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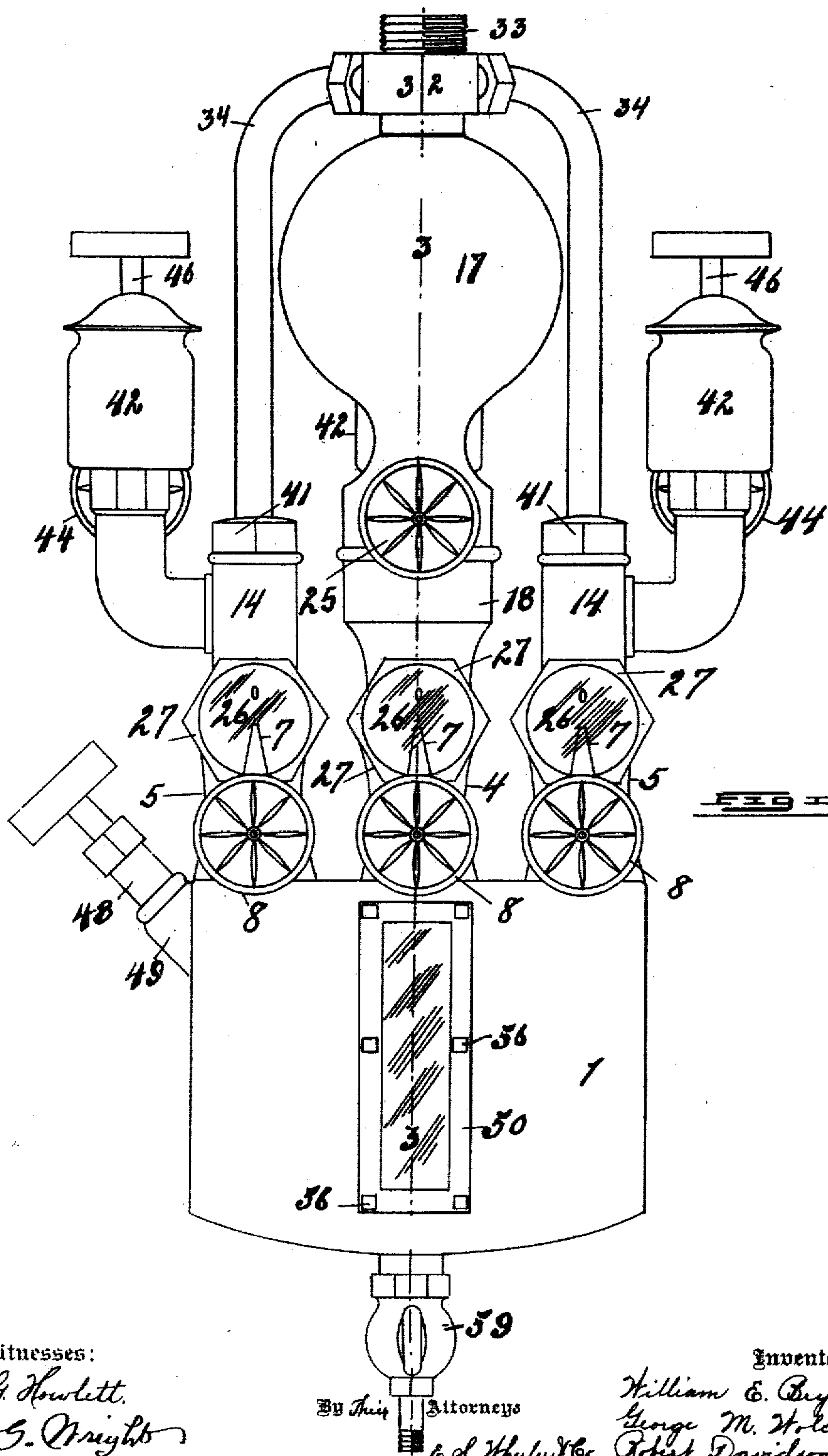
PATENTED MAR. 6, 1906.

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LUBRICATOR.

APPLICATION FILED APR. 23, 1904.

