Sept. 12, 1961 D. J. STEARNS 2,999,264

MEANS FOR UNBLOCKING PIPES

Filed April 4, 1960

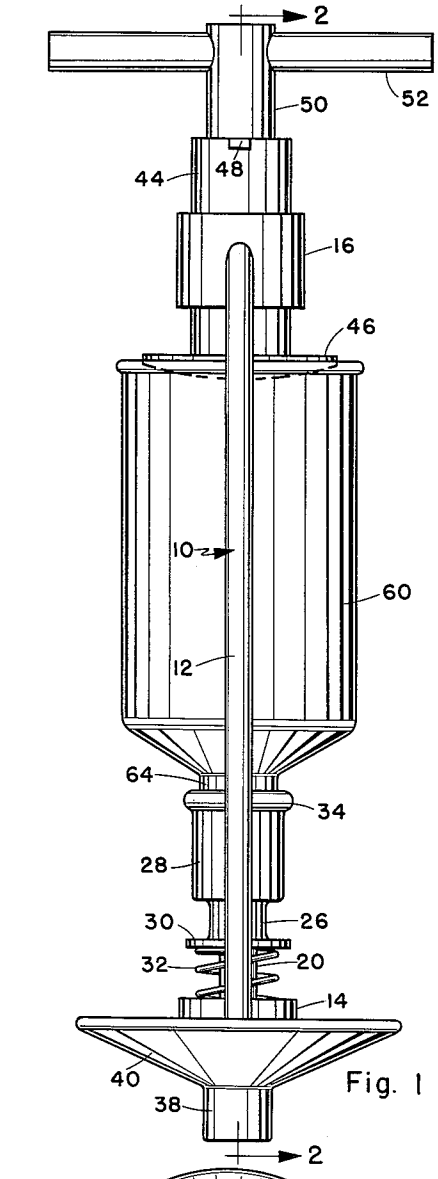


Fig. 1

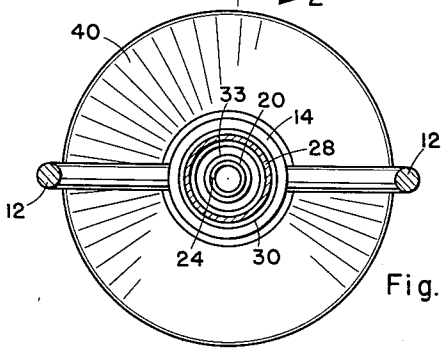


Fig. 3

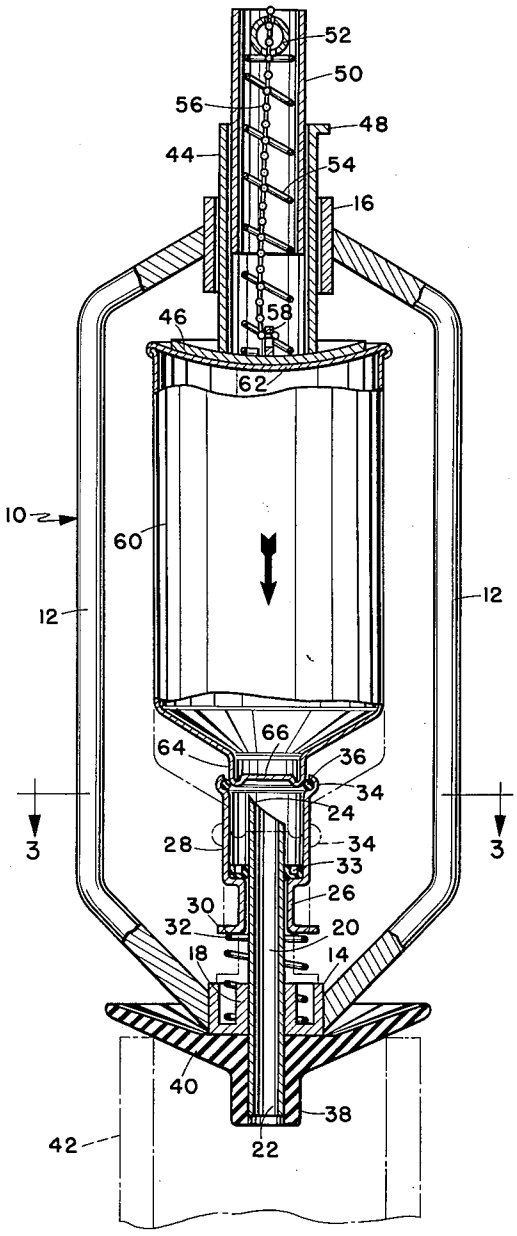


Fig. 2

INVENTOR.

DONALD J. STEARNS

BY Knox & Knox

United States Patent Office 2,999,264
Patented Sept. 12, 1961

2,999,264

MEANS FOR UNBLOCKING PIPES

Donald J. Stearns, 33 E. I St., Chula Vista, Calif.

Filed Apr. 4, 1960, Ser. No. 19,875
5 Claims. (Cl. 15—406)

The present invention relates generally to plumbing equipment and more particularly to means for unblocking pipes.

