No. 675,326. Patented May 28, 1901.

C. DORN & W. G. T. MARCELLUS.

PUMPING APPARATUS.

(Application filed Sept. 28, 1900.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

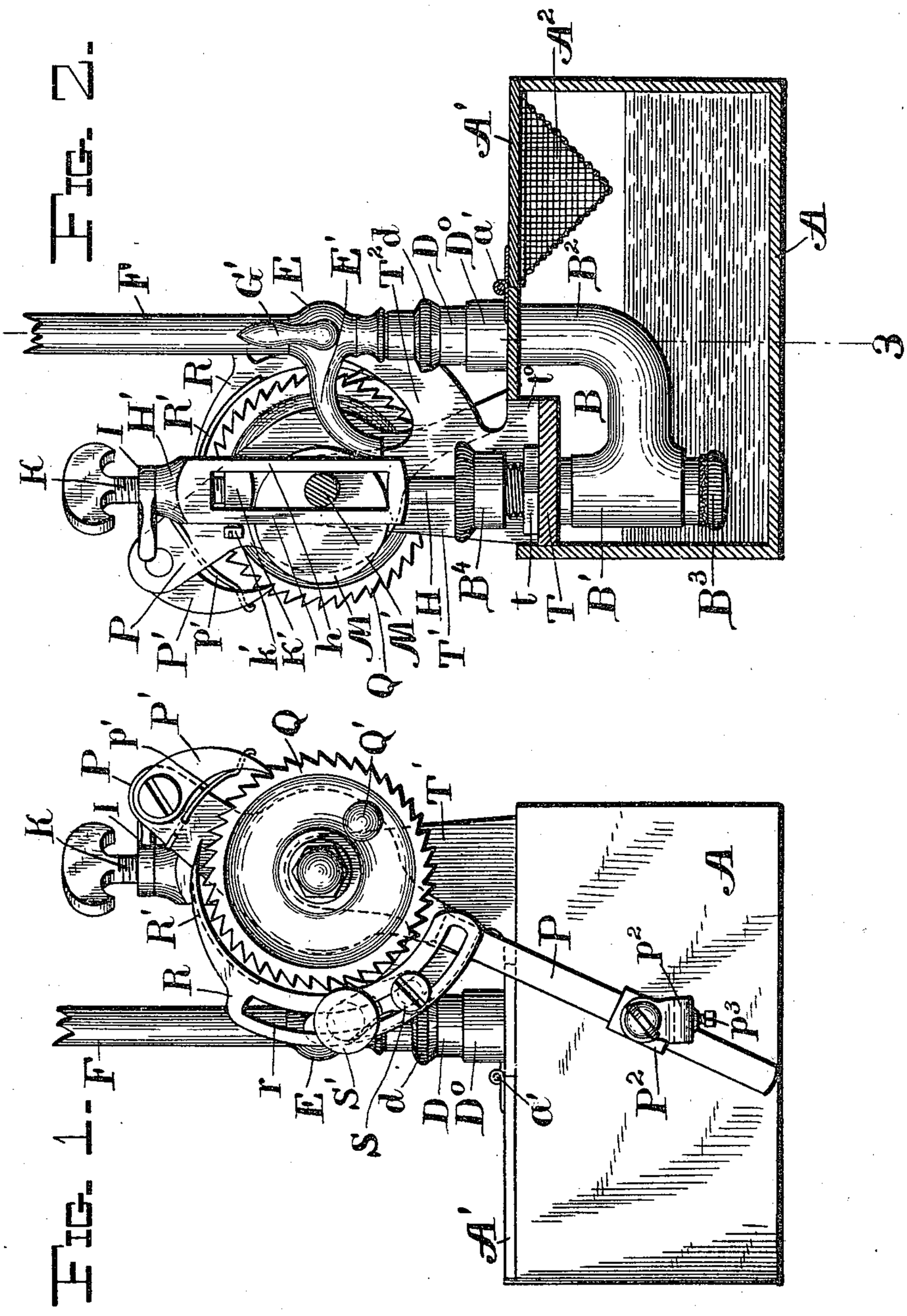

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FIG. 6.

