May 8, 1934. J. FRASER 1,958,038

SHOWER BATH SPRAY HEAD

Filed Nov. 14, 1930

Fig. 1.

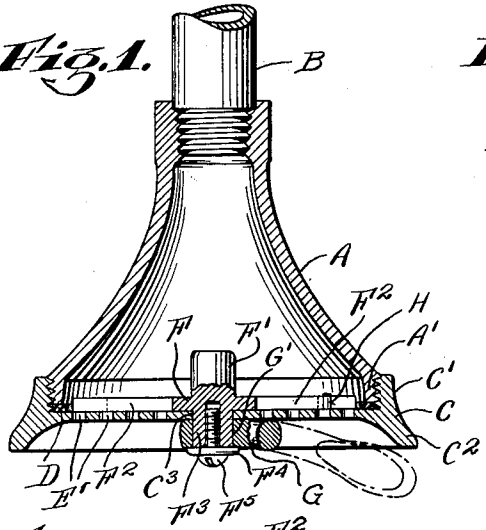


Fig. 3.

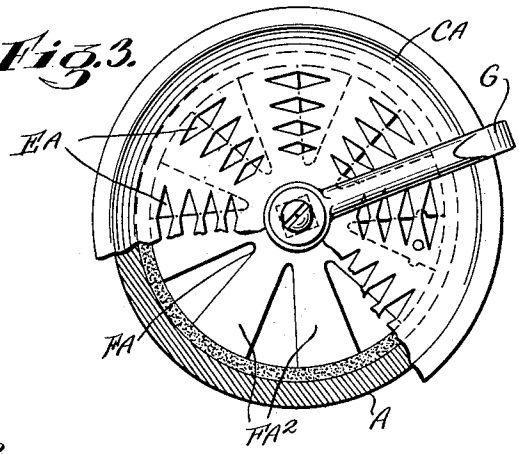


Fig. 2.

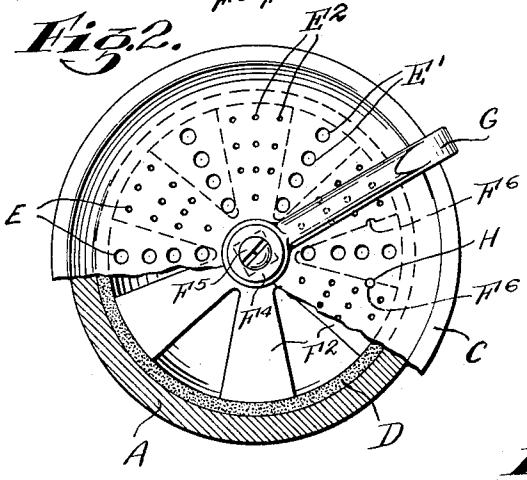


Fig. 4.

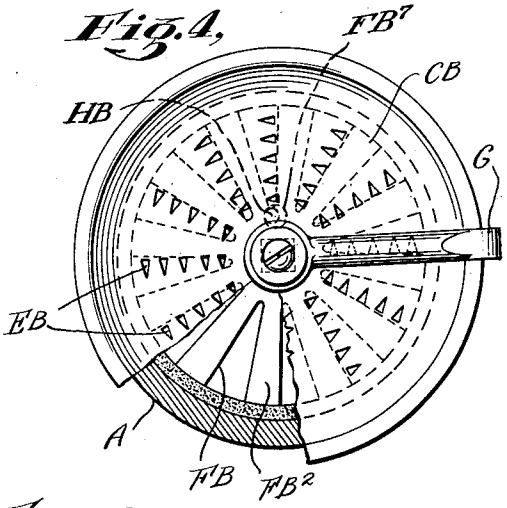


Fig. 6.