4 SHEETS—SHEET 1.



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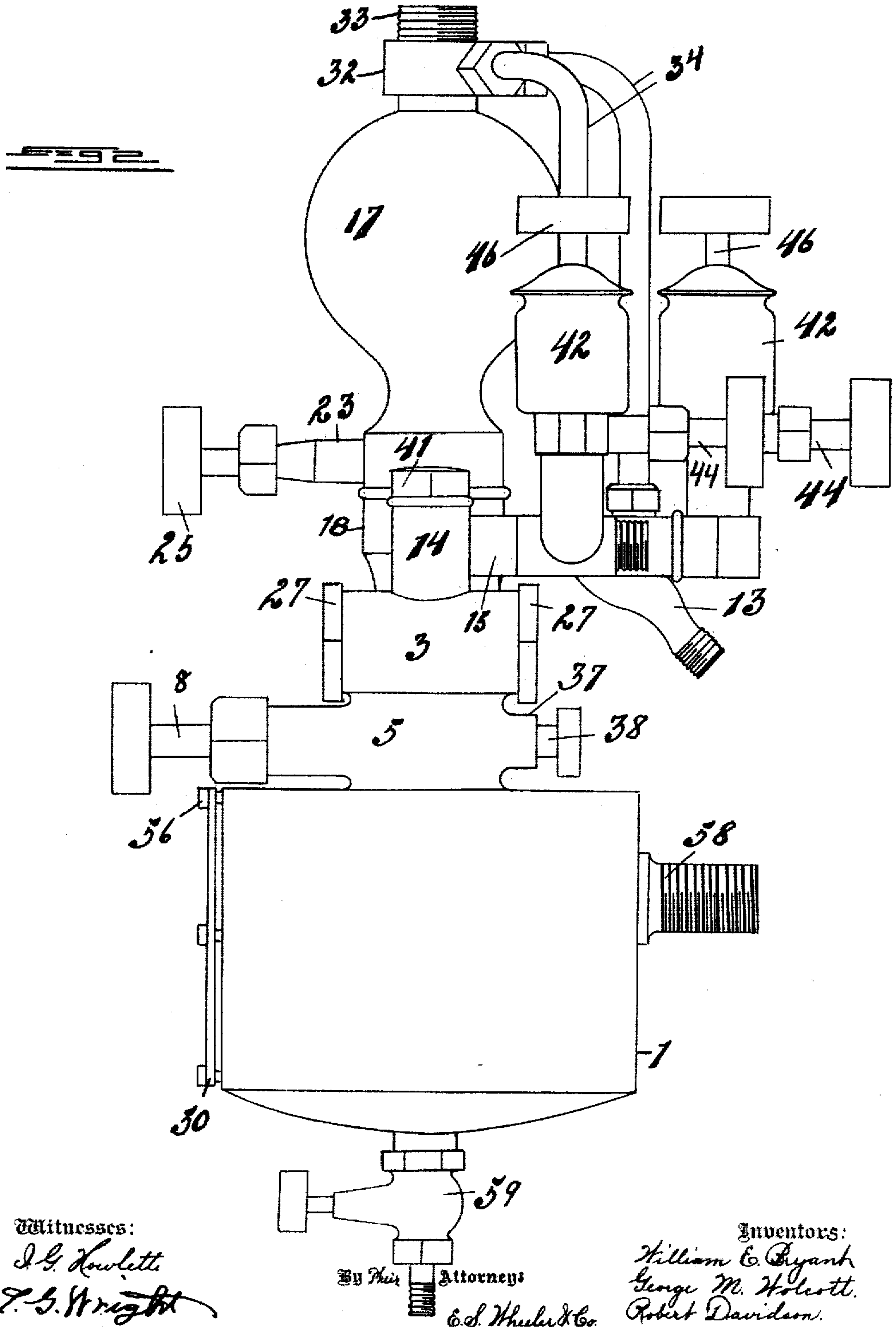
