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(54) **A swimming pool bottom flushing device**

(57) The device comprises a tubular arrangement attached to the pipe arranged at the swimming pool bottom, and a water ejector nozzle axially fitted into said supporting arrangement in a freely rotatable, vertically shiftable arrangement. The device is characterized in that the nozzle supporting arrangement comprises a socket attached to the inside of the pipe and does also incorporate a fitted-in ball-bushing housing the nozzle. The nozzle is formed by an open-ended tubular body provided at least with one opening in its periphery, said tubular body being at its open top fitted with a tubular, rotationally positionable plug peripherally provided with openings of different diameters provided to selectively face the openings of the tubular body in order to control the outflow of the water jet being ejected for the flushing of the swimming pool bottom.

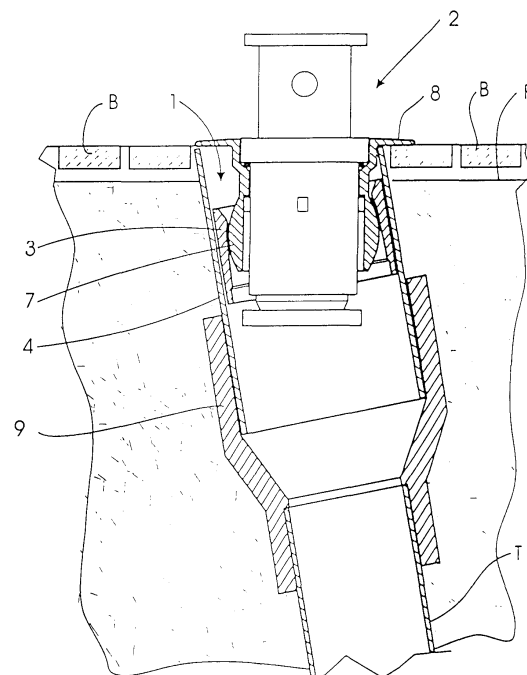


Fig. 5

Description

[0001] The present invention relates to a swimming pool bottom flushing device.

[0002] This device is of the type comprising a tubular supporting arrangement glued to the PVC pipe arranged at the swimming pool bottom, and a nozzle axially fitted into said supporting arrangement in a freely rotatable, vertically shiftable arrangement, said nozzle laterally having at least one orifice through which water is ejected to flush the swimming pool bottom, means being provided between the supporting arrangement and the nozzle to determine the intermittent, partial rotation of the nozzle.

[0003] This kind of devices require the water delivery pipe to which the nozzle supporting arrangement is fitted to be laid exactly at right angles to the swimming pool bottom, since otherwise said supporting arrangement and the nozzle would be fitted up in an inclined arrangement thus hampering the flushing action to be exerted by the device since the water jets ejected from the nozzle would not properly flush the swimming pool bottom.

[0004] It is at present very difficult to achieve said accuracy since the installation of all the necessary devices at the swimming pool bottom must be carried out before the concreting of said bottom, and the water delivery pipes must be perfectly positioned and must maintain said perfect positioning all along the concrete pouring process.

[0005] This entails long labour hours and the use of various accessories to maintain the perpendicular arrangement of the pipes, it being even in spite of this very difficult to obtain a perfect installation.

[0006] It is the object of this invention to provide a device allowing to perfectly and in a simple, quick and inexpensive way fit the supporting arrangements and their nozzles to the water delivery pipes.

[0007] This device does for such a purpose comprise a supporting arrangement formed by a ball-bushing fitted into a socket attached to the water delivery pipe, said nozzle being fitted into said ball-bushing.

[0008] In this way the nozzle will always be fitted at right angles to said bottom even if said pipe is finally laid in an inclined arrangement with respect to the swimming pool bottom.

[0009] The socket attached to the pipe has on its inner surface alternate, longitudinal protrusions of which some have a concave profile in the vicinity of one of the socket's openings, whereas the other protrusions have said concave profile in the vicinity of the opposite one of both socket's openings, the ball-bushing being fitted between said protrusions and externally having an all-around flange fitting on the open top of the water delivery pipe and on the surfacing of the swimming pool bottom.

[0010] Also characteristic of this device is the fact that the nozzle comprises a fitted-in upper, tubular plug arranged as per a rotationally positionable arrangement and laterally having openings of different diameters pro-

vided to selectively face at least one opening of the nozzle's tubular body in order to control the flow rate and pressure of the water jet ejected for the flushing of the swimming pool bottom.

[0011] The construction of said tubular body of the nozzle allows to indifferently fit it, through the use of corresponding means, with a spring or a weight provided to urge said tubular body downwards in its vertically shifting motion.

[0012] Said tubular body is inserted into a bushing fitted into the tubular supporting arrangement supporting the nozzle, said tubular body on its periphery having lugs extending between alternate projections projecting as per an inclined plane from the inner periphery of said bushing in order to thus obtain its intermittent rotation as it shifts vertically.

[0013] A safety element has been provided in order to disengageably engage the top plug with the tubular body of the nozzle.

[0014] This device is in a practical and safe way arranged for the attachment of the swimming pool bottom surfacing in those cases having for such a surfacing a sheet for example of plastics material.

