

C. B. RICHARDS & W. H. JENKINS.

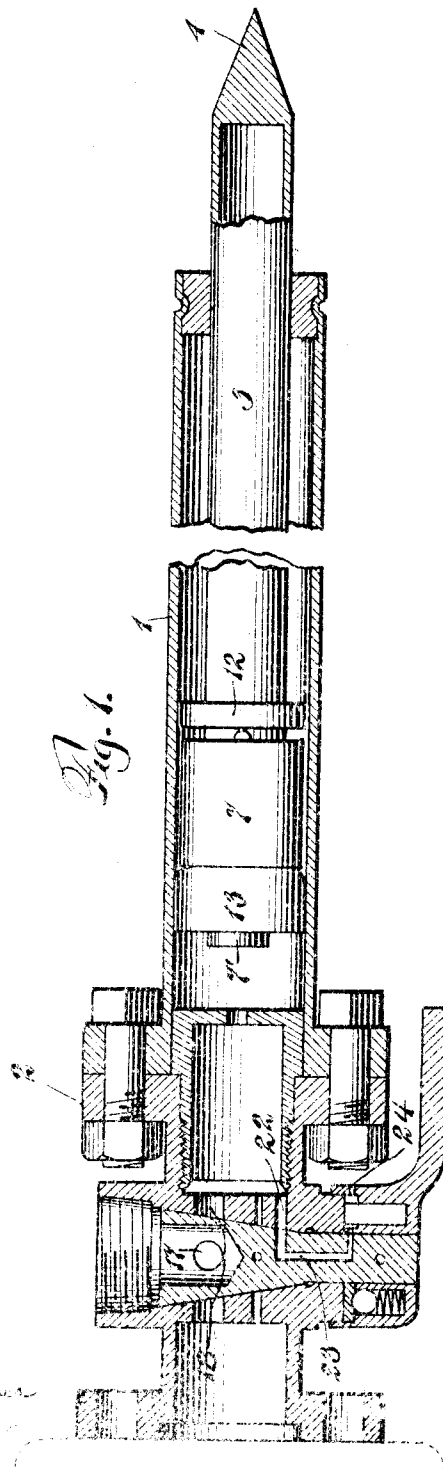
DRILLING MACHINE.

APPLICATION FILED OCT. 23, 1909.

1,063,598.

Patented June 3, 1913.

2 SHEETS-SHEET 1.



WITNESSES

Harvey L. Lechner
Darius B. Bingham

INVENTORS

Charles B. Richards
William H. Jenkins
by atty
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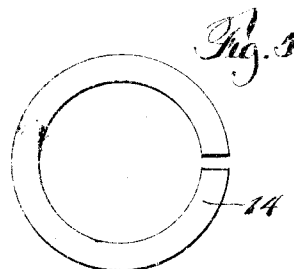
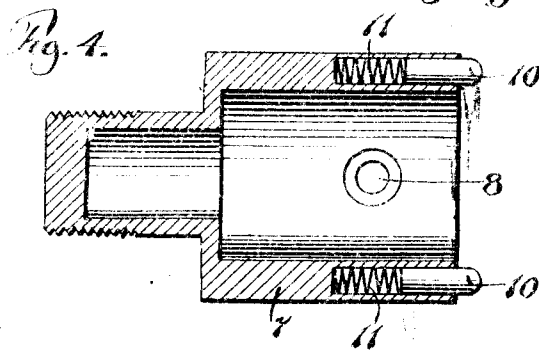
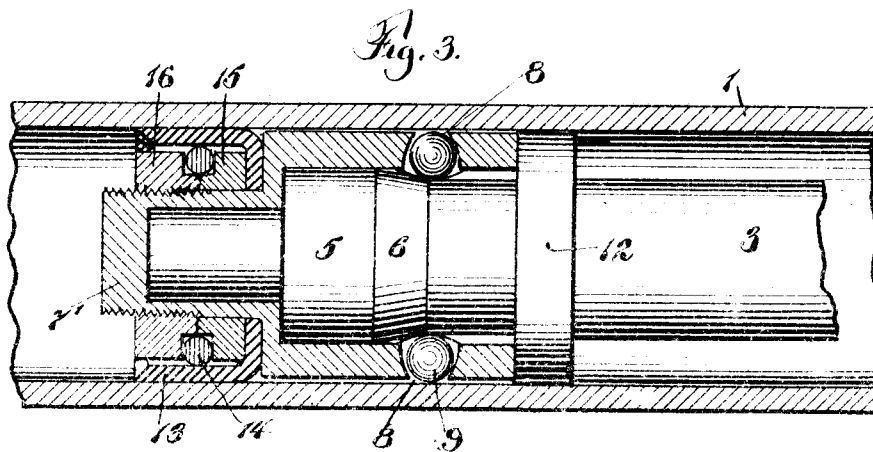
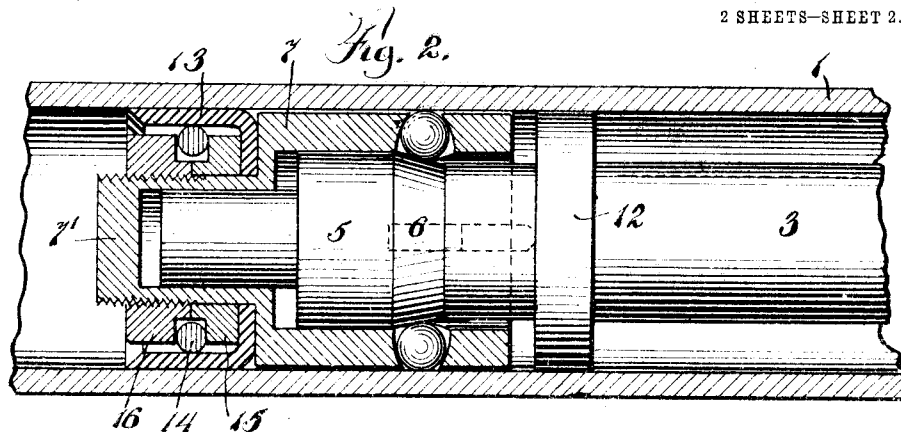
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2 SHEETS—SHEET 2.



