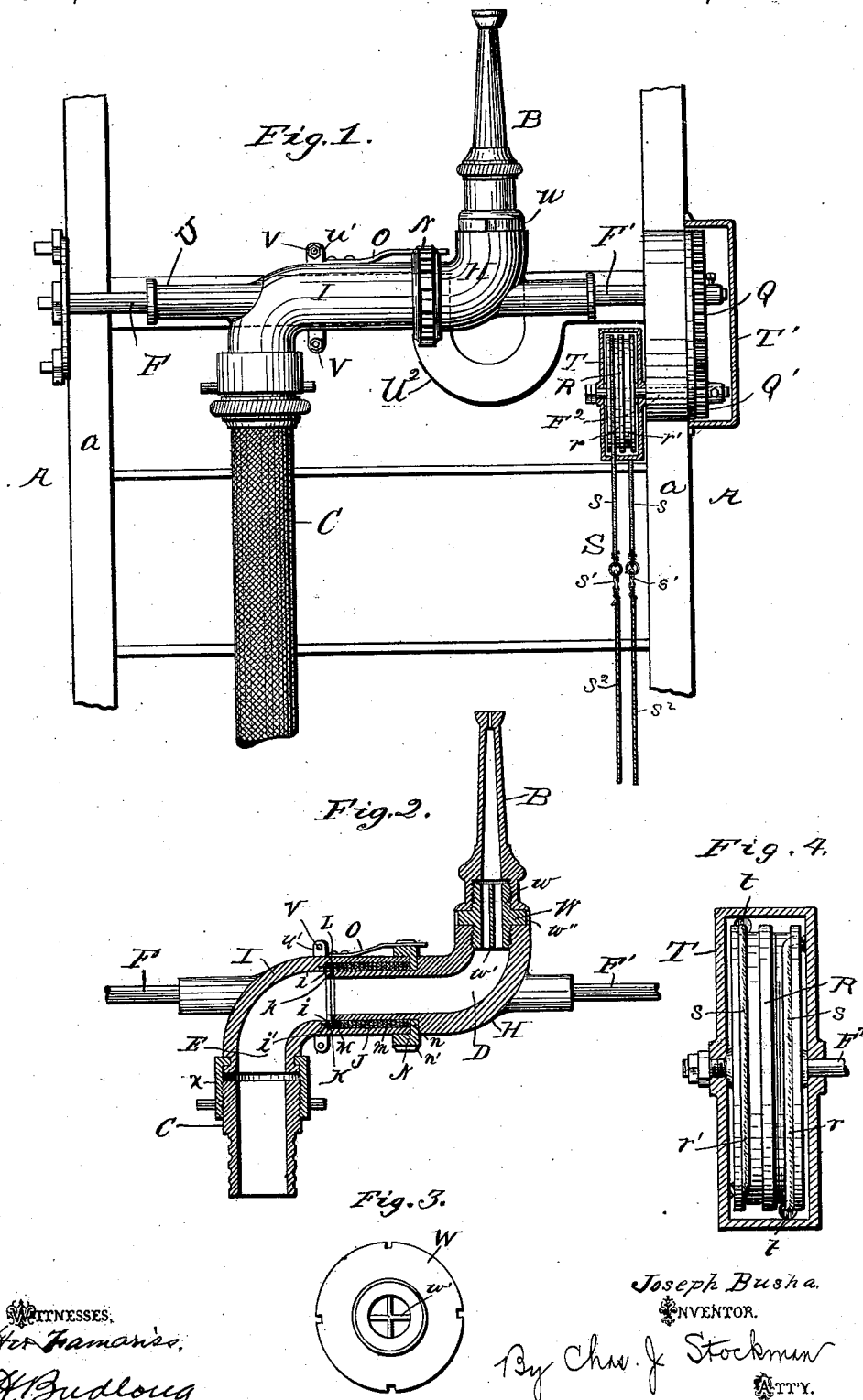


J. BUSHA.
PORTABLE WATER TOWER.

No. 550,040.

Patented Nov. 19, 1895.



WITNESSES.
Walter Hamaness.
O. H. Budlong

Joseph Busha.
INVENTOR.

