E. ROBERTS.

SPRAY NOZZLE.

APPLICATION FILED SEPT. 29, 1917.

1,353,495. **Patented Sept. 21, 1920.**

Fig. 1.

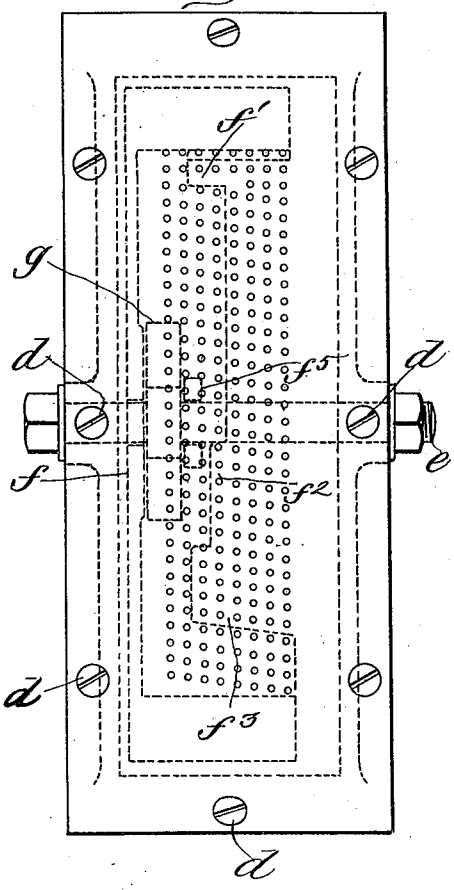
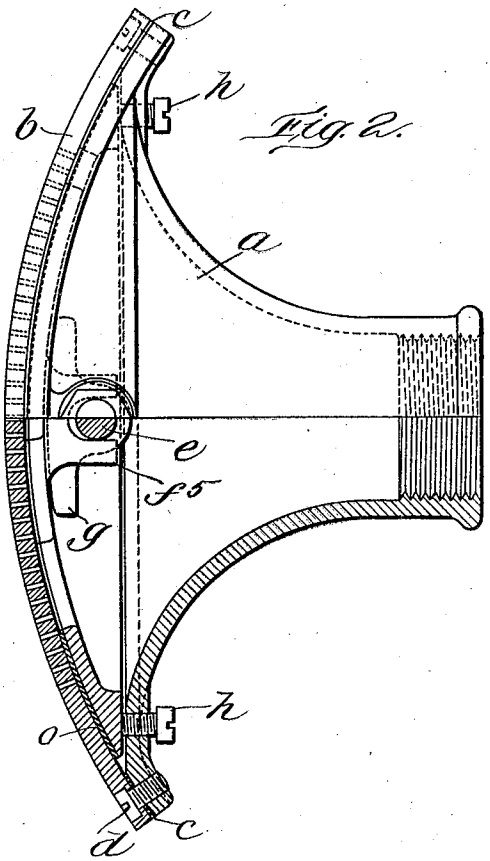


Fig. 2.



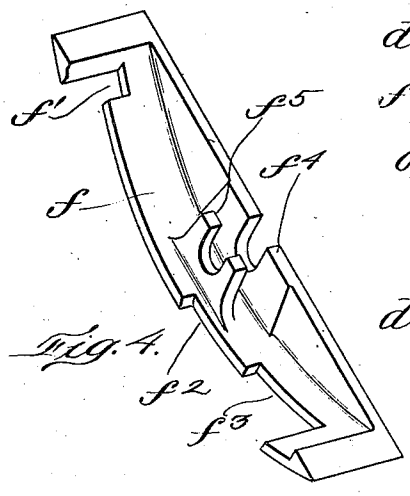
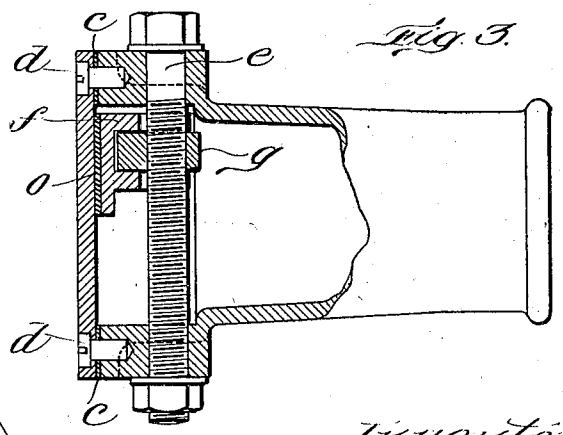


Fig. 4.

