No. 629,895. Patented Aug. 1, 1899.

G. B. ESSEX.

LUBRICATOR.

(Application filed Apr. 29, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

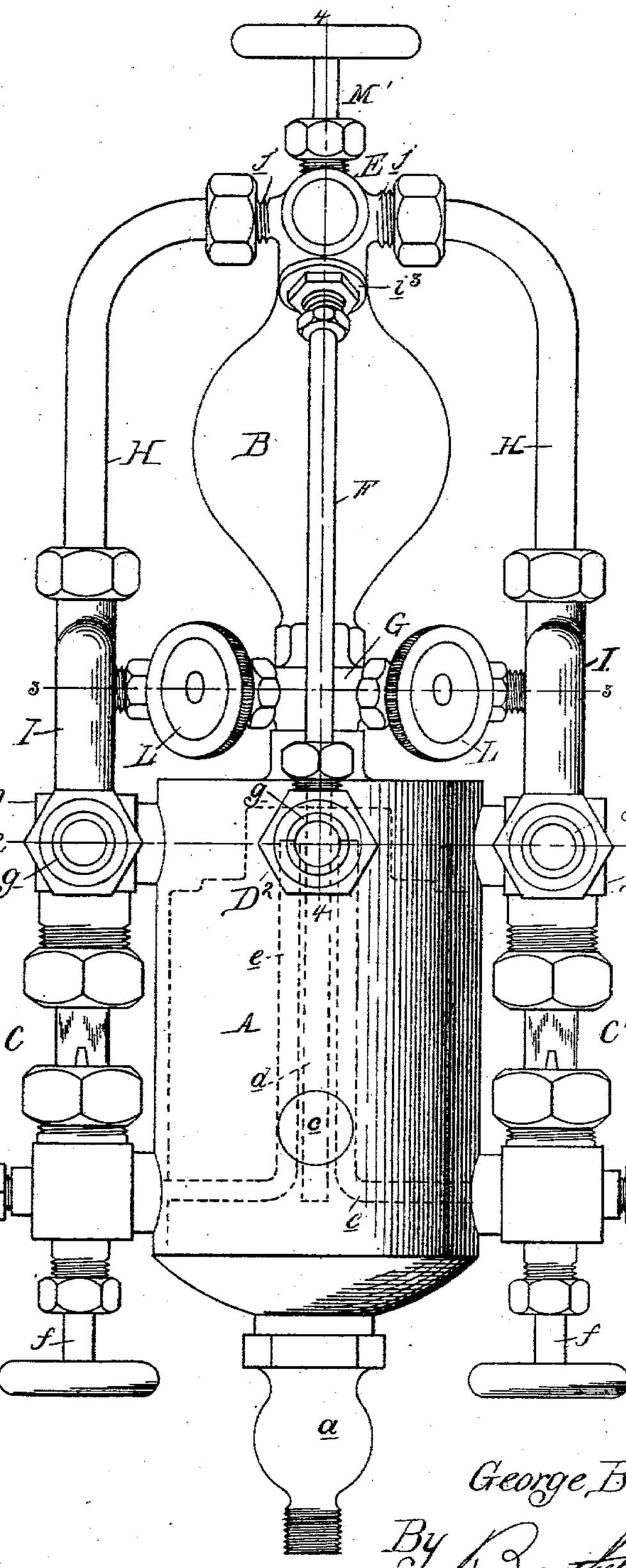

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Fig. 5.

