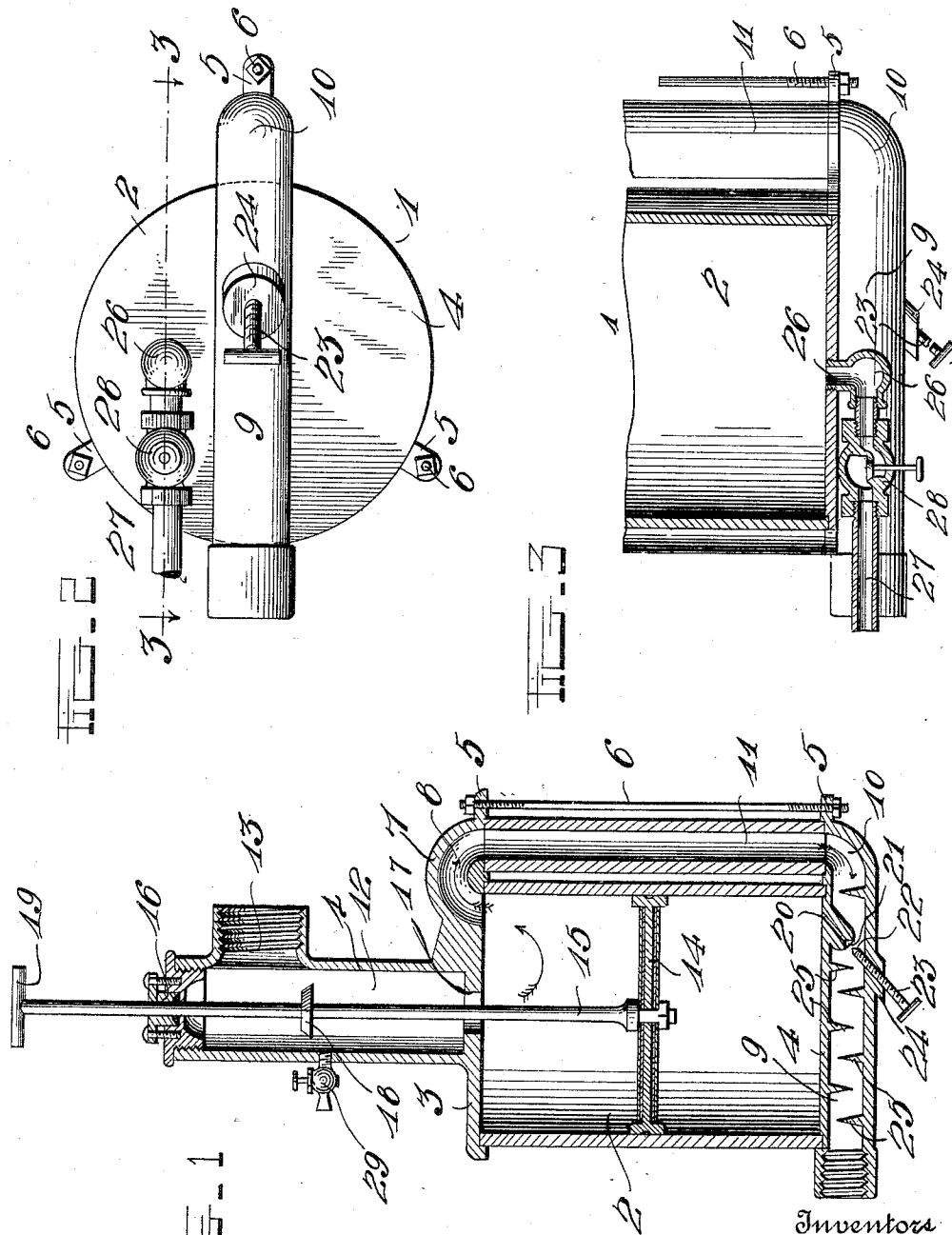


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 AUTOMATIC FLUID INJECTOR FOR SPRAYING DEVICES.
 APPLICATION FILED JAN. 12, 1911.

1,006,016.

Patented Oct. 17, 1911.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC FLUID-INJECTOR FOR SPRAYING DEVICES.

1,006,016.

Specification of Letters Patent. Patented Oct. 17, 1911.

Application filed January 12, 1911. Serial No. 602,258.

To all whom it may concern:

Be it known that we, WALKER H. SPAYD and FRED M. SPAYD, citizens of the United States, residing at Van Wert, in the county of Van Wert and State of Ohio, have invented certain new and useful Improvements in Automatic Fluid-Injectors for Spraying Devices; and we do 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 relates to improvements in automatic fluid injectors for spraying devices.

