July 9, 1968 F. M. NASH 3,391,870

DISCHARGE FITTING ASSEMBLY

Filed Oct. 11, 1965 2 Sheets-Sheet 1

Fig. 1.

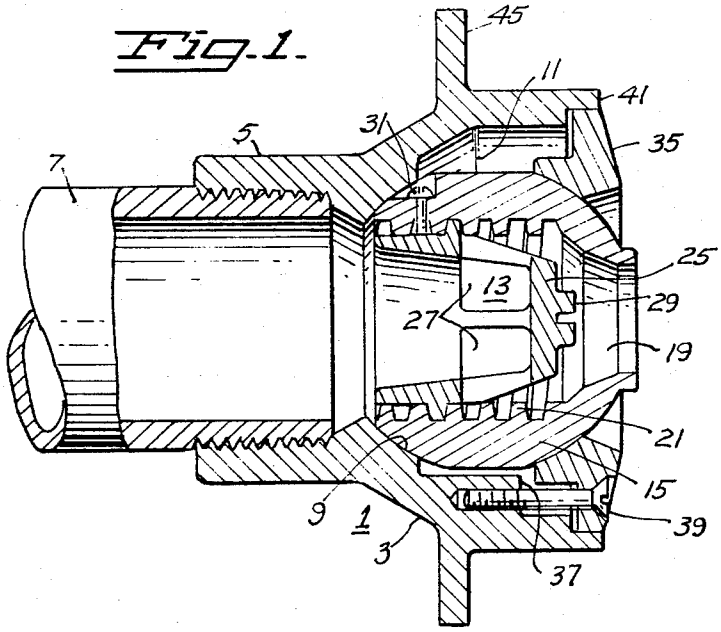
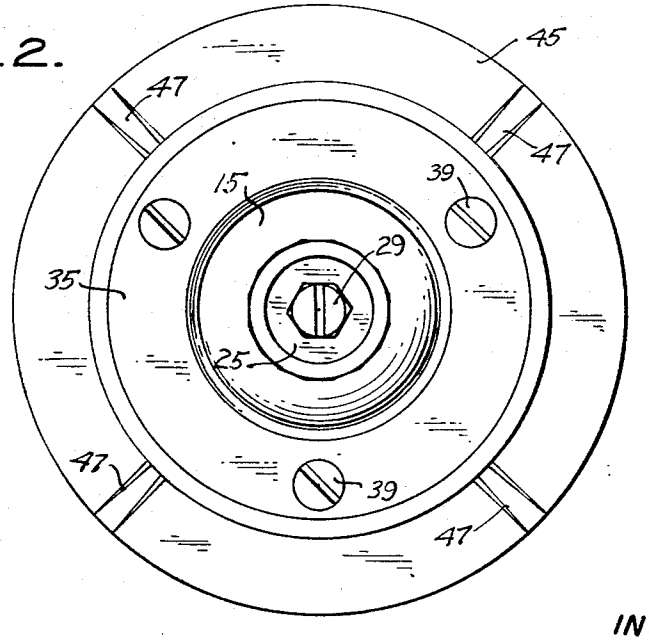


Fig. 2.



