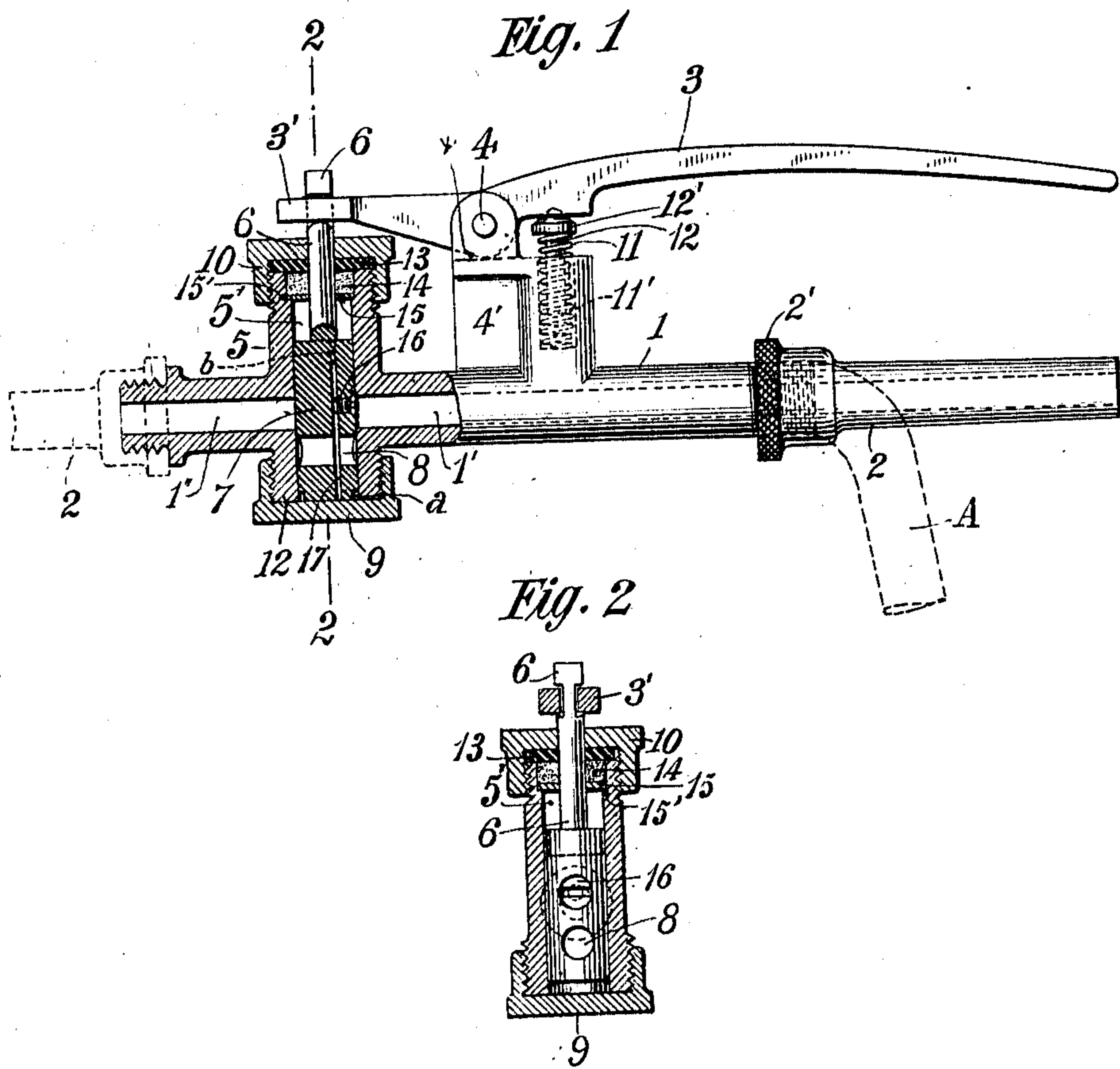


J. M. & J. A. WILSON.  
 NOZZLE FOR DELIVERING VISCOUS LIQUIDS, AS PAINT REMOVERS.  
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Patented Apr. 18, 1911.



Witnesses:  
*Raphaël Ketter*  
*C. D. Morrill*

*John M. Wilson*  
*James A. Wilson*  
 Inventors:

By *his* Attorneys:  
*Byrnes, Townsend & Swenarton.*



# UNITED STATES PATENT OFFICE.

JOHN M. WILSON, OF MONTCLAIR, NEW JERSEY, AND JAMES A. WILSON, OF BROOKLYN,  
NEW YORK.

