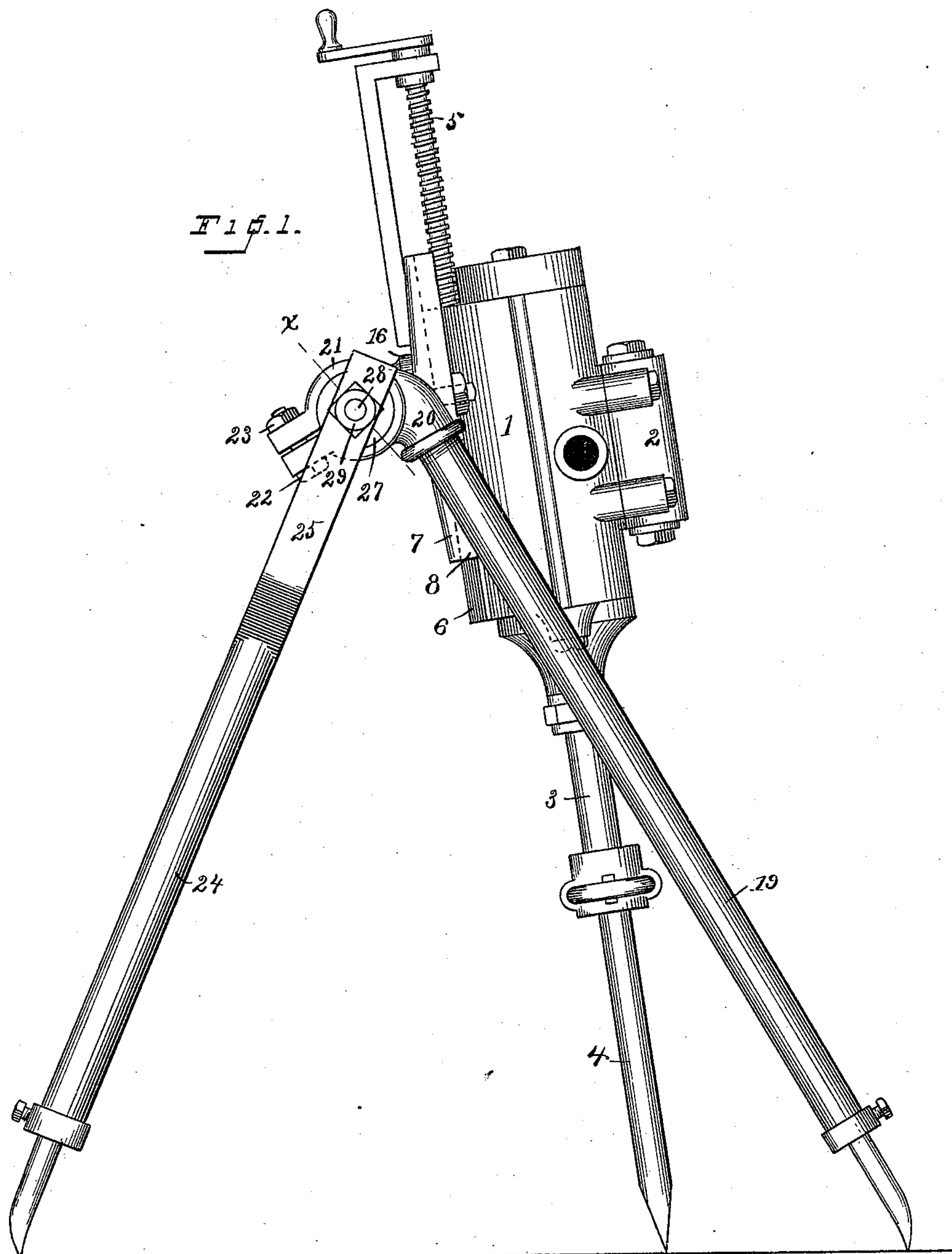


2 Sheets—Sheet 1.

No. 455,269.

