

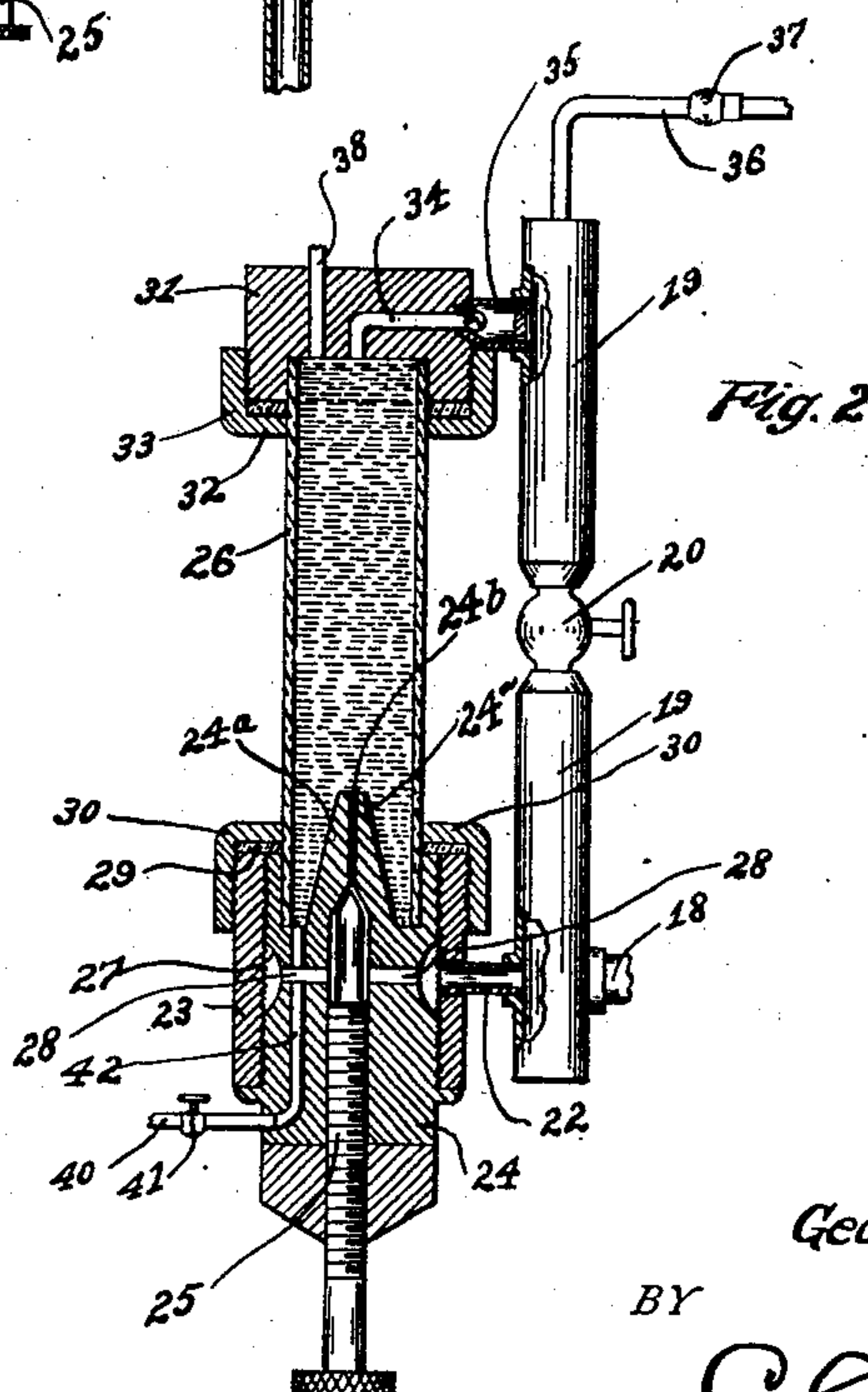
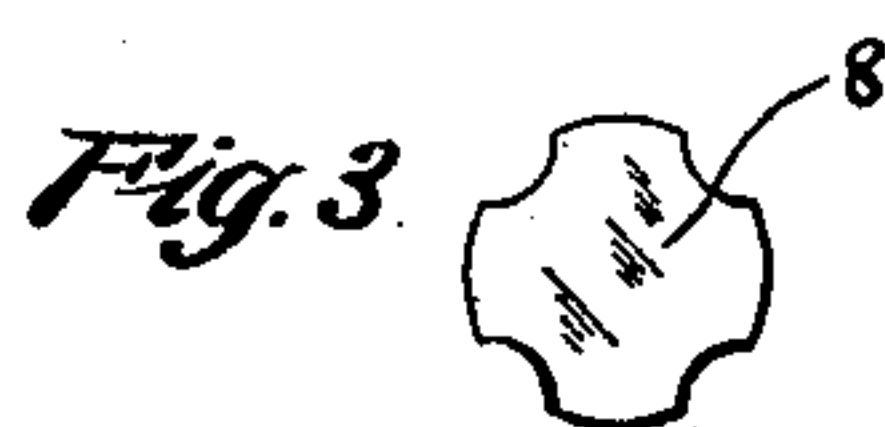
