March 2, 1926. 1,574,768

G. G. TUTTLE

HANDLE FOR ROCK DRILLS

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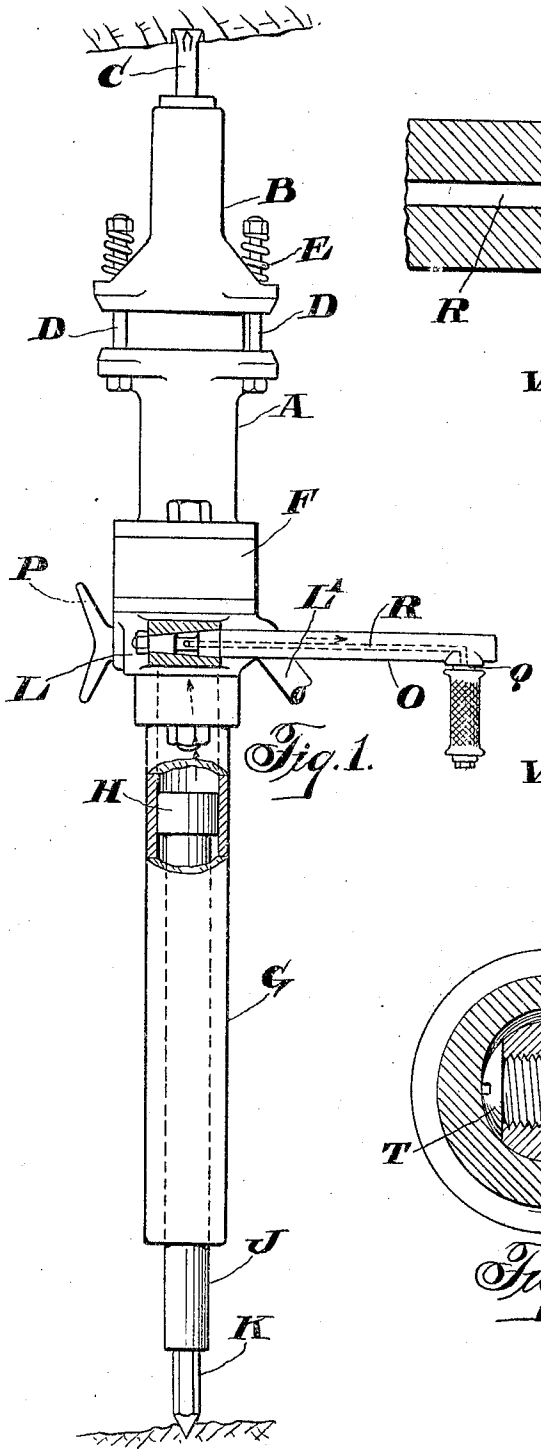


Fig. 1.

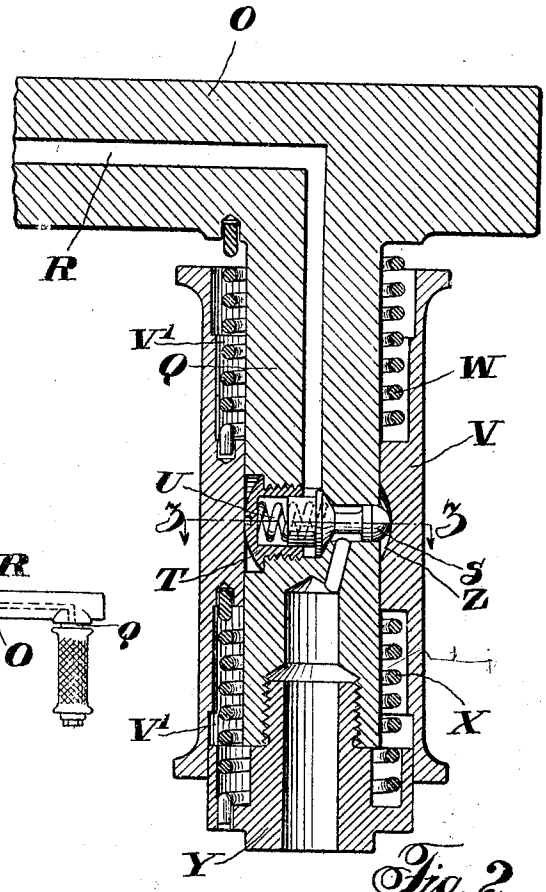


Fig. 2.

