

Nov. 22, 1927.

1,650,091

P. A. NELSON
AUTOMATIC LUBRICATOR

Filed July 12, 1926

2 Sheets-Sheet 1

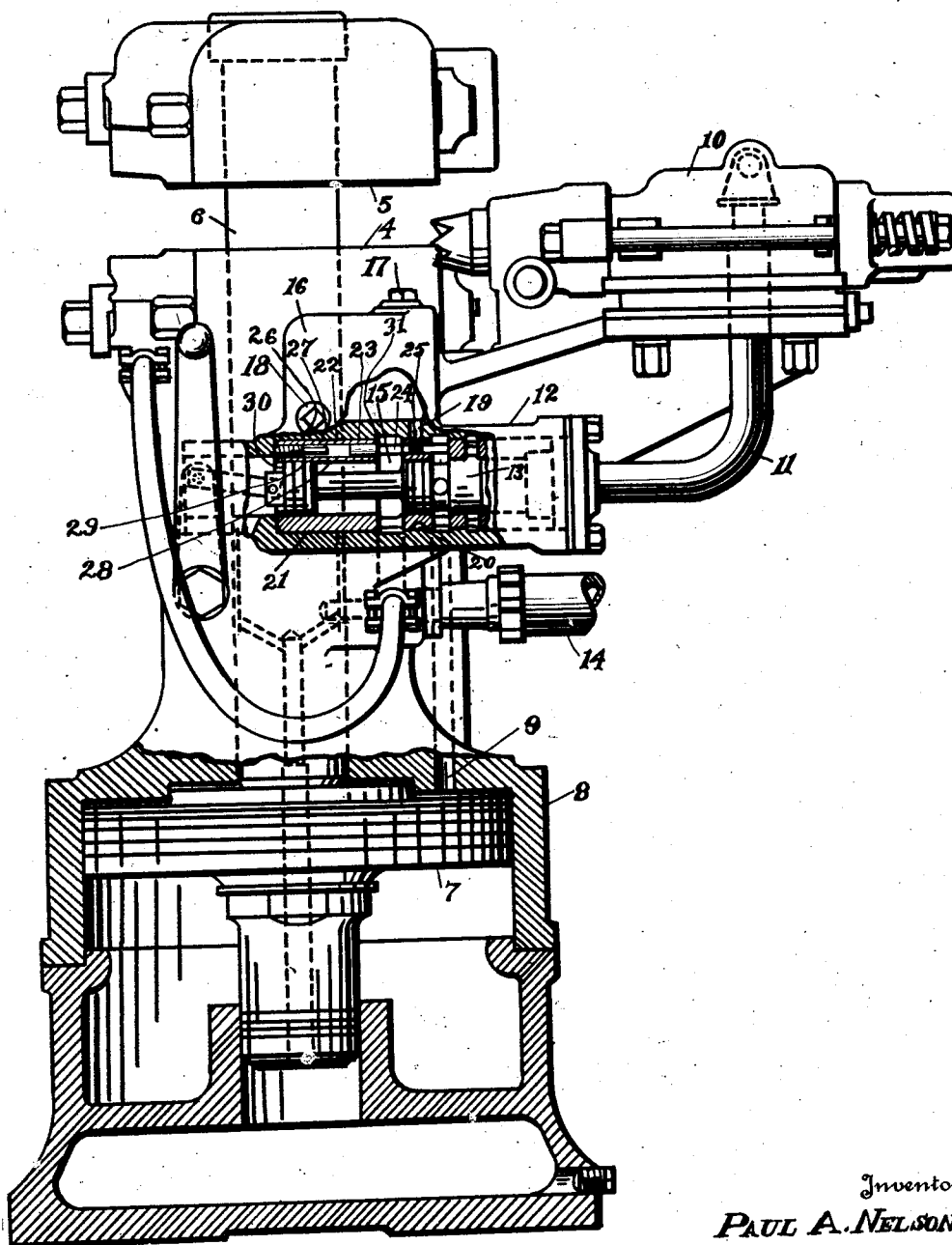


FIG. 1.

