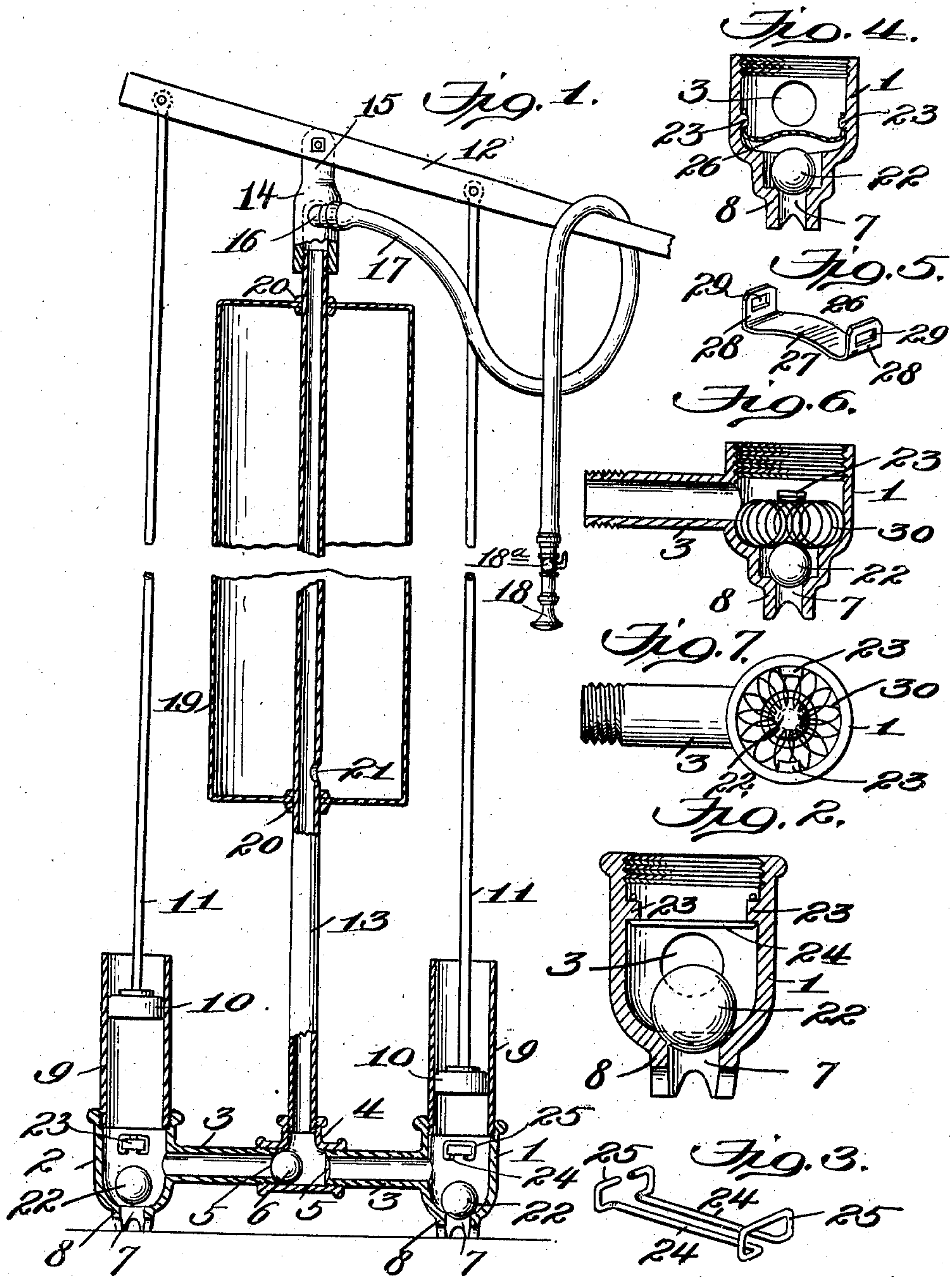


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 DUPLEX SPRAY PUMP.
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963,626.

Patented July 5, 1910.



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UNITED STATES PATENT OFFICE.

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DUPLEX SPRAY-PUMP.

963,626.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MILTON T. McCARTY, a citizen of the United States, residing at Frankfort, in the county of Clinton and State of Indiana, have invented new and useful Improvements in Duplex Spray-Pumps, of which the following is a specification.

This invention relates to a duplex spray pump, and the primary object of the same is to provide a device of this character which is comparatively simple in its construction, efficient in operation, durable and readily actuated, the parts of the pump being so assembled and having such arrangement that they will not get out of repair.

