(No Model.) 2 Sheets—Sheet 1.

A. J. COOPER.

COAL DRILLING MACHINE.

No. 313,577. Patented Mar. 10, 1885.

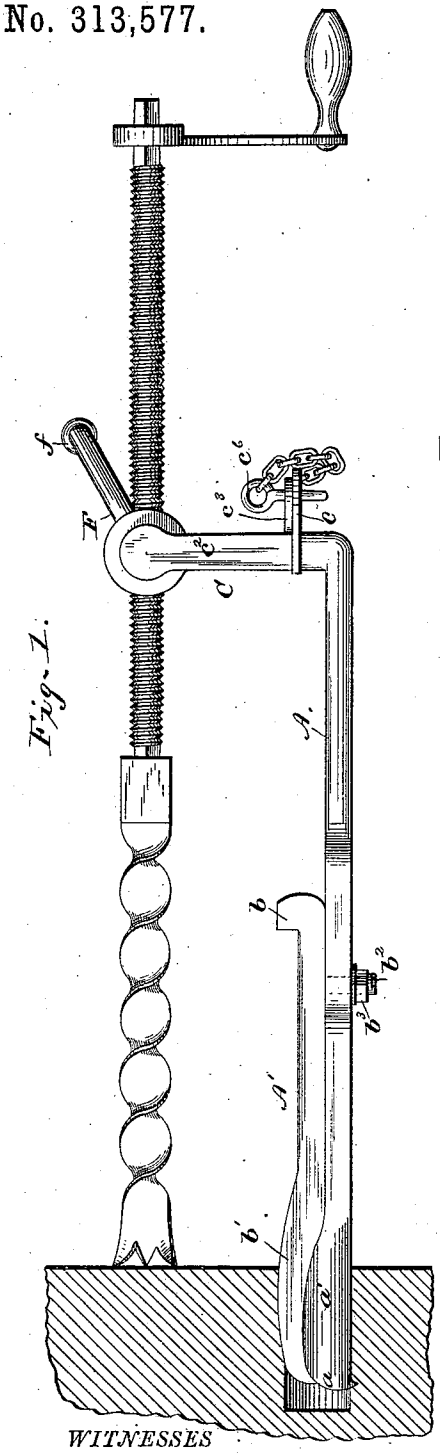


Fig. 1.

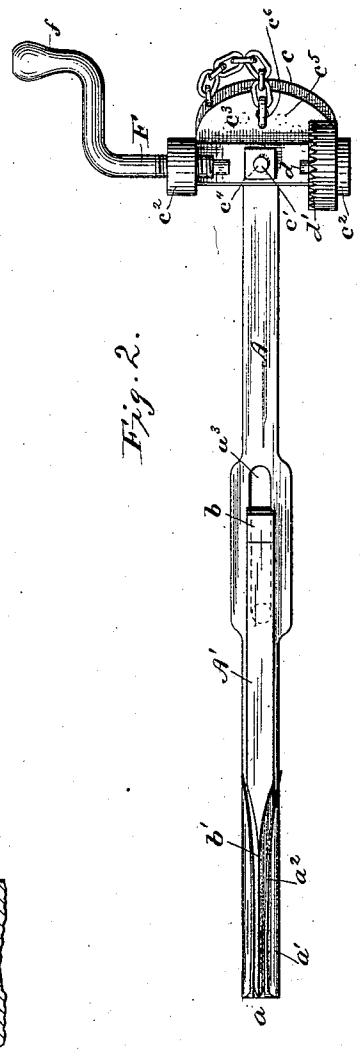


Fig. 2.

WITNESSES

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Fig. 3.

