Oct. 10, 1933. J. M. DONAHUE 1,930,227

SHOWER HEAD

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Fig. 1.

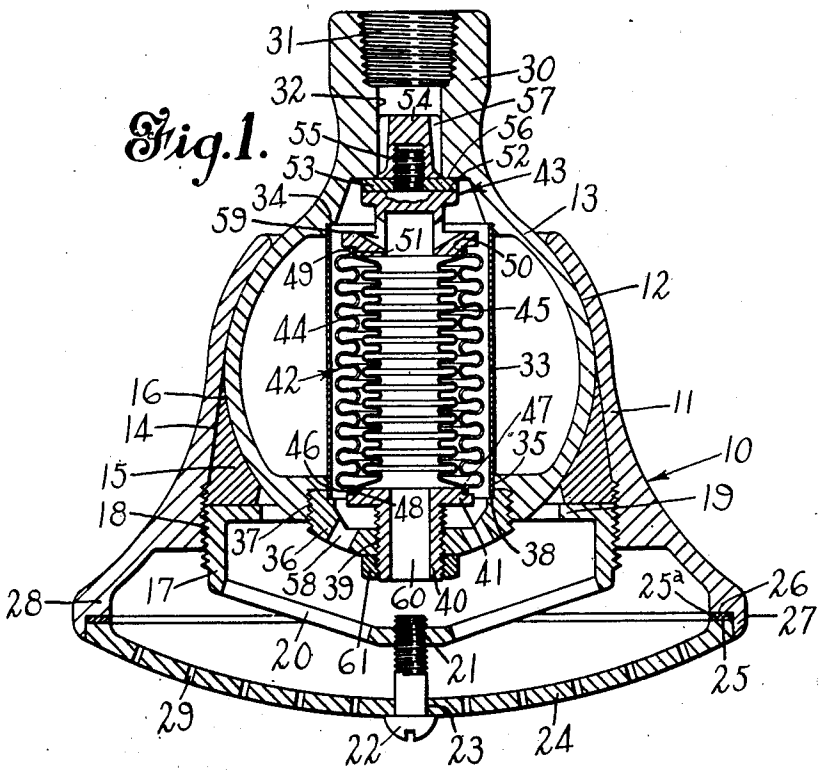
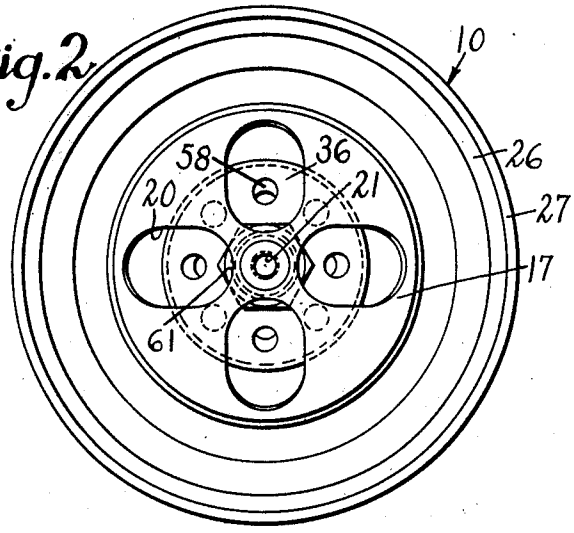


Fig. 2.



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Fig. 3.