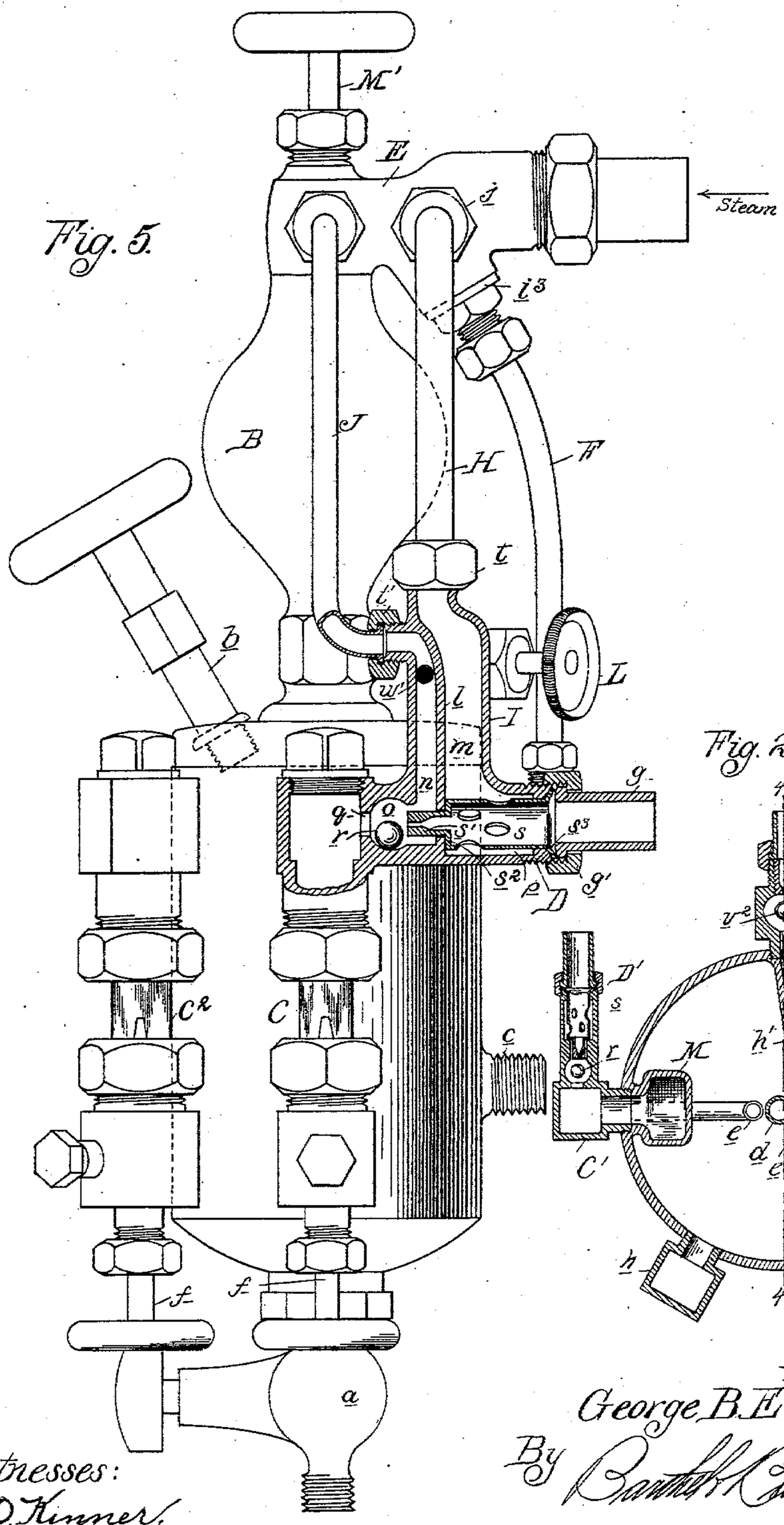

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 4.

