

(No Model.)

2 Sheets—Sheet 1.

F. W. CROSS.

DOOR FOR BULKHEADS OR COMPARTMENTS OF SHIPS.

No. 549,843.

Patented Nov. 12, 1895.

Fig. 2.

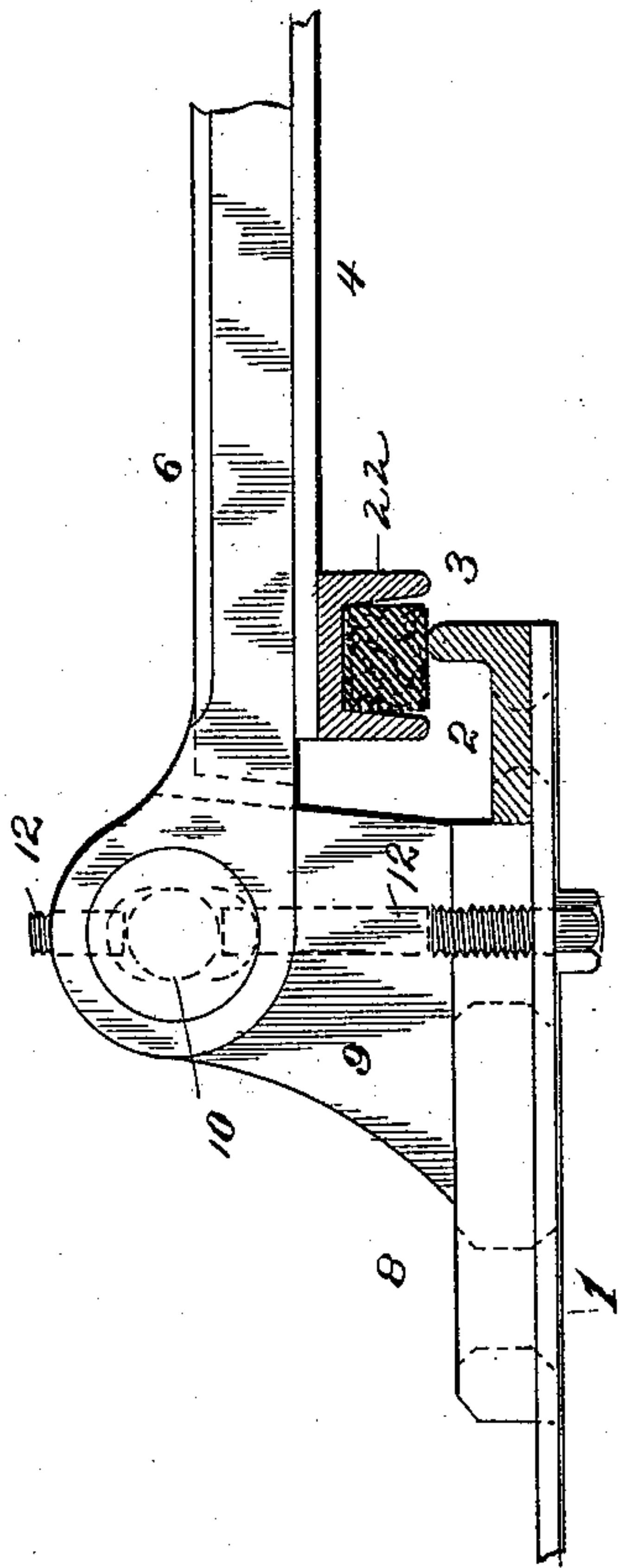
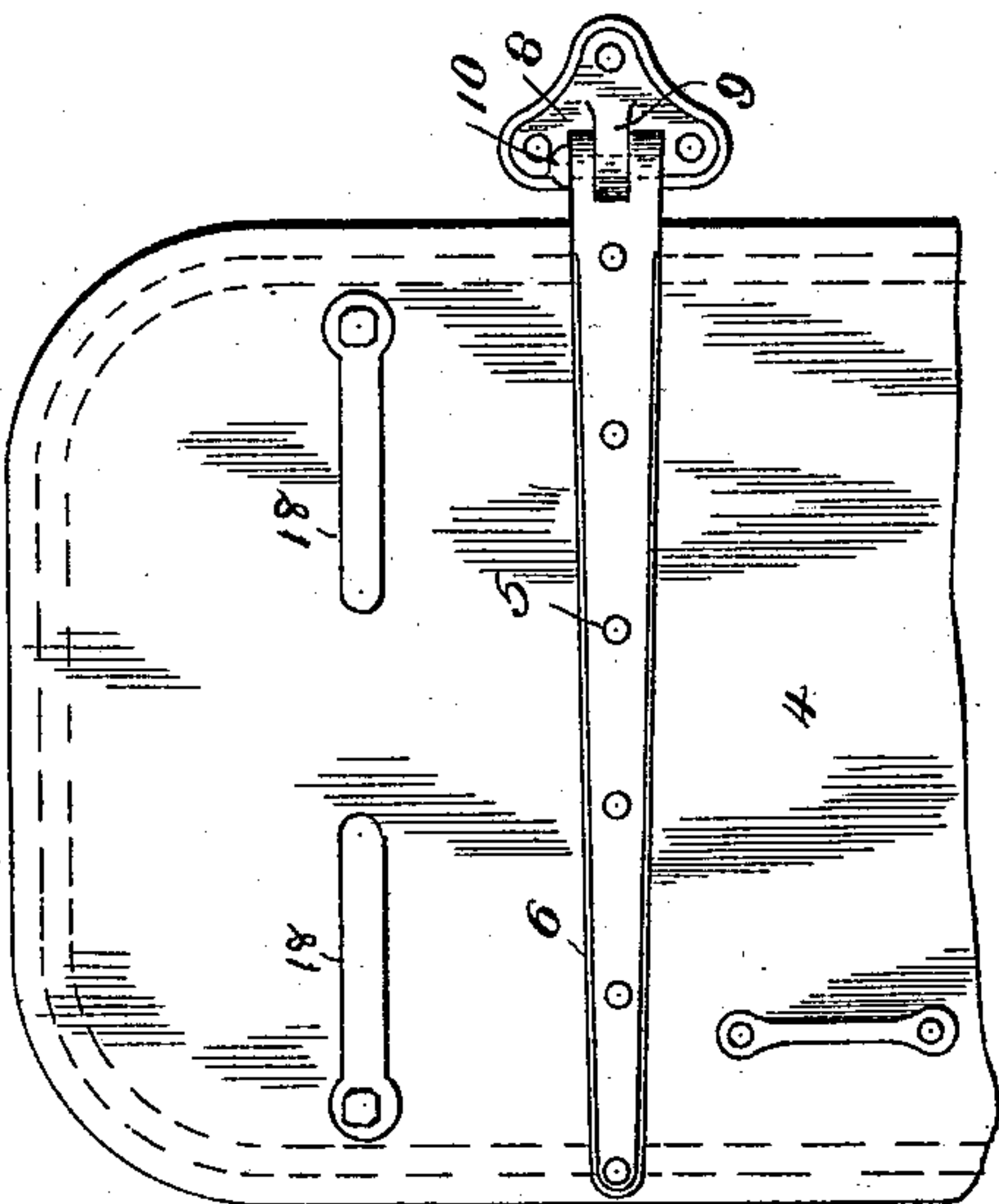


