March 19, 1957 B. LATASTE 2,785,926

MEANS FOR ATOMIZING LIQUID

Filed Nov. 10, 1954

Fig. 1

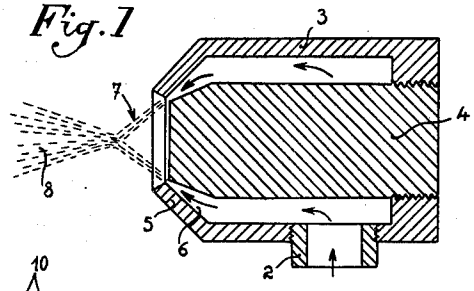


Fig. 2

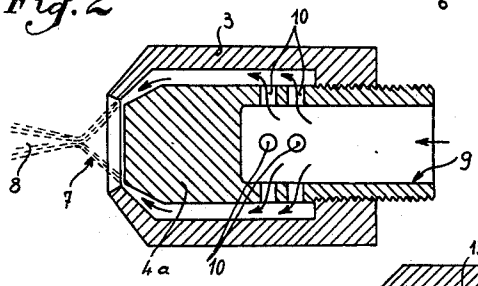


Fig. 3

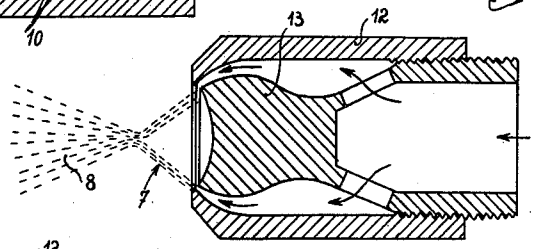


Fig. 4

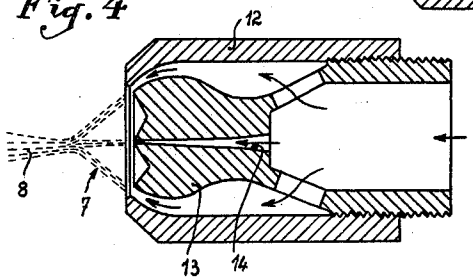
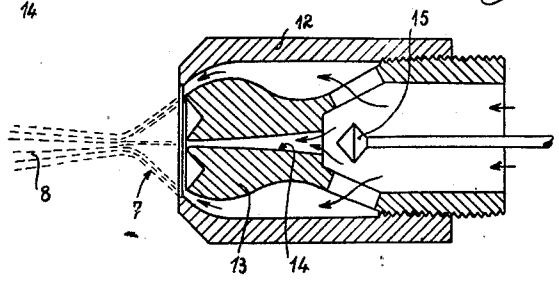


Fig. 5



United States Patent Office 2,785,926
Patented Mar. 19, 1957

2,785,926

MEANS FOR ATOMIZING LIQUID

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Application November 10, 1954, Serial No. 468,128
Claims priority, application France November 23, 1953
3 Claims. (Cl. 299—141)

Numerous methods have been proposed for obtaining the atomization of water or the like liquids. Thus, it is possible to act on the jet through the fineness and the multiplicity of the nozzle openings, through the projection of liquid particles onto a solid surface to make them bounce back, through various disturbances brought to the jet within the opening of the nozzle, through a divergent throttled projection or else through the interengagement of two jets.

My invention has for its object a particularly simple atomizing method which consists in causing the liquid jet to follow a path such that it forms a hollow convergent cone the apex of which is located ahead of and outside the nozzle and in the open, so that the atomization is obtained, without the interference of any further operative part, merely through the convergence of the elementary liquid streams through their consequent splitting.

To this end, I provide the end of the nozzle with a nose piece the inner wall of which defines with an axial inner core a frustoconical annular channel for the passage of the liquid under pressure, the geometrical apex of which frustoconical channel is located in the open, to the front of the nozzle.

This annular frustoconical channel is furthermore and preferably of a decreasing cross-section so as to produce an acceleration of the liquid jet and thus a sufficient speed without any high pressure being required.

I have illustrated in accompanying diagrammatic drawings, by way of example and by no means in a limiting sense various embodiments of atomizing means operating in accordance with my improved method, Figs. 2, 3, 4 and 5 being axial sectional views of said different embodiments.