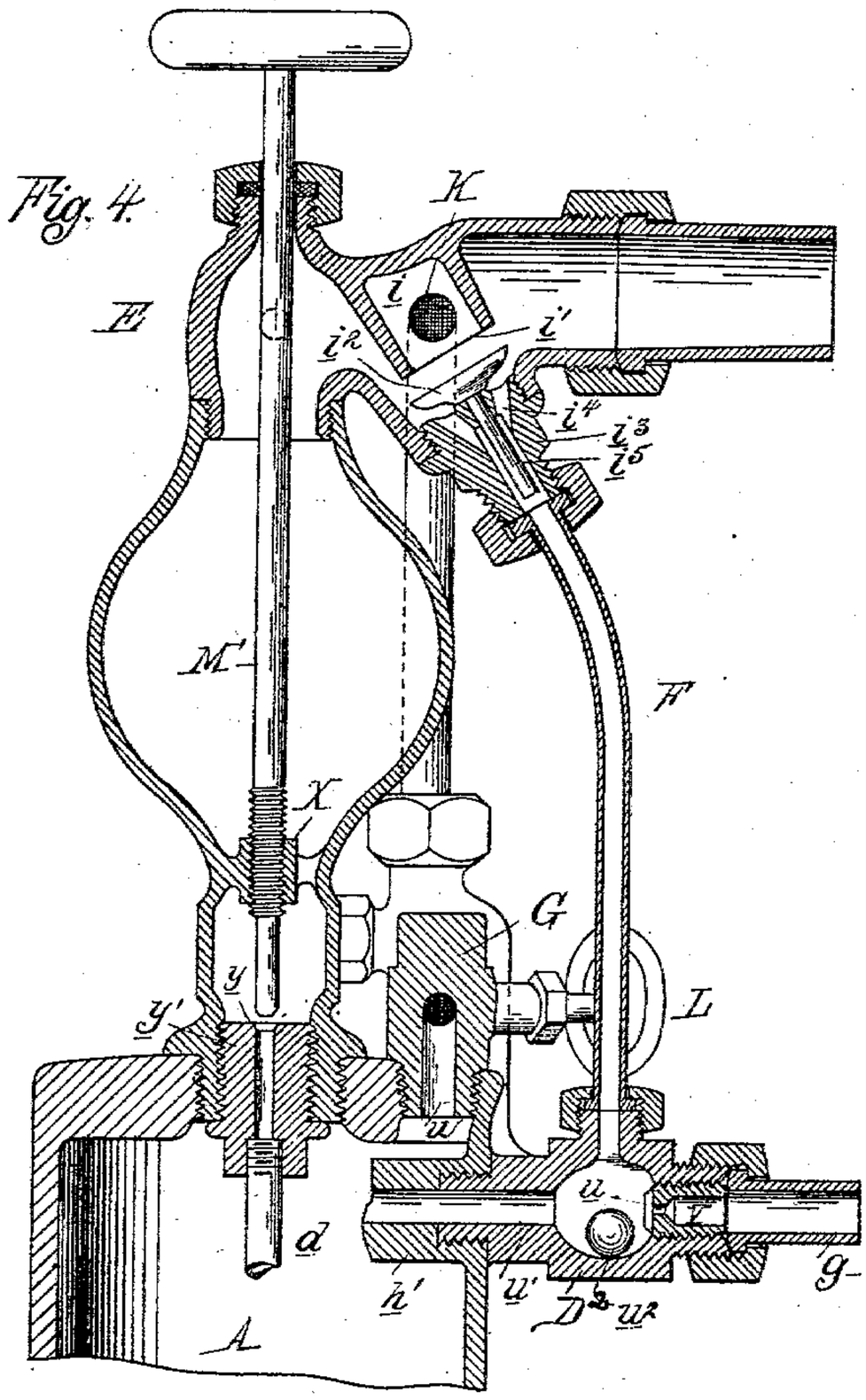
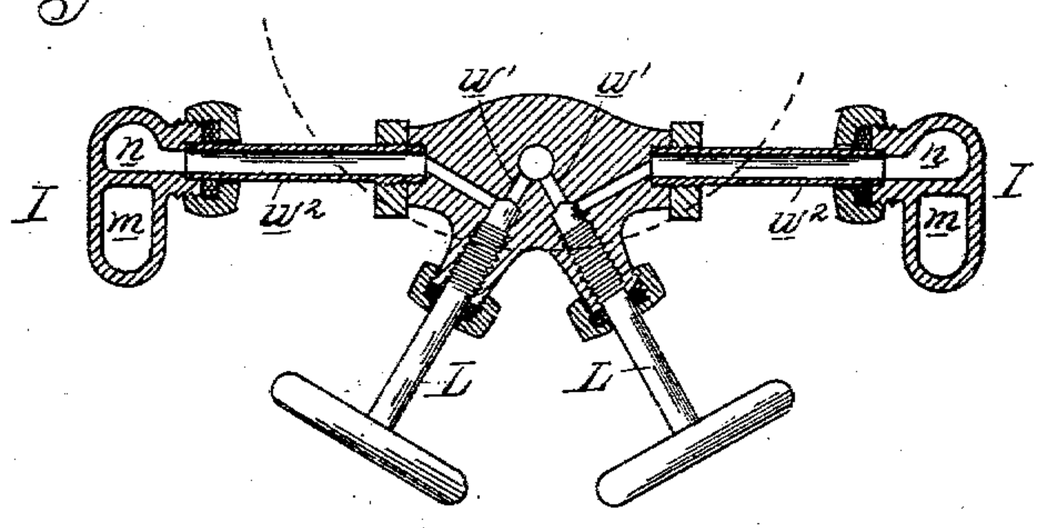


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE B. ESSEX, OF DETROIT, MICHIGAN.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 629,895, dated August 1, 1899.

