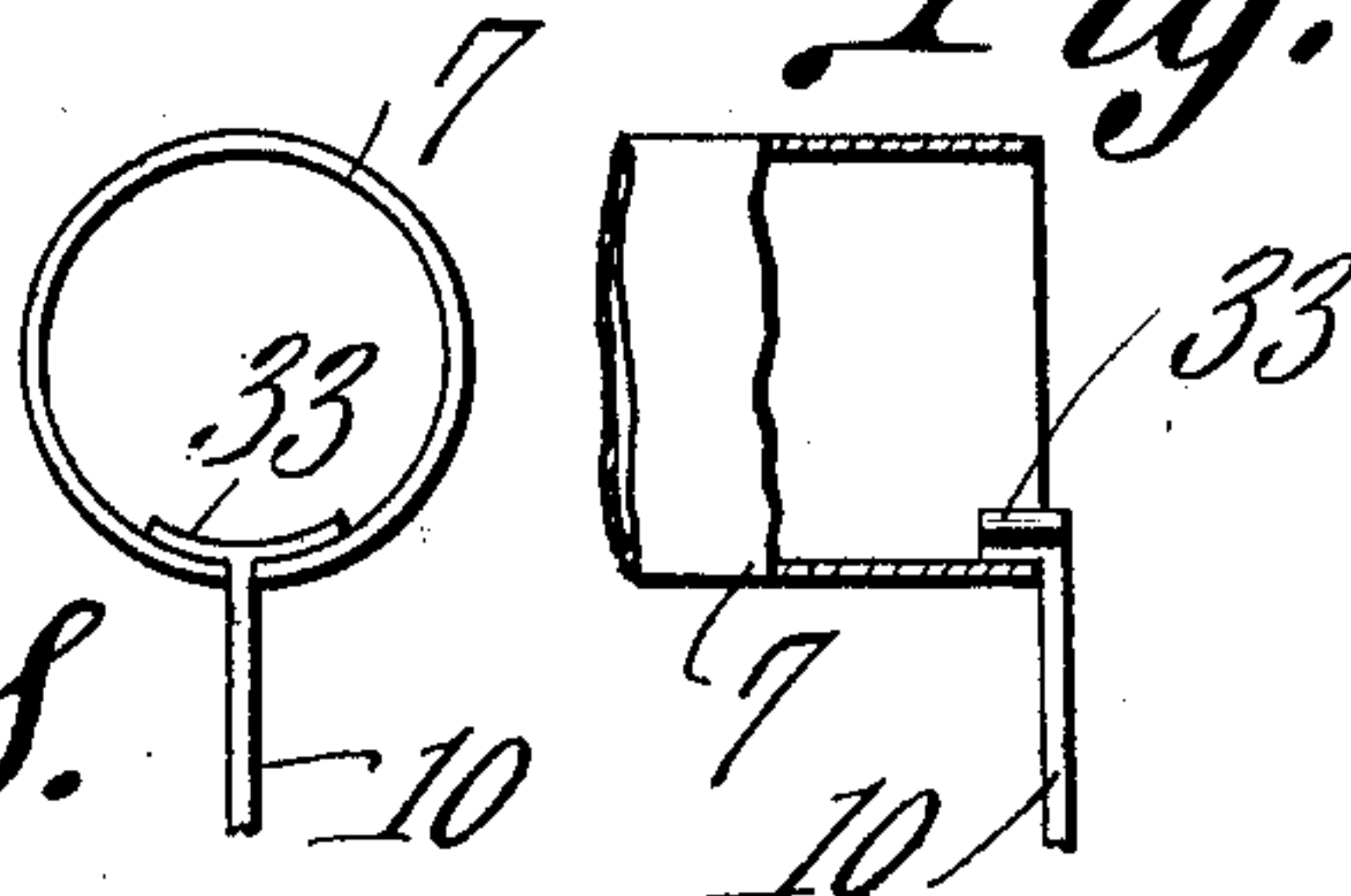


Fig. 9.

