

2000 PAPER P3 - SAMPLE SCRIPT B

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SAFETY DEVICE

The present invention relates to a safety device for preventing expulsion of a valve assembly from a pressurised vessel, for example a pressurised keg for dispensing beverages.

Pressurised vessels such as beer kegs have a valve assembly which fits into the keg neck and has a dispense tube, or spear, that descends inside the keg from the valve to near the bottom of the keg.

These pressurised vessels are dangerous in that unauthorised tampering with a pressure vessel can lead to the valve assembly being ejected with considerable force.

EPO, 123, 456 discloses a known solution to this problem, whereby an elliptical collar is fitted to the neck of the dispensing tube, such that removal of the valve assembly can only be achieved by "canting" the valve assembly in the neck of the keg.

Although the solution provided by EPO, 123, 456 prevents the valve assembly being ejected under force from the keg, it has the disadvantage that valve assemblies are cumbersome to remove and replace. In particular, the device shown in EPO, 123, 456 requires the use of a special tool, which makes removal of the valve assembly even more difficult.

In the brewing industry, kegs are returned to the breweries, where the valves are removed for the kegs to be cleaned. Clearly, the safety device shown in the prior art is unsuitable, since the time taken to remove & replace valves on a large number of barrels would be totally unacceptable. Furthermore, the solution is unsuitable for automation.

Therefore, the aim of the present invention is to provide a safety device which, on the one hand prevents unwanted expulsion of the valve assembly from a pressurised keg, while, on the other, enables the valve assembly to be easily removed and replaced when necessary.

According to a first aspect of the present invention there is provided a safety device (...according to claim one).

Preferably, the anti-expulsion device prevents the valve from being removed when the vessel is in the upright position, and allows the valve to be removed when the vessel is in the inverted position.

Preferably, the anti-expulsion member comprises a pair of plates which are pivotally connected to the dispensing tube of the valve.

{ other preferred features }

{	+	}
{	details of method insertion / removal	}
{	+	}
{	Automated Brewing re-filling here.	}

Brief description of the drawings

Reference will now be made to how the invention may be put into effect, by way of example only, to the accompanying drawings in which:-

Figure 1 shows insertion of a valve assembly having a safety device according to the present invention;

Figure 2 shows the normal operating position of the safety device in a vessel;

Figure 3 shows the device in operation when preventing accidental removal of the valve assembly;

Figure 4 shows the safety device prior to removal from an inverted keg; and

Figure 5 shows a plan view of the safety device.

Detailed description of a preferred embodiment of the present invention.

Figure 1 shows a valve assembly having a safety device according to the present invention. The conventional valve assembly comprises a valve section 1, having a dispensing tube, or spear 3, which projects into the body of a pressurised vessel 5.

The safety device comprises a pair of elongate members 7, which are pivotally connected to the dispensing tube 3 by means of a carrier 9 (details of which will be provided later. The carrier 9 is positioned sufficiently away from the valve section 1, such that it allows the elongate members 7 to pivot inwardly, towards the axis of the dispensing tube 3, as the valve assembly is inserted into the keg 5.

Figure 2 shows the valve assembly after being inserted into the keg 5. As can be seen, the weight of each elongate member 7 causes each member to pivot outwardly, until they rest in a position which is substantially perpendicular to the axis of the dispensing tube 3. Each elongate member 7 is sufficiently long such that it prevents the valve assembly from being removed from the vessel 5 in this orientation.

Figure 3 shows the valve assembly in the process of being expelled from the vessel 5. Expulsion from the neck of the vessel is prevented by the elongate members 7 of the safety device, which protrude outwardly from the dispensing tube 3, by a distance which is co-operatively greater than the diameter of the neck of vessel 5.

Figure 4 illustrates how the valve assembly may be removed from the vessel 3. When the vessel 3 is inverted, the weight of each elongate member 7 causes each member 7 to pivot against the dispensing tube 3. In this position, the combined diameter of the dispensing tube 3 and the elongate member 7 is less than the diameter of the neck of the vessel 3. Thus, the valve assembly can be easily removed from the vessel when inverted in this way.

Figure 5 shows in greater detail the preferred embodiment of the safety device according to the invention.

Each elongate member has upturned sides 11 which provide greater strength, and therefore greater resistance to expulsion. One elongate member 7a is provided with a pair of tabs 13, which act as pivots, and co-operate with apertures 15 in the other elongate member 7b.

