

No. 767,032.

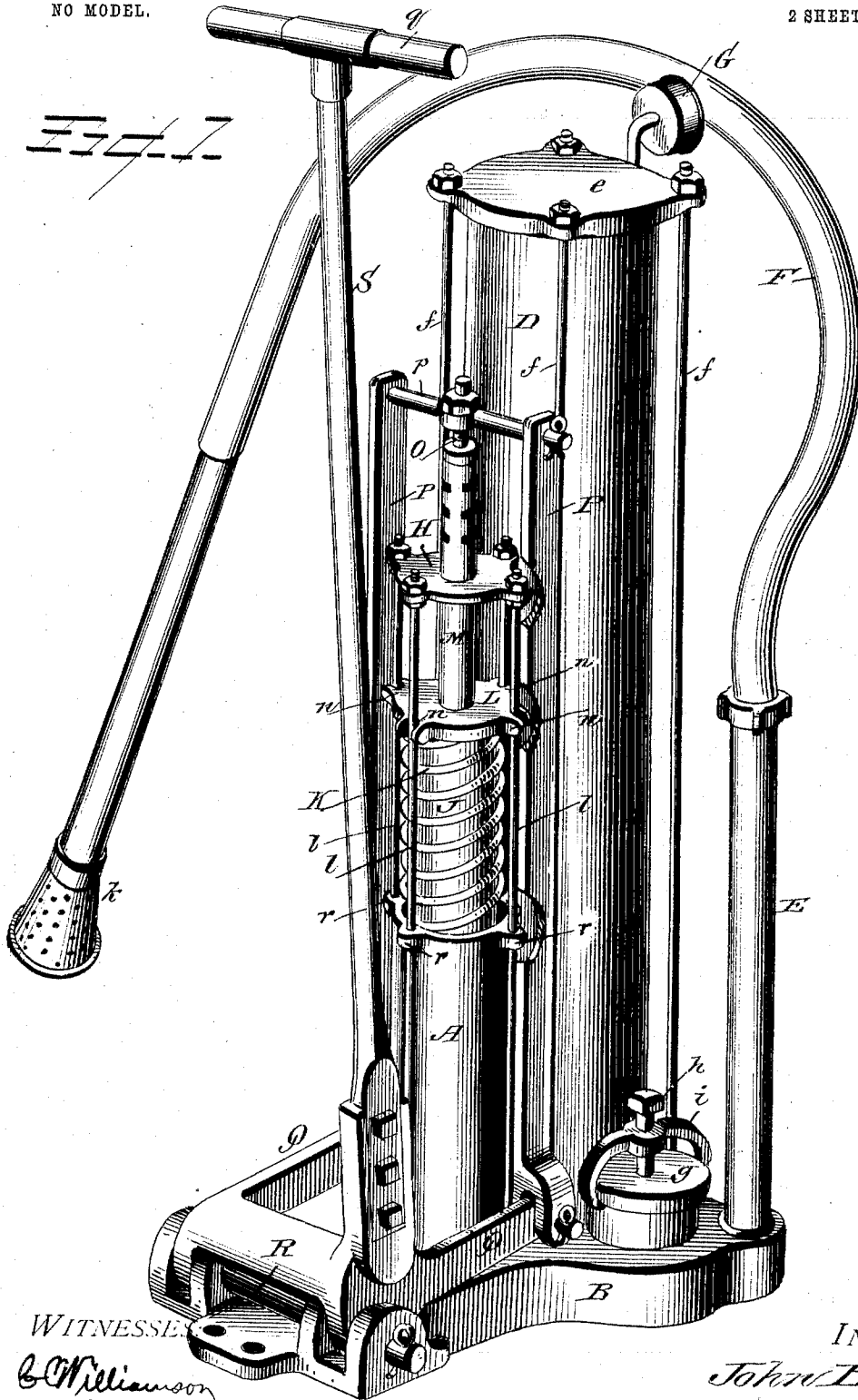
PATENTED AUG. 9, 1904.

J. BEAN.
SPRAY PUMP.

APPLICATION FILED JAN. 21, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

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M. E. Moore

INVENTOR

John Bean

By *Chas. H. Fowler*
Attorney

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2 SHEETS—SHEET 2.

Fig. 2.