Patented June 30, 1891.



WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

H. BALL.
TRIPOD FOR ROCK DRILLS.

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Fig. 2.

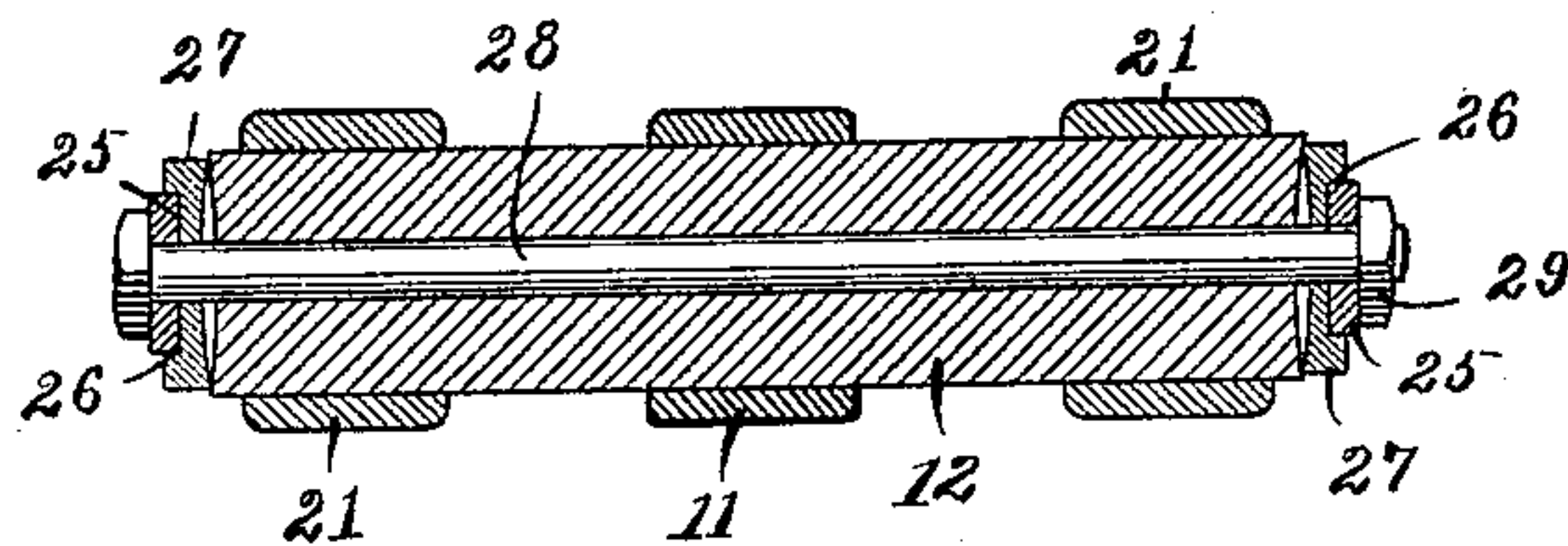


Fig. 3.

