H. H. GAGE.

SPRAY AND STREAM PUMP.

APPLICATION FILED DEC. 11, 1913.

1,129,286. Patented Feb. 23, 1915.

Fig. 2.

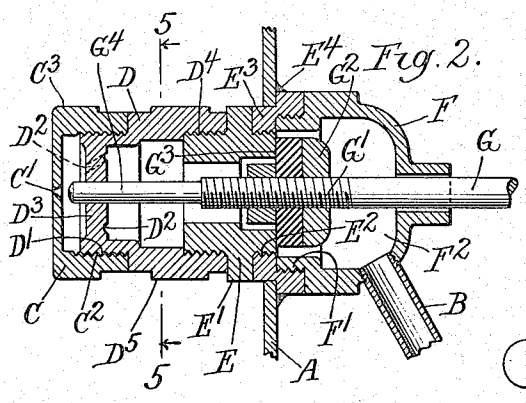


Fig. 5.

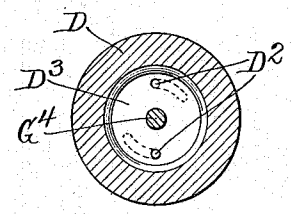


Fig. 3.

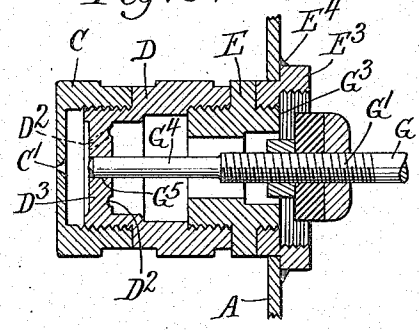


Fig. 1.

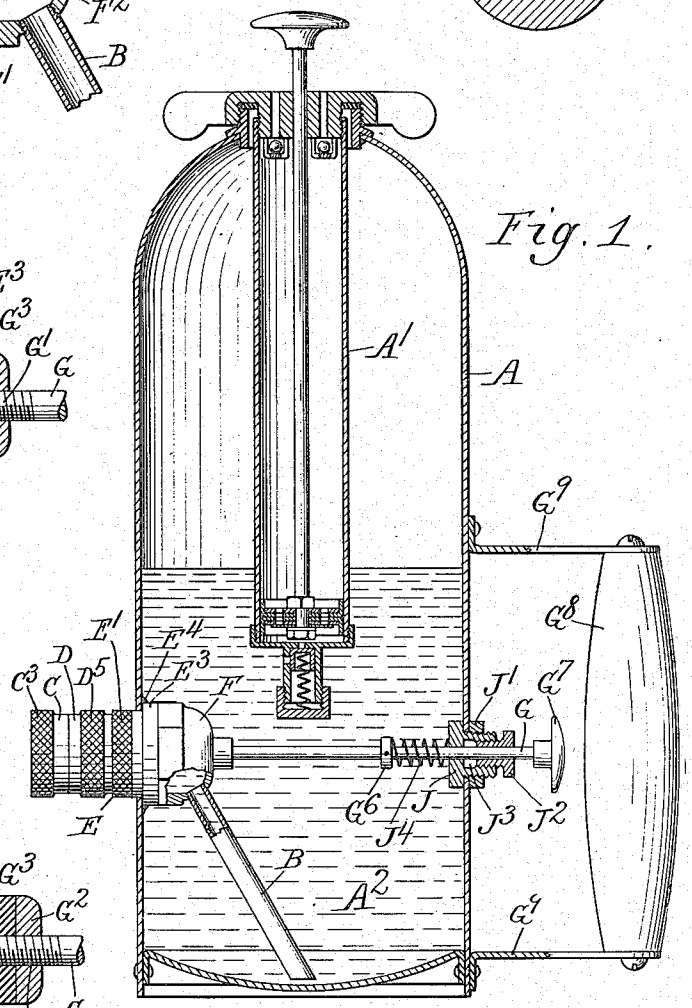
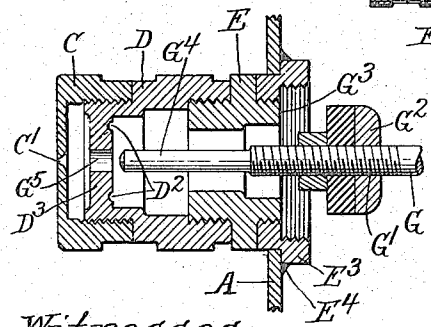


Fig. 4.



