

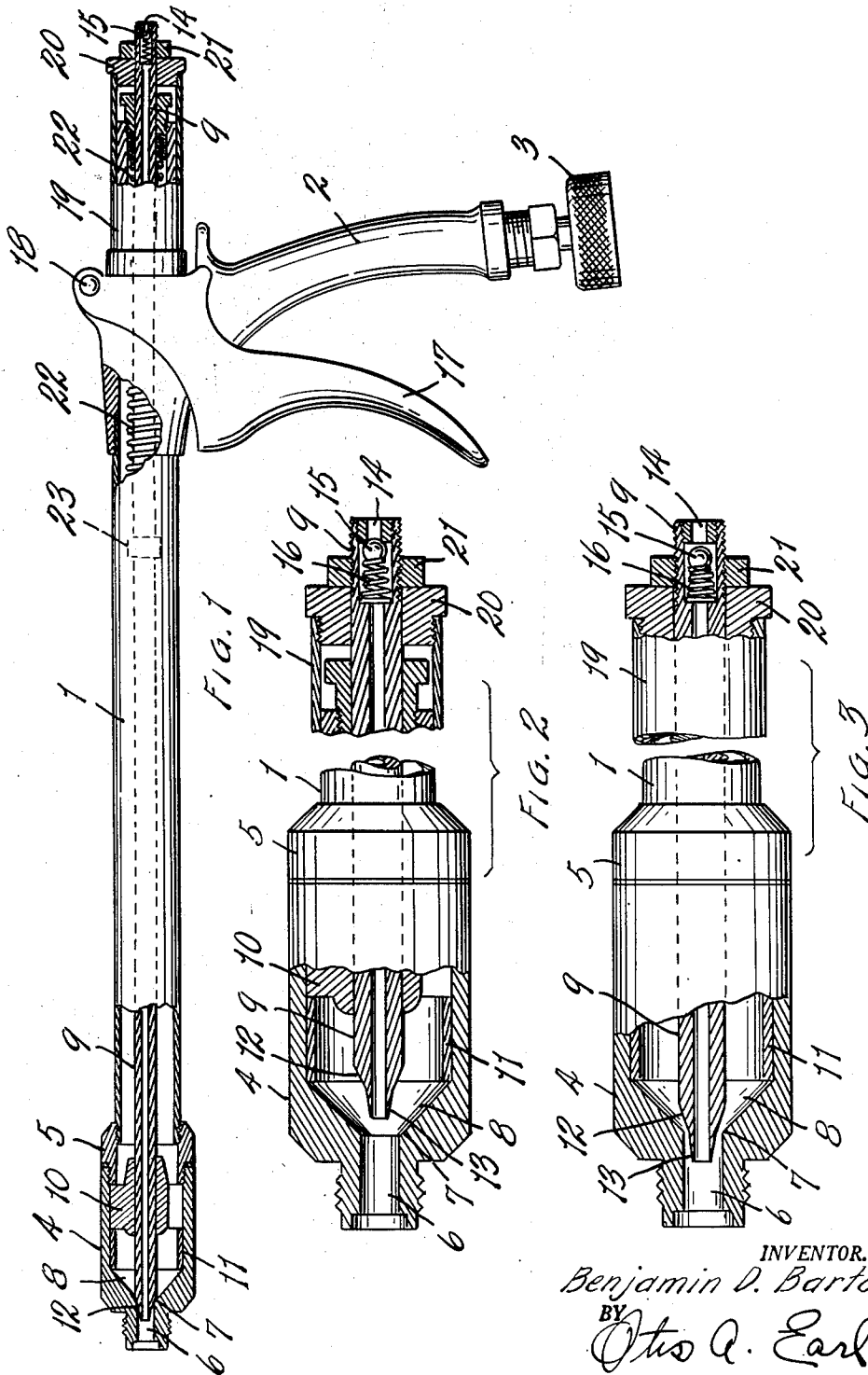
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B. D. BARTON

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SPRAY GUN FOR FIRE APPARATUS AND THE LIKE

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INVENTOR.
Benjamin D. Barton
BY
Otto A. Earl
Attorney.

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SPRAY GUN FOR FIRE APPARATUS AND THE LIKE

Benjamin D. Barton, Battle Creek, Mich., assignor to American Marsh Pumps, Inc., Battle Creek, Mich., a corporation of Michigan

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This invention relates to improvements in spray guns for fire apparatus and the like.

The main objects of this invention are:

First, to provide a spray gun well adapted for use in the fighting of fires and which is also adapted for use for spraying trees and the like and which is highly efficient for delivering so-called fog or mist and other types of sprays up to substantially a solid stream delivery.

Second, to provide a structure having these advantages which is easily controlled by the operator.

Third, to provide a structure in which the parts are very simple and easily assembled and disassembled should occasion require but one which is not likely to become clogged even when used in the spraying of liquids in which there are substantial amounts of solids.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary side elevational view of a spray gun embodying my invention partially in longitudinal section.

Fig. 2 is an enlarged fragmentary view partially in longitudinal section with the valve in open position.