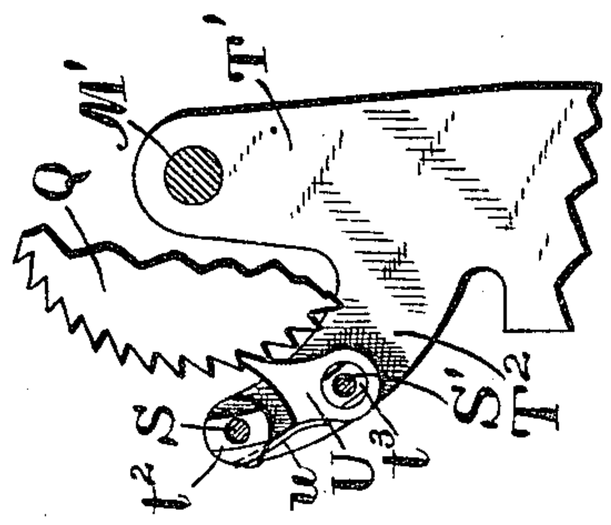


FIG. 7.

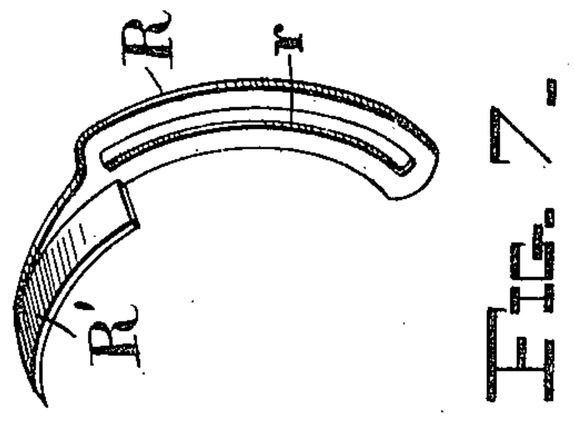


FIG. 4.

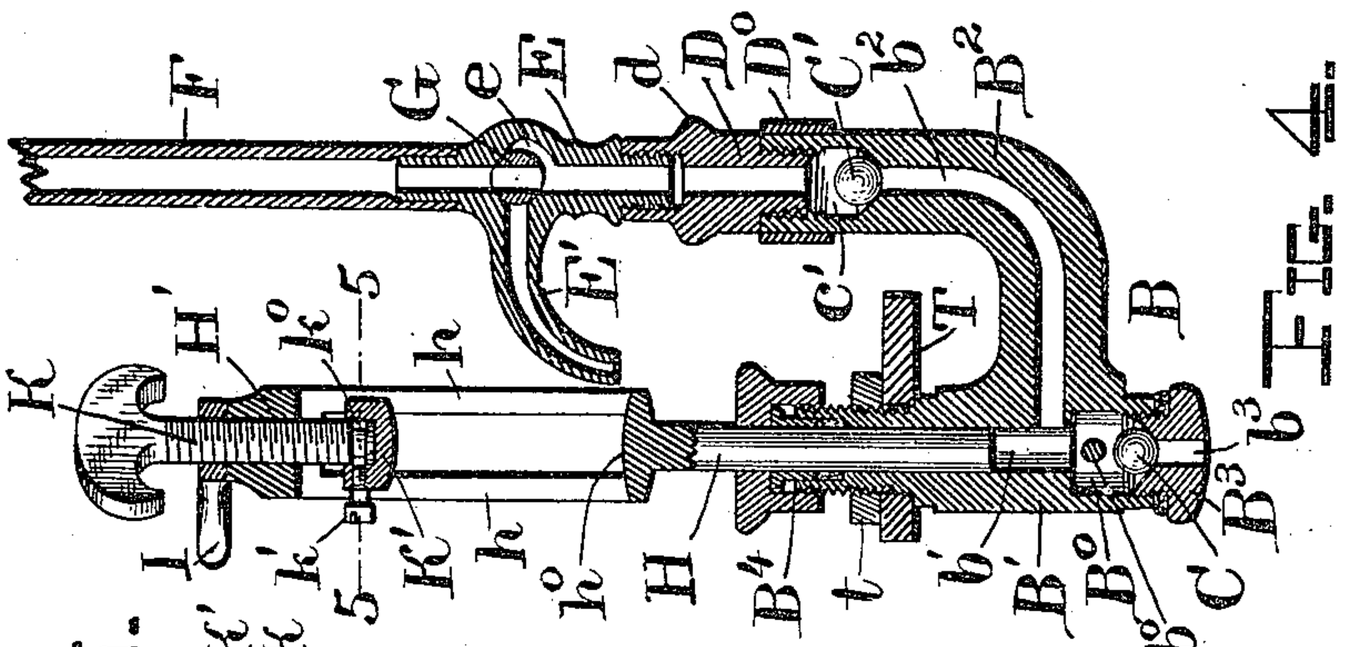


FIG. 5.

