Feb. 26, 1924. 1,484,643

C. C. HANSEN

HAND REGULATING VALVE FOR ROTATION MOTORS

Filed April 13, 1923

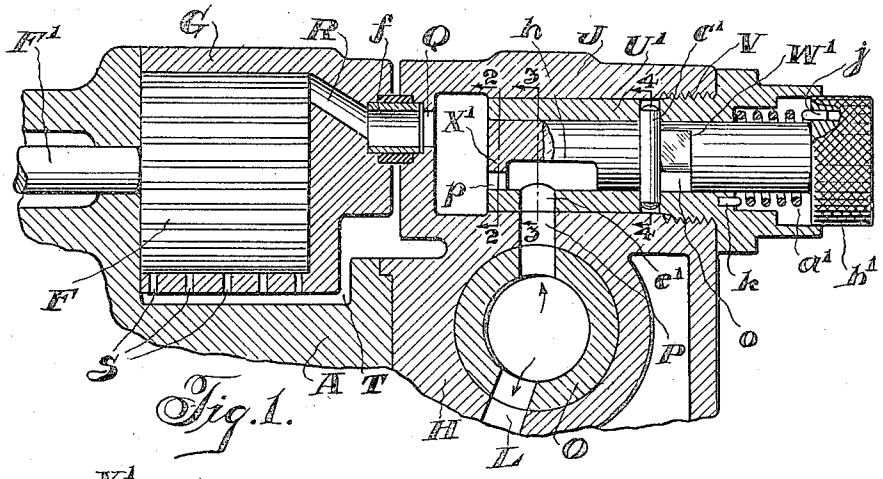


Fig. 1.

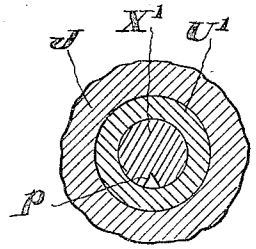


Fig. 2.

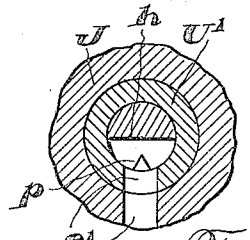


Fig. 3.

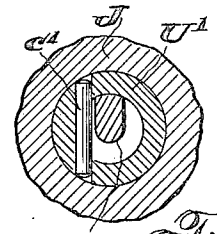


Fig. 4.

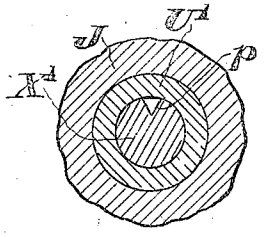


Fig. 5.

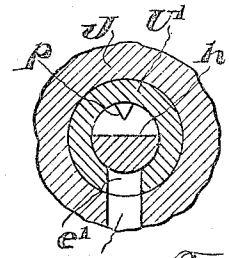


Fig. 6.

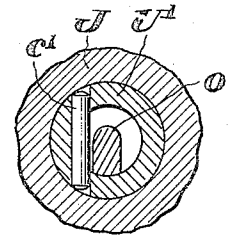


Fig. 7.

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UNITED STATES PATENT OFFICE.

CHARLES C. HANSEN, OF EASTON, PENNSYLVANIA, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

HAND REGULATING VALVE FOR ROTATION MOTORS.

Original application filed March 23, 1922, Serial No. 545,991. (Patent No. 1,456,234.) Divided and this application filed April 13, 1923. Serial No. 631,757.

To all whom it may concern:

Be it known that I, CHARLES C. HANSEN, a citizen of the United States, and a resident of Easton, county of Northampton, and State of Pennsylvania, have invented a certain Hand Regulating Valve for Rotation Motors, of which the following is a specification accompanied by drawings.

This invention relates to fluid actuated rock drills of the hammer type, but more particularly to a hand operated valve for regulating the supply of motive fluid to the rotation motor of such a machine, and this application is a division of my copending application Ser. No. 545,991 filed March 23, 1922, Patent No. 1,456,234, May 22, 1923.

In my copending application, Serial No. 514,816, filed November 12, 1921, I have disclosed an automatic and manually adjustable regulating valve for rotation motors, but the object of the present invention, while in some respects similar, is to procure a simpler manually adjustable device by means of which the supply to the motor may be increased when desired, or shut off entirely or regulated between these limits. Another object of the invention is to enable these results to be accomplished by means of a combined rotary and longitudinally movable valve, which automatically returns to normal position after having been temporarily moved for a given adjustment.

