April 10, 1928. 1,665,224

C. G. SHIELDS

SPRAYING APPARATUS

Filed April 17. 1926

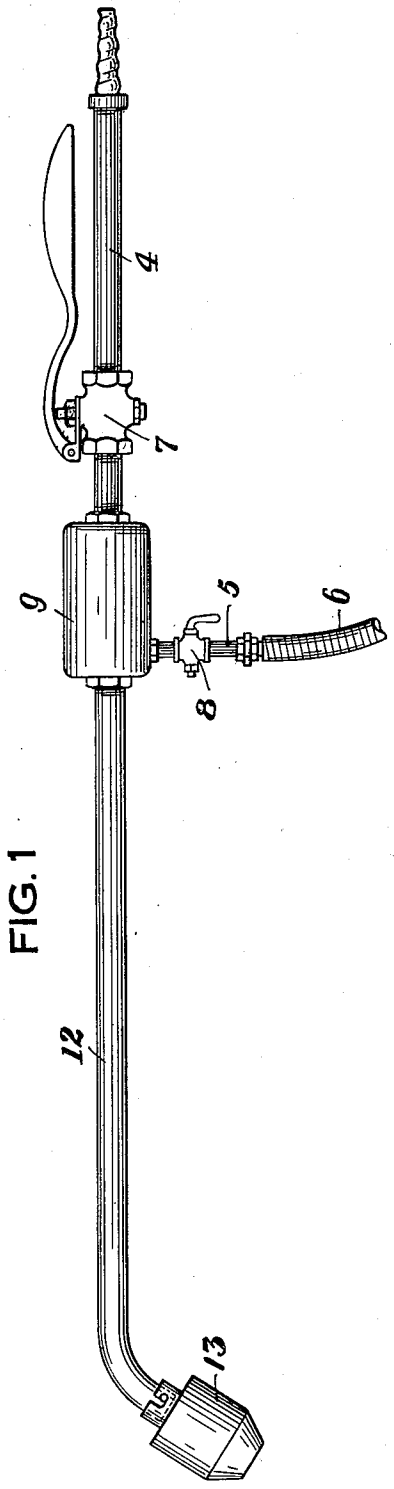


FIG. 1

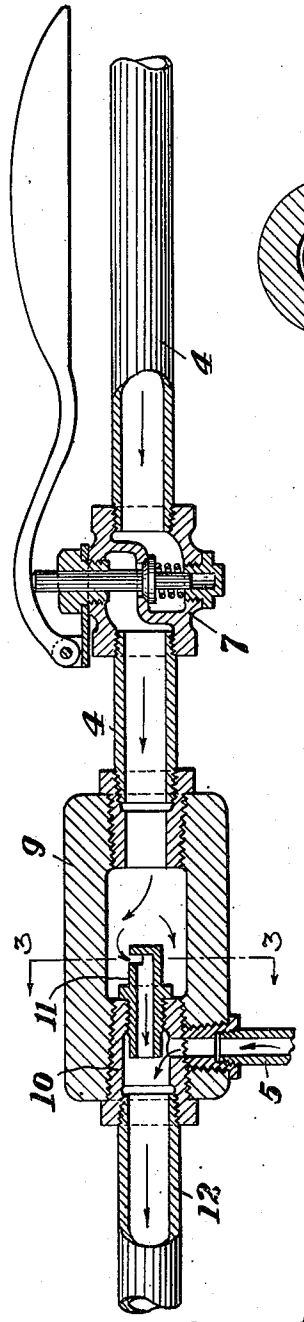


FIG. 2

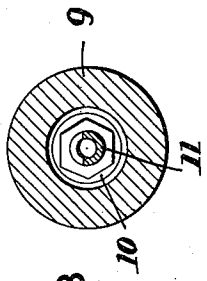


FIG. 3

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UNITED STATES PATENT OFFICE.

CLARENCE G. SHIELDS, OF FLOREFFE, PENNSYLVANIA.

SPRAYING APPARATUS.

Application filed April 17, 1926. Serial No. 102,676.

My invention relates to spraying or atomizing apparatus for use in spraying liquids, such as, gasoline, paint, water, and oil, by means of compressed air.

One object of my invention is to provide a device suitable for atomizing liquid fuels, such as gasoline, and supplying the same through a burner nozzle in a manner that is more efficient and safer than in the case of devices heretofore employed.

Another object of my invention is to provide an apparatus wherein a more effective mixture of liquid with air under pressure is secured than in the case of devices of the prior art.