Fig. 3.



Inventor:
Eugene Roberts
by Geo. N. Goldsborough Atty.

UNITED STATES PATENT OFFICE.

EUGENE ROBERTS, OF SALT LAKE CITY, UTAH, ASSIGNOR TO SUGAR CENTRIFUGAL DISCHARGER COMPANY, OF SALT LAKE CITY, UTAH, A CORPORATION OF UTAH.

SPRAY-NOZZLE.

1,353,495. Specification of Letters Patent. Patented Sept. 21, 1920.

Application filed September 29, 1917. Serial No. 193,879.

To all whom it may concern:

Be it known that I, EUGENE ROBERTS, citizen of the United States, and resident of Salt Lake City, county of Salt Lake, State of Utah, have invented certain new and useful Improvements in Spray-Nozzles, of which the following is a specification.

This invention relates to spray nozzles, and more particularly to such a spray nozzle as is adapted and intended for use in connection with the operation in washing the body of sugar that is walled up against the peripheral wall of a centrifugal basket, after the operation of separating the syrup or juice from the sugar has been completed.

For this class of service it is very important that the distribution of the spray should be accurately effected and controlled so that each portion of the walled up body of sugar shall receive neither too little nor too much of the liquid spray directed against it. An excess of spray at any point means dissolving and waste of sugar, while a deficiency of spray at any point results in an incomplete or inefficient washing. The requirements of different grades of sugar and different volumes of sugar to be washed according to the size of the centrifugal basket employed, make it desirable to secure a convenient and accurate adjustment of the volume and shape of the spray to suit individual conditions.

It is the object of the present invention to provide a spray nozzle constructed and arranged to make it possible and convenient to secure a wide range of adjustment and control of the spray suited to these varying conditions. To this end the invention comprises, generally speaking, a segmental chamber or nozzle, having an outer peripheral wall, curved about a transverse or substantially horizontal axis, and provided with a series of close perforations, combined with a cut off plate closely fitting the interior or concave face of the peripheral wall or spray plate, and a transverse adjusting screw for adjusting said plate across the perforated area, so as to cut off a greater or less number of the spray orifices, in order to narrow or widen the fan shaped spray. The cutting off of the adjustable plate may be given any desirable contour in order to vary the amount of spray delivered at different heights on the sugar wall, and the connection of said plate with the remainder of the nozzle is such as to permit its ready removal and replacement so that plates of various contours may be used as desired. These and other features of the invention will be particularly described in this specification, and will be defined in the claims annexed hereto.

In the accompanying drawings I have illustrated a convenient and particular form of spray nozzle illustrating the principles of this invention in which

Figure 1 is a front elevation of the nozzle, showing the exterior face of the perforated plate or spray plate.

Fig. 2 is a side elevation of the device, the lower half being shown in the central section.

Fig. 3 is a horizontal section through the central part of the spray nozzle.

Fig. 4 is a detail view showing in perspective the cut off member or plate by which the volume of the spray is regulated.

In the practice of my invention according to the form illustrated in the drawings, I employ an approximately segmental casing *a*, the outer faces of whose side and top and bottom walls are convexly curved about a transverse axis, which axis is substantially horizontal when the device is in use.

The chamber or nozzle *a* is provided with a peripheral wall *b* similarly curved, and comprising an oblong concavo-convex plate, whose interior portion or area is provided with a series of numerous, closely arranged, perforations which radiate or diverge in vertical planes to throw a fan shaped spray.

To prevent leakage I prefer to interpose between the outer edges of the nozzle casing and the inside convex face of the spray plate *b*, a packing *c*.

The spray plate *b* is removably secured to the nozzle member by a series of screws *d* normally set down to squeeze the interposed packing to prevent leakage.

At the middle of the side walls of the nozzle are provided opposed apertures, intended to receive the adjusting screw *e* and form a bearing therefor to hold said screw in operative position. A cut off plate *f* shown in Fig. 4, is formed with its outward convex face, curved to snugly fit against the inside of the convex face of the spray plate or member *b*. It will be noticed that one edge of said spray plate is formed with a series of steps or notches as at f' f^2 and f^3, which indent the plate laterally or transversely.

