

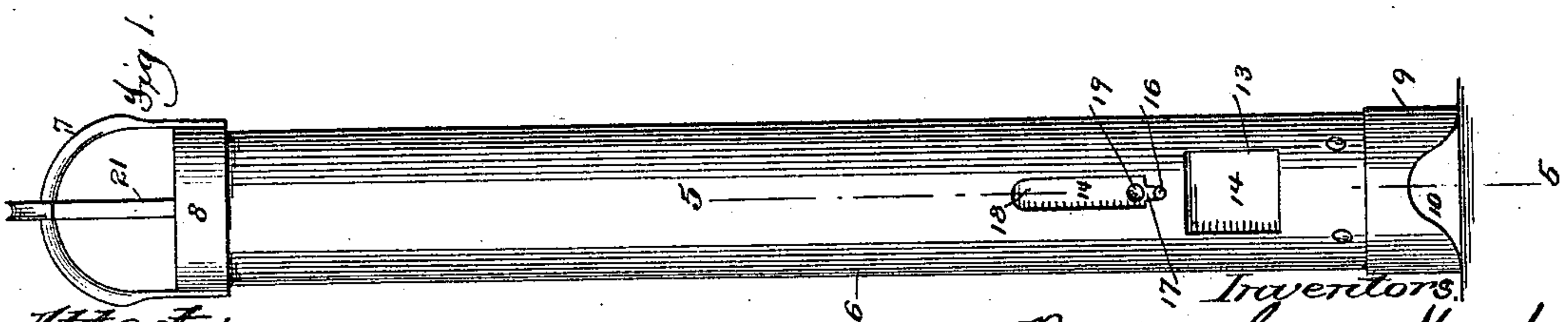
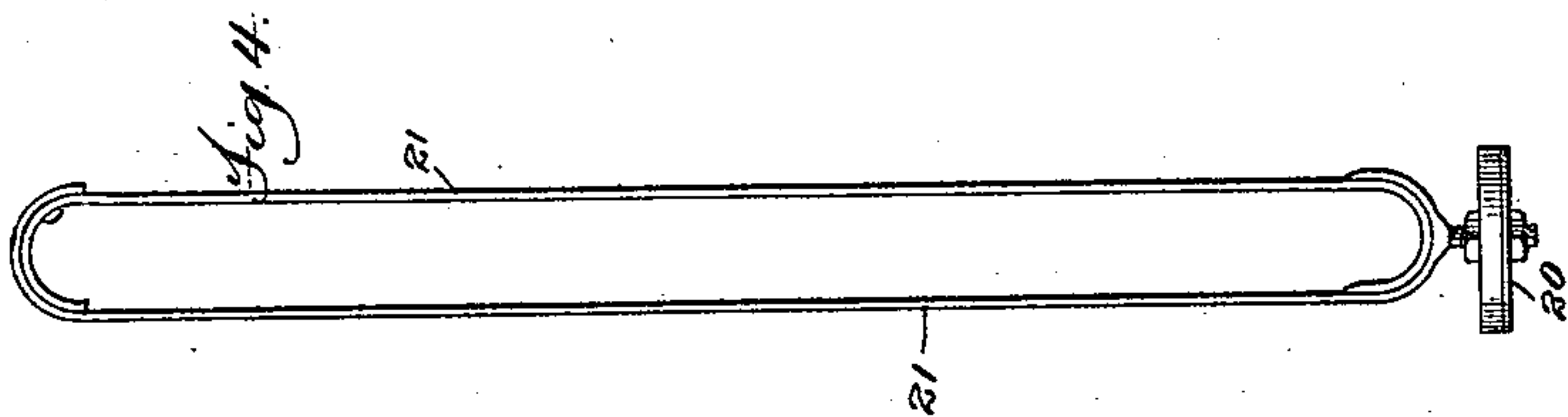