Fig. 1.



Witnesses

John D. ...
Bernard ...

Fig. 4.

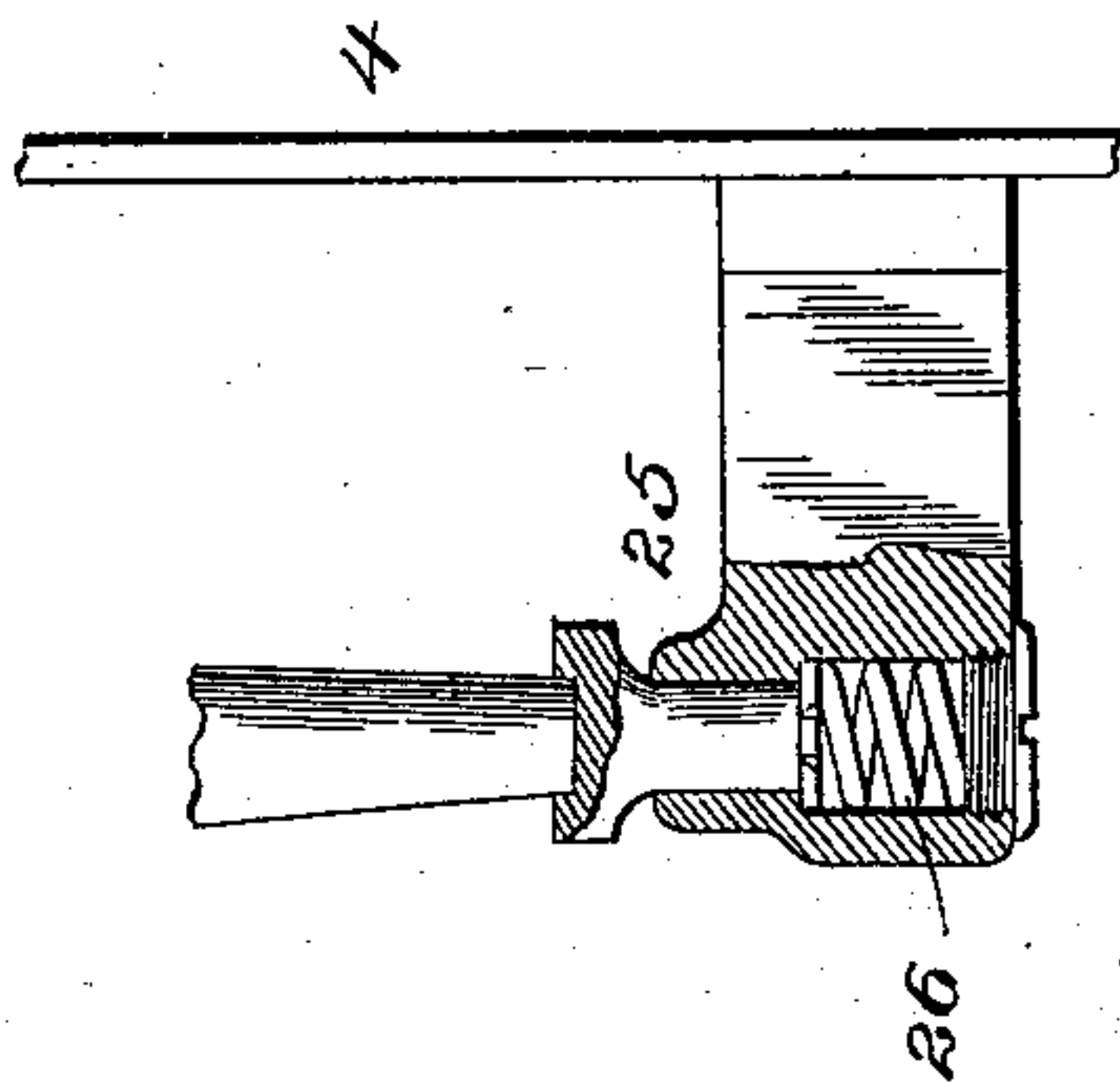


Fig. 3.

