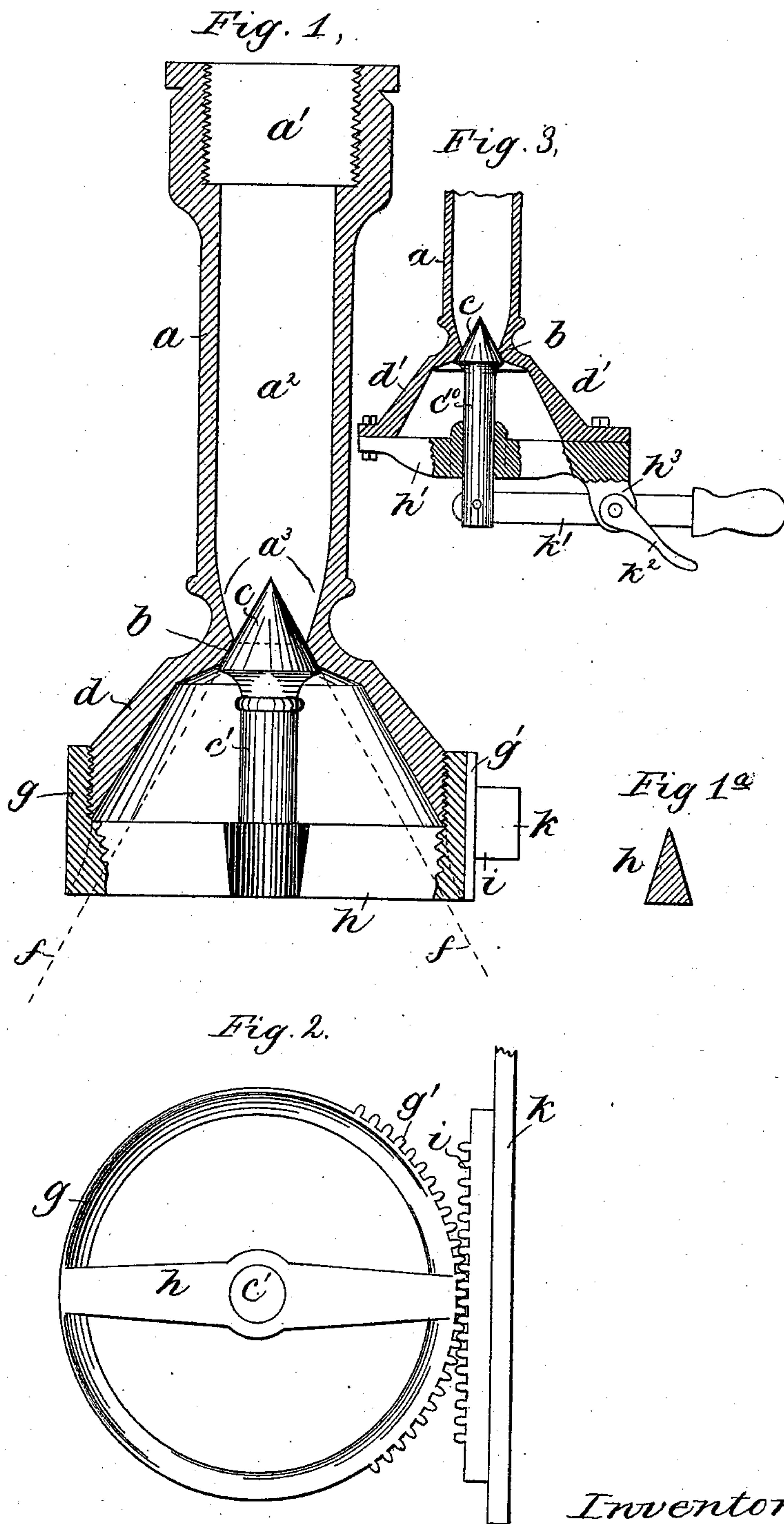


(No Model.)

C. D. STANFORD.
SPRAYING DEVICE OR ATOMIZER FOR LIQUIDS.

No. 429,658.

Patented June 10, 1890.



Witnesses
Jas. J. Maloney
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Att'y.

UNITED STATES PATENT OFFICE.

CHARLES D. STANFORD, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
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SPRAYING DEVICE OR ATOMIZER FOR LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 429,658, dated June 10, 1890.

Application filed April 5, 1887. Serial No. 233,733. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. STANFORD, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Spraying Devices or Atomizers for Liquids, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to a nozzle or device for delivering liquids in the form of a fine spray, the device being especially useful for delivering hot malt liquors for the purpose of cooling the same, but being also applicable for other purposes—such, for example, as the delivery of water for lawn-sprinklers or other similar uses.

One object of the invention is to produce an atomizer or spraying device having a large and free passage to its discharge-orifice and having such orifice easily controllable as to size, so that it may be opened wide for the purpose of flushing out or cleaning the device in case the orifice has become clogged with particles carried by the liquid.

Figure 1 is a longitudinal section of a spraying device or atomizer embodying this invention; Fig. 1^a, a sectional detail; Fig. 2, an end view thereof, and Fig. 3 a partial sectional view showing a modified construction.

