

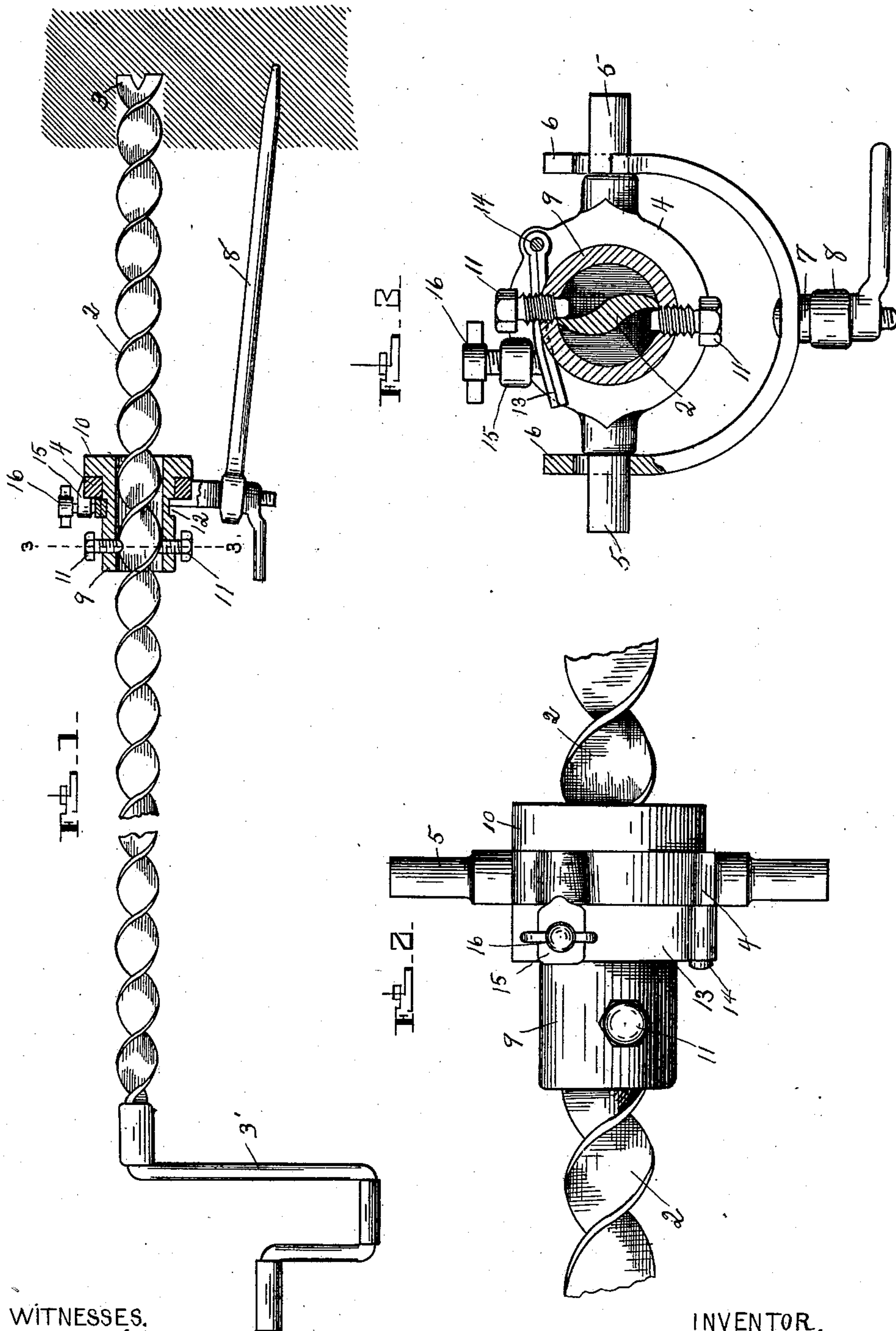
No. 721,895.

PATENTED MAR. 3, 1903.

L. K. KOONTZ.
COAL OR ROCK DRILL.

APPLICATION FILED MAR. 7, 1901.