The tabs 13 pass through stirrups which extend axially away from the carrier 9, the stirrups having corresponding apertures, thereby permitting the elongate members 7a & 7b to pivot with respect to one another. The carrier 9 grips the dispensing tube by means of an aperture 17, thereby enabling the safety device to be easily connected to existing valve assemblies.

Although the invention has been described using two pivotal member 7, it will readily be appreciated that the invention is equally applicable with just one pivotal member, or more than two pivotal members. As mentioned above, the invention has many advantages over the prior art, whereby it enables valve assemblies to be prevented from accidental ejection, while enabling them to be easily removed, when desired, to enable vessels to be sterilised and re-filled.

The fact that the vessel has to be inverted to remove the valve, also acts as an anti-tampering device.

Furthermore, the provision of two oppositely opposed elongate members has the added advantage of absorbing the impact forces generated by accidental induced expulsion of the valve assembly.

CLAIMS

1. A safety device for preventing expulsion of a valve assembly from a pressurised vessel, in which the valve assembly has a dispensing tube which projects into the body of the vessel, the safety device comprising:

at least one anti-expulsion member moveably connected to the dispensing tube, wherein the anti-expulsion member is moveable between a first position in which removal of the valve assembly is prevented, to a second position in which removal of the valve assembly is allowed.

2. A safety device as claimed in claim 1, wherein the anti-expulsion member moves between the first and second positions in accordance with the orientation of the vessel.

3. A safety device as claimed in claim 1 or 2, wherein the anti-expulsion member is pivotally connected to the dispensing tube.

4. A safety device as claimed in claim 3, wherein the anti-expulsion member pivots inwardly against the dispensing tube when the vessel is orientated in the inverted direction, and outwardly, substantially orthogonal to the axis of the tube when the vessel is orientated in the upright direction.

5. A safety device as claimed in claim 3 or 4, comprising first and second anti-expulsion members.

6. A safety device as claimed in claim 5, wherein the first and second anti-expulsion members are attached to the dispensing tube of the valve by a carrier.

7. A safety device as claimed in claim 6, wherein the carrier comprises first and second stirrups which extend axially from the body of the carrier, each stirrup having an aperture for supporting

the pivotal anti-expulsion members.

8. A safety device as claimed in any one of claims 3 to 7, wherein the anti-expulsion members are made to pivot by their own weight.

9. A safety device as claimed in any one of the preceding claims, wherein the anti-expulsion member comprises an elongate plate having upturned sides.

{claim in here about tab 13/aperture 15 on each plate)

10. A safety device as claimed in any one of claims 6-9, wherein the carrier is attached to the dispensing tube at a position which is sufficiently away from the valve assembly to allow the anti-expulsion members to pivot inwardly.

11. A valve assembly for a pressurised vessel, the valve assembly having a safety device as claimed in any one of claims 1 to 10.

12. A method of removing a valve assembly from a vessel, the valve assembly having a safety device according to any one of the preceding claims, the method comprising steps of:

inverting the vessel such that the valve assembly points downwardly; and

removing the valve assembly in the inverted position.

13. A method of re-filling beverage vessels by removal and refitting of valve assemblies as defined in claim 12.

14. A safety device substantially as hereinbere described, with reference to any one of Figures 1 to 5 of the drawings.

15. A method of inserting or removing a valve assembly in a pressurised vessel, the method being substantially as hereinbefore described, with reference to Figures 1 to 4 of the drawings.

Brief note to Examiner

- claimed safety device per se since it can be attached to existing valve assemblies.

- Although claim 1 restricted to “pressurized” I believe this should not unduly limit the scope, since valves would not otherwise be expelled when the keg is in the upward direction.

- A method of re-filling beer kegs would be advantages, since the invention provides great saving in this respect, since the invention allows AUTOMATION, whereas the EP doc does not.

- I'm afraid no time to draft such a claim properly. More though would be needed to cover these aspects.

Fig.1.