One object of the invention is to provide an injector of this character adapted to be operated and controlled by the pressure of water passing therethrough to inject any kind of fluid into the water, the quantity of the fluid injected being automatically controlled by the amount of pressure applied to the injecting mechanism.

Another object is to provide an injector of this character having an improved means for thoroughly mixing the fluid with the water passing through the injector and means whereby the flow of the water will be automatically stopped after all of the fluid has been ejected from the device.

With these and other objects in view the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings: Figure 1 is a central vertical sectional view of our improved injecting device; Fig. 2 is a bottom plan view thereof; Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 2.

Referring more particularly to the drawings 1 denotes our improved injector which comprises a cylindrical body portion 2 adapted to contain the liquid to be injected into the water. The upper end of the body is closed by a top plate 3 and the lower end by a bottom plate 4. The top and bottom plates 3 and 4 are provided with laterally projecting apertured ears 5 through which are arranged tie bolts 6 whereby said top and bottom plates are clamped into fluid tight engagement with the upper and lower ends of the body as shown.

On one side of the top plate 3 is formed

an upwardly and laterally projecting extension 7 in which is formed a curved or arched discharge passage 8. Arranged on the bottom plate 4 of the body 2 is a centrally disposed water discharging tube 9 one end of which projects beyond one side of the body 2 and is threaded for connection with a hose. On the opposite end of the discharge tube 9 is formed an upwardly opening elbow 10 with which is engaged the lower end of a water conducting tube 11 the upper end of which is engaged with the outer end of the passage 8 in the extension 7. The ends of the tube 11 are held in fluid tight engagement with the elbow 10 and discharge end of the passage 8 by the clamping bolts 6 hereinbefore described.

On the top plate 3 is arranged a centrally disposed upwardly projecting tubular neck 12 on one side of which is formed an interiorly threaded nipple 13 adapted to be connected with a faucet, hydrant or other water supply.

Slidably mounted in the cylindrical body portion 2 and having a fluid tight engagement with the inner walls thereof is a plunger or piston 14, said piston having a stem or rod 15 which projects upwardly through the neck 12 and through a stuffing box 16 arranged in the upper end of the neck whereby a fluid tight closure is formed at the upper end of the neck. At the lower end of the neck 12 where the same joins the top plate 3 is formed a valve seat 17 with which is adapted to be engaged a valve 18 carried by the plunger rod 15. The valve is engaged with the seat 17 when the plunger is in a full retracted position and the contents of the injector forced therefrom. On the outer end of the plunger rod is formed a handle 19 whereby the plunger is manually operated as will be hereinafter more fully described.

Arranged in the bottom plate 4 of the injector and opening into the discharge tube 9 is a fluid injecting port 20 around which in the tube 9 is formed a valve seat 21 with which is adapted to be engaged a needle valve 22 whereby said port may be closed or the size of the same regulated. The valve 22 is provided with a threaded stem 23 which is screwed into a boss 24 arranged in the lower side of the tube 9 as shown.

In the tube 9 between the injecting port 20 and the discharge end of the tube are 110

arranged a series of tapered lugs 25, said lugs being disposed in staggered relation on opposite sides of the tube whereby a circuitous passage is formed through the tube 5 which will cause the fluid injected through the port 20 to thoroughly mix with the water passing through the tube.

In the bottom plate 4 adjacent to one side of the tube 9 is formed an inlet port 26 10 with which is connected a fluid inlet tube 27 having arranged therein a cut off valve 28. In the neck 12 is arranged a relief valve 29 designed to permit the water in the neck 12 to flow out and relieve the pressure in 15 said neck when the piston is drawn rearwardly to draw fluid into the member 2.

