

(No Model.)

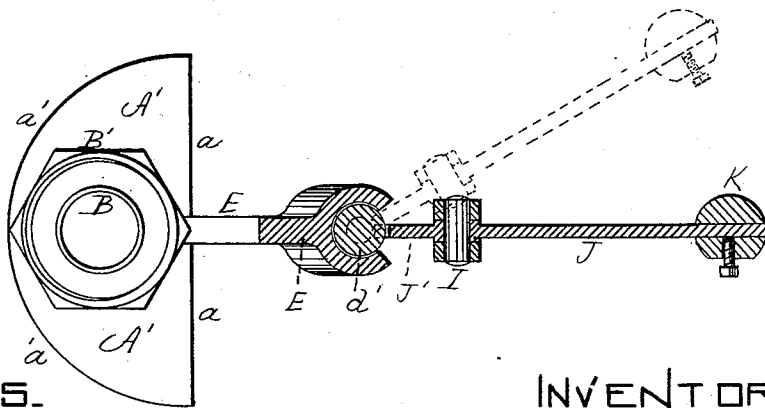
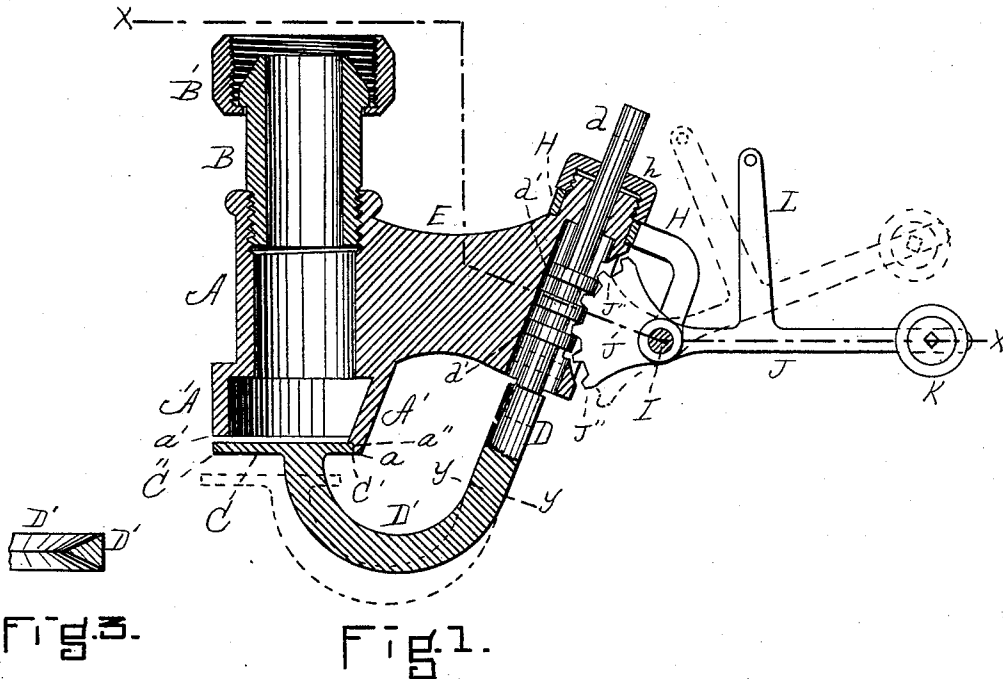
2 Sheets—Sheet 1.

C. C. HANFORD.

SPRAYING DEVICE FOR COOLING BEER, &c.

No. 477,859.

Patented June 28, 1892.



WITNESSES.

*L. R. Smith.*

*B. M. Williams*

INVENTOR.

FIG. 2

*Clarence C. Hanford,*  
*By his Atty.*  
*Henry Williams*

(No Model.)

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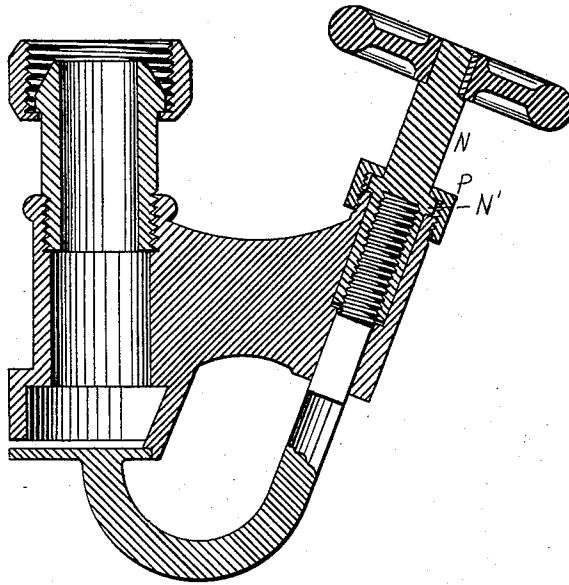


Fig 4.

