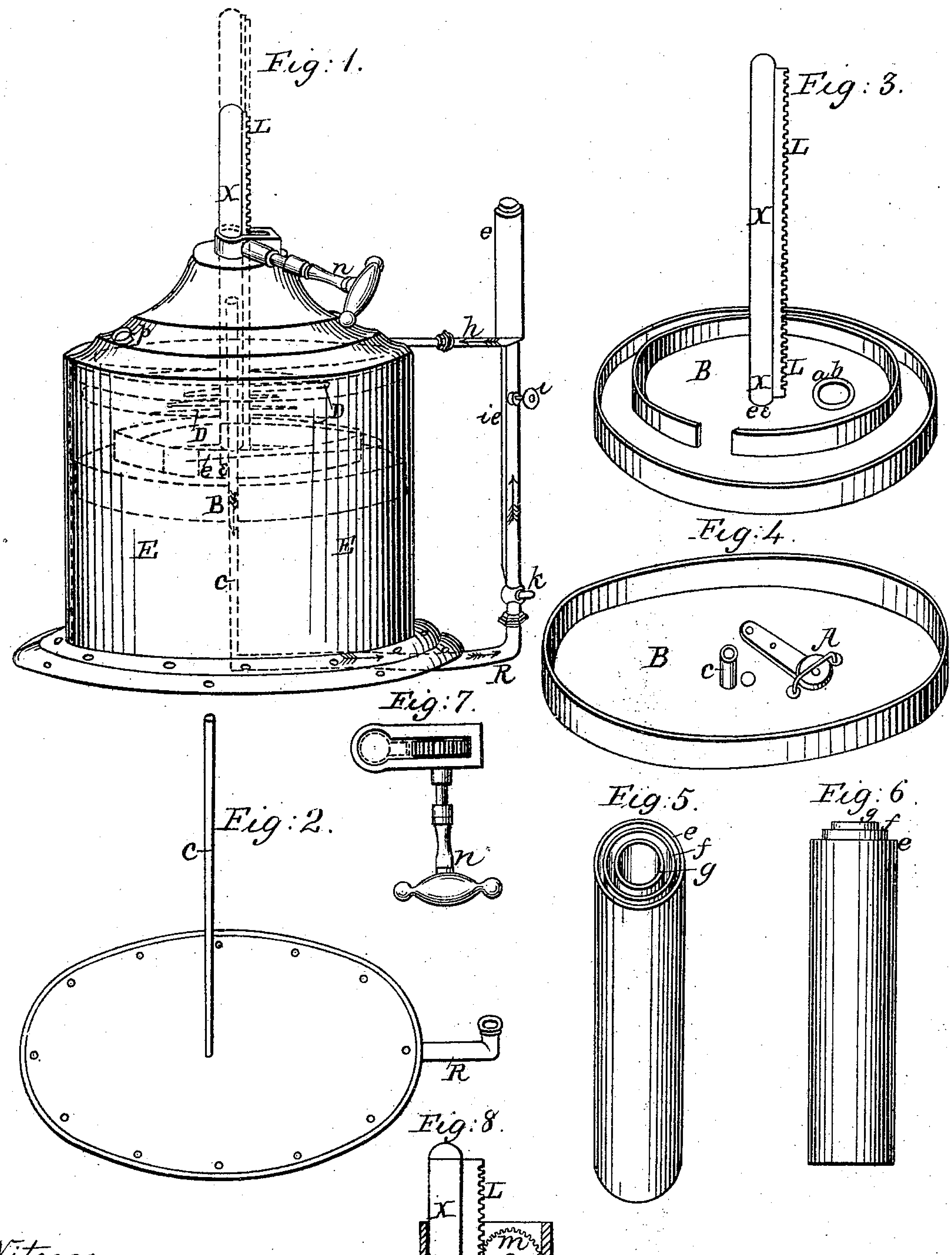
S. E. & H. B. CLEVELAND.

Lamp.

No. 15,172. Patented June 24, 1856.



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UNITED STATES PATENT OFFICE.

SAML. E. CLEVELAND AND H. B. CLEVELAND, OF BUFFALO, NEW YORK.

LOCOMOTIVE-LAMP.

Specification of Letters Patent No. 15,172, dated June 24, 1856.

To all whom it may concern:

Be it known that we, SAMUEL E. CLEVELAND and HENRY B. CLEVELAND, both of the city of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in the Construction of Locomotive-Lamps; and we hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The nature of our improvements and invention consists in the arrangement and combination of a plunger valve, and spring for the purpose of forcing the oil from the reservoir to the burner, as hereinafter more fully described.

To enable others skilled in the art to make and use our invention we will proceed to describe its construction and operation.

In the construction and operation of this class of lamps it is desirable to have great pressure upon the oil, in order to force it to the burner, and at all times insure a constant and uniform supply. To effect this object it is necessary that a pressure plunger should be provided, which will fit the reservoir or oil-can so perfectly that the oil cannot pass between it and the body of can, when the pressure is applied to the plunger. And it is also necessary to afford an opportunity for the oil to pass below the plunger, when the plunger is raised. For these purposes we make our plunger to exactly fit the inside of the reservoir or oil can like as a piston, so that no oil can pass between it and the oil can, when the pressure is applied; and then we provide a valve in the bottom of the plunger, so that the oil will pass through the valve, when the plunger is raised, and also prevent it from passing back when the pressure is applied to the plunger. This pressure plunger is represented at B, Figure 3. *a b*, is the aperture, leading to the valve. Z is the ratchet bar by which the plunger B, is raised. X is a tube which incloses or sets over the tapering tube as hereinafter more fully described.

