United States Patent

[11] 3,532,108

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[54] **TAMPER PROOF FIRE HYDRANT**
4 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **137/296,** 251/62, 251/291
[51] **Int. Cl.** **E03b 9/02,** F16k 31/143
[50] **Field of Search** ..... 251/128, 291, 62; 137/272, 280—285, 289, 294—296, 298—302, 322

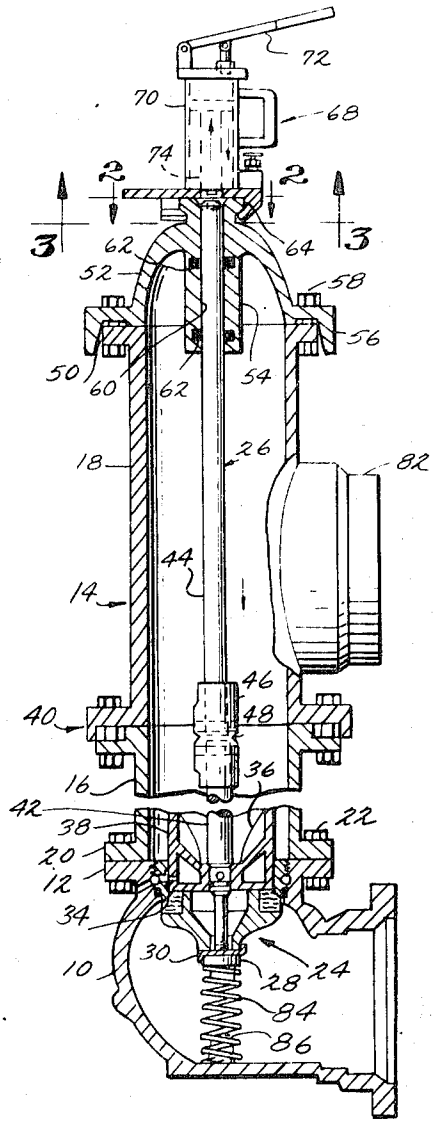
[56] **References Cited**

UNITED STATES PATENTS

797,384	8/1905	Thurston	137/299
1,124,455	1/1915	Kemp et al	137/283
2,596,532	5/1952	Coolidge et al	251/291X
3,070,115	12/1962	Jester	251/291X

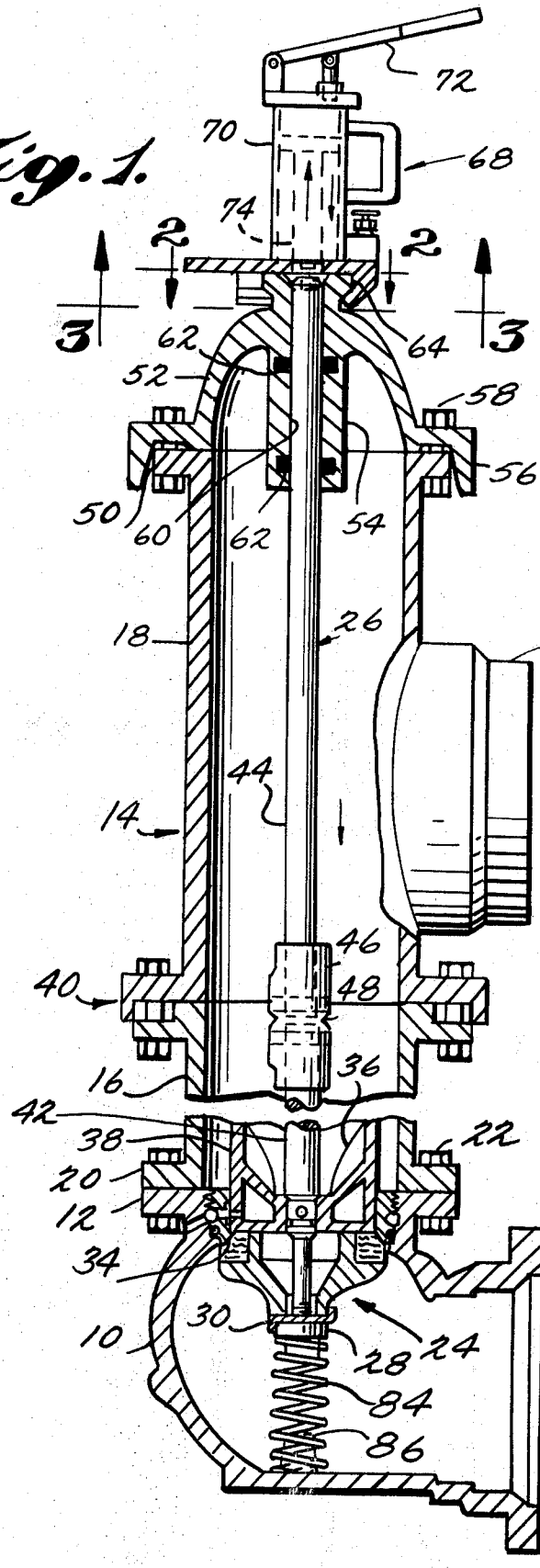
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ABSTRACT: A tamper proof fire hydrant which can only be operated with use of a special operating device or tool, thus preventing the opening of the hydrant by unauthorized persons for unauthorized use. The fire hydrant is provided with valve means operable against pressure of water, the valve means utilizing a stem and operating means which are only reciprocable.