Application filed April 29, 1899. Serial No. 715,021. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. ESSEX, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Lubricators, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates more particularly to improvements in locomotive-engine lubricators; and it consists in the improved construction and arrangement of parts, fully set forth hereinafter and shown in the accompanying drawings, in which—

Figure 1 is a rear elevation of my improved lubricator. Fig. 2 is a horizontal section thereof on line 2 2, Fig. 1. Fig. 3 is a horizontal section thereof on line 3 3, Fig. 1. Fig. 4 is a vertical central section on lines 4 4, Figs. 1 and 2. Fig. 5 is an elevation taken at right angles to Fig. 1 with some parts shown in vertical section.

In the accompanying drawings, A is the oil-cup, provided with the usual waste-cock *a* at the bottom, the filling-plug *b* in the top, the screw-nipple *c* on the side for screwing the lubricator in position, and the oil-gage *h*. Connected to the top of the oil-cup is the condenser B, which has a discharge-pipe *d* leading down to near the bottom of the oil-cup, and C C′ C² are three upward-flow sight-feed tubes communicating through the usual discharge-tubes *e* with the interior of the oil-cup, under control of the usual regulating-valves *f*. The sight-feed tubes have the usual oil-nozzles and are provided with lateral outlets or feed-arms D D′ D², which have suitable coupling-nipples *g* for connecting them to the tallow-pipes, which respectively connect the outlets D D′ with the steam-chests of the locomotive-cylinders and the outlet D² with the air-brake engine. As will be seen, the outlet D² is placed on the same side of the oil-cup as the outlets D D′ by means of a duct *h*′, leading from the top of the sight-feed tube C² through the top of the oil-cup, as plainly shown in Fig. 2.

The parts as described above are all of the usual construction and operation and do not form any part of my invention.

The condenser has a hollow head E, made of a separate casting screwed into the top of the condenser and forming an induct for the steam into the condenser, suitable coupling means being provided for connecting it with the source of steam direct from the locomotive-boiler. Within this head, on the upper side thereof, is cast a steam-chamber *i*, around which the steam can freely pass into the condenser and which communicates through a port *i*′ at its underside with the steam-induct. This port *i*′ is controlled by a check-valve *i*², which is guided by a valve-stem *i*⁵ in a guide-bearing of the hollow screw-plug *i*³. The plug *i*³ has connected to it an equalizing-pipe F, which through passages *i*⁴ communicates with the steam-induct and leads to the feed-arm D², as clearly shown in Fig. 4.

The steam-chamber *i* has openings K on opposite sides which lead through passages across the space between the walls of the steam-chamber and the head into coupling-nipples *j j*, (see Fig. 1,) to which are connected the auxiliary pipes H H. These auxiliary pipes connect with the feed-arms D D′ in the following manner, particularly shown in Fig. 5, in connection with the feed-arm D, in which I is an upwardly-extending branch of said feed-arm divided by a transverse partition *l* into two separate passages *m n*. The partition *l* extends across the feed-arm and divides it into two chambers *o p*. The chamber *o* communicates with the sight-feed tube through a port *q* and contains a ball-valve *r*, normally resting in a depression of the chamber and adapted to close the port *q* upon the relief of pressure in the sight-feed tube, as will occur when the glass should be broken. The chamber *p* communicates with the chamber *o* through the nozzle *s*, which is formed with a tubular perforated extension *s*′, formed with the shoulder *s*² at its base, which seats the nozzle in an opening in the partition *l*, and with the flaring rim *s*³, by means of which the nozzle is removably clamped in position by the coupling members *g g*′ of the tallow-pipe. The passages *m n* terminate in coupling-nipples *t t*′. To the former the auxiliary pipe H is coupled, and to the latter is coupled an equalizing-pipe J, which leads from the head E. The feed-arm D′ is constructed in the same manner as the feed-arm D and provided with an auxiliary pipe H and equaliz-

ing-pipe J. The feed-arm D^2 connects with the top of the sight-feed tube C^2 through a horizontal tube *h*, (see Figs. 2 and 4,) which is preferably cast integral with the oil-cup in such manner that the passage through it may be formed by drilling from opposite ends. This arm D^2 is also formed with a chamber *u*, communicating through the port *u'* with the sight-feed tube C^2 and inclosing a ball-valve u^2, which normally rests in a depression on the bottom of the chamber *u* and is adapted to close the port *u'* upon a relief of pressure, as in the case of the breaking of the sight-feed tube. The equalizing-pipe F, already described, is connected into the top of this chamber, and into the outlet leading from this chamber into the tallow-pipe is secured the nozzle *v*.

