No. 688,306. Patented Dec. 10, 1901.

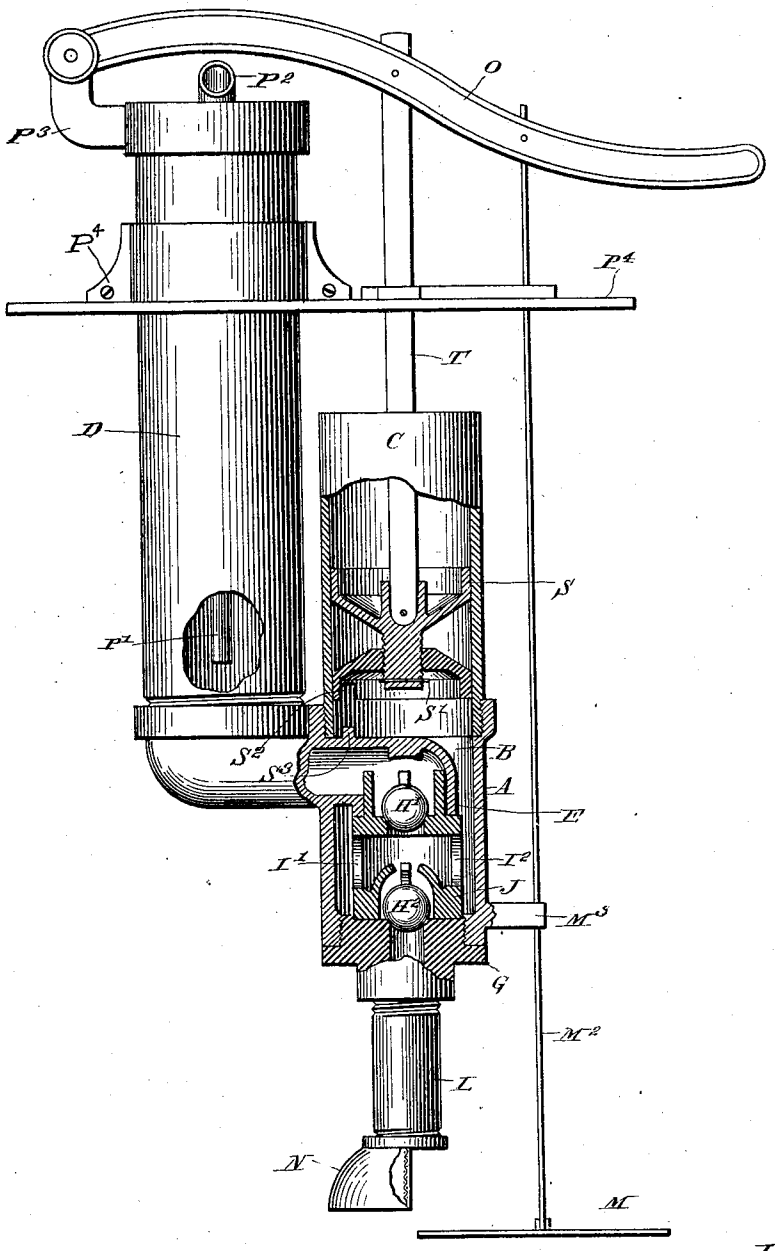
F. R. HARDIE.

SPRAY PUMP.

(Application filed Sept. 7, 1900.)

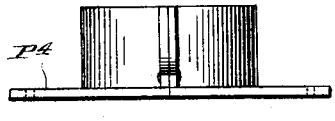
(No Model.)

Fig. 1.



Witnesses:
Charles Hardie
H. H. Hardie

Fig. 2.



Inventor:
Francis R. Hardie

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS ROBERT HARDIE, OF DETROIT, MICHIGAN, ASSIGNOR TO THE HARDIE SPRAY PUMP MFG. CO., OF DETROIT, MICHIGAN.

SPRAY-PUMP.

SPECIFICATION forming part of Letters Patent No. 688,306, dated December 10, 1901.

Application filed September 7, 1900. Serial No. 29,318. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS ROBERT HARDIE, a subject of the Queen of Great Britain, residing in the city of Detroit, county of Wayne, State of Michigan, have invented certain new and useful Improvements in Spray-Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in spray-pumps used in spraying vegetation for the destruction of insect pests injurious thereto; and it consists in so forming the pump and so associating its several parts as to make its working parts easy to take apart and replace, so that any obstruction may be removed or the working parts examined or cleaned; and it also consists in so placing the suction-strainer and the agitator that the agitator as well as keeping the mixture stirred also tends to keep the strainer clear, as hereinafter more fully shown and described.

In the drawings, Figure 1 is a side elevation, partially in section. Fig. 2 is a detailed view of the flanges which secure the pump rigidly to the tank from which the liquid is drawn.

Like letters apply to like parts in both figures.