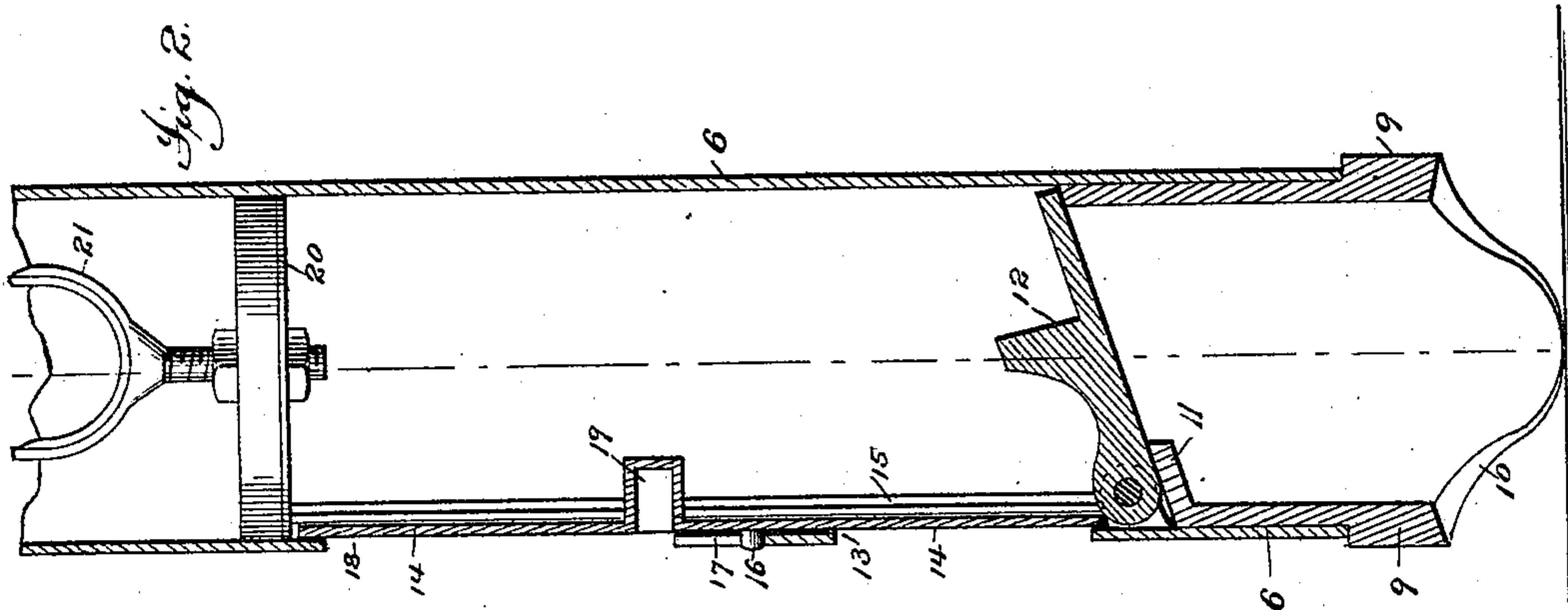
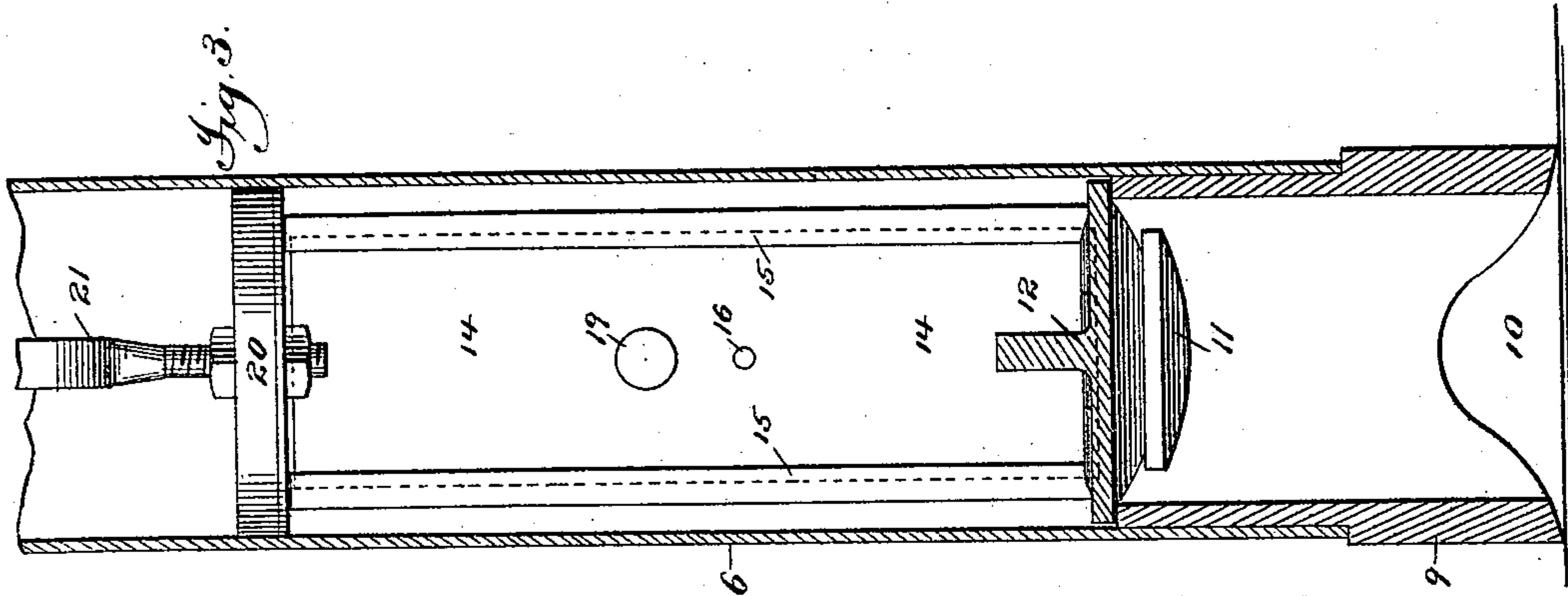
(No Model.)

