

Description

Field of the invention.

[0001] The present invention relates to a device (comprising at least an anchor body suitable to pass from a vertical to a horizontal position, a metal wire inserted in a sheath and tightening means suitable to make the metal wire slide relatively to the sheath) which allows to fix easily a tap or a group of taps (to which the metal wire is fastened) to a household object and/or a sanitary fixture (washbasin, sink, bidet etcetera), avoiding the drawbacks of the known fixing devices.

Prior art

[0002] A tap (or a group of taps) is usually fixed to the surface of a household object or sanitary fixture by mounting from the bottom, i.e. by inserting a threaded rod integral with the tap (which, preferably but not necessarily, is already connected to the pipes for the cold and warm water supply) in a hole made in the sanitary fixture, and by fixing in place the tap with a nut screwed on the "rod" or with other known fixing means, functionally equivalent. Usually such a fixing is a long and expensive operation as usually the features of the sanitary fixture (which for example can be almost totally closed in its back part, as in many washbasin supports) or the position of the tap rod (the tap can be quite close to the wall and/or in a sunken -or anyway accessible in a difficult way- position) don't allow to reach easily the lower surface of the fixture to tighten the tap fixing nut.

[0003] In order to avoid such a drawback many layout solution have been suggested, which use an anchor body driven by an Allen screw passing through the hole of the rod of the pop-up plug system (the mechanism which, by means of a rod and levers, pushes up and raises down for example the basin plug, so-called "salt-erello" in the italian technical slang): of course such a layout solutions cannot be used if the tap to be installed don't comprises a pop-up-plug system.

[0004] The present invention relates to a universal fixing device which can be advantageously used for every kind of tap.

Summary of the invention

[0005] The scope of the present invention is providing a device to fix a tap to a household object and/or a sanitary fixture, comprising at least, combined together:

- an anchor body, suitable to reach a substantially vertical and a horizontal position;
- a metal wire, integral with the tap and inserted in a sheath relatively to which slides when tensioned; and
- tightening means suitable to make the metal wire slide relatively to the sheath to tighten it;

where the metal wire tension causes on the sheath a thrust which, transferred on the anchor body, brings it in horizontal position and presses it against the lower edge of the household object and/or sanitary fixture, so blocking the tap.

[0006] Preferably but not necessarily, the anchor body is hinged to a hinge.

[0007] The thrust caused on the sheath can be transmitted to the anchor body in a direct way or by means of the hinge and/or a slide which on a guide integral to the tap.

List of Figures

[0008] The present invention will be better described hereinafter with reference to the non limiting embodiments shown in the attached figures, where:

- Figure 1 shows a first side view of a first embodiment of the device according to the present invention, combined with a tap;
- Figure 2 shows a second side view of the device of Figure 1, orthogonal to the one of Figure 1;
- Figure 3 shows schematically the assembly sequence of the device of Figure 1 and 2;
- Figure 4 shows schematically an example of tightening means;
- Figures 5-8 better show in bigger detail single parts of the device of Figure 1 and 2;
- Figure 9 shows a first cross-section view of a second embodiment of the device according to the present invention, combined with a tap;
- Figure 10 shows a second side view, partially cross sectioned, of the device of Figure 9, orthogonal to the view of Figure 9;
- Figure 11 shows two views of a hinge used in the device of Figure 9 and 10;
- Figure 12 shows a first side cross section view of a third embodiment of the device according to the present invention, combined with a tap;
- Figure 13 shows a second side view, partially cross sectioned, of the device of Figure 12, orthogonal to the one of Figure 12;
- Figures 14-16 better show in bigger detail parts of the device of Figures 12 and 13;
- Figure 17 shows a first side cross-section of a fourth embodiment of a device according to the present invention, combined with a tap;
- Figure 18 shows a second side view, with a partial cross section, of the device of Figure 17, orthogonal to the one of Figure 17;
- Figure 19 shows three views of the anchor body of Figures 17 and 18;
- Figure 20 shows a side cross-section view of a fifth embodiment of a device according to the present invention, combined with a tap;
- Figure 21 shows a plan of the anchor body of Fig-

ure 20.

[0009] In the attached Figures, corresponding elements will be referred to with the same reference numerals;

Detailed description

[0010] The present invention relates to a device to fix a tap to a household object and/or to a sanitary fixture, and which comprises at least, combined together, an anchor body suitable to reach a substantially vertical position and a horizontal position; a metal wire integral with the tap and inserted in a sheath relatively to which it slides when tightened; tightening means suitable to tighten the metal wire by making it slide relatively to the sheath.

[0011] The tension of the metal wire origins a thrust on the anchor body, positions it horizontally and press it against the lower edge of the household object and/or sanitary fixture, so blocking the tap.

[0012] Preferably but not necessarily, the anchor body is hinged on a hinge.

[0013] Figure 1 shows a first side cross-section view of a first embodiment of a device according to the present invention, suitable to fix the tap 7 to the household object and/or sanitary fixture 8.

[0014] Figure 1 shows the anchor body 1 (better visible in Figure 7) hinged on the hinge 2 (better shown in Figure 8), the metal wire 4, the sheath 5, a guide 3 (better shown in Figure 6) connected to the tap 7 and a hollow guide 6 (better shown in Figure 5) suitable to slide on the guide 3.

[0015] The guide 3 is inserted in a relief 18 (Figure 7) made on the anchor body 1, and in a relief 20 (Figure 8) made in the hinge 2, the end of the sheath 5 fits in a socket 9 (Figure 5) made in an end of the hollow guide 6 and the metal wire 4 passing through the sheath 5 enters through the bore 10 (Figure 5) in the inner cavity of the guide 6, passes through a longitudinal clearance hole 11 (Figure 6) made in the guide 3 and is fastened to the tap base 7 by the fastening means 12, not described herein because according the common prior art.

[0016] The hollow guide 6 exerts the thrust on the sheath 5 by the tension of the metal wire 4 to the anchor body 1.

[0017] The other end of the metal wire 4 is fastened to tightening means (Figure 4) suitable to tighten the metal wire 4 making it slide relatively to the sheath 5.

[0018] Figure 2 shows a second side cross section view of the device of Figure 1, orthogonal to the section of Figure 1; Figure 2 shows the anchor body 1 hinged on the hinge 2 and the guide 3 fitted in the hollow guide 6; an end of the sheath 5 and the metal wire 4 are fitted in the socket 9 at the end of said hollow guide 6; the metal wire 4, protruding from the sheath 5, enters the inner cavity of the guide 6 through the bore 10 (Figure

5), passes in the longitudinal clearance hole 11 (Figure 6), made in the slide 3 and is fastened to the fastening means 12.