The device consists of a body or main portion *a*, shown as threaded at *a'* for the purpose of readily attaching it to a supply-pipe for the liquid that is to be delivered, the said body *a* having an unobstructed passage *a*² from its inlet end *a'* to the discharge-opening *b*. The passage *a*² is preferably slightly contracted, as shown at *a*³, as it approaches the said discharge-opening *b*, which latter is preferably made tapering or conical and flaring outward. The tapering outlet-opening contains a co-operating tapering plug *c*, which may seat tightly in the said opening and by moving slightly off its seat will leave an annular discharge-orifice at *b*, through which the liquid issues in a thin sheet that is conical or flaring outward, so that at a very short distance from the orifice the said sheet becomes distended and breaks up into an exceedingly fine spray, the fineness of which can be regu-

lated by moving the conical plug *c* toward and from its seat in the orifice or outlet-opening *b* of the spraying device.

In order to support and operate the plug *c* without interfering with the free flow of liquid through the passage *a*², the main portion *a* of the device is provided with an extension *d* beyond the orifice, which extension diverges or flares outward and is of larger diameter in any given plane than the cone of which the surface of the plug *c* forms a part, so that the conical sheet of liquid represented in dotted lines at *f* passes by the inner surface of the extension *d* without touching the same.

In the construction shown in Figs. 1 and 2 the end of the extension *d* is provided with external screw-threads and has screwed upon it a ring *g*, provided with a cross-piece or bridge *h*, in which is supported the spindle or stem *c'* of the plug *c*. The said bridge *h* is preferably V-shaped in section, (see Fig. 1^a), having its apex toward the orifice *b*, so that it affords no appreciable obstruction to the particles of liquid which as the apparatus is generally used have already become separated before they reach the said bridge *h*.

The thread that connects the ring *g* and extension *d* is preferably of steep pitch, so that a slight rotary movement will produce considerable longitudinal movement of the plug *c*, which may thus be readily adjusted by turning the ring *g*.

When the atomizer is used as a portion of an apparatus for cooling malt liquors, there will be a number of such devices placed in line and connected with a common supply-pipe for the liquid to be cooled. In such cases it may be desirable to adjust all the spraying devices simultaneously, and for this purpose the ring *g* may be provided with teeth *g'*, meshing with a rack-bar *i*, connected with or forming part of a slide-bar *k*, extending by all the spraying devices, so that a movement of the said slide-bar will operate the plugs *c* of all the devices simultaneously.

In using the device for atomizing malt liquors the orifice will be very narrow, and the particles suspended in the liquid will pass freely through the passage *a*², and will be arrested, if at all, only when they arrive

at the orifice, where the pressure will generally be sufficient to force them through; but if they become clogged in the course of time they can be readily freed by opening the orifice wide for an instant and then adjusting it back to its working position.

In the construction represented in Fig. 3 the body *a*, with its discharge-opening *b*, and the regulating-plug *c* are substantially the same as shown in Fig. 1; but the device for operating the plug *c* is different. In this construction the extension *d'*, instead of extending wholly around the orifice, is made as a pair of arms, and a bridge *h'* is fastened directly to the said arms. The stem *c*¹⁰ of the plug *c* is fitted to slide in a socket *h*² in the bridge *h'*, and the said bridge-piece is provided with a lug *h*³, in which is pivoted a handled lever *k'*, connected with the stem *c*¹⁰, as shown, so that the latter may be readily moved by the said lever, the pivoted fulcrum of which may be made with sufficient friction to retain the lever in any position, or may be provided with a clamping device *k*², of common construction, for fastening said lever in any desired position.

I claim—

1. In a spraying device for liquids, a nozzle or discharge-tube having an orifice which may be adjusted to control the spray it produces and to allow the liquid to flush or clean out the said nozzle and a movable bar co-operating therewith and adapted when it is moved to adjust the orifice of said spraying device to flush the same and control the spray, substantially as and for the purpose described.

2. A spraying device or nozzle adapted to be attached to a liquid-delivery pipe and being provided with a tapering spray-producing plug and support therefor, combined with a movable flushing-bar co-operating with said plug-support for adjusting the said plug by the motion of said bar, thereby controlling the spray and flushing said spraying device, substantially as and for the purpose described.

3. The combination of the main portion hav-

ing an unobstructed passage through it, an outlet-opening at the end of the said passage, diverging extension on the said outlet provided with a screw-thread, a plug controlling said outlet, and a threaded ring connected with the said threaded extension and provided with a bridge-piece that supports the said plug, the said ring being provided with gear-teeth, and a rack co-operating therewith, substantially as and for the purpose set forth.

4. In a spraying device for liquids, the combination of the main portion or delivery-tube adapted to be attached to a delivery-pipe and having an unobstructed passage through it, an outlet-opening at the end of said passage with a tapering plug at the mouth and controlling the outlet of said delivery-tube, and a support for said plug connecting with said main body and longitudinally adjustable with relation thereto, said support being provided with a bridge-piece V-shaped in cross-section, with its apex toward the outlet, substantially as and for the purpose described.

5. In a liquid-spraying apparatus, the combination of the main body or delivery-tube adapted to be connected with a liquid-delivery pipe, a tapering plug supported at the mouth of said delivery-tube, and a support for said plug connected with said main delivery-tube and adjustable thereon by a screw-thread, said plug-support being provided with gear-teeth, and a rack meshing with said gear-teeth and longitudinally movable with relation to the spraying device for the purpose of adjusting the plug-support and plug with relation to the outlet thereof, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. D. STANFORD.

Witnesses:

JOS. P. LIVERMORE,
JAS. J. MALONEY.