R. G. MEAD & B. MAGEE.

SAND OR MUD PUMP.

No. 396,501.

Patented Jan. 22, 1889.



Attest:
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UNITED STATES PATENT OFFICE.

RANSOM GARNER MEAD AND BOON MAGEE, OF WARREN, PENNSYLVANIA.

SAND OR MUD PUMP.

SPECIFICATION forming part of Letters Patent No. 396,501, dated January 22, 1889.

Application filed September 3, 1887. Serial No. 248,716. (No model.)

To all whom it may concern:

Be it known that we, RANSOM GARNER MEAD and BOON MAGEE, citizens of the United States, and residents of Warren, in the county of Warren and State of Pennsylvania, have invented certain new and useful Improvements in Sand or Mud Pumps, of which the following is a specification.

Our invention relates to what are commonly termed "sand-pumps," which embody a cylindrical case or metallic tube having a valve at its bottom opening upwardly and provided with a suitable plunger. The use of such a pump for removing the detritus in well-boring is well understood.

The object of our invention is to improve the ordinary type of the sand-pump, whereby it may be emptied with increased facility and may be withdrawn from the well with less liability of breakage of the parts supporting the weight and strain.

The features of our invention are hereinafter set forth, and are illustrated in the accompanying drawings, which form a part of this specification, and in which like parts are indicated by like figures of reference. The specific invention for which we desire protection by Letters Patent is pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is a front elevation of a pump embodying our improvements. Fig. 2 is a central vertical section through the line 5 5 of Fig. 1. Fig. 3 is a similar sectional view at right angles to Fig. 2, and Fig. 4 is a view in elevation of the pump-plunger and its attached bail.

Referring to the drawings, 6 indicates the pump barrel or tube, which is cylindrical, and which by preference is composed of thin iron of sufficient rigidity—such, for instance, as the iron used in the construction of boiler-flues. In practice this barrel 6 will be made about four inches in diameter and about twenty feet long.

The pump-barrel 6 is provided at its top with a bail, 7, preferably made integral with a band, 8, that is secured to the top of the pump-cylinder. The bottom of the pump-barrel 6 is provided with a foot-piece, 9, which is so shaped at its bottom, as at 10, as to facilitate the entrance of the sand, &c., into the

cylinder. The foot-piece 9 also provides an inclined seat, 11, for the weighted valve 12, which is suitably hinged, as shown, to the rim of said foot-piece. That portion of the foot-piece 9 which the cylinder 6 embraces, and to which it is riveted or otherwise firmly secured, is of smaller diameter than its exposed portion in order that when the foot-piece is in place the diameter of its exposed bottom end will be no greater than the diameter of the cylinder 6. The valve 12 is normally closed and is automatically opened to permit the passage of the detritus when the pump is lowered into the well.

Just above that point of the pump-barrel 6 where the valve-seat 11 is located we cut an opening, 13, in said barrel, preferably of the shape shown, which is adapted to be closed and uncovered by the valve 14, which in this instance consists of a suitably-curved piece of metal operating in the guides 15 on the inside of the pump-cylinder and provided with a stop or guide pin, 16, co-operating with a notch, 17, in the pump-cylinder. Above the notch 17 the pump-cylinder is cut out, so as to form a long narrow opening, 18, which exposes a tubular socket, 19, formed in the slide or valve 14. The object of the socket 19 is to furnish means whereby the slide or valve 14 may be easily raised from the outside, which is done by inserting a rod in the tubular socket 19, which latter is of depth sufficient to give the required hold and whose inner end is closed to prevent the sand, &c., from passing out through said opening.

The slide or valve 14 is arranged on the inside of the pump-cylinder, as it is less liable to be interfered with or get out of order when thus arranged, and besides the outside of the pump-barrel is thereby maintained at a uniform diameter throughout its length, which is desirable in order to prevent the binding of the pump in the well, which would be quite liable to happen if the slide or valve 14 were located on the outside of the cylinder.