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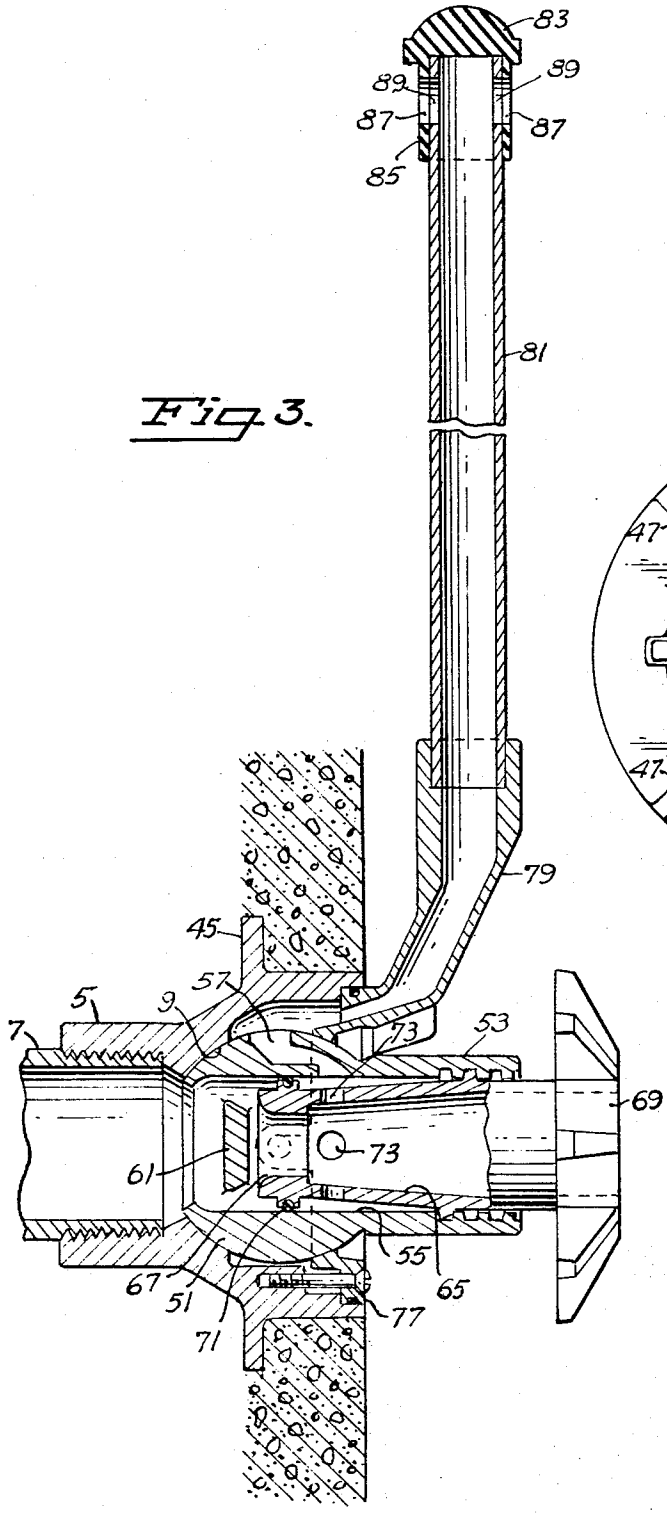

Fig. 3.

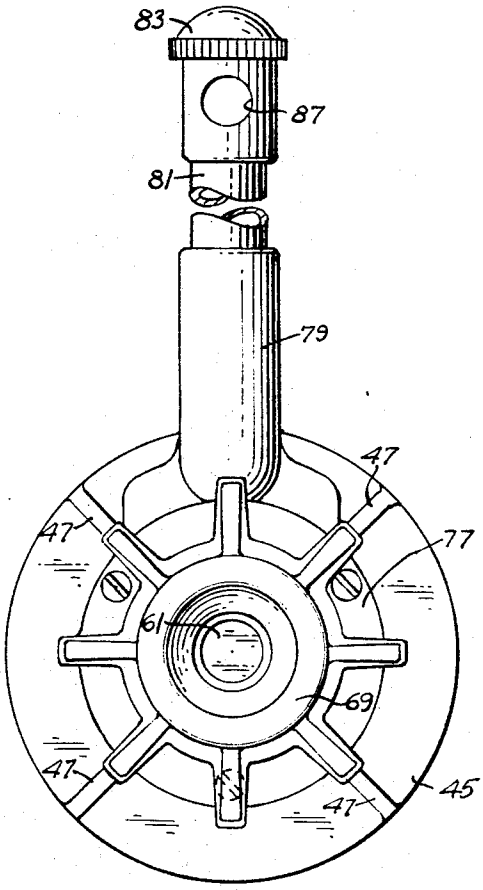

Fig. 4.

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DISCHARGE FITTING ASSEMBLY

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9 Claims. (Cl. 239—417.3)

ABSTRACT OF THE DISCLOSURE

A flow line to a swimming pool, terminates in the pool wall, in a socket fitting adapted for interchangeable installation of a discharge nozzle to form a discharge nozzle assembly for pool installations, capable of conversion to therapeutic assembly, whereby one assembly may readily be converted to the other.