WITNESSES.

*L. K. Smith*  
*B. M. Williams*

INVENTOR.

*Clarence C. Hanford.*  
*By his Atty.*  
*Henry Williams*

# UNITED STATES PATENT OFFICE.

CLARENCE C. HANFORD, OF MEDFORD, MASSACHUSETTS, ASSIGNOR TO  
HERBERT C. HANFORD, OF SAME PLACE.

## SPRAYING DEVICE FOR COOLING BEER, &c.

SPECIFICATION forming part of Letters Patent No. 477,859, dated June 28, 1892.

Application filed April 7, 1892. Serial No. 428,237. (No model.)

*To all whom it may concern:*

Be it known that I, CLARENCE C. HANFORD, of Medford, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Spraying Devices for Cooling Beer and other Liquids, of which the following is a specification.

This invention is an improved spraying device or atomizer more especially for use in cooling beer, ale, &c., and the invention relates particularly to that class of spraying devices in which the operation is performed by the opening of a valve. In this class of spraying devices it is customary for the valve to open and close so that its movement is on a line which is the same as a line extending centrally through the passage or discharge-tube, whose end constitutes the seat of the valve. In other words, if this discharge-tube is vertical at the portion next the valve-seat, the valve moves vertically, with the result that the spray flares out on all sides unless a hood or shield is applied to one side.

In this invention or improvement the valve moves away from its seat not vertically, or at right angles with the face of the seat, but at an angle with the line of direction of the discharge-passage or delivery-tube, and hence at an angle other than a right angle with the horizontal face of the valve-seat. By this means and by means of the shape of the valve and the construction of the parts of the spraying device it is made to spray to one side, so that the spray is in the shape of an arc of a circle, preferably a semicircle, so that the device can be placed at a side of or at a corner of the tank without spraying over the edge.

The invention is especially but not exclusively adapted for use in comparatively small breweries.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a vertical section of my improved spraying device with the actuating mechanism shown in elevation. Fig. 2 is a sectional view taken on line *x*, Fig. 1. Fig. 3 is a section taken on line *y*, Fig. 1. Fig. 4 is a vertical section showing a modification.

A is the discharge or delivery tube, to the upper end of which is screwed a pipe B and half-union B', connecting with the source of

supply. The lower portion A' of this tube A is formed into the shape of a half-circle, as shown in Fig. 2, and the diametral edge *a* extends a little lower than the semicircular edge *a'*, and is provided with a step *a''*.

C is the valve, corresponding in shape with that of the lower portion A' of the discharge-pipe, and hence being of the shape of a half-circle, and with its diametral edge C' fitting into the step *a''* and its semicircular edge C'' at a short distance from the corresponding edge of the lower end of the discharge-pipe when the valve is as nearly closed as possible. The stem of this valve is curved, as shown, at D', and thence extends upward in a straight line into the portion D, and thence in a straight line into the portion *d*. The curved portion D' of the valve-stem is made triangular in cross-section, as shown in Fig. 3, with the apex at the upper edge, so that as little obstruction as possible to the spray may be produced. The portion *d* is preferably round in cross-section and has formed on its periphery a series of annular disks or rack-teeth *d'*. This portion *d* is adapted to slide longitudinally in the web E, which is integral with and extends from the discharge-pipe A, and is set at an angle, say, of twenty or thirty degrees, from a vertical line.

H is a bracket supported by the web E and held in place thereon by the nut *h*. This bracket extends downward, as shown in Fig. 1, and is provided with a horizontal pin or pivot I, which constitutes a fulcrum for the lever J, whose short arm J' is provided with teeth J'', formed on an arc of a circle and engaging the disks or rack-teeth *d'* on the valve-stem. The long arm of this lever is provided with an adjustable weight or counter-balance K, and extending upward from the lever is a vertical bar L, by means of which the lever can be suspended from the point above it and its long arm raised or lowered.