[0015] The tubular supporting arrangement comprises at its open top a collar exteriorly extending into a peripheral flange having embedded in it several nuts each of them threadingly engaging a respective screw clamping a ring on said flange for the retention of the swimming pool bottom surfacing sheet between said ring and flange, said sheet being for such a purpose provided with the corresponding openings.

[0016] The surfacing sheet is applied on a sealing washer placed on the flange of the tubular supporting arrangement and provided with orifices for the passage of said screws.

[0017] These and other characteristics will be best made apparent by the following detailed description whose understanding will be made easier by the accompanying five sheets of drawings showing practical embodiments cited only by way of examples not limiting the scope of the present invention.

[0018] In the drawings:

Figs. 1 and 2 show in a partly-sectioned elevation the fitting of the ball-and-socket joint supporting arrangement into the water delivery pipe with this latter having been laid in a perpendicular or in an inclined arrangement with respect to the swimming pool bottom, respectively,

Fig. 3 illustrates in an elevational view the arrangement of the ball-bushing in order to be fitted into the socket completing the ball-and-socket joint,

Fig. 4 shows in a sectional elevation the fitted-together arrangement of said socket and ball-bushing,

Fig. 5 is a sectional elevation of the assembly forming the device installed at the bottom of a swimming pool, with the water delivery pipe arranged in an in-

clined arrangement,

Figs. 6 and 7 show in a sectional elevation the assembly forming this device equipped with a spring or with a weight, respectively,

Fig. 8 shows in an exploded, elevational view the components of the spring-biased nozzle,

Fig. 9 illustrates the tubular body of the nozzle provided to be equipped with a weight,

Fig. 10 is a sectional elevation of the bushing provided to be freely fitted around the tubular body of the nozzle,

Fig. 11 shows in a sectional elevation the assembly forming this device for the attachment of the swimming pool bottom sheet surfacing,

Figs. 12 and 13 illustrate in a sectional elevation the device of Fig. 11 fitted to the bottom of a swimming pool with the water delivery pipe arranged as per an inclined and a vertical arrangement, respectively, and

Fig. 14 shows in a perspective, exploded view the tubular supporting arrangement of Fig. 11.

[0019] According to the drawings the swimming pool bottom flushing device comprises a tubular supporting arrangement 1 attached to the bottom F of a swimming pool, and a nozzle 2 with at least one lateral opening provided to eject the water, said nozzle being axially fitted into said supporting arrangement in a freely rotatable, vertically shiftable arrangement.

[0020] Said supporting arrangement 1 comprises a socket 3 having a cylindrical outer surface through which it is attached by means of glue to the inside of the water delivery pipe 4, said socket having on its inner surface longitudinal protrusions 5 and 5' arranged as per an alternate arrangement two by two, of which the former have a concave profile 6 in the vicinity of the open top of socket 3, whereas protrusions 5' have their concave profile 6' in the vicinity of the open bottom of said socket, a ball-bushing 7 being fitted between said protrusions and at its upper end forming an all-around flange 8 fitting on the open top of pipe 4 and on the surfacing of the swimming pool bottom F.

[0021] In Fig. 3 is shown how to arrange ball-bushing 7 in order to fit it into socket 3. The former is arranged in a coaxial arrangement as regards the latter, and is pressed in thus causing the top lips of protrusions 5' to resiliently yield due to their thinness.

[0022] In the case of said pipe 4 having an inclined arrangement with respect to the swimming pool bottom F (Figs. 2 and 5) the excess pipe portion projecting from said bottom will be cut off, and ball-bushing 7 will be tilted into an arrangement at right angles with respect to bottom F, nozzle 2 axially projecting from said ball-bushing to thus perfectly flush this bottom with the lateral water jets ejected from said nozzle.

[0023] The gluing of the ball-and-socket joint assembly in PVC pipe 4, together with the arrangement of flange 8 on the swimming pool bottom, determines

through self-centring the correct levelling of the device on said bottom.

[0024] By Fig. 5 can be seen how in spite of the inclined arrangement of pipe 4 ball-bushing 7 allows to properly arrange the tiles on swimming pool bottom F, said tiles in this case being stoneware tiles B or the like.

[0025] At 9 is shown a two-diameter coupling going from the diameter of a conventional pipe T to the diameter of pipe 4.

[0026] The nozzle is comprised of an open-ended tubular body 13 provided with at least one opening 14 in the upper region of its periphery, said nozzle being fitted at its open top 15 with a tubular, rotationally positionable plug 16 peripherally provided with two openings 17 and 17' of different diameters provided to selectively face the opening 14 of the tubular body in order to control the outflow of the water jet ejected for the flushing of the swimming pool bottom F, this latter being in this case flagged with stoneware tiles B or the like.

[0027] The selective fitting of plug 16 into tubular body 13 is obtained and secured by means of several bayonet locks 18 (Fig. 8), the inner periphery of said tubular body for such a purpose having the pertinent lugs 19 (Figs. 6 and 7).

