

(No Model.)

A. T. BALLANTINE.

DOPE CUP.

No. 360,755.

Patented Apr. 5, 1887.

Fig. 1.

Fig. 2.

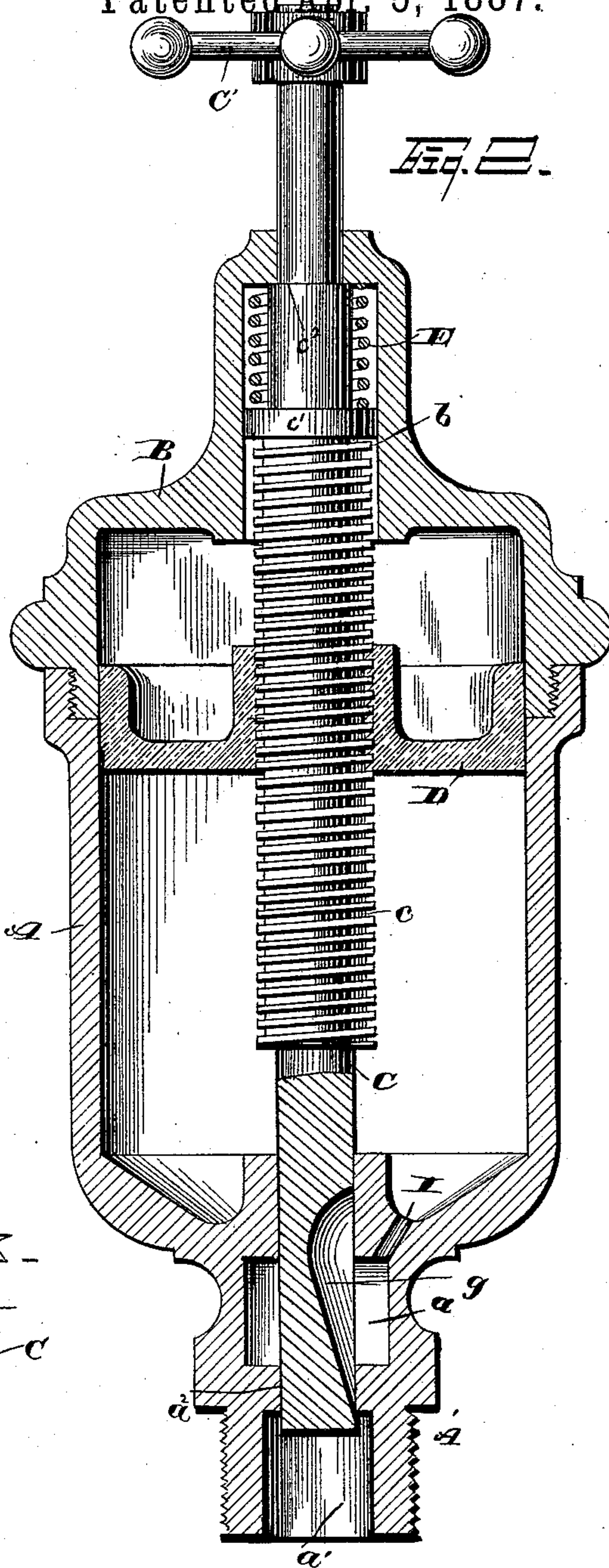
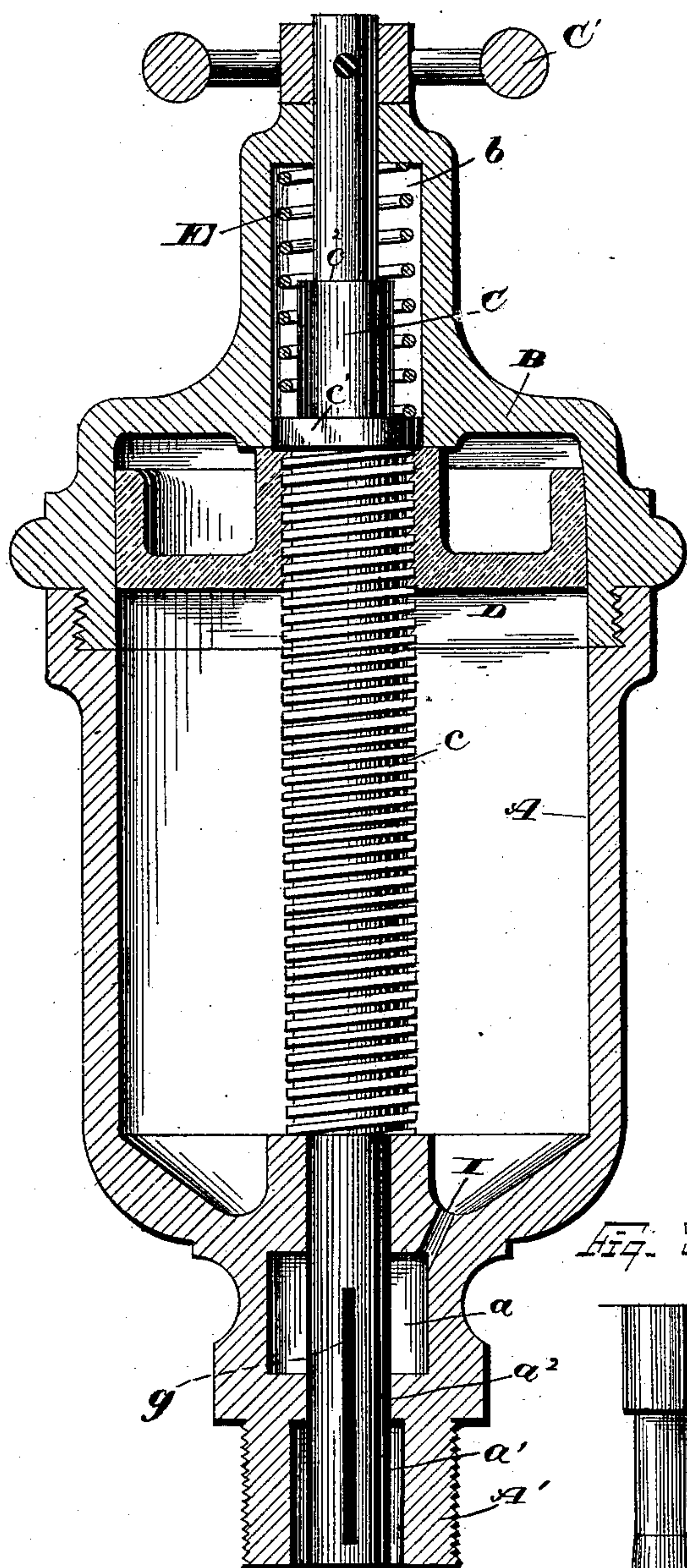
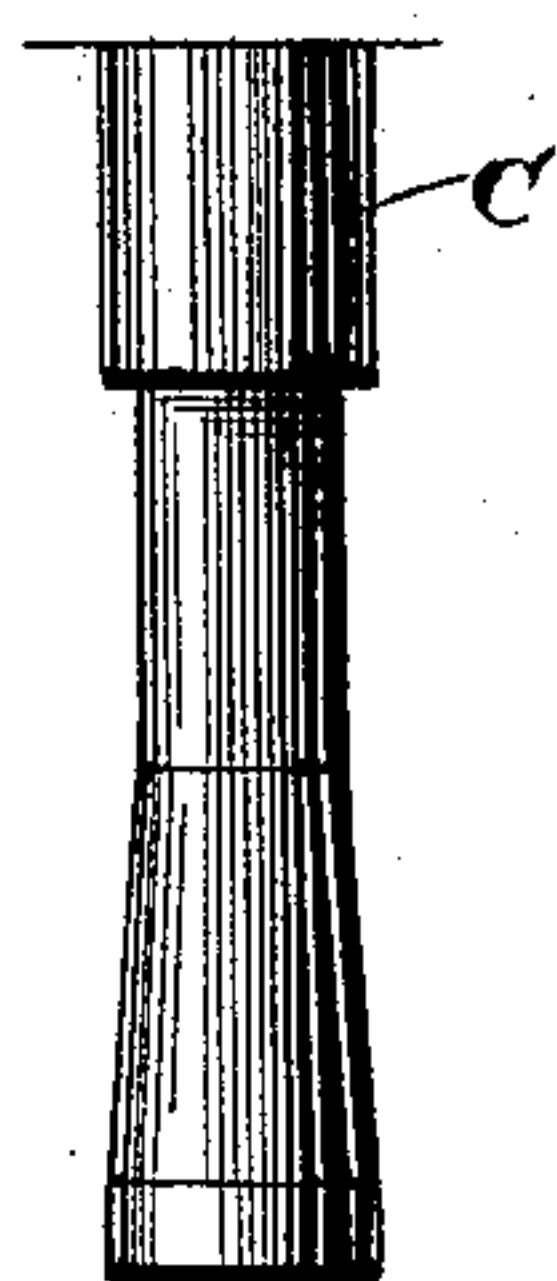