Into the top of the oil-cup is secured a screw-plug G, formed with a vertical passage, communicating at the lower end with the top of the oil-cup and dividing on top into two horizontal passages *w'*, each of which is controlled by a regulating-valve L. The passages *w'* lead in opposite directions and are connected by means of stub-pipes w^2 and suitable coupling-nipples to the passages *n* of the oil-feed branches I. In this manner auxiliary oil-passages (or so-called "blind" feed-passages) are formed from the oil-cup into the feed branches D D', and thus if either of the two sight-feed glasses should break the sight-feed can be cut out by closing the regulating-valve in the bottom and opening the valve L leading to the same feed-arm, the ball-valve in the feed-arm being seated automatically by the relief of the pressure on the breaking of the glass.

The oil-feed arms D D' at their inner ends communicate with pockets M, cast in the interior of the oil-cup, and in this manner the walls of the pockets absorb heat from the steam admitted into the oil-feed arms and keep the oil in the cup warm. The connection *h* also tends to keep the oil warm.

In the axis of the condenser is mounted the valve-spindle M', which has a screw-threaded guide-bearing X, and passes out through a stuffing-box in the head E. The lower end of the spindle is formed with a taper seat adapted to seat upon the discharge-outlet *y*, formed in a screw-plug *y'*, which secures the discharge-pipe *d* to the condenser.

In the practical operation of my lubricator, which is of the well-known type, in which the lubricant is gradually flooded out of the oil-cup into the tallow-pipes by the water of condensation from the condenser, which receives a constant supply of steam from the boiler through a connection with the head E, the steam is directly admitted into the chamber *i*, and thus has a short unobstructed flow by way of the ports K, auxiliary steam-pipes H, and passages *m* into the tallow-pipes at their junction with the feed-arms D and D' and through the tallow-pipes into the steam-chests, thus carrying the lubricant discharged from the oil-cup along with it and preventing any stoppage from condensation, as the quantity of steam thus flowing produces over-pressure in said pipes. When the steam is shut off, however, for stopping the locomotive, it is obvious that as the momentum of the train keeps the engine still running it will draw a supply of steam into the cylinder through the auxiliary steam-pipes H, and thereby cause a sudden relief of pressure therein, which seats the valves i^2.

The arrangement of the chamber *i* prevents it from being flooded by water of condensation, nor will it be robbed of its supply of steam by the equalizing-pipes, which are of lesser size than the pipes H.

The auxiliary or blind oil-feed provided by means of the passages *w*, *w'*, w^2 and *n* is obtained in a simple and reliable way, and its use whenever occasion demands does not disturb the equalization of pressure within the lubricator.

What I claim as my invention is—

1. The combination with the condenser and the oil-reservoir having an outlet-arm to which the tallow-pipe is connected leading to the part to be lubricated, of an equalizing-pipe leading into said outlet-arm near its junction with the oil-reservoir, a restricted passage or nozzle in the outlet-arm beyond its connection with the equalizing-pipe, an auxiliary steam pipe or connection leading into said outlet-arm beyond said nozzle and adapted to carry the oil to the part to be lubricated and a valve operating automatically to cut off the supply of steam into said outlet-arm from said auxiliary pipe upon a relief of pressure in the tallow-pipe.

2. The combination with the condenser and the oil-reservoir having an outlet-arm to which the tallow-pipe is connected leading to the part to be lubricated, of a steam-head on the condenser in constant communication with the source of steam, an equalizing-pipe leading from said steam-head into the outlet-arm near its junction with the oil-reservoir, a restricted passage or nozzle in the outlet-arm beyond its connection with said equalizing-pipe, an auxiliary steam-pipe leading from said steam-head into the outlet-arm beyond said nozzle, and a valve operating automatically to cut off the steam from said auxiliary pipe upon a relief of pressure in the tallow-pipe.

3. The combination with the condenser, oil-reservoir, its outlet-arm and the nozzle located therein through which the oil passes into the tallow-pipe, of a steam-head on the condenser in constant communication with the source of steam and with the condenser, a steam connection from said steam-head into the outlet-arm between the reservoir and the nozzle and another steam connection from said head into the outlet-arm beyond the nozzle.

