

R. S. BLAIR.
 SPRAYING DEVICE.
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1,322,753.

Patented Nov. 25, 1919.

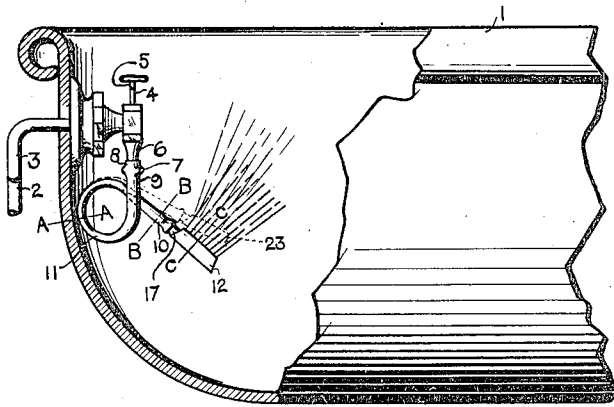


FIG. 1

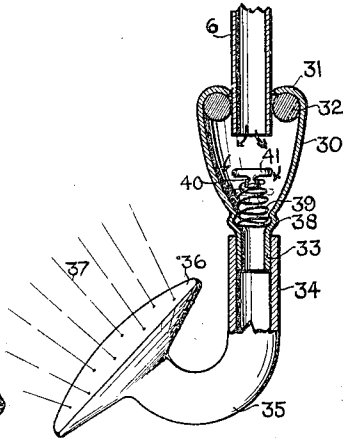


FIG. 6

FIG. 2 ○

○ FIG. 3

FIG. 4

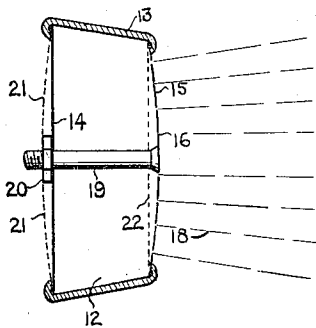
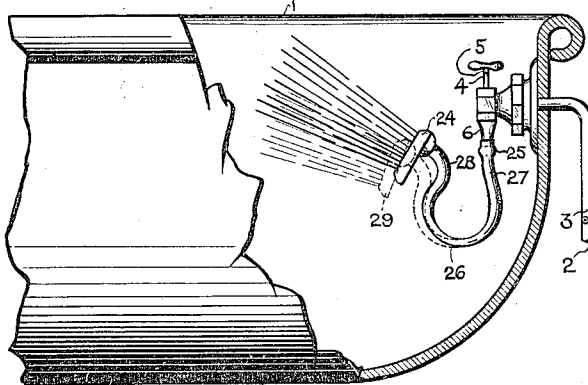


FIG. 5



WITNESSES:

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SPRAYING DEVICE.

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To all whom it may concern:

Be it known that I, ROBERT S. BLAIR, a citizen of the United States, and resident of South Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Spraying Devices, of which the following is a specification.

This invention relates to spraying devices and more particularly to bath sprays.

One of the objects thereof is to provide a simple and practical device of the above nature which shall be convenient and efficient in use.

Another object is to provide in connection with apparatus of the above type means for automatically regulating the discharge under varying conditions of its supply.

Another object is to provide a bath spray of simple construction adapted automatically to maintain a substantially constant range of discharge as the water supply is increased or diminished.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangements of parts which will be exemplified in the structure hereinafter described, and in scope of the application of which will be indicated in the following claims.

In the accompanying drawing in which is shown one or more of the various possible embodiments of the several features of this invention,

Figure 1. is a side elevation of a part of a bath tub,—certain parts being cut away in order to disclose the structure more clearly.

Fig. 2. is a sectional view taken along the line A—A of Fig. 1.

Fig. 3. is a similar view taken along the line B—B of Fig. 1.

Fig. 4. is an enlarged sectional view taken along the line C—C of Fig. 1.

Fig. 5. is a side view of a portion of a bath tub, certain parts being cut away in order to disclose the structure more clearly, and showing a slightly different form of spraying apparatus.