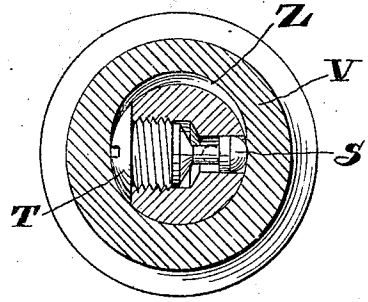


Fig. 3.

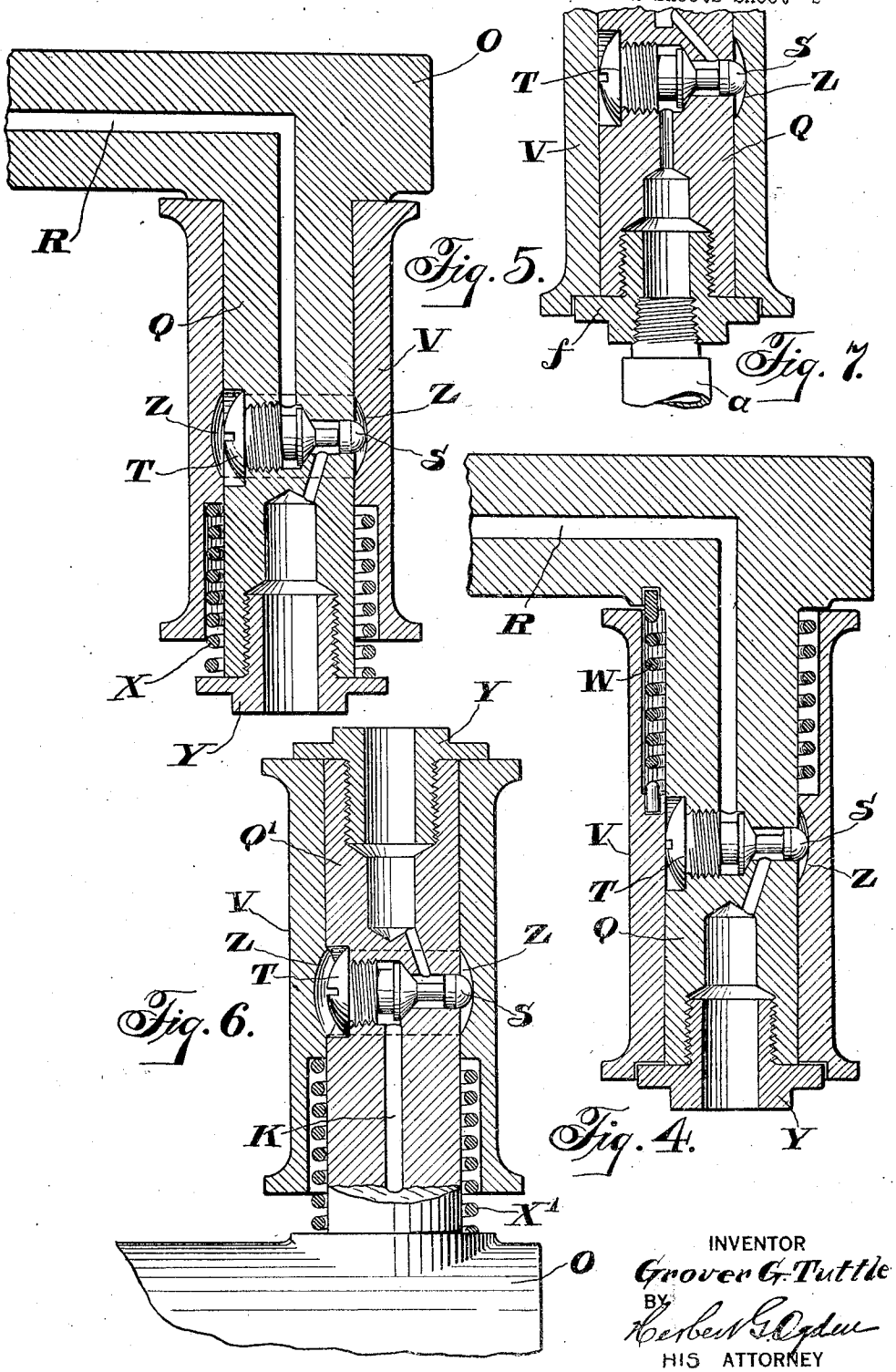
INVENTOR
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BY
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HIS ATTORNEY