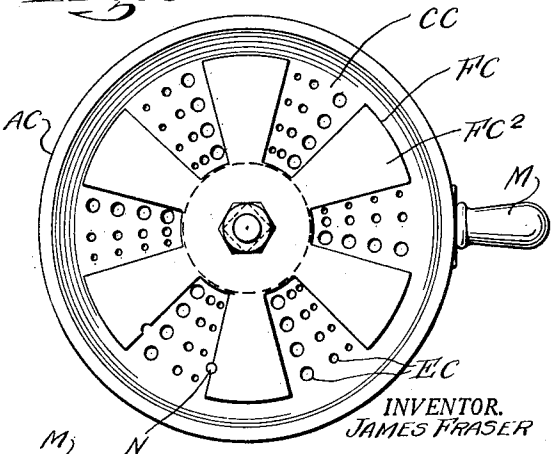
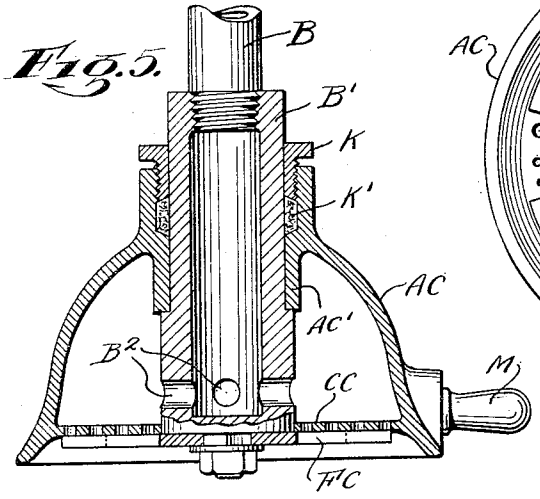


Fig. 5.



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Patented May 8, 1934 1,958,038

UNITED STATES PATENT OFFICE

1,958,038

SHOWER BATH SPRAY HEAD

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Application November 14, 1930, Serial No. 495,685

10 Claims. (Cl. 299—144)

My present invention relates to the construction and mode of use of spraying devices primarily adapted for use in shower baths. Spray heads of this character heretofore in use have been generally characterized by a multiplicity of small discharge orifices or apertures, usually several hundred in number and each a few hundreds of an inch in diameter, distributed over a major portion of the area of a plate forming the discharge side of the spray head. One objectionable feature in a spray head of this type is that after it has been in use for any considerable period of time, it is frequently found that many of the discharge orifices are wholly or partially clogged by sand or other foreign matter carried into the shower head with the water. Such deposits tend to accumulate on the inner side of the apertured face plate and in the orifices and when present, substantially lower the effectiveness of the shower head. Another and more important objectionable feature of such prior constructions is that the character of the spray discharged from the spray head cannot be varied by the user. Since the various individuals using the shower bath often prefer different shower forces and volumes and no such variation being usually possible in such prior constructions, complete satisfaction with such spray heads by all the users is impossible.

The general object of my present invention is to provide an improved construction of a shower bath spray head. A more specific object of my invention is the provision of a shower bath spray head having a multiplicity of discharge orifices, the aggregate cross-sectional area of which may be varied to vary the shower force and volume in accordance with the desires of the user. A further specific object is the provision of a simple and effective manually operated control mechanism for rendering the individual orifices wholly or partly effective or ineffective and thereby effecting the desired regulation. Another object is the provision of a shower bath spray head having a control mechanism, the operation of which requires no careful adjustment by the user in securing a particular desired variation in character of the spray. Still another object is the provision of a control mechanism which in its operation materially aids in the removal of undesirable deposits on the inner side of the apertured face plate.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it reference should be had to the accompanying drawing and descriptive matter in which I have illustrated and described preferred embodiments of the invention.

Of the drawing:

Fig. 1 is a sectional elevation of one form of my invention;

Fig. 2 is a bottom view of the form illustrated in Fig. 1 with certain parts broken away and in section;

Figs. 3 and 4 are views similar to Fig. 2 of modified forms;

Fig. 5 is a sectional elevation of still another modification; and

Fig. 6 is a bottom view of the form illustrated in Fig. 5.