My apparatus, in addition to being suitable for supplying atomized fuel oil through a burner nozzle, can also be employed as a paint sprayer; to direct oil against leaf springs for lubricating the same; coating surfaces with oil to protect them from the weather; to direct a spray of gasoline, water, or other liquid against surfaces requiring cleansing, etc.

One form which my invention may take is shown in the accompanying drawing, wherein Fig. 1 is a side view of apparatus embodying my invention; Fig. 2 is a longitudinal sectional view, on an enlarged scale, of a portion of the apparatus of Fig. 1; and Fig. 3 is a view taken on the line 3—3 of Fig. 2.

The apparatus, when in use, is connected through an air supply pipe 4 with a source of air pressure (not shown), and to a source of liquid supply through an inlet pipe 5 which communicates, preferably through a metal hose 6 with a source of liquid, such as gasoline, paint, oil, or water. The hose 6 may be of any suitable length, so that no tank need be carried with the spraying apparatus.

The inlets 4 and 6 are controlled by suitable valves, 7 and 8 respectively, and lead into a chambered block 9. A nipple or reducer 10 that serves as an atomizing chamber has screw-threaded engagement with one end of the block 9, and has an opening in its side for the entry of liquid from the pipe 5, as indicated by the arrows.

The air nozzle 11 has screw-threaded engagement with the inner end of the nipple 10, and is provided with a slot in one side so that air may enter from the inlet 4 and pass into the nipple 10. Experiments show that by providing an opening in the side of the air nozzle 11, and causing the compressed air to flow radially into the nozzle and then axially thereof, a better vacuumizing and atomizing effect is produced, with less air pressure, than in the case of a passage straight through the nozzle.

Referring further to the said experiments, tests show that for a given arrangement of apparatus 70 lbs. air pressure is required to spray gasoline, where an air nozzle having a straight axially extending passage is employed, while with an air nozzle, such as the nozzle 11, having an opening in its side, only 35 lb. air pressure is required to spray gasoline. For spraying heavier liquids, such as crude oil, paint, auto enamels and varnish, air pressures up to 90 lb. per square inch proved ineffective where the ordinary straight passage nozzles are employed, but, with the structure shown in the drawing, pressures not in excess of 90 lbs. per square inch were sufficient to spray paint, etc. In spraying the heavier liquids it is also important to have the liquid conduit 5 connected to the spray chamber at a point close to the front end of the air nozzle, because if it is placed too far rearwardly of the air nozzle, ordinary air pressures will be insufficient to draw in a supply of the liquid to be sprayed.

A spray pipe 12, is connected to the outer end of the nipple 10, and a spray nozzle of any suitable form may be connected thereto. In the drawing, a burner nozzle 13 of a usual form is shown in place upon the end of the pipe 12, and a mixture of air and fuel oil may be supplied through the pipe. Such mixture can be ignited at the nozzle and the device serve as a blow torch, it being customary to first heat the nozzle over a flame in order to facilitate the ignition of the atomized fuel. The arrangement just described is particularly useful when used as a blow torch, for the reason that fuel oil may be employed instead of gasoline, thus avoiding danger of explosions and reducing liability to fires.

In utilizing the device to spray oil, paint or water upon surfaces for the purpose of coating or cleansing the same, any suitable form of nozzle is substituted for the burner nozzle 13.

It will be understood that in use, the valve 8 is opened to the desired degree, and that the control lever valve 7 is depressed to admit the entry of air pressure and that fluids

other than those above specifically mentioned may be utilized.

The inlet pipes 5 and 6 may be cleared of one liquid previous to using a different liquid, by the operator holding a finger over the outer end of the pipe 12 and opening the air valve, the pipe 6 being first withdrawn from the reservoir or other source of supply.

I claim as my invention:

Spraying apparatus comprising a chambered block, an air pressure conduit extending into said block at one end, a spray chamber disposed within the block at the other end and having screw-threaded connection with the wall of the latter-named end, so as to be removable therefrom, a spray pipe communicating with the forward end of said chamber, an air nozzle disposed within said block and extending into the other end of said chamber, and a liquid inlet communicating with the said chamber at a point approximately mid-way of its ends, through openings in the side wall of said block and the adjacent wall of the chamber, the air nozzle being supported by and removable with the said spray chamber.

In testimony whereof I the said CLARENCE G. SHIELDS have hereunto set my hand.

CLARENCE G. SHIELDS.