Witnesses.
Edward T. Wyatt.
Minnie M. Sundfor

Inventor.
Harry H. Gage.
by Parker & Carter
Attorneys.

UNITED STATES PATENT OFFICE.

HARRY H. GAGE, OF CHICAGO, ILLINOIS.

SPRAY AND STREAM PUMP.

1,129,286. Specification of Letters Patent. Patented Feb. 23, 1915.

Application filed December 11, 1913. Serial No. 805,915.

To all whom it may concern:

Be it known that I, HARRY H. GAGE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Spray and Stream Pumps, of which the following is a specification.

My invention relates to means for ejecting fluids by means of a spray and stream in succession.

It is illustrated in the accompanying drawing, wherein—

Figure 1 is a cross section through the spray and stream pump of my invention; Fig. 2, an enlarged detail cross section of the nozzle in closed position; Fig. 3, an enlarged detail cross section of the nozzle in position to discharge a spray; Fig. 4, an enlarged detail cross section of the nozzle in position to discharge a stream; and Fig. 5, a cross section along line 5—5 of Fig. 2.

Like parts are indicated by the same letter in all the figures.

A is a casing containing an air pump A^1 in its upper portion and a liquid reservoir A^2 in its lower portion. The air pump I do not here describe in detail because it may be of any desired form. It is removable to the end that a charge of liquid may be inserted in the casing, and it is adapted when in place and properly operated to supply pressure within the casing so as to cause the liquid to feed therefrom. Any means by which such pressure can be supplied to the casing is a proper substitute for the air pump.

B is a liquid tube one end of which is below the surface of the liquid in the casing and the other makes a connection with the nozzle. The nozzle consists of the following parts: a cap C centrally perforated at C^1 and screw-threaded at C^2 and provided with a roughened exterior C^3. This cap is adapted to screw onto the thimble D which is screw-threaded at D^1 to engage the screw thread C^2 and is provided with the inclined perforations D^2 D^2 in its end piece D^3. D^3 is also perforated for the valve stem. The thimble D is internally screw-threaded at D^4 to engage the screw-threaded end of a short tube E. The thimble is exteriorly roughened at D^5. The tube E is screw-threaded to engage the screw thread D^4, is roughened at E^1 and is screw-threaded at its other end E^2 to engage a screw thread on the connector E^3 which is inserted in a hole in the casing A and secured in any desired position as, for example, by solder at E^4.

In one form of my device, as illustrated in Figs. 1 and 2, I employ the inner shell F screw-threaded externally at F^1 to engage the inner screw thread of the part E^3 and provided with a chamber F^2 whence leads the pipe B. This structure, however, can be dispensed with as illustrated in Figs. 3 and 4.

G is a valve rod which is screw-threaded at G^1 to carry the adjustable valve G^2 and adapted to engage the end G^3 of the part E which thus serves as a valve seat. The valve stem is reduced in size at G^4 and is adapted to fit somewhat snugly in the aperture G^5 in the head of the thimble. The valve stem G is provided with a collar G^6, and it projects through the casing and has at its outer end a pull G^7. On the side of the casing is secured the handle G^8 by means of the standards G^9 G^9.

J is a stuffing box passed through an aperture in the side of the casing, held in position by the nut J^1 and associated with the screw-threaded thumb nut J^2 which is adapted to apply pressure to the stuffing material J^3 about the valve stem.

J^4 is a spiral spring which encircles the stem and lies between the stuffing box and the collar.