[0019] Figure 3 shows schematically the assembly sequence to set working the tap 7 fixed with the device shown in Figures 1 and 2.

[0020] The device according to the present invention and tightening means, if any (not shown in Figure 3) are made pass through the hole in the household object and/or in the sanitary fixture 8 (Figure 3a), with the guide 6 partially unthreaded from the guide 3 (fixed to the tap 7) so that the anchor body 1 can have a (substantially) vertical position; the metal wire 4 is tightened; the thrust of the tension of the metal wire on the sheath 5 makes the guide 6 to slide relatively to the guide 3, the guide 6 brings in a horizontal position the anchor 1, makes it slide along the guide 3 and blocks it against the lower edge of the household object and/or sanitary fixture 8 (Figure 3b).

[0021] To remove the tap 7 it's sufficient to decrease the tension of the metal wire 4 to let the anchor body 1 can have a position (substantially) vertical of Figure 3a so that the device according to the present invention can be easily unthreaded from the hole of the household object and/or of the sanitary fixture 8.

[0022] Figure 4 shows schematically a possible embodiment of the tightening means, which consist of a first hollow body 13 and of a second body 14, coaxial to and coupled with the first body 13 by means for example of a screw-internal thread coupling: the first body 13 has in one end a socket 9' (similar to the one with the reference numeral 9 in Figure 5) in which the end of the sheath fits, while the metal wire passes (through the bore 10') in the cavity of the first body 13, is fastened to the second body 14 and is tightened pulling the second body 14 out of the first body 13 by means of the coupling screw-internal thread so that the metal wire slides relatively to the sheath.

[0023] In the embodiment of Figure 4 the tightening means further comprise a handle 15 which makes the handling easier; obviously the handle 15 can be omitted without departing from the scope of the present invention.

[0024] Further without departing from the scope of the present invention, it's possible to substitute the tightening means, described as a non limiting embodiment with reference to Figure 4, with other reversible functionally equivalent means, suitable to tighten and to keep tight the metal wire, respectively to loosen the metal wire) not described hereinafter because trivial for a skilled technician and anyway departing from the present invention.

[0025] Figures 5-8 better show parts of the device of Figures 1 and 2.

[0026] Figure 5 shows a cross-section of the hollow guide 6, the socket 9 made at an end of the hollow guide 6 in which the end of the sheath 5 fits, and the bore 10

which connects the socket 9 with the inner cavity of the hollow guide 6.

[0027] Figure 6 shows a side- and a top- view of the guide 3, inside which the longitudinal clearance hole 11 is showed with dotted line.

[0028] Figure 7 shows three side views of the anchor body 1, shaped like an overturned "C": a front cross section showing one of the holes 17 in which the hinge 2 is inserted, a side cross section of the anchor body 1 sectioned by the holes 17 and a top view, showing the relief 18 (shown also in the other two views) in which the guide 3 is inserted: the relief 18 has such a length that the anchor 1 can be both in the (substantially) vertical position shown in Figure 3a, and in the horizontal position shown in Figure 3b.

[0029] Moreover the anchor body 1 has a chamfered edge 19 to facilitate its insertion in the hole of the household object and/or sanitary fixture 8 (Figure 3a).

[0030] Figure 8 shows a front cross section and a top view of the hinge 2, which has the relief 20 in which the guide 3 is inserted.

[0031] Figure 9 shows a first side view of a second embodiment of a device according the present invention suitable to fix the tap 7 to the household object and/or to the sanitary fixture 8.

[0032] Figure 9 shows the anchor body 1 (similar to the one shown in Figure 7) hinged on the hinge 2' (better shown in Figure 11), the sheath 5 fitted in the hinge 2' and the metal wire 4, fastened to the tap 7 by means of the fastening means 12.

[0033] When the metal wire is tightened making it slide in the sheath 5, the thrust of the tension of the metal wire 4 on the sheath 5 is exerted to the anchor 1 by the hinge 2', bringing the anchor 1 in an horizontal position and blocking it against the lower edge of the household object and/or of the sanitary fixture 8.

[0034] Figure 10 shows a second side view of the device of Figure 9, orthogonal to the view of Figure 9; in Figure 10 the anchor body 1 (sectioned) hinged on the hinge 2', the sheath 5 and the metal wire 4 fastened to the fastening means 12 can be seen.

[0035] Figure 11 shows a front cross section view and a top view of the hinge 2': in Figure 11 the socket 9 -in which the end of the sheath 5 fits- and the bore 21 in which the metal wire 4 passes -in order to be fastened to the tap 7 by means of the fastening means 12- can be seen.

[0036] Figure 12 shows a first side cross section of a third embodiment of a device according to the present invention suitable to fix a tap 7 to the household object and/or to the sanitary fixture 8.

[0037] Figure 12 shows the anchor body 1 (similar to the one shown in Figure 7) hinged to the solid hinge 2" (Figure 16), the metal wire 4, the sheath 5, a guide 3' connected to the tap 7 and a hollow guide 6' suitable to slide along the guide 3'.

[0038] The end of the sheath 5 fits in a socket 9, similar to the one shown in Figure 5, made at an end of

the hollow guide 6' (Figure 14); the hinge 2" is connected with the hollow guide 6' and slides in a slotted hole 24 (Figure 15) made in the guide 3'.

[0039] Coming out from the sheath 5, the metal wire 4 enters (through the bore 10; Figure 14) the inner cavity of the guide 6' and is fastened to the guide 3'; particularly the metal wire 4 passes through a clearance hole 25 made in the guide 3' and is fastened inside the slotted hole 24 by means of the fastening means 12.

[0040] When the metal wire is tightened, making it slide in the sheath 5, the thrust caused by the tension of the metal wire 4 on the sheath 5 is transferred to the anchor body 1 by the hollow guide 6 and by the hinge 2" (fixed to the guide 6) which slides in the slotted hole 24 of the guide 3', bringing the anchor body 1 in horizontal position and blocking it against the lower edge of the household object and/or of the sanitary fixture 8.

[0041] Figure 13 shows a second side view of the device of Figure 12, orthogonal to the view of Figure 12; Figure 13 shows the anchor 1 (sectioned) hinged on the hinge 2", the hollow guide 6' at the end of which an end of the sheath 5 and the guide 3' are fastened.

[0042] Figures 14-16 better show single components of the device of Figures 12 and 13.

[0043] Figure 14 shows a section of the hollow guide 6', which differs from the guide 6 described in Figure 5 essentially because at the end opposite to the one of the socket 9, there is a couple of bores 23 in which the hinge 2" is inserted.