In the form of my invention illustrated in Figs. 1 and 2, A represents a shower head shell or casing of the conventional bell shape and threaded at its normally upper or inlet end for attachment to a water supply pipe or nipple B. At the expanded and normally lower end thereof, the casing is preferably formed with a depending circumferential flange A', which is externally threaded for attachment to an uprising internally threaded circumferential flange C' formed on a separable circular plate C, which forms the discharge wall of the shell. A rubber washer D is arranged between the contacting portions of the casing and face plate to insure a fluid-tight engagement between these parts. The portion of the face plate area included within the periphery of the flange A' is formed with a multiplicity of discharge orifices E, through which the water entering the casing A passes out in the form of a spray. The peripheral portion of the face plate extends downwardly and outwardly as shown at C^2.

In accordance with my present invention, provisions are made for varying the aggregate cross-sectional area of the discharge orifices E. This makes it possible to vary the total volume of discharge and in some cases to vary the size and intensity of the individual spray jets. In the preferred arrangements illustrated, the discharge orifices are not of uniform area and distributed in the usual manner but are so proportioned and distributed over the area of the face plate that by the use of suitable control provisions, the character of the spray discharged may be varied in accordance with the desires of the user. For example, in the construction illustrated in Figs.

1 and 2, the orifices E are arranged in groups E′ and E^2 with the orifices in each group similar but with the orifices of adjacent groups differing in the character of the jets which they develop. In this construction, the orifices in group E′ are of substantially greater cross-sectional area and fewer in number than the orifices in group E^2. The discharge area of the face plate is divided into twelve equal sectors. The orifice groups of one kind are arranged in every other sector with the groups of the other kind arranged in the intervening sectors. The orifices of each group are preferably symmetrically spaced relative to the radial center line of the corresponding sector.

With this arrangement of the discharge orifices, it will be readily understood that if the orifices of either kind are rendered wholly or partly ineffective by the operation of suitable control provisions that the character of the spray discharged will be different from that developed by the simultaneous use of all of the orifice groups. My provisions for regulating the character of the spray discharged preferably consist of a flow obstructing member F having a central post F′ rotatably mounted in a central opening C^3 formed in the face plate C. At the upper or inner side of the face plate a plurality of flat sectoral vane or blade members F^2 are rigidly mounted on the post. The blades F^2 are six in number and angularly spaced relative to the face plate with their under sides substantially in contact with the inner side of the face plate. The number of flow obstructing blades is thus one-half the number of sectors of the face plate which contain the discharge orifices. The blades are so proportioned that each covers an area corresponding to one apertured sector of the face plate.

The post F′ is formed with a lower portion F^3 projecting below the under or outer side of the face plate and preferably of square or angular cross section to provide a secure connection with a correspondingly shaped eye G′ at one end of a handle G, which, as shown in Fig. 2, extends radially from the post towards the periphery of the face plate. A metallic washer F^4 and a screw F^5 cooperate in holding the flow obstructing member and handle in their proper positions relative to the face plate.

With the foregoing construction, the flow obstructing member F may be partly rotated to provide a spray discharge through the orifice groups E^2 or E′ only or through some of the orifices in groups E^2 and parts of the orifices in groups E′. In the first case, the discharge spray will be substantially a needle shower; in the second, the spray will have a greater force and volume; and in any intermediate positions the spray will vary in force and volume between the first and second extremes. The rate of change in the character of the spray discharged will depend upon the rate of angular movement of the flow obstructing member.

With the described formation of the discharge orifices and flow obstructing member, means are preferably provided for limiting the angular movements of the flow obstructing member. In the present embodiment this movement is restricted to the angular distance occupied by one group of orifices. For this purpose, a post H is mounted on the inner side of the face plate between two of the blades F^2 and on the radial line of separation of adjacent orifice groups. When one of these blades F^2 is in contact therewith, all of the orifice groups E′ will be rendered ineffective and only the orifice groups E^2 in effect. In the other extreme position of the flow obstructing member, all of the groups of orifices E^2 will be closed and only the orifice groups E′ effective. Since the sprays discharged in the limit positions are quite distinct in character, the use of the stop means will enable a user to easily and accurately make such adjustments.

As shown in Fig. 2, the two blades of the flow obstructing member which are arranged to contact with the stop H, are formed with a small curved notch F^6 at the point of contact in their contacting edge to effect the entire angular movement required for the desired regulation and which would be otherwise incomplete with the stop member in this position.