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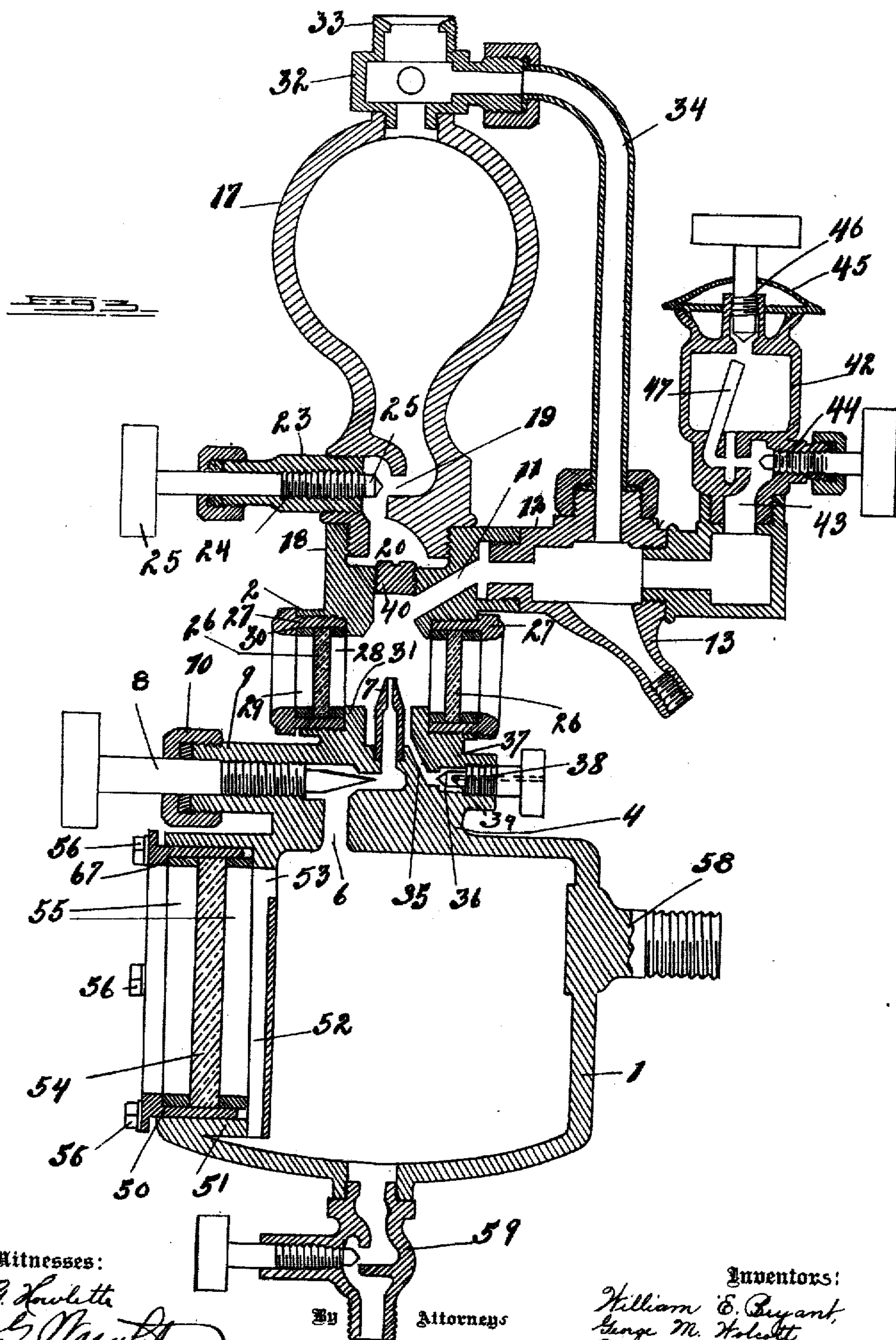
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4