In the operation of the device the fluid to be injected is drawn into the body portion 2 through the inlet pipe 27 by means of the 20 piston 14 which is drawn upwardly in the body portion by the piston rod 15 and handle 19. After the fluid is thus drawn into the injector the valve 28 in the inlet pipe 27 is closed and the water turned on 25 and permitted to flow through the inlet or nipple 13 and through the neck 12 onto the upper side of the piston. The water under pressure thus engaging the piston will force the latter downwardly in the body 2 and 30 will pass out through the discharge passage 8 in the upper end of the injector and through the conducting tube 11 and discharge tube 9. The plunger when thus forced forwardly by the pressure of the 35 water will force the fluid below the piston out through the injecting port 20 and into the tube 9 where the same will mix with the water flowing through said tube thus impregnating the water with the fluid. The 40 amount of fluid thus forced into the tube 9 will be controlled by the force or pressure exerted on the piston by the flow of water through the injector thereby automatically regulating the quantity of fluid supplied to 45 the water according to the pressure of the same in passing through the injector so that all of the water will be equally impregnated. When the piston has been forced by the 50 water to the extreme lower end of the fluid chamber, and all of the fluid thus driven therefrom the valve 18 will come into engagement with the valve seat 17 thereby closing the lower end of the neck and preventing any water from passing through 55 the injector until the piston has again been manually drawn back to an operative position.

Our improved injector may be employed in various capacities such as for mixing insecticides or poison solutions with the water 60 for spraying plants or trees or mixing disinfectants or the like with water or other liquid passing through the injector.

From the foregoing description taken in 65 connection with the accompanying draw-

ings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may 70 be resorted to without departing from the principle or sacrificing any of the advantage of the invention as defined in the appended claims.

Having thus described our invention what 75 we claim is:

1. An automatic fluid injector comprising a cylinder, end plates arranged on the opposite ends of said cylinder, means to secure 80 said plates in fluid tight engagement with said ends, a neck formed on one of said end plates, said plate also having formed therein a discharge passage, a discharge tube arranged on the opposite end plate, a water 85 conducting tube connecting said discharge tube with the discharge passage on the opposite end plate, means to connect said neck with a water supply, a piston slidably 90 mounted in said cylinder, a piston rod connected with said piston and projecting through said neck, a stuffing box arranged in the latter around said piston rod, means for supplying the injecting fluid to the cylinder below said piston, and means whereby 95 the fluid is injected from the cylinder into said discharge tube by the pressure of the water on the opposite side of the piston.

2. An automatic fluid injector comprising a cylinder, end plates arranged on the opposite ends thereof, a neck formed on one 100 of said end plates, said plate also having formed therein a discharge passage, a discharge tube arranged on the opposite end plate, a water conducting tube connecting 105 said discharge tube with the discharge passage in the opposite end plate, means to connect said neck with a water supply, a piston slidably mounted in said cylinder, means through which an injecting fluid is drawn 110 into the cylinder by said piston, an injecting valve arranged in one end of the cylinder whereby the latter is connected with 115 said discharge tube, and the injecting fluid thereby forced into said discharge tube by the pressure of the water on the opposite side of the piston, a valve operated by the 120 piston and adapted to close the inner end of said neck when the injecting fluid has been forced from the cylinder thereby cutting off further passage of water through the injector.

3. An automatic fluid injector comprising a cylinder, end plates arranged on the opposite ends thereof, a water discharge passage formed in one of said end plates, a 125 neck formed on said plate, said neck having in its lower end a valve seat, a threaded nipple arranged on one side of said neck, a stuffing box arranged in the upper end of the 130 neck, a piston slidably mounted in said cyl-

inder, a piston rod connected with said piston and projecting up through the neck and out through the stuffing box therein, a valve arranged on said piston rod and adapted to engage the seat in said neck, a handle whereby said piston may be manually operated, a discharge tube connected to the discharge passage in the upper end plate of the cylinder whereby the water entering the upper portion of the latter is discharged, an injecting valve to connect the lower end of the cylinder with said discharge tube whereby the fluid in the cylinder below the piston is forced into said discharge tube by the pressure of the water on the opposite side of the piston.

4. A fluid injector of the character described comprising a cylinder, end plates arranged on the opposite ends of said cylinder, a neck formed on one of said end plates, said plate also having formed therein a discharge passage, a discharge tube arranged on the opposite end plate, a water conducting tube connecting said discharge tube with the passage on the opposite end

plate, means to connect said neck with a water supply, a piston slidably mounted in said cylinder, means whereby said piston may be manually operated, a valved fluid inlet pipe connected to the lower end of the cylinder whereby the injecting fluid is drawn into the latter by the movement of said piston in one direction, an injecting valve to connect the lower portion of said cylinder with the discharge tube whereby the injecting fluid is forced into the tube when the piston is forced in the opposite direction by the pressure of the water in the opposite end of the cylinder, and a series of baffle plates arranged in said discharge tube whereby the fluid is thoroughly mixed with the water passing through the tube.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WALKER H. SPAYD.
FRED M. SPAYD.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."