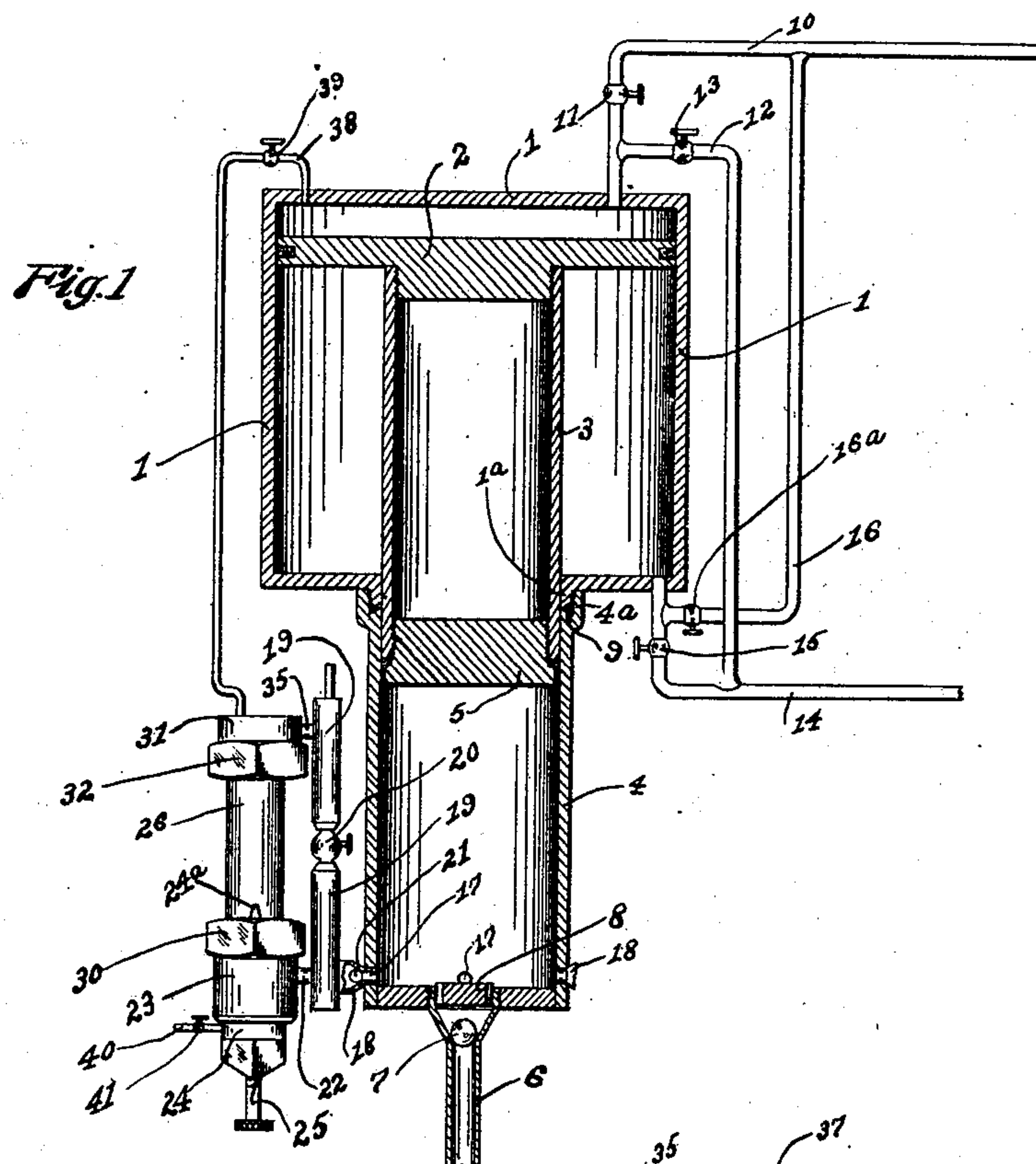
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LUBRICATOR.