Fig. 3.



WITNESSES

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# UNITED STATES PATENT OFFICE.

ALEXANDER T. BALLANTINE, OF CLEVELAND, OHIO.

## DOPE-CUP.

SPECIFICATION forming part of Letters Patent No. 360,755, dated April 5, 1887.

Application filed December 15, 1885. Serial No. 185,783. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER T. BALLANTINE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Dope-Cups; and I 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 pertains to make and use the same.

My invention relates to improvements in so-called "dope cups" in which a piston operating in the cup is by means of a screw-rod forced with such pressure upon the dope that the latter is discharged through suitable openings at the bottom of the cup. A continued pressure of the piston on the dope is had by means of a spring that is compressed by the backing out of the screw-rod in giving pressure to the piston, by means of which construction the distance that the rod protrudes from the cup indicates the compression of the spring and consequent pressure of the piston, and by the gradual return of the rod, caused by the recoil of the spring, indicates the displacement of dope that is taking place; or, in other words, indicates the rapidity with which the dope is being fed out of the cup. The screw-rod at the lower end acts as a discharging-valve, having a graduated opening for the escape of the dope, the area of such discharging-outlet being greater or less inversely in proportion to the pressure of the piston, by means of which the varying pressure of the spring upon the piston results in substantially an even flow of dope from the cup.

In the accompanying drawings, Figures 1 and 2 are side elevations in section of my improved dope-cup, showing, respectively, the parts in different positions. Fig. 3 is an elevation showing a modification of the discharging-valve.

A represents the cup, and B the cap or cover, the two parts having a screw-threaded attachment, as shown. The cup and cap are bored to the same size, and a piston, D, is fitted therein, the latter having a central bore that is screw-threaded, and engages the screw-threads *c* of the rod C. This rod extends up through the socket *b* of the cap and through the end wall of the cap, and outside is pro-

vided with the hand-wheel C' or thumb-piece, as the case may be. The rod has a collar, *c'*, and a shoulder, *c''*, the former serving as a seat for one end of the coil-spring E, and the latter, by abutting against the upper wall of the socket, acts as a stop to limit the outward movement of the rod. Below the threaded portion the rod C has a smooth surface that fits nicely in the central bore at the bottom of the cup. The shank of the cup has screw-threads A', for attaching the cup, and has an annular chamber, *a*, considerably larger in diameter than the rod C. The bore of the shank at the lower end is also larger than the rod, as shown at *a'*. Between the chamber *a* and the enlarged bore *a'* the bridge *a''* fits the rod nicely. From the inside of the cup one or more holes, I, lead to the chamber *a*.

The rod C is provided with one or more slots, *g*, and the rod with the slot is made to serve as a discharging-valve. This slot *g* is milled into the rod for some depth at the upper end thereof, and runs out at the bottom end, as shown more clearly in Fig. 2. When the rod is in the depressed position shown in Fig. 1, the slot *g* spans the bridge *a''*, leaving a full opening from the chamber *a* into the bore *a'*. When the rod is elevated, as shown in Fig. 2, a very slight opening is had through the lower part of the slot *g*, past the bridge *a''*. A graduated discharge-opening is therefore had, greater or less, according to the depression or elevation of the rod.

