E. L. BURTON.

DRILLING MACHINE.

APPLICATION FILED FEB. 17, 1912.

1,041,013.

Patented Oct. 15, 1912.

3 SHEETS—SHEET 1.

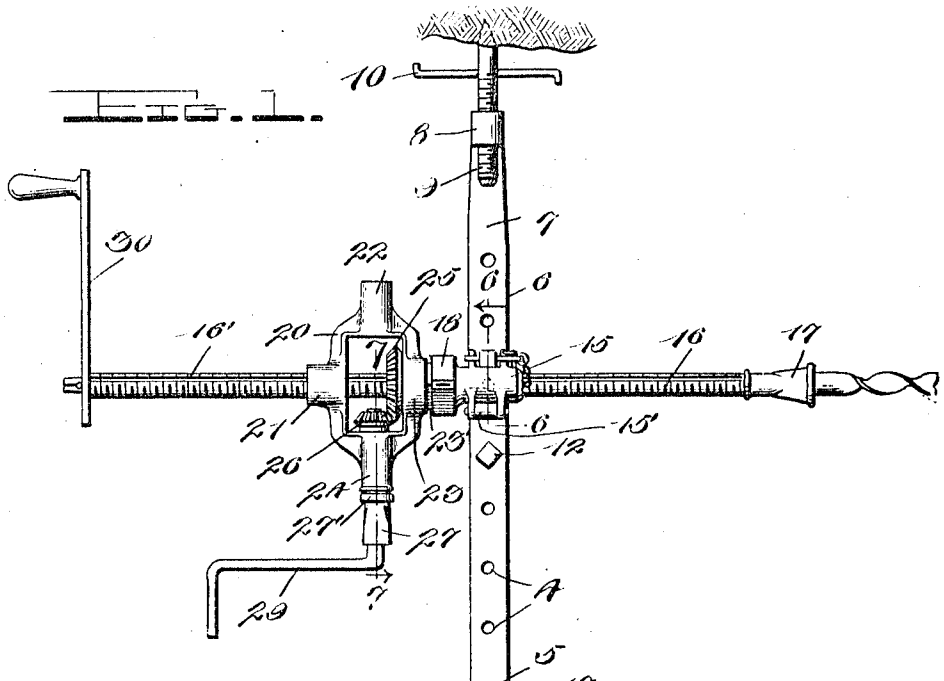

FIG. 1.

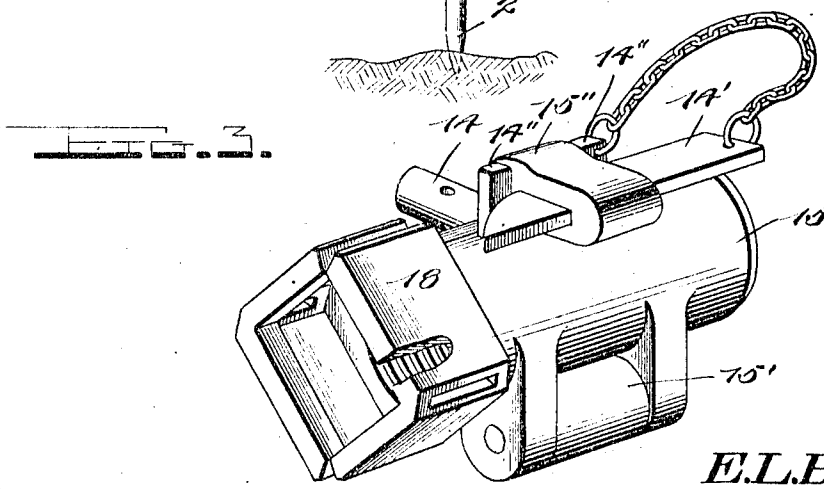

FIG. 3.