NOZZLE FOR DELIVERING VISCOUS LIQUIDS, AS PAINT-REMOVERS.

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Specification of Letters Patent.

Patented Apr. 18, 1911.

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*To all whom it may concern:*

Be it known that we, JOHN M. WILSON and JAMES A. WILSON, both citizens of the United States, and residents, respectively, of Montclair and Brooklyn, in the counties of Essex and Kings and States of New Jersey and New York, have invented certain new and useful Improvements in Nozzles for Delivering Viscous Liquids, as Paint-Removers, of which the following is a specification.

Our invention relates to nozzles of the automatically-closing type and has for its particular object the provision of a nozzle adapted to supply viscous liquids, such as paint-removing compositions and liquid paints in a uniform manner, irrespective of the presence of volatile solvents in said removers, paints and the like.

The nozzles heretofore constructed have been found unsuitable for the above purposes, for various reasons, and particularly because the construction was such as to admit of either the evaporation of volatile solvents or of the oxidation of the oily vehicle of the compositions employed, or else admitting of the occlusion of quantities of the compositions employed beneath the movable element or valve which serves to cut off the supply of liquid through the outlet port.

In the accompanying drawings, which serve to illustrate the construction of a nozzle embodying our invention, Figure 1 is a longitudinal perspective elevation, partially in section, and Fig. 2 is a cross-sectional view along the line 2—2 of Fig. 1 showing the connection between the lever and the piston-rod.

Referring to the drawings in detail, the reference numeral 1 designates a tubular body of a nozzle having a longitudinal bore 1' serving as an inlet port and a second bore 1'' serving as an outlet port, and in alignment with said inlet port. The opposite ends of said tubular body are threaded and are adapted to optionally receive a tip 2, said tip being preferably attached to the inlet end of said body when the instrument is out of commission, and being attached to the opposing end or outlet end of said body, as indicated by the dotted lines in Fig. 1, when it is desired to use said instrument or implement.

In use a hose or pipe A is secured in any desired manner to the inlet end, as indicated in the dotted lines Fig. 1, it being understood that the tip 2 is obviously applied to the outlet end. In fact the transposition of said tip 2 from the outlet end of the implement to the inlet end, enables the implement to be readily packed in a compact manner, and to be inserted in the smallest possible container for the purposes of transportation. A lever 3 provided with a curvilinear face  $\alpha$  is secured by means of a pivot 4 to a transversely-projecting offset 4'. In proximity to said offset is a second offset, herein termed the valve-casing 5, adapted to receive a snugly-fitting, cut-off piston 7, having a piston-rod 6 which is reduced adjacent the upper end, as shown, to receive the forked-end 3' of the lever 3. In proximity to the lower end of said cut-off piston, which piston is adapted to completely fill the lower end of said valve-casing when the former is in its lowermost position, is a liquid-way 8 adapted to be optionally elevated into alignment with the inlet port 1' and the outlet port 1'', said passage being preferably substantially equal in cross-sectional area to that of said outlet port. A removable screw-cap 9, adapted to be threaded onto the lower end 12 of said valve-casing, serves to seal the same against the atmosphere and also serves as a seat to limit the downward movement of said cut-off piston, and it is evident that said cut-off piston, which is ground or machined to tightly fit within the machined wall of the valve-casing, will in the event of the escape of any liquid below the same during its upward movement, gradually displace said liquid upwardly and into the water or liquid passage 8. The upper end of said valve-casing is closed by a threaded cap 10 which is apertured to receive the piston-rod 6, which is adapted to reciprocate with respect to said cap. If desired suitable packing may be disposed around said piston-rod to prevent the escape of liquids which may be dispensed through said nozzle, although preferably when employing heavy viscous liquids, such as heavy paint removers, as described in the patent to John M. Wilson, No. 872,314 of November 26, 1907, and therein termed "film-forming paint and varnish removers," it is merely necessary to have the



surfaces of the respective elements in frictional engagement with each other carefully machined, and thereby the binding of the packing or washers, which often occurs, is entirely eliminated and any irregular operation of the valve-mechanism is prevented.