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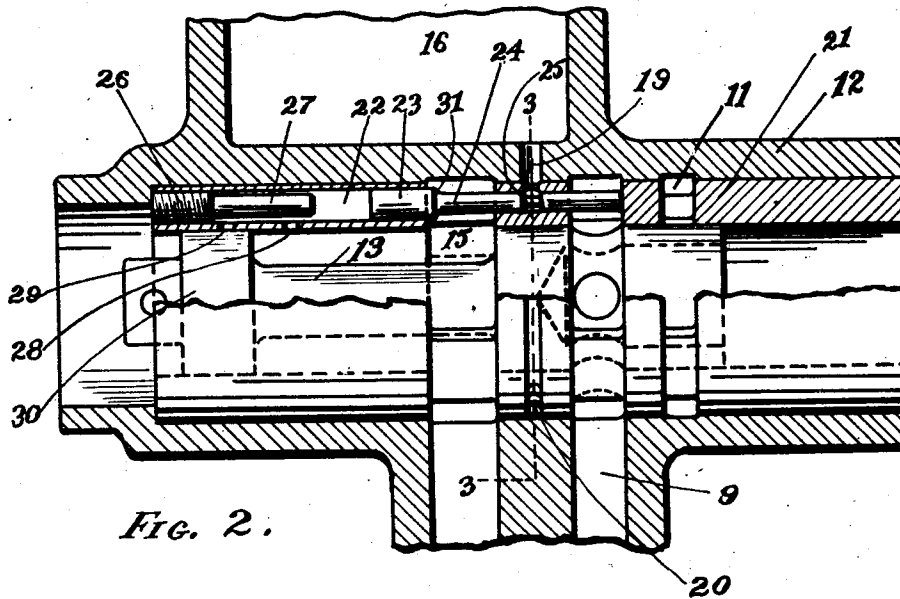
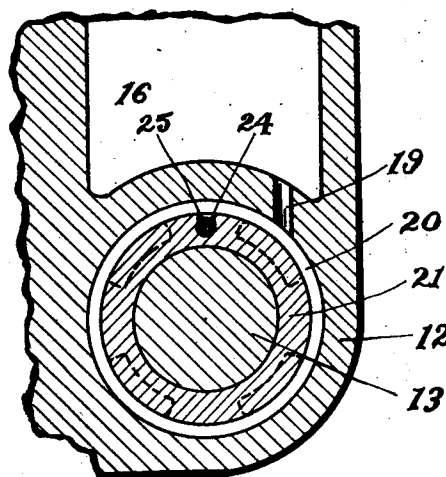
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UNITED STATES PATENT OFFICE.

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AUTOMATIC LUBRICATOR.

Application filed July 12, 1926. Serial No. 121,980.

The present invention relates more particularly to lubricating mechanism for rock drill sharpeners, though it may be employed in other analogous relations.

5 The object is to provide means of a simple and effective character, whereby lubricant is supplied to the motive fluid that enters the instrumentalities operated by such motive fluid, so as to lubricate the moving parts thereof.

In the accompanying drawings:—

Figure 1 is a view partly in elevation and partly in section of a drill sharpener equipped with the lubricating mechanism.

15 Figure 2 is an enlarged sectional view through the controlling valve and the lubricant delivery means,

Figure 3 is a cross sectional view on the line 3—3 of Figure 2.

20 The structure disclosed is a drill sharpener, and is preferably of the type described and illustrated in my co-pending application, Serial No. 110,137, filed May 19, 1926. It is believed to be unnecessary to go into detail regarding this structure except to state that it consists of a pair of work-clamping dies 4 and 5, the upper die 5 being carried by a plunger rod 6 that is connected to a piston 7. This piston is located in a cylinder 8, and motive fluid is supplied to the upper end of the cylinder through a passageway 9 to operate on the piston 7, and move the die 5 downward into coaction with the die 4. In order to clamp the work, 35 a dollying hammer is shown at 10, and motive fluid is supplied thereto through a conduit 11. Mounted on the side of the machine is a valve casing 12 containing a valve 13 that controls the supply of motive fluid to the passageway 9 and conduit 11 to control the operation of the piston 7 and dollying hammer 10. Motive fluid is supplied to the valve casing through a conduit 14 from any suitable source, this conduit being connected to a constant pressure chamber 15 in the valve casing.

45 As is fully set forth in the aforesaid co-pending application, when the valve 13 is moved to the right, motive fluid from the chamber 15 is admitted first to the passageway 9, whereupon the piston 7 is moved downwardly and thereafter motive fluid is supplied to the conduit 11 to cause the actuation of the dollying hammer.

The present invention relates to means for 55 introducing lubricant into this motive fluid, so that the moving parts of the said instrumentalities are properly lubricated. To this end there is formed on the side of the machine and on the upper side of the valve 60 casing 12 a lubricant reservoir 16 having a filling opening closed by a removable plug 17, and also preferably provided with a drain opening closed by a plug 18. This reservoir has an outlet 19 in its bottom 65 that opens into an annular groove 20 formed in the valve cage 21. Said valve cage is provided in its upper side with a longitudinal bore forming a cylinder 22, this bore opening into the constant pressure chamber 15. A piston 23 reciprocates in the bore 70 and has a stem 24 that extends across the groove 20 and is provided with a reduced portion, forming a pocket 25 that is movable between a position in said groove and a position in the pressure chamber 15. A plug 26 in the outer end of the bore 22 has a stop pin 27 in the path of the piston. Ports 28 and 29 afford communication between the bore 22 and the outer portion of 75 the valve chamber. The valve 13 has an outer head 30 that is movable across the ports 28 and 29.