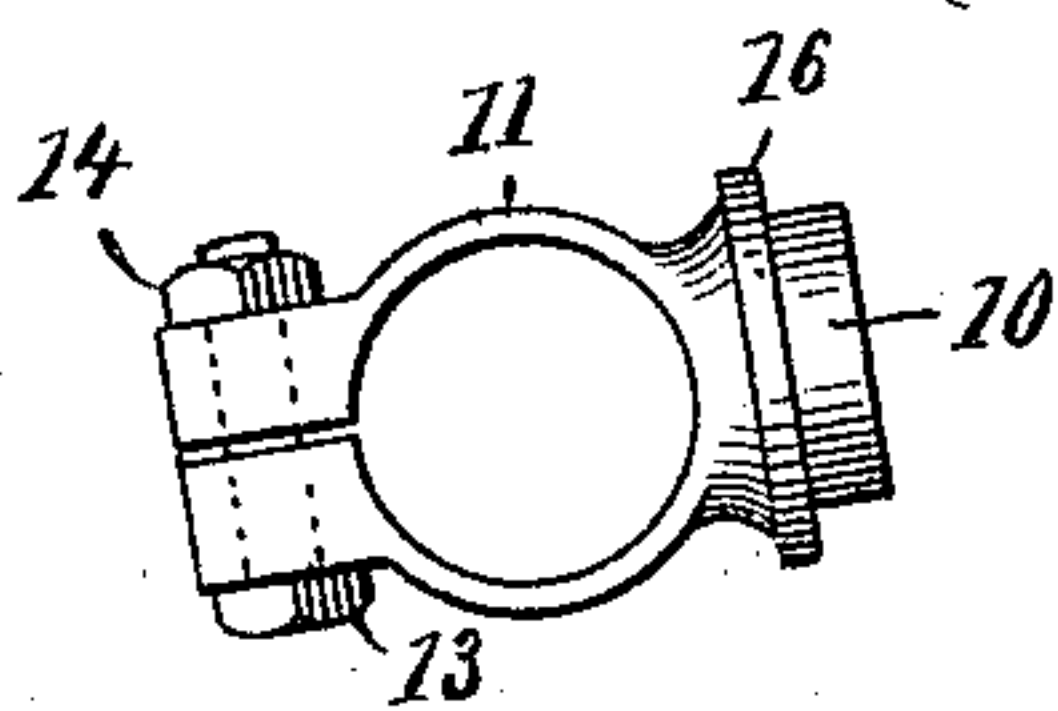


Fig. 4.