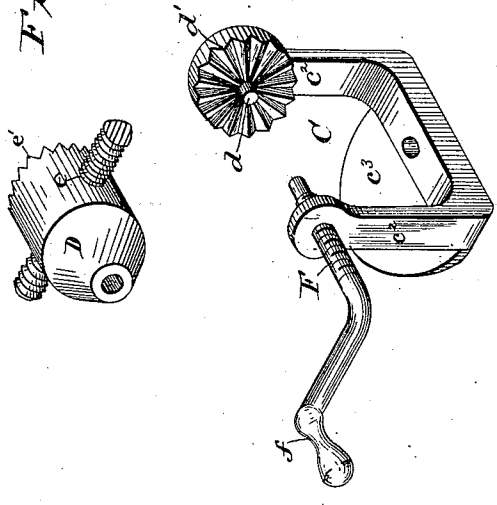
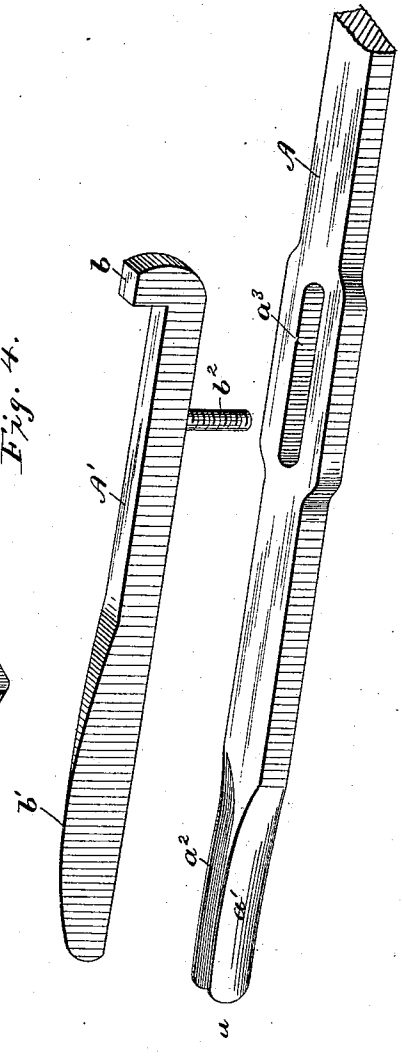


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALFRED J. COOPER, OF DURYEA, PENNSYLVANIA.

COAL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 313,577, dated March 10, 1885.

Application filed December 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALFRED J. COOPER, of Duryea, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Coal-Drilling Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

My present improvement in drilling-machines relates more especially to that class employed for drilling coal or rock; and it consists in the improved means devised for sustaining the machine in working position, also in the novel arrangement and application of the nut in which the feeding-screw or drilling-spindle is mounted and guided, all as hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, and Fig. 2 a plan view, of my improved drilling-machine. Fig. 3 is a detail illustrating the nut and its turret or supporting-yoke detached. Fig. 4 is a detail illustrating the means for clamping the drilling mechanism in position, the wedge being detached from the supporting bar or post.

Similar letters of reference in the several figures indicate like parts.

The letter A designates the supporting bar or post, one end of which is adapted to be inserted in a hole formed in the coal or rock, and is provided with means for wedging or clamping it firmly in position, while the other end carries the drilling mechanism. In the present instance the end *a*, which is to be thus inserted in a drill-hole in the coal or rock, is provided with a preferably rounded portion, *a'*, grooved on one side, as at a^2, to receive the approximately triangular or sharp edge wedge A'. This wedge is formed with a head, *b*, to facilitate its insertion and withdrawal, an angular wedge-shaped end, *b'*, and it is furnished with a bolt, b^2, passing through a slot, a^3, in the bar or post A, and held in place by a nut, b^3. When the end *a* of the bar or post A is inserted in the hole in the coal or rock, and the wedge A' is driven into place, the bar or post will be firmly and securely clamped and held in position. The angular or sharp edge of the wedge A', by forming a groove or way in the coal or rock as it is driven into place, takes a firm hold, and the post or bar is prevented from turning, while the dovetailed or grooved way in which the wedge moves serves to secure the latter in position, and not only assists in preventing the rotation of the bar or post, but prevents any deflection or bending of the wedge, as not infrequently occurs. The opposite or outer end of the bar or post A carries a face-plate, *c*, parallel with the direction of the bar or post A, and a post or pivot, *c'*, at right angles thereto. Mounted upon this pivot or post *c'*, and resting upon the face-plate *c*, is a standard or turret, C, provided with two arms, c^2 c^2, and the flange or brace c^3, the latter extending beyond the pivot *c'* and bearing upon the face-plate *c*. A nut, c^4, or other suitable fastening device, is applied to the post or pivot *c'*, to retain the turret C in place upon the bar or post A, but at the same time permitting it to rotate about the post or pivot *c'*. A series of holes, c^5, are made in the face-plate *c*, to receive a pin, c^6, passing through the flange or brace c^3, whereby the turret is adjusted and maintained in position when turned upon its pivot *c'*. The arms c^2 c^2 of the turret C support the adjustable and removable nut D, which latter is constructed and applied as follows: On the inner face of one of the arms c^2 are formed or attached a pin or stud, *d*, and a series of alternate grooves and projections, *d'*, and the opposite arm, c^2, is provided with a screw-threaded orifice coincident with the stud *d*. The nut D is formed with the transverse screw-threaded orifice *e*, and is provided at one end with a series of projections, *e'*, adapted to engage the projections *d'* on the face of the arm c^2, and with a hole or bearing to receive the stud *d*. The opposite end of the nut D is provided with a similar bearing to receive the end of the set-screw F, which latter is furnished with a crank, *f*, and passes through the threaded orifice in the arm c^2.

