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FEEDING MECHANISM FOR ROCK DRILLS

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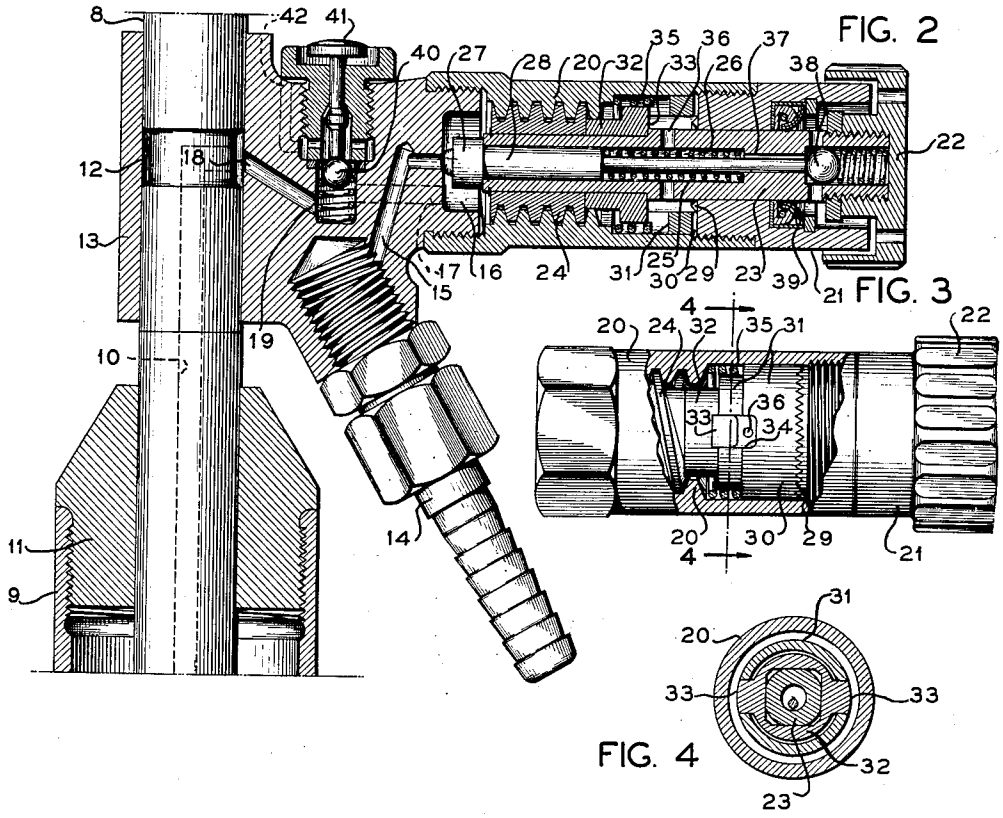
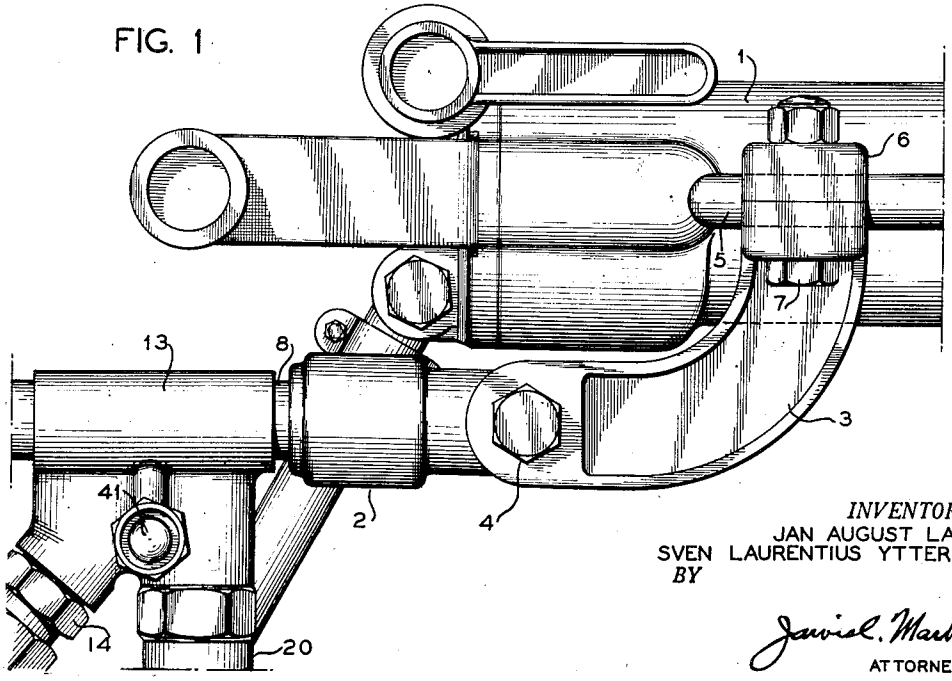


