

(No Model.)

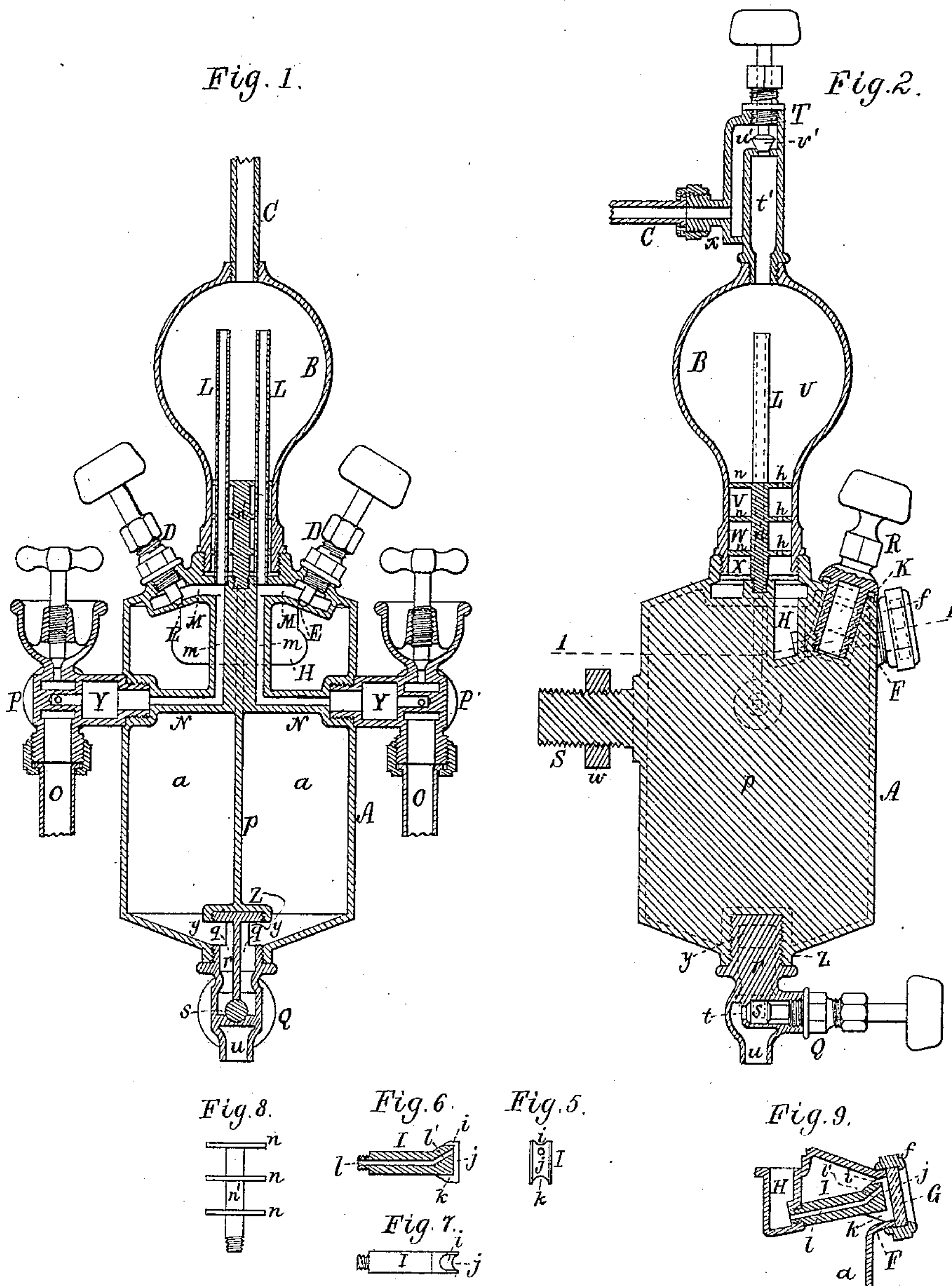
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W. H. CRAIG.

STEAM ENGINE LUBRICATOR.

No. 397,972.

Patented Feb. 19, 1889.



Witnesses.
L. J. Fadelief,
Thos. Houghton.

Inventor.
Warren H. Craig.
per M. H. Singleton.
Atty.