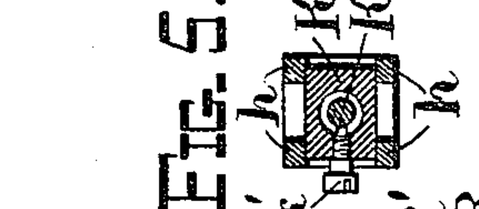
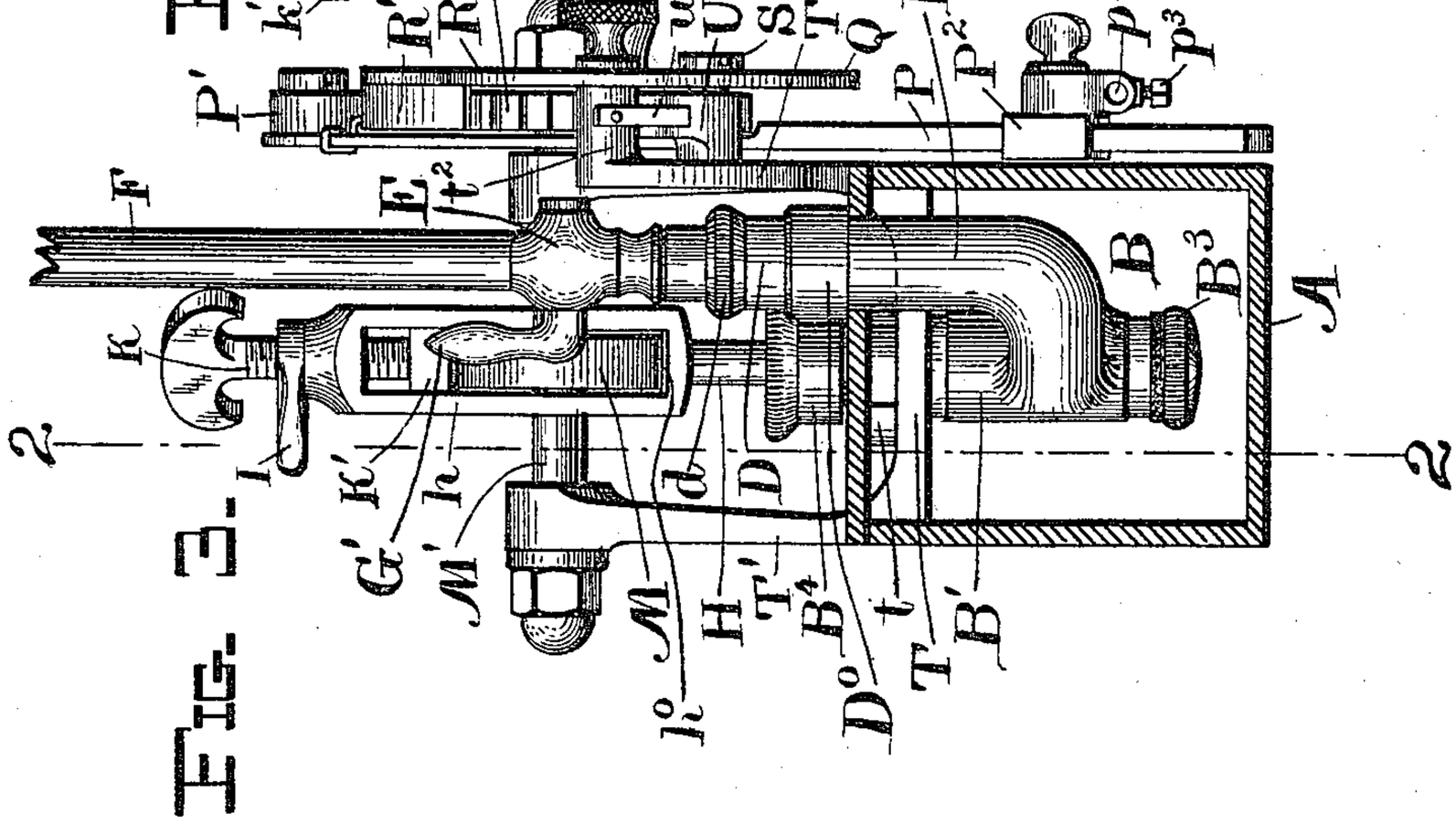


FIG. 3.



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UNITED STATES PATENT OFFICE.

CHRISTIAN DORN AND WILLIAM GEORGE TRUBY MARCELLUS, OF PHILADELPHIA, PENNSYLVANIA; SAID DORN ASSIGNOR TO A. G. FROMUTH, OF SAME PLACE.

PUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 675,326, dated May 28, 1901.

Application filed September 28, 1900. Serial No. 31,423. (No model.)

