

(No Model.)

J. N. SOUTHWICK & A. WALKER.
COAL OR ROCK DRILLING MACHINE.

No. 563,087.

Patented June 30, 1896.

Fig. 1.

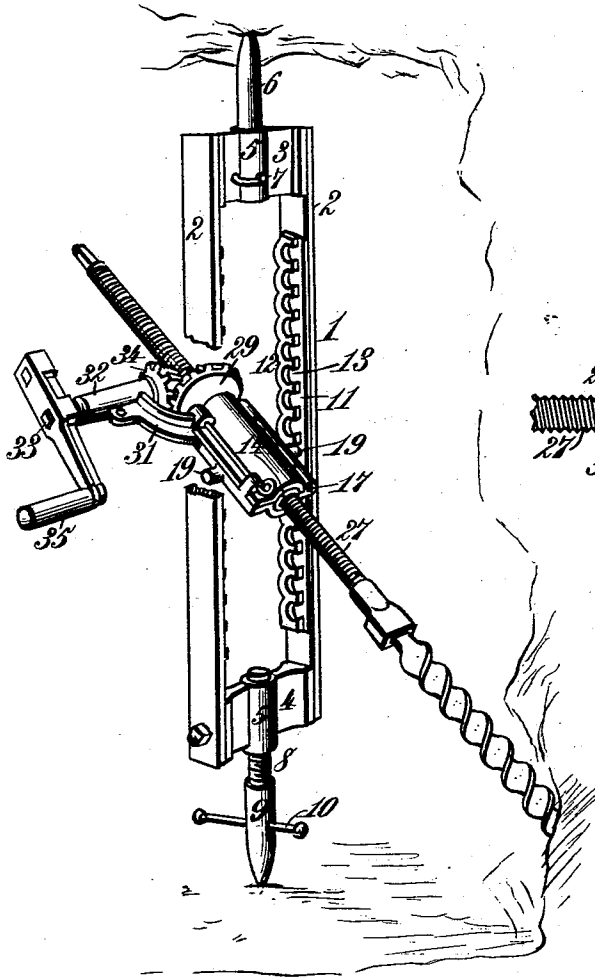


Fig. 2.

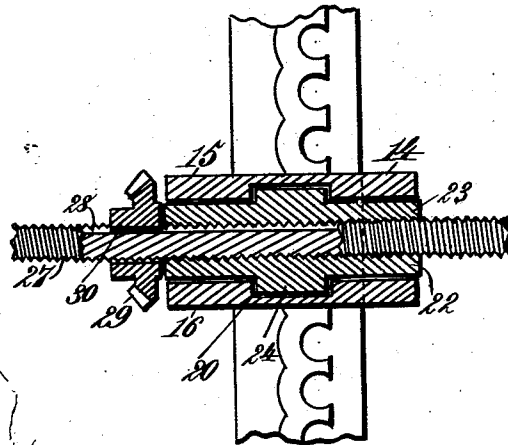
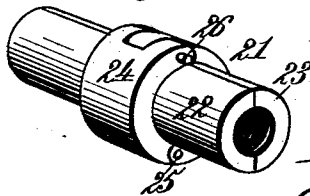


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

JESSE N. SOUTHWICK AND ALEXANDER WALKER, OF WHAT CHEER, IOWA;
SAID SOUTHWICK ASSIGNOR TO SAID WALKER; SAID WALKER ASSIGNOR
OF TWO-THIRDS TO WILLIAM THOMPSON AND THOMAS THOMPSON, OF
SAME PLACE.

COAL OR ROCK DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 563,087, dated June 30, 1896.

Application filed February 7, 1895. Serial No. 537,655. (No model.)

To all whom it may concern:

Be it known that we, JESSE N. SOUTHWICK and ALEXANDER WALKER, both citizens of the United States, residing at What Cheer, in the county of Keokuk and State of Iowa, have invented new and useful Improvements in Coal or Rock Drilling Machines, of which the following is a specification.

Our invention relates to an improved coal or rock drilling machine, and has for its object to provide improved means for automatically regulating the feed of the drill, whereby, when an abnormal resistance is offered to the drill when it encounters coal or rock of unusual hardness, the drill is automatically fed slower, thus rendering unnecessary an increased expenditure of power and preventing the threads on the drill-rod or feed-nut from being stripped or broken off, or from being subjected to excessive wear, and to provide a solid and firm support for receiving and sustaining the end thrust of the drill-rod.

To these ends our invention consists in the novel features and in the construction and arrangement of parts hereinafter fully described, and definitely pointed out in the claim following the description, due reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a perspective view of our improved drill in operative position. Fig. 2 is a vertical central section thereof. Fig. 3 is a detail perspective view of the sectional threaded feed-nut.

Referring to the drawings, the numeral 1 indicates a bifurcated frame comprising two uprights 2, united at their upper and lower ends, respectively, by cross-bars 3 and 4, bolted or otherwise suitably secured to said uprights. The said cross-bars are each provided with a central bearing 5, and in the bearing of the cross-bar 3 is fitted a pointed spindle 6, which is adjustably secured therein by a tail set-screw 7, tapped through a suitable threaded perforation formed in said cross-bar, and in the bearing of the cross-bar 4 is secured a threaded rod 8, over which is fitted an inte-

riorly-threaded spindle 9, provided with a 50 turn-rod 10.