[0028] Tubular body 13 is freely fitted into a bushing 20 fitted through bayonet coupling by means of four equispaced lugs 21 into the tubular supporting arrangement 1 provided to support the nozzle, said tubular body on its outer periphery also comprising four equispaced lugs 22 extending between alternate projections 23 projecting as per an inclined plane (Fig. 10) from the inner periphery of said bushing in order to thus obtain its intermittent rotation as it is vertically shifted upwards as per arrow D (Fig. 7) by virtue of the water pressure.

[0029] When the water pressure lessens the downward vertical shifting motion of tubular body 13 is indifferently achieved by means of a spring 24 (Figs. 6 and 8) or by means of a weight 25 (Figs. 7 and 9).

[0030] Spring 24 is arranged around said tubular body and between a peripheral flange 26 of the open bottom 27 of said body and a step 28 of the inner periphery of bushing 20 (Fig. 10).

[0031] Weight 25 is tubular and is inserted into tubular body 13 thereby being inferiorly retained by means of a ring 29 fitted through bayonet coupling at 30 to the open bottom 27 of said tubular body, said ring for such a purpose having two opposed lugs 31 (Fig. 9).

[0032] A seal 32 is arranged on top of flange 26 of tubular body 13.

[0033] In order to prevent top plug 16 from being accidentally disengaged from the nozzle's tubular body 13 (said disengagement possibly causing components of the nozzle to fall into pipe 4) a safety element has been provided to engage said plug with said body, said safety element consisting in a resilient, split annular piece 16' tangentially extending into a stub 16". This annular piece is arranged inside plug 16 next to its top bottom thereby passing stub 16" through a lateral orifice 17" of

said plug, said stub thus projecting from said orifice to thereby fit into one of the four notches 13' provided at the open top 15 of tubular body 13 (Fig. 8). In order to unlock the safety element the free end of stub 16" will be pushed thereby causing said stub to be shifted into the inside of plug 16 due to the resilient yielding on the part of annular piece 16', this then allowing to actuate said plug in order to change its position by means of its bayonet locks.

[0034] In the case of said pipe 4 being fitted with this swimming pool bottom flushing device being arranged in an inclined arrangement with respect to said bottom the tubular supporting arrangement 1 will comprise a socket 3 and a bushing 7 forming a ball-and-socket joint in order to obtain the upward shifting motion of the nozzle's tubular body 13 at right angles with respect to the swimming pool bottom.

[0035] According to Figs. 11 through 14 this swimming pool bottom flushing device comprises a tubular supporting arrangement 1' and 1" attached to the bottom F of a swimming pool, and a nozzle 2 with at least one lateral opening for ejecting the water, said nozzle being axially fitted into said tubular supporting arrangement in a freely rotatable, vertically shiftable arrangement.

[0036] Tubular supporting arrangement 1' and 1" at its open top comprises a collar 33 exteriorly extending into a peripheral flange 8' having equispacedly embedded in it six nuts 34 each threadingly engaging a respective taper-headed screw 35 clamping a ring 36 on said flange 8', said ring being for such a purpose provided with respective countersunk orifices 37, the sheet L of plastics material to be used to cover the swimming pool bottom F being thus retained between said ring and flange, said sheet for such a purpose having the corresponding openings A.

[0037] Said surfacing sheet L will be advantageously applied on a sealing washer 38 placed on flange 8' of tubular supporting arrangement 1', 1", said washer being provided with the corresponding orifices 39 for the passage of said screws 35.

[0038] Tubular supporting arrangement 1' (Figs. 11, 12 and 14) consists of a ball-bushing 7' fitted into a socket 3' glued to the inside of pipe 4', this providing a shifting motion of nozzle 2 at right angles with respect to the swimming pool bottom even if pipe 4' is arranged in an inclined arrangement (Fig. 12). Socket 3' comprises an outer, concentric bushing 3" provided to increase its diameter to thus adapt it to the diameter of pipe 4' to which said socket is to be attached. This outer bushing 3" can form a one-piece structure with socket 3', or it can consist of an independent piece suitably fitted to said inner socket.

[0039] Tubular supporting arrangement 1" (Fig. 13) is formed by a bushing 3"" provided to be directly glued to pipe 4" since in this case the presence of a ball-and-socket joint is not necessary as said pipe is arranged in a perpendicular arrangement with respect to the swimming pool bottom F.