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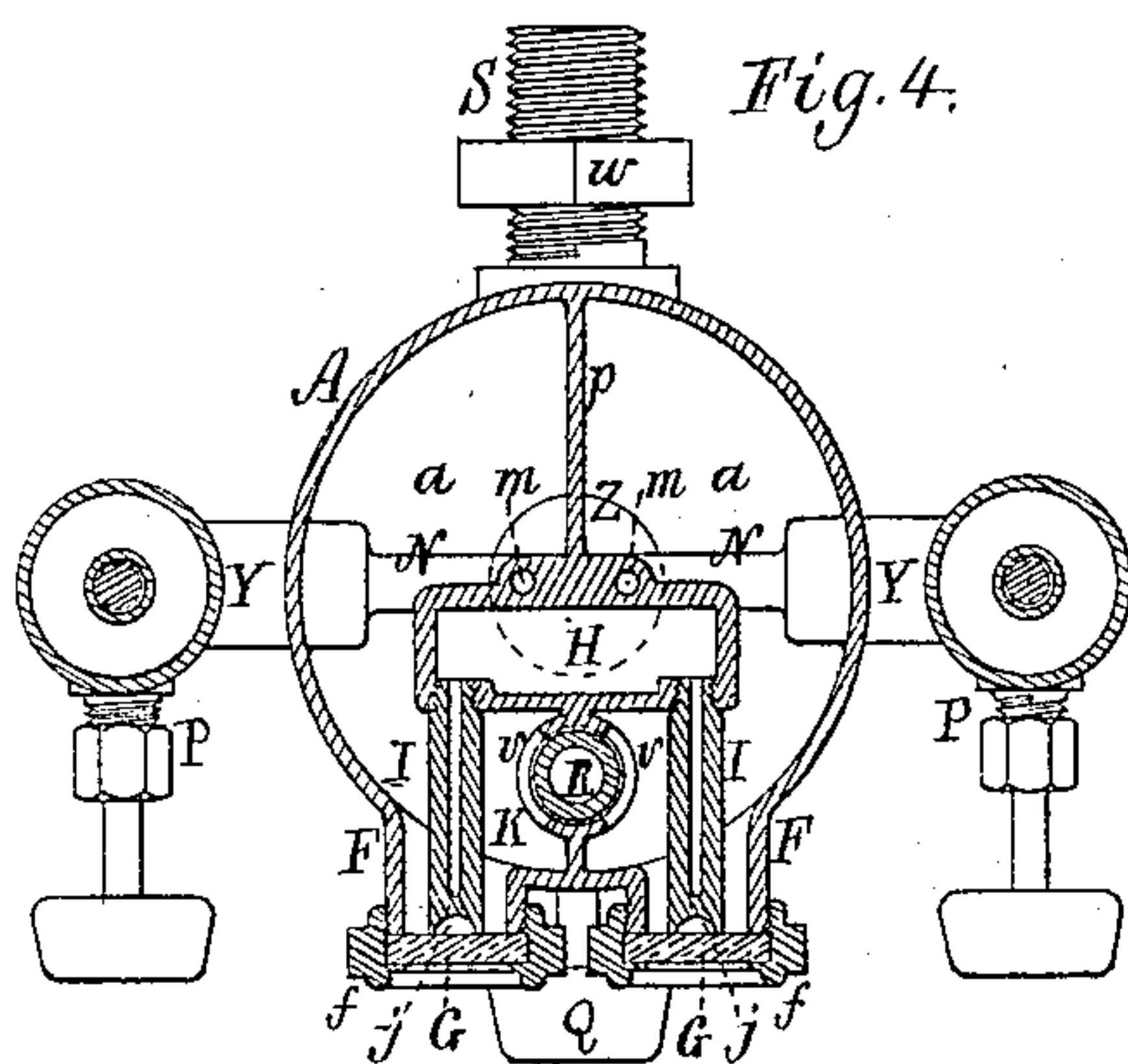