FIG. 2

FIG. 3

FIG. 4

FIG. 1



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FEEDING MECHANISM FOR ROCK DRILLS

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This invention relates to feeding mechanisms for rock drills comprising an expansible pressure fluid operated feed leg, a supporting device on said feed leg for hingedly supporting a rock drill on the feed leg, and a valve device for controlling the supply of pressure fluid to the feed leg. In such feeding mechanisms the pressure fluid, for instance compressed air, is supplied to the feed leg over a valve device separate from the control valve of the rock drill.

One object of the invention is to provide a valve device for a feeding mechanism of the type set forth, which is adjustable for different feed pressures. Another object of the invention is to provide a valve device, in which the adjustment of the valve device may be maintained irrespective of the socks to which the feeding mechanism is subjected during operation of the rock drill. A further object of the invention is to provide a valve device, which is cheap and simple in manufacture, and which is easy to assemble and to disassemble.

For these and other purposes we provide a passage in the valve device for conducting pressure fluid to the feed leg, a pressure reduction valve in said passage, a valve control member for setting said valve for different fluid pressures, and a coupling between said member and a stationary part for arresting the member in different positions of adjustment.

In the accompanying drawings one embodiment of a feeding mechanism according to the invention is illustrated by way of example. It should be understood, however, that the invention is not limited to the embodiment described hereinbelow and may be modified in several different ways within the scope of the claims.

Fig. 1 is a side elevation of the rear portion of a rock drill and a part of the feeding mechanism forming a supporting device for the rock drill. Fig. 2 is a longitudinal section through a portion of a feed leg and the valve device of a feeding mechanism according to the invention. Fig. 3 is a side elevation and partial section of a handle for the feeding mechanism forming a part of the valve device, and Fig. 4 is a section on line 4—4 in Fig. 3.

The rock drill 1 in Fig. 1 is provided with a feeding mechanism comprising a supporting device secured to a feed leg. The supporting device consists of a head 2, to which two side members 3 are hingedly connected by means of a bolt 4. The side members 3 are clamped to the conventional side bolts 5 of the rock drill by means of clamps 6 and bolts 7. The rock drill 1 is consequently swingable on the bolt 4 relative to the head 2. The head 2 of the supporting device provides a socket which is secured to the expansible feed leg, the latter being a device separate and detachable from the drill and consisting of a pair of telescopically arranged members 8 and 9, the member 8 of which carries the head 2 as is obvious from Fig. 1. The member 9, which is illustrated partially in Fig. 2, forms a cylinder, in which a piston, not shown, provided at the end of the member 8 which also is not illustrated, is movable in conventional manner. The member 8, which consists of a hollow rod, is provided with a passage 10 for pressure fluid opening at the end of said piston remote from a head 11 provided on the member 9, as is well known in the art and therefore not illustrated in the drawings. The head 11 is slidable on the rod 8. The rod 8 is provided with an annular recess 12, in which the passage 10 opens and which is enclosed by a housing 13 forming a part of a valve device for controlling the supply of pressure fluid to the feed leg.

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Pressure fluid is supplied to the valve device through a connection 14 screwed into the housing 13 and communicating with a passage 15 leading to a chamber 16 in the housing 13. From the chamber 16 passages 17 and 18 lead to the annular groove 12 over an intermediate chamber 19. A handle formed as an internally screw threaded sleeve 20 is secured to the housing 13 and extends substantially perpendicularly to the rod 8. The outer end of the sleeve 20 has secured therein a further sleeve 21, the outer end of which is partially enclosed in a knob 22. The knob 22 is secured to a spindle 23 forming a valve control member and carrying a screw 24 meshing with internal screw threads in the sleeve 20 with so much play that air may escape along said threads from the chamber 16. A spring 25 is disposed in a bore 26 in the spindle 23, said spring serving to push the pressure reduction valve member 27 towards a seat formed at the opening of the passage 15 in the chamber 16. The stem 28 of said valve member is slidable in the bore 26, and it is easily understood that the pressure of the fluid in the chamber 16, which communicates with the feed leg through the passages 17 and 18, is reduced with respect to the pressure of the live air in the passage 15 by an amount corresponding to the amount the screw 24 is screwed out by means of the knob 22. When the spindle 23 is screwed all the way down, the spindle forces

the valve member 27 towards its seat by engaging an abutment on the valve member 27.