My invention relates to pool installations having a fitting for discharge of water into the pool, and more particularly to a fitting having a built in volume flow control.

Such fittings are normally designed to provide a jet stream to establish and maintain a surface movement pattern, whereby to stimulate movement of floating debris in the direction of an installed skimmer, to effect removal of such debis. Available fittings for such purposes, suffer from the drawback that when throttled down, the jet action is correspondingly reduced, which is undesirable.

Among the objects of my invention are:

(1) To provide a novel and improved discharge fitting assembly for pool installations;

(2) To provide a novel and improved discharge fitting assembly for pool installations, having volume flow control means which permits volume flow adjustment without sacrificing jet action;

(3) To provide a novel and improved discharge fitting assembly for pool installations, which enables directional control of the jet stream therefrom;

(4) To provide a novel and improved discharge fitting assembly for pool installations, capable of conversion to a hydrotherapeutic installation;

(5) To provide a novel and improved discharge fitting assembly capable of being formed of molded nonmetallic components.

Additional objects of my invention will be brought out in the following description of a preferred embodiment of the same, taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a longitudinal view in section through a discharge fitting assembly of the present invention;

FIGURRE 2 is a front view in elevation of the fitting assembly of FIGURE 1;

FIGURE 3 is a view, corresponding to that of FIGURE 1, illustrating the fitting assembly as converted to a hydrotherapeutic installation; and

FIGURE 4 is a front view in elevation of the hydrotherapeutic installation of FIGURE 3.

Referring to the drawings for details of my invention in its preferred form, the discharge fitting assembly illustrated comprises a housing 1 including a socket 3 and hollow tail extension 5 internally threaded for connection to a pipe 7.

The socket has a chamber defined by a spherical surface area 9 adjacent to and surrounding the hollow tail extension, with the balance 11 of the chamber to the mouth thereof, being of greater radii than the said spherical surface area 9, thus creating an enlargement of the chamber at and adjacent the entrance thereof.

The socket is adapted to receive a ball valve assembly 13 within the said chamber, such assembly including a ball valve body 15 of a diameter to provide a complementary fit with the aforementioned spherical surface

area, and having a flow passageway therethrough in flow communication with the hollow tail extension. At its exposed end, such flow passageway tapers to form a nozzle 19 for discharge of a jet stream.

That portion of the passageway to the rear of the nozzle is provided with a thread 21 to threadedly receive a hollow valve insert 25, formed with flow openings 27 in the wall thereof, threaded installation enabling adjustment of the valve insert with respect to the tapered end or nozzle end of the passageway to permit adjustment of flow through the nozzle without sacrificing jet action, to the point of shutoff.

To permit of such adjustment conveniently, the tip or accessible end of the valve element is formed with the equivalent of a screw head 29, whereby, with the aid of a screw driver inserted through the nozzle end of the ball valve body, the valve element in question may be rotated to cause it to advance or retreat with respect to the nozzle surface, thereby to alter the effective discharge opening.

The valve element is inserted into the ball valve body from the rear, and to thereafter limit the maximum opening adjustment at the nozzle and at the same time preclude accidental disassembly of the valve element from the ball valve body during adjustment in the direction of maximum opening, a screw 31 installed in the ball valve body so as to emerge between threads thereof at a point behind the threads of the valve element, will perform this function.

Means are provided for retaining the ball valve assembly in the socket chamber, such means in the preferred embodiment of my invention, taking the form of a retainer ring 35 affixed to the front edge of the socket and offering a complementary fit with the ball valve body. To effect such installation of the retainer ring, the housing is preferably formed with a plurality of screw receiving bosses 37 in the enlarged portion of its chamber, beyond the reach of the ball valve body, and the retainer ring is held in frictional contact with the ball valve body by suitable retaining screws 39 passing therethrough and anchored in such bosses. The front edge 41 of the socket is preferably recessed to receive said retainer ring with sufficient clearance to permit of such frictional contact with the ball valve body.