(Application filed Apr. 18, 1902.)

(No Model.)



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LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 715,717, dated December 9, 1902.

Application filed April 18, 1902. Serial No. 103,526. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WHITAKER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Lubricators, of which the following is a specification.

My invention relates to lubricators, and has particular relation to sight-feed lubricators; and the objects of my invention are to provide a lubricating mechanism with improved construction of sight-feed, to provide improved means for forcing the oil by drops through said feed, and to produce other improvements the details of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of my improved mechanism, showing the sight-feed in elevation. Fig. 2 is an enlarged central vertical section of said sight-feed, and Fig. 3 is a face view of one of the ball-valve plugs which I employ in the manner hereinafter described.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ a suitable-sized cylinder 1, within which is contained a piston comprising a head 2, which is adapted to fit and slide within said cylinder, and a hollow or tubular downwardly-extending stem portion 3. The tubular stem 3 extends through the lower side of the cylinder, 1 and into a cylindrical oil-chamber 4, said stem 3 being provided in its lower end with a plug or filling-block 5, the flanged lower end portion of which is adapted to fit and slide within the oil-cylinder 4. This plug or filling-block forms a secondary or auxiliary piston, as will be readily seen from Fig. 1. The lower end of the oil-cylinder has leading therein an oil-supply pipe 6, in the upper flaring end of which is provided a ball-valve 7, which is prevented from moving downward by the size of the pipe-body 6 and prevented from being forced into the cylinder 4 through the medium of a recessed block or disk 8, the latter being more clearly illustrated in Fig. 3 of the drawings. In uniting the oil-cylinder 4 with the power-cylinder 1 I preferably cause the threaded short downwardly-extend-

ing neck 1^a of said power-cylinder to be engaged by the internally-threaded upwardly-extending flange 4^a of said cylinder 4, this flange portion embracing suitable packing 9, arranged between the ends of the neck portion 1^a and cylinder 4.

Leading from a boiler or other suitable source of steam-supply into the upper side of the cylinder 1 is a steam-supply pipe 10, the latter being provided with a valve 11. Leading outward from the pipe 10, between the valve 11 and the cylinder 1, is a waste or outlet pipe 12, the latter having a valve 13. This waste-pipe arm 12 leads into a waste-pipe 14, which leads from the lower end of the cylinder 1, said waste-pipe 14 also being provided with a valve, which is indicated at 15. Between this valve 15 and the cylinder is connected one end of a pipe 16, the remaining end of which connects with the steam-pipe 10 on the outer side of its valve 11, said pipe 16 having a valve 16^a. Although the pipes 10, 16, and 12 are, for the sake of clearness in illustration, shown on the outer side of the main cylinder, it is obvious that these pipes may be carried downward through an enlarged wall of said cylinder.

The lower end of the oil-cylinder 4 is provided with one or more outlet-openings 17, and leading from each of these openings is a short pipe-arm 18, which connects the oil-cylinder with a vertical pipe-section 19, the latter being provided with a central cut-off valve 20. Within the short tubular or pipe connection 18 I provide a ball-valve 21, which is adapted to prevent the return of oil from the pipe 19 to the cylinder 4 by closing the port 17.