Witnesses

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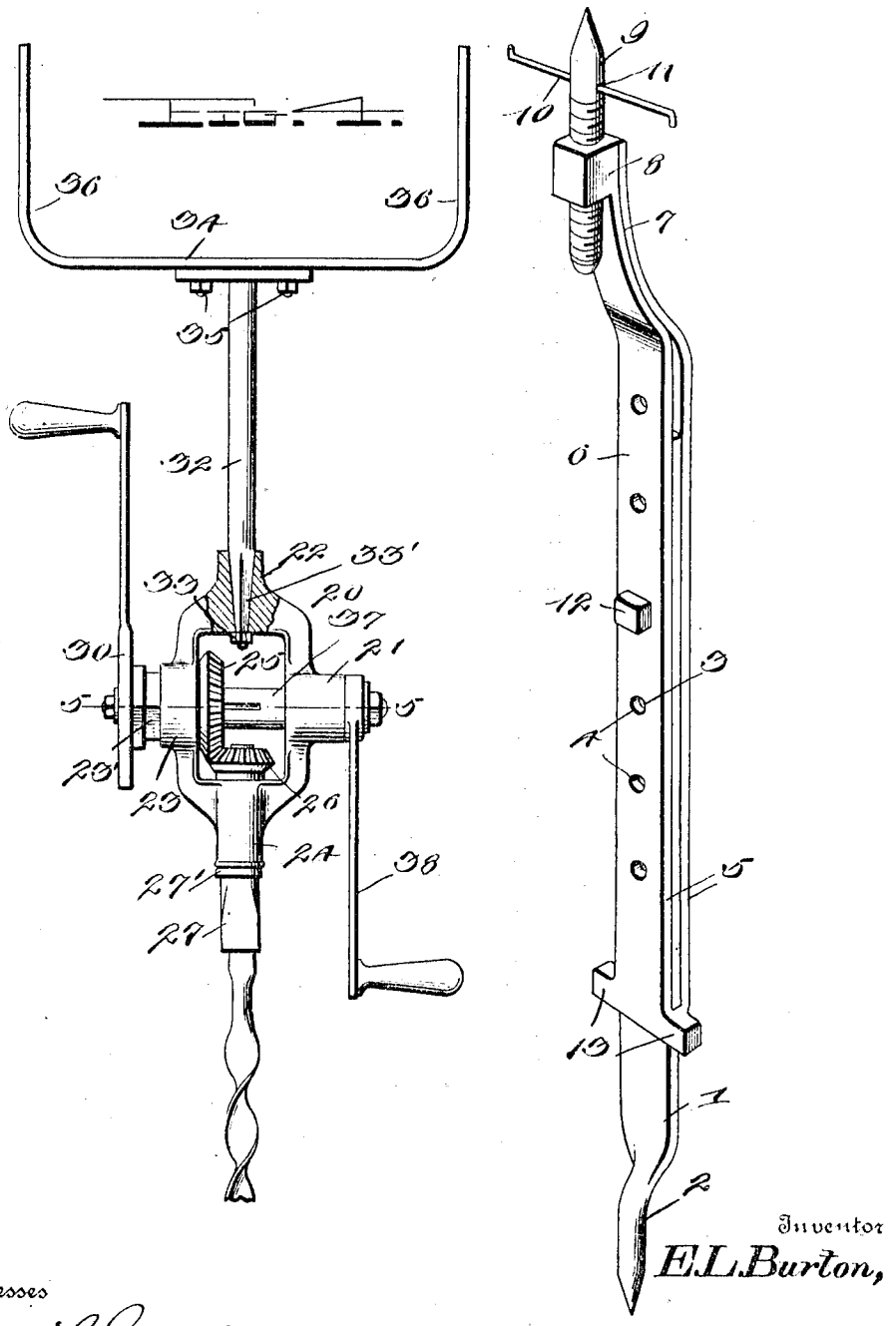
3 SHEETS—SHEET 2.

FIG. 2.



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3 SHEETS—SHEET 3.

Fig. 5.