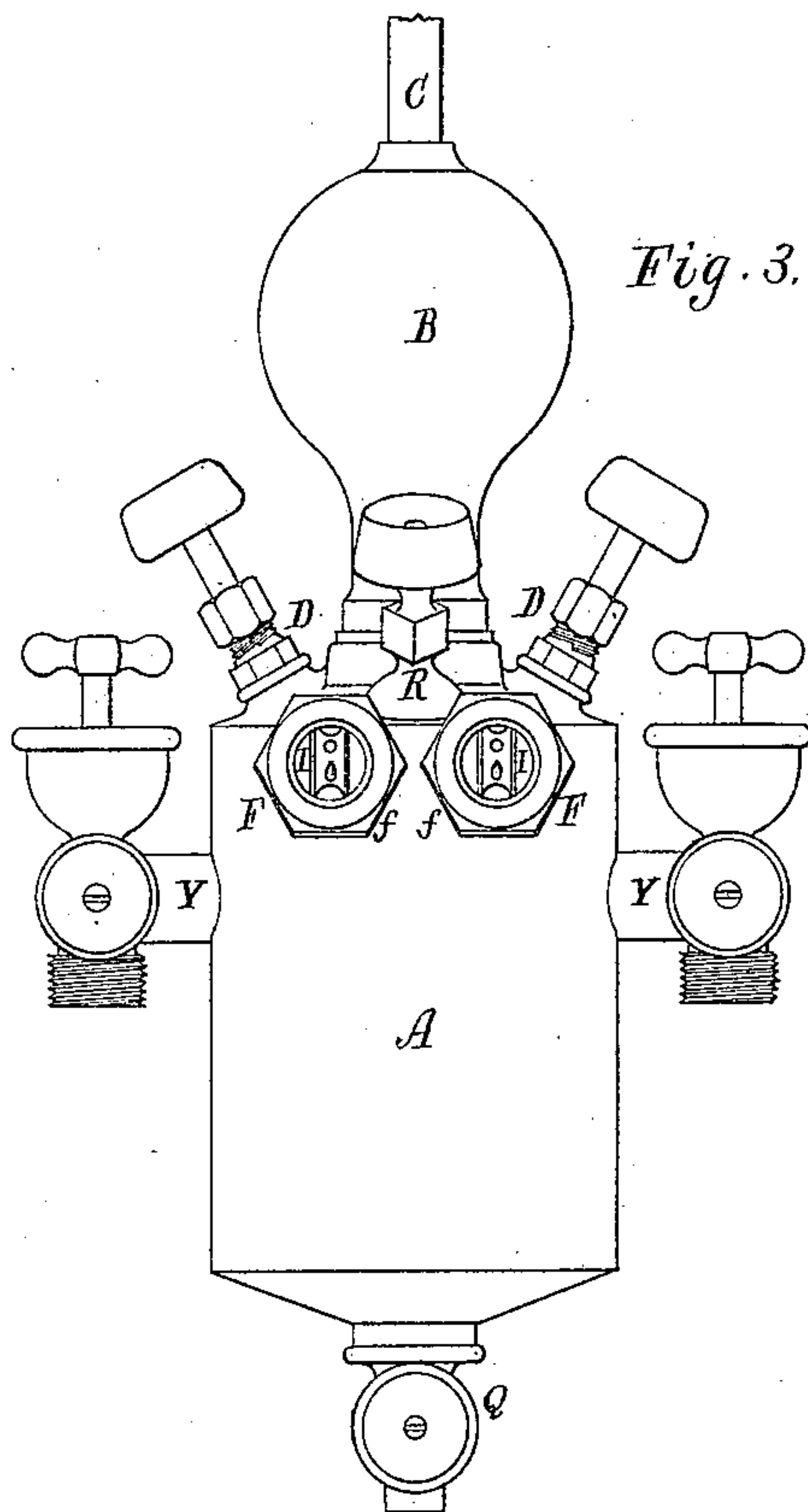
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UNITED STATES PATENT OFFICE.