Fig. 6. is a sectional view of another form of automatic regulating device.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to Fig. 1. of the drawing there is shown at 1 a bath tub provided with hot and cold water supply pipes 2 and 3 which are controlled respectively by the faucets or valve spindles 4 and 5 their joint discharge passing through the nozzle 6. To this nozzle there is detachably secured, as at 7 a resilient tubular member 8 which is preferably round in cross section at 9 and 10 and elliptical, as indicated in Fig. 2 of the drawings, at 11 the greater axis of the ellipse being disposed horizontally. To the outer end of the member 8 there is secured a spray 12, a preferred embodiment of which is shown in detail in Fig. 4 of the drawing, although many of the advantages of this invention may be attained by a simple spray of the ordinary type at this point.

The spray 12, comprises rigid side walls 13 of tapering form to provide a rear wall 14, which is greater in area than the front wall 15. These two latter walls are of thin resilient metal and the wall 15 is perforated as at 16 to permit the discharge to pass out and is normally outwardly convex. The water is led through the side wall 13 as indicated at 17 in Fig. 1. of the drawing, and with low pressure the discharge is outwardly dispersed, as indicated by the lines 18 in Fig. 4. The wall 14, however, is connected with the wall 15, as by the pin 19 and adjustable nut 20, and upon the pressure of the water becoming excessive the wall 14, which is of the greater area tends to bulge outwardly and rearwardly toward the dotted line 21, and to draw the wall 15 toward the dotted line 22, thus flattening to a greater or less extent the wall 15 and preventing the discharge from being dispersed over such a wide angle. In this manner any increase of pressure with a tendency to throw the sprayed water throughout a longer path, automatically lessens the extreme angle between jets of the spray and tends to maintain uniform the area over which they are sprayed at their point of impact.

It may here be noted that with low pressure of water, the pressure being of course varied by adjustment of the hot and cold faucets, the discharge is thrown as indicated in Fig. 1, of the drawing at such an angle, as to have a maximum range. As the pressure is increased, however, the looped or curved portion of the tube 8 tends to straighten out and throw the water higher,

the spray tending to move toward the position indicated in dotted lines at 23. The distance which the water is thrown lengthwise of the tub is thus maintained substantially uniform as any increase in the strength of the discharge of the spray, simultaneously raises the angle of the discharge and thus maintains the range lengthwise of the tub substantially constant.

In Fig. 5 of the drawing there is shown a form of device in which an ordinary spray 24 is connected by a resilient tube 25 with the spout 6, the tube 25 being elliptical in cross section at 26 and round at 27 and 28. This form of apparatus is normally set for its most efficient angle of discharge, that is, maximum range, and as the pressure increases it is automatically tilted toward the position indicated by dotted lines at 29, the resilient tube 25 straightening out. In this manner the spray is tilted downwardly as the pressure increases and discharge over the end of the tub is prevented.

In Fig. 6 of the drawing there is shown a different form of apparatus in which, however, certain parts of the objects of this invention are achieved. In this figure the spout 6, connected as before described for the joint discharge from hot and cold water faucets, fits into a cup 30, flanged at 31, and having a rubber ring 32 to form a tight and yet readily separable joint between these members. The lower end of the cup or funnel 30 terminates in a short tube 33 which fits within a rigid tube 34 curving as at 35 to the upwardly inclined spray 36 of any ordinary construction. This spray is directed upwardly to throw the jets 37 not only lengthwise of the tub but at a sharp upward angle and thus permit them to fall in the form of a shower.

The tube 34 is intended to maintain its shape throughout the use of the apparatus but it may be, if desired, of malleable metal, so as to permit it to be adjusted or set to a different angle if desired.