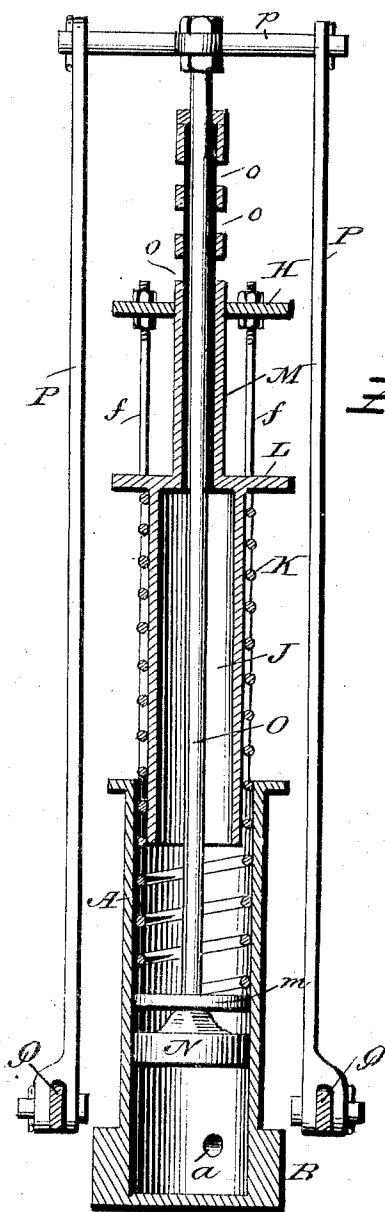


Fig. 3.

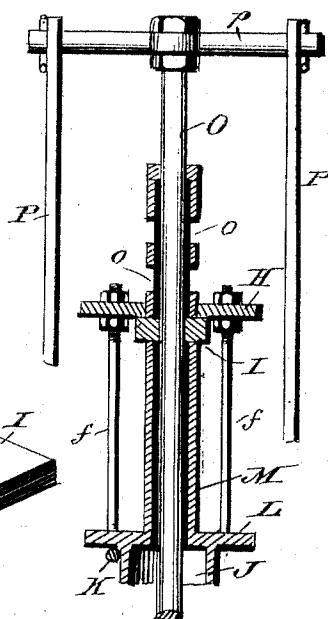


Fig. 5.

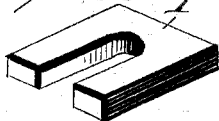
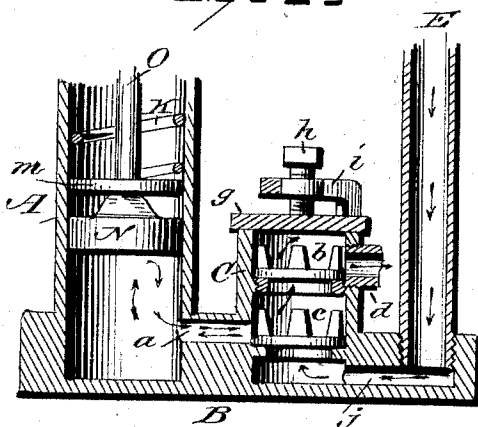


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN BEAN, OF LOS GATOS, CALIFORNIA, ASSIGNOR TO BEAN SPRAY PUMP CO., OF SAN JOSE, CALIFORNIA.

SPRAY-PUMP.

SPECIFICATION forming part of Letters Patent No. 767,032, dated August 9, 1904.

Application filed January 21, 1904. Serial No. 189,994. (No model.)

To all whom it may concern:

Be it known that I, JOHN BEAN, a citizen of the United States, residing at Los Gatos, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Spray-Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

The present invention has for its object to provide a spraying-pump that will be effective in its operation and a pump that will equalize the work at varying pressures when desired and avoid the unevenness of work and divide the pressure against the handle, so as to make it even each way, and improve the pump in the various details of construction, whereby a perfectly operating device will be obtained and possess superior results in spraying the liquid and in the general operation of the parts.

The invention consists in a spraying-pump constructed substantially as shown in the drawings and hereinafter described and claimed.

Figure 1 of the drawings is a perspective view of a spraying-pump embodying my invention; Fig. 2, a sectional elevation of the cylinder, piston, and its connections; Fig. 3, a detail view of the upper portion of the piston-rod and its connections; Fig. 4, a sectional elevation of the base or bottom portion of the pump, showing a portion of the pump-cylinder, the piston, valves, and portion of the suction-pipe; Fig. 5, a perspective view of the slotted key.