WARREN HILLIARD CRAIG, OF LAWRENCE, MASSACHUSETTS.

STEAM-ENGINE LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 397,972, dated February 19, 1889.

Application filed October 6, 1888. Serial No. 287,449. (No model.)

To all whom it may concern:

Be it known that I, WARREN HILLIARD CRAIG, a citizen of the United States, residing at Lawrence, county of Essex, State of Massachusetts, have invented new and useful Improvements in Steam-Engine Lubricators, the nature of which is set forth in the following specification and claims hereinafter presented.

In some respects the lubricator herein described is like one patented to me July 28, 1885, and numbered 322,912, the main features of difference being that of construction, whereby I obtain better results and lessen the cost of manufacture.

It consists in a lubricator having mechanism whereby the sight-feed, of whatever character, may be shielded, as it were, from the pulsation of the steam in the pipe or boiler of the engine to which it may be attached. It also corrects the bad effects of jar and motion when attached to locomotives.

It consists of chambers arranged between the sight-feed chamber or chambers and the steam-space that it may be connected or communicate with, such chambers communicating with each other and the sight-feed chamber and steam-space by small openings. The pulsation of the steam caused by the working of the engine or the motion of the same is therefore transmitted through the small openings into the several chambers. It will be seen that the shock that heretofore caused the drops to break when forming in the sight-feed chamber is lessened by its passage from one chamber to another, so that when the drop reaches the drop-chamber, where the feed is observed, its bad effects have been corrected or lost in the chambers through which it had to pass. Furthermore, by the construction of steam and oil chambers and also passages in the manner shown and described with my duplex oil-reservoir I gain further advantages.

In the accompanying drawings, Figures 1 and 2 are vertical and median sections of a lubricator provided or made in accordance with my invention, said sections being taken in planes at right angles to each other. Fig. 3 is a front elevation of the lubricator. Fig. 4 is a partially-horizontal section of the same on line 1 1 of Fig. 2. Fig. 5 is a front view;

Fig. 6, a vertical and longitudinal section; and Fig. 7 is a top view of one of the conduits I. Fig. 8 is an elevation of a series of flanges and their supporting-shank, the office of which will be hereinafter set forth. Fig. 9 is a vertical section of the pocket and one of the conduits which convey the water of condensation to a sight-feed glass, also of one of the tubular projections or observation-chambers.

The nature of my invention is defined in the claims hereinafter presented.

In the accompanying drawings, A denotes a duplex oil-reservoir having attached to its top a condenser, B, which is ball-shaped and is provided with a neck, the greater portion of which is cylindrical, as shown, and screws at its lower end into the top of the said reservoir. From the top of said condenser there leads a pipe, C, to convey steam into it from the boiler of the locomotive. In the top of the oil-reservoir are arranged regulating-valves D D, which operate to open or close the openings E E, which lead from chambers M M, arranged in the top of the reservoir, into the oil-chambers *a a* of the said reservoir. Opening out of each of the chambers *a*, near the top thereof and on the side of the reservoir, is a tubular projection, F. These projections are screw-threaded at their outer ends to receive glands *f f*, in which are arranged glass plates or panes G G, which are borne by the said glands against the ends of and so as to close the openings in the projections F, as shown in Figs. 4 and 9, and also permit the drops of water as they drop down before the panes to be observed.

Communicating with the space which receives the lower end of the condenser is a pocket, H, into the sides of which, next the projections F and near to the bottom of said pocket, are screwed conduits I I, upwardly inclined, as shown. The outer ends of said conduits are widened vertically and bear against or nearly touch at their side edges the glass plates G, said ends of the conduits being grooved, as shown, at *i j k* to form a passage about said ends and against the glass panes, the bottom grooves, *k*, being deeper than the other grooves, so that the water from the pocket, which will enter the grooves *j* in the form of drops from the ducts *l* of the conduits, may pass freely down into the oil-chambers *a*

of the reservoir to the bottom thereof. The said ducts *l* lead through the conduits *I* from end to end and open communication between the pocket *H* and the passages *j*, and at its outer end each duct *l* rises at an angle with the rest of the duct, as shown at *l'* in Fig. 6, so as to form a trap.

In the cylindrical portion of the neck of the condenser is arranged a series of horizontal partitions, *n n n*, supported on or forming part of a shank, *n'*, as shown in Figs. 2 and 8. These partitions at their edges fit closely to the neck of the condenser, and are each provided with a small hole, *h*, through which the water of condensation passes from one chamber to another of the several chambers *U V W X* of the condenser and into the pocket *H* of the reservoir.

The object of forming the condenser with the series of chambers, as described, communicating each with the other by small openings, is to insure that the water of condensation as it passes in view behind the glass panes shall be in the form of ordinary drops, so as to be readily seen by the engineer.

In the lubricators in use on locomotives at the present time, owing to their construction, the condenser having but a single chamber, the pulsation of the steam in the boiler caused by the motion of the valves and by the jar and motion of the engine is transmitted to the water in the condenser, and the said water is thereby caused to take the form of small particles instead of drops.

Leading upward from the reservoir and through the partitions *n n n* nearly to the top of the condenser and opening out of the chambers *M M* in the reservoir are pipes *L L*, and there are also communicating with the said chambers *M M* passages *m m*, which lead downwardly into ducts *N N*, arranged horizontally, or about so, in the reservoir and connecting with the tubular brackets *Y Y*, secured to said reservoir, and communicate through said brackets with the discharge-pipes *O O*, commonly called "tallow-pipes," and which lead to the valve-chests of the engine. The said brackets are provided with valves *P P* to close the passages connecting the ducts *N* with the pipes *O*, and on the top of the brackets are tallow-cups of ordinary construction, provided with cocks to enable the oiling of the valves to be performed in the usual way, if desired.