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Fig. 1.



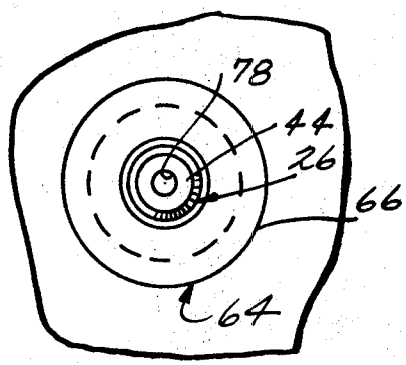


Fig. 2.

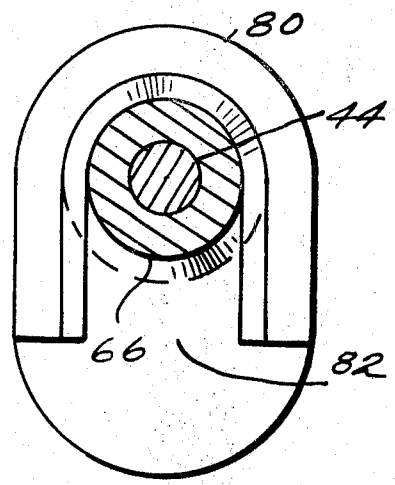
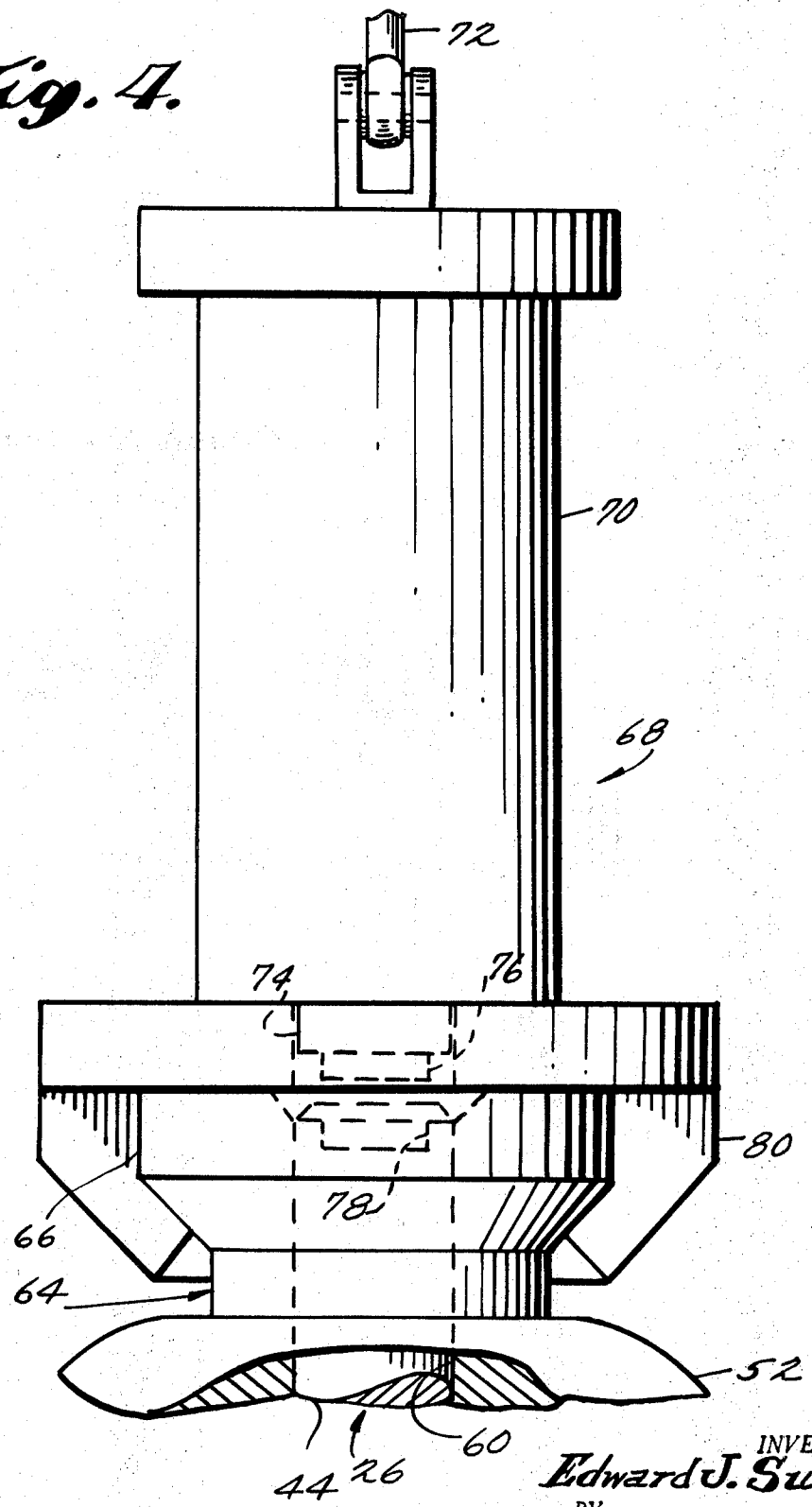


Fig. 3.

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Fig. 4.



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TAMPER PROOF FIRE HYDRANT

The present invention relates to improvements in fire hydrants and, more particularly, to improvements in those types of fire hydrants having a vertical barrel, a hydrant shoe with a hydrant valve positioned therein and a closure bonnet to which may be detachably attached a special tool or operating member.

In recent years municipalities have found increasing unauthorized use of fire hydrants by persons during hot weather, civil disturbances, and the like. The unauthorized use has caused considerable waste of water which is both costly and dangerous during seasons of the year when reservoirs are heavily taxed through normal use. Additionally, the unauthorized use has resulted in breaking of the hydrant operating mechanism without notification to the proper authorities. Hence, occasions have occurred when use of the hydrant was necessary but users have found the same inoperable.

An important object of the present invention is to provide a fire hydrant which is capable of operation only by authorized personnel having special tools or operating devices.

Another object of the present invention is to provide an improved hydrant structure in which the self-contained operating devices, such as the operating nut, are eliminated and the hydrant utilizes only a vertical valve stem movable by means detachably connected to the hydrant.