By Chas. J. Stockman
ATTY.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 5

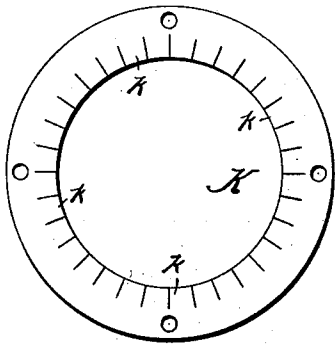


Fig. 6

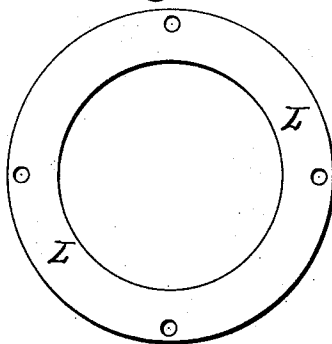


Fig. 7

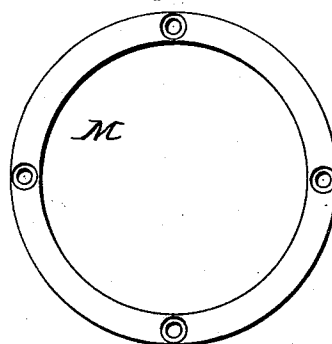


Fig. 8

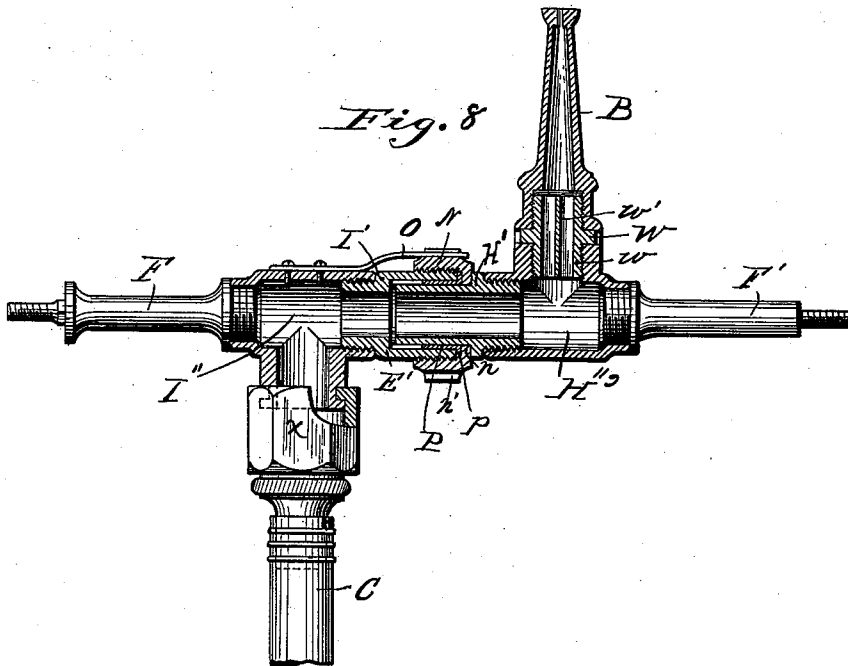
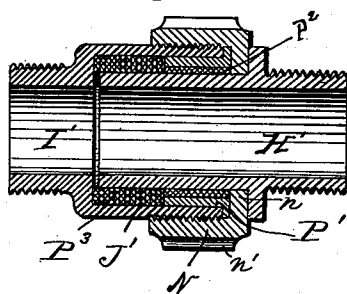


Fig. 9



WITNESSES,

Walter Farnsworth.
O. H. Gudlow.

Joseph Buscha
INVENTOR.

By Chas. J. Stockman
ATTY.

UNITED STATES PATENT OFFICE.

JOSEPH BUSHA, OF PITTSBURG, PENNSYLVANIA.

PORTABLE WATER-TOWER.

SPECIFICATION forming part of Letters Patent No. 550,040, dated November 19, 1895.

Application filed December 27, 1893. Serial No. 494,860. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BUSHA, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Portable Water-Towers; 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 appertains to make and use the same.