Claims

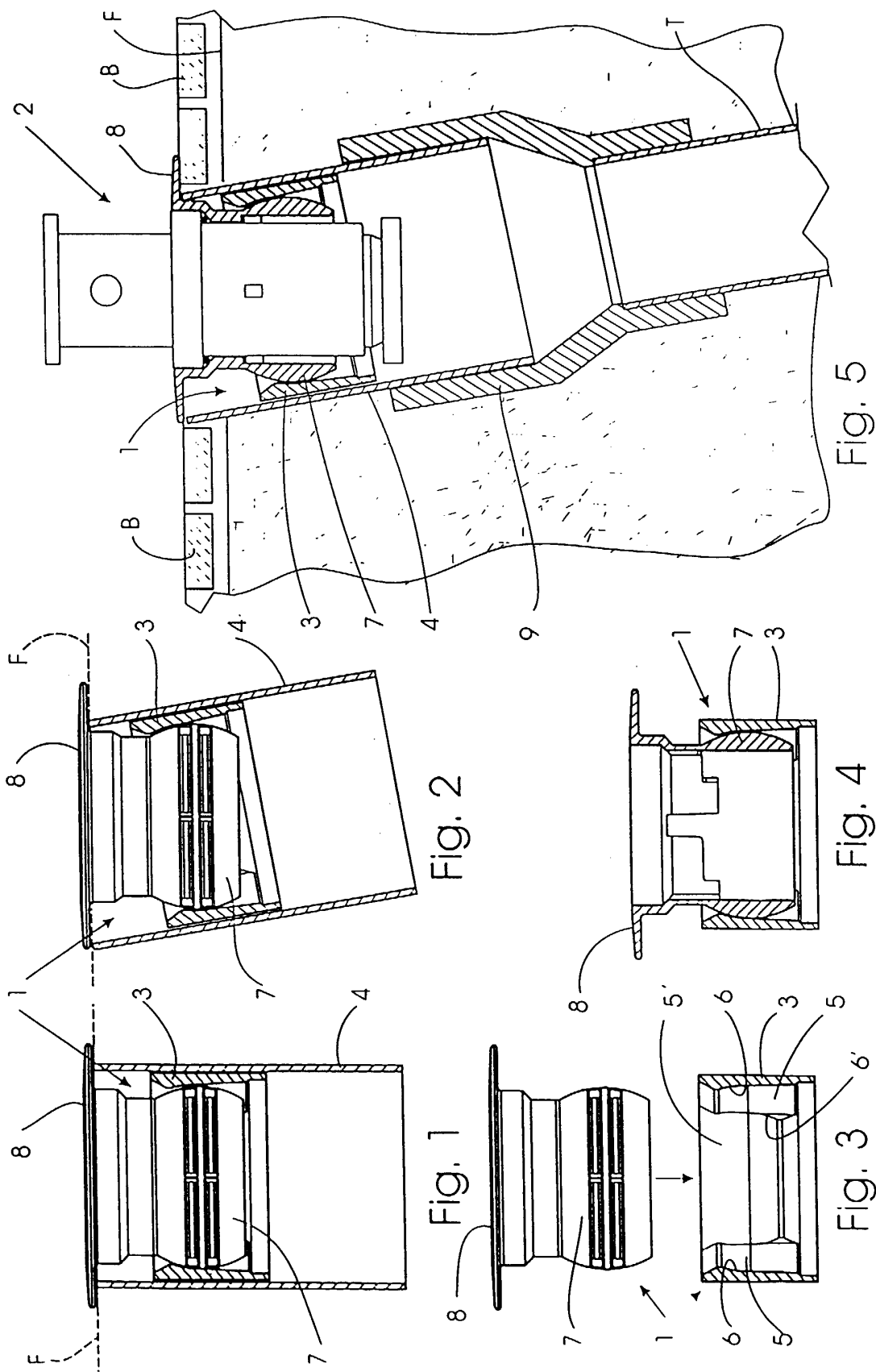
1. A swimming pool bottom flushing device comprising a tubular supporting arrangement attached to the pipe arranged at the swimming pool bottom, and a water ejector nozzle axially fitted into said supporting arrangement in a freely rotatable, vertically shiftable arrangement; characterized in that the nozzle supporting arrangement comprises a socket attached to the inside of the pipe and does also incorporate a fitted-in ball-bushing housing the nozzle.
2. A swimming pool bottom flushing device as per claim 1, characterized in that the socket has on its inner surface alternate, longitudinal protrusions some of which have a concave profile in the vicinity of one of the socket's openings, whereas the other protrusions have their concave profile in the vicinity of the opposed one of both socket's openings.
3. A swimming pool bottom flushing device as per claim 1, characterized in that the ball-bushing has at its top edge an outer all-around flange fitting on top of the pipe's open top.
4. A swimming pool bottom flushing device as per claim 1, characterized in that the nozzle is formed by an open-ended tubular body provided with at least one opening in its periphery and fitted at its open top with a tubular, rotationally positionable plug peripherally provided with openings of different diameters provided to selectively face the openings of the tubular body in order to control the outflow of the water jet being ejected for the flushing of the swimming pool bottom.
5. A device as per claim 4, characterized in that the top plug is secured by means of a bayonet attachment in each of the positions it can adopt when fitted to the tubular body of the nozzle.
6. A device as per claim 4, characterized in that the tubular body is freely inserted into a bushing fitted into the tubular supporting arrangement supporting the nozzle, said tubular body on its periphery having lugs extending between alternate projections projecting as per an inclined plane from the inner periphery of said bushing in order to obtain its intermittent rotation as it shifts vertically, this tubular body comprising means urging it towards its lowered position.
7. A device as per claim 6, characterized in that the means urging the tubular body towards its lowered position consist in a spring arranged around said body between a peripheral flange of the open bottom of said body and a step of the inner periphery of the bushing housing said tubular body.

