

(No Model.)

F. G. HUBBARD.  
LUBRICATOR.

No. 442,624.

Patented Dec. 16, 1890.

Fig. 1.

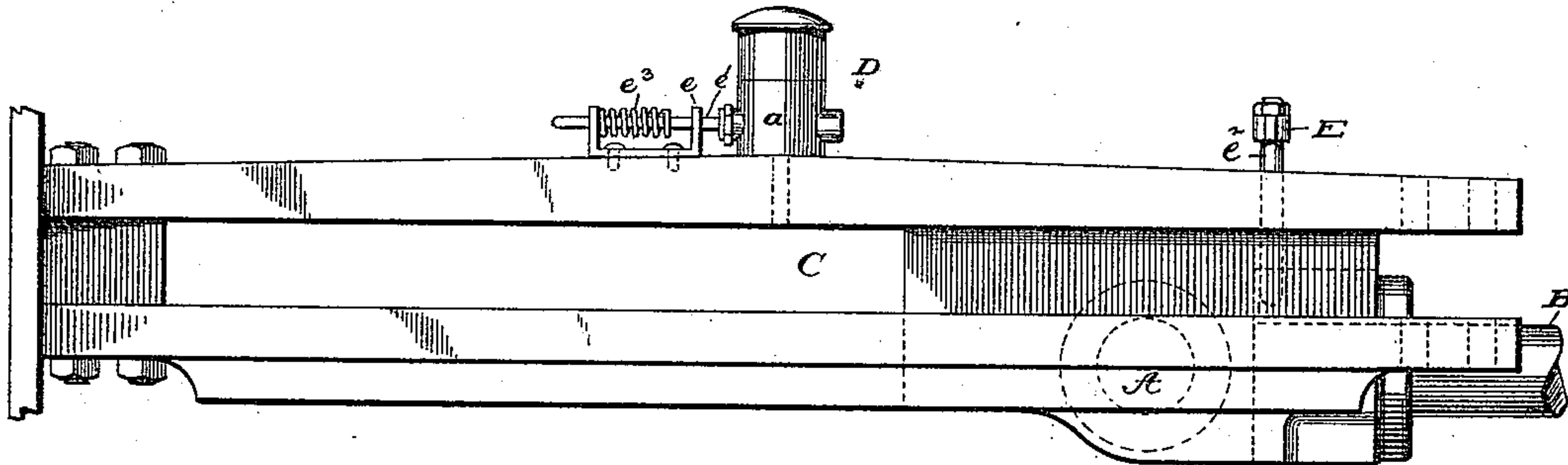


Fig. 2.