The advantages secured by this construction and arrangement of the feeding-nut D and its attachment to the turret C, as described, are numerous and obvious. The feeding-screw or

drilling-bar can readily be withdrawn and turned end for end, as is usual, by simply loosening the screw F, and the nut D can be set and held firmly with the drilling-bar at any desired angle relative to the bar or post A, whereby the drill can be made to operate without the necessity of first drilling a preliminary opening in the material in order to give support and direction to the drill or bit, as has heretofore been the practice. Moreover, larger or smaller feeding-nuts D can be applied to the turret without the necessity of changing any of the other parts of the machine, and by the employment of a relatively-short stud, *d*, the excessive springing of the screw or drilling-bar when removing the drill is obviated without in any degree weakening the structure.

The interlocking projections e' d' form a clutch, and in connection with the short stud *d* and screw F serve not alone to facilitate the adjustment of the parts, but also to hold them firmly and fixedly in position from the beginning to the end of the drilling operation, a matter of considerable importance, in that it not only prevents the bending of the feed-screw or drilling-bar and enables the drill to be properly directed, but it also obviates the necessity for the preliminary drilling of a hole to receive the end of the drill, thereby effecting a saving in time and labor, and at the same time securing all the advantages of a drilling-machine which can be quickly adjusted to bore holes at any desired angle, and from the same anchorage, if desired.

I claim as my invention—

1. In a coal or rock drilling machine, and as a means for securing the supporting bar or post A, and in combination with the longitudinally grooved or dovetailed end of the latter, the angular wedge sliding in the said groove and provided with a biting-edge, substantially as described.

2. In combination with the bar or post A, rounded and grooved as described, the wedge A′, having the bolt b^2 and head *b*, said wedge sliding in the groove in post A, substantially as described.

3. The combination, with the supporting bar or post A, provided with the pivot and face-plate, as described, of the turret having the flange or face-plate c^3, and the arms c^2 c^2, and the adjustable feed-nut secured between the arms, said turret being applied to the pivot and held in adjusted position by the pin c^6, passing through the perforations c^5 in the face-plate, substantially as described.

4. The combination, in a coal or rock drilling machine, and with the supporting bar or post, of the turret provided with the arms c^2 c^2, the one carrying the stud or pin and a series of projections, and the other a screw, and the feeding-nut with bearings in each end to receive the said stud and screw, and a series of projections interlocking with those on the turret-arm, substantially as described.

5. In combination with the nut D, for carrying the feeding-screw or drilling-bar as described, and provided with a recess at either end and interlocking projections on one end, the arms c^2 c^2, provided the one with a stud or pin and interlocking projections engaging those on the nut, and the other with a screw entering the opposite end of the nut, whereby the said nut can be released, removed, or locked firmly in position by turning the said screw, substantially as described.

ALFRED J. COOPER.

Witnesses:
WM. L. MARCY,
A. S. STEUART.