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UNITED STATES PATENT OFFICE.

GROVER G. TUTTLE, OF PHILLIPSBURG, NEW JERSEY, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

HANDLE FOR ROCK DRILLS.

Application filed March 5, 1923. Serial No. 622,748.

To all whom it may concern:

Be it known that I, GROVER G. TUTTLE, a citizen of the United States, and a resident of Phillipsburg, county of Warren, State of New Jersey, have invented a certain Handle for Rock Drills, of which the following is a specification, accompanied by drawings.

This invention relates to fluid pressure operated rock drills of the hammer type, but more particularly to air feed control for the feeding element of a stope drill.

The operator desires to maintain full rotation and hammer power without reducing the air feed under certain conditions, but with the usual air feed controlling device he must necessarily remove his hand from the rotation handle, provided on the machine, and adjust the throttle accordingly. This must be done quickly or disastrous results may follow, which is often times the case.

The objects of the invention are to enable the operator to control the feeding element or the air feed cylinder directly from the rotation handle in a simple and convenient manner, and by means of a hand grip which may be either rotated or moved longitudinally, thereby providing a substantially instantaneous control.

Further objects of the invention will hereinafter appear, and to all of these ends the invention consists of the devices and features of construction shown in the accompanying drawings, in which—

Figure 1 is a side elevation partly in vertical section, of a stope drill embodying the invention;

Figure 2 is an enlarged detail longitudinal sectional view of a portion of the rotation handle shown in Figure 1;

Figure 3 is a transverse sectional view taken on the line 3—3 of Figure 2, with the parts in a different position;

Figure 4 is a detail longitudinal sectional view of a portion of the handle showing a modification of the invention;

Figure 5 is a similar view of another modification of the invention;

Figure 6 is a similar view of a further modification of the invention applied to an upward extension of the rotation handle, and

Figure 7 is a detail longitudinal sectional view of a portion of the handle showing a further modification of the invention, in which the supply of motive fluid to the air feed cylinder is controlled.

Referring to the drawing, a stope drill is illustrated in Figure 1 having the usual cylinder A and front head B carrying the drill steel C. The front head B is held to the cylinder A by the usual side bolts D and the cushion springs E. The cylinder A and its operative parts comprise the percussive element of the tool for imparting the impact blows of the piston to the drill steel. The drill steel may be rotated in any suitable manner but in this instance is shown rotated by a gear motor enclosed by the gear casing F.

The feeding element comprises the usual feed cylinder G in which the piston H moves. The piston rod J, which carries the rock engaging pointer K, is secured to the piston H. Between the gear casing F and the feed cylinder G is located the head block L to which is secured the rotation handle O. Motive fluid for operating the tool is supplied through the inlet L′. The throttle valve handle P actuates the throttle valve which controls the admission of motive fluid to the feeding element, as well as to the cylinder.

The rotation handle O as shown in this instance is provided with the downward extension Q forming a convenient portion which is usually gripped by the hand of the operator. A passage R in the rotation handle connects the air feed cylinder with the atmosphere and a valve S in the handle controls this passage, thus enabling the operator to regulate the feeding element in accordance with the requirements of work, without removing his hand from the handle. A spring U, one end of which seats in the plug T while the other end bears against one end of the valve, normally maintains the valve closed, thereby closing the passage R.