This invention has relation to that class of portable water-towers in which the nozzle is journaled to a truck-ladder and is provided with means operated from the bottom of the truck for turning it to the proper angle to direct the water to the place desired; and the invention consists in certain peculiarities in the construction, arrangement, and combination of the several parts thereof substantially as hereinafter described, and particularly pointed out in the subjoined claims.

The general object of my invention is to so improve the details of construction of water-towers of the class stated that they will possess a maximum efficiency and may be operated quickly and with a minimum of power. This object is accomplished by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a side view of part of a ladder with my improvement attached thereto, the casings inclosing the pulleys and gear-wheels being shown in section to disclose said pulleys and gear-wheels. Fig. 2 is a sectional view, showing the interior construction of the nozzle and chambers through which the water passes from the supply-pipe to said nozzle. Fig. 3 is a detail view of the nozzle, looking at the receiving end thereof, and shows the division-walls therein for causing the water to issue therefrom in a steady stream. Fig. 4 is a sectional view of the pulley engaged by the operating-rope. Figs. 5, 6, and 7 are enlarged detail views of packing-rings. Fig. 8 is a view similar to Fig. 2 of a modified construction. Fig. 9 is a sectional view of a further modified construction of packing.

The same letters of reference designate the same parts in the several figures.

A designates the upper end of a ladder to which my improved water-tower is secured, B the revoluble nozzle through which the water issues, and C the pipe through which

the water is supplied to said nozzle, said supply-pipe preferably being flexible hose or tubing for an obvious purpose.

Suitably packed chambers D and E are provided for the passage of water from the supply-pipe to the nozzle, said chamber D being formed in a part which is secured to and revolves with the nozzle, and said chamber E being formed in a part which has no movement independent of that of the ladder to which the device is attached. In the construction of the device (shown best in Fig. 2) said passages D and E are respectively formed in bent tubes H and I, with the former of which the nozzle is connected and with the latter of which the supply-pipe is connected. The adjacent ends of these tubes are located the one within the other and are so formed as to provide, when the parts are together, an opening J between their adjacent surfaces.

It will be observed that the inner end of the revoluble tube H comes nearly to but not quite in line with a shoulder *i* in the inner tube, so as to leave a space between them. This space is occupied by a packing consisting of a thin metallic (preferably brass) ring K and a rubber or leather ring L. These packing-rings project into the water-chamber D, and the projecting part of the thin metallic ring K is formed with a series of cuts *k*, which give it such elasticity that the water entering the chamber under pressure will force and retain the split part of said ring into close contact with ring L, and the latter into close contact with the end of tube H, and also cause it to protect the rubber ring L from liability to displacement by the pressure of the water, thereby making the joint absolutely water-tight under all conditions. The remaining part of the opening J is filled by a metallic ring M, a series of rubber or leather rings *m*, and an inwardly-projecting ring *n* of a nut N, which latter is screwed to the end of the tube I, and with its said inwardly-projecting ring serves to retain said rings in place.

Limited wear of the packing-rings may be compensated for by properly adjusting the nut N, as is obvious.

I prefer to secure the end rings K, L, and M to the shoulder *i* of tube I by screws *i'* or other suitable means passing through said rings into said shoulder. This nut N is held from accidental movement in any direction

by a spring-catch O, having one of its ends rigidly secured to the adjacent tube and its other end suitably located to engage any one of a series of recesses n' in the outer surface of said nut.

In the construction (shown best in Fig. 8) the nozzle is connected with the supply-pipes by disconnected tubes H' and I' and chambered couplings II' and I' , said couplings respectively connecting said tubes with the nozzle and supply-pipe. In this construction a metallic ring P, of comparatively great length, is inserted within the opening corresponding with opening J, Fig. 2, between the adjacent surfaces of the tubes II' and I' , and serves as a packing to close said opening, and it may be used either with or without all or some of the packing-rings hereinbefore described, said ring having a shoulder p engaged by the ring n of nut N.