For installation purposes in the wall of a pool, the housing is preferably formed with a peripheral anchoring flange 45 braced by suitable front buttress flanges 47 and rear flanges, if desired which flanges will serve to positively anchor the assembly in a pool wall, and preclude any possibility of the same angularly rotating from its installed position following such installation.

The fitting assembly as thus described above, is adjustable both as to direction and as to volume. As to its volume adjustment, it is important to note, that such change in volume of discharge is effected without sacrificing jet action.

The above described discharge fitting assembly offers the additional and important advantage that it lends itself to conversion to a hydrotherapeutic assembly, capable of performing the function of hydromassage units capable of discharging an aerated jet stream.

Toward this end, I provide an assembly adapted to take the place of the ball valve assembly, and such includes a ball valve body 51 of a size to provide a complementary fit with the sperical surface area 9 of the socket, and having a forward cylindrical extension 53 integral therewith, with a passageway 55 through said ball valve body and extension. An air intake passageway or passageways 57, are formed through the ball valve body and in communication with the passageway 55 therethrough.

Flow of water through the ball valve body and extension is made adjustable by means including an element 61 supported within the ball valve body and having a conical

surface facing in the direction of the extension, and a venturi **65** having a tapered entrance **67**, said venturi being adjustatbly threaded into said extension with the tapered entrance terminating in proximity to said element **61**.

A control knob **69** affixed to the exposed end of the venturi, enables rotation of the venturi to effect adjustments in the spacing between the aforementioned element **61** and the tapered inlet to the venturi.

To assure full flow of water through the venturi, the venturi is formed with an elevated channel provided with an O-ring seal **71** in proximity to the inlet end of the venturi. In the installed position of the venturi, such O-ring will engage the wall of the passageway through the ball valve body, in a region between the aforementioned element **61** and the inner ends of the air intake passageways **57**, and to assure of mixture of such air with the water flowing through the venturi, the venturi is provided with a plurality of peripheral openings **73**.

The range of adjustment of the venturi may, if desired, be limited by a pair of pins (not shown) inserted through the ball valve body to project slightly into the passageway **55** to either side of the elevated channel in which the O-ring is installed. This serves the added function of preventing complete withdrawal of the venturi, or the jamming of the same against the element **61**.

The ball valve element and extension, with the venturi installed therein, is retainable in functional position within the socket by a retainer ring **77** similar to that employed in the directional fitting assembly of FIGURE 1, except that the retainer ring for use in the hydrotherapeutic installation, is provided with an air intake nozzle **79** extending upwardly from the ring and adapted to receive and support in vertical position, a snorkel tube **81**. This snorkel tube carries a rotatable cap **83** including a depending skirt having side openings **87** adapted, upon rotation of the cap to align with corresponding openings **89** in the snorkel tube. By rotating the cap, air intake into the venturi may be adjusted from zero to maximum as represented by the full exposure of the openings **89**. In this manner, aeration of the water flow through the venturi may be adjusted to satisfy desired conditions.

While the components of the above described assemblies might be manufactured of suitable metals and alloys, they lend themselves to fabrication by molding, utilizing available plastics for the purpose.

From the foregoing description of my invention in its preferred form, it will be apparent that the same fulfills the objects attributed thereto, and while I have illustrated and described the same in considerable detail, I do not desire to be limited in my protection to the specific details illustrated and described except as may be necessitated by the appended claims.

I claim:

1. A dicharge fitting assembly comprising a housing including a socket and means for connection of said housing to a pipe, said socket having a chamber defined by a spherical surface area adjacent said connection means, with the balance of said chamber to the mouth thereof, of greater radii than said spherical surface area, a ball valve assembly in said chamber, including a ball valve body in complementary fit with said spherical surface area and having a flow passageway therethrough and tapering at its exposed end to form a nozzle for discharge of a jet stream, and a valve insert adjustably mounted for axial travel in said passageway to enable adjustment of said valve insert with respect to said tapered end, to permit adjustment of flow through said nozzle without sacrificing jet action, means retaining said ball valve assembly in said chamber, said means including a retainer ring at the front edge of said socket and having a complementary fit with said ball valve body, means for limiting maximum adjustment of said valve insert in the direction away from said tapered end of said ball valve body, and means interchangeable with said ball valve assembly for converting said discharge fitting assembly to a hydrotherapeutic assembly.