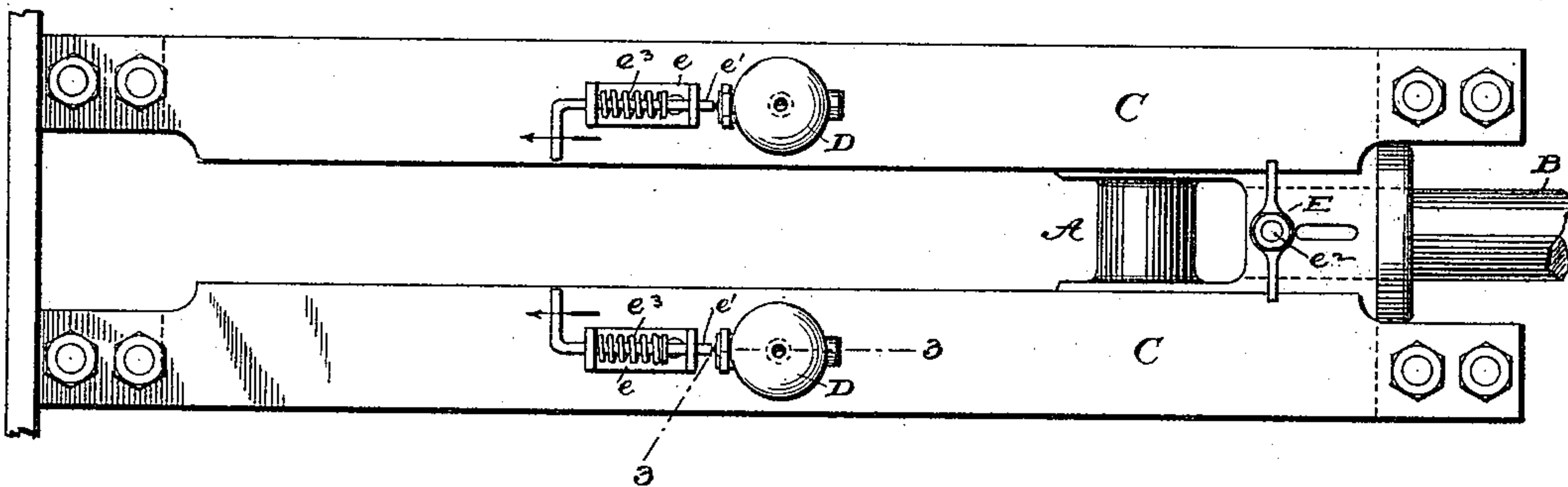
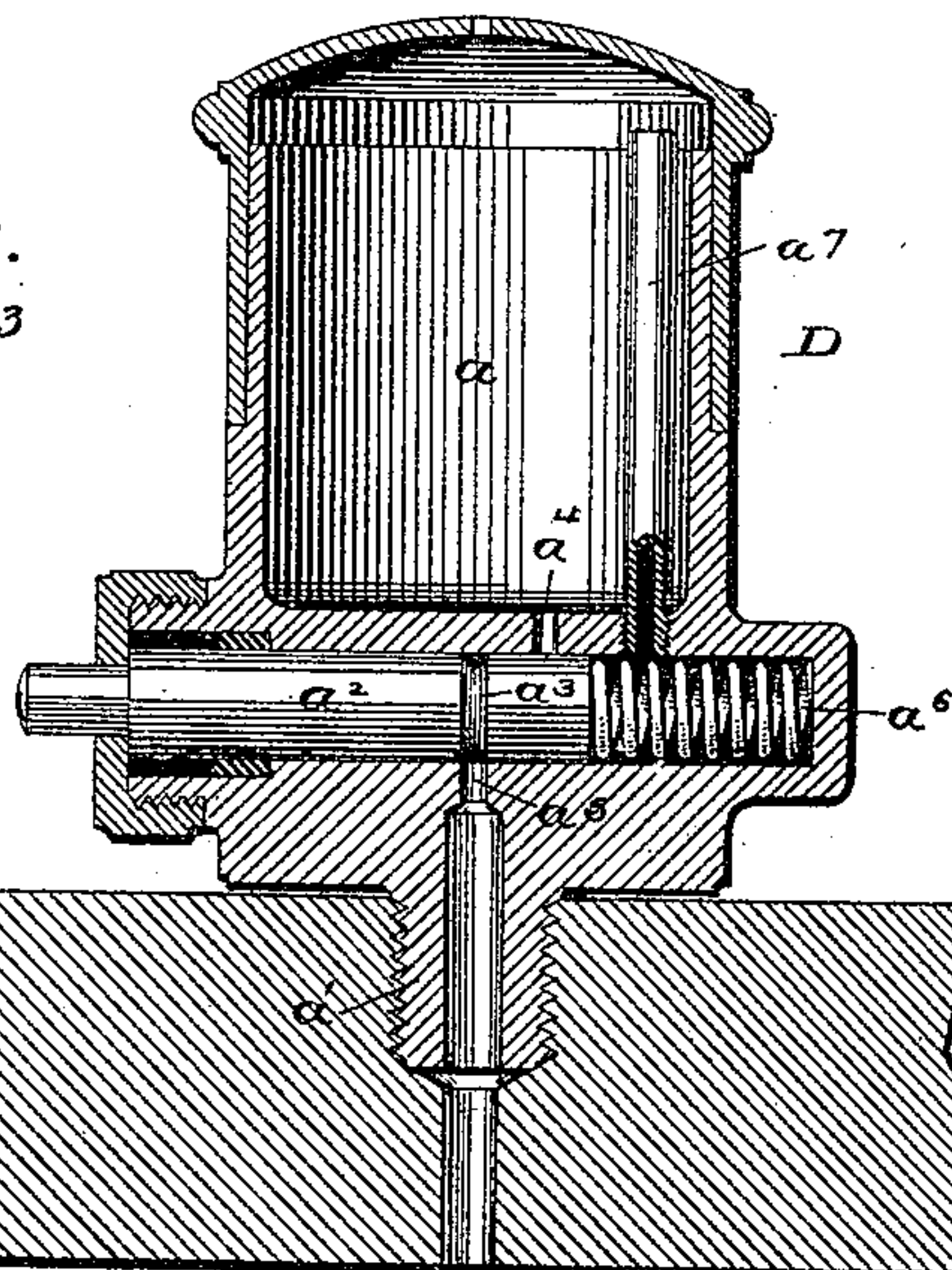


Fig. 3.  
on line 3-3



Witnesses:  
M. M. Mortimer  
J. Stanley Ellmore

Inventor:  
F. G. Hubbard  
By his Atty.  
P. Y. Dodge



# UNITED STATES PATENT OFFICE.

FRANK. G. HUBBARD, OF MILWAUKEE, WISCONSIN.

## LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 442,624, dated December 16, 1890.

Application filed April 15, 1890. Serial No. 348,011. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK. G. HUBBARD, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain  
5 Improvements in Lubricators, of which the following is a specification.

My invention relates to a device intended more particularly for effecting the lubrication of the cross-head guides of locomotive-engines, although adapted for use in other  
10 places.