In the construction shown in Fig. 9 the opening J' , corresponding with opening J above referred to, is made of greater diameter than said opening J and is occupied by a packing consisting of a ring P' , of similar construction to ring P, above mentioned, a rubber ring P^2 , placed between and in contact with the surfaces of said ring P' and the inner tube, and a series of packing-rings P^3 , located in the space between the inner ends of said rings P' and P^2 and the innermost wall of said opening.

The above are examples of different constructions of packing which may be used in my improved device, and while they possess advantages over any with which I have experimented I do not wish to be understood as limiting myself to any of the specific constructions thereof herein shown and described, but reserve to myself the liberty of employing any suitable form of packing in lieu thereof, whether such substituted construction consists wholly or in part of any of the elements of the packings above set forth; nor do I wish to be understood as limiting myself to the use of either of the above-described constructions of tubes for connecting the supply-pipe with the nozzle.

It will be observed on reference to Fig. 1 that the nozzle and other parts of the device are located between the side bars a of the ladder and that the supply-pipe is located near one side rail of the ladder and the nozzle and the gearing for operating the nozzle are located near the other side rail, and also that said nozzle is connected with the supply-pipe by a transversely-extending tube. This arrangement is of prime importance in that by it the device is perfectly balanced and the necessity of employing guy-ropes or other like means for keeping the ladder in proper position is thereby dispensed with.

F designates an arm, and F' a shaft, which are located at opposite ends of the device and are respectively secured to and journaled in the opposite side bars of the ladder or in frames bolted to said side bars. The rod

and the shaft are removably secured to the ladder and serve to support the device in position upon the same.

U designates a transverse rod or bar which is bolted or otherwise suitably secured at its ends to the side bars of the ladder and is also preferably secured intermediate its length to the non-rotatable side of the device by any suitable means. Adjacent to the nozzle it is formed with a downwardly-projecting open part u^2 , so as not to interfere with the movements of said nozzle. This bar is one of the most important parts of my present invention, as it efficiently retains the sections II and I or II' and I' in their proper relative position at all times by preventing the lateral pressure of the water when the device is in operation from spreading the side bars apart. By thus retaining said sections in their proper relation with each other the use of a nut and flange for drawing said sections together is dispensed with and the friction consequent upon revolving the nozzle is thrown upon the smallest possible point, and therefore is inappreciable in amount. The bar being also secured to the non-rotatable section of the device serves as an additional support for the ladder.

On the outer end of shaft F' is keyed a gear-wheel Q, which meshes with a pinion Q', keyed on the outer end of a short shaft F^2 , the inner end of said shaft F^2 having keyed to it a compound pulley, which may either be a single pulley R, formed with two grooves r, r' , extending parallel with each other entirely around its periphery or two pulleys, each having a single groove. S designates operating-ropes which extend from said compound pulley, to which they are secured, to a point within easy reach of the operator at the bottom of the ladder. The upper ends of these ropes are knotted to keep them from disengagement from the pulley or pulleys and respectively extend from opposite sides of the pulley or pulleys through openings therein, having their exits at diametrically-opposite points thereof, and thence in the grooves around the periphery or peripheries of said pulley or pulleys in reverse directions, as clearly shown in Fig. 4. By pulling upon one rope or one side of the rope the pulley will be operated and its motion transmitted to turn the nozzle properly to direct the stream to the point desired, and by pulling upon the other rope or side thereof the nozzle may be turned in the other direction. Importance is attached to this particular construction of means for turning the nozzle, as it is of the simplest possible construction and dispenses with many features or elements heretofore deemed essential to the proper operation of devices of this character, and practical experience has demonstrated that by means of it the device may be operated with the greatest ease. Employing a compound pulley or two pulleys mounted upon a single shaft journaled in a side bar of the ladder is also advantageous, in that it

enables me to completely inclose them within a casing of small size, such as the revoluble one hereinafter described, which will completely protect all of the operating mechanism, except the gear-wheels Q and Q', which latter, by their arrangement, may be completely inclosed within another small casing. Thus it will be seen that my operating means are of simpler, lighter, more easily operated, and effective construction than those heretofore proposed, each of which advantages is of especial importance in this class of devices.