[0044] Figure 15 shows two side views, orthogonal each to the other, of the guide 3'; in Figure 15 the slotted hole 24 -made in the body of the guide 3'- in which the hinge 2" slides, and the clearance hole 25 -which allows the metal wire 4 to enter the slotted hole 24, where is fastened to the fastening means 12 (not represented in Figure 15 to simplify the drawing) are shown.

[0045] Figure 17 shows a first side cross section view of a fourth embodiment of a device according to the present invention suitable to fix a tap to a household object and/or to a sanitary fixture 8; Figure 17 shows the anchor 1' shaped as an overturned "C" (Figure 19), the metal wire 4 and the sheath 5, the end of which fits with the external surface of the anchor body 1'.

[0046] At the exit of the sheath 5, the metal wire 4 passes through the anchor body 1" (by means of the hole 26 in the anchor 1'; Figure 19) and is fastened to the tap 7 with the fastening means 12.

[0047] Figure 18 shows a second side view of the device of Figure 17, orthogonal to the view of Figure 17: Figure 18 shows the anchor body 1' (sectioned), the metal wire 4, the sheath 5 and the fastening means 12.

[0048] Figure 19 shows three views of the anchor body 1', which differs from the one shown in Figure 7 essentially in the fact that there is only the hole 26 in which the metal wire 4 is inserted.

[0049] In order to install the tap 7 by means of the device shown in Figures 17 and 18, the tightening means (not shown in the Figures) and the above men-

tioned device are inserted into the hole of the household with the metal wire partially unthreaded from the sheath 5 to allow the wire to bend so that the anchor body 1' can reach a (substantially) vertical position and tightens the metal wire 4: the thrust the tension of the metal wire 4 produces on the sheath 5 brings in horizontal position the anchor body 1', makes it sliding along the wire 4 and blocks it against the lower edge of the household object and/or to the sanitary fixture 8.

[0050] Figure 20 shows a side cross section of a fifth embodiment of a device according to the present invention suitable to fix a tap 7 to the household object and/or of the sanitary fixture 8; Figure 20 shows the anchor body 1" obtained from an element of a "C"-shaped flat metal sheet (Figure 21), the metal wire 4 and the sheath 5, the end of which fits with the external surface of the anchor body 1".

[0051] At the exit of the sheath 5, the metal wire 4 passes through the hole 26' made in the anchor 1" (Figure 21) and is fastened to the tap 7 with the fastening means 12.

[0052] The anchor body 1" will not be further described because it's possible to use a part that is commonly purchased for taps and fittings.

[0053] The "C"-shape of the anchor body 1" allows to make it pass through the hole 27 of the household object and/or sanitary fixture 8, even if that hole 27 has a smaller diameter than the circumference arc 28 which forms the outer edge of the anchor body 1": for example, the arc 28 can have a diameter of about 50 mm and the hole a diameter of about 33 mm.

[0054] Preferably between the end of the sheath 5 and the anchor body 1" a wire terminal 29 is inserted, which has a hole, in which the metal wire 4 passes, and a cavity 30 in which the end of the sheath 5 fits.

[0055] In order to install the tap 7 with the device shown in Figures 20 and 21, the tightening means (not shown in the Figures) and the aforesaid device are inserted in the hole 27 of the household object and/or of the sanitary fixture 7, being the metal wire 4 partially unthreaded from the sheath 5 so that the wire can bend and the anchor body 1" can reach a (substantially) vertical position, the anchor body 1" is vertically turned to introduce it in the hole 27 and the metal wire 4 is tightened: the thrust of the tension of the metal wire 4 against the sheath 5 makes the anchor body 1" reach a horizontal position, makes it slide along the metal wire 4 and blocks against the lower edge of the household object and/or of the sanitary fixture 8.

[0056] Without departing from the scope of the present invention, a skilled technician can make all the modifications and improvements, which the usual technique and natural evolution of the field suggest, to the fastening device to which the present description refers.

Claims

1. Device to fix a tap (7) to a household object and/or

to a sanitary fixture (8), characterised in that it comprises at least, combined together:

- an anchor body (1, 1', 1"), suitable to reach a substantially vertical and a horizontal position;
- a metal wire (4), inserted in a sheath (5) relatively to which the metal wire (4) slides when tightened; and
- tightening means suitable to tight the metal wire (4) making it slide relatively to the sheath (5);
- the tension of the metal wire (4) generating on the sheath (5) a thrust which, transferred to the anchor body (1, 1', 1"), brings said anchor body (1, 1', 1") in a horizontal position and presses it against the lower edge of the household object and/or of the sanitary fixture (8), so blocking the tap (7).

2. Fixing device according to claim 1, characterised in that the anchor body (1) is hinged on a hinge (2, 2', 2").
3. Fixing device according claim 2, characterised in that the anchor body (1) is shaped as an overturned "C", and has at least a couple of holes (17) in which the hinge (2, 2', 2") is inserted, and a relief (18) of such a length that it allows the anchor body (1) to reach both the substantially vertical and the horizontal position.
4. Fixing device according to claim 1, characterised in that the anchor body (1) has a chamfered edge (19).
5. Fixing device according to claim 2, characterised in that it also comprises a guide (3) integral with the tap (7) and a hollow guide (6) suitable to slide along the guide (3); and in that:
 - the guide (3) is inserted in a relief (18) belonging to the anchor body (1) and in a relief (20) belonging to the hinge (2);
 - the end of the sheath (5) fits in a socket (9) made in an end of the hollow guide (6);
 - the metal wire (4) coming out of the sheath (5) enters the internal cavity of the hollow guide (6), passes through a longitudinal clearance hole (11) made in the guide (3) and is fastened to the tap (7);
 - the thrust that the tension of the metal wire (4) exerts on the sheath (5) is transmitted to the anchor body (1) by the hollow guide (6).
6. Fixing device according to claim 2, characterised in that the sheath (5) fits in the hinge (2') and in that the thrust generated on the sheath (5) by the tension of the metal wire (4), integral with the tap (7), is

transmitted to the anchor body (1) by means of the hinge (2').

clearance hole (26') in which the metal wire (4) passes.

7. Fixing device according to claim 6, characterised in that the hinge (2') has a socket (9) in which an end of the sheath (5) fits, and a bore (21) in which the metal wire (4) passes before being fastened to the tap (7). 5

8. Fixing device according to claim 2, characterised in that also comprises a guide (3') integral with the tap (7) and a hollow guide (6') suitable to slide along the guide (3'); and in that: 10

- the end of the sheath (5) fits in a socket (9) made at an end of the hollow guide (6'); 15
- the hinge (2'') is integral to the hollow guide (6') and slides in a slotted hole (24) made in the guide (3'); 20
- the metal wire coming out of the sheath (5) enters the inner cavity of the guide (6') and is fastened to the guide (3'); 25
- the thrust generated by the tension of the metal wire (4) on the sheath (5) is transmitted to the anchor body (1) by the hollow guide (6) and by the hinge (2'').