From the vertical pipe 19 is supported my improved sight-feed, which is constructed as follows: Leading laterally from the lower portion of said pipe 19 is a short pipe-arm 22, the latter leading into a vertically-arranged tubular valve-casing 23. Into this valve-casing is screwed from the lower end thereof a valve-plug 24, which terminates at its upper end in a reduced conical nozzle 24^a. Within this valve-plug is formed an internally-threaded opening which is adapted to receive the threaded portion of a needle-point valve-stem 25. The central opening of the plug 24 is continued through the nozzle 24^a in the form of a reduced passage, which is indicated at 24^b,

and communication between this passage and the interior of the valve-plug body is adapted to be cut off by the conical or tapering upper end of the needle-valve 25 in the usual manner. About the base of the nozzle 24^a the upper end portion of the plug 24 is recessed or provided with a circular channel, within which is supported the lower end of an upwardly-extending sight-feed tube 26, the latter being of glass or other suitable transparent material. Opposite the point where the pipe-arm 22 leads into the casing 23 the plug 24 is grooved peripherally, as indicated at 27, and through said grooved portion are formed any desired number of ports 28, which lead to that portion of the central valve-opening within which is contained the upper and reduced portion of the valve. Upon the upper side of the casing 23 and plug 24 and about the glass tube 26 I provide a suitable packing-ring or gasket 29, the latter being held in place by a cap-nut 30, the downwardly-extending internally-threaded portion of which engages external threads of the upper portion of the casing 23. The upper end of the glass tube enters a socket in the lower side of a cap body or block 31, the lower portion of which is embraced by the upturned flange of a cap-nut 32, which surrounds the glass tube 26. Also surrounding this tube is a gasket or packing-ring 33, which is clamped between the nut 32 and underside of the cap 31. Leading outward from the upper end of the tube 26 and through the cap-body is an oil-passage 34, the latter connecting through the medium of a ball-valve-containing tube or casing 35 with the interior of the upper portion of the pipe 19. From the upper end portion of the pipe 19 leads to the steam-chest or other point to be lubricated an oil-conducting pipe 36, within which is provided at 37 a suitable form of spring-pressed check-valve, against which is exerted the pressure of steam within the steam-chest or other steam-containing chamber to which said pipe 36 leads.

Leading out of the upper side of the main or power cylinder 1 is a small condensed-steam-conducting pipe 38, which is provided with a suitably-placed valve 39. This pipe 38 leads, as shown more clearly in Fig. 2 of the drawings, through the cap 31 and to the tube 26. Leading from the bottom of the tube 26 downward and thence outward through the plug 24 is a port 42, the outlet-pipe extension 40 of which is provided with a valve 41.

In order to illustrate the operation of my device, we will assume that the cylinder 4 has been filled or partially filled with oil in the manner hereinafter described, that the valves 13, 16^a, 39, and 41 are closed, and that the valve 20 is open. We will also assume that the sight-feed tube 26 has been filled with water. The steam which enters the upper portion of the cylinder 1 exerts a downward pressure on the piston 2 within said cylinder, causing a certain proportion of the oil which is contained in the cylinder 4 to be forced

outward through the port 17 and outlet-pipe 18 into the vertical pipe 19, the oil rising and filling the latter, as well as the pipe 36, which leads therefrom. All parts of the system of pipes being now filled with oil, except the sight-feed, the valve 20 is closed. As the piston 2 gradually descends, however, it is obvious that the increased pressure of the oil within said cylinder 4 and lower portion of the pipe 19 will result in forcing a certain proportion of said oil through the pipe-arms 22 into the annular space 27 of the valve-plug, thence through the ports 28 to the interior of said plug, and thence out through the sufficiently-opened nozzle-passage 24^b. From this nozzle-passage the oil rises through the water at intervals in drops, these drops successively entering the passage 34 of the cap 31, thence entering the ball-valve casing 35 and joining the body of oil contained in the upper portion of the pipe 19. This increased pressure of oil within the upper portion of the pipe 19 and the pipe 36 results in overcoming the spring-actuated valve 37 and permits of the additional drop of oil passing through said valve to the point to be lubricated. Through this operation it will be seen that during the downward movement of the piston within the cylinder 1 drops of oil will successively pass through the water contained within the tube 26. The passage of the oil-drops through the water will clearly indicate to the observer that oil is being dropped from the pipe 36 to the lubricating-point at intervals corresponding with the intervals between the rising of the oil-drops through the sight-feed.