In the construction of my spray-pump I use a base-casting A, having two passages in it, the passage B being a straight longitudinal passage, forming a continuation of the bore of the plunger-pipe C. The other passage continues from the lower end of the air-chamber D and is turned downward into passage B in the form of an elbow E. It only partly fills the passage B, leaving space around it on three sides. The three orifices of this base-casting are internally screw-threaded. One of the upper orifices receives the air-chamber D and the other the plunger-pipe C. The lower one receives the suction-bush G. The ball-valves H′ and H^2 are contained in the cylindrical casting J, which has a number of apertures through its side walls, as at I′ and I^2. At the top it is provided with bars for cage for ball H′. A bevel-seat is formed in it below the bars for ball H′ to seat upon. An annular shoulder is formed outside the bars to fit closely against the lower face of elbow E, making a tight joint. At the lower end of casting J a number of curved bars are cast to form a cage for the ball H^2.

The bush G has a bevel-seat at the upper extremity of its bore to form a seat for the ball H^2. This bush fits up against the lower end of the cylinder J, which it holds tightly in place, also fitting up tightly against the lower face of base A. It is internally screw-threaded to receive the suction-nipple L.

The strainer N is screwed upon the lower end of the suction-nipple L. It has an opening at the side next the agitator M, which is covered with a wire-gauze, so as to strain the liquid.

The agitator M is a flat disk attached to the agitator-rod M^2, which connects it with the handle O. The rod plays through the guide M^3.

The air-chamber D has its lower end screw-threaded to fit into orifice of base. It is a hollow cylinder with a closed top, except that the discharge-pipe P^2 is screwed through the center of it. A bracket P^3 is cast integral with the air-chamber and serves to pivot the handle O. The discharge-pipe P^2 screws into the top of the air-chamber and is suspended within it, reaching nearly to the bottom of the air-chamber. Its lower end is open and its upper end carries an elbow onto which hose may be attached. Around the air-chamber a pair of flanges P^4 are clamped, so as to attach it to a vessel containing the liquid to be pumped. They are provided with a slot to admit the plunger-rod and the agitator-rod. The handle O is pivoted on the bracket P^3. It is slotted to receive the upper ends of the plunger-rod and the agitator-rod.

The plunger-tube C is a hollow cylinder open at the top and screw-threaded at the bottom to fit into orifice of base. It is smooth within to admit of the plunger S working freely in its bore. The plunger S is formed in two parts. Both parts fit the bore of the plunger-tube C for a little distance, and then they are beveled off toward each other, so as to form an annular V-groove for packing. The parts screw one upon the other, so that the V-groove may be increased or decreased in width. To prevent them from entirely unscrewing, a pin S′ is driven through the screw. The upper part is slotted in the

central portion to receive the plunger-rod T, which connects it with the handle. A notch S^2 is cut in the lower half, which is intended to fit over the lug S^3, which is cast upon the elbow E of the body A, and thus prevent the lower half of S from turning around, so that a wrench being applied to the plunger-rod T when it has been disconnected from the handle will screw the upper part of S either into or out of the lower part, thus forcing any packing which is in the V-groove of plunger S more or less tightly against the bore of the plunger-pipe C.

The operation of my pump is as follows: It is first fixed upon a receptacle for the fluid which is to be pumped, whereupon the handle O being raised the plunger is drawn up, leaving a partial vacuum behind it, which acts through the chamber B around the elbow E and through the apertures I′ and I^2, holding down ball H′ and raising ball H^2, drawing the liquid through the bore of the bush G, the suction-nipple L, and the strainer N. The agitator M is also raised, which stirs the liquid and causes the liquid in its immediate vicinity to surge in and out of the gauze of the strainer, which tends to keep it clear. Upon depressing the handle O the liquid now under the plunger S is forced through the chamber B, around the elbow E, through the apertures I′ and I^2 of the cylinder J, holding down the ball H^2 and raising the ball H′, through the elbow E into the bottom of the air-chamber, compressing the air above it to form a cushion, and entering the open end of the discharge-pipe P^2 escapes at the top thereof.

Having thus described the construction and operation of my improved pump, what I claim as my invention is—

1. In a pump, a base-casting having two passages formed therein, the one passage in continuation with a plunger-tube and suction-tube, the opening of the other passage being a curved passage or conduit contained in an elbow, centrally disposed, cast integral with the base, and turned downward in the first-mentioned passage, and in combination therewith a perforated valve-cylinder containing the inlet and discharge valves, and held up tightly against the said elbow by a portion of the suction-pipe screwing into the lower orifice of the base-casting, substantially as described and for the purpose specified.

2. In a pump, a base-casting having a guide formed thereon and an air-chamber connected thereto, in combination with a pump-handle pivoted upon the air-chamber, a strainer having an inlet-grating at the side, an agitator near the said grating, connected to the said handle by a rod working through said guide, a valve cylinder or cage containing the ball suction and discharge valves, said valve cylinder or cage being contained in base-castings, and rigidly held in place by the suction-pipe, substantially as described and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANCIS ROBERT HARDIE.

Witnesses:

HENRY H. HARDIE,

CHARLES HARDIE.