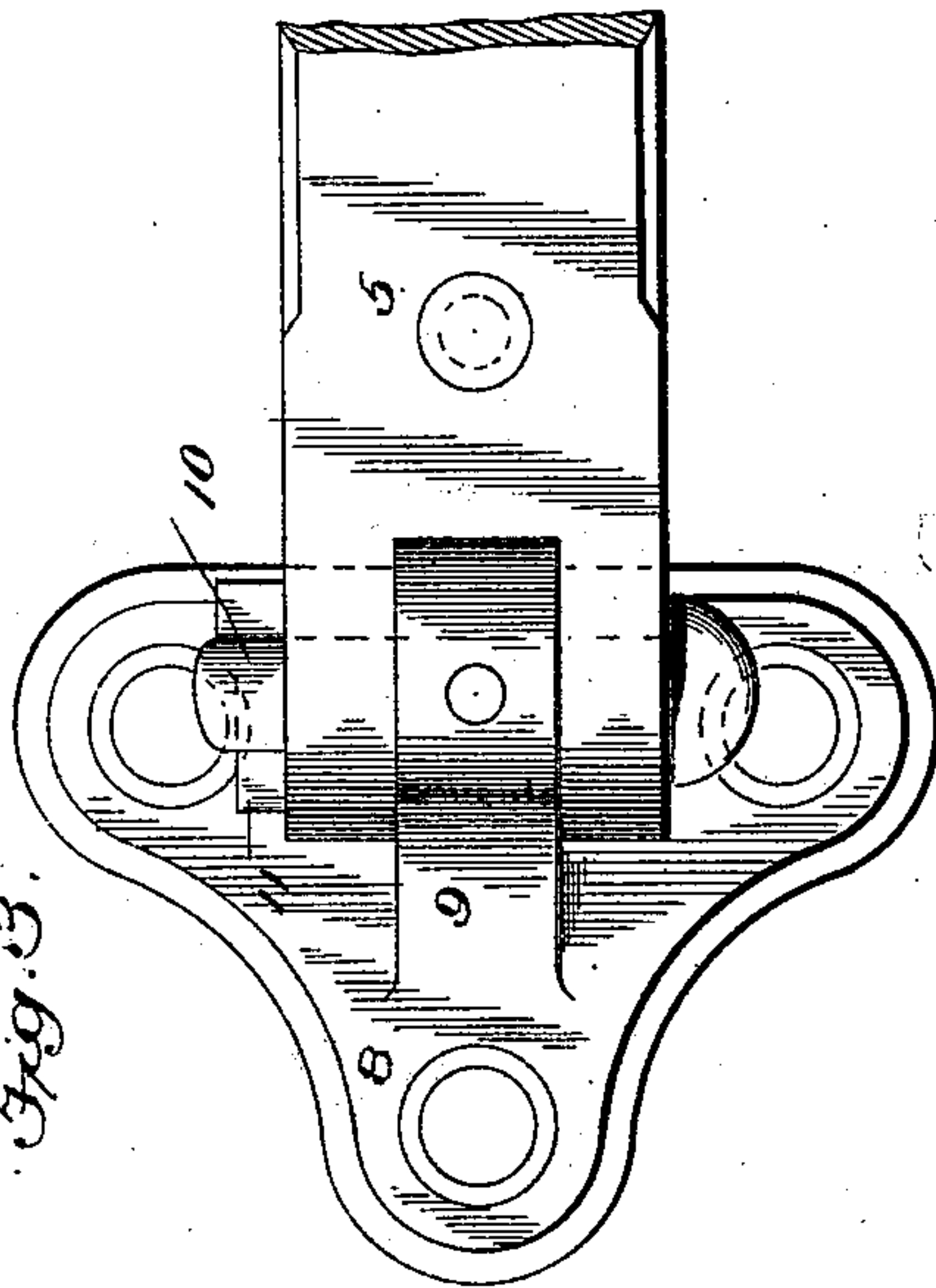
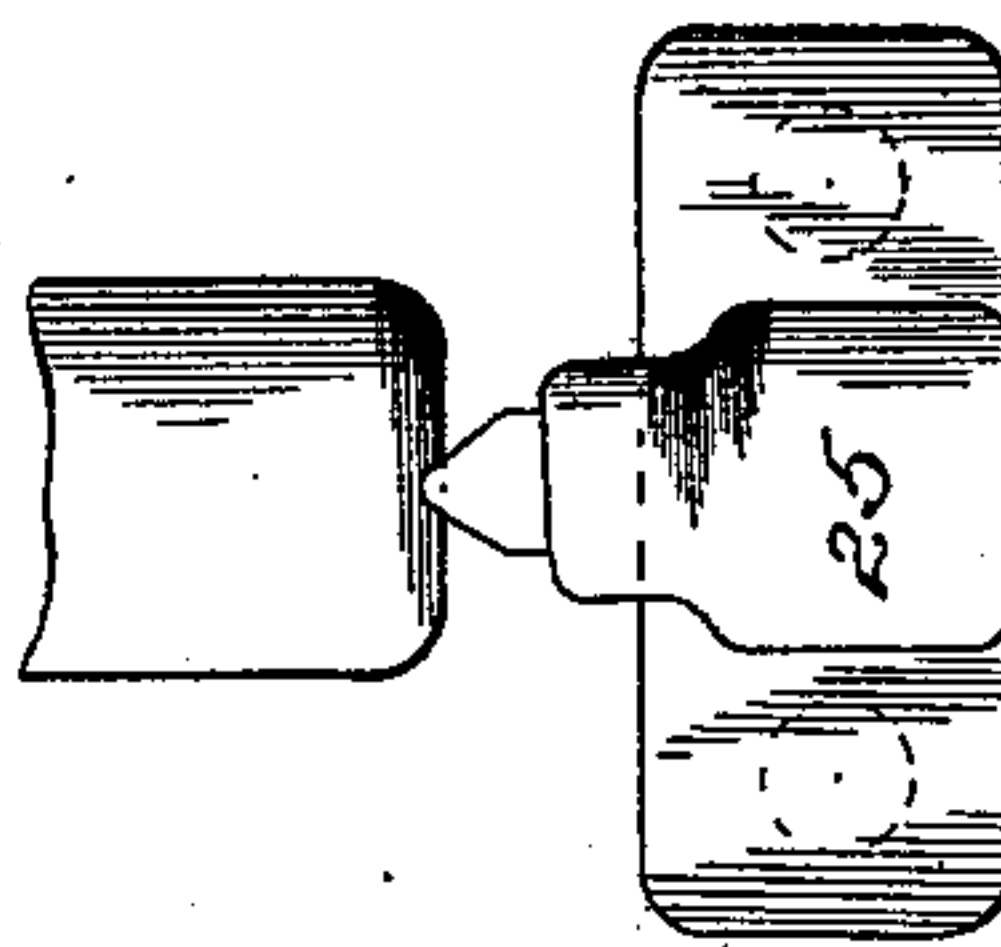


Fig. 5.