WITNESSES

Harvey L. Leckner
Dorothy Bellinger

INVENTORS

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UNITED STATES PATENT OFFICE.

CHARLES B. RICHARDS AND WILLIAM H. JENKINS, OF CLEVELAND, OHIO, ASSIGNORS,
BY MESNE ASSIGNMENTS, TO THE CLEVELAND ROCK DRILL COMPANY, OF CLEVELAND,
OHIO, A CORPORATION OF OHIO.

DRILLING-MACHINE.

1,063,598.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed October 23, 1909. Serial No. 524,274.

To all whom it may concern:

Be it known that we, CHARLES B. RICHARDS and WILLIAM H. JENKINS, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful improvements in Drilling-Machines, of which the following is a specification.

Our invention has relation in general to drilling machines, and in particular to the feeding means employed in advancing such machines to their work. It has for its primary objects; the provision of an improved feeding device for drilling machines; the provision of an improved drill feed locking device; the provision of a fluid actuated feeding device wherein the feed device will be locked on cessation of pressure, and the provision of a feed device adapted to permit of the rocking of the drilling machine without rocking the feed bar thereon. These and such other objects as may hereinafter appear will attain by means of a structure illustrated in the accompanying drawings, wherein—

Figure 1 is a longitudinal section through the feeding device.

Figure 2 is an enlarged section through the locking device, showing the parts in locked position.

Figure 3 is a view similar to that of Figure 2, with the parts in unlocked position and.

Figures 4 and 5 are detail views of parts of the locking device.

In general, our invention is intended to provide a feed for fluid operated drilling machines which will lock itself thereby holding the machine in relation to the work being done, whenever there may be a cessation of the pressure sustaining the machine and feed device.

In carrying out our invention we provide a cylinder 1 having fitted therein a valve head 2, which is suitably secured to a drilling machine in a portion of where it is inserted in forced line. Figure 1 is in the usual manner. Mounted in the cylinder 1 is a feed bar 3 and in the portion of the bar 3 which is adapted to bear against the ground or other support. The bar 3 has

an enlarged portion 4 and a tapered portion 5 at its end adjacent the throttle valve head 2, the portion 5 having a piston head 7 slidably mounted thereon and extending over the tapered portion 6 of the feed piston. The head 7 is provided with two or more openings 8 in which are mounted balls 9 adapted to ride on the tapered portion 6 of the feed piston and to bear against the wall of the cylinder 1 when the piston head 7 is moved to the left (see Figure 2) and adapted to be free of the said tapered portion and of the cylinder wall when the head 7 is in its rest position to the right (see Figure 3), the former being locked and the latter unlocked position. The piston head 7 is normally held in locked position, the position of Figure 2, by means of pins 10 mounted in recesses formed in the head 7 and entering springs 11 which press the pins 10 against the collar 12 formed on the piston 3 adjacent the tapered portion 5, and force the head 7 away from the cylinder locking position.

The piston 3 is packed in the cylinder by means of a cup leather 13 secured on the back 14 of the head 7, the leather being spring held against the wall of the cylinder by the split ring 14, which is positioned by means of the follower 15 and the follower nut 16 screw threaded to the shank 17. Air or other fluid pressure is admitted by a throttle valve of the usual type, mounted in the throttle valve head 2, through the ports 17 and 18 into the cylinder 1 and is exhausted therefrom by the ports 22, 23 and 24.