Mounted within the cup 30 and having its lowermost coil interlocked with an annular recess 38 is a spiral spring 39, the upper end of which is secured about the shank 40 of a flat button 41. Spring 39 as well as the button 41 and surrounding portions of the cup 30 are so shaped as to cause the button to be pressed downwardly toward the tube 33 as the pressure of discharge through the spout 6 is increased, this depression being substantially proportional to the increase of discharge. In this manner as the discharge is increased or decreased from the spout 6 the button 41 is moved downwardly or upwardly and thus varies the obstruction of the outlet of the water from cup 30 to the tube 33. The discharge through the spray is thus held substantially constant in the amount and pressure, and any tendency

to vary this through adjustment of either of the faucets is automatically corrected by a greater or less throttling tendency of the button 41. It is to be especially noted that the spring 39 should be so wound and proportioned that its resistance to compression increases rapidly as the compression progresses in order to prevent an unduly great depression of the button as the discharge through the spout 6 is increased.

It will thus be seen that there is provided apparatus in which the several objects of this invention are achieved.

As various changes might be made in the above constructions and as this invention might be embodied in other forms it is intended that all matter herein described or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having described this invention, I claim:—

1. In spraying apparatus, in combination, means connected with a source of fluid supply, a spraying device and means adapted automatically to tend to cut down the range of discharge of said spraying device as the pressure from said source of supply increases.

2. In spraying apparatus, in combination, means connected with a source of fluid supply, a spraying device and means adapted, automatically to tend to vary the range of discharge of said spraying device inversely in accordance with the pressure from said source of supply.

3. In spraying apparatus, in combination, a source of fluid supply, a spraying device and means comprising a resilient member connecting said source of supply with said spraying device, said resilient member being subjected to the effect of changing pressure from said source of fluid supply and adapted to tend to cut down the range of discharge of said spraying device as said pressure increases and maintain said range substantially constant.

4. In spraying apparatus, in combination, a source of fluid supply, a spraying device, a curved resilient member and means connecting said member between said device and said source of supply and tending to swing said spraying device angularly into a position for less range of discharge, as said resilient member is distorted by increase of pressure from said source of supply.

5. In spraying apparatus, in combination, a discharge spout, a spraying device, and a curved resilient tube connecting said spraying device with said discharge spout and normally holding said device at an angle for greatest range of discharge, said tube being positioned to swing said device into a less favorable angle for discharge as the

pressure from said spout is increased and to swing it back toward said most favorable angle as said pressure is lessened.

6. In spraying apparatus, in combination, 5 a discharge spout, a spraying device and a curved resilient tube connecting said spraying device with said discharge spout and normally holding said device at an angle for greatest range of discharge, said tube being 10 positioned to swing said device into a less favorable angle for discharge as the pressure from said spout is increased and to swing it back toward said most favorable angle as said pressure is lessened and said 15 tube having a horizontally elongated cross section at its curved portion.

7. In spraying apparatus, in combination, means connected with a source of fluid supply, a spraying device, means adapted automatically to tend to cut down the range of 20 discharge of said spraying device as the pressure from said source of supply increases, and means adapted automatically to decrease the maximum angle of divergence 25 between the jets discharged from said spraying device as pressure within said device increases.

8. In spraying apparatus, in combination, 30 a source of fluid supply, a spraying device, a curved resilient member, means connecting said member between said device and said source of supply and tending to swing said

spraying device angularly into a position for less range of discharge as said resilient member is distorted by increase of pressure 35 from said source of supply, and means adapted automatically to decrease the maximum angle of divergence between the jets discharged from said spraying device as the pressure within said device increases. 40

9. In spraying apparatus, in combination, a source of supply of hot and cold water, a common discharge member, means adapted to vary independently the supply of hot and cold water to said discharge member, means 45 adapted to spray water from said discharge member, and means adapted automatically to tend to cut down the range of discharge from said spraying means as the pressure from the source of supply is increased by 50 said varying means.

10. In spraying apparatus, in combination, means connected with a source of fluid supply, a spraying device set substantially at its angle of maximum range, and means 55 adapted automatically to tend to cut down the range of discharge of said spraying device as the pressure from said source of supply increases.

Signed at South Orange, in the county of 60 Essex and State of New Jersey this 1st day of November A. D. 1915.

ROBERT S. BLAIR.