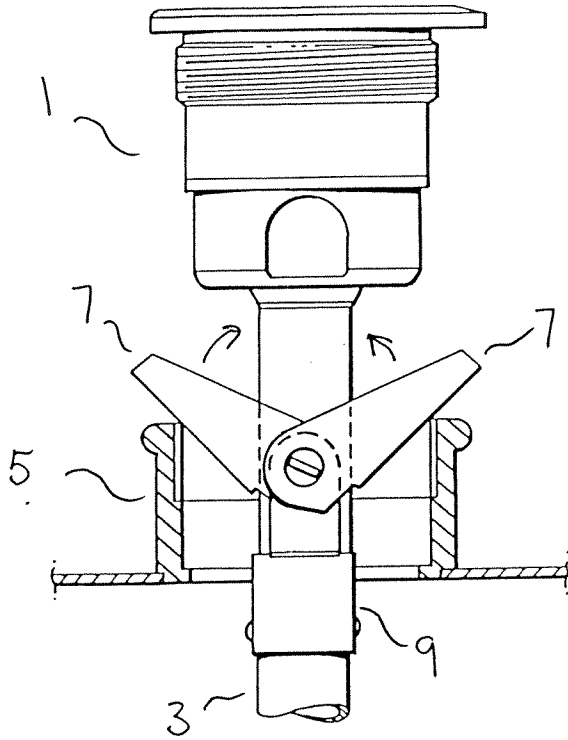


Fig.2.

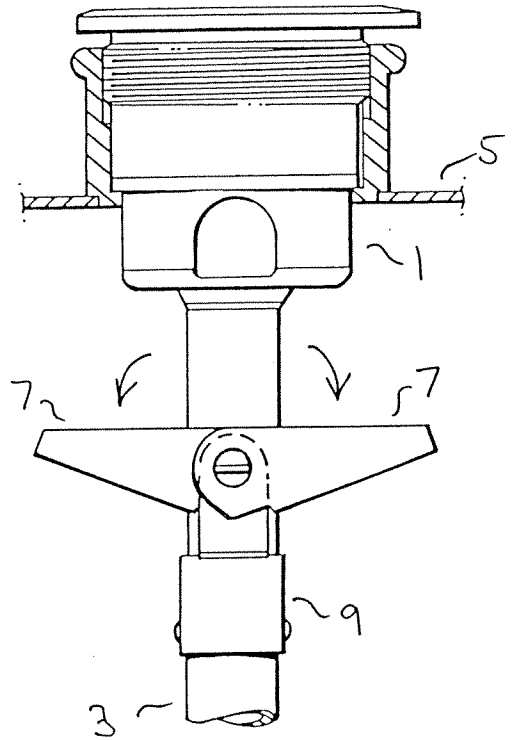


Fig.3.

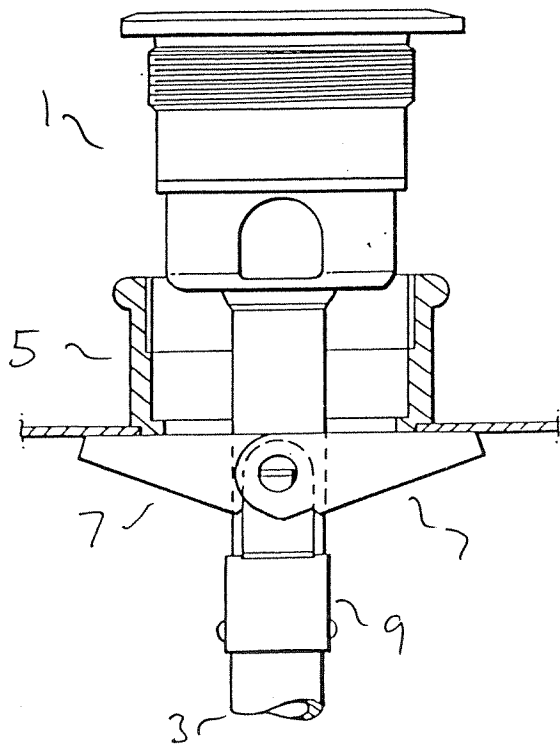


Fig.4.

