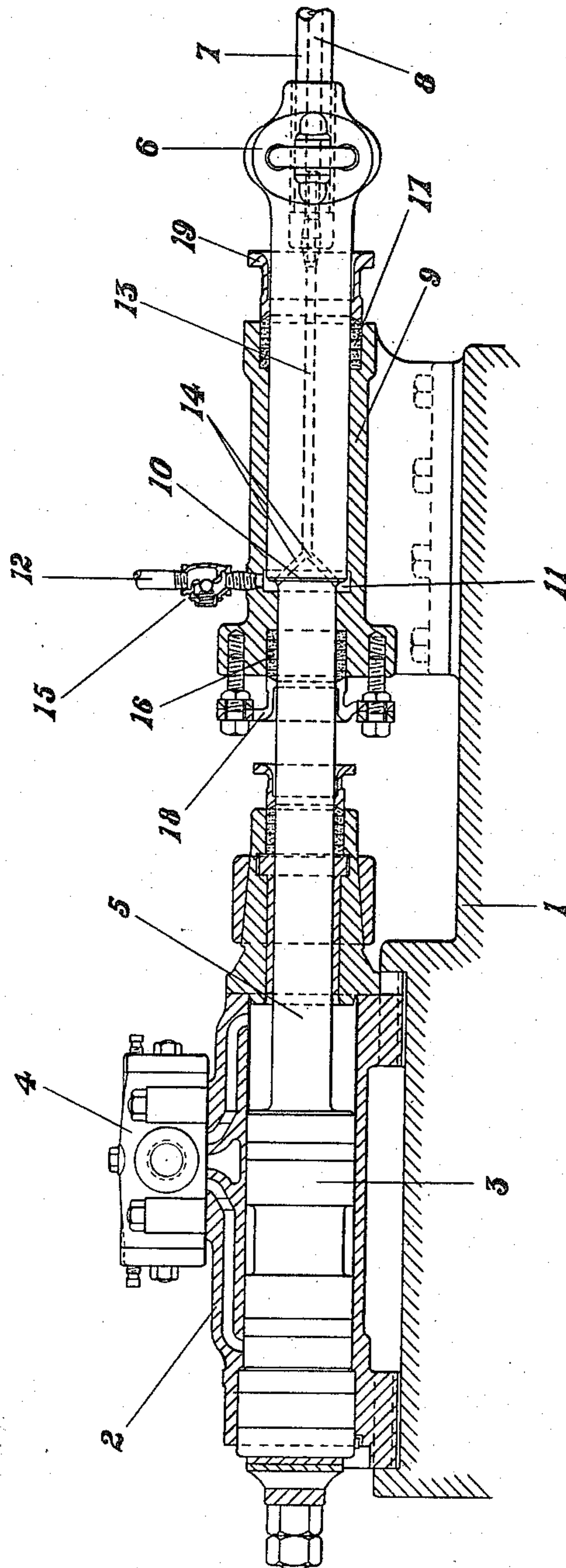


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C. C. HANSEN.
PERCUSSIVE DRILL.
APPLICATION FILED OCT. 21, 1912.

1,154,921.

Patented Sept. 28, 1915.



WITNESSES:
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PERCUSSIVE DRILL.

1,154,921.

Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed October 21, 1912. Serial No. 726,892.

To all whom it may concern:

Be it known that I, CHARLES C. HANSEN, a citizen of the United States, residing at Easton, in the county of Northampton and State of Pennsylvania, have invented a certain new and useful Improvement in Percussive Drills, of which the following is a specification.

This invention relates to percussive drills and more particularly to drills of the type wherein air or water or a similar fluid is forced into the hole to clear it of rock cuttings and dust.

Under some conditions, for instance in submarine drilling or in other isolated situations where a single drill or only a few drills are to be used, it is often advisable to operate the drill or drills directly by steam. Under such conditions when it is desired to blow out the hole a separate source of fluid under pressure is required as the steam is not effective for this purpose. In other cases also where air for operating the drills is available it is desirable to use water to clear out the hole and a supply of water under pressure is not at hand.