The normal position of the device is shown in the drawings. While it is in this position the beer, passing down through the discharge-pipe A, is forced out in a fine spray diagonally over the curved edge C'' of the valve C. If the long arm of the lever J be lifted, the toothed segment J' moves the valve-stem longitudinally, and hence not vertically,

but at a decided angle from a vertical line, so that the valve C does not drop vertically from its seat, but at the same angle at which its stem is set. The positions of the parts when the valve is dropped considerably are shown in broken lines in Fig. 1. As soon as the valve is moved away from its seat, as above described, so that its diametral or straight edge C' is out of contact with the diametral or straight edge a of the lower portion A' of the delivery-tube, the volume of spray not only increases, but is thrown to some extent over the straight edge C' of the valve, as well as over the curved edge C'', but the volume passing over the diametral edge is not so great as that which passes over the curved edge for several reasons: First, the straight edge is not as long as the curved edge; second, the straight edge is not so distant from its seat as the curved edge is from the curved edge a' of the delivery-tube, and, third, because the rear or flat portion of the lower part A' of the delivery-tube is set at a slant, as shown in Fig. 1, so as to tend to guide the liquid toward the curved edge of the valve. What fluid does spray over the straight edge C' does not spray out to such a distance as that which sprays over the curved edge for obvious reasons, and especially is this the case when the valve is not moved down far enough to get below the horizontal line of the lowest end of the rear part of the portion A'. It will readily be seen, therefore, that this device may be placed at a side or corner of the tank provided the curved edge of the valve faces inward without spraying over the edge of the tank. It is also evident that the diagonal movement of the valve has the effect of throwing the spray which passes over its curved edge to a greater distance *i. e.*, to make the direction of its movement more nearly horizontal than would be the case if the valve moved downward vertically, while the movement of the spray over the straight edge (which is next the side of the tank) is rendered more nearly vertical. Thus the atomizer may be placed near the side or corner of the tank and spray a great distance through the air toward the center of the tank, with corresponding cooling results. This is especially advantageous to small breweries.

The distance or width of the opening between the curved edges C'' and a' may be determined by circumstances.

In the modification shown in Fig. 4 the principle is exactly the same, the only difference in construction being that the movement of the valve-stem is produced by an internally-threaded screw N, into which the externally-threaded end of the valve-stem extends, said screw N being provided with an annular ring N', which lies between the web

and a cap P. The circular shape of the disk-teeth d' enables the lever J J' to be moved around them, as desired, to accommodate itself to any required position in relation to the tank.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A spraying device comprising a discharge-pipe or delivery-tube and a valve placed at the end thereof and provided with a valve-stem set at an angle with the delivery-tube and adapted to be moved in the line of the same angle, whereby the movement of the valve from and toward its seat is at an angle with the line of direction of said delivery-tube, substantially as described.

2. The herein-described improved spraying device, comprising the delivery-tube A, the end of whose lower portion A' is formed into the semicircular outer edge a' and the straight or diametral inner edge a, and the valve C, whose outer edge C'' is curved to correspond with the outer lower edge of the delivery-tube and whose inner edge C' is straight or diametral to correspond with the inner lower edge of the delivery-tube, said valve being adapted to be moved in a line at an angle with the line of direction of the delivery-tube, substantially as set forth.

3. The herein-described improved spraying device, comprising the delivery-tube A, the end of whose lower portion A' is formed into the raised semicircular outer edge a', and the straight or diametral inner edge a, extending to a lower point than said outer edge and forming a seat for the corresponding edge of the valve, and the valve C, whose outer edge C'' is curved to correspond with the outer lower edge of the delivery-tube and whose inner edge C' is straight or diametral to correspond with the inner lower edge or valve-seat of the delivery-tube, said valve being adapted to be moved in a line at an angle with the line of direction of the delivery-tube, substantially as described.

4. The herein-described improved spraying device, consisting, essentially, of the delivery-tube A, the integral web E, the valve C, provided with the diagonally-placed valve-stem D D', supported by and moving in said web, said portion d being provided with the disks or rack-teeth d', the bracket H, supported by said web, and the lever J, whose short arm J' is provided with segment-gear for engaging said rack-teeth, substantially as set forth.

CLARENCE C. HANFORD.

Witnesses:

HENRY W. WILLIAMS,  
F. B. SMITH.