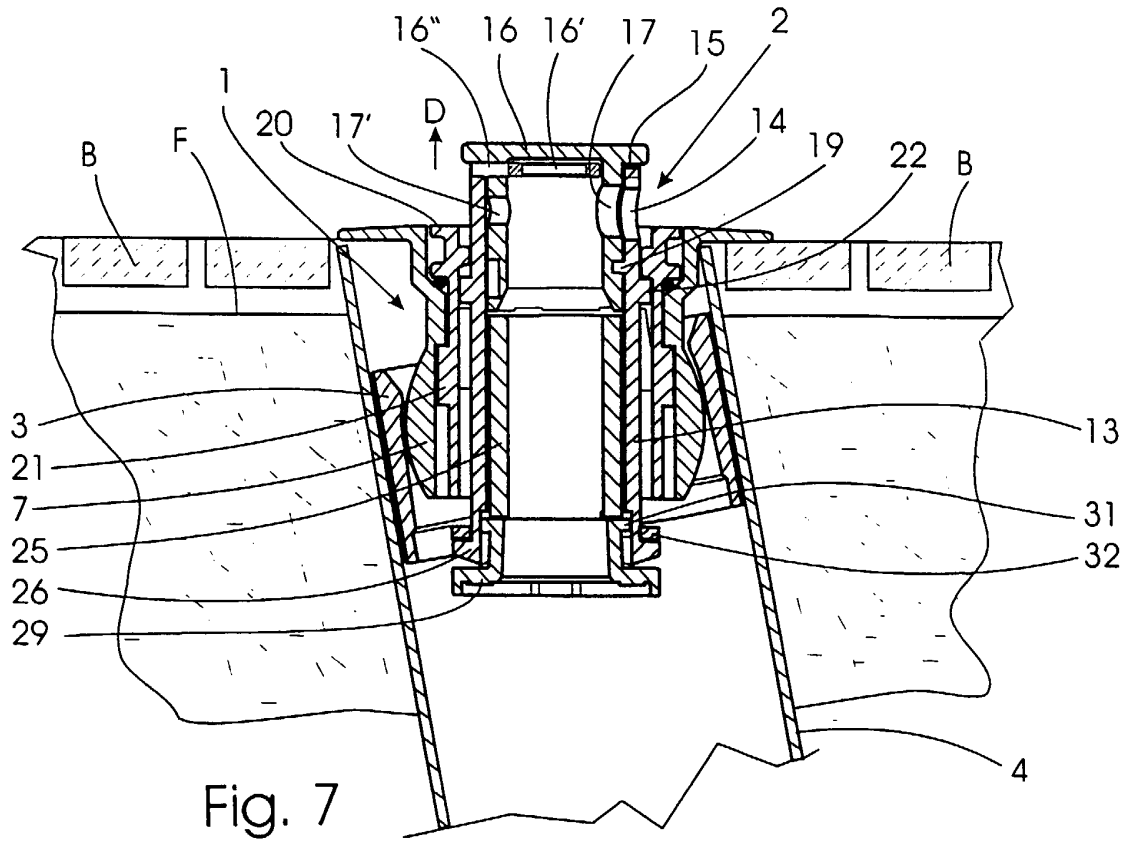
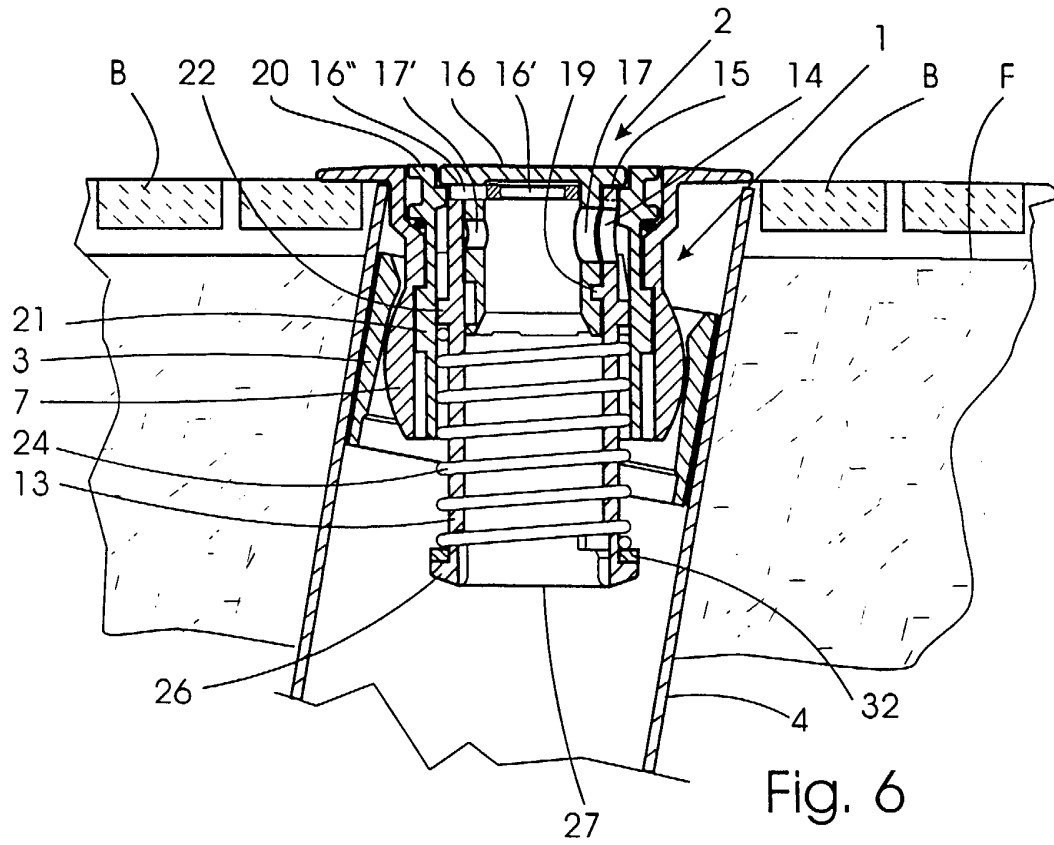
8. A device as per claim 6, characterized in that the means urging the tubular body towards its lowered position consist in a tubular weight inserted into said tubular body and inferiorly retained by means of a ring fitted through bayonet coupling to the open bottom of said tubular body. 5
9. A device as per claim 3, characterized in that it comprises a safety element provided to disengageably engage the top plug with the tubular body of the nozzle, said safety element consisting in a resilient, annular piece tangentially extending into a stub, said annular piece being arranged inside the top plug thereby passing the stub through a lateral orifice of said plug, said stub thus projecting from said orifice to thereby fit into one of the notches provided at the open top of the nozzle's tubular body. 10
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10. A swimming pool bottom flushing device as per claim 1, characterised in that the tubular supporting arrangement at its open top comprises a collar exteriorly extending into a peripheral flange having embedded in it several nuts each threadingly engaging a respective screw clamping a ring on said flange for the retention of a swimming pool bottom surfacing sheet between said ring and flange, said sheet being for such a purpose provided with the corresponding openings. 20
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11. A swimming pool bottom flushing device as per claim 10, characterized in that the surfacing sheet is applied on a sealing washer placed on the flange of the tubular supporting arrangement and provided with orifices for the passage of the screws. 30
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12. A swimming pool bottom flushing device as per claim 10, characterized in that the tubular supporting arrangement consists of a ball-bushing fitted into a socket attached to the inside of the pipe. 40