In the accompanying drawings, A represents the pump-cylinder, which may be of any suitable diameter and length, as found most desirable, said cylinder projecting from a suitable base B of any preferred construction.

The cylinder A communicates with a valve-chamber C through a passage-way *a*, said chamber containing the valves *b c* of any suitable construction, which are supported in seats in the chamber. These valves and their seats may be variously modified and changed in

form and construction, as I do not wish to limit myself to the construction shown.

The upper end of the chamber C communicates, through a passage-way *d*, with the lower end of an air and liquid tank D, said tank being shown in Fig. 1 of the drawings. This tank may be of any suitable construction and may be varied in diameter and length, as found most desirable, said tank being subject to many changes or modifications without in any manner departing from the spirit of my invention, and may have a cap *e* and stay-rods *f* connected thereto, if found preferable. The upper or open end of the valve-chamber C may also be closed by a cap *g*, held in place by a set-screw *h*, engaging a bracket *i*, or any other suitable means may be provided for closing the chamber and enabling access thereto when desired, such construction being shown in Fig. 4 of the drawings.

The base B has a passage-way *j*, which communicates with the valve-chamber C and with the lower end of a suction-pipe E, and to the upper end of this pipe is suitably connected a suction-hose F, provided with a suitable strainer *k* of any preferred construction.

Any suitable form of pressure-gage G may be provided and communicate with the tank D, whereby the pressure therein may be conveniently ascertained.

The pump-cylinder A is open at its upper end and is provided with horizontally-extending ears *r*, through which pass guide-rods *l*, as shown in Fig. 1 of the drawings, the upper ends of the rods being secured to the support H, which is designed to support the slotted key I (shown in Fig. 5 of the drawings) when said key is brought into use.

A cylinder J of smaller diameter than the pump-cylinder engages with the pump-cylinder and carries a coiled spring K, which spring extends around the outer periphery of the cylinder J and projects below the end thereof into the pump-cylinder. The lower and upper ends of the spring K bear against the disk *m* and the under side of a cap L, respectively, said cap forming the closed end of the cylinder J, and is provided with guide-

yokes *n* to engage the rods *l*. An upwardly-projecting tubular extension *M* communicates with the upper end of the cylinder *J* and has a plurality of notches *o*, with which the key *I* is engaged in order to hold the spring *K* under compression, as circumstances require.

In Fig. 3 of the drawings the key *I* is shown as engaged with one of the notches *o*, whereby the coils of the spring *J* may be compressed, any suitable key being used, and any desirable means may be provided for engaging said key with the tubular extension *M*, the means shown being one in many that will effect the result desired.

The pump-piston comprises the piston-head *N* and piston-rod *O*, which may be of the usual construction, said rod extending up through the cylinders *A* *J* and the tubular extension *M* and is connected in any suitable manner to a cross-bar *p*. To the ends of the cross-bar *p* is suitably connected the upper ends of pitman-rods *P*, the lower ends of said rods being pivotally connected to the free ends of levers *Q*, which project from a rock-shaft *R*, said shaft having its bearing in the base *B* of the pump. A suitable swinging lever *S* is suitably connected to the rock-shaft *R*, by which said shaft is operated by moving the lever back and forth by means of the handle *q* at the upper end of the lever.

I do not wish to be understood as limiting the invention to any specified form and construction of the pitman-rods, the rock-shaft, and the levers projecting therefrom, as well as the swinging operating-lever, these features being subject to many changes or variations without in the least departing from the essential features of the invention, and the general construction of the pump may be modified in detail so long as such modifications come within the scope of the invention.

The spring used in the pump in connection with the means employed to compress the same at any degree required is capable of equalizing the work at varying pressures, or when the key or other means for compressing the spring is removed it can slide up and down without hindrance, as the case may require. The cylinder *J*, around which the spring is coiled, forms a guide for the spring and supports it in its proper position, as without the cylinder the upper end of the spring would not have any support, thereby providing a supporting and guiding cylinder for the spring to render it perfect in its operation. In compressing the spring *K* the cylinder *J*, with its cap *L* bearing upon the upper end of the spring, is pressed down until the proper one of the notches *o* comes on line below the support *H*, after which the key *I* is engaged with the notch, as shown in Fig. 3 of the drawings, which will hold the coils of the spring compressed, as desired. A further advantage of the supporting and guiding cylinder *J* for the spring *K* and the compressor-cap *L* prevent

the spring from swaying out of shape under a heavy pressure when it is compressed.