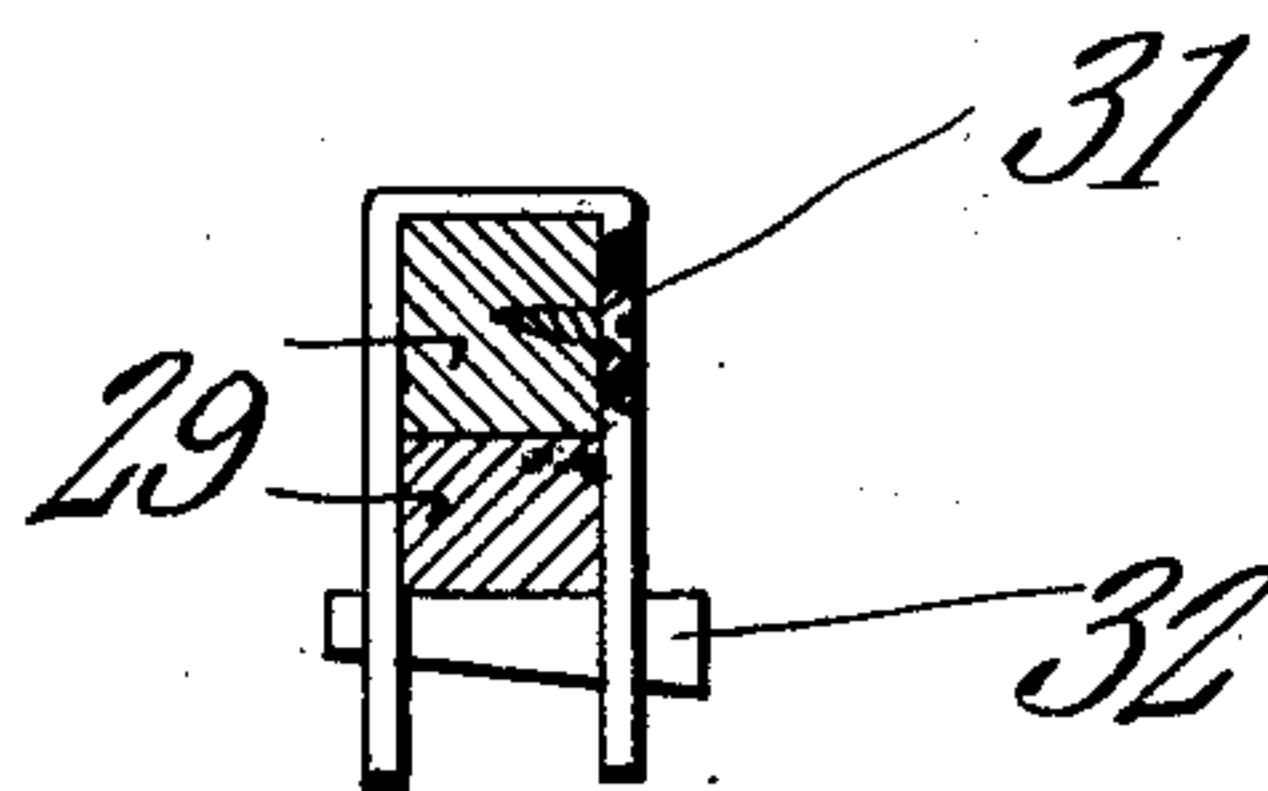


Fig. 10.