9. Fixing device according to claim 8, characterised in that the metal wire passes through a clearance hole (25) made in the guide (3') and is fastened inside the slotted hole (24). 30

10. Fixing device according to claim 8, characterised in that the hollow guide (6') has, at the end opposite to the end where the socket (9) is made, a couple of bores (23) in which the hinge (2'') is inserted. 35

11. Fixing device according to claim 1, characterised in that an end of the sheath (5) fits with the external surface of the anchor body (1', 1''), in that, coming out of the sheath (5), the metal wire (4) passes in a clearance hole (26, 26') made in the anchor body (1', 1'') and is fastened to the tap (7) and in that the thrust generated on the sheath (5) by the tension of the metal wire (4) brings the anchor body (1', 1'') in a horizontal position, makes it sliding along the metal wire (4) and blocks it against the lower edge of the household object and/or of the sanitary fixture (8). 40 45

12. Fixing device according to claim 11, characterised in that the anchor body (1') has an overturned "C"-shape and comprises the clearance hole (26) in which the metal wire (4) passes. 50

13. Fixing device according to claim 11, characterised in that the anchor body (1'') consists of a flat metal plate element with a "C" shape and comprises the 55

14. Fixing device according to claim 11, characterised in that also comprises a wire terminal (29) -positioned between the end of the sheath (5) and the anchor (1'')- which comprises a hole in which the metal wire passes (4) and a cavity (30), in which the end of the sheath (5) is positioned, which fits with the external surface of the anchor body (1'') by means of the wire terminal (29).