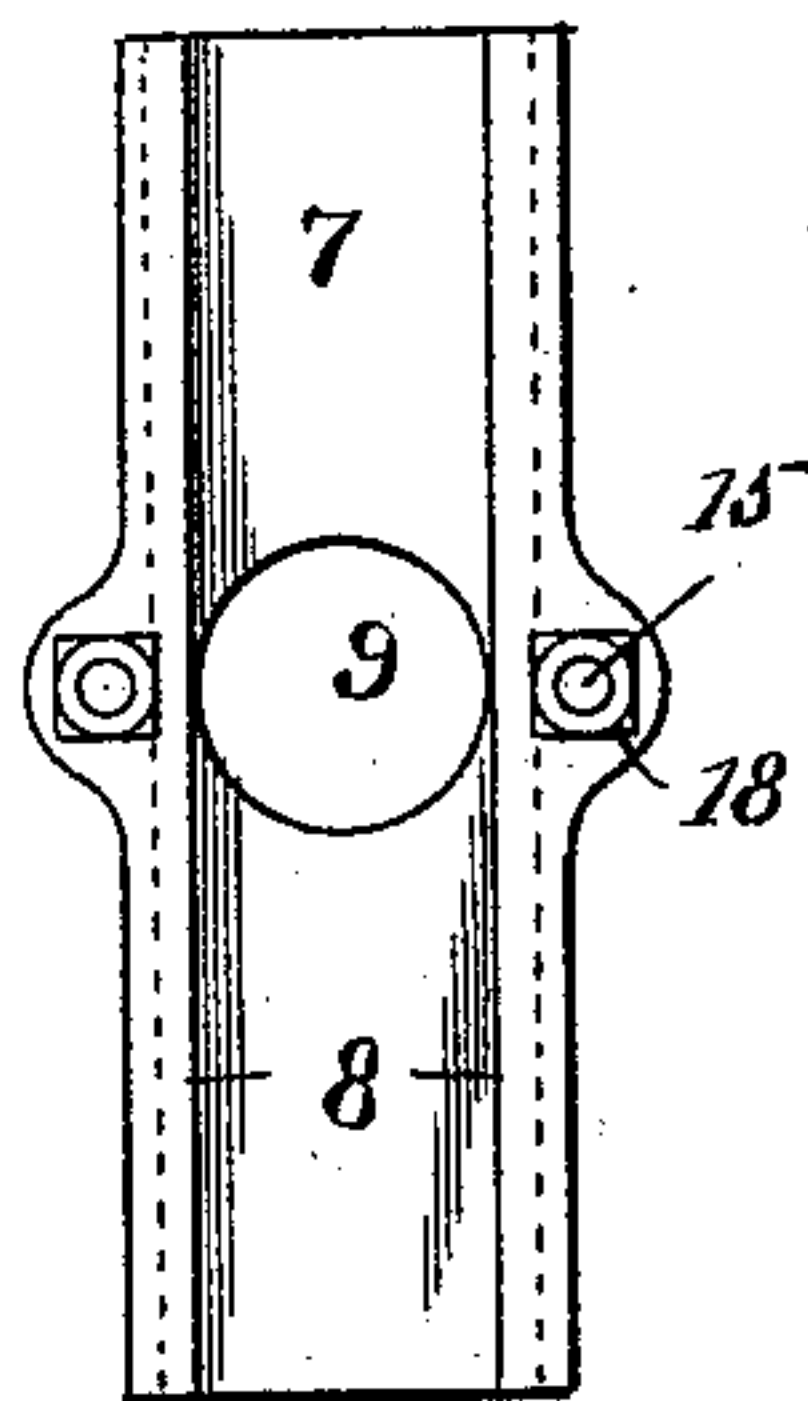


Fig. 5.