Assuming the parts as shown in Figures 1 and 2, it will be understood that fluid 85 under pressure is in the chamber 15, but this fluid is cut off from the passageway 9 and conduit 11. At the same time, the port 28 is opened to the motive fluid in the chamber 15, while the port 29 is closed by the head 30 of the valve 13. If now, the valve is moved to the right, the passageway 9 is first opened to motive fluid, and thereafter the conduit 11 is also opened to said motive fluid. In this movement the head 30 first 90 closes the port 28, thus cutting off motive fluid from the piston chamber 22, and afterwards said head uncovers the port 29 to atmosphere. The consequence is that the motive fluid in the chamber 22 will exhaust 100 and the motive fluid acting against the shoulder 31 of the piston 23 will cause said piston to move to the left. This will carry the pocket 25 filled with oil into communication with the pressure chamber 15, so that the oil will be delivered into the motive fluid supply. When the valve is again moved to the left, the port 29 will first be closed and 105

the port 28 thereafter opened, whereupon motive fluid will pass into the chamber 22, and operating against the full area of the piston 23, will overcome the pressure against the shoulder 31 and move the piston and consequently the stem to the right until the pocket 25 is in communication with the outlet 19 of the reservoir, whereupon said pocket will refill with oil, to be carried into the motive fluid supply upon a succeeding operation of the controlling valve.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim, is:

1. In mechanism of the character set forth, the combination with a valve casing having a fluid supply chamber, means for constantly supplying fluid to said chamber, an outlet means for the fluid opening from the valve casing, a valve in the casing for controlling the passage of fluid from the supply chamber to the outlet means, a lubricant reservoir having an outlet into the valve casing, a piston valve controlling the lubricant outlet and having an actuating piston, and a piston chamber in which said piston operates; said piston chamber having a motive fluid supply port opening into the fluid supply chamber, said supply port being covered and uncovered by the valve on its movement to open and cut off communication between the supply chamber and outlet means of the valve chamber.

2. In mechanism of the character set forth, the combination with a valve casing having a fluid supply chamber, means for constantly supplying fluid to said chamber, an outlet means for the fluid opening from the valve casing, a valve in the casing for controlling the passage of fluid from the supply chamber to the outlet means, a lubricant reservoir having an outlet into the valve casing, a piston valve controlling the lubricant outlet and having an actuating piston, and a piston chamber in which said piston operates, said piston chamber having a motive fluid supply port opening into the fluid supply chamber, and also having an exhaust port, said supply port and exhaust port being alternately covered and uncovered by the valve on its movement to open and cut off communication between the supply chamber and outlet means of the valve chamber.

3. In mechanism of the character set forth, the combination with a valve casing having a fluid supply chamber, means for

constantly supplying fluid to said chamber, an outlet means for the fluid opening from the valve casing, a valve in the casing for controlling the passage of fluid from the supply chamber to the outlet means, a lubricant reservoir having an outlet into the valve casing, a piston valve controlling the lubricant outlet and having an actuating piston provided with opposing surfaces of different areas, said areas being normally operated against simultaneously by the fluid of the fluid supply chamber and thereby holding the piston in a predetermined position, and means controlled by the valve for cutting off the fluid to the surface of larger area and permitting its exhaust to cause the fluid operating against the smaller area to move the piston and lubricant controlling valve.

4. In mechanism of the character set forth, the combination with a valve casing having a fluid supply chamber, means for constantly supplying fluid to said chamber, an outlet means for the fluid opening from the valve casing, a valve in the casing for controlling the passage of fluid from the supply chamber to the outlet means, a lubricant reservoir having an outlet into the valve casing, a piston valve controlling the lubricant outlet and having an actuating piston provided with opposing surfaces of different areas, said valve casing having supply ports opening from the fluid supply chamber and simultaneously admitting fluid to said opposing surfaces of the piston, an exhaust permitting means from the surface of greater area, and a head on the valve that controls the supply port and exhaust port of the larger area to close one and open the other alternately.

5. In mechanism of the character set forth, the combination with a fluid operated instrument to be lubricated, and means for supplying motive fluid thereto, a valve casing constituting a part of the motive fluid supply means and having a constant pressure chamber, a valve in said casing controlling the passage of motive fluid from the constant pressure chamber to the instrument, a lubricant reservoir having an outlet, a cylinder opening into the constant pressure chamber, a piston in said cylinder operated on by the fluid in the constant pressure chamber and having a stem provided with a lubricant pocket that is movable between the reservoir outlet and the constant pressure chamber on the movement of the piston, and ports between the constant pressure chamber and the cylinder and controlled by the valve for admitting and exhausting fluid to the cylinder and against the piston.

In testimony whereof, I affix my signature.

PAUL A. NELSON.