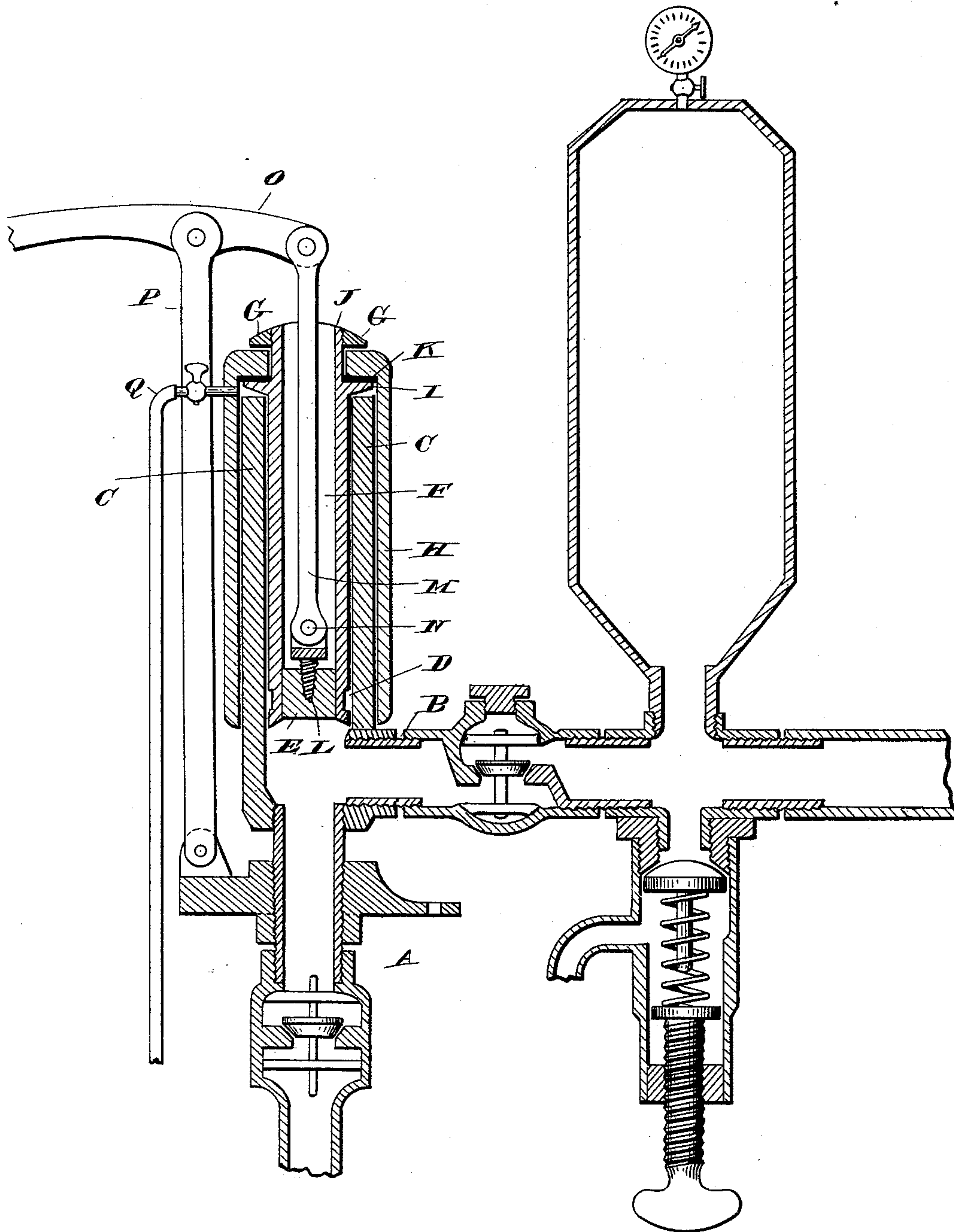


(No Model.)

F. CAVALLARO.  
PUMP.

No. 415,497.

Patented Nov. 19, 1889.



Witnesses

H. W. Neely.  
J. W. Fowler

Inventor

Francesco Cavallaro.  
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Attorney



# UNITED STATES PATENT OFFICE.

FRANCESCO CAVALLARO, OF SAN JOSÉ, CALIFORNIA, ASSIGNOR OF ONE-HALF  
TO FRANK STOCK AND A. S. MACKENZIE, OF SAME PLACE.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 415,497, dated November 19, 1889.