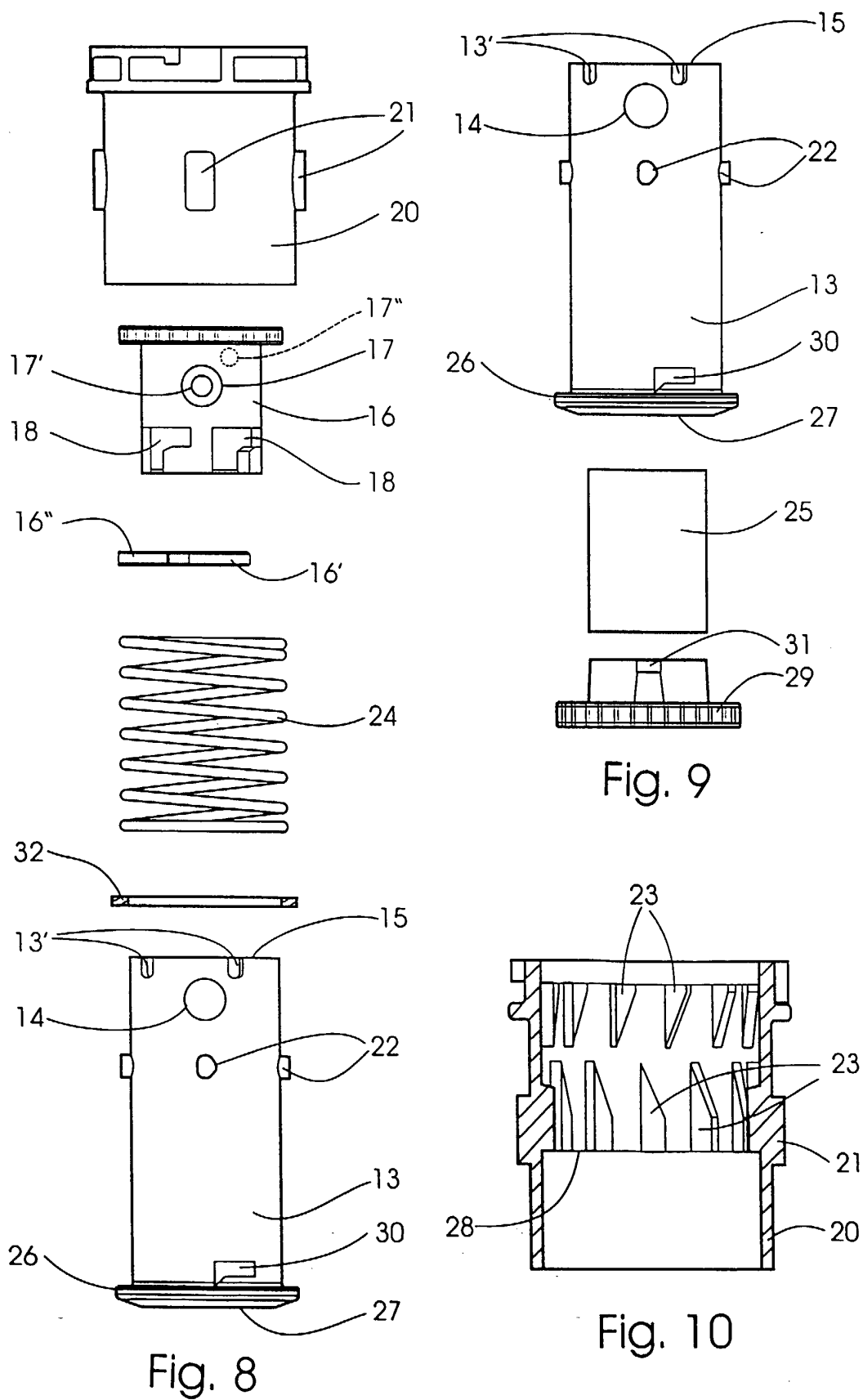
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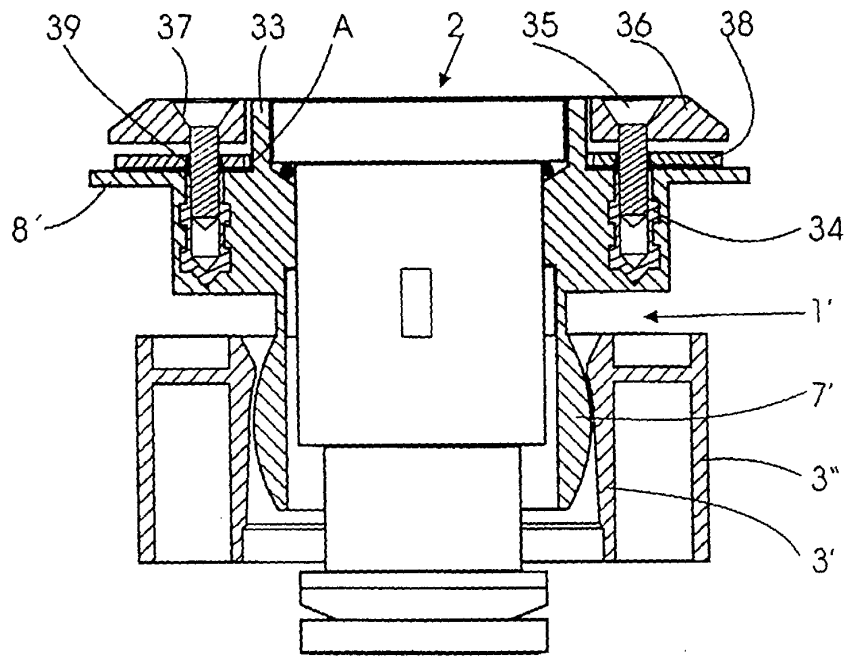