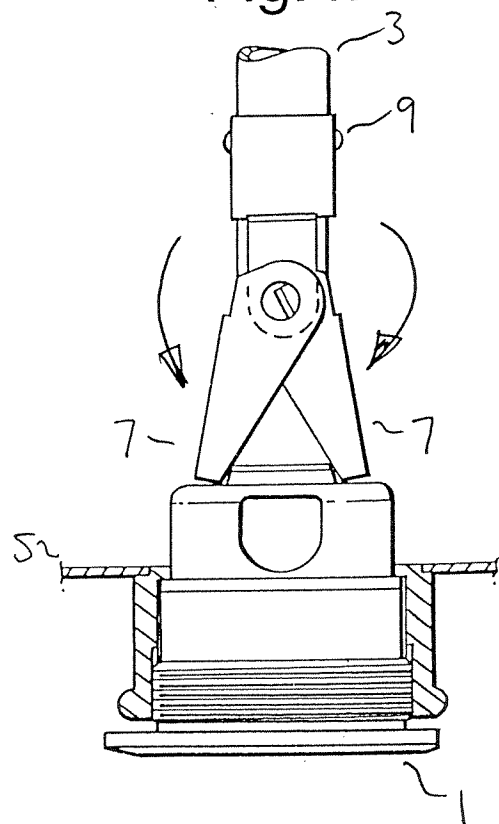
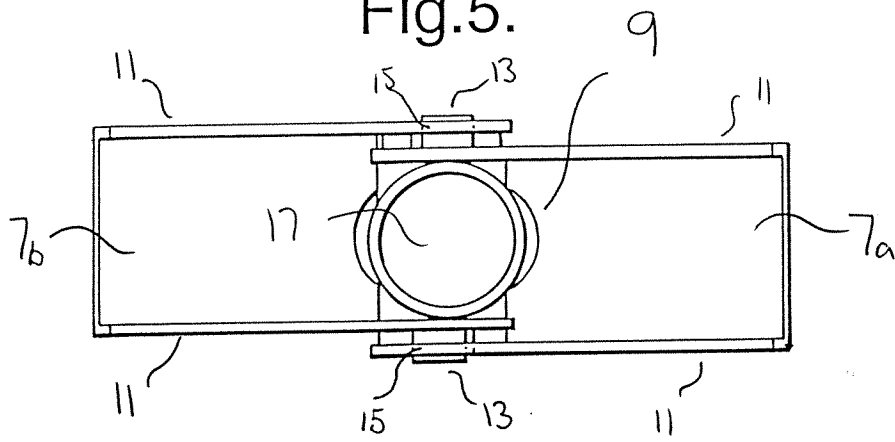


Fig.5.



Brief note to Examiner

- claimed safety device per se since it can be attached to existing valve assemblies.
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Improved Safety Device

The invention relates to an improved safety device for preventing the removal or expulsion of an extractor tube assembly from the outlet opening of a beverage container when the beverage container is in its normal beverage dispensing orientation.

Beverage dispensing systems, typically for dispensing alcoholic beverages such as beer, lager or cider, usually comprise a metal keg, of stainless steel or aluminium, having a threaded opening in the top surface of the keg. An extractor tube assembly, incorporating a valve assembly permitting gas, usually carbon dioxide or nitrogen, to flow under pressure into the keg and an extractor tube or spear which extends into the keg to near the keg bottom, is securely screwed into the opening.

Gas pressure within the keg acts on the beverage to force it to flow up the extractor tube and into a line leading to a dispensing valve at the bar, which is operated to dispense the beverage from the keg.

With such a system, the keg is under pressure even after it has been disconnected from the system. Normally this is of no consequence as the, then empty, keg is returned to the brewer to be depressurised, washed and refilled. However, unauthorised tampering with a pressurised keg can be very dangerous as the valve assembly could be ejected with considerable force from the keg.

EP 0123 456 discloses a safety device preventing an extractor tube assembly from being ejected from a keg in the event of unauthorised tampering or failure of the extractor tube assembly securing thread. An abutment plate is secured to the extractor tube having a major lateral dimension greater than the keg outlet opening such that removal of the extractor tube assembly is not normally possible by virtue of the plate abutting the outlet. While this device does improve the safety of the apparatus by preventing the ejection or unauthorised removal of the extractor tube assembly from the keg, it has the disadvantage that a special tool is required in order to remove or replace the extractor tube assembly during refilling of the keg. This special tool is required to depress the extractor tube against the action of a spring to provide sufficient clearance between the fitting and the outlet to enable the whole extractor tube assembly to be canted to allow the abutment plate to pass through the outlet aperture.

The invention provides an improved safety device which prevents unauthorised removal or expulsion of an extractor tube assembly from the outlet opening of a keg when the keg is in its normal, beverage dispensing, orientation, but allows the extractor tube assembly to be easily removed and refitted by the brewer during refilling of the keg without requiring the use of any special tools.