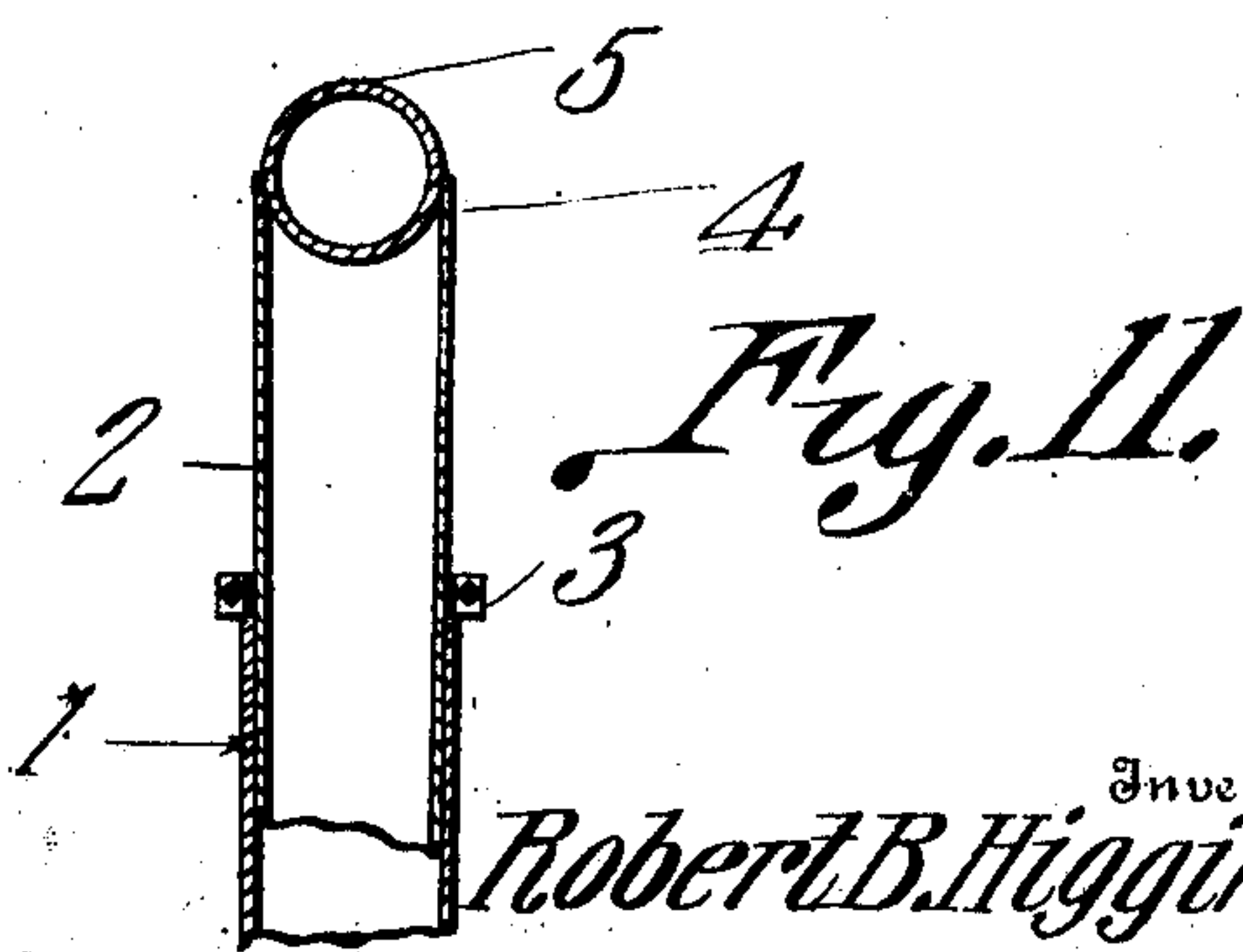


Fig. 11.

Witnesses

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ADJUSTABLE CONCRETE-FORM.

975,241.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed February 9, 1910. Serial No. 542,927.

To all whom it may concern:

Be it known that I, ROBERT B. HIGGINS, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Adjustable Concrete-Form, of which the following is a specification.

This invention relates to forms for use in the construction of floors, beams and columns of concrete structures.

One of the objects of the invention is to provide a form which is adjustable both as to height, length and width.

Another object is to provide improved means whereby the beam portions of the form can be supported from the joists of the floor form, the various parts being so assembled as to be readily disconnected for the purpose of taking down the form.

A still further object is to provide improved means for holding the column forms properly assembled.

A still further object is to provide a form of the class mentioned which can be readily set up or taken apart and which is not bulky but, on the contrary, occupies the minimum amount of space both while in use and while in storage.

With these and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings, Figure 1 is a perspective view of a portion of a form embodying the present improvements. Fig. 2 is an end elevation of the joists of the floor form and showing a hanger engaging the same. Fig. 3 is a transverse section through one of said joists and showing another form of hanger mounted thereon. Fig. 4 is an enlarged transverse section through one of the supporting posts of the form. Fig. 5 is a perspective view of one of the rings used in connection with said post. Fig. 6 is an elevation of one of the connecting cross bars used in connection with the hangers. Fig. 7 is a section through the lapping portions of one of the hangers and the cross bar supported thereby and showing the means for detachably connecting them together. Fig. 8 is an end elevation of one of the floor joists of the form and showing another modified form of hanger engaging the same.