These indentations are employed for the purpose of permitting a relatively greater volume of liquid to be delivered at those points rather than at the widest portion of the plate, and the volume and extent of the indentations will correspond to the requirements imposed by particular conditions, both as to the nature and grade of the sugar being treated, as well as to the size and thickness of the sugar wall built up in the particular basket employed.

The cut off member is provided with rearwardly extending notched flanges f^4 and f^5, the notches being located to permit the respective flanges to straddle the adjusting screw when in position. An elongated nut g is mounted on the adjusting screw e and is shaped to fit in between the flanges f^4 and f^5 with its outer portion in front of the screw, extending vertically between the two flanges close to the inside face of the plate f so that the nut is prevented from rotating with the screw, and is therefore forced to travel along the screw, as the screw is rotated, in order to shift the cut off member transversely over the perforated area of the spray plate. By this movement, a greater or less number of perforations are closed or cut off, and thus the width of the spray from side to side is narrowed or widened.

In order to prevent leakage between the cut off member and the perforated spray plate, I provide two set-screws h which are tapped into the wall of the spray nozzle immediately behind the end portions of the cut off plate, so as to set the cut off plate snugly against the inside face of the spray plate. These set-screws also serve to lock the cut off plate or member against any accidental movement from position.

As a further precaution against leakage between the cut off plate and the spray plate, I employ a thin sheet of packing o which is preferably cemented or otherwise secured to the convex face of the cut off plate f.

What I claim is:

1. A spray nozzle for washing solids in centrifugal baskets embracing in its construction a segmental body or casing whose outer or delivery side is open, a spray plate removably secured to said body to cover its open side, said plate being provided through its interior area with a series of closely arranged perforations disposed to throw a fan shaped or vertically diverging spray, a cut off plate closely fitted against the inside face of the spray plate and an adjusting screw mounted in the casing and operatively connected with the cut off plate to shift the cut off plate transversely of the spray plate to widen or narrow the spray substantially as described.

2. A spray nozzle for washing solids in centrifugal baskets embracing in its construction a hollow casing whose outer or delivery end is curved about a transverse axis, an elongated concavo-convex spray plate removably secured to the delivery end of said casing, said spray plate having its middle portion provided with a series of fine spray perforations diverging from top to bottom thereof, a laterally movable cut off plate arranged to fit snugly against the inside convex face of the spray plate, and an adjusting screw extending transversely of the nozzle and having operative connection with said cut off plate to shift said cut off plate laterally across the perforated area of the spray plate to widen or narrow the volume of spray.

3. A spray nozzle for washing solids embracing a hollow casing provided with inlet and outlet openings at opposite ends thereof, a concavo-convex spray plate removably secured to the delivery end of said nozzle and having an oblong area provided with series of fine perforations diverging from top to bottom to deliver a fan shaped spray, a cut off plate snugly fitted against the inside face of said spray plate and movable laterally thereof, and an adjusting screw operatively and detachably connected with said cut off plate in order to adjust the cut off plate across the perforated area of the spray plate by the rotation of said screw, substantially as described.

4. A spray nozzle for washing solids embracing a casing whose open delivery end is convexly curved about a transverse axis, a correspondingly curved spray plate provided with fine perforations extending radially through said spray plate, a packing interposed between the delivery end of the nozzle and the adjusting face of the spray plate, an elongated cut off plate formed to fit the curvature of the inside face of the spray plate and provided with a packing to be interposed between said plates, a nut detachably engaging said cut off plate and a transverse screw engaging said nut so as to shift the cut off plate transversely of the spray plate to vary the width of the spray delivered.

5. A spray nozzle for washing sugar or the like embracing in its construction a hollow casing having an elongated convexly curved exterior wall provided with longitudinal rows of diverging orifices forming a spray plate for delivering a fan-shaped spray, an elongated cut off plate formed to fit snugly against the inside face of said spray plate and shiftable transversely of its length to cut off successive longitudinal rows of orifices and thereby narrow the width of the spray delivered while preserving its fan shape, substantially as described.

6. A spray nozzle embracing a segmental chamber whose open delivery end is convexly curved about its transverse axis, a perforated spray plate removably secured to

said curved delivery end, a cut off plate curved to fit snugly against the inside face of the spray plate, and a transverse adjusting screw, a nut thereof having a detachable loose engagement with said cut off plate to shift said cut off plate laterally, said screws mounted in the casing to engage and hold the opposite ends of the cut off plate pressed firmly against the spray plate, substantially as described.

In witness whereof, I have subscribed the above specification.

EUGENE ROBERTS.