March 22, 1932. M. O'FARRELL 1,850,565

STOPER FEED CONTROL

Filed March 27, 1926

Fig. 1

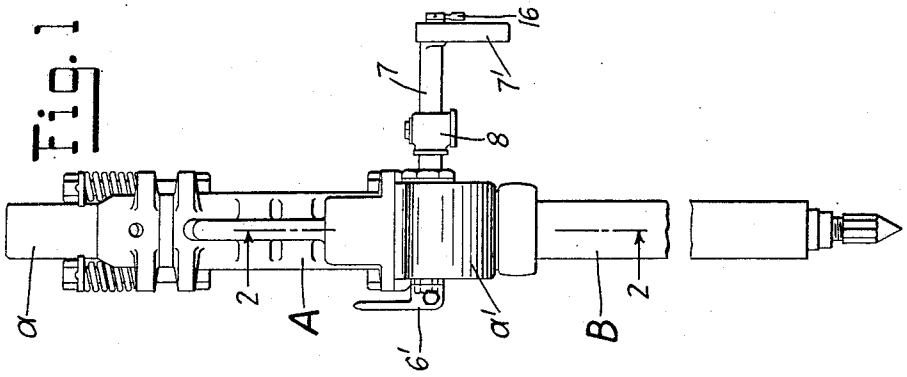


Fig. 2

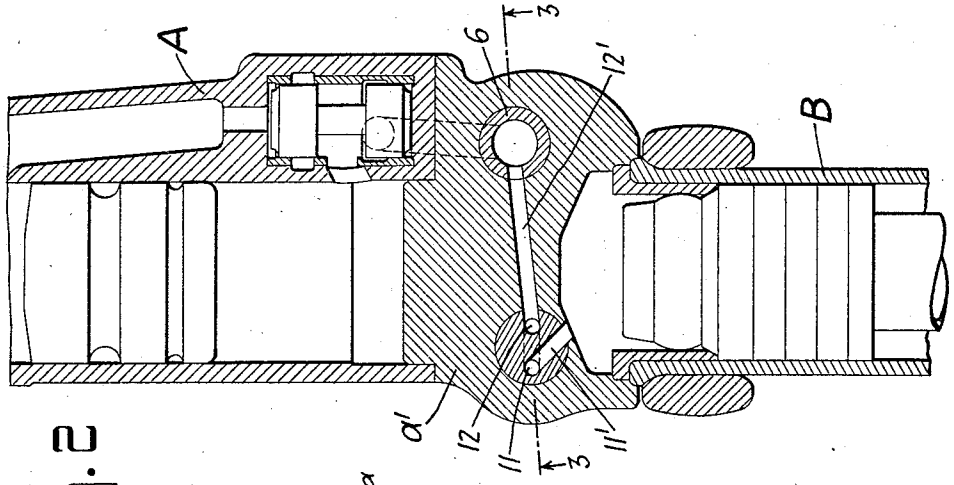


Fig. 3

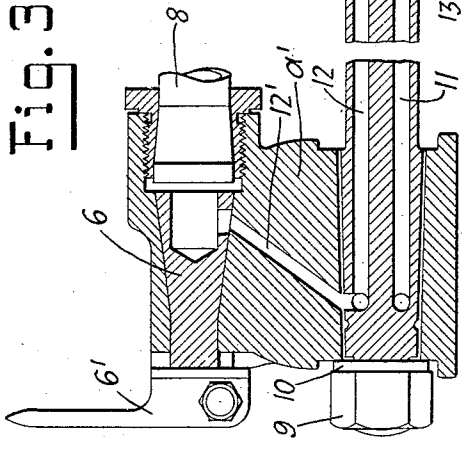


Fig. 5

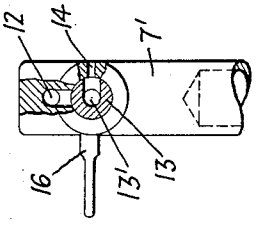
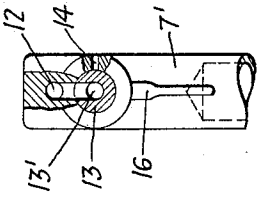


Fig. 4



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UNITED STATES PATENT OFFICE

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STOPER FEED CONTROL

Application filed March 27, 1926. Serial No. 97,870.

This invention relates to percussive machines used in mining, quarrying, and similar operations, particularly fluid pressure drills commonly known as stopers and provided with a feed leg operated by the motive fluid for feeding the drill bit to the work.

In machines of the type described the motive fluid supply to both the percussive motor and to the feed leg is ordinarily controlled by the throttle valve. In practice irregularities in the formation being drilled make it necessary quickly to vary the action of the feed leg. To do this by the throttle valve is not practical since the operator does not ordinarily have his hand upon this valve and a hasty movement of it is likely to modify the operation of the percussive motor. Moreover the throttle valve does not lend itself to instant and accurate adjustment of the operation of the feed leg. Attempts have heretofore been made to improve this condition by providing a supplemental control for the feed leg mounted upon or adjacent to the steadying handle of the stoper.

Among the objects of the invention are to provide a more positive and more flexible means of control for the feeding mechanism, to provide for varying the motive fluid supply directly from the steadying handle, and in general to improve prior arrangements in the interest of more satisfactory and efficient operation of drilling machines having a fluid pressure feeding device.