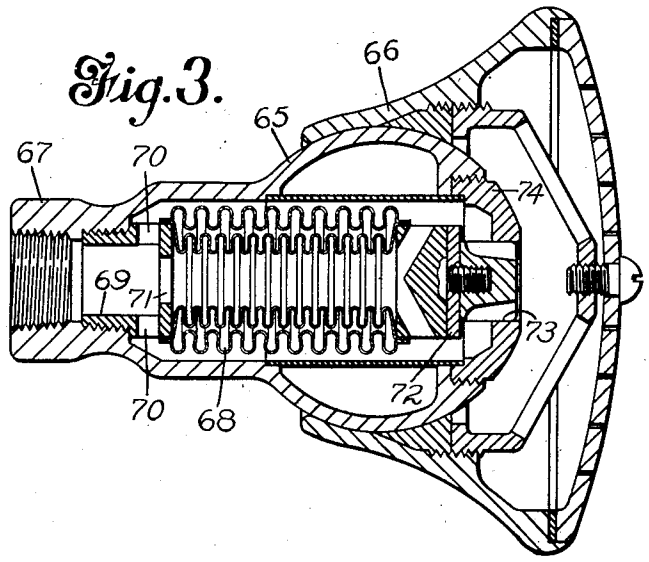
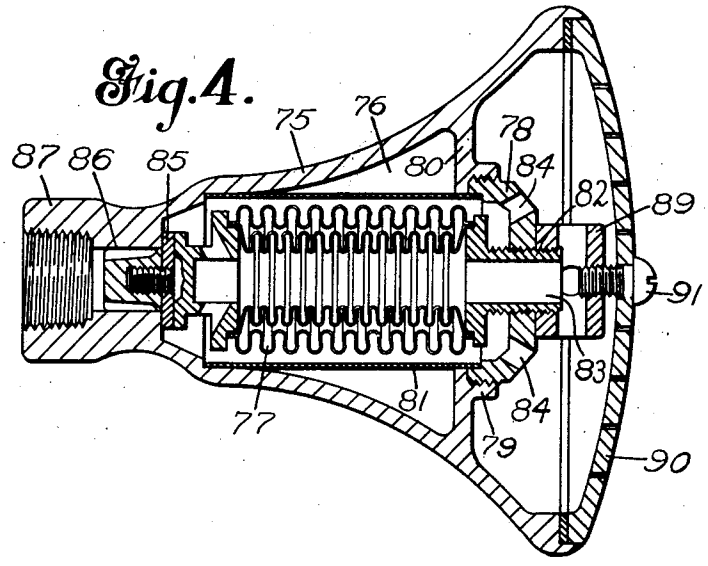


Fig. 4.



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UNITED STATES PATENT OFFICE

1,930,227

SHOWER HEAD

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Application October 22, 1931. Serial No. 570,299

8 Claims. (Cl. 236—93)

My invention relates to a shower head, and more especially to a plumbing fixture by means of which water may be discharged in the form of a spray for bathing or other purposes.

One of the main objects of the invention is to provide a shower head for head or body showers or the like, wherein the flow of water may be varied or cut off upon the temperature thereof varying beyond a predetermined degree.

In a more specific aspect, it is an object of the invention to provide a shower head capable of automatically cutting off the flow of water when the temperature of the same exceeds a predetermined amount, thereby preventing a bather from becoming scalded.

Another object of the invention is to provide a relatively simple form of shower head capable of angular adjustment and which may be readily taken apart for cleaning or adjustment purposes.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the drawings:

Fig. 1 is a cross-sectional view showing a shower head according to my invention;

Fig. 2 is an end view on a slightly reduced scale, the spray head of the shower head being removed to show details of the interior construction;

Fig. 3 is a cross-sectional view of a modified form of my invention, and

Fig. 4 is a cross-sectional view showing a further modification.

Referring then to the drawings in which I have illustrated my invention by showing a preferred embodiment of the same, the reference numeral 10 indicates, in general, the improved shower head which, in this instance, takes the form of a generally bell-shaped body 11, having a socket 12, in which is received a generally hollow spherical ball 13 the latter in conjunction with the body 11 forming a ball and socket joint. From the socket 12 the interior surface of body 11 tapers outwardly, as at 14, and between the ball 13 and surface 14 is ring packing 15, having a relatively thin end portion 16 adapted to be forced into the tapering space between the surface 14 and the ball 13 by a threaded plug 17, mounted in a threaded opening 18 near the end of body 11.