Application filed February 19, 1889. Serial No. 300,508. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCESCO CAVALLARO, of San José, Santa Clara county, State of California, have invented an Improvement in Pumps; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improved construction for a force-pump, which is especially designed as a pump for spraying trees, but which may be used equally well in any place where a force-pump may be needed.

It consists in the novel construction of the pump cylinder and plunger, which will be more fully explained by reference to the accompanying drawing, in which the figure is a vertical section of my pump.

A is the lower part of a suction-pipe containing the ordinary lift-valve, and B is the discharge-pipe with a check-valve fixed in it in the usual or any suitable manner of construction for such pumps. The pump-cylinder C is turned and bored outside and inside concentrically, so as to be smooth. The plunger consists of a sleeve F and a post E, that is fitted into the tube or sleeve F, which is turned to fit and move smoothly within the barrel C, with just sufficient space around it to allow a little water to enter, which serves as a water-packing and makes a frictionless joint for the cylinder F without the necessity for extra packing. Upon the top of the cylinder F is screwed a collar G, clamping to the cylinder F an outer sleeve H, which is fitted to move smoothly and freely about the outside of the pump-cylinder C in the same manner that the cylinder F moves inside. If desired, the outer cylinder H and the collar G may be made in a single piece, the collar being screw-threaded on the inside, so as to screw upon the upper end of the cylinder F. The two cylinders F and H thus inclose the pump-barrel C, and when they are reciprocated move up and down about it.

The upper end of the cylinder F has a flange or extension I just below the screw-threaded portion J, upon which the collar G screws, and a packing-ring may be inserted between the collar G and this flange I, so that when the collar G is screwed down it will fit

closely upon this packing-ring K and will thus insure a tight joint.

L is a screw-plug fitted into the piston and having its upper end formed with lugs to receive the lower end of the plunger-rod M, which is pinned to the lugs of the screw L by a pin at N. The upper end of the plunger-rod M is connected with the lever or handle O, which is fulcrumed upon the standard P, and by means of this handle the plunger is caused to reciprocate. By thus inclosing the outer and inner side of the barrel C with the cylinder F and H, I provide a very perfect guide, and the small space between the cylinders allows a little water to enter, which forms a perfect water-packing, while at the same time lubricating the plunger-cylinder, so that it moves with the least possible friction. So tight a joint is formed by this means that no leakage is possible.

In order to prevent a vacuum being formed at the upper end of the cylinder C by the reciprocation of the double cylinders F and H and the collar G, I have shown a pipe or passage Q, screwing into the outer cylinder H and opening into the space above the cylinder C, and this pipe will allow air to enter as the plunger rises, and thus prevent the vacuum in the space which would be formed above the top of the cylinder. At the same time any small portion of water which may by any possibility be forced up between the cylinders F and C will be discharged through this pipe instead of falling down about the outside of the cylinder.

The usual air-chamber R may be applied to the discharge-pipe B beyond the check-valve, and the end of the pipe is fitted to receive any suitable or desirable form of nozzle to which the discharge-pipe can be attached.

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

1. In a force-pump, the combination of the stationary pump-cylinder, the exterior cylinder turned to fit the pump-cylinder, a plunger having an interior cylinder provided with a flange I and having a closed lower end, a collar uniting the top portions of the inner and outer cylinders, a washer K, forming a

tight joint between the two cylinders, and a rod M, connected with the plunger, whereby the inner and outer cylinders are caused to reciprocate about the pump-cylinder, substantially as described.

2. In a force-pump, the stationary cylinder C, having the exterior and interior bored and turned concentrically, a plunger consisting of the interior cylinder fitted to move within the stationary cylinder and having the bottom closed, as shown, a flange I, projecting around the upper part of said plunger and above the end of the stationary cylinder, a washer fitting upon the top of said flange and a collar screwed upon the upper end of the

plunger and pressing upon said washer, an exterior guide-tube secured to said collar and extending down upon the outside of the pump-cylinder, a pump handle or lever and the connecting-rod extending therefrom to the bottom of the interior of the plunger and connected therewith by a pivot-pin, substantially as described.

In witness whereof I have hereunto set my hand.

FRANCESCO CAVALLARO.

Witnesses:

GEO. H. STRONG,  
S. H. NOURSE.