A still further object of the present invention is to provide a hydrant utilizing a detachable valve operator means capable of opening the hydrant against the fluid pressure of the main, the valve of the hydrant being closed by the pressure of the fluid in the main when the operator means is released and/or removed.

Ancillary to the immediately preceding object of the present invention it is a further object to provide a fire hydrant with valve means that is normally urged toward its closed position by spring means and/or water pressure.

Still a further object of the present invention is to provide an improved hydrant structure which is cheaper to manufacture and easier to repair or replace as the operating means for the valve stem is eliminated as a part of the in situ hydrant structure.

These and other objects and advantages of the present invention will become more apparent from the following detailed description in the specification, claims and accompanying drawings in which:

FIG. **1** is a vertical sectional view, partly in elevation, of a fire hydrant embodying the principles of the invention, the fire hydrant being shown with the detachable valve operator means secured thereto;

FIG. **2** is a view taken on the line **2–2** of FIG. **1** with the operator removed;

FIG. **3** is a view taken on the line **3–3** of FIG. **1**, and

FIG. **4** is an enlarged view of the detachable valve operating means attached to the bonnet of the fire hydrant, the view looking from the left of FIG. **1** toward the right.

Referring now to the drawings wherein like character or reference numerals represent like or similar parts, the fire hydrant of the present invention includes a hydrant shoe **10** adapted to be connected to a water main (not shown), the shoe **10** having an upwardly facing opening or mouth surrounded by a peripheral flange **12**. A barrel **14**, which is made in two sections, **16** and **18**, is provided at its lower end with a peripheral flange **20** which is bolted to the flange **12** of the shoe **10** by bolt means **22**. The shoe **10**, which is normally formed of cast iron, may be similar to that disclosed in U.S. Pat. No. 3,104,554, issued September 24, 1963, to Frank H. Mueller and John J. Smith, the patent having a common assignee with the instant application.

A reciprocable valve element generally designated at **24** is carried on the lower end of the an upwardly extending valve

stem **26** by a cap nut **28** and a lock washer **30**, the valve element having an upwardly facing frustoconical seating surface arranged to cooperate and seal with a frustoconical downwardly facing hydrant main valve seat **34**. The upper portion **36** of the valve element **24** is provided with vertically extending rib elements **38** arranged to cooperate with longitudinal grooves in the ring seat of the shoe in the usual manner. As will now be evident, the ribs **38** prevent the valve element **24** as well as the valve stem **26** from rotating but they permit the same to reciprocate vertically to open and close the valve.

The barrel sections **16** and **18** of barrel **14** are detachably connected together by means of a frangible connection generally designated at **40** and described in detail in the aforementioned U.S. Pat. No. 3,104,554. At this point, it should also be mentioned that the valve stem **26** is made of two parts, a lower stem part **42** and an upper stem part **44** connected together by a frangible sleeve connection **46** having a weakening groove **48** thereon. Thus, if the hydrant is subjected to a severe blow, such as from an automobile striking the same, the frangible connection **40** permits the upper barrel section **18** to be knocked over without damage whereas the frangible connection **46** permits separation of the valve stem parts so that the valve element **24** in the shoe is not damaged.

The upper barrel section **18** is provided with a peripheral flange **50** for receiving a bonnet or closure member **52**. The bonnet or closure member **52** is preferably cast iron and is provided with a downwardly extending centrally positioned interior boss **54** and with a circumferential flange **56**. Bolt means **58** or the like secure the bonnet **52** to the barrel **14**, as clearly shown.

As shown in FIGS. **1** and **4**, the boss **54** of the bonnet **52** is provided with a bore **60** therethrough. The bore **60**, which opens to the exterior of the bonnet, is provided with spaced annular grooves **62** arranged to receive O-ring seals or the like for sealing engagement with the upper end of the valve stem **26**. The upper end of the valve stem **26** extends through the bore **60** and terminates at or just below the exterior surface of the bonnet **52** so that a wrench or other conventional tool cannot operatively engage the same.