Fig. 3 is a fragmentary view corresponding to Fig. 2 with the valve partially open.

Referring to the drawing the tubular barrel 1 is provided with a so-called pistol type grip 2 constituting a supply conduit opening to the barrel and having a suitable hose connection designated generally by the numeral 3. The barrel is provided with a chambered head comprising a nozzle section 4 and a coupling section 5 threaded into the nozzle section and threaded upon the barrel. The head has an elongated discharge port 6 terminating in its inner end in the annular valve seat 7. The wall 8 of the chamber is conical and merges into the valve seat.

The eduction tube 9 is slidably supported in the spider or like guard 10 which is secured in position between the spacer 11 and the coupling member 5. This provides a very simple assembly in which the parts can be readily manufactured and assembled. The conical control valve 12 is desirably formed directly upon the eduction tube which also has a tapered nozzle 13 projecting forwardly from the valve. This nozzle is of

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such length that it projects beyond the valve centrally into the port in spaced relation to the walls thereof during a substantial part of the movement of the valve to and from its seat but may be entirely withdrawn therefrom as is shown in Fig. 2. The cooperating relation of the nozzle to the port is illustrated in Fig. 3.

The eduction tube is provided with an air inlet 14 at its rear end and with an outwardly seating check valve 15 biased toward its seat by the springs 16. The eduction tube, which constitutes the valve stem, is controlled from the trigger-like lever 17 pivoted at 18 and engaging the sleeve 19 slidable upon the barrel, the rear end of the sleeve being provided with a head 20 engaging the thrust nut 21 on the eduction tube. The spring 22 surrounding the eduction tube engages the thrust collar 23 thereon as shown by dotted lines in Fig. 1 to urge the valve to its seat.

When the valve is partially open, for example as shown in Fig. 3, the flow of liquid under pressure through the outlet port and around the nozzle serves to set up a flow of air through the eduction tube and air mixing with the liquid results in a spray, the character of the spray depending on the degree of opening of the valve. When the valve is in fully open position the nozzle 13 is fully retracted from the port and in this position the pressure of the liquid serves to seat the check valve and a long solid stream results as compared to a spray. A very wide variation in the character of the discharge can be secured merely by manipulation of the valve.

While the structure illustrated is primarily designed for fire fighting equipment the invention may be readily adapted in apparatus for use in spraying trees and the like where a wide range in the character of the spray is desired and that is particularly desirable in the spraying of trees of substantial height.

I have illustrated and described my improvements in a highly practical embodiment thereof. I have not attempted to illustrate or describe other embodiments or adaptations as it is believed that this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

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

1. In a structure of the class described, the combination of a barrel provided with a liquid supply connection and with a chambered head provided with an elongated discharge port and with a rearwardly facing valve seat at the inner

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end of the port, the end wall of the chamber being conical and merging into the valve seat, an eduction tube annularly spaced from said barrel to provide an annular passageway for the liquid reciprocatingly supported in said barrel in axial alignment with said port and having a conical forwardly facing control valve coacting with said valve seat, and a tapered nozzle projecting beyond the valve and centrally into said port in spaced relation to the walls thereof during a substantial part of the movement of the valve to and from the seat but being entirely withdrawn therefrom when the valve is in fully opened position, said eduction tube having an air inlet opening exteriorly of the barrel, an outwardly seating spring biased check valve for said air inlet, the vacuum in the eduction tube resulting from the flow of liquid around the nozzle when the valve is partially opened inducing air flow through the eduction tube, the pressure of the liquid when the valve is fully opened acting to seat the air inlet check valve, spring means acting to seat said control valve, and means for manually opening the control valve.

2. In a structure of the class described, the combination of a barrel provided with a liquid supply connection and with a chambered head provided with an elongated discharge port and with a rearwardly facing valve seat at the inner end of the port, an eduction tube reciprocatingly supported in said barrel in axial alignment with said port and having a control valve coacting with said valve seat, and a tapered nozzle projecting beyond the valve and centrally into said port in spaced relation to the walls thereof during a substantial part of the movement of the valve to and from the seat but being entirely withdrawn therefrom when the valve is in fully opened position, said eduction tube having an air inlet opening exteriorly of the barrel, an outwardly seating spring biased check valve for said air inlet, the vacuum in the eduction tube resulting from the flow of liquid around the nozzle when the valve is partially opened inducing air flow through the eduction tube, the pressure of the liquid when the valve is fully opened acting to seat the air inlet check valve, spring means acting to seat said control valve, and means for manually opening the control valve.