The principal objects of the invention are to effect a properly-graduated delivery of oil to the guides whenever the engine is in motion and to prevent the delivery of the lubricant when the engine is at rest.  
15

In the accompanying drawings, Figure 1 is a side elevation showing the ordinary cross-head and cross-head guides with my lubricators applied thereto. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical central section through one of the lubricators on the line 3 3 of Fig. 2.  
20

Referring to the drawings, A represents the  
25 cross-head; B, the piston-rod to which it is attached; C, the horizontal cross-head guides constructed and arranged as usual, and D the lubricator. There are two lubricators, attached one to each of the upper guides. Each  
30 lubricator consists of a cup or body portion  $a$ , provided at the lower end with a tubular neck  $a'$ , which is threaded into the guide and which communicates with an opening leading downward through the latter. In the base of the  
35 cup there is mounted a horizontal plunger  $a^2$ , provided with a circumferential groove  $a^3$ , which by the reciprocation of the plunger is caused to register alternately with a feed-opening  $a^4$ , leading downward from the cup,  
40 and with the delivery-opening  $a^5$  through the neck or bottom of the cup. A spiral spring  $a^6$ , acting against the end of the plunger, tends constantly to force the same outward, so that its groove  $a^3$  will register with the  
45 discharge-opening  $a^5$ . At one end the plunger is reduced to form a neck, which is extended outward through a gland or stuffing-box, so as to be exposed outside of the cup to the action of the operating devices herein-  
50 after described. A vertical tube  $a^7$  extends from the chamber at the inner end of the plunger upward into the top of the cup or

lubricator, allowing air to pass into and out of the space behind the plunger as the latter reciprocates. As the plunger is driven in-  
ward, the air is expelled through the tube, and  
55 being driven upward into the top of the cup is there compressed to assist in driving the oil or other lubricant downward through the port  $a^4$  into the plunger of the piston. 60

For the purpose of operating the plunger I mount on each of the cross-heads, in a suitable guide-plate  $e$ , a horizontal sliding bolt  $e'$ , one end of which is arranged in position to act upon the plunger, while the opposite end is  
65 bent inward at a right angle in position to encounter a bar E, carried by a stud  $e^2$ , screwed into the cross-head. Each of the rods  $e'$  is encircled by a spiral spring  $e^3$ , acting at one end against the supporting-plate and at the  
70 opposite end against a collar on the rod. This spring tends constantly to urge the rod toward the plunger and is of greater strength than the spring  $a^6$ , so that when the parts are released the spring  $e^3$ , overcoming the spring  
75  $a^6$ , holds the plunger inward with its groove  $a^3$  in connection with the opening  $a^4$ . This is the normal position of the parts. As the cross-head advances, the bar E acts against the two rods  $e'$ , carrying them forward in the  
80 direction of the arrow away from the feed-plunger  $a^2$ , whereupon the plunger is driven forward by the spring  $a^6$ , closing the opening  $a^4$  and carrying the groove  $a^3$  over the opening  $a^5$ , whereupon the contained oil is dis-  
85 charged. As the cross-head retreats, the bar E releases the rods  $e'$ , whereupon the springs  $e^3$  act to return the rod and plunger to their normal positions. As the air-tube, which is of small size, checks the admission of air into  
90 the space or chamber behind the piston, the motion of the latter is retarded in such manner as to prevent a violent or hammering action and to give sufficient time to insure the filling of the groove or channel in the piston. 95

The employment of the two independent springs to move the piston in opposite directions is advantageous, in that the several parts of the lubricator are permitted to move smoothly and easily when the engine is driven  
100 at high speeds.

Having thus described my invention, what I claim is—

1. In a lubricator, the oil-cup having the

delivery-orifices  $a^4$  and  $a^5$  out of line with each other, the reciprocating plunger grooved to transfer oil from one orifice to the other, the spring acting to move the plunger in one direction, and a pneumatic retarding mechanism, substantially as shown, to limit the speed of the plunger.

2. The oil-cup provided with the feed-plunger and its actuating-spring  $a^6$ , in combination with the independent plunger-actuating rod, and its actuating-spring of greater strength than spring  $a^6$ .

3. In combination with an oil-cup, an oil-delivery plunger, and a spring to move the same in one direction, in combination with a spring-actuated rod to move the same in the opposite direction against the resistance of the first-named spring, and a cross-head ar-

ranged to overcome the second spring and render the same inactive at each stroke, thereby allowing the weaker spring to actuate the piston.

4. In combination with the cross-head and the arm or bar E, carried thereby, the two cross-head guides, the two oil-cups, their plungers, the springs acting against the plungers, and the external rods arranged to encounter the arm E, the springs acting on said rods.

In testimony whereof I hereunto set my hand this 12th day of March, 1890, in the presence of two attesting witnesses.

FRANK. G. HUBBARD.

Witnesses:

C. C. DIMOCK,  
H. B. EARLING.