NO MODEL.



WITNESSES.

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COAL OR ROCK DRILL.

SPECIFICATION forming part of Letters Patent No. 721,895, dated March 3, 1903.

Application filed March 7, 1901. Serial No. 50,186. (No model.)

To all whom it may concern:

Be it known that I, LOUIS K. KOONTZ, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Coal or Rock Drills, of which the following is a specification.

This invention relates to coal and rock drills; and the object thereof is to provide automatically-variable feed mechanism for operating directly on the active portion of the twist drill or auger and adapted to be actuated by rotation of the drill without regard to the manner in which power is applied to the latter.

The invention consists in the novel structural features and combination and arrangement of parts hereinafter fully described and claimed, and illustrated by the accompanying drawings, wherein—

Figure 1 is a vertical longitudinal sectional view of my improved mechanism shown in position on a drill. Fig. 2 is a plan view of the same. Fig. 3 is a vertical cross-sectional view taken on line 3 3 of Fig. 1.

Referring to the drawings, 2 represents a full-length twist-drill continuous from end to end and provided at its inner end with bit 3 and at its outer end with crank 3'. Any desired form of bit may be used, and a ratchet-lever or other actuating device (not shown) may be substituted for the crank.

4 represents a bearing-head provided with side trunnions 5, adapted to rest in notched arms 6 of chair 7, the latter being mounted on grip-bar 8 in usual manner. It will be understood, however, that so far as the present invention is concerned it is immaterial how head 4 is supported, so that when preferred a vertical post, well known in the art, may be used in place of bar 8. Revolvably mounted in the bore of head 4 is sleeve or barrel 9, having at its inner end the annular shoulder 10, adapted to bear against the inner face of head 4. Adjustable in the outer portion of this sleeve are the oppositely-positioned screws 11, which are engaged by opposite edges of the drill-twist, as clearly shown in Fig. 3, these screws comprising the only impediment to the free longitudinal movement of drill 2 through sleeve 9. Instead of

the screws the sleeve may be cast with integral inward projections, as will be understood, though screws are preferable, as they may be adjusted to compensate for wear. Also by means of these screws twist-drills varying in size may be used without providing a special sleeve for each size, it being only necessary to adjust the screws according to the size used.

Immediately behind head 4 sleeve 9 is formed with the annular peripheral depression 12 to receive the flat spring 13. The latter is here shown doubled upon itself around hinge-pin 14, projecting from the head 4. The free end of the spring extends beneath lug 15, projecting from head 4, with adjusting-screw 16 working through the lug and bearing on the spring and operating to either increase or diminish the frictional engagement of the spring with sleeve 9. The spring bearing in depression 12 prevents the sleeve from dropping forward in head 4. I do not restrict myself to the spring mechanism here shown for frictionally uniting head 4 and sleeve 9, as this may be accomplished in various ways without departing from the spirit or scope of my invention.

In operation rotary motion is applied directly to the drill by the crank or other actuating device at the outer end thereof. When the resistance against rotation of sleeve 9 in head 4, caused by spring 13, is greater than the resistance of the coal or rock against the bit, sleeve 9 will remain stationary, and screws 11, engaging the drill-twist, will cause the drill to feed forward while rotating. On the other hand, when the resistance to the bit is greater than the resistance offered by spring 13, sleeve 9 will rotate with the drill, and the latter will not advance. The resistance by the spring may be regulated by screw 16 to meet various working conditions. In practice the opposing forces—to wit, the mineral and the spring—are usually so balanced by means of the spring adjustment that sleeve 9 will maintain a practically constant rotation, though at slower speed than the drill, whereby the latter is advanced or fed forward as rapidly as desired.

