D. S. WAUGH.

THROTTLE VALVE FOR ROCK DRILLS.

APPLICATION FILED OCT. 18, 1909.

993,424.

Patented May 30, 1911.

2 SHEETS—SHEET 1.

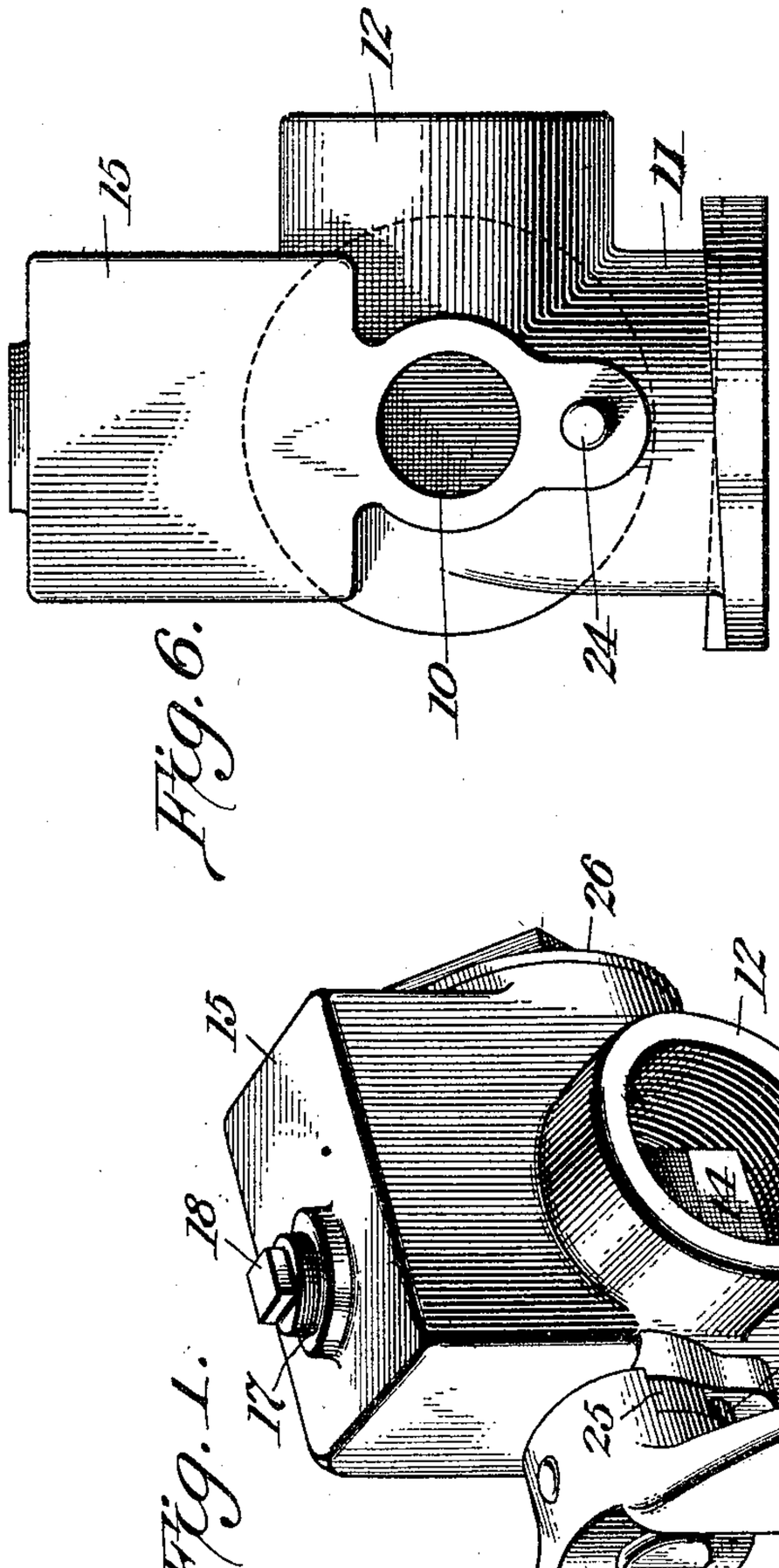

Fig. 6.