The improved pump will spray, sprinkle, or throw a solid stream and is therefore advantageous and practical for spraying fruit-trees, bushes, flower-beds, animals, or for washing windows, vehicles, or extinguishing fires. The pump is light in weight and may be readily transported from one place to another, and in its operation a few strokes will result in a storage of enough water and a compression of sufficient air to permit it to be moved from the water supply and carried to different places to discharge a spray where desired, the pump under these conditions being effective as a spraying means for a considerable length of time.

The invention consists in the construction and arrangement of the several parts which will be more fully hereinafter specified.

In the drawing: Figure 1 is a sectional elevation of a spray pump embodying the features of the invention and broken away in parts. Fig. 2 is a transverse section through one of the bowls particularly illustrating a guard means for a ball valve operating in the bowl. Fig. 3 is a detail perspective view of the guard means shown applied in Figs. 1 and 2. Fig. 4 is a view similar to Fig. 2 showing a modification in the form of the guard means. Fig. 5 is a detail perspective view of the guard shown by Fig. 4. Fig. 6 is a view similar to Figs. 2 and 4, showing a further modification in the form of the guard means. Fig. 7 is a top plan view of the bowl and guard means as shown by Fig. 6.

The numerals 1 and 2 designate bowls, each having an inwardly projecting outlet pipe 3 of suitable length, the two outlet pipes being connected to a T-coupling 4.

The ends of the outlet pipes 3 within the T-coupling are formed with concave seats 5, one in each, to coöperate with a ball valve 6 held within the coupling and movable horizontally to engage either seat 5. The lower extremities of the bowls 1 and 2 are formed with inlet openings 7, one in each, surrounded by depending tubular supports 8 adapted to rest on the bottom of a well or other water supply means. In the upper extremity of each bowl is fitted a cylinder or barrel 9 and therein is a piston 10, the two pistons 10 of the cylinders 9 having piston rods 11 extending upwardly and movably attached to a hand-lever 12. Rising from the center of the T-coupling 4 is a discharge pipe 13 having on its upper end a discharge head 14 provided with a fulcrum projection 15 to which the lever 12 is movably attached, the upper extremities of the piston rods 11 being connected to the lever at points equally distant from the attachment of the said lever to the fulcrum projection so as to give a uniform stroke to the said piston rods and the pistons connected thereto and working in the cylinders 9. The head 14 has a spout 16 projecting outwardly therefrom to which a hose 17 is attached, the said hose being provided with a suitable spray nozzle 18 and being of any desired length, the nozzle 18 having a suitable valve 18^a.

Surrounding the upper portion of the discharge pipe 13 is an air storage chamber or tank 19 which is completely closed and is held in place by suitable collars 20 secured to the upper and lower ends thereof and to the discharge pipe. This air storage chamber has communication with the discharge pipe through the medium of an opening 21 in the latter adjacent to the lower end of the chamber, and when the valve 18^a is closed and the pump is operated air is compressed in the said chamber and water or other liquid with which the pump is used is at the same time drawn into the chamber so that the pump may be removed from its source of liquid supply and carried around and practically serve as spraying means for a considerable length of time or until the compressed air within the chamber has become expended. The liquid forced through the discharge pipe by the duplex pumps comprising the cylinders 9 and pistons 10 enters the bottom of the air storage chamber or tank 19, and as this liquid rises

it compresses a body of air in the upper portion of the chamber and the expansion of this confined air will serve to produce a continuous stream of liquid through the spray hose 17 until the chamber is practically emptied of liquid.

In the bottom of each bowl and controlling the bottom inlet 7 is a ball valve 22, the ball valve of each bowl being free to be moved by the suction exerted by the upstroke of the respective piston 10. Each bowl above the point of communication therewith of the pipe 3 has a pair of diametrically opposed lugs 23 on the inner wall thereof and removably applied thereto, as shown by Figs. 1, 2 and 3, is a wire guard which limits the upward movement of the ball and insures settling of the ball to its seat when the suction thereon is relieved. This guard consists of two parallel members 24 having end loops 25 upturned and disposed at right angles thereto, the loops 25 projecting outwardly equally with relation to the members 24 and removably applicable over the lugs 23, it being preferred that the wire of which this guard is formed be resilient to render it practicable in the performance of its function and advantageous in removing and applying the same.

As shown by Figs. 4 and 5, the wire guard illustrated by Figs. 1, 2 and 3 is replaced by a sheet metal guard 26 having a longitudinally bowed body 27 and upstruck angular ends 28 with openings 29 therein to removably fit over the lugs 23. The guard shown by Figs. 6 and 7 consists of a coiled spring 30 which is given a circular contour and the terminals connected and the spring as a whole is then arranged under or beneath the lugs 23 and held in place by frictional engagement with the wall of the bowl.