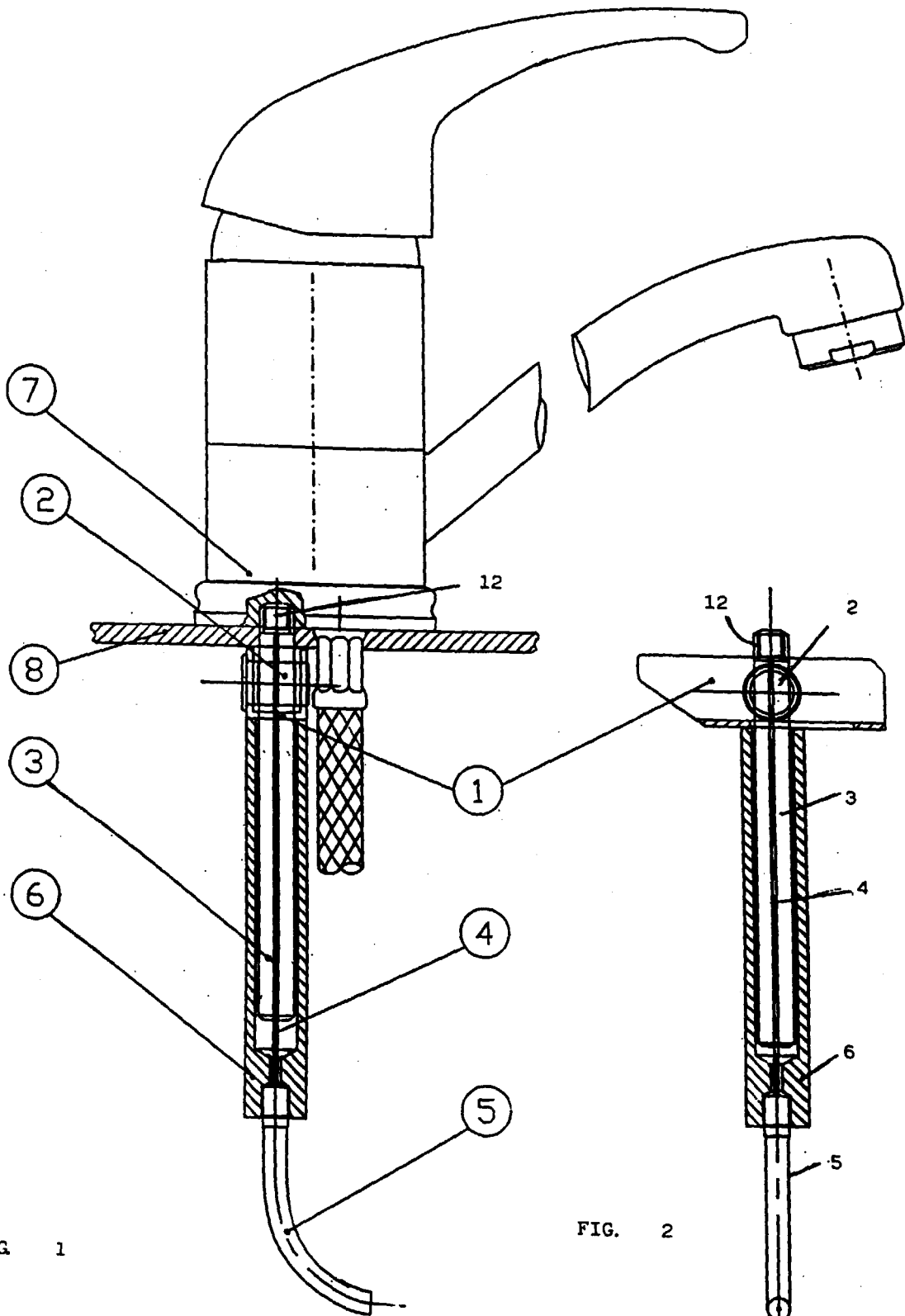


FIG. 1

FIG. 2

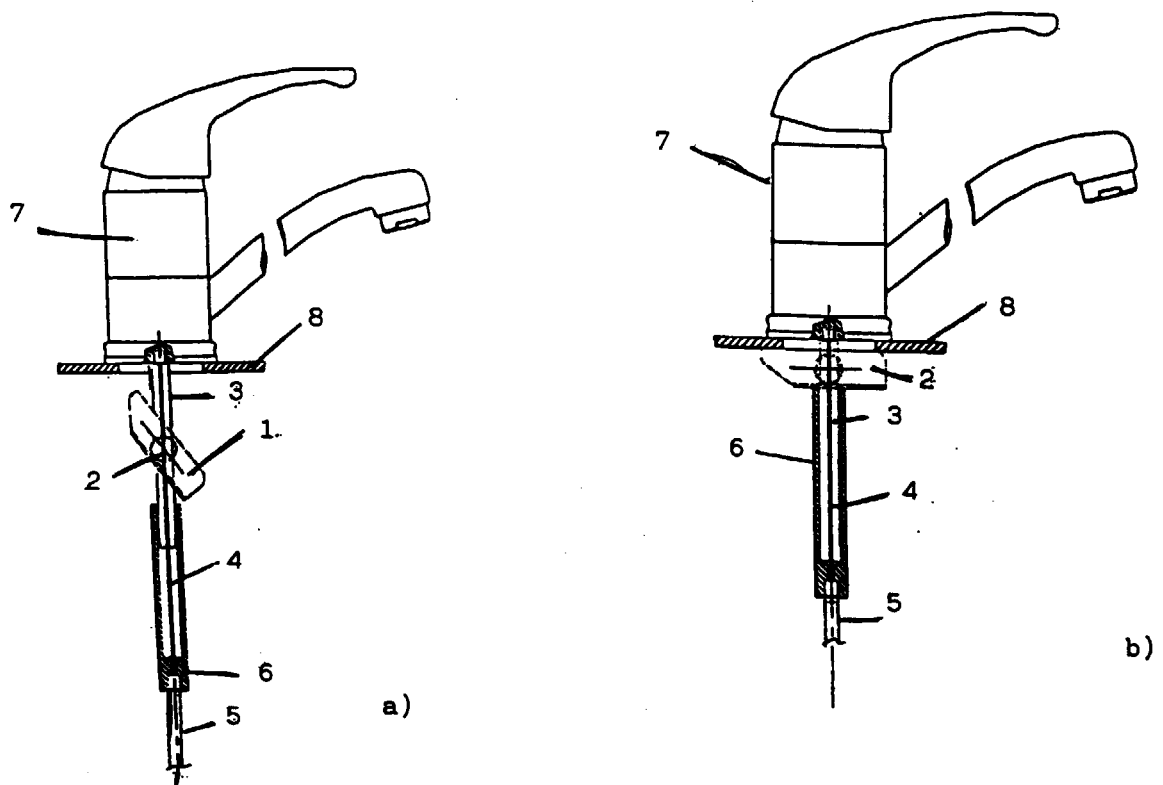


FIG. 3

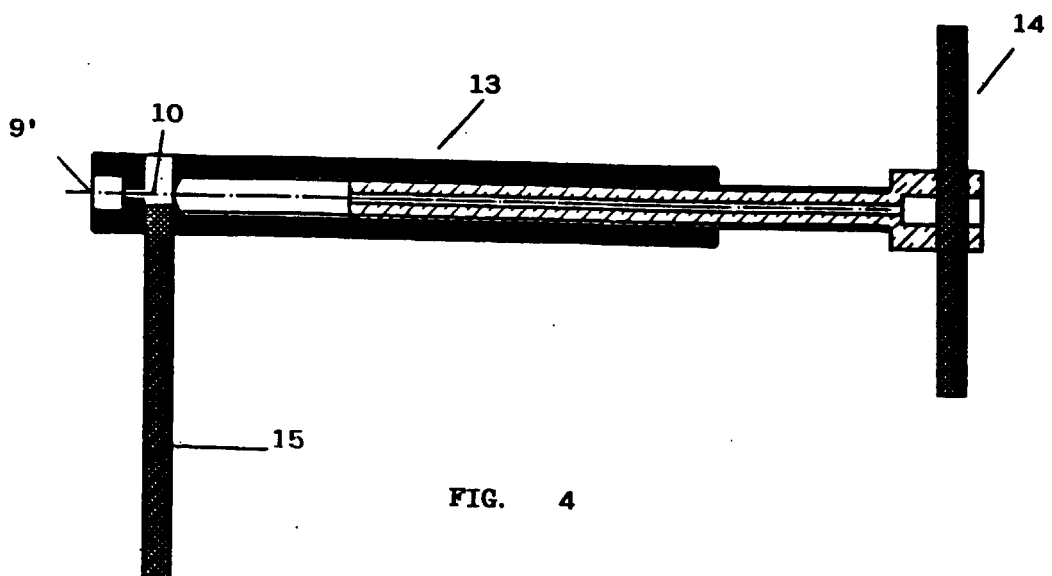
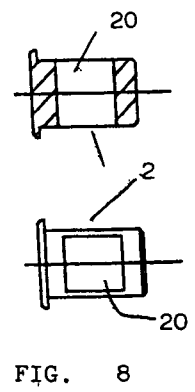
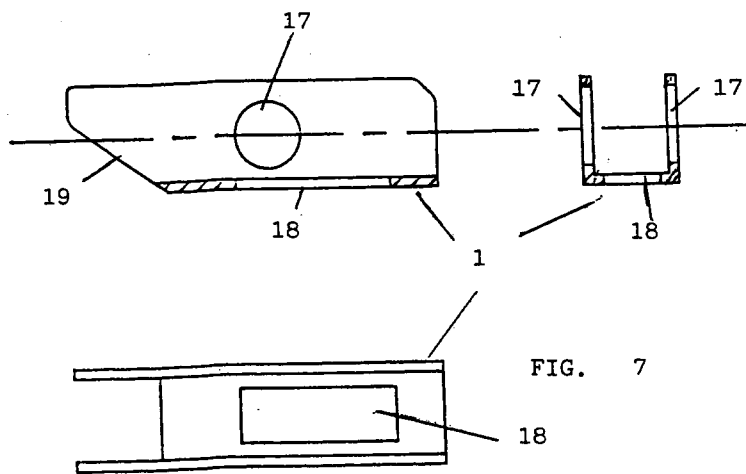
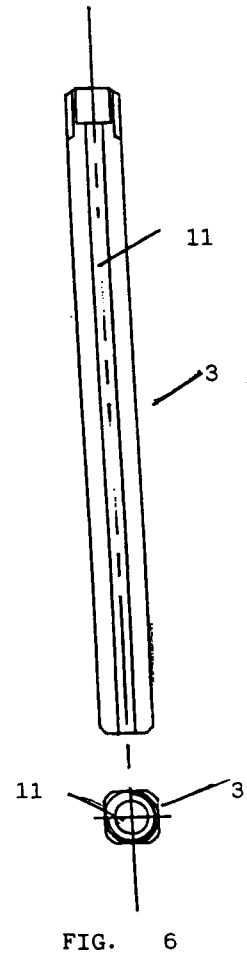
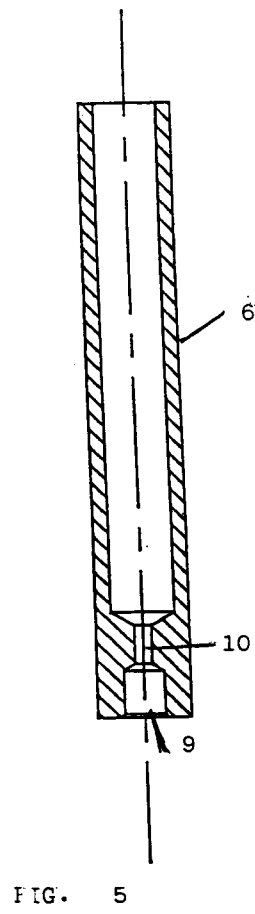