The offset 4' is preferably of substantially tubular configuration at its rear end, the said offset being flattened at its forward end to reduce the amount of metal which is required in the construction of the same, obviously said offset being cast and not hammered-out from an elliptical tube, and the tubular portion of the offset is adapted to receive a pin 12, actuated by a coil spring 11 which embraces said pin and is positioned within the recess aforesaid. The upper end of said pin preferably is provided with a conical head 12' which serves as an abutment for one end of said coil spring, the opposite end of said spring obviously being in engagement with the bottom of said recess 11' when said lever is depressed by gripping the handle end 3 and exerting pressure thereon.

The construction herein described, owing to the fact that the cut-off piston is adapted to alternately project from the lowermost end of the valve-casing to the uppermost end of the same, thereby completely filling the same periodically and affecting the ejection of any liquid which may tend to escape beneath the lowermost end, and also, although it is less likely to occur, above the upper end of the said cut-off piston. It is evident that the provision of such a cut-off piston requires that the elastic element actuating the same be positioned externally of the valve-casing, and not only does the construction shown, wherein the coil spring is positioned externally of the valve-casing and intermediate the handle-end of the lever and its fulcrum, permit of the more effective actuation of said lever, owing to the elimination of all possibility of clogging due to dried or semi-dried films of paint removers containing wax, collodion, &c., but also the renewal of said spring element, or the adjustment of the same, can be accomplished without opening the valve-casing and thereby permitting access of the atmosphere within the same.

This nozzle can be advantageously employed for delivering a solid stream of a wax-containing, or collodion-containing, paint remover, or a liquid paint, to an exposed surface and the said mixture so applied can then be suitably spread thereon by means of an ordinary paint brush. Preferably the injection of the mixture employed, is accomplished by means of pneumatic pressure according to the method described in the patent to Wilson above mentioned, and this nozzle may be advantageously substituted in lieu of the nozzle therein described, it being evident that the tip 2 or if desired,

a spray-tip may be employed, according as a solid stream of the liquid, or a fine spray of the same, may be desired.

Owing to the fact that immediately following the release of the handle 3 from the pressure applied thereto, the coil spring 11, which normally exerts pressure upon said pin 12, will effect instantly the closure of the inlet port 1' and the said piston containing occluded liquid in the water-way 8 will be projected into the lower end of the valve-casing 5, all the volatile or oxidizable ingredients of the liquid mixture employed will be effectually sealed against atmospheric influence, thus permitting of the repeated actuation or reciprocation of the cut-off piston, without permitting the same to be clogged with pasty or semi-dried residues of the liquid employed. In order to permit the said valve to be interchangeably employed for the application of viscous, film-forming removers, as well as volatile and extremely light, non-film-forming removers, commonly known as "washes," it is essential that the valve mechanism be constructed so as to eliminate the necessity for employing rubber gaskets or packing-rings, either around the movable element or at the joints, as the solvents contained in said removers are extremely active in their action on rubber and readily dissolve the same. The construction preferably employed consists of a bifurcated cut-off piston 7, which is provided with an adjusting screw 16 adapted to optionally increase the diameter of said piston in a direction parallel to the longitudinal axis of the liquid-way 8. A channel or slot 17, positioned to one side of the longitudinal axis of said piston effects the division of the said piston into two distinct legs, the one as shown being substantially smaller than the other and being accordingly readily adjustable with respect to the larger one, by means of said adjusting screw 16, which is in threaded engagement with an aperture extending completely through the smaller leg, thus permitting the inner end of said screw to abut against the inner face of the larger leg. By slightly turning said screw it is evident that the smaller leg will be sprung outwardly, provided the end of said screw is caused to exert pressure upon the inner face of said larger leg, and vice versa when the screw is reversed the pressure will be relieved and the two legs of the piston will assume their normal position with respect to each other.

The bifurcated piston described, admits of the machining of the opposing faces of the piston independently in order that an exact fit between the walls of said valve-casing and the faces of said piston may be secured, as by the mere revolution of the adjusting screw the opposing faces of said piston, which are adjacent the inlet and



outlet ports of said valve-casing, may be brought into intimate engagement with the walls of said valve-casing, which are both above and below said inlet and outlet ports.

5 Thus, entirely irrespective of whether a tight fitting piston can be constructed without the employment of flexible packing-rings when solid pistons are employed, it is possible by the employment of the aforesaid  
10 bifurcated piston to procure a liquid-tight fit without any packing-rings on the piston whatsoever.