A sleeve V forming a hand grip, is mounted upon and surrounds the rotation handle extension Q. This sleeve V has recesses V′ at each end forming retaining means for the coil springs W and X which center the sleeve. The spring W is secured at one end to the rotation handle and at the other end to the sleeve V, while the spring X is secured at one end to the sleeve V and at the other end to a hollow cap or plug Y, which is threaded into the rotation handle extension Q to prevent removal of the sleeve from

said extension. The sleeve V is internally cupped at Z to provide a space for the spherical head of the valve S, in which space said head normally lies when the valve is seated.

When it is desired to reduce the pressure in the feed cylinder, as when the drill steel strikes a soft spot, or becomes stuck, the operator may either give the sleeve a slight turn, thereby forcing the valve S inwardly from its seat and opening the passage R thus permitting pressure fluid from the air feed cylinder to pass through the passage R to the atmosphere, or he may move the sleeve upwardly or downwardly and thereby produce the same result. Thus it will be seen that the operator does not have to remove his hand from the rotation handle.

In the modification shown in Figure 4 the sleeve V encircles the extension Q of the rotation handle, the cap or plug Y holding the sleeve from moving vertically. The spring W is secured to the rotation handle and to the sleeve V for maintaining the sleeve in its normal position as has been hereinbefore described. The head of the valve S seats in the cupped portion Z of the sleeve V. In order to force the valve S from its seat, to allow pressure fluid to bleed from the air feed cylinder to atmosphere, the sleeve V is turned about a quarter of a revolution.

In Figure 5, I have shown a modified form of my invention in which the ends of the spring X are not secured to the sleeve and plug but merely rest thereon. A slight space is provided betwen the sleeve V and the cap or plug Y, so that the valve S may be unseated by forcing the sleeve V downwardly, the spring X returning the sleeve to its normal position thereby seating the valve S.

In the construction shown in Figure 6 I have applied my invention to an upward extension Q′ of the rotation handle. The spring X′ in this instance is interposed between the sleeve V and rotation handle O. The unseating of the valve S is accomplished by forcing the sleeve V downwardly. It is extremely advantageous at times to have the rotation handle extension turned upwardly, especially when transporting the tool, so that the extension will not press against the carrier's back.

In Figure 7, I have shown the inlet *a* for motive fluid secured to the extension Q of the rotation handle, in this instance threaded into the cap or plug *f*. When the operator desires to admit motive fluid to the feed cylinder, it is necessary to rotate the sleeve V thereby forcing the valve S inwardly.

The device is simple and enables the operator to efficiently and substantially instantaneously control the air feed under all circumstances without removing his hand from the operating handle.

I claim:

1. In a rock drill, the combination with an element to be controlled, of a handle, a passage through the handle leading from the element to be controlled to the atmosphere, a valve through said handle for controlling the passage, a sleeve forming a grip mounted loosely on said handle for controlling the valve, a dished portion in said sleeve constantly in contact with the valve whereby the valve may be opened upon movement of the sleeve with respect to the handle, and springs in each end of the sleeve for holding the sleeve normally in balanced suspension and for automatically returning the sleeve to its mean position.

2. In a rock drill, the combination of an element to be controlled, of a handle, a passage through the handle leading from the element to be controlled to the atmosphere, a valve slidable transversely through said handle for controlling the passage, a sleeve forming a grip mounted slidably and rotatably on said handle for controlling the valve, a dished portion in the sleeve intermediate its ends to constantly contact with the valve whereby the valve may be opened upon slidable and rotative movement of the sleeve, a recess in each end of the sleeve, a plug for preventing removal of the sleeve from the handle, and springs in the recesses to hold the sleeve in balanced suspension and to return said sleeve to a mean position to permit closing of the valve, one of said springs being anchored at one end to the sleeve and at its other end to the handle and the other spring being anchored at one end to the sleeve and at its other end to the plug.

In testimony whereof I have signed this specification.

GROVER G. TUTTLE.