FIG. 4



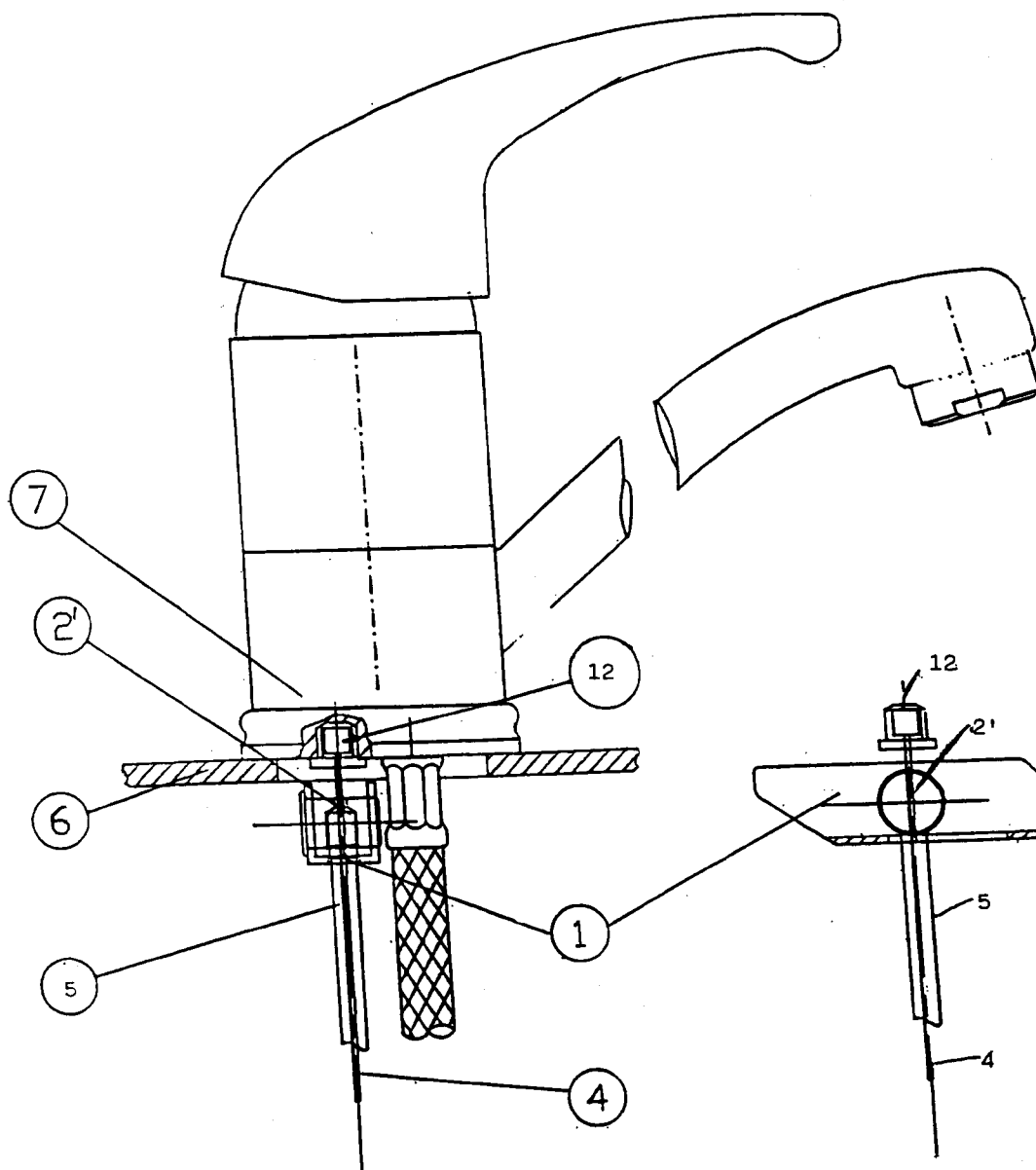


FIG. 9

FIG. 10

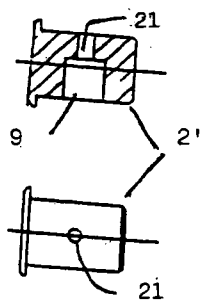


FIG. 11

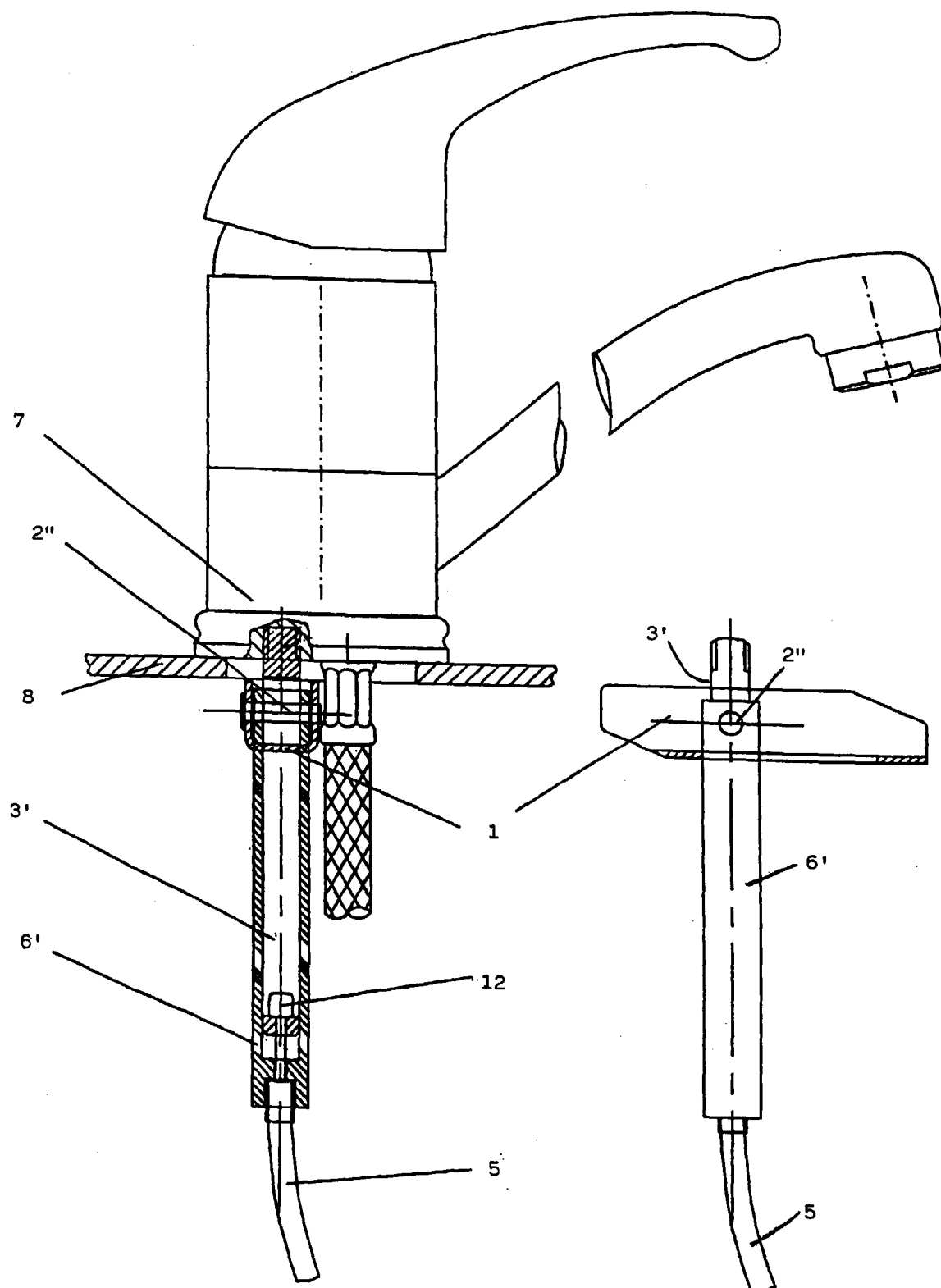


FIG. 12

FIG. 13