To set up the frame 1 in position, the frame is placed between two faces or walls of rock in the usual manner and the spindle adjusted to the approximate distance by means of the 55 tail set-screw 7, and the frame is finally braced in position by turning the spindle 9 on the threaded rod 8.

To the adjacent sides of the uprights 2 are secured plates 11, each provided with a cor- 60 rugated raised flange 12, forming a series of semicircular recesses 13, the recesses of one plate lying opposite and registering with the recesses of the other plate for the purpose hereinafter described. Adapted to be sup- 65 ported between said uprights 2 is a sectional boxing 14, constructed in two halves 15 and 16, hinged together at one side, as at 17, and at their other side detachably secured to- 70 gether by a pin or bolt 18. Each of said sections 15 and 16 forms a complete semicircle which, when the sections are closed, consti- tute a hollow cylinder, and said boxing is pro- 75 vided at its opposite sides with trunnions 19, that are adapted to be seated in the recesses 13 on the uprights 2. The inner semicircular faces of the sections 15 and 16 are smooth, and midway between their ends are each provided with a semiannular groove or recess 80 20.

Within the boxing 14 is journaled a sectional feed-nut 21, comprising two semicir- 85 cular sections 22 23, screw-threaded upon their interiors and each provided upon its exterior, midway between its ends, with a semiannu- lar collar 24, that is adapted to fit within the annular groove 20 in the boxing 14. The sections 22 and 23, forming the feed-nut 21, are hinged together at one side, as at 25, and are detachably secured together at their other 90 edges by a pin or bolt 26.

Fitted in the threaded feed-nut 21 is the threaded drill-rod 27, provided at one end with means of any suitable or preferred con- 95 struction for gripping or holding the drill or auger, the thread of said drill-rod corresponding in size and pitch to the thread of the feed-nut. The drill-rod 27 is provided with a lon-

gitudinal groove 28, and loosely fitted over said drill-rod is a bevel-gear 29, provided with a spline 30, that engages said groove and causes said rod to turn with said gear when the latter is rotated, while at the same time the rod is permitted to pass freely through said gear as it is fed forward in the manner presently hereinafter described. Cast integrally with one of the sections of the boxing 14 is an arm 31, provided at its extremity with a bearing 32, in which is journaled a spindle 33, having rigidly secured at one end a bevel-gear 34, that gears with the gear 29 on the drill-rod, the outer end of said spindle being adapted to have fitted thereto a crank 35.

The operation of our improved drilling-machine is as follows: The frame 1 having been first set up in position in the manner described and the boxing carrying the feed-nut, drill-rod, and driving mechanism having been seated in the desired or appropriate recesses 13 on the frame, the drill can be pointed in the desired direction vertically by turning the same upon the trunnions 19, and can be adjusted laterally by turning the frame upon its spindles as axes. The drill may also be very quickly adjusted to the desired height by seating the trunnions in any two of the corresponding recesses 13 of the uprights 2. The drill having been adjusted to the desired position, the same is actuated by turning the crank 35, which, through the medium of the gear-wheel 34, rotates the gear 29 on the drill-rod. The latter gear, by means of the spline 30 engaging the groove 28 in the drill-rod, rotates the latter, and the thread of the drill-rod and the feed-nut 21 corresponding with each other the drill-rod is fed forward as it turns within the feed-nut. The boxing 14 clasps or embraces the feed-nut with sufficient friction to prevent the latter from turning with the drill-rod normally, but when the drill encounters a substance of unusual or abnormal hardness the feed-nut will partly partake of the rotary movement of the drill-rod and partially turn

therewith, thus feeding forward the drill with a decreased speed, whereby the strain upon the threads of the rod and feed-nut is reduced and the necessity of applying increased power to rotate the drill is avoided. The annular flange formed on the feed-nut and seated in the annular groove in the boxing forms a broad, solid, and firm seat or support for receiving and sustaining the end thrust of the drill, and being formed midway between the ends of the feed-nut permits the latter to be reversed or turned end for end within the boxing. After the hole has been drilled the drill may be instantly withdrawn by opening the boxing and feed-nut upon their hinges, when the drill may be drawn out from the drilled hole without rotating it.

We have illustrated our improved feed mechanism in connection with that type of drill known as a "post-drill," but it will be readily apparent that the same may be employed with equal advantage and in precisely the same manner with a "grip-drill."

Having described our invention, what we claim is—

In a drilling-machine, the combination with the frame, of the sectional boxing 14 consisting of two hinged sections provided with trunnions 19 seated in bearings in said frame, said boxing being provided with an internal annular groove 20, the sectional feed-nut 21 consisting of two hinged sections provided with a collar 24 fitting in the groove 20, a threaded drill-rod carried by said feed-nut, a wheel feathered on the drill-rod, and means for rotating said wheel, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JESSE N. SOUTHWICK.
ALEXANDER WALKER.

Witnesses:

WM. T. RAMSAY,
J. C. BEEM.