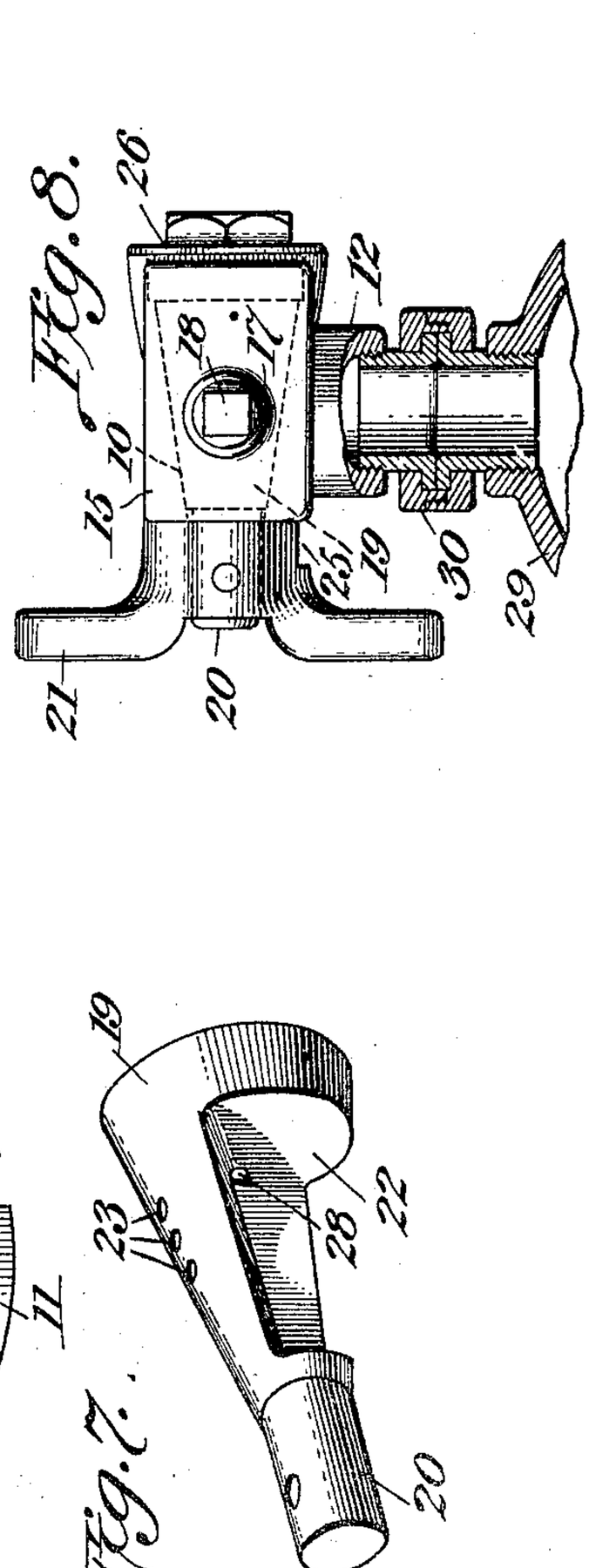

Fig. 8.

Fig. 1.

Fig. 7.