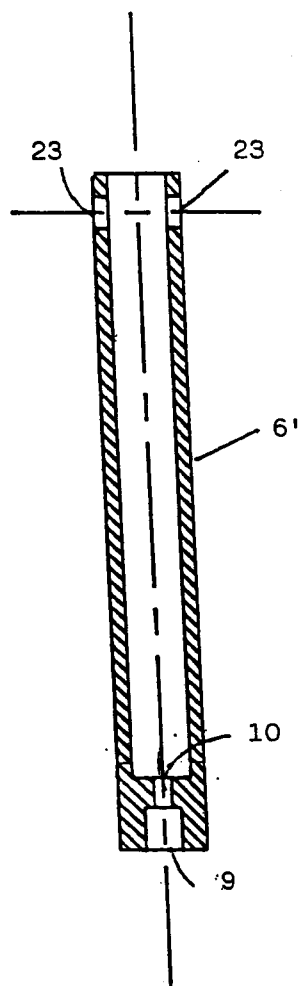


FIG. 14

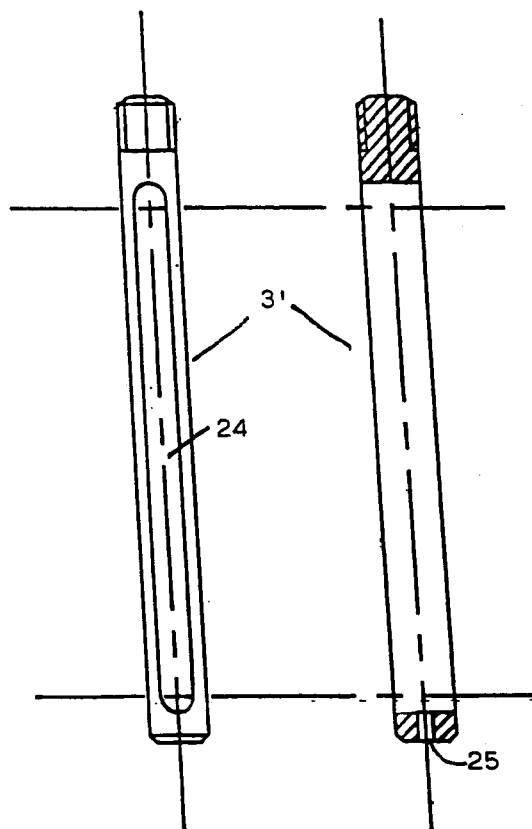


FIG. 15

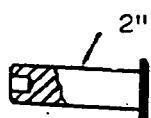


FIG. 16

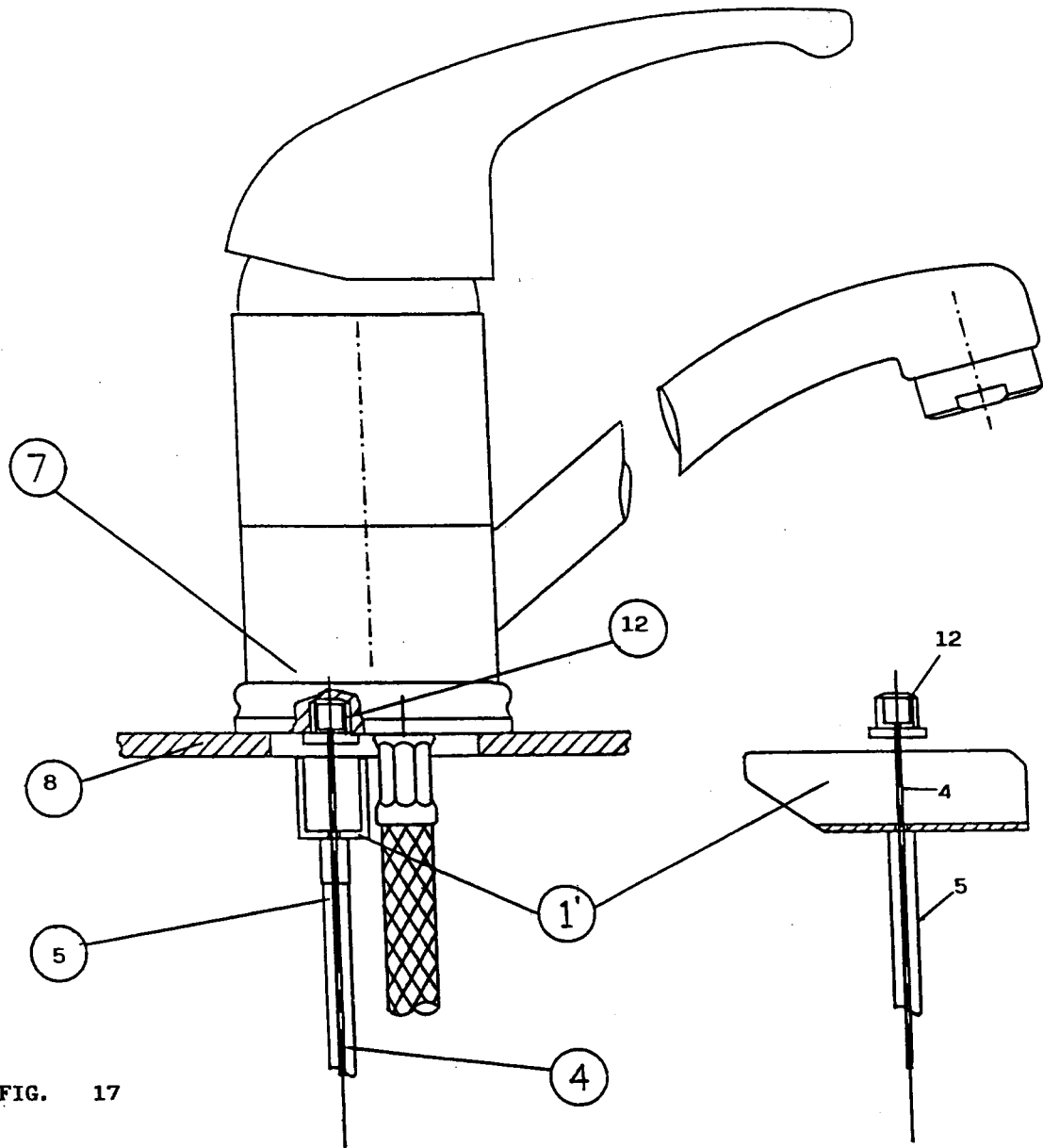