At the upper end of the valve-casing a shoulder 15' is provided which is adapted  
15 to receive a metallic washer 15 of slightly larger diameter than the inner diameter of said valve-casing. An elastic felt gasket 14 is supported on said metal washer, the said felt gasket being sufficiently thick to con-  
20 tact with and to intimately engage a leather washer 13 which is of sufficient diameter to extend across the upper end of said valve-casing and form a packing-ring for the  
25 exterior threaded end of said valve-casing. The central openings through said washers and gasket are of a size to snugly receive the piston rod 6 and said elastic felt gasket is sufficiently thick so that when the cap 10  
30 is screwed down tight it will be compressed by the leather washer 13 and thereby an extremely intimate fit will be secured between the piston rod 6 and said felt, thereby en-  
35 tirely eliminating any possibility of the escape of the liquid while admitting of the ready reciprocation of the piston rod.

Communication between the upper end of the valve-casing, namely the chamber 5', and the lower end of said valve-casing, is afford-  
40 ed by means of a vertical peripheral groove b which communicates with the said slot 17 and thus permits of the escape of air or liquid from above said piston. The lower end of said piston is cut away as shown at  
45 a to reduce the amount of surface in contact with casing.

Having thus described our invention what we claim is:

1. In a nozzle, the combination comprising  
50 ing a body portion provided with longitudinal and transverse bores, an expansible cut-off valve arranged to reciprocate within said transverse bore, said cut-off valve being provided with a liquid-way therethrough nor-  
55 mally out of alinement with said longitudinal bore, and elastic means adapted to maintain said liquid-way out of alinement with said longitudinal bore.

2. In a nozzle, the combination comprising  
60 ing a valve-casing, an inlet port and an outlet port in communication therewith and oppositely disposed with respect thereto, an expansible cut-off valve adapted to snugly fit within said casing and capable of pe-  
65 riodically engaging with the opposing ends

of said casing, and means disposed externally of said casing capable of actuating said piston and adapted to normally seal said inlet and outlet ports against communication.

2. In a nozzle, the combination comprising a valve-casing, an inlet port and an outlet port in alinement with each other, an expansible cut-off valve disposed intermediate said ports and arranged to normally  
75 seal the same against communication, said valve being adapted to snugly fit within said casing and being capable of periodically and alternately engaging the opposing ends of  
80 said casing, when said valve is seated and unseated respectively and means external of said casing adapted to normally affect the sealing against communication of said inlet and outlet ports.

4. In a nozzle, the combination comprising a body portion provided with communicating longitudinal and transverse bores, an expansible cut-off valve arranged to reciprocate within said transverse bore, an offset  
85 on said body provided with a recess adapted to receive a spring-pin and a lever secured to said cut-off valve and fulcrumed on said offset, said lever being normally depressed with respect to the end connected to said  
90 valve by said spring.

5. In a nozzle, the combination comprising a body portion provided with a valve-casing and an offset distinct from said valve-casing, an expansible cut-off valve adapted to reciprocate within said valve-casing and  
100 capable of engaging the lower end of said valve-casing, a lever fulcrumed on said offset and secured to said valve, a spring element positioned in a recess in said offset and adapted to normally depress one end of said  
105 lever and maintain the lower end of said valve in contact with the lower end of said valve-casing.

6. In a nozzle, the combination comprising a body portion provided with a valve casing and an offset distinct from said valve-casing, a cut-off valve adapted to reciprocate within said valve-casing and capable of engaging the lower end of said valve-casing,  
110 a lever pivotally connected with said offset, said lever being provided with a curved face adapted to relieve the pivot element from excessive pressure during oscillation of said lever, a spring-pin having a conical upper  
115 end positioned within a recess in said offset and adapted to normally maintain the end of said lever with which it permanently contacts in an elevated position.

7. A cut-off valve, comprising a valve-casing, transverse inlet and outlet ports, a  
125 bifurcated piston provided with a liquid-way therethrough adapted to optionally afford communication between said inlet and outlet ports and means for optionally effecting the separation of the lower ends of said  
130



bifurcated piston in excess of the normal separation thereof, means for limiting the upward movement of said cut-off piston when said liquid-way is in register with said inlet and outlet ports, and packing means positioned immediately above said means adapted to limit the upward movement of said piston, said packing means being arranged to entirely envelop a piston-rod integrally connected with said piston, a cap adapted to seal one end of said casing and provided with an opening adapted to snugly

receive said piston rod and packing means adapted to seal the joint between said cap and said casing.

Signed at New York in the county of New York and State of New York, this 31st day of July A. D. 1908.

JOHN M. WILSON.  
JAMES A. WILSON.

Witnesses:

CHARLES T. CARLL,  
J. KEMPF.