The oil-reservoir *A* is divided into the two chambers *a a* by the partition *p*, and at the bottom of said reservoir is a socket, *Z*, screw-threaded and having openings *y y*, which communicate with the chambers *a a*, and there is screwed into said socket *Z* a drain-cock, *Q*, the induct of which is divided into two chambers, *q q*, by a partition, *r*, said chambers *q* opening through the side of the cock into the chambers *a a*. On withdrawing the plug *s* of the valve from its seat *t* the contents of both chambers *a a* will escape through the educt *u* of the cock.

In the top of the reservoir is a filling-mouth, *K*, it having openings *v v* through its sides, one to each chamber *a*. Said mouth is closed by a plug, *R*, as shown. On the side of the reservoir opposite to the glass panes is a supporting-shank *S*, screw-threaded and provided with a nut, *w*, to secure the lubricator to a proper support when in use.

To the top of the condenser I usually apply, as shown in Fig. 2, a valve, *T*, such valve being provided with a vertical tubular passage, *t'*, opening at its bottom into the top of the condenser *B*. At its upper end it opens into a chamber, *u'*, communication between the said passage and chamber being closed by the valve-plug *v'*. The chamber *u'* extends downward alongside of the passage *t'*, and near the bottom of said chamber is a branch pipe, *x*, to connect with the steam-pipe *C*. It will be seen that by this construction or manner of connecting the steam-pipe to an intermediate connection instead of directly to the condenser the water of condensation in the pipe *C* is prevented from passing into the condenser, thus allowing live steam to continually pass to the pipes *L L* instead of steam and water, the water that is used in the lubricator being condensed in the condenser and not in the pipe *C*.

The operation of the lubricator hereinbefore described will be essentially as follows: The lubricator being attached to the locomotive in a position to be conveniently observed, the pipe *C* will connect the condenser with the steam-space of the boiler, and the pipes *O O* will lead to the valve-chests of the cylinders, the chambers *a a* being charged with oil through the filling-mouth *K*, which is shown as closed by the plug *R*. Steam entering the condenser will become partially condensed, and the water of condensation flowing through the openings *h* in the partitions *n* will accumulate in the chambers and in the pocket *H*, and will fill the conduits *I I* and escape from said conduits in the form of drops down between the outer ends thereof and the glass panes *G*, and will descend to the bottom of the oil-chambers. On opening the valves *D D* the oil will be borne upward by the water through the openings *E E* into the chambers *M M*, and, the valves *P P* in the brackets being open, live steam from the pipe *C* will pass down the tubes *L L*, passages *m m*, and ducts *N N*, through the brackets *Y Y* and pipes *O O*, to the valve-chests of the cylinders, carrying with it the oil that flows from the chambers *a a* into the chambers *M M*.

Having described my invention, what I claim is—

1. A sight-feed lubricator provided in its water-space with one or more partitions, each having a small opening or hole, whereby pulsation is prevented, as set forth.

2. A lubricator provided with a duplex oil-reservoir, a water-pocket located at the upper part thereof, the tubular projections *F F*, and the conduits *I I*, leading from the pocket into

the projections and each projection communicating with one side of the duplex oil-reservoir, whereby each part of the oil-reservoir is supplied with condense-water independent
5 of the other, as set forth.

3. A lubricator provided with a duplex oil-reservoir, a water-pocket located at the upper part thereof, the projections F F, provided with a glass pane or window, and the con-
10 duits I I, leading from the pocket into the projections and having the passages close to the panes or windows and leading into each side of the oil-reservoir, as set forth.

4. A lubricator provided with a duplex oil-
15 reservoir, a water-pocket, a sight-feed for each part of the oil-reservoir, and a conduit connecting the pocket with each sight-feed chamber and being connected with each part of the oil-reservoir, as set forth.

5. In a sight-feed lubricator, the sight-feed 20 chamber and projection, in combination with the conduit I, having its outer end located close to the glass of the projection, such outer end being widened and concaved at its top, front, and bottom, forming a chamber, as set 25 forth.

6. A lubricator provided at the top of its condenser with the trap consisting of the chamber *u'* and passage *t*, alongside each other and communicating with each other, the 30 chamber having the branch pipe *x*, and the passage being adapted to the top of the condenser, as set forth.

WARREN HILLIARD CRAIG.

Witnesses:

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EDWIN SIMONDS.