In the form of operating-ropes shown in the drawings the upper ends *s* thereof, which engage the pulley or pulleys, are of metal and have rings *s'* at their lower ends, while the lower end *s²* is a continuous piece, not made of metal, and has snap-hooks *s³*, which engage said rings; but, while this construction is advantageous, it is a detail which may be varied without departing from the spirit of the invention.

The compound pulley is inclosed within a casing T, which is loosely mounted on the shaft F², so as to be revoluble thereon. The operating-ropes above referred to pass through openings *t* in said casing. This casing serves to protect the pulley, and, as it is revoluble, it is obvious that it will permit the pulley to be operated by the ropes, either from a point directly beneath said pulley or from points at either side thereof, which is of prime importance, as frequently the fire is so fierce as to make it dangerous to stand in the immediate vicinity thereof. The gear-wheel Q and pinion Q' also are preferably inclosed within a protecting-casing T'. Said casings T and T' will preferably be made water-tight to positively protect the parts inclosed thereby from dripping water.

A great disadvantage heretofore incident to devices of this character has been in the "whirling" or "twisting" of the water in the nozzle, which prevents it from issuing therefrom in a steady stream. This is especially the case with those devices in which the nozzle has communication with the supply-pipe through a tube or tubes which extend at substantially right angles with said nozzle and supply-pipe. To overcome this disadvantage I insert in the receiving end of said nozzle a device W, of peculiar and advantageous construction, for dividing said receiving end into a series of ways or passages for the water, by means of which such swirling of the stream of water is prevented and the water caused to issue from the nozzle in a strong steady stream. The form of the device W shown in the drawings consists of an outer-threaded tube *w*, having its outer end screwed into the nozzle and its inner end screwed into the tube H or coupling H', an inner X-shaped part *w*, which divides the device into four ways or passages for the water, and an outwardly-extending part *w²* for convenience in screwing or unscrewing it. This construction is advantageous, because it provides

means by which the division-walls will be more efficiently held from movement within the nozzle and will be braced throughout their entire length.

The supply-pipe C is connected with the tube I or coupling I' by means of a swiveled nut X, into which is screwed the coupling *c* of said supply-pipe, whereby the latter may be readily disconnected from the other parts of the device.

Although I have described my invention as an attachment to truck-ladders and have set forth the construction which adapts it particularly for use in such connection, it is obvious that it is practical for attachment to ladders which do not form a part of trucks, and that it may form a part of a portable water-tower, whether the latter is attached to and supported by a ladder or not, and, further, that with slight changes, which any skilled mechanic will comprehend without illustration or description thereof, it may be attached to a stationery stand-pipe and thereby form a part of a stationary fire-extinguisher. I therefore do not wish to be understood as limiting myself to its use as an attachment to truck-ladders, nor do I wish to be understood as limiting myself to the specific construction herein shown and described, as changes other than those above set forth may be made in the details of construction without departing from the spirit of the invention.

Having now described my invention, what I believe to be new, and desire to secure by Letters Patent, and what I therefore claim, is—

1. The combination with a ladder and a supply pipe, of a revoluble nozzle supported by the side bars of the ladder and communicating with the supply pipe, a shaft rigidly connected with the revoluble nozzle and journaled in one of the side bars of the ladder, a pinion carried by said shaft on one side of the side bar, a second shaft journaled in the said side bar, a pinion on one end of the second shaft engaging the pinion on the other shaft, a double pulley on the opposite end of the second shaft, and operating ropes attached to said double pulley to turn it in either direction, substantially as and for the purpose specified.

2. The combination with a support and a supply pipe, of a revoluble nozzle journaled on said support and communicating with the supply pipe, mechanism carried by the support to operate the nozzle and consisting of engaging pinions, a double pulley and operating ropes, a fixed casing inclosing the pinions, and a revoluble casing inclosing the double pulley and provided with openings for the passage of the operating ropes, substantially as described.

3. In a fire extinguisher, the combination with the supporting side bars, the revoluble nozzle, the supply pipe, and the laterally extending tube-sections having communication with said nozzle and supply pipe, of the transverse bar, secured at its end to said side

bars and serving to keep the tube-sections in their proper relative positions, said transverse bar having a downwardly projecting open part to permit movement of the nozzle, substantially as described.