FIG 4

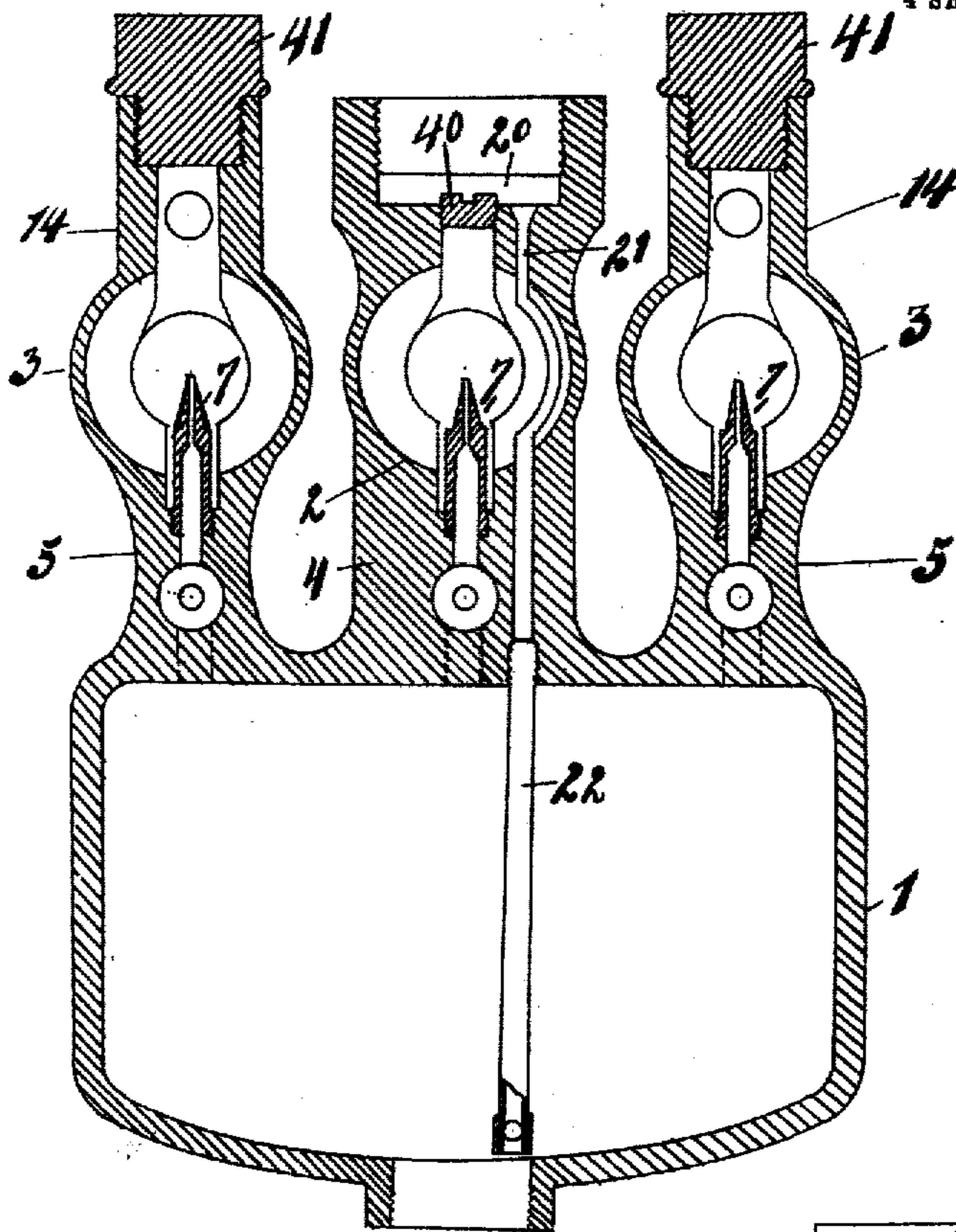


FIG 5

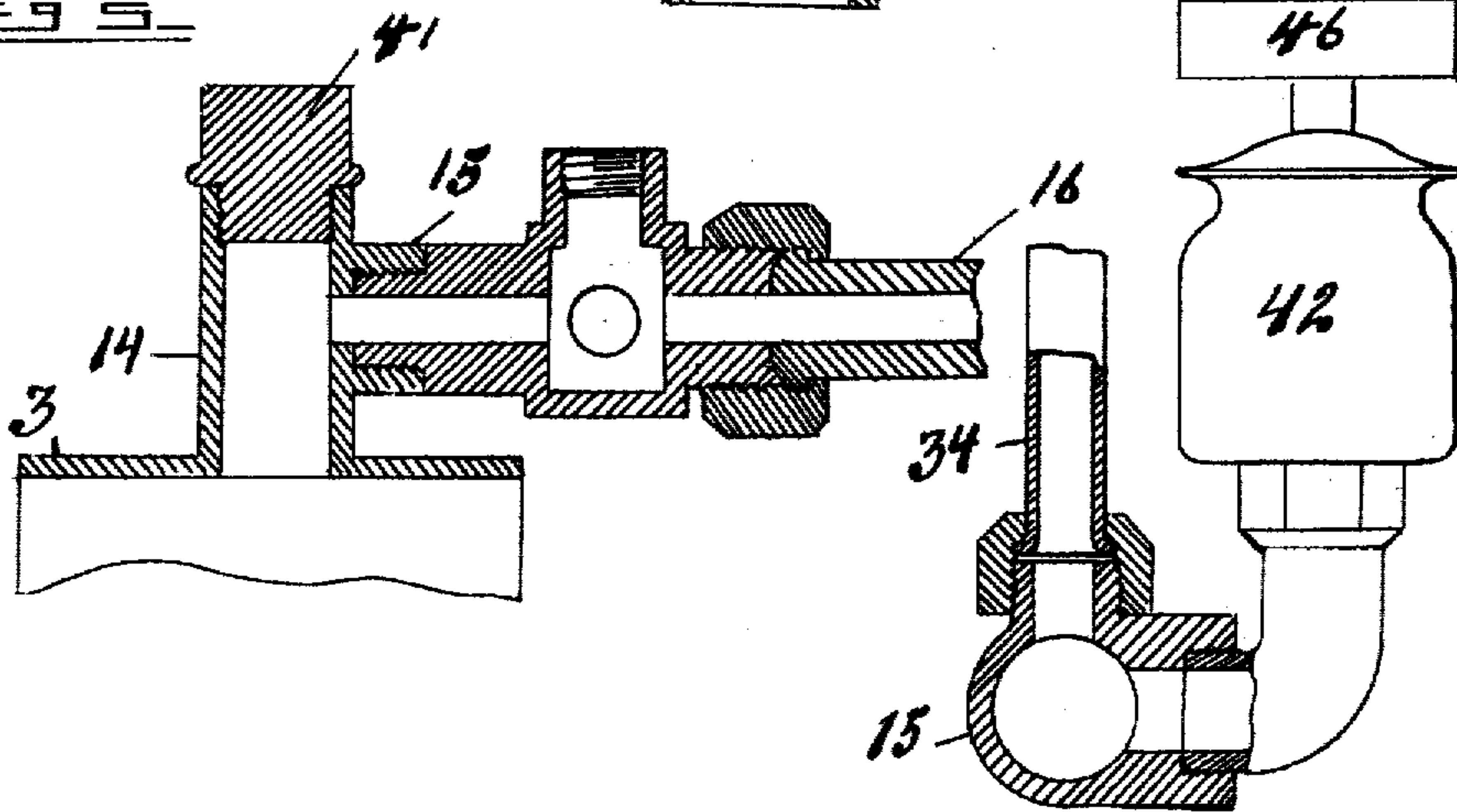


FIG 6

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UNITED STATES PATENT OFFICE.

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LUBRICATOR.

No. 814,016.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed April 23, 1904. Serial No. 204,590.

To all whom it may concern:

Be it known that we, WILLIAM E. BRYANT, GEORGE M. WOLCOTT, and ROBERT DAVIDSON, citizens of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Lubricators; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to lubricators, and more expressly to locomotive-lubricators wherein provision is made for feeding the oil drop by drop through sight-feed glasses to the locomotive-engine cylinders and to the air-brake engine-cylinder, the lubricator herein shown being of the triple-feed type; and the invention consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The objects of the invention are to provide a sight-feed lubricator of the bull's-eye pattern wherein the arrangement is such as to produce a simple and inexpensive apparatus capable of accurately and positively feeding the oil to the parts to be lubricated.

A further object is to produce a bull's-eye sight-feed lubricator wherein the plural sight-feed features are arranged in a horizontal plane in connection with a cylindrical body or reservoir.

A further object is to provide a lubricator having the sight-feed features located exterior to the reservoir upon the top thereof in line with the minor or diametrical axis of the reservoir and to locate the condenser above the plane of said sight-feed features and connect said condenser through a suitable passage with the bottom of the reservoir.