The threaded plug 17 is somewhat saucer-shaped and is provided at its inner end with an inwardly directed flange 19 bearing against packing 15, and at its outer end is provided with a plurality of openings 20 for the passage of water, and a threaded opening 21 in which is mounted a screw 22 passing through opening 23 in face plate 24 and serving to hold the latter on body 11. In the present instance the plate 24 is provided adjacent its periphery with an upwardly facing annular surface 25 and the body 11 is provided at its lower edge with a downwardly facing annular surface 26 and an annular flange 27 projecting downwardly from the surface 26 and surrounding the same. A washer or ring packing 25^a is placed between the opposed surfaces 25 and 26 when the parts are assembled to prevent leakage of water. It will be apparent that when the screw 22 is threaded in the opening 21, the plate 24 will be drawn upwardly against the lower end 28 of the body 11 and the packing ring 25^a will be compressed between the surfaces 25 and 26 to make a water-tight joint. As the plate 24 is arch shaped in cross-section, tightening of the screw 22 will tend to distort the central portion of this plate if it is made of light material. Due to the fact that the peripheral edge of the plate is confined within the annular shoulder 27, it will be prevented from spreading or being forced outwardly, and distortion of the plate due to the tightening of the screw 22 will be prevented.

The head 24 is provided with a number of water discharge openings 29 by means of which the usual spray is produced. Ball 13 is provided with a stem 30, threaded at 31 for reception on a waterpipe or the like, stem 30 having a bore 32 through which water passes into the interior of the ball, thence, generally speaking, through the openings 20 in sleeve or plug 17, and through openings 29 in plate 24.

In assembling the shower head, the ball 13 is dropped into socket 12 through the large end of body 11, the packing 15 being placed in position between surface 14 and ball 13, the sleeve 17 threaded into body 11 to force the packing against the ball 13 and surface 14. The packing 25^a being assembled in groove 25, the plate 24 is mounted on the end of body 11 and secured in place by screw 22. It will be readily understood that the nut 17 may be utilized to force the packing 15 as tightly as is necessary against the ball 13 and surface 14.

A feature of the invention resides in an arrangement wherein the passage of water through the shower head may be readily controlled, and a suitable means to this end adapted to cut off the passage of water when the temperature reaches a predetermined amount and thereby prevent scalding of a bather, will now be described.

Mounted within the interior of ball 13 is a

tubular member 33 one end of which bears against shoulder 34 and the other end of which fits tightly in and passes outwardly through opening 35, to be engaged by a threaded plug 36, mounted in threaded opening 37 of ball 13, and having a shoulder 38 bearing against the end of tubular member 33. The plug 36 is provided with an axially directed threaded opening 39, in which a sleeve 40 is received, the sleeve 40 being provided at its inner end with a radially directed annular flange 41 on which is mounted a thermostatic bellows, generally indicated by the reference numeral 42, the opposite end of the bellows being secured to a valve, generally indicated by the reference numeral 43, and adapted to control the passage of water through the bore 32.

The thermostatic bellows herein takes the form of a pair of collapsible cylindrical walls 44 and 45, mounted one within the other and having their corresponding ends 46 and 47 sealed together on a shoulder 48 of flange 41, while the opposite ends 49 and 50 are sealed together on a shoulder 51, of valve 43. The valve 43 is provided with a flat upper face 52, on which is mounted disk packing 53 of leather or other suitable material, packing 53 being secured on face 52 by a valve stem 54, threaded on stud 55, integrally formed with respect to valve 43 and extending axially through the packing, the latter seating against a face or valve seat 56, on ball 13 at the inner end of bore 32. The stem 54 is grooved at 57 to provide for the passage of water when the valve packing is moved away from seat 56, the water passing downwardly between the wall 44 and tube 33, and thence through openings 58 in plug 36, and through openings 59 in valve 43, through the space within the wall, and through a relatively large axially extending opening 60 in sleeve 40. The valve 43 may be adjusted with respect to seat 56 by rotation of sleeve 40 in plug 36, and held in any position of adjustment by means of nut 61, mounted on sleeve 40 and bearing against plug 36. It will be readily understood that the space between the walls 44 and 45 is partially or wholly filled with an expansible fluid.

As the water passing around the walls 44 and 45 increases in temperature, the expansible fluid within the bellows expands moving the valve 43 in the direction of seat 56, the adjustment of the valve being such that when the temperature of the water reaches a predetermined amount the valve packing 53 will be held against seat 56 with sufficient force to cut off the supply of water passing through the fixture, the position of the valve at this time being indicated in Fig. 1 of the drawings, it being understood that when water of normal temperature flows through the fixture the valve packing 53 will be moved away from seat 56.