The use and operation of my invention are as follows: Assuming that the parts are arranged, as for example, in Fig. 1 and that the pump or other suitable mechanism has been operated to supply a proper pressure on the interior of the casing at the bottom of which there is a quantity of the liquid to be discharged, the apparatus is taken in the hand and brought to the position where it is to be used. Since the valve G^2 is seated by the action of the spring J^4 against its seat as well as by the action of the pressure within the casing, no liquid will flow past such valve toward the discharge. If, now, the pull be operated to retract the rod toward the right, the valve will be lifted from its seat and liquid will flow past the seat G^3 into the chamber beyond, whence, because of the pressure back of the liquid, it will be discharged through the inclined passages D^2 and issue in a spray through the opening C^1. If, now, the pull be further operated, the end of the stem will be withdrawn from the hole G^5 and the

stream of material will pass through that hole and through the opening C^1 opposite, and the liquid will be discharged in a stream. Thus, by a succession of movements of the valve stem and its associated parts, the nozzle may first be closed, then opened so as to deliver a spray, then further opened so as to deliver a stream, and then again closed. The parts can be conveniently assembled, and to remove them it is only necessary to unscrew the inner part F when that is employed and remove the pull and unscrew the upper portion of the nozzle, whereupon the stem and all the other parts can be withdrawn from the casing. The operation is, of course, still simpler when no such part as F is employed.

The parts are shown with the nozzle closed in Figs. 1 and 2, with the nozzle open so as to deliver a spray in Fig. 3 and with the nozzle open so as to deliver a stream in Fig. 4. The object of the tube B is simply to effect a more complete delivery of all the liquid without tilting the case, but where the tube B is dispensed with and the part F not used the same result is obtained for practical purposes by tilting the casing to a point where but little liquid remains in it. I have in effect two discharge ways, one consisting of the inlet at the valve when it is open thence through the inclined openings D^2 and out through discharge opening C^1, and the other consisting of the opening at the valve, the opening G^5 in the end of the thimble and the opening C^1, and they act and are separate but are controlled by one and the same valve or valve stem.

I claim:

1. A discharge nozzle for a spray and stream pump comprising a casing with an outlet, an inner chamber with two outlets therefrom, one adapted to cause the nozzle to deliver a spray and the other a stream, and a liquid inlet to said chamber and a valve device adapted to control the inlet to the chamber and the stream outlet from the chamber.

2. A discharge nozzle for a spray and stream pump comprising a casing with an outlet, an inner chamber with two outlets therefrom, one adapted to cause the nozzle to deliver a spray and the other a stream, and a liquid inlet to said chamber and a valve device adapted to control the inlet to the chamber and the stream outlet from the chamber, said valve device consisting of a stem and two valves which successively operate to open their respective passages.

3. A discharge nozzle for a spray and stream pump comprising a casing containing two chambers separated by a diaphragm, an inlet to one chamber, an outlet from the other, and a spray forming passage through the diaphragm and a stream forming passage through the diaphragm and a valve device to control the inlet and the stream forming passage.

4. A discharge nozzle for a spray and stream pump comprising a casing containing two chambers separated by a diaphragm, an inlet to one chamber, an outlet from the other, and a spray forming passage through the diaphragm and a stream forming passage through the diaphragm and a valve device to control the inlet and the stream forming passage, said valve device consisting of a valve stem with two valve portions thereon.

5. A discharge nozzle for a spray and stream pump comprising a casing containing two chambers separated by a diaphragm, an inlet to one chamber, an outlet from the other, and a spray forming passage through the diaphragm and a stream forming passage through the diaphragm and a valve device to control the inlet and the stream forming passage, said valve device consisting of a valve stem with two valve portions thereon which successively act to open or close the inlet and the stream passage.

6. A spray nozzle comprising an apertured diaphragm, one of said apertures having it axis perpendicular to the diaphragm and arranged adjacent to the center thereof, the other having its axis inclined to the diaphragm and arranged adjacent the periphery thereof, a centrally apertured cap covering the diaphragm, a housing carrying said diaphragm, a valve stem slidable in said housing and free to reciprocate in and open and close the central aperture, a liquid supply discharging back of said diaphragm and a shut-off valve mounted on said valve stem, a seat for said shut-off valve, the distance between the valve seat and the apertured diaphragm being less than the distance between the valve and the end of the valve stem.

In testimony whereof, I affix my signature in the presence of two witnesses this 21st day of November, 1913.

HARRY H. GAGE.

Witnesses:
MINNIE M. LINDENAU,
MINNIE SUNDFAR.