WITNESSES

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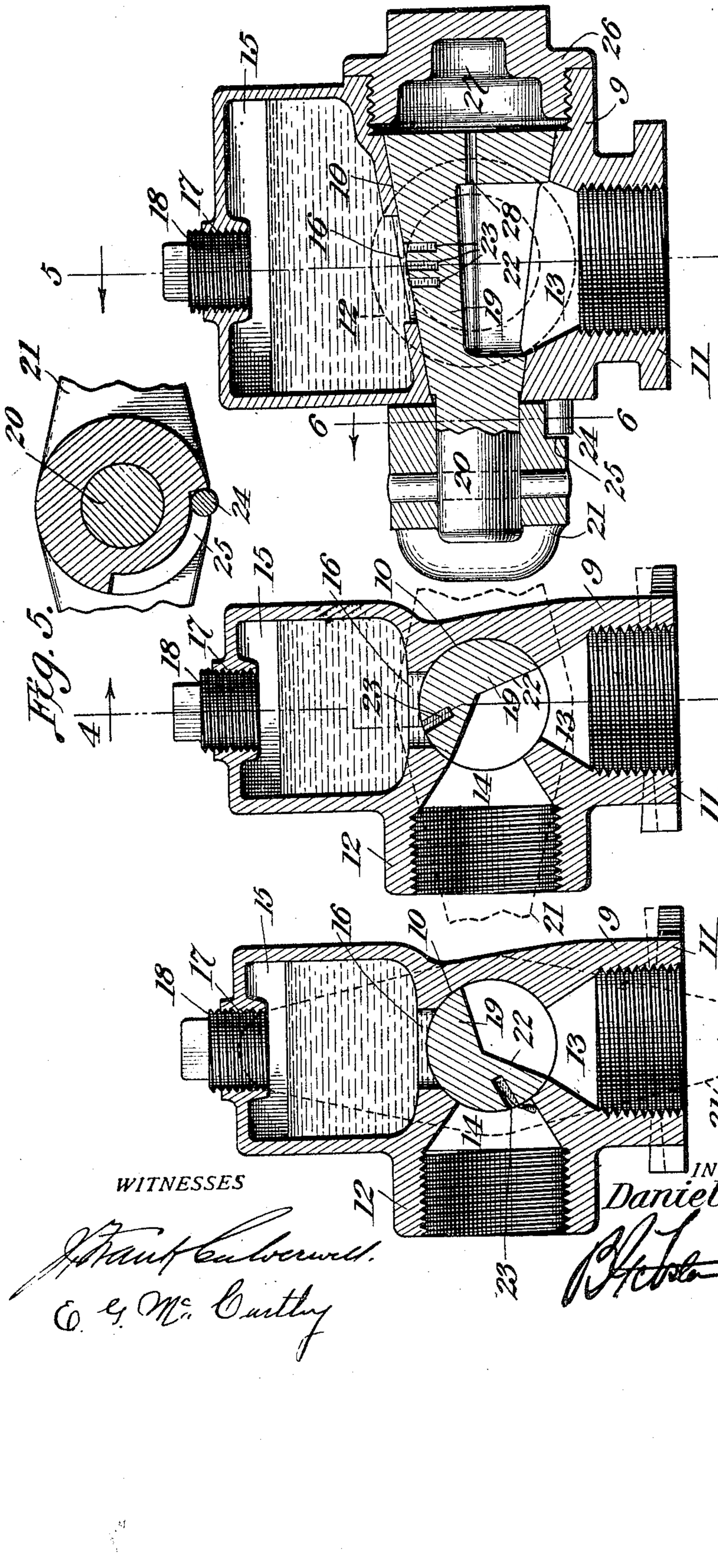

Fig. 4.

Fig. 5.

Fig. 3.

Fig. 2.

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THROTTLE-VALVE FOR ROCK-DRILLS.

993,424. Specification of Letters Patent. Patented May 30, 1911.

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To all whom it may concern:

Be it known that I, DANIEL S. WAUGH, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Throttle-Valves for Rock-Drills, of which the following is a specification.

The present invention relates to means for controlling the supply of motive fluid to a rock drill motor or other structure of an analogous character employing compressed air or like motive fluid.

One of the primary objects of the present invention is to provide an exceedingly simple structure which will also constitute automatic means for delivering lubricant to the motor.

The preferred form of construction is illustrated in the accompanying drawings, wherein:—

Figure 1 is a perspective view of the device. Fig. 2 is a sectional view therethrough showing the valve in closed position. Fig. 3 is a similar view illustrating the valve in opened position Fig. 4 is a sectional view on the line 4—4 of Fig. 3, Figs. 2 and 3 being sectional views on the line 5—5 of Fig. 4. Fig. 5 is a detail sectional view on the line 6—6 of Fig. 4. Fig. 6 is a view in elevation of the casing. Fig. 7 is a detail perspective view of the valve. Fig. 8 is a plan view partially in section, illustrating one form of connection between the valve and a motor.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed, an outer casing 9 is employed that is preferably a single casting, and has an internal transversely disposed tapered valve seat 10 that opens through opposite sides of said casing. Right angularly disposed nipples 11 and 12 project from the bottom and one side of the casing, and are provided respectively with inlet and outlet ports 13 and 14 opening through different sides of the valve seat. The upper portion of the casing is formed into a lubricant reservoir 15 having a bottom delivery port 16 that opens through the upper side of the valve seat. The top of the reservoir has a threaded opening 17 normally closed by a detachable plug 18.