4. The combination with the condenser and the oil-reservoir having an outlet-arm to which the tallow-pipe is connected leading to the

part to be lubricated, of a steam-head on the condenser in constant communication with the source of steam, an equalizing-pipe leading from said steam-head into the outlet-arm near its junction with the oil-reservoir, a restricted passage or nozzle in said outlet-arm beyond the connection with the equalizing-pipe, a separate steam-chamber in the steam-head, an auxiliary steam-pipe leading therefrom into the outlet-arm beyond the nozzle, and a valve in the steam-head controlling the admission of steam into the separate chamber and operating automatically to close said chamber upon relief of pressure therein.

5. The combination with the condenser, oil-reservoir and its outlet-arm connecting it with the tallow-pipe of a steam-head on the condenser in constant communication with the boiler, passages leading therefrom into the condenser and outlet-arm, a separate steam-chamber in said head, an auxiliary steam-pipe leading from said chamber to the outlet-arm at its junction with the tallow-pipe and a valve controlling the admission of steam into said separate chamber and operating automatically to close said chamber upon relief of pressure therein.

6. The combination with the condenser, oil-reservoir and its outlet-arm connecting it with the tallow-pipe, of a steam-head on the condenser in constant communication with the boiler, passages leading therefrom into the condenser and outlet-arm, a separate steam-chamber in said head communicating therewith through a port on its under side, an auxiliary steam connection leading from said separate chamber into the outlet-arm at its junction with the tallow-pipe, and a normally open gravity-valve in guide-bearings below the separate chamber and operating automatically to close the port into said chamber upon a reduction of pressure in said chamber.

7. The combination with the condenser, oil-reservoir and outlet-arm through which the oil is discharged into the tallow-pipes, of a steam-head on the condenser in constant communication with the boiler and with the condenser, an equalizing-pipe leading from said steam-head into the outlet-arm near its junction with the oil-reservoir, a nozzle in the outlet-arm beyond its connection with said equalizing-pipe, a separate steam-chamber in said head communicating therewith through a valve-port on its under side, a valve operating automatically to close said chamber upon relief of pressure in said chamber, and an auxiliary steam-pipe leading from said chamber into the outlet-arm at a point beyond the nozzle therein.

8. The combination with the condenser, oil-reservoir and sight-feed tube, of the outlet-arm communicating with the top of the sight-feed tube and provided with coupling members for connecting its discharge end with the tallow-pipe, the nozzle in said outlet-arm, the steam-chambers in front and rear of the nozzle, the steam connections leading to said chambers, and the perforated extension of the nozzle passing through the steam-chamber beyond the nozzle and provided with the flaring rim removably securing said nozzle in the outlet-arm by means of the coupling members.

9. The combination with the condenser, oil-reservoir, sight-feed tube and valve controlling its communication with the oil-reservoir, of the outlet-arm communicating with the top of the sight-feed tube, the nozzle in said outlet-arm, the steam-chamber in said outlet-arm between the nozzle and the sight-feed tube, the equalizing-pipe leading into the top of said chamber, the ball-valve in a depression on the bottom of said chamber and operating automatically to close the communication with the sight-feed tube upon relief of pressure therein, the steam-chamber between the nozzle and the discharge end of the outlet-arm, the auxiliary steam-pipe leading into said chamber and a valve operating automatically to cut off the admission of steam into said chamber upon relief of pressure therein.

10. The combination with the condenser, oil-reservoir, and sight-feed tube, of the outlet-arm connecting the sight-feed tube with the tallow-pipe, the vertical arm or branch of said outlet-arm, the partition dividing said outlet-arm and branch into two chambers or passages, one communicating with the sight-feed tube and the other with the tallow-pipe, the nozzle seated in said partition and through which the chambers communicate, and the equalizing and auxiliary steam-pipes leading into the branch of the outlet-arm and communicating respectively into the chambers on opposite sides of the nozzle.

11. The combination with the condenser, oil-reservoir, sight-feed tube and valve controlling its communication with the oil-reservoir, of the outlet-arm from the sight-feed tube having a valve-port through which said sight-feed tube communicates into the outlet-arm, and an equalizing-pipe leading into said outlet-arm beyond said valve-port, a valve adapted to automatically close said port upon relief of pressure in the sight-feed tube, and an auxiliary oil-feed comprising a plug secured in the top of the oil-reservoir, a passage formed through said plug communicating at one end with the top of the oil-reservoir and at the other end with connections and passages leading into the outlet-arm beyond the valve-port therein and a valve in said plug controlling the flow of oil through the passage in the plug.

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

GEORGE B. ESSEX.

Witnesses:
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