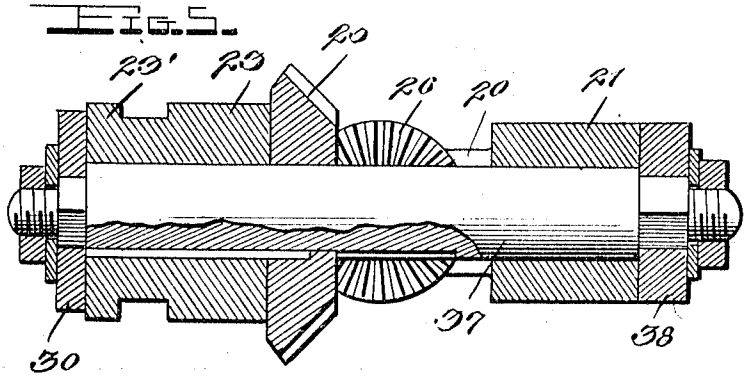


Fig. 6.

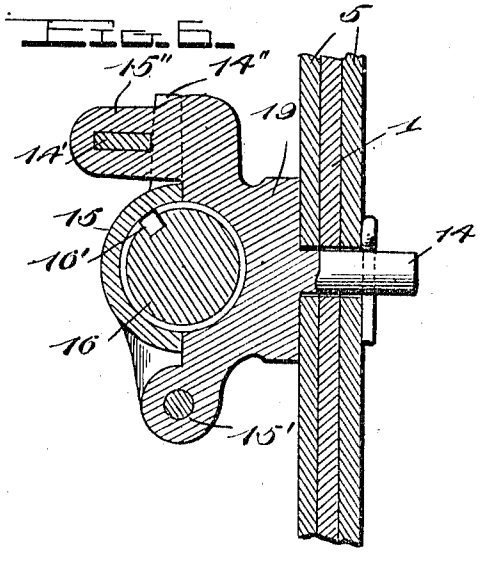


Fig. 7.

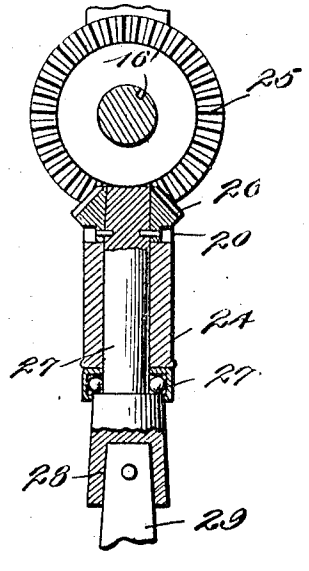
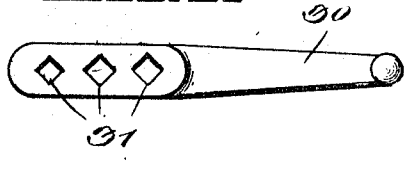


Fig. 8.



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UNITED STATES PATENT OFFICE.

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DRILLING-MACHINE.

1,041,013. Specification of Letters Patent. Patented Oct. 15, 1912.

Application filed February 17, 1912. Serial No. 678,245.

To all whom it may concern:

Be it known that I, ELISHA L. BURTON, a citizen of the United States, residing at Thealka, in the county of Johnson and State of Kentucky, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention comprehends certain new and useful improvements in drilling machines for use particularly in mining, and the invention has for its primary object an improved construction of drilling machine of this character whereby the machine may be easily transformed from a breast drill to a standard supported or "stope" drill, and vice versa, as desired.

A further object of the invention is an improved drilling machine which will, as above indicated, embody two drills in one, thereby relieving the miner or other operator of some of the apparatus which he has heretofore been compelled to keep on hand for his daily work, and at the same time reducing the cost which is incidental to the purchase and maintenance of the more cumbersome mechanism.

The invention has for a still further object to provide means for adjusting the various parts to suit the conditions that may arise, to provide a breast drill that will possess a maximum degree of efficiency and yet be light and strong, to provide a drilling machine which may be so adjusted that two operators may be employed in connection with the one machine, if desired, and to provide a drilling machine which will be composed of comparatively few and simple parts that may be easily manufactured, readily assembled and not liable to get out of order. And the invention also aims to generally improve this class of devices and to render them more useful and commercially desirable.