Rotatably mounted in the valve seat 10 is a tapered throttle valve 19 having a stem 20 projecting from the smaller end of said seat and having an actuating handle 21 suitably secured to it. This valve has its central portion cut away, as shown at 22, forming a passage that may be moved to a position to establish communication between the inlet ports 13 and 14, as shown in Fig. 3, or to a position to cut off such communication, as illustrated in Fig. 2. The valve also has in another side one or more lubricant receiving pockets 23, and these pockets are so arranged that when the valve is in opened position, as shown in Fig. 3, they will communicate with the lubricant delivery port 16, and when the valve is in closed position, they will be disposed at a downward inclination in communication with the outlet port 14, as shown in Fig. 2. In order to secure a decided downward inclination, the pockets may be disposed tangentially to the axis of rotation of the valve.

In order to permit the necessary turning movement of the valve and yet prevent its movement sufficiently far to bring the passage 22 into communication with the lubricant delivery port 16, a stop pin 24 is mounted on the exterior of the casing, and operates in a slot 25 formed in the hub of the operating handle, the length of this slot determining the amount of movement the valve may have. Furthermore in order to at all times maintain the valve in properly seated condition and take up the wear thereof, the larger end of the valve seat is closed by a plug 26 threaded therein which plug is spaced from the larger end of the valve, and is preferably chambered, as shown at 27. The said valve is provided with a longitudinally disposed channel 28 leading from the passage 22 through the larger end of the valve, and thus conducting fluid under pressure into the chamber 27.

It will be understood that motive fluid under pressure from any suitable source is conducted by suitable means to the inlet 13, and while the casing may be connected to the motor by any well known coupling, preferably said casing is swiveled to the motor. To indicate such a connection, attention is called to Fig. 8, wherein a portion of the motor is illustrated at 29, and the swiveled connection 30 is made between the nipple 12 and said motor. This arrangement permits the said motor to be set

at any desired angle of inclination, while the casing may be kept in vertical position.

The operation of the structure briefly set forth is as follows. As is well known, in the use of drilling machines, the motive fluid is ordinarily cut off and turned on at frequent intervals, necessitating the turning of the controlling valve. In this structure, when the valve is opened, the lubricant receiving pockets register with the delivery port of the lubricant reservoir, as shown in Fig. 3. When the valve is closed, these pockets are brought to a downward inclination in communication with the outlet port 14, and consequently the lubricant will gravitate from the pockets into the said port. As soon as the valve is again opened, the lubricant will be carried by the motive fluid into the machine. Thus a simple and practicable structure is produced for not only controlling the supply of motive fluid to a motor, but incidentally and automatically supplying lubricant to such motor in an economical form, and yet in sufficient quantities to insure the proper lubrication of the working parts of the apparatus. This structure also keeps the valve in properly lubricated condition, reducing wear thereon, and at the same time, said valve is maintained in properly seated condition, and whatever wear there is, is taken up by the air pressure against the larger end.

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 within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In a device of the character set forth, the combination with a casing having a valve seat, inlet and outlet ports communicating with different sides of said seat at substantially right angles to each other and a lubricant reservoir having a delivery port communicating with still a different side of the valve seat and in the same plane as the inlet and outlet ports, of a rotary valve located in the casing in the seat and having a transverse channel that is movable to a position to connect the inlet and outlet ports and to a position to cut off communication between said ports, said valve also having a lubricant receiving and delivery pocket that moves into communication with the reservoir port when the valve is open and into communication with the outlet port when the valve is in closed position, and means for limiting the rotation of the valve to prevent the channel therein moving into communication with the reservoir delivery port.

2. In a device of the character set forth, a casing having an inlet and an outlet port, a reservoir having a delivery port in the casing, and a valve in the casing for opening and closing communication between the inlet and outlet ports, said valve having a lubricant-receiving and delivery pocket provided with a closed bottom and an open mouth that alternately moves into and out of communication with the reservoir port and the outlet port accordingly as the valve is moved to opened and closed position.

3. In a device of the character set forth, a casing having right angularly disposed inlet and outlet ports, a reservoir having a delivery port in the casing in a plane intersecting the inlet and outlet ports, and a rotary valve in the casing for opening and closing communication between the inlet and outlet ports, said valve having a lubricant-receiving and delivery pocket provided with a closed bottom and an open mouth that moves into communication with the reservoir port when the valve is opened and into communication with the outlet port when the valve is closed.

In testimony whereof, I affix my signature in presence of two witnesses.

DANIEL S. WAUGH.

Witnesses:
W. H. LEONARD,
F. L. EMERSON.