A further object is to provide a sight-feed lubricator having a cylindrical reservoir upon the top of which the sight-feed features are mounted, locating the condenser above said sight-feed features, and connecting the oil-discharge arms by means of equalizing-tubes with the source of steam which supplies the condenser.

A further object is to provide a sight-feed lubricator of the bull's-eye pattern with circular observation-glasses mounted in position so as to enable them to be readily removed and replaced when desired.

The above objects are attained by the structure illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a lubricator involving our invention. Fig. 2 is a side elevation of the lubricator. Fig. 3 is a central vertical section through the lubricator as on line 3 3 of Fig. 1. Fig. 4 is a transverse section through the bull's-eye sight-feed features and through the reservoir. Fig. 5 is a fragmentary view in section through one of the oil-delivery arms. Fig. 6 is a fragmentary view, partly in section, showing the connection of the auxiliary oiler with one of the side arms that delivers oil to the engine-cylinders.

In lubricators of the balanced condensation-displacement type, such as herein shown, it is necessary to build the reservoir and all of the connected parts sufficiently strong to withstand boiler-pressure, and sometimes the pressure in the reservoir even exceeds the boiler-pressure, owing to the expansion of the oil when heated to a high temperature. Because of the presence of this high temperature within the lubricator it has been found necessary to substitute the bull's-eye sight-feed glasses, which have been commonly employed. In multiple-feed lubricators it is essential that the sight-feed features be arranged in a horizontal plane, so that the engineer may readily observe the feeding of the oil therethrough at a glance. Where these sight-feed features have been located in the body of the reservoir in order to arrange them in the same horizontal plane, it has been necessary to make the reservoir oblong in shape, the opposed sides of the body being flat and parallel. In order to strengthen the body of the reservoir having this flat shape, so as to withstand the pressure to which it is subjected, it was found necessary to tie the opposite walls of the cup by interior tubular braces, a structure expensive to mold and requiring a great deal of labor to produce. We employ the simple cylindrical form of reservoir, in which, because of its shape, no tubular braces are necessary to strengthen it and

in which there are no cored passages, and we arrange for placing our sight-feed features in the same horizontal plane by mounting them upon the top of the reservoir transversely thereof and locating the condenser above the sight-feed features. By this arrangement the oil is enabled to pass directly from the reservoir between the sight-feed glasses to the oil-discharge arms, which are connected to the several tallow-pipes at such height as to provide the requisite fall to the respective cylinders.

Referring to the characters of reference in the several views of the drawings, 1 designates the cup or reservoir in which the lubricant is contained and which is cylindrical in shape. Formed integral with and located in a row upon the top of the reservoir are the barrel members 2 and 3. These barrel members are supported upon the neck portions 4 and 5, which connect them with the top of the lubricator. Formed through the neck portion of each of said barrel members is an angular oil passage-way 6, which communicates at its lower end with the top of the reservoir and terminates at its upper end in an oil-delivery nozzle 7, which projects centrally within the barrel member. Communicating with each of the oil passage-ways 6 is a controlling-valve 8, which regulates the flow of oil there-through, said valve screwing through a boss 9 and having around the stem thereof a gland 10. The oil is caused to pass upwardly from the nozzles 7 in drops, being fed by the water of condensation which flows into the reservoir and displaces the oil therein. The drops of oil after leaving the nozzle in the central barrel 2 pass upwardly through the channel 11 into the oil-discharge arm 12, from which depends a coupling 13, to which is connected the upper end of the tallow-pipe, (not shown,) which leads to the cylinder of the air-brake pump. From the nozzles in the side barrels 3 the oil passes upwardly through the connections 14 into the oil-discharge arms 15, the ends of which are connected to the tallow-pipes 16, that lead to the opposite cylinders of the locomotive. The condenser 17 is located above the central sight-feed barrel 2, and its base screws into a fitting 18, formed integral with said barrel, there being in the lower portion of said condenser a water passage-way 19, down which the water of condensation is adapted to flow, said passage-way communicating with the recess or chamber 20 in said fitting, in which the base of the lubricator is screwed. Extending downwardly from said chamber 20 is a cored duct or way 21, which passes around one side of the sight-opening through the barrel 2 in the wall thereof, thence downwardly through the neck 4, supporting said barrel, its lower end communicating with the tube 22, which screws upwardly into the top of the reservoir, and whose lower end terminates near the bot-