Fig. 9 is a view partly in section and partly in elevation of one end portion of said joist and showing the hanger in position therein. Fig. 10 is a transverse section through the brace clamp and through the brace members seated therein. Fig. 11 is a vertical section through the upper portion of one of the supporting posts and showing a joist engaged and supported thereby. Fig. 12 is a perspective view of a portion of a modified form of joist.

Referring to the figures by characters of reference 1 and 2 designate the telescopic sections of a supporting post, the upper section 2 being provided with a collar 3 which is clamped therearound and is designed to rest upon the upper end of the section 1 and thus support the upper end of said section 2 is forked or recessed as indicated at 4 so as to constitute a seat for a main joist 5 of the floor form. This main joist 5 also consists of telescopic tubular sections held against collapsing or shortening, by a split ring or collar 6 which is clamped around the inner or smaller section and is designed to bear against the adjoining end of the larger section. It is of course to be understood that one of these posts is located at each end of the main joist 5. These posts and main joists are located at each end of each floor section of the form, it being understood that any desired number of floor sections may be employed, according to the size of the floor to be constructed and to the number of intersecting beams to be formed between the sections. In Fig. 1 portions of four sections of the form have been shown, it being understood that each of these sections consists not only of the supporting posts located at the corners thereof and the main beams 5 mounted on said posts, but also consisting of longitudinally extending top joists 7 formed of telescopic tubes, the inner or smaller tube of each joist being provided with a split ring or collar 8 designed to abut against the adjoining end of the outer or larger section so as to prevent the inner or smaller tube from sliding into the larger tube after the parts have been properly adjusted. These joists 7 extend slightly beyond the main joists 5 and are preferably slotted in their ends as shown at 9 so as to receive hangers 10 having heads 11 which are designed to bear upon and straddle the

upper portion of the joist 7. Each of these hangers 10 has a series of apertures 12 formed therein for the reception of bolts 13 which extend through apertures 14 formed within connecting bars 15, two of these bars are attached to each of the hangers 10, one bar being arranged above the other and the said bars constitute means for connecting the adjoining hangers of two adjoining floor sections of the form. Obviously when the two hangers have been connected by means of the cross strips 15, the said hangers are prevented from swinging toward or away from each other, and, of course, lateral movement of the hangers with respect to the joist 7, is prevented because the said hangers are seated within opposed slots within the joists.

It is to be understood that one end of each of the strips of the connecting members 15 may be provided with a slot 16 adapted to receive a bolt 17 having a finger 18 extending at right angles therefrom and constituting the head thereof, it being understood that when the bolt is tightened, this finger will bind upon the slotted portions of the strip or member 15 and thus securely attach it to the hanger, it being apparent however, that by loosening the bolt, the said strip 15 can be swung upwardly out of engagement with the bolt 17 and without the necessity of detaching the bolt.

It is to be understood that the floor sections of the form are spaced apart distances slightly greater than the width of the beams to be molded there-between and the adjoining parallel joists of the opposed sections constitute supports for hangers 19 having hooks 20 at their upper ends which engage and straddle the upper portions of the said joists and are connected at points below said joists by means of upper and lower cross strips 15 similar to those heretofore described. The upper strips 15 supported by the various hangers, constitute rests for the angular bottom plates 21 of the beam forms, the said plates lapping along the bottom of the form and extending upward to angular side plates 22 which lap the plates 23 supported by the joists 7 and on which the floor is molded. It is to be understood of course that these beam forms extend under and at opposite sides of the iron girders which usually constitute the cores of beams in concrete structures.