Inventor

Frank W. Cross
by Frank W. Jones

Attorney

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Fig. 6.

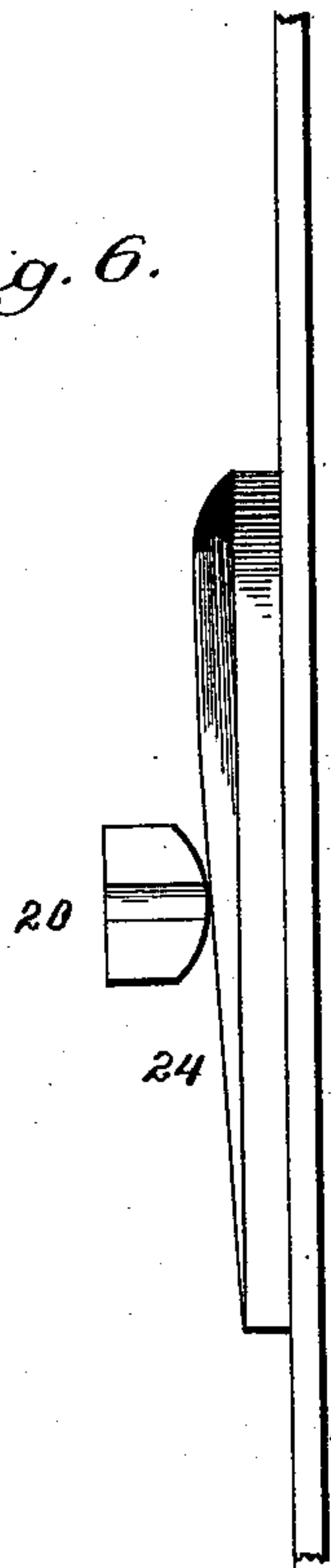


Fig. 7.

