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G. L. YOUNG

SPRAY NOZZLE

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Fig. 1.

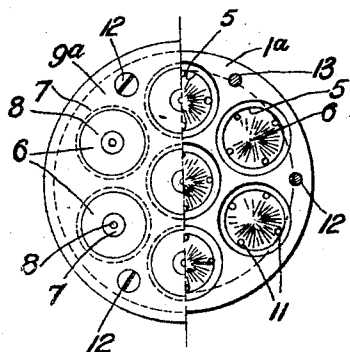


Fig. 2.

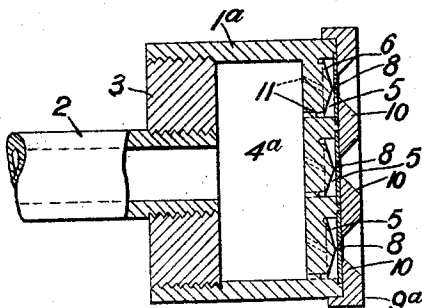


Fig. 3.

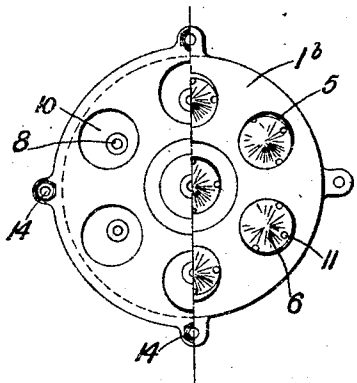
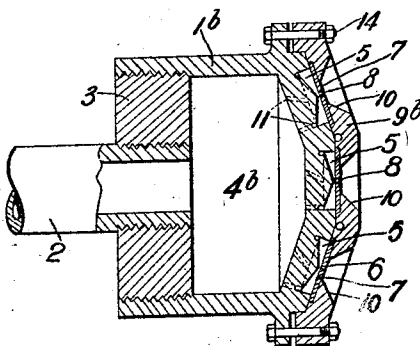


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE LAING YOUNG, OF SOUTH SHIELDS, ENGLAND.

SPRAY NOZZLE.

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To all whom it may concern:

Be it known that I, GEORGE LAING YOUNG, a subject of the King of Great Britain and Ireland, and residing at 22 Roseberry Avenue, South Shields, in the county of Durham, England, have invented certain new and useful Improvements in or Relating to Spray Nozzles, of which the following is a specification.

This invention relates to multiple spray nozzles such as are used for example in liquid fuel burners for furnaces, in carburettors for internal combustion engines, or in sprays for disinfectants or any other purposes, and has for its main object to ensure better atomization and thereby increased combustion in the case of liquid fuel, but also to enhance efficiency by increasing the area over which the atomized liquid is delivered, while incidentally the invention aims at a construction simplifying the manufacture of the nozzle and enabling its adaption to varying qualities of consistencies of the liquid by ready exchange of certain parts.

The accompanying drawings show by way of examples constructions of multiple spray nozzles embodying this invention.

Figures 1 and 2 show in front elevation with part of the cap removed and in axial section respectively, a multiple spray nozzle, having the spray elements arranged parallel to each other, while

Figures 3 and 4 are similar views of a multiple spray nozzle having the spray elements arranged to deliver diverging sprays.

The multiple spray nozzle includes a body 1^a provided with a plurality of spray elements each of which consists of a circular recess 5 constituting an atomizing chamber with preferably a forwardly projecting obtusely conical bottom. The recess is closed at its forward end by a disc 7 in the centre of which the delivery orifice 8 is arranged in juxtaposition to the apex of said conical bottom. The recess 5 and disc 7 thus form a small chamber which has its depth decreasing from the periphery to the center and which is in communication with the chamber 4^a by means of holes 11 drilled tangentially in relation to the walls and an-

gularly in relation to the axis of the atomizing chamber 5.

The liquid passes by way of the passages 11 into the chamber 5, where, striking at an angle the disc 7 adjacent to the walls of chamber 5, it is atomized and by being deflected caused to whirl round the axis of the burner. Owing to the chamber 5 being centrally restricted in depth by its projecting cone-shaped bottom 6 the liquid is guided towards and into the delivery orifice 8 and on emerging still whirling therefrom is thrown at a tangent against the sides of the flared mouth 10 and deflected thereby.

By causing the whirling liquid to issue from the delivery orifice in a whirling motion, a very wide and efficient, hitherto unattainable distribution of the liquid is effected.

The nozzle body 1^a (Figures 1 and 2) is mounted by means of the plug 3 on the supply tube 2. It is of sufficient diameter to accommodate the desired number of spray elements (for example seven as shown) spaced so as to cover the desired area.

In the face end of the nozzle body 1^a are arranged a plurality of recesses 5 each communicating individually by passages 11 with the common supply chamber 4^a and constructed and formed as previously described. A disc 7 in which the delivery orifice 8 is formed is provided for each of the recesses 5, the said discs being locked in position by a common cap 9^a provided with a plurality of flared apertures 10 adapted to register with the several atomizing chambers 5. The cap 9^a may be screwed on to or be secured to the nozzle body by means of screws 12 when in order to ensure correct registering one or more dowel pins 13 may be provided (Figure 1).

While in the example just described the face of the nozzle is arranged at right angles to its axis and the spray elements are parallel thereto, Figures 3 and 4 show a similar arrangement in which, however, the spray elements are so disposed that the sprays are delivered in diverging directions.

For this purpose the face of the nozzle body 1^b is preferably in the form of a trun-

cated cone as shown or it may be of spherical formation if desired.

As a modification the discs 7 may, as shown, be fitted into recesses provided in the cap 9^b (Figure 4).

The cap 9^b is shown as being secured to the nozzle body by means of bolts 14.

The effect of the arrangement described on the flow of the liquid is as follows:—

The liquid is forced through the helical passages 11 into each chamber 5 formed in the face of the nozzle body and strikes under an angle against the disc so that it is, in being atomized, whirled round until, by rising spiral-like on the conical bottom of the chamber towards the delivery orifice 8, it is forced through this orifice in a whirling motion, so that on issuing therefrom it will be thrown at a tangent against the flaring nozzle mouth and by deflection be spread over a wide area. It will be understood that thus the angle at which the nozzle mouth is

flared, determines the spread of the sprays, or in other words the angularity or extent of the cone of sprays.

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

A spray nozzle comprising a nozzle body having a plurality of circular recesses provided with conical bottoms and constituting atomizing chambers, a disc covering the open end of each of said chambers and each disc having an orifice therein situated in juxtaposition to the apex of its respective conical bottom, a cap common to all of said discs securing them in position on the body, said cap being provided with a plurality of flaring mouths cooperating with said discs, and means for supplying fluid to said chambers in a tangential swirl.

In testimony whereof I have signed my name to this specification.

GEORGE LAING YOUNG.