With my improvement the operation of drilling is greatly simplified and labor less-

ened. With the appliances now generally used drilling is started with a short auger-section, and when the hole has advanced to the depth thereof the drill is withdrawn and
 5 a longer auger-section inserted, and to secure the desired depth it may be necessary to back out again and insert a third and longer auger or couple together the two auger-sections first used. All this is occasioned
 10 by the necessary use of a screw-threaded feed-bar, to which the auger is coupled, and should it be attempted to start in the first instance with a long auger-section, together with its coupled feed-bar, the machine would be of
 15 such length that there would not be sufficient room therefor in the mine-rooms, and in such event also the feed mechanism would be too far removed from the face of the coal to secure an efficient working. Hence it is always
 20 desirable to have the feed mechanism as close to the coal as practicable, so that the drill may be held steady and prevented from springing laterally or wobbling. With my improvements herein proposed a full-length auger
 25 may be used in the first instance, as it comprises the full length of the machine, no feed-bar being necessary. Also the feed mechanism may be positioned as close to the face of the coal as desired, as it operates alike on all
 30 portions of the twist-drill. The feed-bar being eliminated, the cost of the machine is much less than those now used.

By the terms "twist-drill" and "twist drill and auger" occurring in either the specification or claims I refer not only to those drills
 35 formed of bar metal which has been spirally twisted to secure the desired shape, as said terms in the sense herein employed contemplate all forms of drills having spiral or volute depressions, and while it is the primary
 40 object of the present invention to dispense with a feed-bar yet it will be understood that the automatically-variable feed mechanism may, if desired, be used on and in conjunction with such bar without departing from the scope of the invention.
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Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

50 1. The combination of a bearing-head having a circular opening, a sleeve of greater length than the head and mounted between its ends to rotate in the head, an annular enlargement at one end of the sleeve adapted
 55 to bear against one face of the head, a friction device secured to the opposite face of the head, the projecting portion of the sleeve being formed with an annular depression which receives the friction device thereby
 60 confining the sleeve against longitudinal movement, means for adjusting said device, and a drill extending through the sleeve and operatively engaging the same, substantially as described.

65 2. The combination of a bearing-head having a circular opening, a sleeve of greater length than the head and extending there-

through and rotatable therein, one end of said sleeve being formed with an annular flange adapted to bear against one face of the head, 70 a flat spring secured to the opposite face of the head and extending transversely across the same, the projecting portion of the sleeve being formed with an annular depression to receive the flat spring and be held thereby 75 against longitudinal displacement, means for adjusting the spring for increasing or diminishing the pressure thereof on the sleeve and a drill extending through the sleeve and operatively engaging the same, substantially as 80 described.

3. The combination of head 4 formed with a circular opening, elongated sleeve 9 fitting and adapted to rotate in the head-opening and formed with end flange 10 which bears 85 against one face of head 4, a combined tension and securing device for the sleeve for retarding rotation and for holding the sleeve against longitudinal displacement within head 4, a twist auger or drill extending through 90 the sleeve, and screws radially adjustable in sleeve 9 which engage the drill-twist, the adjustment of said screws compensating for wear and providing a range of adjustment whereby drills of varying size may be used 95 in the same sleeve 9, substantially as described.

4. The combination of a fixed bearing-head, a sleeve revoluble therein and formed with an annular external shoulder adapted to bear 100 against the forward face of the head, said sleeve being formed with an annular external depression at the opposite side of the head, a yielding device carried by the head adapted to bear in said depression for retarding 105 rotation of the sleeve and for holding the same against longitudinal displacement, internal projections on the sleeve, and a twist-drill working through the sleeve and operatively engaged by the said projections, sub- 110 stantially as described.

5. Feeding mechanism for rotating forwardly-advancing devices comprising a head or body having an unthreaded bore, a stem having a spiral exterior rotatable and movable 115 longitudinally in the said bore, and radially-adjustable devices carried by the head or body adapted to engage the spiral convolutions of the stem, substantially as described.

6. The combination of a rotatable longitudinally-fixed sleeve, means for retarding rotation thereof, a twist-drill extending through the sleeve, and inwardly-projecting radially-adjustable devices carried by the sleeve and adapted to be engaged by the drill-twist, sub- 125 stantially as described.

In testimony whereof I have hereto set my hand in presence of two subscribing witnesses.

LOUIS K. KOONTZ.

Witnesses:

J. M. NESBIT,
ALEX. S. MABON.