Fig. 4, shows the under side of the plunger. The valve is represented at, A. This valve may be constructed in any common or well known way.

In Fig. 1, E, E, represents the reservoir or oil-can. This is made of copper or other suitable material in the cylindrical form, so that the plunger B, will work in it like a piston. D, D, represents a strong spiral spring, which is the power or force applied to the plunger. This spring sets upon the upper side of the plunger and between it and the top of the can or reservoir.

The oil is supplied to the can or reservoir, through the opening represented at P. When the can is to be filled with oil the plunger B, is near the bottom of the can, the oil being above and the spring, D, D, immersed in the oil. When the plunger is raised a portion of the oil passes through the valve and below the plunger, and then the power and pressure of the spring is exerted upon the plunger and by the plunger upon the oil below, and thereby the oil is forced up on the outside of the tapering tube, *c*, until it flows over into the tube and down through it into the feeding tube R.

It will be observed, that a compensating tube (X,) is connected with the ratchet bar L and plunger B. This tube passes over the tapering tube (*c*) and is made smaller at its mouth as shown at (*e*, *e*,) Figs. 1 and 3. The diameter of its mouth is a trifle larger than the diameter of the tapering tube, *c*, over which it works. When the oil can is nearly full of oil, and the plunger nearly at the bottom the spiral spring is expanded and consequently exerts less power upon the plunger and the oil below. To compensate for the less power exerted by the spring the tube *c* (Figs. 1, and 2,) is made tapering, so that there is greater room or space for the oil to pass through the mouth of the tube X, when the pressure of the spring is least, the smaller end of the tube being connected to the plunger. As the plunger is raised, the spring is compressed, and exerts a greater power, and the tapering tube increases in size, and the space for the passage of the oil decreases, and this increase and decrease is exactly proportioned so that a constant and uniform supply of oil to the burner is secured. As the oil consumes in the burner the spring constantly presses the plunger down upon the oil below, and as the plunger goes down, the spring expands, and its power becomes less, but the space for the oil to pass through the mouth of the tube X becomes greater, and hence the compensation becomes complete.

In locomotive lamps heretofore constructed, the oil has not been supplied to the burner by pressure, and indeed there has not to our knowledge been any plunger, or pres-

sure force used in connection therewith. In our improvements we use mechanical power as herein described in order to put the oil under pressure and force it to the burner, in a constant and uniform supply, under all its conditions, and this we claim as new.

Our third improvement relates to providing the feeding tube R with the stop cock K. In lamps constructed without this improvement when the plunger is being raised the suction of air through the burner is so great as to extinguish the light and when the pressure of the spring is exerted it will blow the oil from the burner but with the stop cock the oil is retained in the burner and there is no suction of air to extinguish the light. In this respect we consider the stop cock a very great improvement as herein combined and used.

Our fourth improvement relates to an inclosing tube or cylinder and a return tube to conduct back to the can the surplus oil from the burner. In lamps heretofore constructed there accumulates on the wick a crust or mass of decarbonized matter which obstructs the light. To avoid this difficulty we intend the supply of oil to the wick to be greater than the consumption, so that there will be a constant flow of pure oil through the wick back to the can. To effect this object we make an outside tube or cylinder, *e*, which surrounds the wick tubes *g*, and, *f*, to catch the overflowing oil from the wick. This tube or cylinder is shown at *e* Fig. 5 and Fig. 1, the wick tube *g* and *f* Figs. 5 and 6. The return tube, *h*, Fig. 1 is connected to the outside or surrounding cylinder, *e*, and to the oil can; so that there is a constant current of oil passing from the can through the wick to the can as indicated by the arrows. By this arrangement the accumulation of crust or de-carbonized matter upon the burning wick is avoided, and a clear white light produced and every particle of oil is saved.

In locomotive lamps, a cone shaped reflector is used. The burner should be placed in the apex of the reflector. To do this effectually it is expedient that the burner should be removed at a distance from the reservoir or oil can. We have accordingly effected a separation of the burner from the oil-can, and succeeded in supplying it with a constant flow of oil by means of the feeding and return tubes. This we claim as our improvement.

In Fig. 1 at, *i*, is shown the ratchet wheel and at, *i e*, the ratchet bar by which the wick is adjusted.

In Figs. 5 and 6 at, *e* is, represented the inclosing tube or cylinder which receives the overflowing oil from the wick and which is connected with the returning tube, *h*. *g*, is the wick tube and *f* a tube surrounding the wick.

In Fig. 8, *m*, shows a section of the ratchet wheel which works on the end of the lever *n*, Figs. 1 and 7. In Fig. 8, X, shows a section of the tube which incloses the tapering tube, *c*, and, L, a section of the ratchet bar by which the plunger is raised. These are connected with the plunger as represented at, X, L, Fig. 3.

In the manufacture of these lamps, the usual metals and materials are used, and a common mechanic skilled in the art, will find no difficulty in the construction of the same. They may be made of different sizes and proportions as circumstances require, and the principle of our improvements may be applied to other than locomotive lamps.

We think we have been sufficiently minute in our description, to give a clear idea of the nature of our improvements, and manner of constructing and using the same.

We therefore claim—

The arrangement and combination of the valve A, with the plunger B, and spring D, D, for the purpose of forcing, the oil from the can, or reservoir, to the burner or wick, substantially as herein set forth.

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