Most of the material depositing on the inner face of the face plate will be moved during the various operations of the flow obstructing member towards the groups of larger discharge openings and pass out therethrough. The shower head construction described moreover permits the face plate to be easily and quickly removed from the casing for inspection and further cleaning if required, without disrupting the control provisions.

In the modification illustrated in Fig. 3, the groups of orifices EA are all of the same character with the orifices in each group varying in cross sectional area. All of the area of the face plate CA is not occupied, and the groups are preferably separated by sectors substantially, but not quite, as large as those occupied by the orifice groups. In this construction the orifices EA are diamond shaped. The individual orifices of each group gradually decrease in width and cross sectional area from the periphery towards the center of the face plate. Eight such groups are shown and the flow obstructing member FA is eight bladed in this form. The flow obstructing member is otherwise similar in construction to that shown in Figs. 1 and 2. The blades FA^2 and the orifices EA are so relatively proportioned in width that when in one extreme position of the flow obstructing member the radial center line of each blade will coincide with the center line of a corresponding group of orifices with only the apex portions of the acute angle ends of each orifice extending slightly beyond the side edges of the corresponding blade so that a fine spray will be discharged from the shower head when the flow obstructing member is in this position. As the flow obstructing member is moved toward its other limit position, more and more of the discharge area of the orifices will be rendered effective until in its limit position in that direction, substantially the whole cross-sectional area of all of the orifices is effective with only the formerly effective apex portions of the orifices covered by the blades.

In the modification illustrated in Fig. 4, the individual orifices EB are in the form of isosceles triangles with the base line of the orifices of each group coinciding with a radius of the face plate CB. The apices of all of the triangles preferably point in the same angular direction. The groups of orifices in this form are greater in number than those of Fig. 3 but occupy less area and are not as widely spaced apart. As in Fig. 3, the orifices in each group while of the same form, gradually decrease in cross-sectional area towards their inner end. The flow obstructing member FB is of the same general character as

that shown in the previous figures, differing therefrom only in the number of blades.

Due to the relatively small angular movement required in this embodiment, the movement limiting means may consist of a stop member HB positioned within an opening FB^7 in the flow obstructing member FB which is sufficiently large to permit a limited angular movement of the flow obstructing member relative to the face plate.

With this arrangement and the parts properly proportioned, in one extreme position of the flow obstructing member FB, the apex portions of the orifices will extend slightly beyond the corresponding side edge of the blades FB^2 to provide a fine spray. On a clockwise movement of the flow obstructing member, the effective cross sectional area of each orifice will be gradually increased until the other extreme position is reached, at which point substantially the whole cross sectional area of each orifice EB will be effective.

In the modification illustrated in Fig. 5, the nipple B is provided with a tubular extension B' threaded on the lower end thereof and provided with ports B^2 opening to the shower casing AC adjacent its lower end. In this construction the casing AC is integrally formed with the face plate CC and adapted to be angularly moved relative to a stationary flow obstructing member FC. As shown, the flow obstructing member is carried by the lower end of the extension B'. A sleeve AC' formed within the casing AC is rotatably mounted on the upper portion of the extension B' and a fluid tight contact between the parts provided by a gland nut K and packing K'. A radial handle M, rigidly connected to the side of the casing, is used for effecting the relative angular movement of the parts. The discharge orifices EC in this embodiment are arranged as in Figs. 3 and 4 in six similar angularly spaced groups with the orifices in each group arranged in radial alignment and each line of orifices differing in character from the orifices in the other lines of the group. In the construction shown all of the orifices are of circular cross section with the orifices in successive lines of each group increasing in cross sectional area. A stop member N is mounted on the under side of the face plate and arranged to extend downwardly between two adjacent blades FC^2 of the six bladed flow obstructing member. In the extreme position indicated in Fig. 6 all of the orifices are in effect. As the casing AC is rotated in a clockwise direction as seen from below, the rows of orifices are gradually cut out until each blade covers a corresponding group. During this clockwise movement, the character of the spray discharged will be gradually varied from a heavy spray to a fine spray.