4. In a fire extinguisher, the combination with the supporting side bars, the nozzle, the supply pipe, the laterally extending tube-sections having communication with said nozzle and supply pipe, the end of one of said sections being located within the end of the other, and a packing within the end of the outer section and encircling the end of the inner section, of a transverse bar, secured at its ends to said side bars and serving to keep said tube-sections in their proper relative positions, substantially as described.

5. In a fire extinguisher, the combination with the supply pipe, a tube having communication therewith, and a nozzle, having a tube entering the end of said first-mentioned tube, the adjacent ends of said tube and nozzle being formed to provide an opening between their surfaces and so located as to provide a space at the inner end of said opening communicating with the water space through the tube, of a packing projecting inward into the water chamber from said space, and packing within said opening, substantially as shown and described.

6. In a fire extinguisher, the combination with two tubes through which the water flows, the adjacent ends of said tubes being received the one within the other, and reduced in thickness to provide an opening between them and formed with shoulders at the ends of said reduced parts which are remote from each other, the extremity of each of said reduced parts terminating a short distance away from the shoulder of the other, thereby leaving spaces at the opposite ends of said opening, a follower in one of said spaces for tightening the packing, and a supplemental packing projecting inward into the water space from the other of said spaces, substantially as described.

7. In a fire extinguisher, the combination with two tubes through which the water flows, the adjacent ends of said tubes being located the one within the other and formed to provide an opening between their surfaces and so located as to provide spaces at the opposite ends of said opening, of a packing within the space at the inner end of said opening, said packing projecting inward into the chamber through which the water flows, packing in said opening between the surfaces of the tubes, and an adjustable ring in the space at the outer end of said opening, said ring serving to take up wear of the packing and being adjustable from the outside of the tubes, substantially as shown and described.

8. In a fire extinguisher, the combination with the supply pipe, a tube having communication therewith, and a nozzle, having a tube entering the end of said first-mentioned tube, the adjacent ends of said tubes being

formed to provide an opening between the surfaces of said adjacent ends and so located as to provide a space at the inner end of said tube of the nozzle, of a metallic packing ring and a flexible packing ring in said space at the end of said last-mentioned tube, said rings having their inner ends projecting into the water passage and said projecting part of the metallic ring being cut, and packing in said opening between the surfaces of the tubes, substantially as shown and described.

9. In a fire extinguisher, the combination with the supply pipe, a tube having communication therewith, and a nozzle, having a tube entering the end of said first-mentioned tube, the adjacent ends of said tubes being formed to provide an opening between the surfaces of said adjacent ends and so located as to provide spaces at the opposite ends of said opening, of a metallic packing ring and a flexible packing ring in the space at the inner end of said opening, said rings having their inner ends projecting into the water passage and said projecting part of the metallic ring being cut, packing in said opening between the surfaces of the tubes, and an adjustable nut engaging the external surface of one of said tubes and provided with a part projecting inward into the space at the outer end of said opening and in contact with said packing therein, substantially as shown and described.

10. The combination with the hose nozzle and the tube through which the water travels in its passage to said nozzle, the adjacent ends of said nozzle and tube being internally threaded, of a plug, screwed into said adjacent ends of the nozzle and tube and having intermediate of its length a ring projecting outward into the space between said adjacent ends of the nozzle and tube, said plug also having a series of division walls within its body, substantially as described and for the purposes specified.

11. The combination with the hose nozzle and the tube through which the water passes to said nozzle, of a coupling plug, screwed to the adjacent ends of said nozzle and tube, and thereby connecting said nozzle and tube together, said plug having within its body division walls for dividing the water chamber through it, substantially as shown and described.

12. In a portable water tower, the combination with the supporting ladder, the supply pipe, and the revolvable nozzle, of a transverse strip, connecting the side rails of the ladder, said strip having opposite said nozzle an opening extending in the direction of the revolution of the nozzle, substantially as shown and described.

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

JOSEPH BUSHA.

Witnesses:

DICK PACKARD,
GEO. W. RUSS.