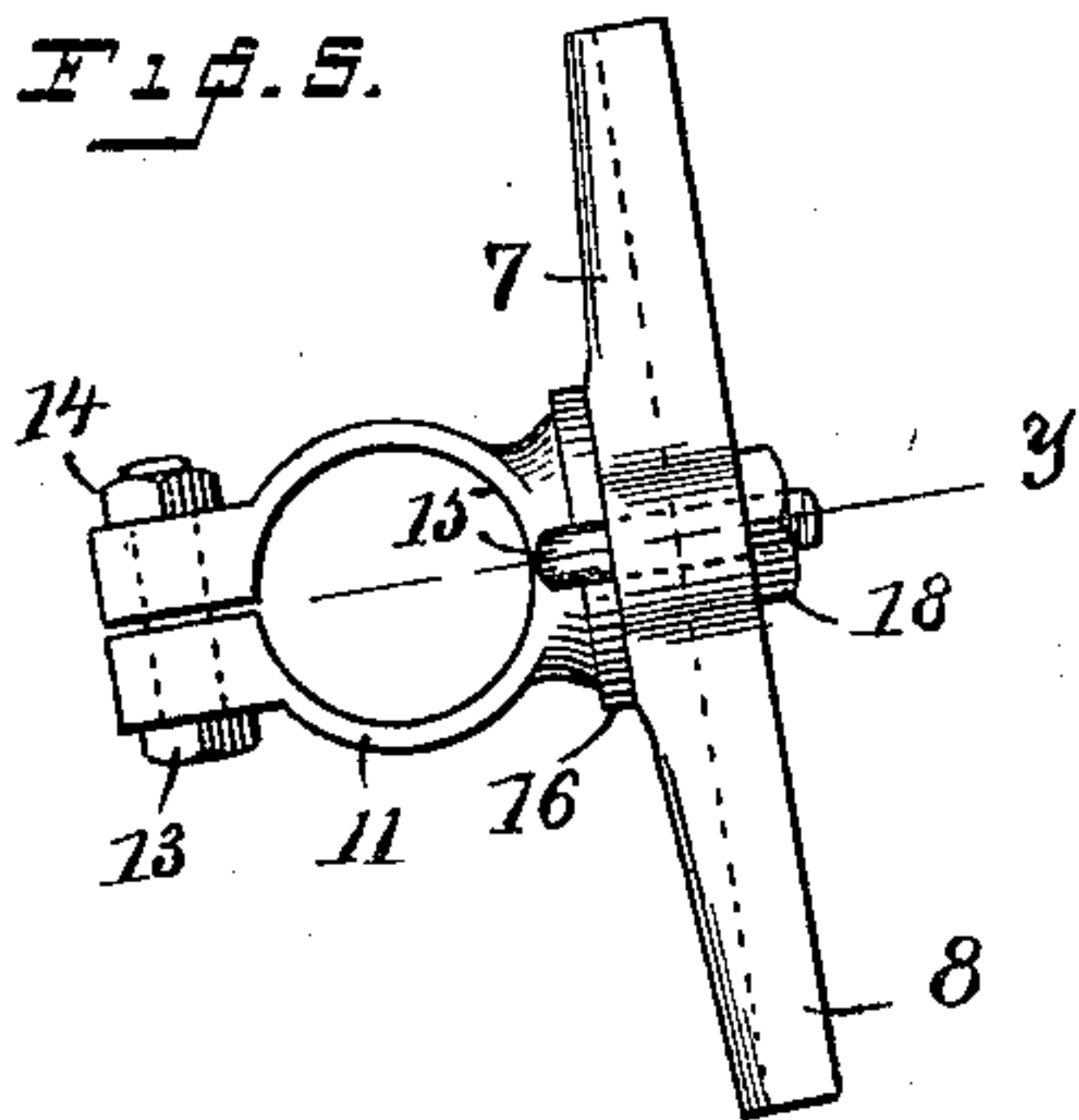
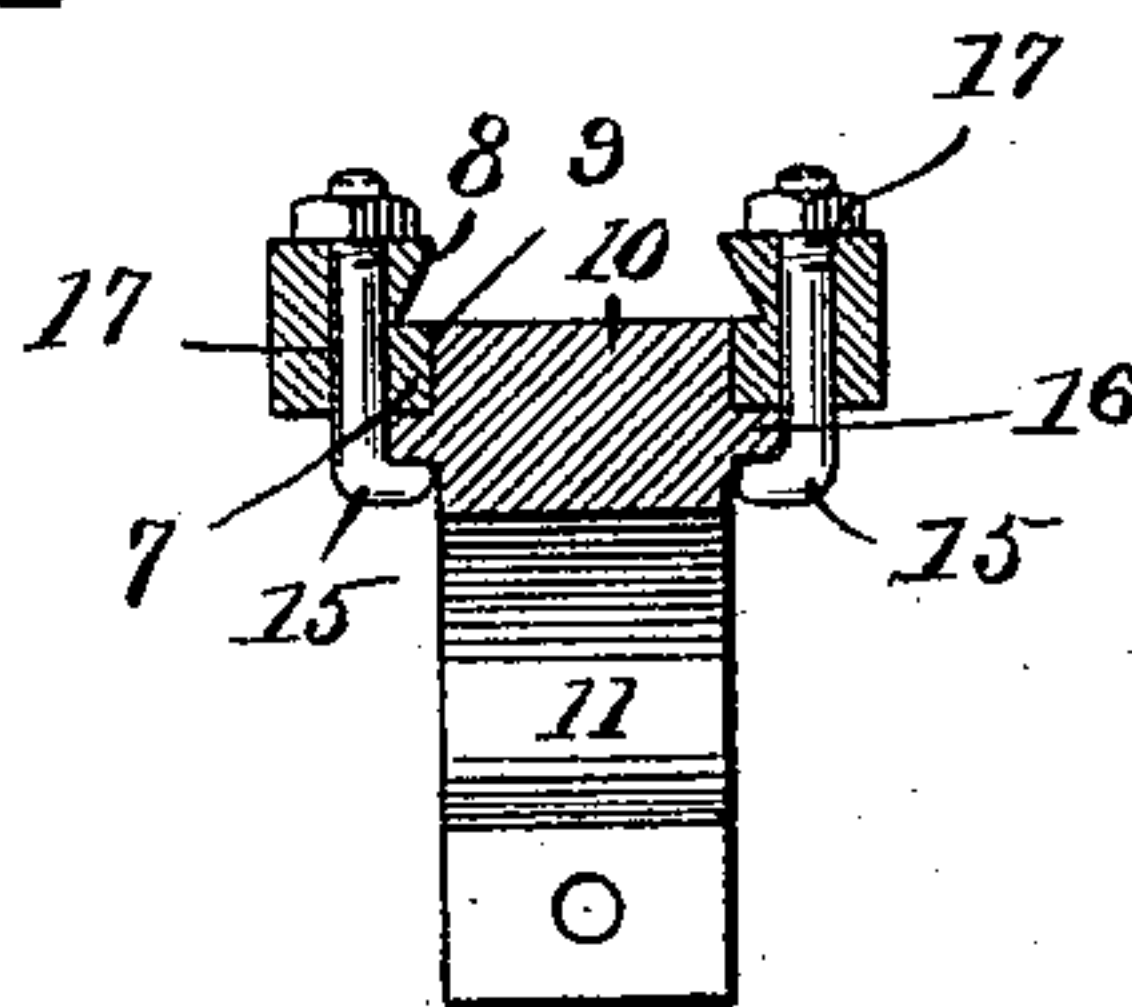