In filling the cup, the piston, by means of the screw-rod, is first elevated into the cap, as shown in Fig. 1. The cap is next unscrewed and removed, of course carrying with it the piston and rod. After the filling and return of the cap and other parts to the position shown in Fig. 1, the piston is screwed down until it rests upon the dope. After this the rod is still further turned in the same direction, to press the piston onto the dope to discharge the latter through the opening I and through the port *g* of the valve. As there is nothing to hold down the rod except the tension of the spring E, the pressure is had by compressing the spring as the rod is backed out. The rod is usually turned in the direction that forces down the piston until the shoulder *c'* strikes the top wall of the cap, as



shown in Fig. 2, in which position the spring is compressed to its maximum tension. In this position of parts, whereby the greatest piston-pressure is had, the valve portion of the rod is drawn up so that but a slight opening of this port *g* is had below the bridge *a*<sup>2</sup>. The recoil of the spring gives a continuous pressure of the piston on the dope, but decreases, of course, as the spring expands. I have then a graduated discharging-opening that is least when the pressure is the greatest, and gradually increases inversely as the pressure decreases, the result being approximately a uniform discharge. When the hub of the hand-wheel reaches the top of the cup, the action of the spring ceases, and the rod is again turned, as aforesaid, to again give tension to the spring. This may be continued until the piston reaches the bottom of the cup, when of course the cup is again refilled. The distance of the hand-wheel above the cap will indicate the amount of unspent energy yet remaining in the spring, and the movement of the hand-wheel toward the cap will indicate the displacement of feed of the dope from the cup.

Springs of different strength may be employed according to the solidity of the dope that is used.

I do not wish to be understood as limiting myself to the construction of the discharging-valves, as various modifications may be made without departing from the spirit and intent of my invention. For instance, the modified form of valve shown in Fig. 3 would produce precisely the same result as the valve shown in Figs. 1 and 2.

Heretofore variously constructed dope cups have been in use, in which, respectively, a spring was employed to give a continued pressure to the piston, and an aperture of fixed size was arranged for discharging the dope. With such construction when the pressure was the greatest the dope would be forced too rapidly from the cup, and much of it would consequently be wasted, and as the pressure of the spring decreased the flow of dope from the cup would decrease until little or no dope would be discharged, resulting probably in great damage to the machinery from the want of sufficient

lubrication. With my improved dope-cup these difficulties are entirely overcome, the result being, as aforesaid, a constant and even flow or feed of the lubricant from the cup.

What I claim is—

1. The combination, with a cup having a discharge-opening, a screw-rod, a piston adjustably secured on said screw-rod, and a spring for forcing the rod downwardly, of a valve located within the discharge-opening in the cup and operated by said rod, substantially as set forth.

2. The combination, with a cup and mechanism for discharging the dope from the cup, of a discharge-valve connected with the discharging mechanism and having a graduated discharging-opening adapted to be more or less closed inversely, according to the pressure applied to the dope, and opened more or less inversely as the pressure decreases.

3. In a dope-cup, the combination, with a piston having a screw-threaded opening therein, and a screw-rod engaging said screw-threads for operating the piston, said rod extending outside of the cup and provided externally with devices for operating it, of a spring resting against the cup and engaging the rod and adapted to be compressed by the backing out of the rod from the piston, substantially as set forth.

4. In a dope-cup, the combination, with a piston having a screw-threaded opening and screw-rod for engaging the screw-threaded opening in the piston, whereby the latter is adjusted, of a spring engaging the rod and the top of the cover, substantially as set forth.

5. In a dope-cup, the combination, with a piston, a screw-rod, and spring for operating the piston, of a discharging-valve connected with the said rod, the parts being arranged substantially as described, whereby the area of the discharging port or opening is increased or diminished inversely, according to the pressure applied to the piston.

In testimony whereof I sign this specification, in the presence of two witnesses, this 8th day of October, 1885.

ALEXANDER T. BALLANTINE.

Witnesses:

CHAS. H. DORER,  
ALBERT E. LYNCH.