On the exterior surface of the bonnet **52** there is provided a male projection generally indicated at **64**, the male projection having an enlarged flanged end **66** surrounding the outer end of the bore **60** as shown.

Referring now to FIGS. **2** and **3** in addition to the previously mentioned FIGS. **1** and **4**, the valve operating means generally designated at **68** is shown detachably connected to the bonnet or closure member **52**. The valve operating means includes a hydraulic jack assembly **70** having the usual operating handle **72** for causing its hydraulic ram **74** to extend from its cylinder. The hydraulic ram **74** is provided with a reduced end portion **76** for fitting into a circular closed end bore **78** provided in the end of the valve stem **26**. Note that there can be no relative vertical movement between the jack assembly **70** and the hydrant when it is desired to use the jack assembly. In order to accomplish this, the jack assembly **70** is provided with a U-shaped female portion **80** having an opening at one side thereof as indicated at **82**, FIG. **3**, so that the same can be slid sideways onto the male projection **64** on the bonnet **52**. The U-shaped section **80** on the housing is so designed that when it is slipped sideways onto the male projection **64** and is bottomed against the same, the ram **74** of the jack means **70** will be directly aligned with the upper end of the valve stem **26**.

The valve operating means **68** will be carried by authorized personnel for use on hydrants. When they desire to operate a hydrant it is merely necessary for them to attach the valve operating means **68** to the top of the hydrant and then operate the jack means **70** by the handle **72** to extend the ram **74** and push downwardly on the stem **26**. This will cause the valve **24** to move downwardly against the liquid pressure of the main. Of course, the usual hydrant nozzles **82** will be opened in the usual manner and connected to hose equipment or the like. When it is desired to turn off the hydrant, it is merely necessary to relieve the pressure on the hydraulic jack means so that

the water pressure in the main and spring **84** will push the valve **24** upwardly against the downwardly facing seat **34**.

In situations where water pressure is low and would not be sufficient to close the valve when the valve operator **70** was released or removed, the valve **24** can be spring urged to the closed position by providing a coil spring **84** between the valve **24** and the bottom of the shoe **10** as shown in FIG. **1**. The shoe **10** may be cast with an upwardly extending lug **86** for receiving and centering one end of the coil spring **84** whereas the other end of the coil spring may be received on the reduced end of the cap nut **28**.

Having set forth the nature and objects and advantages of the present invention, it will be perceived that certain changes, adjustments and modifications may be made without departing from the principle and spirit of the invention.

I claim:

1. A tamper proof fire hydrant: comprising a barrel, a shoe connected to the lower end of said barrel and having valve means therein arranged to be opened against fluid pressure of a main; a bonnet member detachably secured to and closing the upper end of said barrel, said bonnet member having an interior downwardly extending boss with a bore therethrough, said bonnet further having a male projection on the exterior thereof surrounding the end of the bore therein, said exterior male projection defining an annular flange; a vertical reciprocating valve stem connected at its lower end to said valve means and extending upwardly through said barrel, said valve stem having its upper end extending through the bore in said bonnet and terminating substantially flush with the exterior of said bonnet when the valve means is closed; and operating means quickly detachable to the exterior of said bonnet member, said operating means including a hydraulic jack member having a housing with a ram arranged to extend therefrom and abut the upper end of said valve stem to move the stem vertically downwardly, said housing having a U-shaped female fitting at the end thereof, from which the ram extends for mating with said male fitting by horizontal movement of said housing.

2. A tamper proof fire hydrant as claimed in claim **1** including spring means for urging said valve means toward its closed position.

3. A tamper proof fire hydrant as claimed in claim **2** in which said spring means includes a coil spring positioned in said shoe and operatively engaging said valve means from beneath the same.

4. A tamper proof fire hydrant as claimed in claim **1**, in which the upper end of said valve stem includes a circular closed end bore and in which the end of said ram arranged to abut said valve stem includes a reduced end portion for fitting into said circular closed end bore.