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TRIPOD FOR ROCK-DRILLS.

SPECIFICATION forming part of Letters Patent No. 455,269, dated June 30, 1891.

Application filed August 25, 1890. Serial No. 362,961. (No model.)

To all whom it may concern:

Be it known that I, HARRY BALL, a citizen of the United States, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Tripods for Rock-Drills; 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.

My invention has for its object to simplify and cheapen the construction of tripods for rock-drills, while at the same time they shall be strong and durable and their operation in use shall be greatly improved.

With this end in view I have devised the novel construction which I will now proceed to describe, referring by numbers to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a rock-drill embodying my present improvements; Fig. 2, a detail sectional view on the line indicated by *x* in Fig. 1; Fig. 3, a detail view of the clamp detached; Fig. 4, a detail view of the carrying-plate detached; Fig. 5, a view of the carrying-plate and clamp locked together, as in use; and Fig. 6 is a section on the line indicated by *y* in Fig. 5.

It is of course well understood by those familiar with the use of rock-drills that in mining the drills are ordinarily supported by columns, and in outdoor work they are supported by tripods. Heretofore, in changing a drill from a column to a tripod, or vice versa, it has been necessary to change clamps, each support requiring a clamp of special construction. In other words, clamps ordinarily used in connection with tripods cannot be utilized in connection with columns. An important feature of my novel tripod is that it is provided with a clamp which is equally adapted either to a tripod or a column, so that the drill and the clamp may be removed from the tripod at any time and attached directly to a column. This is a valuable feature in use, as the clamps are an important item of expense. Another important feature is the simplicity of the adjustment of the tripod, which enables me with few movements to lock the

drill firmly in position to bore a hole at any required angle either above or below the cylinder of the drill.

1 denotes the cylinder of a rock-drill; 2, the steam-chest; 3, the piston-rod; 4, the drill attached thereto; 5, the feed-screw; and 6, a flanged base usually cast integral with the body of the cylinder. The parts just described may all be of any ordinary or preferred construction, as they form no portion of my present invention.

7 denotes a carrying-plate having undercut ways 8, which are engaged by the flange upon the base. This plate is provided with a central opening 9 to receive a boss 10, which is formed integral with the arms 11 of the clamp.

12 denotes the hub of the tripod, which is made of the same diameter its entire length. In practice the arms of the clamp are adapted to inclose either the hub of my novel tripod or a column, and are locked in position by a bolt 13, having a nut 14.