Turning first to Fig. 1, the liquid to be atomized enters a pipe 2 opening laterally into a cylindrical nozzle body 3 of which one end is provided with a tapped opening inside which is screwed a solid axial core member 4 while its other end forms an oblique throttle 5 defining with the end of the axial core member 4 an annular space 6 the cross-section of which is more and more reduced when it is considered nearer the outer end of the cylindrical body.

It should be remarked that the terminal throttle section or nose-piece 5 of the cylindrical body forms the outer end of the wall of a cone the apex of which is located outside and to the front of the nozzle. It is readily apparent that the liquid fed through the pipe 2 and flowing in the direction of the arrows between the core and the inner wall of the nozzle body, as shown in Fig. 1, passes out of the body 3 in the shape of a conical hollow convergent jet 7 the streamlets forming which close up so as to burst or to split in proximity with the apex of the convergent cone. This leads to an atomization of the liquid jet which is then transformed into a solid atomized jet 8.

In the modification illustrated in Fig. 2, the liquid, instead of entering the chamber in the cylindrical body through a lateral pipe, enters said chamber through an axial blind bore 9 formed in the central core member 4*a* and opening into the cylindrical body 3 through lateral ports 10 connecting said bore 9 with the gap between the outer periphery of the core member 4*a* and the inner periphery of the nozzle body 3.

In the case illustrated in Fig. 3, the outer members 12 and 13 have respectively an outer and an inner shape such that the jet assumes an unvarying acceleration, the lateral ports being preferably oblique with reference to the axis of the nozzle.

In the case illustrated in Fig. 4, the outer member 12 and the core 13 have the same shape as in the case of Fig. 3, but the core 13 is provided with an axial conical perforation 14 wherethrough a central jet is adapted to pass so as to increase the range of the atomized jet to which an acceleration is thus imparted.

In the case of the modification illustrated in Fig. 5, an axial needle valve allows adjusting as required the annular throughput between the two members 12 and 13 and it also controls the central jet, which allows obtaining various combinations of range, throughput and grade of atomization, as required.

Obviously, my invention is by no means limited to the sole embodiments of the atomizing nozzle which have been disclosed hereinbefore by way of example and it covers, in contradistinction, all the modifications thereof falling within the scope of accompanying claims.

What I claim is:

1. A device for atomizing a liquid, comprising a nozzle terminating with an outer throttle section the inner wall of which is frustoconical and converges towards the outlet end of the throttle section and a core extending axially of the nozzle and including a front section registering with the throttle section of the nozzle and bounded by a frustoconical surface forming with the inner surface of the throttle section an annular frustoconical channel and the geometrical apex of which lies in the open to the front of the nozzle, said inner core being provided with an axial bore opening into the rear thereof and adapted to be fed with liquid and with lateral ports connecting said blind bore with the outer periphery of the core in register with the part of the inner periphery of the nozzle lying to the rear of the throttle section.

2. A device for atomizing a liquid, comprising a nozzle terminating with an outer throttle section the inner wall of which is frustoconical and converges towards the outlet end of the throttle section, a core extending axially of the nozzle and including a front section registering with the throttle section of the nozzle and bounded by a frustoconical surface forming with the inner surface of the throttle section an annular frustoconical channel and the geometrical apex of which lies in the open to the front of the nozzle, said inner core being provided with an axial blind bore opening into the rear thereof and adapted to be fed with liquid with an axial tapering perforation connecting the front end of the blind bore with the front end of the core in register with the outlet end of the throttle section to allow the passage of a central jet through said axial perforation and with lateral ports connecting said blind bore with the outer periphery of the core in register with the part of the inner periphery of the nozzle lying to the rear of the throttle section.

3. A device for atomizing a liquid, comprising a nozzle terminating with an outer throttle section the inner wall of which is frustoconical and converges towards the outlet end of the throttle section, a core extending axially of the nozzle and including a front section registering with the throttle section of the nozzle and bounded by a frustoconical surface forming with the inner surface of the throttle section an annular frustoconical channel and the geometrical apex of which lies in the open to the front

of the nozzle, said inner core being provided with an axial blind bore opening into the rear thereof and adapted to be fed with liquid, with an axial tapering perforation connecting the front end of the blind bore with the front end of the core in register with the outlet end of the throttle section to allow the passage of a central jet through said axial perforation and with lateral ports connecting said blind bore with the outer periphery of the core in register with the part of the inner periphery of the nozzle lying to the rear of the throttle section,

and a needle valve registering with the axial perforation in the core to adjust the relative flow through the lateral ports and through the central perforation of the core.

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