To all whom it may concern:

Be it known that we, CHRISTIAN DORN and WILLIAM GEORGE TRUBY MARCELLUS, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pumping Apparatus for Lubricators and other Purposes; and we do hereby 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.

Our invention relates to improvements in pumps, and while especially intended as an improvement in pumps for a lubricator it may be applied to a great many other uses in which a pump with adjustable delivery is required.

Our invention also relates to certain improvements in the lubricator itself and in its certain combinations and arrangements of parts, which will be hereinafter more fully described and claimed.

Reference is had to the accompanying drawings, in which we have shown a lubricator and attachments fitted with our invention and its attachments and in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a side elevation of the lubricator as detached from the engine. Fig. 2 represents a section along the line 2 2 of Fig. 3 and looking to the right. Fig. 3 represents a section along the line 3 3 of Fig. 2 and looking to the left. Fig. 4 represents a sectional elevation through the pump proper. Fig. 5 represents a section along the line 5 5 of Fig. 4. Fig. 6 is a detail view of the ratchet-and-pawl arrangement, and Fig. 7 is a detail view showing the adjustable gear for the ratchet.

A represents the box or tank holding the oil, provided with a lid A′, hinged, as at a', and preferably having a strainer A^2 resting on the box beneath the lid to strain the oil when it is poured in.

B represents the pump-body, which consists of the two members B′ and B^2, containing the cylinder b' and the delivery-passage b^2, respectively. Beneath the cylinder b' is an enlarged chamber B^0, spanned by a wire b^0, beneath which the ball-valve C is provided, which ball-valve normally closes the passage b^3 in the screw-plug B^3. The delivery end of the passage b^2 is controlled by the ball-valve C′, mounted in the chamber c' below the union D, which is preferably provided with a milled ring d for convenience in assembling the parts. The band D^0 is placed around the upper end of the member B^2 and rests on the top of the box, thus assisting in the support of the pump.

Screwed in the upper end of the union D is the cock E, which has a passage therethrough normally delivering oil to the pipe F, by which said oil is carried to the cylinder, boiler, or other part to be lubricated. This passage is controlled by means of the plug-valve G, mounted in the chamber e, which chamber is so shaped that if the plug-valve be turned at right angles to the position shown in Fig. 4 the oil will flow through the spout E′ and, dropping down upon the plate T, will pass through the opening t^0 and return to the tank A. The purpose of this cock is to occasionally test the apparatus to see whether the oil is flowing at the proper rate.

The plate T is preferably integral with the brackets T′, in which the cam-shaft M′ is bracketed.

H represents the piston-rod, which also serves as a piston and projects into the cylinder b', passing through the gland B^4 and a lock-nut t, the latter serving to hold the pump-body up to the plate T. This piston-rod terminates in a quadrilateral yoke having four bars h, terminating in the cross-head H′, which cross-head is screw-threaded to receive the screw K, which screw is locked in the desired position by means of the locking-nut I. The lower end of the screw is provided with an annular groove K^0, into which the screw k' projects, which screw is mounted in the plug K′, and thus this plug is detachably secured to this screw K.

The cam M projects between the bars h, as shown in Fig. 3, and as it rotates strikes alternately the plug K′ and the face h^0 at the end of the piston-rod H. By adjusting the screw K the travel of the piston may be increased or diminished at will, and thus the length of the stroke of the pump may be in-

creased or diminished as desired, thus regulating the amount of oil or other fluid delivered at each downstroke of the pump. In order to still further diminish the amount of oil delivered, we provide the ratchet-and-pawl arrangement shown in the drawings, in which the arm P is loosely mounted on the shaft M′ and is connected, by means of the sliding sleeve P^2, the holder p^2, and clamp-screw p^3, with a rod connected to any reciprocating part of the mechanism. This vibrating arm P carries a pawl P′, held to the ratchet Q by means of the spring p'. This ratchet Q is fast on the shaft M′, as is also the cam M, and thus as the ratchet moves the cam moves; but the ratchet is arranged to move only a few teeth at a time, and therefore it takes a number of revolutions of the engine to rotate the cam, each revolution of which causes the pump to make one downward or delivery stroke. The ratchet is held against backlash by means of the spring-pawl U, (see Fig. 6,) pivoted on the pin t^3 on the arm T^2 of the bracket T′, which pawl is normally pressed forward by the spring u, fastened to the lug t^2. As an additional means for limiting the travel of the ratchet we provide the curved plate R, having the shield R′ projecting over the ratchet-teeth, as shown in Figs. 1 and 7, and the pawl P′ slides back over this shield R′, and thus is held out of engagement with the teeth on the return stroke until it passes clear of the edge of the shield, as will be readily understood by examining Fig. 1. This shield is adjusted by means of the slide r, which passes over the guide-lugs t^2 and t^3, and is held in place by means of the guide-screw S and the clamp-screw S′.