According to the invention there is provided a safety device for an extractor tube assembly used in a beverage container, said device comprising mounting means for mounting the device onto the extractor tube and at least one retaining member connected to the mounting means for movement from a first position wherein the maximum overall dimension of the safety device radially of the

extractor tube is less than the diameter of the beverage container outlet opening, permitting, in use, the removal of the extractor tube assembly from the beverage container, to a second position wherein the maximum overall dimension of the safety device radially of the extractor tube is greater than the diameter of the beverage container outlet opening, preventing, in use, the removal or expulsion of the extractor tube assembly from the beverage container outlet opening, preventing, in use, the removal or expulsion of the extractor tube assembly from the beverage container wherein, in, use, the retaining member is biased from its first position to its second position when the beverage container is in its normal, beverage dispensing, orientation and the extractor tube extends substantially vertically downwardly. Preferably the biasing force is provided by the force of gravity acting on the at least one retaining member.

The at least one retaining member may comprise an elongate limb pivotally connected to the mounting means such that, in its first position the elongate limb rests against the extractor tube and extends in a substantially upwardly direction relative to the normal orientation of the extractor tube and in its second position, the elongate limb extends substantially radially outwardly from the extractor tube.

Preferably, two retaining members are provided diametrically opposed to one another. Each retaining member may comprise an elongate limb pivotally connected to the mounting means for movement between respective first and second positions in the manner of butterfly wings. Preferably the retaining members are pivotally mounted on a common axis, each pivoting under their own weight from their first to their second position when the beverage dispenser is in its normal, beverage dispensing orientation. Stop means may be provided for preventing each retaining member from pivoting past its second position.

In a preferred embodiment, each retaining member comprises an elongate plate having upturned strengthening sidewalls, one of said sidewalls being provided with an outturned projection adjacent one end, the opposed side wall being provided with a corresponding aperture, the two retaining members being interconnected with the outturned projection of one retaining member passing through the corresponding aperture of the other retaining member, the mounting means including a mounting portion for mounting the securing device onto the extractor tube and a pair of axially extending plates extending therefrom on opposite sides of the extractor tube, the diametrically opposed free ends of the plates having apertures therein receiving the outturned projections of the retaining members.

According to a further aspect of the invention there is provided a safety device as claimed in claim 9.

A safety device according to the invention will now be described with reference to the accompanying drawings in which:-

Figures 1 to 4 show the safety device connected to the extractor tube of an extractor tube assembly and successively illustrate:-

- Figure 1 insertion of the assembly into the neck of a normally oriented keg (shown in cross section);
- figure 2 the normal, operating position of the safety device in the keg;
- Figure 3 the device acting to prevent accidental removal of the assembly;
- Figure 4 the assembly prior to removal from an inverted keg;

Figure 5 is a plan view of the safety device of figures 1 to 4.

The safety device 1 comprises a pair of diametrically opposed retaining members 2, 3, pivotally connected about a common axis to a carrier 4, by means of which the safety device is mounted on the extractor tube 5 of an extractor assembly 6.

The extractor assembly 6 is threadedly secured into the neck 7 of a keg 8. Since the keg 8 is highly pressurised in order to force beverage contained therein up the extractor tube 5 and through a line to a dispensing outlet, which is often on a floor above the room where the keg 8 is kept, there is a danger that the extractor assembly 6 might be ejected from the keg 8 with considerate force should the securing threads 9, 9' fail or the assembly be tampered with.

In order to avoid this the safety device 1 is arranged so that the retaining members 2, 3 abut the underside of the keg 8, adjacent the neck 7, should the extractor assembly 6 be released from the neck 7 of the keg 8, preventing removal or expulsion of the extractor tube 5, and hence the extractor assembly 6, from *(words apparently deleted)* as shown in figure 3. The retaining members 2, 3 remain in their outwardly extending operative position while the keg is maintained in its normal, beverage dispensing, operative orientation, due to the weight of the retaining member acting to hold the retaining members 2, 3 in their extended position. Each retaining member 2, 3 consists of an elongate plate with upturned, strengthened sidewalls 10, 11, 12, 13. One sidewall 11, 12 of each retaining member 2,3 is provided with an outwardly extending projection or tab 14,15 adjacent one end, while the opposed side wall is provided with a corresponding aperture 16, 17. The two retaining members are interconnected with the outwardly extending projection of one retaining member being received in the aperture of the other retaining member to form a pair of diametrically opposed butterflies pivotable about the projection on the common axis of the projection. The carrier 4 has a pair of axially extending plates 18, 19, extending therefrom on opposite sides of the extractor tube, the diametrically opposed free ends of the plates having apertures therein receiving the outwardly extending projections 14, 15 of the retaining members 2, 3.