The plunger 20 of our pump is of the usual construction; but the bail 21, by which it is raised and lowered in the pump-cylinder, which comprises two strong but flexible members of a length corresponding to about the length of the pump-barrel 6, differs from that

commonly used, in that both of its members are formed without a "snap-opening" and are bent over and riveted together at the top, thereby greatly strengthening the bail and enabling dependence to be placed on both of its members in raising the pump from the well.

The manner in which our pump is used will be readily understood. The sand-pump line is fastened to the top of the bail 21 of the plunger, and when it is desired to remove an accumulation of sand, mud, or the like within the well, the pump being lowered into the well, the plunger sinks to the bottom of the pump, and in the act of drawing the plunger out by means of the sand-line a suction is created within the pump-cylinder, causing the weighted valve 12 to rise and the detritus to fill into the cylinder. As the charged pump is raised from the well, the valve 12 automatically closes, thus maintaining the pump in its charged condition. When the pump is lifted from the well and set in an upright position, it is emptied by lifting with a rod (inserted into socket 19, as explained) the slide or valve 14, which permits the pump to empty by gravity in an obvious manner. The slide or valve 14 being closed, the pump is in condition for repeating the operation explained.

The foot-piece 9, having the external circumferential shoulder at its lower end and the internal valve-seat, 11, at its upper end, gives the advantage, if using boiler-iron for the cylinder and telescoping it with and riveting it to a casting for its support, of having also an upwardly-inclined ledge or valve-seat extending inwardly at the hinged side of the valve only a sufficient distance to form a support for the hinged end of the valve, and thus relieve its pintle-hinge of the weight and strain which it would otherwise have to bear from the load of mud when the valve is closed. It is this construction which permits the pintle-hinge to be secured to the inner wall of the cylinder, and it is this construction which gives a firm seating to the valve on an upward incline at the top edge of the said foot-casting, so that the valve will thereby form a chute to clear itself of the mud and water when the cylinder-slide is open. The inclined position of the valve, moreover, permits it to open more freely by the suction of the piston. Referring to the slot 18 in the pump-cylinder, it is never open, and its function is threefold—that is to say, to give access to the socket 19, by which the slide is opened and closed, and to co-operate with the slide-pin 16 to limit both the opening and the closing movement of the slide, which in either position forms a cover for said slot 18, while in either position of the slide the socket by which the slide is opened and closed is always exposed by the slot. This construction co-operates with an interiorly-arranged slide

which controls the discharge-opening 13, so that while the interior slide is operated from the outside of the cylinder the provision by which this is effected gives a closed cylinder-surface with no projection from said surface. The stop-pin 16 of the slide moves within the slot 18, while the socket 9 of the slide stands inward a distance sufficient to give a good hold for a rod by which to raise and to force down the slide. To place the slide in guides on the outer side of the cylinder would not do in a sand-pump, for the reason, among others, that it has been found that the pump cannot be prevented from sticking in the walls of the well in such arrangement, and such external arrangement would greatly increase the difficulty of raising the cylinder from the well. The placing of the slide within the cylinder is therefore an important matter in a sand-pump, and when so placed the provision for operating it in a closed cylinder-wall is also important.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a sand-pump, the pump-cylinder having the discharge-opening 13, an interior wall-slide, 14, for closing said opening, and a valve having its hinge secured to the pump-wall at the lower edge of said opening and inclining upward therefrom, whereby the said valve when closed is caused to act as an inclined chute to facilitate the discharge of the sand and mud from the cylinder through said opening when the latter is uncovered, as shown and described.

2. The combination, in a sand-pump, of the pump-cylinder having the discharge-opening 13 and wall-slot 18, a valve, and a piston with a slide fitted in interior guides, and means for operating said slide from the outside, consisting of a socket, 19, projecting inward from said slide, having an uncovered relation to the cylinder-slot 18, while the latter is maintained in closed relation to the pump-chamber by said slide, substantially as described.

3. The pump-cylinder having the wall discharge-opening 13 and slot 18, and having the interior guides, 15 15, in combination with the slide 14, having the interior projecting socket, 19, and the exterior projecting pin, 16, the latter operating to maintain the uncovered relation of said socket to said cylinder-slot 18, and the slide serving to perpetually close said slot, the valve 12, and the piston 20, substantially as described.

Signed at Warren, in the county of Warren and State of Pennsylvania, this 2d day of August, A. D. 1887.

RANSOM GARNER MEAD.
BOON MAGEE.

Witnesses:

W. V. N. YATES,
GEO. H. HIGGINS.