tom of the reservoir, whereby the water of condensation from the condenser is deposited at the bottom of said reservoir. Screwed into the side of the condenser is an internally-threaded plug 23, which receives the threaded stem 24 of the valve 25, through the operation of which the flow of the water of condensation may be regulated, thereby regulating the feed of the oil from the reservoir through the several sight-feed passages.

The glasses which are located in the opposite ends of the sight-feed barrels to render possible the observation of the passage of the oil from the nozzles 7 are in the form of circular disks 26. These glasses are seated in tubular fittings 27, which are externally threaded and are adapted to screw into the opposite tapped ends of the sight-feed barrels, there being within the inner ends of each of said tubular fittings a washer 28, which bears against the inner face of said glass, and within the outer ends of each of said fittings a washer 29, which bears against the outer face of said glass and is confined by the annular shoulder 30 on the fittings, whereby as the fittings 27 are screwed into the ends of the barrel the inner washer is forced against the annular shoulder 31 within the barrel, thereby confining the glass between both washers and enabling sufficient pressure to be exerted upon the washers to make a tight joint. With this arrangement where it is desired to remove a glass for cleaning or other purpose it is only necessary to unscrew the tubular fitting 27, whose outer end is provided with a hexagon formation, as shown in Fig. 1, to enable the application of a wrench thereto. When setting a glass, it is placed within said fitting between the washers 28 and 29 and the fitting screwed into place.

For the purpose of supplying steam to the condenser a fitting 32 is screwed into the top thereof, which is connected through its threaded boss 33 with a steam-pipe (not shown) connected with the boiler. For the purpose of equalizing the lubricator there is employed an equalizing-tube 34, which leads from the fitting 32 and connects with the oil-discharge arm of each sight-feed barrel, the tube leading to the central arm 12 passing downwardly in the rear of the condenser and the tubes leading to the side arms 15 passing downwardly upon opposite sides of the condenser, as clearly shown in Figs. 1 and 2. The presence of steam in the oil-discharge arms causes the chambers within the sight-feed barrels to fill with water up to the level of the oil-discharge openings into the feed-arms, so that the oil which passes from the nozzles is enabled to rise through said water between the observation-glasses and flow out the discharge-arms to the tallow-pipes. In order to drain the water from between the sight-feed glasses when desired, a small channel 35 is formed in the neck below the sight-

feed barrel, which communicates with the enlarged passage 36, leading outwardly through the boss 37, in which is seated the valve 38, adapted to close the opening of the channel 35, said valve having an aperture 39 through its stem which when the valve is off its seat allows the water to flow from the channel 35 through the hollow stem of the valve.

On referring to Figs. 3 and 4 it will be seen that there is a screw-plug 40 in the opening in the fitting 18, which communicates with the interior of the barrel 2. The opening closed by said plug is necessary to allow the introduction of the nozzle 7 and the screwing of said nozzle into place, so as to communicate with the oil-passage 6. After the nozzle is in position said plug 40 is used to close said opening, so as to cause the water of condensation to pass downwardly through the passage 21 and prevent it from flowing directly into the barrel 2. From the side barrels 3 the nozzles are introduced through the connections 14, which are closed by the screw-plugs 41.

By this arrangement a large bull's-eye sight-feed is afforded which enables the engineer to have an unobstructed view of the passage of the oil, as he can see entirely through the barrels because of the opposed glasses in the opposite ends thereof, which afford sufficient light to enable the flow of oil to be readily observed. At the same time the danger incident to the breaking of the ordinary cylindrical glass is obviated.