As shown in figure 4, when the keg, and the extractor tube assembly 6, is inverted, the retaining members 2,3, fall under their own wight so that they rest against the extractor tube 5 and thus allow the extractor tube assembly to be removed from and/or inserted into the neck 7 of the keg 8.

Claims

1. A safety device for an extractor tube assembly used in a beverage container, said device comprising mounting means for mounting the device onto the extractor tube and at least one retaining member connected to the mounting means for movement from a first position wherein the maximum overall dimension of the safety device radially of the extractor tube is less than the diameter of the beverage container outlet opening, permitting, in use, the removal of the extractor tube assembly from the beverage container, to a second position wherein the maximum overall dimension of the safety device radially of the extractor tube is greater than the diameter of the beverage container outlet opening, preventing, in use, the removal or expulsion of the extractor tube assembly from the beverage container, wherein, in use, the retaining member is biased from its first position to its second position when the beverage container is in its normal, beverage dispensing, orientation and the extractor tube extends substantial vertically downwardly.
2. A safety device as claimed in claim 1, wherein the at least one retaining member is biased from its first position to its second position by the force of gravity acting on the at least one retaining member.

3. A safety device as claimed in any preceding claim, wherein the at least one retaining member comprises an elongate limb pivotally connected to the mounting means such that, in its first position the elongate limb rests against the extractor tube and extends in a substantially upwardly direction relative to the normal orientation of the extractor tube and, in its second position, the elongate limb extends substantially radially outwardly from the extractor tube.
4. A safety device as claimed in any preceding claims, wherein a pair of diametrically opposed retaining members are provided.
5. A safety device as claimed in claim 4, wherein each retaining member comprises an elongate limb pivotally connected to the means for movement between respective first and second positions in the manner of butterfly wings.
6. A safety device as claimed in claim 5, wherein the retaining members are pivotally mounted on a common axis, each pivoting under their own weight from their first to their second positions, in use, when the beverage dispenser is in its normal, beverage dispensing, orientation.
7. A safety device according to claim 6, wherein stop means are provided for preventing each retaining member from pivoting past its second position.
8. A safety device according to claim 7, wherein each retaining member comprises an elongate plate having upturned strengthening sidewalls, one of said sidewalls being provided with an outturned projection adjacent one end, the opposed sidewall being provided with a corresponding aperture, the two retaining members being interconnected with the outturned projection of one retaining member passing through the corresponding aperture of the other retaining member, the mounting means including a mounting portion for mounting the safety device onto the extractor tube and a pair of axially extending plates extending therefrom on opposite sides of the extractor tube, the diametrically opposed free ends of the plates having apertures therein receiving the outturned projection of the retaining means.
9. A safety device for an extractor tube assembly used in a beverage container, said device comprising mounting means for mounting the device onto the extractor tube and retaining means adapted to abut the neck of the beverage dispenser preventing removal or expulsion of the extractor tube assembly from the beverage container when the beverage container is in its normal, beverage dispensing, orientation, wherein the device is adapted to permit removal of the extractor tube from the beverage container without the use of special tools when the beverage container is inverted.
10. A safety device substantially as hereinbefore described with reference to the accompanying drawings.

Fig.1.