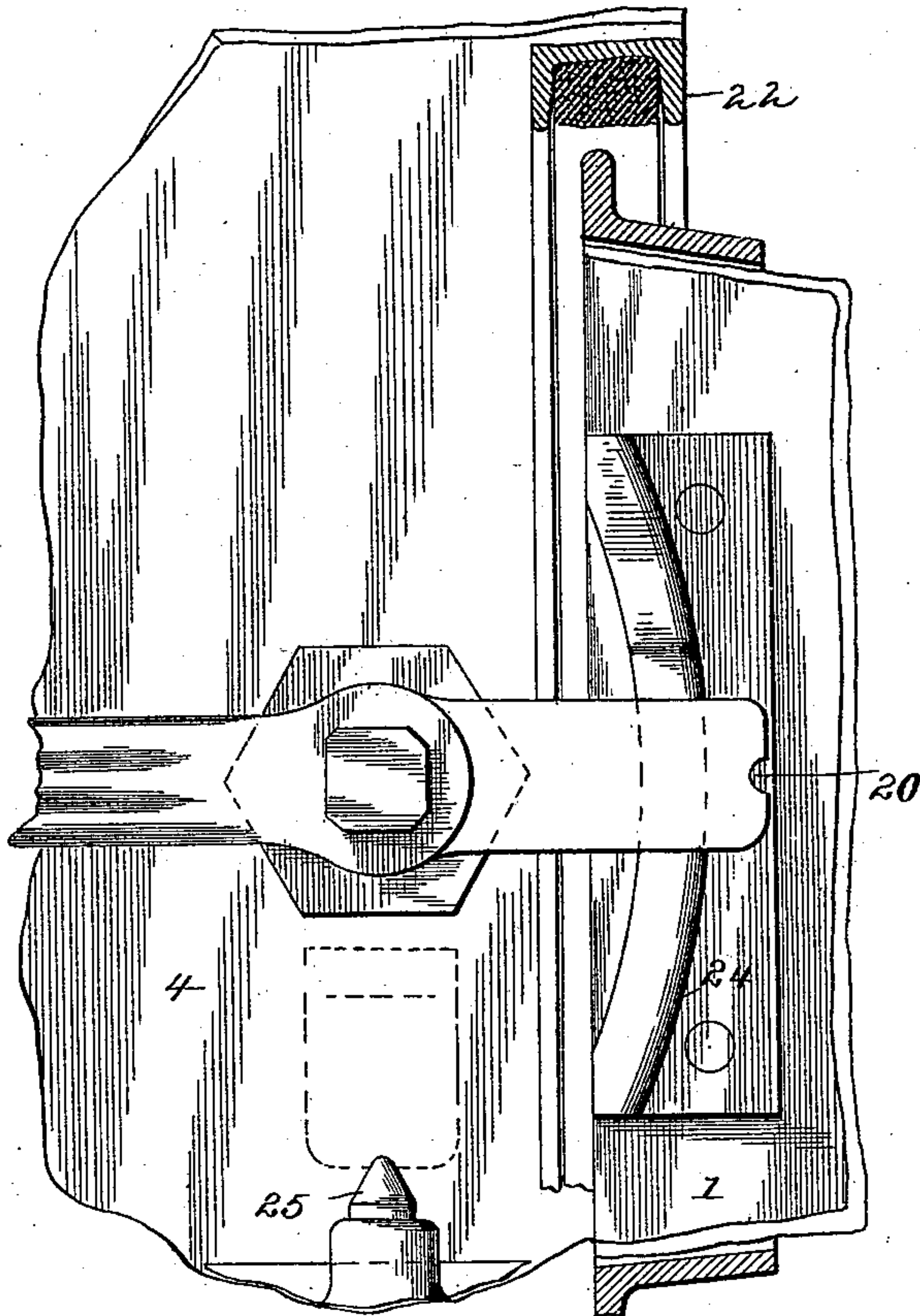