The operation of the device is as follows. The parts being in the position of Figures 1 and 2, that is in locked position, pressure or fluid admitted to the cylinder 1 bears against the cup leather packing 13 and head 7 and compresses the springs 11, forcing the head 7 against the collar 12 and thereby permitting the balls 9 to ride off the tapered portion 5 of the feed piston 3 and free of the wall of the cylinder, the parts thereby assuming the unlocked position of Figure 3. During continuance of pressure the parts will remain in this position and the cylinder and with it the drilling machine

chine will be fed to the work. On cutting off pressure from the cylinder, the springs 11 through the pins 10 will normally force the head 7 back from the collar 12, the tapered portion 6 wedging the balls 9 against the wall of the cylinder, thereby locking the piston in whatever position it may be at the time of the cessation of pressure. The cup leather 13 has sufficient friction on the cylinder wall, due to the split ring 14, to secure the compression of the springs 10 and release the balls 9 when force is applied to the piston 3 tending to move it to the left, but the piston 3 cannot be moved to the right save by admission of pressure into the cylinder 1. One of the advantages of this automatic feature of the feed is that the feed piston or bar will not slide out when the machine is being carried around or set up.

Another advantage of the arrangement of packing and piston head is that the latter swivels on the feed piston 3 because of the friction of the cup leather 13 on the cylinder when pressure is admitted thereto, the result being that the feed piston will remain still when the machine is being rocked during the drilling operation, thereby preventing the point 4 from wearing out.

Other advantages will readily present themselves to those skilled in the art.

Having thus described our invention and illustrated its use what we claim as new and desire to secure by Letters Patent is the following:—

1. In combination, a feed cylinder, a head, a feed member having a lost motion connection with the head, locking means actuated by the relative movement of the feed member and head in one direction to lock the head in position in the cylinder, and actuated by the relative movement of the feed member and head in the other direction to release the head.

2. In combination, a feed cylinder, a head, a feed member having a lost motion connection with the head, locking means actuated by the relative movement of the feed member and head in one direction to lock the head in position in the cylinder, and actuated by the relative movement of the feed member and head in the other direction to release the head, spring means being provided to automatically secure the said relative movement to locked position when the device is not in use, and the movement to release position being secured by the admission of fluid pressure behind the head.

3. A drill feed locking mechanism comprising in combination, a cylinder, a feed member mounted therein, a tapered portion on the feed member, a piston head slidably mounted on the feed member, and a locking member coacting with the tapered portion of the feed member and with the cylinder to

lock the feed member, said locking member being operable through the movement of the piston head.

4. A drill feed locking mechanism comprising in combination a cylinder, a feed member mounted therein, a tapered portion on the feed member, a piston head slidably mounted on the feed member, locking members coacting with the tapered portion of the feed member and the cylinder operable through the movement of the piston head, and means normally holding the locking members in locked position.

5. In drilling mechanism, the combination with a feed cylinder and a head therein, of a bar swiveled in the head and having a limited longitudinal movement with respect to the head, locking means for maintaining the head against rearward movement when the bar is in one extreme of longitudinal movement with respect to the head, and means whereby the locking means is released when the bar is in the other extreme of longitudinal movement with respect to the head.

6. In combination, a cylinder, a feed member mounted therein, a piston head slidably mounted on the feed member, and wedging means operated by the relative movement of head and feed member for locking the feed member to the cylinder.

7. In combination, a cylinder, a feed member mounted therein, a piston head slidably mounted on the feed member, and wedging means operated by the relative movement of head and feed member in one direction for locking the feed member to the cylinder and operated by the relative movement of such parts in the reverse direction to release the feed member.

8. A drill feed locking mechanism comprising in combination, a cylinder, a piston head, a feed member having a lost motion connection with the piston head and provided with a tapering portion, a locking member carried by the piston head and coacting with the cylinder wall and the said tapering portion, and spring means for giving the piston head and the feed member relative movement in one direction to cause the said tapering portion to actuate the locking means and lock the piston head in position, the head being movable with respect to the feed member to release the locking means by the admission of pressure behind the said piston head.

9. A drill feed locking mechanism comprising in combination, a cylinder, a piston head, a feed member having a lost motion connection with the piston head and provided with a tapering portion, a locking member carried by the piston head and coacting with the cylinder wall and the said tapering portion, spring means for yieldingly maintaining the piston head against

longitudinal movement in the cylinder, and spring means for giving the piston head and the feed member relative movement in one direction to cause the said tapering portion to actuate the locking means and lock the piston head in position, the head being movable with respect to the feed member to release the locking means by the admission of pressure behind the said piston head.

In testimony whereof we have hereunto signed our names in the presence of the two subscribed witnesses.

CHARLES B. RICHARDS.
WILLIAM H. JENKINS.

Witnesses:

DOERING BELLINGER,
A. MARTIN.