With these and other objects in view as will more fully appear as the description proceeds, the invention consists in the constructions, arrangements, and combinations of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention reference is to be had to the following description and accompanying drawings in which:—

Figure 1 illustrates my improved drilling machine arranged as a standard or "stope" drill; Fig. 2 is a detail view of the standard of the machine. Fig. 3 is a detail perspective view of a clamping sleeve designed to be adjustably and detachably connected to the standard and to receive the feeding mechanism of the apparatus. Fig. 4 illustrates the machine arranged as a breast drill. Fig. 5 is a sectional view on the line 5—5 of Fig. 4; Figs. 6 and 7 are similar views on the lines 6—6 and 7—7, respectively, of Fig. 1; and Fig. 8 is a detail view of one of the handles employed.

Corresponding and like parts are referred to in the following description and designated in the accompanying drawings by like reference characters.

The standard of my improved drilling machine is extensible, being constructed in lower and upper sections adjustably connected together. The lower section 1 is provided with the usual foot or spur 2 arranged to penetrate the ground so as to be securely held thereby when the standard is in position. The section 1 is formed with any desired number of apertures 3, which are arranged to register with corresponding apertures 4 in the spaced members 5 of the upper section 6 of the standard, as clearly indicated in Fig. 2. The lower section 1 moves in between the two members 5 of the standard 6, and the upper ends of said members are connected together as at 7 and one of them is formed with a threaded lug 8 in which a threaded rod 9 is mounted, the rod being pointed at its upper extremity and designed to be partially embedded in the roof of the tunnel or gallery in which the mining operation is being performed. The rod 9 is formed with a transverse opening 11 designed to receive a handle 10 whereby the rod may be turned for adjustment. In order to secure the two sections 1 and 6 of the standard together at the required adjustment, I provide a bolt 12 the shank of which is designed to enter any of the registering apertures 3 and 4, as clearly illustrated in Fig. 2. The upper section 6 of the standard is formed at its lower end with lateral projections 13 which securely hold together the

lower extremities of the members 5 and assist in placing the standard in the ground.

The pin 14 is designed to be inserted in any of the registering apertures 3 and 4, said pin projecting laterally and preferably forming an integral part of a split sleeve 15, the two parts of which are hingedly connected together as at 15′ and are located in closed position by means of a latch 14′ extending through a lug 15″ carried by one of the parts or sections of the sleeve, the latch 14′ being adapted to bear against lugs 14″ that are formed on the other section of the sleeve, as best illustrated in Fig. 3.

16 designates the feed bar which is provided at one end with a socket 17 for the reception of a drill. The sleeve 15 is enlarged at one end as at 18, the enlargement being polygonal in shape (square in the present instance) and adapted to receive a correspondingly shaped part 23′ of a frame 20. The sleeve is formed at one side with a flat face 19 whereby it may have proper bearing against the adjoining face of the standard. The feed bar 16 extends through the interiorly threaded sleeve 15 and also through the frame 20, which latter is formed with a squared end 23′ adapted to fit within the correspondingly shaped enlargement of the sleeve. The frame 20 is formed with four bearing sleeves set in quartering relation to each other and designated 21, 22, 23 and 24, respectively, the bearing sleeve 23 being formed with the squared extension 23′, just mentioned. Mounted in the frame 20 is a bevel pinion 25 which has a spline connection with a groove 16′ extending longitudinally in the bar 16. The pinion 25 meshes with a corresponding pinion 26 which is secured to one end of a shaft 27 which is mounted in the bearing 24 and which has a ball bearing 27′ and a handle receiving socket 28 as best illustrated in Fig. 7. One end of the shaft 27 carries, in the embodiment of the invention now being described, a crank handle 29. 30 designates another handle for the actuation of the device, this last named handle, as best illustrated in Fig. 8 being formed with a plurality of openings 31 any one of which is designed to receive the squared rear end of the feed bar 16 so as to detachably secure the handle on the feed bar at different positions to secure the desired leverage. By providing the two handles 29 and 30, the apparatus may be worked from the side or from the rear, as is evident.