At the corners of the form sections, where the beam forms converge, openings are formed for the reception of the upper ends of the metal plates 24 constituting the forms of the columns. The upper ends of these plates 24 are provided with laterally extending flanges 25 which bear upon the bottoms of the beam forms, as shown at the upper left hand portion of Fig. 1 and the plates constituting the column form are held to-

gether at intermediate points by frames consisting of lapping strips 26 similar to the strips 15 heretofore described and which are detachably engaged and supported at their lapping portions, by pintles 27 extending upwardly from plates 28 secured to the rings 3 as shown in Fig. 5. Obviously these plates 28 and pintles 27 not only serve to support the strips 26 but also hold them properly assembled. It will be apparent therefore that when it is desired to disconnect the strips 26, it becomes merely necessary to lift them off of the pintles engaging them. Should it be desired to utilize more than one frame for the purpose of holding the plates of the column form together, additional collars 3 can be attached to either or both of the sections 1 and 2 of each supporting post, each of these collars being provided with a plate 28 and a pintle 27.

Those of the floor sections which are located at points removed from the walls of the structure being built, can have their posts braced and connected by means of extensible braces 29 each consisting of slidably connected members one of which has a collar 30 attached to it, and slidably mounted upon the other member. A yoke 31 may be attached to one of these members and provided with a wedge 32 which, when driven transversely through the yoke, will serve to bind the two members of the brace tightly together after they have been adjusted to proper positions relative to each other. The outer ends of the two members of each brace can be attached to collars 3 upon opposed posts, and, if preferred, and as shown in Fig. 1, every two adjoining posts may be connected by two crossed braces.

It will be understood that when the various parts of the form have been set up in the manner described the concrete or other material can be placed within and upon the forms and the structure thus quickly and accurately formed. When it is desired to remove the form from the molded structure, it becomes merely necessary to disengage the strips 15 from the bolts 17 and to swing them downwardly. The lower plates constituting the beam forms can then be easily removed as can also the plates constituting the column forms. These latter plates are of course disconnected after the strips 26 have been lifted off of the molding pintles 27. After the forms of the columns and beams have been removed in this manner, the braces 29 can be detached from the supporting posts, and the upper members 2 of the post can be moved downwardly within the lower members by loosening the collars 3. The various joists will thus be lowered away from the molded floor structure and can be collapsed and taken apart as will be obvious.

If preferred, and as shown in Fig. 9, the

hangers may be provided with laterally extending heads 33 extending into and resting upon the bottom portion of each end of a joist, it thus being unnecessary to slot the joist as shown at 9 in Fig. 1. Both forms of hangers used upon the ends of the joists, will however efficiently hold said joists against rolling upon the main joists 5, the weight supported by the hangers being of course sufficient to hold the said joists against movement.

Importance is attached to the fact that the forms herein described can be adjusted both in the direction of their length and width as well as vertically and it therefore becomes possible to accurately fit the forms within the structure after they have been assembled and without the necessity of taking them apart and rebuilding them. By utilizing sheet metal in constructing the walls of the forms, the different sections can be arranged to lap and thus prevent waste of material without indenting the finished surface of the concrete structure to an undesirable extent.

While the various tubular members of the structure have been shown cylindrical it is to be understood that, if desired, they may be in the form of rectangular or triangular tubes or in fact of any other desired contour, and, in lieu of utilizing tubes, it will be apparent that telescopic or slidably connected angle members may be efficiently used. Such a structure has been indicated in detail in Fig. 12.

Various changes can of course be made in the construction and arrangement of the parts without departing from the spirit or sacrificing any of the advantages of the invention as defined in the appended claims.

What is claimed is:—

1. A structure of the class described including a plurality of spaced separate units each including corner posts and cylindrical joists supported by the posts, hangers engaging the ends of the joists to hold said joists against rotation, connections between the opposed hangers of adjacent units, and beam forms supported by said connections and between the hangers.

2. In a device of the class described, a supporting post consisting of telescopically connected tubular members, a collar adjustably mounted upon the inner one of said members and normally bearing against the outer member to support the inner member, an upstanding pintle connected to and movable with the collar.

3. In a device of the class described the combination with supporting posts, of collars adjustably mounted thereon, crossed extensible braces connecting the collars of opposed posts, and means upon each brace for locking it against extension or contraction.

4. In a device of the class described, a form support consisting of joist engaging hangers, a supporting strip pivotally connected to each hanger, said strips being disposed one above the other and each having a slot therein, and means upon each hanger for engaging the slotted portion of one of the strips for binding said strip to the hanger.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ROBERT B. HIGGINS.

Witnesses:

HERMAN ALBERS,
GEORGE JOHNS.