3. In a structure of the class described, the combination of a barrel provided with a liquid supply connection and with a chambered head provided with an elongated discharge port and with a rearwardly facing valve seat at the inner end of the port, the end wall of the chamber being conical and merging into the valve seat, an eduction tube reciprocatingly supported in said barrel in axial alignment with said port and having a conical forwardly facing control valve coacting with said valve seat, and a tapered nozzle projecting beyond the valve and centrally into said port in spaced relation to the walls thereof during a substantial part of the movement of the valve to and from the seat but being entirely withdrawn therefrom when the valve is in fully opened position, said eduction tube having an air inlet disposed rearwardly of the valve thereof and opening exteriorly of the barrel to the outside atmosphere, an outwardly seating check valve for said air inlet, a spring normally retaining said check valve in an outwardly seated position, the vacuum in the eduction tube resulting from the flow of liquid around the nozzle when the valve is partially opened acting to open the check valve admitting air to the induction

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tube to be discharged into and mixed with the liquid as it is discharged through the discharge port, the pressure of the liquid when the valve is fully opened acting to seat the air inlet check valve and prevent flow of liquid out of said air inlet.

4. In a structure of the class described, the combination of a barrel provided with a liquid supply connection and with a chambered head provided with an elongated discharge port and with a rearwardly facing valve seat at the inner end of the port, an eduction tube reciprocatingly supported in said barrel in axial alignment with said port and having a control valve coacting with said valve seat, and a tapered nozzle projecting beyond the valve and centrally into said port in spaced relation to the walls thereof during a substantial part of the movement of the valve to and from the seat but being entirely withdrawn therefrom when the valve is in fully opened position, said eduction tube having an air inlet disposed rearwardly of the valve thereof and opening exteriorly of the barrel to the outside atmosphere, a check valve for said air inlet, said check valve being outwardly seating and constituting means to prevent flow of liquid under pressure from the eduction tube and to permit flow of atmospheric air into the tube, the vacuum in the eduction tube resulting from the flow of liquid around the nozzle when the valve is partially opened inducing opening of said check valve and air flow through the eduction tube to provide a mist-like spray, the pressure of the liquid when the valve is fully opened acting to seat the air inlet check valve and prevent flow of liquid out of said air inlet.

5. In a structure of the class described, the combination of a barrel provided with a liquid supply connection and with a chambered head provided with a discharge port and with a rearwardly facing valve seat, the end wall of the chamber being conical and merging into the valve seat, an eduction tube reciprocatingly supported in said barrel in axial alignment with said port and having a control valve coacting with said valve seat, and a tapered nozzle projecting beyond the valve and centrally into said port during a substantial part of the movement of the valve to and from the seat but being entirely withdrawn therefrom when the valve is in fully opened position, said eduction tube having an air inlet disposed rearwardly of the valve thereof and opening exteriorly of the barrel to the outside atmosphere, a check valve for said air inlet, said check valve being outwardly seating and constituting means to prevent flow of liquid under pressure from the eduction tube and to permit flow of atmospheric air into the tube, the vacuum in the eduction tube resulting from the flow of liquid around the nozzle when the valve is partially opened inducing opening of said check valve and air flow through the eduction tube to provide a mist-like spray, the pressure of the liquid when the valve is fully opened acting to seat the air inlet check valve and prevent flow of liquid out of said air inlet.

6. In a structure of the class described, the combination of a barrel provided with a liquid supply connection and with a chambered head provided with a discharge port and valve seat at the inner end of the port, an eduction tube reciprocatingly supported in said barrel in axial alignment with said port and having a conical forwardly facing control valve coacting with said valve seat, and a tapered nozzle projecting be-

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yond the valve and centrally into said port during a substantial part of the movement of the valve to and from the seat but being entirely withdrawn therefrom when the valve is in fully opened position, said eduction tube having an air inlet disposed rearwardly of the valve thereof and opening exteriorly of the barrel to the outside atmosphere, a check valve for said air inlet, said check valve being outwardly seating and constituting means to prevent flow of liquid under pressure from the eduction tube and to permit flow of atmospheric air into the tube, the vacuum in the eduction tube resulting from the flow of liquid around the nozzle when the valve is partially opened inducing opening of said check valve and air flow through the eduction tube to provide a mist-like spray the pressure of the liquid when the valve is fully opened acting to seat the air inlet check valve and prevent flow of liquid out of said air inlet.

7. In a structure of the class described, the combination of a barrel provided with a liquid supply connection for delivery of liquid to the barrel under pressure, and with a chambered head provided with an elongated discharge port and with a rearwardly facing valve seat at the inner end of the port, the end wall of the chamber being conical and merging into the valve seat, an eduction tube reciprocatingly supported in said barrel in axial alinement with said port and having a conical forwardly facing control valve coacting with said valve seat, said educ-

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tion tube being annularly spaced from said barrel to provide an annular passageway for the liquid through the barrel throughout substantially the entire length of the barrel, and a nozzle projecting beyond the valve centrally into such port in spaced relation from the walls thereof during a substantial part of the movement of the valve to and from the seat, said eduction tube having an inlet disposed rearwardly of the valve thereof and opening exteriorly of the barrel to the outside atmosphere, the vacuum in the education tube resulting from the flow of the liquid under pressure around the nozzle when the valve is partially open inducing air flow from the outside atmosphere through said eduction tube to provide a mist-like spray, and means connected to said eduction tube for adjusting the same and valve.

BENJAMIN D. BARTON.

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