To provide for supplying oil to the engine-cylinder should the feeding of the oil from the reservoir become interrupted or temporarily stopped by the clogging of one of the oil-passages, each of the oil-feed arms is provided with an auxiliary oiler in the shape of an oil-cup 42, which is mounted upon and communicates with the oil-feed arm through an oil passage-way 43, leading from the interior of the cup and adapted to be closed by a valve 44, as shown in Fig. 3. A removable cap 45 enables the oil-cup to be filled, at which time the valve 44 is closed, because of the fact that there is a high pressure in the feed-arm, with which the cup communicates. After the cup has been filled it is closed by the hand-screw 46, when upon opening the valve 44 the oil in the cup will flow out through the oil-passage 43, owing to the fact that the tube 47, which communicates at its lower end with said passage and extends to the upper end of the cup, equalizes the pressure therein.

To enable the reservoir to be replenished with oil after it has become exhausted, a filler-plug 48 is employed which screws into a hollow boss 49, which communicates with the interior of the cup.

To provide a gage-glass which will indicate the quantity of oil in the reservoir, there is employed a rectangular frame 50, adapted to fit within a corresponding receptacle 51 with- in the body of the lubricator, having an oil-

channel 52 at the back thereof which is open at the bottom and which at the top communicates with the interior of the cup through the opening 53. Seated within the frame 50 is a rectangular glass 54, which is confined between the washers 55. Pressure is exerted upon said glass to maintain a tight joint by reason of the inner washer engaging the rear wall of the receptacle as the frame is crowded therein through the operation of the screws 56, which pass through the margins of said frame into the wall of the reservoir, the outer washer being confined by the shoulder 57 at the outer edge of the frame.

Projecting from the rear face of the oil-reservoir is a threaded stud 58, which is provided for the purpose of mounting the lubricator in position. At the bottom of the lubricator is a drain-cock 59, which allows the contents of the reservoir to be drawn off.

Having thus fully set forth our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A condensation-displacement lubricator, comprising a condensing-chamber, an oil-reservoir, a plurality of independent sight-feed features arranged in a row on the top of the reservoir and communicating directly with the interior of the reservoir through said top, and an independent equalizing-tube for each sight-feed feature.

2. A condensation-displacement lubricator, comprising a condenser, a cylindrical oil-reservoir, a plurality of sight-feed features arranged in a row across the top of said reservoir, each sight-feed feature communicating directly and independently with the interior of the reservoir, and an independent equalizing-tube for each sight-feed feature.

3. In a lubricator, the combination of the reservoir, an oblong sight-feed member mounted upon the top of the reservoir and communicating directly therewith, observation-glasses in the opposite ends of said sight-feed member, a discharge-arm communicating with the sight-feed member at a point above said glasses, a condenser communicating with the bottom of the reservoir, and an exterior equalizing-tube connecting the condenser with the oil-discharge arm.

4. In a lubricator, the combination of the reservoir, a hollow sight-feed member formed integral with and located upon the top of said reservoir and communicating directly therewith, an observation-glass in each end of said hollow sight-feed member, an oil-discharge arm communicating with said hollow member at a point above said glasses, a condenser communicating with the bottom of the reservoir, and an equalizing-tube communicating with the oil-discharge arm independently of the sight-feed member.

5. In a lubricator, the combination of a cylindrical reservoir, a plurality of sight-feed members formed integral with and mounted

upon the top of said reservoir, each sight-feed member communicating directly therewith, said sight-feed members forming oblong sight-feed chambers whose major axes extend in horizontal planes, an observation-glass in each end of each of said sight-feed members, a condenser mounted upon one of the sight-feed members, there being in the wall of said member a passage-way connecting the condenser with the bottom of the reservoir, an oil-discharge arm communicating with each of said sight-feed members, and an equalizing-tube connected with each of said discharge-arms.

6. In a lubricator, the combination with the cylindrical reservoir, of a plurality of sight-feed members mounted upon the top of said reservoir, said sight-feed members forming oblong sight-feed chambers, there being a valve-controlled passage-way for each of said

chambers formed through the top of the reservoir, establishing direct communication between said reservoir and chambers, an observation-glass at each end of each of said sight-feed chambers, a condenser mounted upon the middle of said sight-feed members, and communicating with the bottom of the reservoir, an oil-discharge arm communicating with each of said sight-feed chambers, and an equalizing-tube connected with each of said discharge-arms.

In testimony whereof we sign this specification in the presence of two witnesses.

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