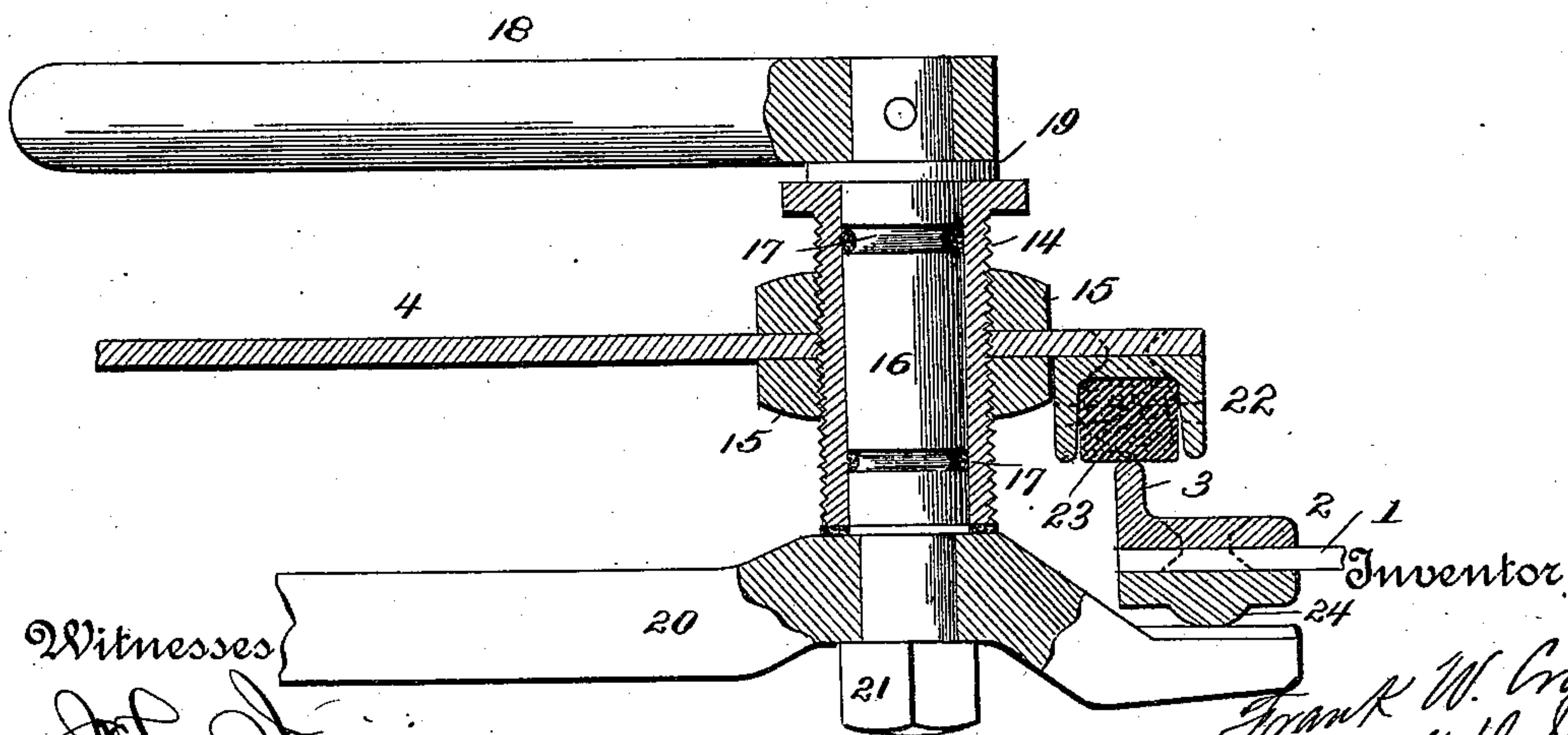