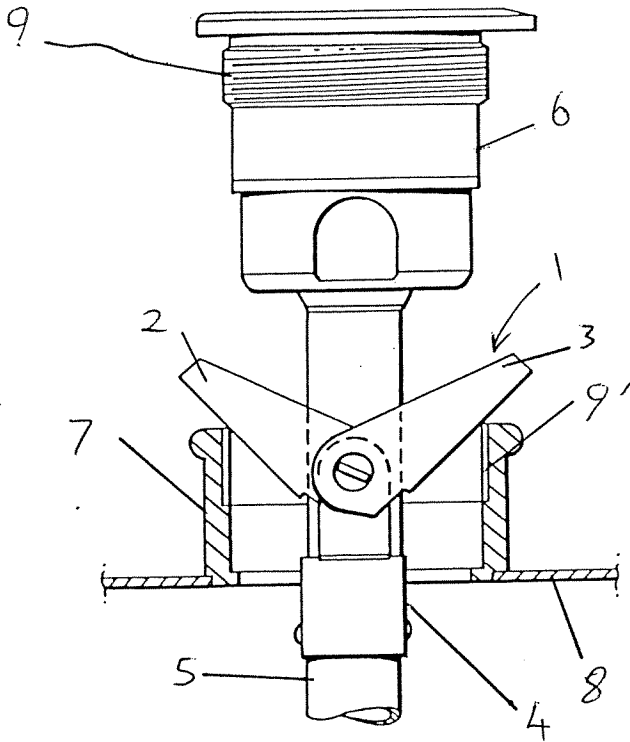


Fig.2.

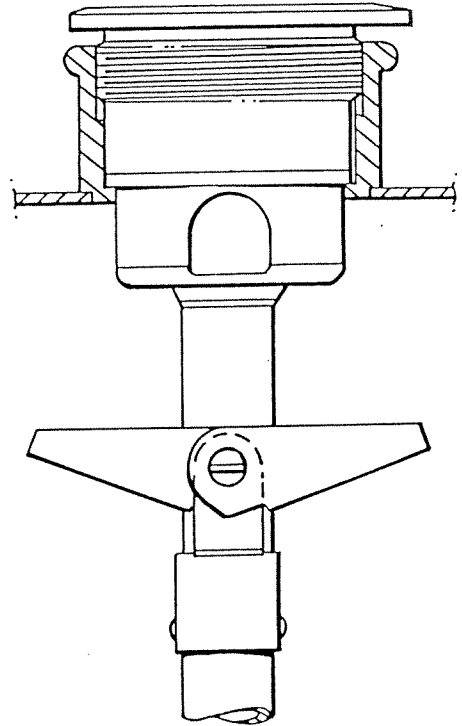


Fig.3.

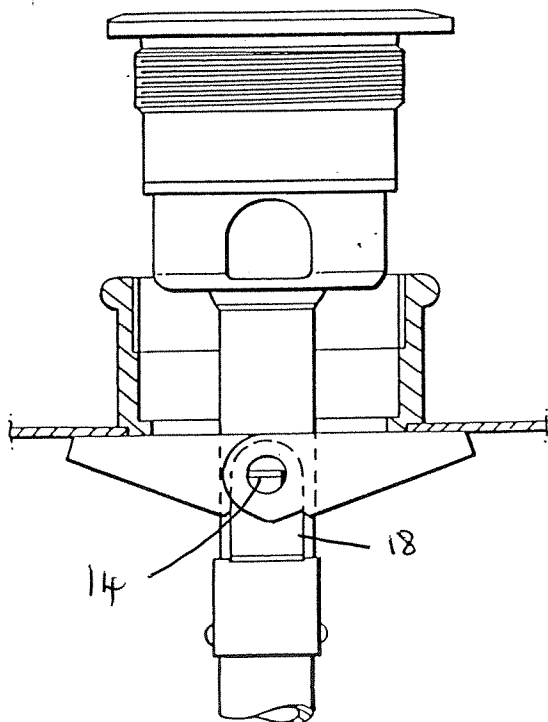


Fig.4.

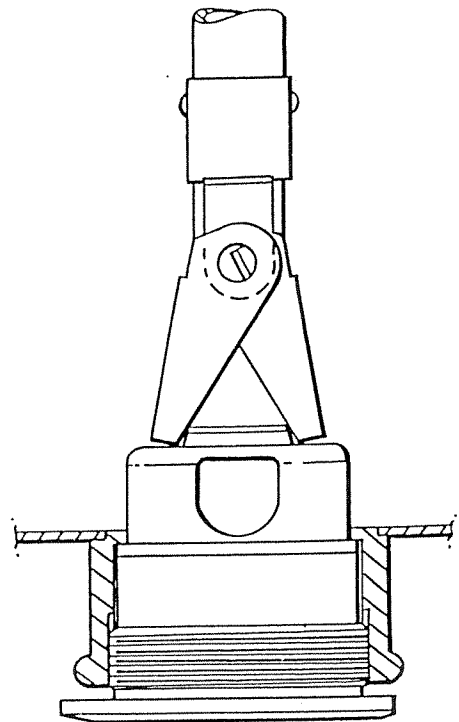


Fig.5.