From as much of the description as has preceded, in connection with the correlated views of the accompanying drawings, the operation of the embodiment of the invention illustrated in Fig. 1 will be apparent. In the practical use of the device the standard is set up and extended to the required degree according to the height of the tunnel or gallery in which the mining operation is to be performed, the sections 1 and 6 being suitably extended in relation to each other and the bolt 12 being then passed in through the registering apertures 3 and 4. The brace rod 9 is then turned by its handle 10 so as to dig into the roof of the tunnel or gallery, the standard being thereby securely held in place, in an evident manner. The pin 14 is then inserted in the apertures 3 and 4 at the desired elevation with the square extension 23′ of the bearing sleeve 23 fitting in the enlarged many sided socket 18 of the sleeve 15 and with the feed bar 16 passing through the sleeve and through the bearings 23 and 21 and the pinion 25. The pin 14 is secured in place in any desired way as by a cotter pin, as clearly illustrated in Fig. 6. It will thus be seen that by turning the handle 29, the feed bar 16 will be fed forwardly and simultaneously rotated, whereby the drill will dig into the rock or the like.

If desired to transform the drill from that embodiment of the invention illustrated in Fig. 1 to the form illustrated in Fig. 4, the frame 20 is removed from the enlarged end 18 of the sleeve 15, the feed bar 16 is removed and the frame 20 is used in a different relation, which I shall now describe.

Referring now particularly to Fig. 4, it will be understood that when the device is to be used as a breast drill a brace rod 32 is inserted in the bearing sleeve 22 of the frame 20, being secured therein by a nut 33 mounted on the threaded end of a stem or shank 33′, said brace rod carrying at its rear end a transversely extending breast strap 34 which may be secured thereto in any desired way, as by nuts and bolts 35. The ends of the strap 34, which is of metal as is usual, are turned rearwardly as indicated at 36, so as to extend along the sides of the operator's body. In this form of the device, a shaft 37 is journaled in the bearing sleeves 21 and 23, instead of the feed bar 16, the said shaft passing through the pinion 25 which is splined thereon and which meshes with the pinion 26 carried by the shaft 27. The shaft 27, in this instance, instead of being provided with the handle 29 has the drilling tool secured therein, and the handle 30 is secured to one end of the shaft 37, a corresponding and oppositely extending handle 38 being secured to the opposite end of said shaft, whereby the said shaft may be rotated to effect the rotation of the shaft 27 and the proper actuation of the drilling tool.

It will thus be seen that I have provided a very simple and efficient construction of drilling machine which may be easily transformed from a breast tool to a standard supported drill, and vice versa, whereby the one machine, with a few attachments may ful-

fil the purposes of what has heretofore required two separate and entirely distinct machines.

While the accompanying drawings disclose what I believe to be the preferred embodiment of my invention, it is to be understood that the invention is not limited thereto but that various changes may be made in the construction, arrangement and proportion of the parts without departing from the scope of the invention as defined in the appended claims.

Having now fully described my invention, what I claim is:—

A drilling machine of the character described, including a frame provided with four bearing sleeves arranged in quartering relation with each other, a shaft journaled in one of said sleeves, a pinion secured to the inner end of said shaft within the frame, another pinion mounted in the adjoining sleeve of the frame and meshing with the first named pinion and having an opening extending therethrough, and means for turning said pinions, the sleeve opposite the sleeve in which the shaft is journaled having a socket for the reception of a breast strap supporting rod and the two sleeves adjoining the sleeve in which the shaft is journaled, together with the pinion mounted therein being designed for the reception of a feed bar or a drive shaft.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ELISHA L. BURTON.

Witnesses:
R. C. BURTON,
W. R. DAVIS.