The object of the present invention is to provide a drill so constructed that it can be operated by one fluid and at the same time furnish a supply of another fluid under pressure for blowing or washing out the hole.

With this object in view I have devised a drill a practical embodiment of which is shown in the accompanying drawing which shows a longitudinal section through the complete drill.

As shown the drill mechanism comprises a base 1 which may be secured to any suitable support (not shown). Mounted on the base 1 is a drill cylinder 2 in which reciprocates a piston 3, the movements of which are controlled by a valve 4, of any ordinary construction, the details of which are not shown. At the forward end of the piston 3 is secured a piston rod 5 which terminates in a chuck 6, of ordinary construction, adapted to hold a drill steel 7 provided with a central bore 8. On the base 1 forward of the drill cylinder 2 is fixedly secured a cylinder 9 which is in alinement with and surrounds the piston rod 5. The piston rod 5 is of larger diameter in its forward portion resulting in the formation of a shoulder 10. The cylinder 9 is also of two

diameters which fit the two diameters of the piston rod thus forming an annular chamber 11 which acts as a pump. Air or water is admitted to this annular chamber 11 through a pipe 12 and is discharged into the hole through a longitudinal bore 15 which registers with the bore 8 of the drill steel and communicates with the annular chamber of the pump cylinder through passages 14, here shown as leading to the face of the shoulder 10. A check valve 15 is provided in the pipe 12 to prevent the fluid from flowing back out of the cylinder through the pipe 12. Packing rings 16 and 17 held in by sleeves 18 and 19 are provided in the ends of the cylinder to prevent leakage around the piston rod.

The operation of the device will be easily seen from the drawing and description. As the piston 3 travels forward the shoulder 10 will move forward in the cylinder 9 drawing fluid into the annular pump chamber 11 through the pipe 12. As the piston 3 moves backward this fluid will be forced out through the passages 14 and 13 into the bore 8 of the drill steel and thence into the hole clearing it from rock cuttings and other material.

The cylinder 9 forms moreover not only a pump cylinder but also a guide for the piston rod, a feature which is very desirable in drills of this kind.

Although the drill is here shown as constructed so that the fluid is forced into the hole on the forward stroke of the drill piston it is evident that this could be reversed without invention and it is to be understood that the present showing and description discloses only one specified modification of my invention and other forms and modifications are included in the spirit and scope of the invention as expressed in the claims.

What I claim is:

1. In combination, a drill cylinder, its piston, a drill piston rod attached thereto and having a shoulder on the forward part, a cylinder surrounding said piston rod and coöperating with said shoulder to form a pump, a passage from said pump cylinder for conveying fluid to the hole and means for admitting fluid to said pump cylinder.

2. In combination, a drill cylinder, its piston, a drill piston rod attached to said piston having a forward portion of larger

diameter having a shoulder, a cylinder surrounding said piston rod and cooperating with said shoulder to form a pump, a passage leading through said rod from said
5 pump cylinder and adapted to supply fluid to the hole, and means to supply fluid to said pump cylinder.

3. In combination, a drill cylinder, its piston, a drill piston rod attached to said
10 piston, a hollow drill steel secured to said piston rod, a shoulder on said piston rod, a cylinder surrounding said rod and cooperating with said shoulder to form a pump, a passage for conveying fluid from
15 said pump through said piston rod to said hollow steel, a passage for admitting fluid to said pump cylinder, and a check valve controlling said passage.

4. In combination, a drill cylinder, its piston, a drill piston rod attached thereto 20 and having a shoulder on its forward part, a hollow drill steel secured to said piston rod, a fixed guide for the piston rod comprising a cylinder, said cylinder surrounding said rod and cooperating with said 25 shoulder to form a pump, a passage through the piston rod to convey fluid from said pump to the drill steel, and means for admitting fluid to said pump cylinder.

In testimony whereof, I have hereunto set 30 my hand.

CHARLES C. HANSEN.

Witnesses:

JOHN F. MOCK,
R. J. DAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."