While in accordance with the provisions of the statutes, I have illustrated and described the best forms of my invention now known to me, it will be apparent to those skilled in the art that changes can be made in the forms of the apparatus disclosed without departing from the spirit of my invention as set forth in the appended claims and that in some cases certain features of my invention may be used to advantage without a corresponding use of other features.

Having now described my invention what I claim as new and desire to secure by Letters Patent, is:

1. A shower bath spray head comprising a shell having a wall formed with a multiplicity of spray orifices arranged in groups, the spray orifices in different groups being of different character, an imperforate flow obstructing member substantially in contact with one side of said wall, and means for relatively moving said member and said wall to vary the number of said orifices effective.

2. A shower bath spray head comprising a shell having a wall formed with a multiplicity of spray orifices arranged in groups, the spray orifices in adjacent groups being of different character, an imperforate flow obstructing member substantially in contact with one side of said wall, and means for relatively moving said member and said wall to vary the character of the orifices in effect.

3. A shower bath spray head comprising a shell having a wall formed with a multiplicity of spray orifices arranged in angularly spaced groups, the spray orifices in each of said groups being of different character, an imperforate flow obstructing member substantially in contact with one side of said wall, and means for relatively moving said member and said wall to vary the number of said orifices effective.

4. A shower bath spray head comprising a shell having a wall formed with a multiplicity of spray orifices, a flow obstructing member having a plurality of angularly spaced flat sectoral blades arranged in a plane parallel to the plane of said wall and substantially in contact with one side thereof, and means for effecting a relative movement between said member and said wall.

5. A shower bath spray head comprising a shell having a circular wall formed with a multiplicity of spray orifices in sectors thereof, the spray orifices in different sectors being of different cross-sectional area, a flow obstructing member having a plurality of angularly spaced imperforate sectoral blades arranged in a plane parallel to the plane of said wall and substantially in contact with one side thereof, and means connected to said member for moving said member relative to said wall.

6. A shower bath spray head comprising a shell having a circular wall formed with a multiplicity of spray orifices in a plurality of angularly spaced sectors thereof, a flow obstructing member having a plurality of angularly spaced imperforate sectoral blades arranged in a plane parallel to the plane of said wall and substantially in contact with one side thereof, and means connected to said member for moving said member relative to said wall.

7. A shower bath spray head comprising a shell having a circular wall formed with a multiplicity of spray orifices in successive sectors thereof, the spray orifices in adjacent sectors being of different cross-sectional area, a flow obstructing member having a plurality of angularly spaced imperforate sectoral blades arranged in a plane parallel to the plane of said wall and substantially in contact with one side thereof, means connected to said member for angularly moving said member relative to said wall to vary the discharge through said wall, and means limiting the angular movement of said member relative thereto.

8. A shower bath spray head comprising a shell having a circular opening at one end, a face plate closing said opening and having a multiplicity of spray orifices formed therein in sectors thereof, some of said spray orifices being of different cross-sectional area, a flow obstructing member having a plurality of angularly spaced imperforate sectoral blades arranged in said shell in a plane parallel to the plane of said face plate and sub-

stantially in contact with the inner side of said face plate, and means at the outer side of said face plate and connected to said member for moving said member relative to said face plate.

9. A shower bath spray head comprising a bell shaped shell having a circular opening at its large end, a face plate normally closing said opening and having a multiplicity of spray orifices formed therein in successive sectors, the spray orifices in adjacent sectors being of different cross-sectional area, a flow obstructing member having a plurality of angularly spaced imperforate sectoral flat blades arranged in said shell in a plane parallel to the plane of said face plate and substantially in contact with the inner side of said face plate, and a handle at the outer side of said face plate and connected to said member for moving said member relative to said plate to vary the discharge therethrough.

10. A shower bath spray head comprising a bell shaped shell having a wall at its larger end formed with a multiplicity of spray orifices in successive sectors, the spray orifices in adjacent sectors being of different cross-sectional area, a flow obstructing member having a plurality of angularly spaced imperforate sectoral blades arranged in said shell in a plane parallel to the plane of said wall and substantially in contact with the inner side thereof, a handle at the outer side of said wall and connected to said member for moving said member relative to said wall, and means on the inner side of said wall limiting the movement of said member relative thereto.

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