Fig. 11

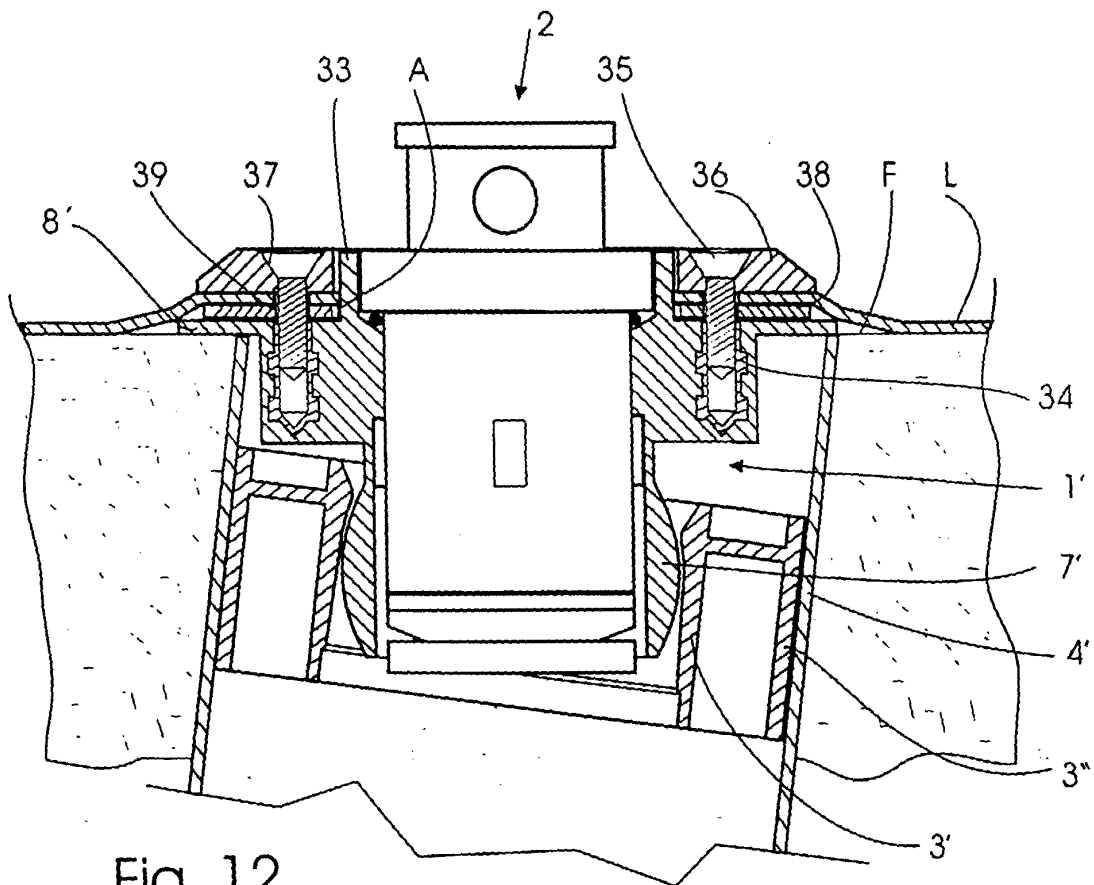


Fig. 12

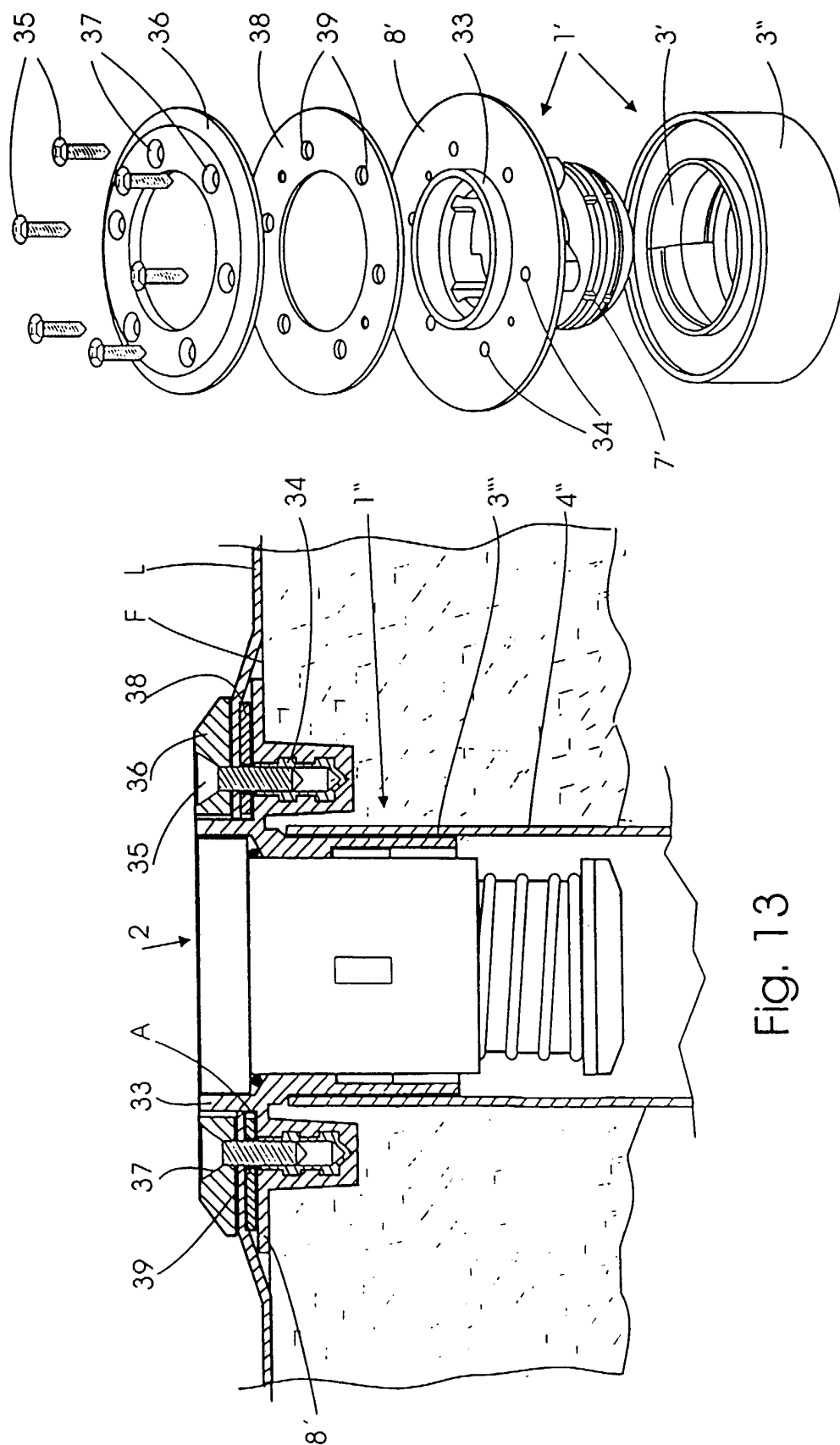


Fig. 14

Fig. 13