The invention consists in providing a supplemental throttle valve in the steadying handle for complete control of the supply for the feed leg. This is accomplished by directing the passage from the pressure fluid supply of the machine through the steadying handle and thence to the feed leg. The supplemental control valve is so arranged in the steadying handle as to control this passage and to be available for instant operation completely to control the motive fluid supply, to stop the supply, or to vent the feed leg. This arrangement provides convenient means for securing any desired movement of the feed leg and avoids the loss of motive fluid resulting with prior arrangements in which only a vent is provided upon the steadying handle.

In order to illustrate the invention, one concrete embodiment thereof is disclosed in the accompanying drawings in which:

Fig. 1 is a side elevational view.

Fig. 2 is a longitudinal sectional view substantially on the line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional view substantially on the line 3—3 of Fig. 2.

Fig. 4 is an end elevational view, partly in section, of the grip portion of the steadying handle.

Fig. 5 is a view similar to Fig. 4, showing the control valve in a different position.

Fig. 1 discloses a drilling machine of the stoper type comprising a percussive motor A, having a front head or chuck a for the working tool or drill steel (not shown) which is arranged to be advanced to the work by the usual feed leg device B. The motor A and leg B are joined together by the back head a' of the percussive motor, in which head is disposed the throttle valve 6 with its handle 6′ and also the steadying handle 7 with its grip portion 7′ by which the entire machine may be manually rotated or rocked to assist in the drilling operation. The pressure fluid supply pipe 8 connects directly with the throttle valve 6 in accordance with the usual practice. The percussive motor A and the feed leg assembly B may be of any suitable or desired type and, since they form no part of the present invention, further description of the same is omitted.

To give the operator complete and convenient control of the operation of the feed leg, suitable means for this purpose are provided upon the steadying handle 7. To this end the steadying handle is arranged to provide a part of the motive fluid passage extending to feed leg B and has a control valve or supplemental throttle disposed upon the grip portion 7′. As indicated in Fig. 3, the steadying handle 7 extends through back head a' and is held therein in fixed position by suitable means including nut 9 and lock washer 10. Within the shank of the handle 7 are spaced parallel passages 11 and 12. Passage 11 at its inner end connects with an angular passage 11′ (Fig. 2) extending to feed leg B, and passage 12 connects with a passage 12′

in back head a' leading to the source of pressure fluid. In the present instance passage 12′ is governed by throttle 6. The outer ends of passages 11 and 12 are arranged to be connected or disconnected by the supplemental valve in the grip portion 7′. This valve consists of a block 13 rotatably mounted in a suitable bore 7a and having an angular passage 13′ therein so disposed as to be always connected to passage 11 and arranged to connect the latter either to passage 12 or to a small port 14 in the handle 7 leading to atmosphere. Block 13 is held in bore 7a by a perforated retainer 15 sleeved over the projesting shank 13a of block 13 and having a screw threaded engagement in the bore. A control handle 16 is secured to shank 13a and its boss has frictional, valve holding contact with the upper face of retainer 15 by reason of a coil spring 17 seated in a counterbore in retainer 15 and bearing against the head of block 13.

As is clearly apparent the above arrangement makes the control of the feed leg assembly B most convenient. The operator keeps one hand upon the steadying handle 7 when running the drill and since the trigger or control 16 of valve 13 is directly upon the grip portion of the steadying handle the supply of motive fluid to and from feed leg B can be instantly regulated. Such instant control is most important in securing maximum results with a drilling machine of the described type particularly when drilling in rock of varying texture. If the point of the drill steel has a tendency to become jammed the supply of motive fluid to the feed leg can be immediately cut off or partly vented so that the percussive motor can continue to operate without excessive pressure from the feed leg. In fact the most flexible and instantaneous control of the feeding of the machine is possible.

Figure 4 illustrates the position of the valve handle 16 when the fluid pressure is passing in full volume to the feed leg. By rocking the control handle 16 slightly in either direction the pressure supply may be regulated to any desired extent. Upon swinging the handle 16 to the left horizontal position (Fig. 5) the supply of the pressure fluid to the feed leg is cut off and the pressure in the leg is vented through atmospheric port 14. If handle 16 is swung to the right horizontal position (not illustrated) the pressure is trapped in the feed leg.

While but one form of the invention has been herein shown and described it is to be understood that the invention is not limited to the specific details thereof but covers all changes, modifications and adaptations within the scope of the appended claims.

I claim as my invention:

1. In a fluid pressure drilling machine having a percussive motor, a feed leg for advancing the percussive motor to its work, a steadying handle secured to said machine comprising a shank portion and a grip portion, said shank portion having spaced axial passages terminating adjacent said grip portion, one of said passages connecting with the source of fluid pressure and the other with said feed leg, said handle having a counter bore at the outer end of one of said passages, a valve block in said counterbore having a passage arranged to connect said feed leg passage to said supply passage or to atmosphere, said block having a stem, a retainer member sleeved over said stem and having a flat outer face, an operating handle secured to said stem and having a flat face to cooperate with the face of said member, and a spring interposed between said block and said member yieldingly to maintain said faces in frictional contact.

2. A steadying handle for attachment to a fluid pressure stoping machine comprising a shank portion and a grip portion, said shank portion having spaced axial passages terminating adjacent said grip portion, said handle having a counter bore at the outer end of one of said passages and a vent port to atmosphere communicating with said counterbore, a valve block in said counterbore having means for interconnecting said passages and for connecting one of said passages to said vent port, said block having a stem, a retaining member sleeved over said stem and secured to said handle, an operating handle for said valve secured to said stem, and means establishing frictional contact between said member and said operating handle for maintaining said valve block means in adjusted position.

Signed by me at Detroit, Michigan, this 23 day of March, 1926.

MATTHEW O'FARRELL.