2. A discharge fitting assembly in accordance with claim **1**, characterised by said converting means including a ball valve body of a size to provide a complementary fit with the spherical surface area of said socket, and an extension thereto, a passageway through said ball valve body and extension, an air intake passageway through said ball valve body and in communication with the said passageway, and means for adjusting liquid flow through said ball valve body and extension.

3. A discharge fitting assembly in accordance with claim **2**, characterised by said adjustable flow means including an element supported within said ball valve body and having a conical surface facing said extension, and a venturi adjustably threaded into said extension with its inner end in proximity to said element, and means for both retaining said ball valve body in said socket and conducting air to said air intake passageways, and means for rotating said venturi about its axis to adjust the same with respect to said element.

4. A discharge fitting assembly in accordance with claim **3** characterised by said retaining and air conducting means including a retaining ring affixable to the front edge of said socket and adapted to provide a complementary fit with said ball valve body, and an air intake tube extending upwardly from said retaining ring and having communication with the interior of said socket.

5. A discharge fitting assembly comprising a housing including a socket and hollow tail extension for connection of said housing to a pipe, said socket having a chamber defined by a spherical surface area adjacent said hollow tail extension, with the balance of said chamber to the mouth thereof, of greater radii than said spherical surface area, a ball valve assembly in said chamber, including a ball valve body in complementary fit with said spherical surface area and having a flow passageway therethrough in flow communication with said hollow tail extension, to provide for discharge of a jet stream, through a nozzle having a tapered end and means cooperating with the nozzle for adjusting flow through said ball valve assembly without sacrificing jet action, and means retaining said ball valve assembly in said chamber.

6. A discharge fitting assembly in accordance with claim **5**, characterised by that portion of said passageway to the rear of said nozzle having a thread, and a valve insert in said passageway and in threaded engagement with the threaded portion thereof, to enable adjustment of said valve insert with respect to said tapered end to permit adjustment of flow through said nozzle.

7. A discharge fitting assembly in accordance with claim **5**, characterised by said ball valve retaining means including a retaining ring applicable to the front edge of said socket and adapted to provide a complementary fit with said ball valve body.

8. A hydrotherapeutic assembly comprising a housing including a socket and hollow tail extension for connection of said housing to a pipe, said socket having a chamber defined by a spherical surface area adjacent said hollow tail extension, with the balance of said chamber to the mouth thereof, of greater radii than said spherical surface area, a ball valve body of a size to provide a complementary fit with the spherical surface area of said socket and an extension thereto, a passageway through said ball valve body and extension, an air intake passageway through said ball valve body and in communication with said passageway, means for adjusting liquid flow through said ball valve body and extension, and means for retaining said ball valve body in said socket, said means including a retaining ring applicable to the front edge of said socket, an air intake nozzle affixed to and extending upwardly from said retaining ring and having a flow passage in flow communication with said air intake passage through the ball

valve body, and a snorkel tube extending upwardly from said nozzle.

9. In combination, a housing for installation in the wall of a swimming pool or the like, said housing including a socket and means for connection of said housing to a pipe, said socket having a chamber defined by a spherical surface area adjacent said connecting means, with the balance of said chamber to the mouth thereof, of greater radii than said spherical surface area, a ball valve assembly and a therapeutic device, interchangeably installable in said housing to form respectively, a discharge fitting assembly and a hydrotherapeutic assembly, said ball valve assembly including a ball valve body of a radius enabling a complementary fit with said spherical surface area, and having a flow passageway therethrough tapering at its exposed end to form a nozzle for discharge of a jet stream, and a valve insert adjustably mounted for axial travel in said passageway to enable adjustment of said valve insert with respect to said tapered end, to permit adjustment of flow through said nozzle and means for retaining said ball

valve assembly in said chamber; said hydrotherapeutic device including a ball valve body of a radius to provide a complementary fit with the spherical surface area of said socket and an extension thereto, a passageway through said ball valve body and extension, an air intake passageway through said ball valve body and in communication to said passageway, and means for adjusting liquid flow through said ball valve body and extension, and means for retaining said ball valve body in said socket.

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