In use boss 10 is passed into the opening in plate 7, as shown in Fig. 6, and the flange of base 6 engages ways 8, as shown in Fig. 1. The plate carrying the drill is locked to the clamp by means of hooked bolts 15, the hooked portions of which engage a flange 16 on the clamp, the upper end passing through holes 17 in the plate and the parts being locked together by nuts 18. In practice plate 7 is made wider at the center, as shown in Figs. 4 and 6, so as to give ample strength to resist any strain that can be brought to bear upon it. It will be seen that by loosening nut 14 slightly the clamp, carrying the entire mechanism of the drill with it, may be turned readily upon the hub or upon a column, (not shown,) and that by loosening nuts 18 slightly the plate and with it the entire drill mechanism may be moved in another plane, thus giving universal movement to the plate and drill mechanism. The parts are locked in place after adjustment by tightening up nuts 14 and 18. It will of course be apparent that the greatest strain in use will come upon the parts which connect the cylinder and operative parts of the drill with the tripod or column. In the present instance the arms of the clamp are made sufficiently wide and strong to prevent the possibility of their

breaking in use, and by the use of the hooked bolts as a means of connecting the carrying-plate with the clamp the entire strain is placed upon the bolts, the two parts being drawn
5 tightly against each other instead of a portion of the strain being upon the parts themselves, as has heretofore been common. The only piece that can possibly break is a bolt, and
10 as the bolts are made heavy and strong it will be seen that the danger of breakage is reduced to the minimum. Moreover, should a bolt break at any time, it may be replaced with but little loss of time and slight expense, skilled labor and the taking of the drill to a
15 machine-shop being wholly unnecessary.

19 denotes the two side legs, which are screwed into sockets 20 in the usual manner. These sockets are provided with clamping-arms 21, which inclose the hub in precisely
20 the same manner as arms 11, and are locked together by bolts 22, having nuts 23, one only of the bolts and nuts being shown. (See Fig. 1.) It will of course be understood that this simple construction enables me to adjust either
25 of the side legs upon the hub by loosening the nut 23 and moving it to the desired position.

24 denotes the back leg, which is provided with the usual branches 25. These branches
30 are preferably made flat on their inner sides and engage grooves 26 in the outer faces of washers 27. The washers are made concave on their inner sides, and the two ends of the cylinder are also preferably made concave, as
35 shown in Fig. 2. The back leg is locked in position by a bolt 28, which passes longitudinally through the hub, through both branches of the back leg, and through both washers, as clearly shown in Fig. 2, the parts being locked
40 in position by a nut 29. By making the washers concave, as shown in the drawings, I insure that there will be contact at all times between the outer edges of the washers and the ends of the cylinder, the central portions
45 of the washers being of course drawn inward

to increase the clamping-surface when nut 29 is tightened up.

Having thus described my invention, I claim—

1. A tripod consisting, essentially, of a hub, 50 side legs having independent pairs of arms which inclose the hub, washers at the ends of the hub, having grooves 26 in their outer faces, a back leg having branches 25, adapted to engage the grooves, and a bolt passing through 55 the hub longitudinally and through the branches and washers, whereby said leg is locked in position.

2. In a tripod, the combination, with hub 12, of a back leg having branches 25, washers 60 at the ends of the hub, having grooves 26 in their outer sides, adapted to be engaged by the branches, and a bolt 28, passing through the hub longitudinally and through the branches and washers, substantially as de- 65 scribed.

3. A hub 12, made concave at its outer ends, the back leg having branches 25, washers 27, made concave on their inner faces and having grooves in their outer faces engaged by 70 the branches, and a bolt passing through the hub, branches, and washers, said parts being locked in position by tightening up the bolt and springing the washers inward.

4. The combination, with the hub and the 75 carrying-plate having an opening 9, of a clamp having arms engaging the hub, a boss engaging opening 9, and a flange 16, a bolt for clamping the arms about the hub, and hooked bolts passing through the carrying- 80 plate and engaging the flange, whereby the carrying-plate may be adjusted relatively to the clamp and both carrying-plate and clamp may be adjusted relatively to the hub.

In testimony whereof I affix my signature in 85 presence of two witnesses.

HARRY BALL.

Witnesses:

RICHARD BOLSTER,
BENJAMIN LOCKWOOD.