The drawings illustrate so much of a rock drill of the hammer type as will serve to make the invention clear, in which—

Figure 1 is a side elevation in longitudinal section of a rock drill having my regulating valve applied thereto;

Figures 2, 3 and 4 are detail transverse sectional views on the lines 2—2, 3—3 and 4—4, respectively, of Figure 1, with the valve in the starting or normal running position; and

Figures 5, 6 and 7 are similar transverse sectional views with the valve closed.

Referring to the drawings, a fluid actuated rotation motor of the gear type having gears F is mounted in the back end portion G of the cylinder A, and the back head H is provided with a valve chest J for the rotation motor regulating valve. One of the gears is provided with a spindle F′ carrying a pinion in the front head of the drill for rotating the drill steel. These last mentioned elements form no part of the present invention, and hence no disclosure thereof is made on the drawing.

Motive fluid is supplied to the machine through the inlet L and passing from the usual throttle valve O enters the valve chest J through the passage P. From the valve chest the motive fluid passes through the port Q and passage R to the rotation motor, exhausting from the motor through the exhaust ports S into the exhaust space T between the back end portion G and cylinder A and thence to atmosphere.

In accordance with the present invention, I provide the valve chest or casing J with a removable valve cage U′ having therein a rotatable and longitudinally movable valve stem W′ provided with a head X′ and a reduced or recessed portion *h* rearwardly of the head. A coiled spring *a′* located between the outer knurled head *b′* of the valve stem and the valve cage, has one end *j* secured to the head and the other end *k* secured to the cage, so that the spring *a′* not only acts as a retracting spring after the stem has been moved inwardly, but if the stem is rotated in a direction to wind the spring the valve and valve stem will be automatically returned or rotated in the opposite direction, to normal position, when the hand or fingers are removed from the knurled head *b′*. A stop in the form of a pin *c′* passes through the cage and through the recessed portion *o* of the valve stem for limiting the longitudinal movement of the stem. This stop pin *o′* also limits the rotary movement of the valve stem through an angle of about 180°, as will be apparent. The wall of the cage is provided with a supply port *e′* near its inner end, and the valve head X′ is provided with a port *p* through which motive fluid continually passes to the motor when the valve is in normal open or running position, as indicated in Figure 1 and in the detail views shown in Figures 2, 3 and 4.

By simply pushing or forcing the valve stem W′ and valve head X′ inwardly, the flow of motive fluid to the motor is increased, since the valve head X′ will be carried inwardly beyond the inner end of the cage U′, and more fluid may flow to the motor.

With the valve in the position indicated in Figure 1 illustrated in detail in Figures

2, 3 and 4, motive fluid is continually passed to the motor, and this is the normal or running position. By rotating a valve through an arc of about 180° as indicated in Figures 5, 6 and 7, motive fluid is entirely shut off from the motor. At intermediate rotary positions of the valve the recessed portion *h* of the valve stem permits more or less fluid to pass to the motor as desired, and the valve will be always automatically returned to normal position by releasing the spring *a'*.

I claim:

1. In a fluid actuated rock drill of the hammer type, the combination of a rotation motor and a valve for controlling the supply of fluid to said motor, said valve comprising a casing, a cylindrical valve cage removably secured in said casing and affording communication between the fluid supply and the motor, a rotatable and longitudinally movable valve stem in said cage having a head and a reduced portion rearwardly of the head, a spring for normally retracting the stem and a stop limiting the movement of the stem, the valve head normally permitting a continuous flow of motive fluid to the motor through the cage, and the supply to the motor being increased by moving the stem and valve head inwardly towards the motor.

2. In a fluid actuated rock drill of the hammer type, the combination of a rotation motor and a valve for controlling the supply of fluid to said motor, said valve comprising a casing, a cylindrical valve cage removably secured in said casing and having a longitudinal bore communicating with the inlet of the motor, a supply port in the wall of said cage at its inner end, a rotatable and longitudinally movable valve stem in said cage having a head and a reduced portion rearwardly of the head, a spring for normally retracting the stem, and a stop for limiting the movement of the stem, the valve head normally lying in the bore of the cage forwardly of the said supply port and permitting a continuous flow of motive fluid to the motor through the cage, and the supply to the motor being increased by moving the stem and valve head inwardly towards the motor, and decreased or shut off by rotating the valve stem.

In testimony whereof I have signed this specification.

CHARLES C. HANSEN.