In Fig. 3 I have shown a somewhat modified form of the invention wherein the ball 65 and the body member 66 are considerably reduced in size with respect to the upper threaded stem 67. In this instance, the thermostatic bellows 68 is secured to a hollow nut 69 which is threadedly engaged in the bore of the stem 67. Openings 70 and 71 are provided in the nut 69 to permit the passage of water therefrom.

To the lower end of the bellows 68 is secured a valve 72, which cooperates with an opening 73 in a threaded plug 74, mounted in the lower end of the ball member 65. In this instance, the thermostatic bellows is secured at its inner end instead of at the outer end, and the thermostatically controlled valve 72 cooperates with a port at the outlet end of the ball member 65.

In Fig. 4 of the drawings I have shown a further modification wherein the ball and socket joint in the shower head has been omitted. In this instance, the body member 75 is provided with a chamber 76 within which is disposed the thermostatic bellows 77. A plug 78 is threadedly secured in the flange 79 of a web 80 at the bottom of the chamber 76.

The web 80 is provided with an opening within which is positioned the sleeve 81 surrounding the bellows 77, this opening lying within the flange 79. The lower end of the bellows is secured to a hollow nut 82, threaded in the plug 78, the nut being provided with an opening 83 for the passage of water, and the plug also being provided with openings 84 for this purpose.

At the upper end, the thermostatic bellows has secured thereto a valve member 85, which cooperates with the inlet opening 86 in the stem 87 to control the entrance of water to the body member 75. A nut 89 is secured upon the nut 82, and to the nut 89 is secured a face plate 90 by means of the screw 91. It will, of course, be obvious that in this form of my invention the thermostatic bellows may be secured at its inner end and the valve 85 arranged to cooperate with a port in the plug 78, if such an arrangement is desired.

While I have shown and described some preferred embodiments of my invention, it will be understood that it is not to be limited to the details shown but is capable of modification and variation within the spirit of the invention and the scope of the appended claims.

What I claim is:

1. In a shower bath fixture, the combination of a hollow body having a socket, a hollow ball mounted in said socket through which fluids pass into the body, and means within said ball for controlling the flow of water therethrough according to the temperature thereof.

2. In a shower bath fixture, the combination of a hollow body having a socket, a hollow ball mounted in said socket through which fluids pass into the body, and means within said ball for cutting off the flow of water when the temperature thereof reaches a predetermined amount.

3. In a shower bath fixture, the combination of a hollow body having a socket, a hollow ball mounted in said socket, a valve mounted in said ball, and a thermostat for controlling the operation of the valve.

4. In a shower head, a hollow body provided at one end with a hemispherical socket, a hollow ball mounted within said socket, means cooperating with said body and ball to hold the latter in said socket for pivotal movement of the body thereon, and means carried within said ball for controlling the flow of water therethrough.

5. A shower head having a fixed portion through which the water flows, and an adjustable portion mounted for pivotal movement upon the fixed portion, said fixed portion being hollow and having means mounted therein to control the flow of water therethrough, said means comprising a valve and a thermostat to control said valve.

6. A shower head comprising a member adapted to be fixedly secured to an outlet, and a second member adjustably connected to the first member for pivotal movement with respect thereto, said first member being hollow and having inlet and outlet openings to permit the flow of water

therethrough, and means mounted within said first member to control said flow, said means comprising a thermostatic bellows secured to the member, and a valve carried by said bellows and adapted to cooperate with one of said openings.

7. In a shower bath fixture, the combination of a hollow body having a socket, a hollow ball member mounted in said socket and having a neck extending without the socket, there being openings at each end of the ball member, a support member mounted within the ball member at one of said openings, a valve and a controlling thermostat therefor carried by said support, and said valve controlling the flow of water through the other opening.

8. In a shower bath fixture, the combination of a hollow body having a socket, a hollow ball member mounted in said socket and having a neck extending without the socket, there being openings at each end of the ball member, a support member mounted within the ball member at one of said openings, a collapsible bellows carried by said support member, a valve carried at one end of said bellows, said valve cooperating with the other of said openings to control the flow of water therethrough, and said bellows being responsive to temperature of the water flowing through the ball member.

JOHN M. DONAHUE.