Fig. 8.



Witnesses

John Smith
& Bernard Burke

Inventor.

Frank W. Cross
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Attorney

UNITED STATES PATENT OFFICE.

FRANK W. CROSS, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF
TO JOSEPH SCHLADT, OF THE DISTRICT OF COLUMBIA.

DOOR FOR BULK-HEADS OR COMPARTMENTS OF SHIPS.

SPECIFICATION forming part of Letters Patent No. 549,843, dated November 12, 1895.

Application filed November 7, 1892. Renewed April 10, 1895. Serial No. 545,151. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. CROSS, a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Doors for Bulk-Heads or Compartments of Ships; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in adjustable water-tight doors for the bulk-heads of ships; and it has for its object to so construct the door and the closing and fastening devices that the same may be applied to the bulk-head without cutting or defacing the framing thereof, provide for securing the water-tight packing which closes the joint between the door and the opening at the bulk-head in such manner that an effective closure may be made with less clamping pressure and with less wear upon the packing than heretofore, and also to provide simple and effective clamping mechanism for fastening the doors to the edges of the bulk-head openings, and, further, to provide for locking the clamping-dogs positively when the door is open and holding them in position to fall properly into place when the door is closed, as more fully hereinafter described.

The above-mentioned objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a plan view of a portion of a bulk-head door, showing my invention. Fig. 2 represents a view, partly in section and partly in elevation, of a portion of the door and one of the hinges, showing the means of adjusting the same. Fig. 3 represents a detached view of the hinge. Fig. 4 represents a portion of the door and a sectional view of the end of one of the clamping-dogs and a spring-detent by which it is held when the door is open. Fig. 5 represents an elevation of said dog and detent, taken at right angles to the view shown in Fig. 4. Fig. 6 represents a side elevation of a portion of the bulk-head, a cam-plate secured thereto, and the clamping-dog bearing against

said cam-plate. Fig. 7 represents an elevation of a portion of a bulk-head and door, showing one of the clamping-dogs and the cam-plate against which one end thereof bears to tighten the door; and Fig. 8 represents a view, partly in elevation and partly in longitudinal vertical section, of a portion of the door and the clamping devices.

Referring to the drawings, the numeral 1 indicates a portion of one of the bulk-heads of a ship, around the opening of which extends a metallic frame having a flange 2, which is attached to the bulk-head, and a flange 3, at right angles thereto, against which the packing of the door is brought to bear to secure a water-tight joint when the door is closed and clamped.

The numeral 4 indicates the door, which is preferably constructed of metal, as usual, and which has secured to it by bolts or rivets or otherwise the members 6 of the hinges upon which it swings, the other members 8 of which are fastened to the bulk-head in any suitable manner. The members 8 are each provided with a lug 9, which has an elongated opening through it, and the members 6 are bifurcated at one end, so as to straddle said lugs, and provided with pintles 10, Figs. 2 and 3, which pass through the elongated opening and serve to connect the two members of the hinge. The pintles are headed at one end and at the other are slotted, and through the slots are passed the usual split pins 11 to confine them in place. Through suitable screw-threaded openings in the lugs 9 are passed externally-threaded pins 12, which bear against the pintle and which may be adjustably set in or out to adjust the hinges, so as to give the packing around the door (to be hereinafter described) a square bearing against the angular flange 3 of the frame surrounding the opening of the bulk-head. At suitable points around the edges the door is provided with clamping devices. (Shown in detail, particularly in the view represented in Fig. 8 of the drawings.)