The downwardly-extending pipe 6 of the oil-containing cylinder 4 may lead into a suitable oil-reservoir, and when it is desired to fill said cylinder 4 with oil it is obvious that an upward movement of the piston 2 is caused within its cylinder, which movement is attained by closing the valves 11 and 15 and opening the valve 16^a, thus introducing steam from the pipe 10 to the under side of said cylinder, resulting in the oil being sucked upward through the pipe 6 into said cylinder 4. In this upward movement of the piston 2 it is obvious that the valve 13 of the pipe 12 may be opened, thus permitting an exhaust of the steam above the piston through said pipe 12.

In case it is desired to clean the water-tube 26 by passing condensed steam therethrough, the valve 39 of the pipe 38 may be opened and the valve 41 of the pipe 40 likewise opened, thus permitting the passage of condensed steam through said pipe 38, thence through the tube 26, port 39, and outlet-pipe 40.

From the construction and operation described it will be seen that simple, reliable, and effective mechanism is provided whereby a lubricating device is provided with an oil sight-feed the operation of which depends upon first filling the entire conducting-pipe

with oil and then diverting the flow of oil to the sight-feed, by which operation the equalization of the oil-pressures above and below the sight-feed is effected immediately and the necessity of employing the slower operation of attaining the equalization by passing the oil in drops through the sight-feed is obviated.

It will readily be understood that owing to the increase in the area of the cylinder 1 and its piston 2 over that of the end plug 5 of the tubular stem 3 a pressure on the oil may be attained, which is intended to be sufficient to overcome the pressure of the steam within the steam-chest or other lubricating-point.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sight-feed lubricator, the combination with a power-cylinder with an oil-chamber depending therefrom, a piston movable in said cylinder, a secondary piston carried by said piston and movable in said chamber, a pipe 19 having valved communication with the lower end of said chamber, a connection from said pipe to the part to be lubricated a sight-feed tube, connections between the upper and lower ends thereof and the upper and lower ends of said pipe 19, a condensed-steam-conducting pipe connecting the upper end of the sight-feed tube with the upper end of the power-cylinder, valves in the connections of the sight-feed tube to the pipe 19, an intermediate valve in said pipe 19 and a passage and pipe leading from the lower end of the sight-feed tube and provided with a valve, all substantially as shown and described.

2. In a sight-feed lubricator, the combination with the power-cylinder and the oil-chamber depending therefrom, and the piston and its secondary piston, of the pipe 19 connected at its lower end with the lower end of the oil-chamber, a connection from said pipe to the part to be lubricated a valve in said pipe between its ends, a sight-feed tube parallel with said pipe 19, a plug at the lower end of said sight-feed tube and having a central passage and a peripheral groove, radial passages con-

necting the peripheral groove with the central passage through said plug, a connection between the lower end of the pipe 19 and said peripheral groove and a cap for said sight-feed tube having valved connections with the upper end of said tube and the upper end of the power-cylinder, substantially as described.

3. In a sight-feed lubricator, the combination with the power-cylinder, the oil-chamber, the piston and its secondary piston movable therein, of a pipe 19 having valved connection with the discharge end of the oil-chamber, a connection from said pipe 19 to the part to be lubricated a valve in said pipe near its mid-length, a sight-feed tube and valve-controlled pipes leading from and communicating with opposite ends of said pipe 19 and connections to permit the blowing out of the sight-feed tube without interfering with the feed of the oil through said pipe 19, as set forth.

4. In a sight-feed lubricator, the combination with the oil-chamber and its piston and the power-cylinder and its piston, of the pipe 19 having valved connection at its lower end with the discharge end of the oil-chamber, a connection from said pipe 19 to the part to be lubricated, a casing connected with the lower end of said pipe, a plug in said casing having a central passage and nozzle, a needle-valve therein, said plug having a peripheral groove and radial ports connecting the same with the passage through the plug and a longitudinal port independent of the central passage, a valved outlet-pipe connected with said port, a sight-feed tube into the lower end of which said nozzle extends, a cap for the upper end of said sight-feed tube, a connection through said cap between the upper end of the said tube and the pipe 19, and a valve-controlled pipe leading through said cap and connecting the upper end of the said tube with the upper end of the power-cylinder, all substantially as shown and described.

GEORGE WHITAKER.

In presence of—

C. C. SHEPHERD,
VIOLA WHITAKER.