The operation of the pumps will be readily understood. On the upstroke of the piston 10 in the cylinder 9 of one bowl, the valve 6 is moved against the seat 5 of the pipe 3 of said bowl and thereby shuts off communication with the discharge pipe 13 and at the same time the ball 22 is elevated and the liquid drawn into the bowl and cylinder 9. At the same time the piston 10 of the remaining cylinder 9 and bowl will be moving downwardly and forcing the contents of the cylinder and bowl through its pipe 3 and up into the discharge pipe 13, as the ball valve 6 will at that time be clear from the pipe 3. This operation continues in alternation and the liquid is regularly forced upwardly through the discharge pipe 13 and if a continuous operation of the pump ensues will pass out through the spray hose 17 and nozzle 18, a portion of the liquid entering the chamber 19 and by accumulation in the latter chamber through continuous actuation of the pump compressing the air, as

hereinbefore explained. When the chamber 19 has become charged it is obvious that it will be unnecessary to further actuate the pump until the compressed air becomes expended or the liquid stored in the chamber is fully drawn out through the discharge pipe.

All the parts of the pump are separably assembled and may be readily dissociated or set up in operative relation the cylinders 9 being screwed into the upper extremities of the bowls 1 and 2 and the pipes 3 and 13 likewise connected to the T-coupling. The head 14 is also removably attached to the upper end of the discharge pipe 13 and the pistons 10 may be readily withdrawn from and inserted into the cylinders 9 as the latter have upper fully open ends. It will also be understood that the pistons 10 will be provided with suitable packings. In the event that any portion of the pump becomes unfit for further use and needs repair or is broken, it can be readily disconnected from the remaining part of the pump organization and repaired or a similar new part substituted therefor.

The pump will be found exceptionally advantageous for the purpose for which it has been devised, and it is obvious that the proportions and dimensions thereof may be modified at will.

What is claimed as new is:

1. In a duplex spray device of the class specified, the combination of pump devices having pistons and automatically operating valves and outlet pipes, an intermediate coupling provided with a valve and having the outlet pipes connected thereto, the valve in the coupling alternately closing the outlet pipes, an upwardly extending discharge pipe connected to the coupling between the points of attachment to the latter of the outlet pipes, the discharge pipe having a spraying means attached to its upper extremity, an air compression and water storage chamber through which the discharge pipe vertically extends, the discharge pipe having an opening therein within the confines of the chamber and near the bottom of the latter and the spraying means being attached to the discharge pipe above the upper extremity of the chamber, and means for operating the pistons to force liquid through the discharge pipe and store said liquid and compress air in the chamber whereby the device may be operated in association with the liquid supply or be withdrawn from said supply and operated as a spraying means through the medium of the air compressed and liquid stored in said chamber, the spraying means being closed to store liquid in the chamber under air compression for subsequent spraying operations.

2. In a spraying device of the class specified, the combination of pump devices hav-

ing automatically operating valves and outlets, a T-coupling to which the outlets are connected, the T-coupling having a freely movable valve therein to alternately engage
5 and close the ends of the outlets, a discharge pipe connected to the lateral branch of the T-coupling, a storage chamber located above the T-coupling and completely closed at all points, the discharge pipe supporting the
10 chamber and extending vertically through the latter, said discharge pipe having an opening therein within the chamber near the bottom of the latter, a spraying means attached to the discharge pipe above the
15 chamber, and means for operating the pumps.

3. In a spraying device of the class specified, the combination of pump devices each having a bowl with an inwardly extending
20 outlet pipe and a cylinder having a piston therein, the bowl of each pump device also having a bottom opening with a ball valve cooperating therewith, a guard removably mounted in each bowl above the ball valve, a

T-coupling to which the two outlet pipes of the bowl are connected, a ball valve freely movable
25 in the T-coupling and operating to alternately open and close the outlet pipes with relation to the coupling, an elongated discharge pipe connected to the lateral branch of the coupling, a storage chamber surrounding and secured to the intermediate portion of the
30 discharge pipe, the discharge pipe having communication solely with the storage chamber through the medium of an opening
35 in the pipe within and near the bottom of the chamber, a spraying device attached to the terminal of the discharge pipe above the chamber and provided with means for closing the same, and means for operating the
40 pistons.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MILTON T. McCARTY.

Witnesses:

JAMES V. KENT,
GRANT HELMS.