The operation of the apparatus is as follows: The arm P being connected, by means of a rod, wire, or other device, with some reciprocating part of the engine, (not shown,) the ratchet will be given a slow and adjustable motion, which will cause the cam M to rotate, and this cam will move the yoke and piston-rod up and down, the stroke of the piston being regulated by means of the screw K. As the piston comes up a partial vacuum will be created in the cylinder b', lifting the valve C and sucking in oil through the opening b^3. The valve C′ during this part of the action remains on its seat. As soon as the piston has reached the final limit of its travel the valve C will drop back on its seat, and as the piston goes down the pressure on the fluid in the cylinder will cause the oil to pass up the channel b^2, lifting the valve C′ and feeding the oil into the union D, and up through the cock E and the pipe F to the part to be lubricated. (Not shown.) While the throw of the piston is regulated by means of the screw K, the number of strokes of the piston is regulated by means of the shield R′ for the ratchet-and-pawl arrangement, and thus the apparatus affords independent means for regulating, first, the length of the stroke of the piston, and hence the delivery or flow of fluid, and, second, the number of strokes of the piston and the consequent rate of flow of the fluid.

It will be seen from the foregoing that a small regular and graded supply of oil may be supplied to the engine or other part to be lubricated and that this supply may be tested by means of the cock E and may be regulated at will by means of the mechanism hereinbefore described.

A handle Q′ may be attached to the ratchet Q to operate the same by hand, as in testing the machine, if required, at which time the connection at p^2 must be released.

While we have described the apparatus as applied to the one specific form of device—to wit, a lubricator—it is not our purpose to confine the invention to any such specific use; but we claim the invention, broadly, as applicable to pumps of various forms and in different relations where it is desired to regulate the flow of a fluid delivered by a pump. Thus it frequently happens that the motive power for the pump varies, as with pumps operated by water-power or where the steam runs down and it is desirable to maintain the efficiency of the pump, at the same time using the reduced power available. Thus instead of pumping minute quantities of oil, as in a lubricator, the pump may be used to pump large quantities of any fluid, and it is our intention to claim our invention, broadly, as applicable to any purpose to which it may be adapted.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a pumping apparatus the combination with a cylinder, a piston and piston-rod traveling in said cylinder, a yoke on said piston-rod, a cam mounted to turn in said yoke, an adjustable stop in said yoke engaging said cam, a ratchet-wheel mounted to turn said cam, a lever having a pawl adapted to engage said ratchet-wheel, a shield extending between said ratchet-wheel and said pawl, and a curved slot in said shield by means of which it may be adjusted, substantially as described.

2. In a pumping apparatus the combination with a cylinder, a piston and piston-rod traveling in said cylinder, a yoke on said piston-rod, a cam mounted to turn in said yoke, a screw in said yoke, a shoe swiveled on said screw and engaging said cam, a lever having a pawl adapted to engage said ratchet-wheel, an adjustable shield extending between said ratchet-wheel and pawl, substantially as described.

3. In a pumping apparatus, the combination with a tank, a U-shaped frame mounted in said tank, and a pump-cylinder secured in said U-shaped frame, of a plunger traveling in said cylinder, a yoke on said plunger, a shaft mounted in said U-shaped frame and passing through said yoke, a cam mounted on said shaft in said yoke, a ratchet-wheel on said shaft, a lever also mounted on said shaft, a pawl on said lever engaging said ratchet-

wheel, a curved shield having a slot therein adjustably connected with said frame, and extending over the teeth on said ratchet-wheel, substantially as described.

4. In a pumping apparatus, the combination with a tank, a U-shaped frame mounted in said tank, and a pump-cylinder secured in said U-shaped frame, of a plunger traveling in said cylinder, a yoke on said plunger, a shaft mounted in said U-shaped frame and passing through said yoke, a cam mounted on said shaft in said yoke, an adjustable stop in said yoke engaging said cam, a ratchet-wheel mounted on said shaft, a lever also mounted on said shaft, a pawl on said lever engaging said ratchet-wheel, a curved shield having a slot therein adjustably connected with said frame, and extending over the teeth on said ratchet-wheel, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

CHRISTIAN DORN.
WILLIAM GEORGE TRUBY MARCELLUS.

Witnesses:
GEORGE KAUPP,
A. P. JORDAN.