The sleeve 21 is provided with radial teeth 29 at the inner end surface of the sleeve, such teeth cooperating with radial teeth 30 on a member 31, which is rotatable and axially displaceable within the sleeve 20. The member 31 consequently forms a coupling with the toothed end of the sleeve 21. The member 31 is in constant engagement with a member 32 through two claws 33 on the member 32 engaging two corresponding recesses 34 in the member 31. A spring 35 is inserted between an abutment in the sleeve 20 and an abutment on the member 31 and the spring 35 consequently acts to bring the teeth 30 into engagement with the teeth 29, so that the knob 22 may be arrested in any position of adjustment of the spindle 23. Air leaking from the chamber 16 through the threads of the screw 24 may flow through bores 36 in the spindle 23 through a passage 37 the opening of which is controlled by a spring-loaded ball valve 38. A packing 39 prevents air leakage around the spindle 23, and, as soon as the valve 27 is opened and the screw 24 screwed out a certain distance, the spring load on the ball valve 38 forces said valve to seated position in which the ball valve prevents air leakage from the chamber 16 to the atmosphere.

A spring-loaded ball valve 40 actuated by a push button 41 is disposed in the intermediate chamber 19, and upon actuation of the push button 41 opens a passage 42 through which air may escape from the cylinder of the feed leg.

What we claim is:

1. A feeding mechanism for rock drills comprising an expansible pressure fluid operated feed leg, a supporting device on said feed leg for hingedly supporting a rock drill on the feed leg, a valve device for controlling the supply of pressure fluid to the feed leg, passages in said valve device for conducting pressure fluid to the feed leg, a pressure reduction valve in said passages, a valve control member for setting said valve for different fluid pressures, and a coupling between said control member and a stationary part of the mechanism for arresting the control member in different positions of adjustment.

2. A feeding mechanism according to claim 1, in which the feed leg comprises a pair of telescopically arranged members and the valve device and the supporting device are provided on one of said members, the valve device forming a handle in which the valve control member is journalled and in which the coupling is disposed.

3. A feeding mechanism according to claim 1, in which the valve control member is rotatable in the valve device and the coupling consists of a toothed member rotatable with the valve control member and a second toothed member in the valve device which is engageable by said rotatable toothed member for holding the valve control member in different positions of adjustment.

4. A feeding mechanism according to claim 3, in which the valve control member comprises a spindle on which the rotatable toothed member is non-rotatable but axially displaceable against spring action for disengaging the second toothed member.

5. A feeding mechanism according to claim 1, in which the valve control member comprises a screw which forms an adjustable abutment for a spring-loaded valve and engages said valve in one extreme position of adjustment to press it towards a seat and close the pressure fluid supply to the feed leg.

6. A feeding mechanism for rock drills comprising an expansible pressure fluid operated feed leg, means for connecting said feed leg to a supporting device of a rock drill, a valve device on the feed leg for controlling the supply of pressure fluid to the feed leg, passages in said valve device for conducting pressure fluid to the feed leg, a pressure reduction valve in said passages, a valve control member for setting said valve for different fluid pressures, and a coupling between said control member and a stationary part of the mechanism for arresting the control member in different positions of adjustment.

7. A controlling device for rock drill feeding mechanisms including a cylinder element, a piston rod and piston element movable therein under the influence of fluid pressure, and means for hingedly connecting one of said elements to a rock drill, a housing on one of the elements, a first passage in said housing for supplying pressure fluid to the housing, a second passage in the housing for conveying pressure fluid to the element carrying the housing, a valve operable to control the flow of pressure fluid from said first passage to said second passage and acted upon by the fluid pressure, a spring acting on said valve in opposite direction to said fluid pressure, a member for controlling the tension of said spring, and means for positively maintaining said control member in different positions of adjustment relatively to the housing for keeping said spring pressure at a desired adjusted value.

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