Referring to Fig. 8, the numeral 14 indicates an externally-threaded sleeve, which passes through an internally-tapped aperture in the door and which is provided with lock

or binding-nuts 15, which bear against the door and serve to hold the sleeve against turning when in a properly-adjusted position. Through the sleeve extends a bolt 16, which
 5 fits snugly but is adapted to turn freely therein. At suitable points the bolt is annularly grooved, as indicated by the numeral 17, and the grooves are fitted with packing-rings of leather or other suitable material to
 10 make water-tight joints between the inside of the sleeve and the bolt. The ends of the bolt project beyond the sleeve at each end, and on the outer end is secured, by means of a set-screw, feather, or otherwise, one end of a lever
 15 18, which sets above a shoulder 19 on the bolt, the shoulder bearing against the flanged outer end of the sleeve before mentioned. The inner end of the bolt passes through an opening near one end of a dog 20, which is confined
 20 thereon by means of a nut 21, which fits upon the inner end of the bolt, the same being screw-threaded for the purpose.

The door near its edge is provided with a channel-iron or frame 22, which is provided
 25 with an outwardly-flaring continuous recess, in which is cemented or otherwise secured the packing 23, of rubber or other material. The said packing consists of a continuous piece of material rectangular in cross-section
 30 and of such width as not to entirely fill the recess in the channel-iron, so that when compressed, when the door is closed, against the flange of the angle-frame around the bulk-head opening it will readily expand and bear
 35 tightly against said flange.

On one side of the bulk-head, at suitable points corresponding to the position of the dogs 20, are located cam-plates 24, against which the short arms of the dogs may be
 40 brought to bear to draw the door inwardly and press the packing against the flange 3 to make a water-tight joint.

To the one surface of the door, in a suitable position, is secured a series of fastening devices 25, (shown in detail in Figs. 4 and 5 of
 45 the drawings,) which consist of a movable bolt set in a chamber in the device and pressed normally outward by a spring 26. The outer end of said bolt is recessed, so as to engage
 50 the end of the dog 20 when the door is opened, and hold it in position until the door is closed.

It will be observed that in the present invention the clamping devices are on the door instead of on the bulk-head framing, which
 55 permits said devices to be more conveniently applied and renders it unnecessary to cut or otherwise deface the said framing to apply them.

The operation of my invention is as follows:
 60 The door being properly hung upon the hinges, the parts are adjusted so that the packing will bear uniformly upon the flange 3 at all points. When closed, the pressure is put upon the door by turning the dogs so as
 65 to engage the cam-plates, distending the pack-

ing, so as to fill the groove in the channel-iron and make a perfectly water-tight joint.

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

1. The combination with the door and the flanged frame secured to the bulkhead, of the channel iron having a flaring groove, and packing secured therein, and mechanism for clamping the door to the bulkhead, substantially as specified, whereby the packing is
 70 allowed to expand when compressed.

2. The combination with the bulkhead framing, provided with a flanged frame surrounding the opening, of an adjustable hinged
 80 door having adjustable fastening devices, and a channel iron and packing, the said channel iron being formed with an outwardly flaring groove, whereby the packing is allowed to expand when compressed, substantially as and
 85 for the purpose specified.

3. The combination with bulkhead door and framing, of an adjustable threaded sleeve extending through a threaded aperture in the door, the annularly grooved bolt and packing,
 90 the lever secured to one end of the bolt, and the dog secured to the other, the cam plate secured to the framing, the channel iron and packing, and the flanged frame against which the packing bears when the door is closed,
 95 substantially as specified.

4. The combination with the pivoted dogs, of the spring fastening devices secured to the door and adapted to engage and hold the dogs
 100 when the door is open, substantially as specified.

5. The combination with the door and its adjustable hinges, of the fastening devices, consisting of an externally threaded sleeve passing through the door, the bolt passing
 105 through the sleeve and provided with a lever at one end and a dog at the other, the latter being adapted to engage a cam plate on the bulk-head framing to clamp the door and its packing to its seat, substantially as specified.
 110

6. A locking dog for bulkhead doors pivoted upon a bolt adjustable laterally with relation to the door substantially as shown and described whereby the dog may be adjusted to
 115 or from the face of said door.

7. The combination with a bulkhead door, of an adjustable threaded sleeve extending through a threaded aperture in said door, a bolt extending through the sleeve and having
 120 secured to one end a locking dog substantially as shown and described, whereby the dog may be adjusted to or from the face of the door.

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

FRANK W. CROSS.

Witnesses:

G. W. S. MUSGRAVE,
 WM. H. H. RALEIGH.