FIG. 17

FIG. 18

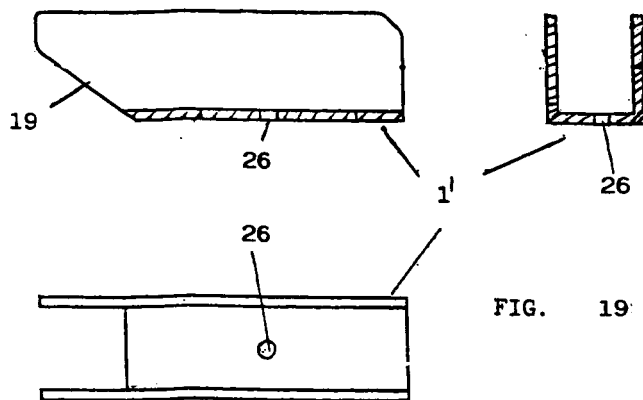


FIG. 19

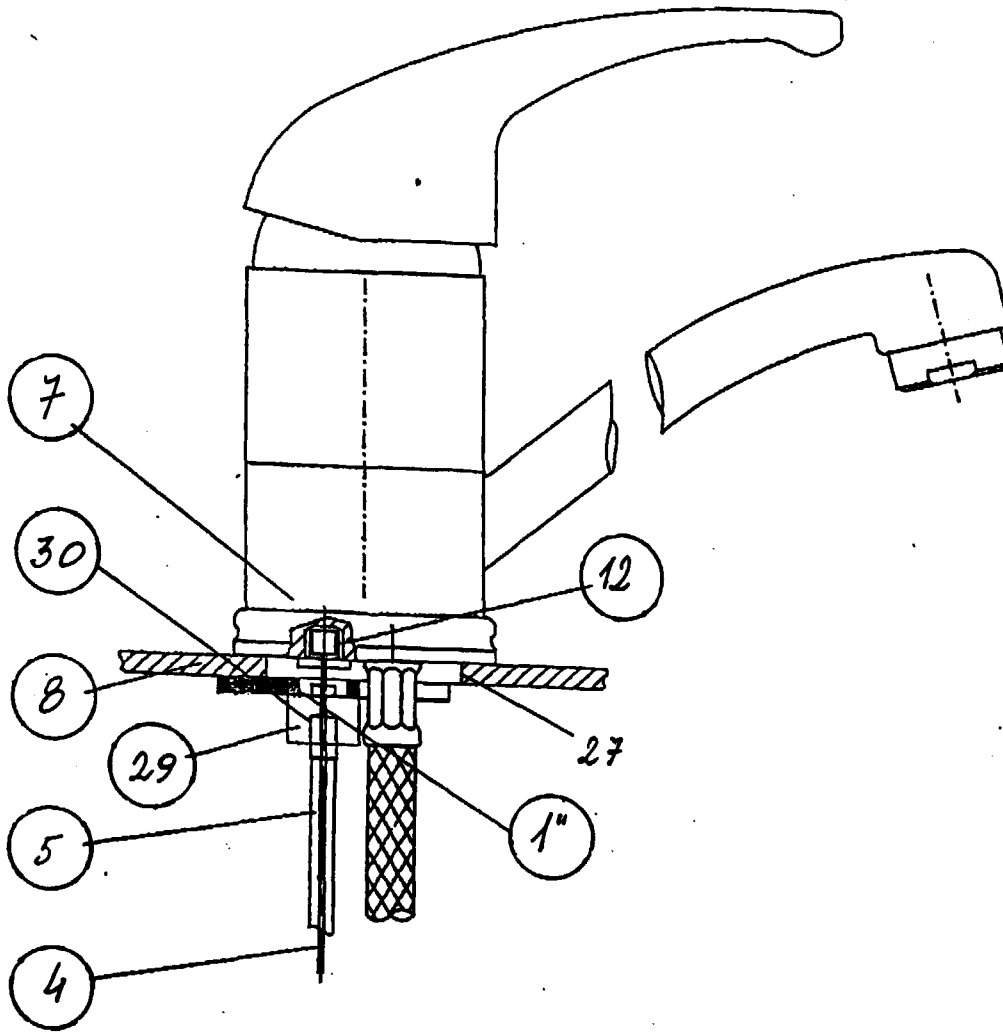


FIG 20

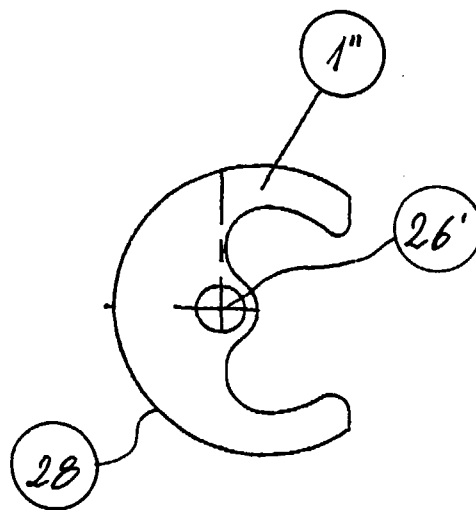


FIG 21