The tubular extension *M* acts as a guide to the piston-rod *O* and the rod as a guide to the extension, one coöperating with the other when in motion. The support *H* for the key *I* also serves as a guide to tubular extension *M* when the extension is moved to compress the spring, thereby serving a double function—viz., that of a support for the key when used and as a guide for the tubular extension.

As the piston is moved in its work the key will hold the tubular extension and the support stationary and let the piston slide through on its up motion, compressing the spring, so that the spring is now ready to assist on the piston's down motion when it does its hardest work. When the air or fluid is to be pumped to a higher or lower pressure, the key is removed and engaged with the notch that will insure a heavier pressure, or any degree of pressure may be secured by the adjustment of the key. The suction-hose *F* being placed in the liquid, the swinging lever *S* is drawn toward the operator, which will lift the piston by means of the pitman-rods and levers connecting therewith. The key being removed from engagement with the tubular extension, as the piston is raised the liquid is drawn in through the lower one of the valves and through the passage-way and into the cylinder of the pump, as indicated by the arrows in Fig. 4 of the drawings. The swinging lever being now pushed forward will force down the piston and drive back the liquid through the passage-way *a*, but above the lower valve *c* and through the upper valve *b*, thence through the passage-way *d* into the tank *D*. After the operation has been repeated a few times and air is to be supplied to the tank the suction-hose *F* is withdrawn from the liquid, and the swinging lever *S* is moved back and forth, as before, which will draw the air in place of the liquid until the pressure-gage *G* indicates twenty or thirty pounds or any pressure that would be found desirable for a perfect operation of the pump, the suction-hose being again placed in the liquid and the swinging lever moved back and forth.

In the several stages of operation thus far described the coiled spring *K* and the supporting and guiding cylinder *J*, with its tubular extension *M* and support *L*, have moved up and down freely with the piston, as the same connect with said piston in any preferred manner. It will be noticed that on the forward movement of the swinging lever when the piston is lifted the only work accomplished is to draw the liquid or air into the pump-cylinder, and on the return stroke of the lever when the piston is forced down the liquid or air is forced out of the cylinder into the tank against the accumulated pressure. Thus the work of the return stroke becomes increasingly heavier, while the work of the forward

stroke remains constantly easier. In order to avoid this unevenness of work and divide the pressure against the swinging lever, so as to make it even each way, the spring is compressed in the following manner: The swinging lever is thrown clear back, which will force the piston down, so that the notches in the tubular extension will come below the support H, after which the key I is engaged with the proper one of the notches below the support, according to the amount of pressure wanted in the tank. The slotted key I when in position under the support H holds the tubular extension M, cap L, and cylinder J stationary, so that when the swinging lever S is drawn forward to suck in the liquid as the piston is raised the spring K is compressed, and on the return stroke when the liquid is forced into the tank the spring expends its energy in assisting the work. While the tubular extension M and the cap L and cylinder J remain stationary, the piston-rod O works freely therethrough, while the extension forms a guide for the rod. The yokes n, which the rods engage, hold the compressor-cap and its connections from turning on its axis.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a spray-pump, a cylinder, a piston adapted to work therein, a supporting and guiding cylinder, a spiral spring extending

around the same and projecting into the pump-cylinder, and means for regulating the tension of the spring, substantially as and for the purpose described.

2. In a spray-pump, a cylinder and a piston adapted to work therein and means for operating said piston, a supporting and guiding cylinder engaging the pump-cylinder, a coiled spring encircling the supporting and guiding cylinder, a tubular extension upon the upper end of the supporting and guiding cylinder and having notches therein, and a slotted key adapted to engage the notches, substantially as and for the purpose specified.

3. A spray-pump comprising a tank, a cylinder and piston adapted to work therein, a supporting and guiding cylinder engaging the pump-cylinder, a spiral spring encircling the supporting and guiding cylinder, means for regulating the tension of said spring, a suction-tube, a valve-chamber communication with the tank, pump-cylinder and suction-tube, and suitable valves operating in said chamber, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN BEAN.

Witnesses:

ALF. P. LAHMER,
W. PECK.