The primary object of this invention is to provide means for unblocking pipes, drains and the like utilizing compressed gas discharged from a pressurized can held in a frame and having pipe sealing means which enables the full effect of the gas to be utilized without leakage.

Another object of this invention is to provide pipe clearing means in which the pressurized can is a replaceable, sealed unit, the gas being released by puncturing the can with a bayonet type piercing means integral with the gas outlet pipe.

Another object of this invention is to provide pipe clearing means in which the pressurized can is held safely clear of the piercing means until intentionally pierced by forcing the device firmly against the pipe to be cleared, the handle of the device incorporating a pre-loading spring which holds the can securely to prevent blow-back.

A further object of this invention is to provide pipe clearing means which may be used with many different sizes of pipes, drains or in sinks or toilet bowls, the sealing means being adapted to fit closely into the opening or end of the pipe.

Finally, it is an object to provide pipe clearing means of the aforementioned character which is simple, safe and convenient to use and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention consists in the novel construction, combination and arrangement of elements and portions, as will be hereinafter fully described in the specification, particularly pointed out in the claims, and illustrated in the drawing which forms a material part of this disclosure, and in which:

FIGURE 1 is a side elevation view of the complete structure;

FIGURE 2 is a sectional view taken on the line 2—2 of FIGURE 1; and

FIGURE 3 is a sectional view taken on the line 3—3 of FIGURE 2.

Similar characters of reference indicate similar or identical elements and portions throughout the specification and throughout the views of the drawing.

The structure includes an open frame 10 having a pair of side bars 12 of metal rod or the like, said side bars being inwardly bent and connected to a base collar 14 at one end and fixed to a guide collar 16 at the other end thereof, the two collars being coaxial. The base collar 14 has a concentric inner hub 18 in which is fixed a tubular spout 20 having a downwardly extending nozzle 22, said spout also extending upwardly and having a pointed end or bayonet portion 24. Slidably mounted on the spout 20 is a barrel 26 with an enlarged upper cup portion 28, the lower end of said barrel having an outwardly extending flange 30 which rests on a safety spring 32 seated in the base collar 14. The sliding connection between the spout 20 and barrel 26 is preferably made leak proof by a suitable sealing ring 33. The upper end of the cup portion has an annular rim 34 holding an O-ring 36, which is normally held above the bayonet portion 24 by the safety spring 32.

Fixed to the nozzle 22 is sealing plug 38 having a radially extending, generally conical skirt 40, of resilient material such as rubber or the like. The skirt engages the edge of an opening or pipe, as indicated at 42 in FIGURE 2, and seals the opening when the plug 38 is inserted therein.

Slidably mounted in the guide collar 16 is a plunger assembly comprising an outer sleeve 44 at the lower end of which is fixed a generally circular pressure pad 46, the upper end of said outer sleeve having an outwardly projecting stop 48 to limit downward travel thereof. Fitted slidably in the outer sleeve 44 is an inner sleeve 50 carrying at its upper end a bar type handle 52 for holding the tool. The inner sleeve 50 is supported on a preload spring 54 fitted therein between the pressure pad 46 and handle 52, but is held against displacement by a link chain 56 connecting said handle to a lug 58 on said pressure pad. A cord or wire may be used in place of the link chain 56 if desired, the only purpose being to prevent separation of the various parts.

The pressurized gas is provided in a rupturable, non-shattering container 60 which will ordinarily be a can with a dished end 62, the pressure pad 46 being shaped to fit said dished end and conveniently hold the can. The other end of the can 60 has a reduced neck 64 which seats securely on the O-ring 36, said neck having an end cap 66. The precise structure of the container or can 60 is immaterial since such cans are readily available and construction varies. The gas to be contained in the can is also variable and can be air, carbon dioxide, or the like. One particularly suitable gas, however, is freon and, when used, may be combined with a quantity of water in the can. Since freon is readily soluble, the release of pressure when the can is punctured is prolonged slightly, rather than having a somewhat explosive effect. The prolonged pressure may be more desirable where the piping to be unblocked contains slip joints or other connections which might be displaced by a sudden explosive pressure.

In use the can 60 is loaded in place and held between the cup portion 28 and pressure pad 46, while the sealing plug 38 is applied to the opening or pipe to be cleared. Initial pressure on the handle 52 telescopes the inner sleeve 50 into the outer sleeve 44 and compresses the preload spring 54, clamping the can 60 tightly and forcing the sealing plug skirt 40 into firm sealed contact with the opening or pipe. Continued pressure on the handle 52 overcomes the resistance of the end cap 66 to rupture by the bayonet portion 24 coupled with the resistance of the safety spring 32 and forces the can 60 downwardly, as indicated in broken line in FIGURE 2, causing the bayonet portion 24 to pierce the end cap 66 and release the compressed gas through the nozzle 22. Once the bayonet point 24 ruptures the container 60, the weaker safety spring 32 is completely overcome and the compressed overload spring 54 quickly expands to supplement the manual downward force applied on the handle 52. In actual practice the operation is accomplished by a single firm thrust. The pressure of the preload spring 54 prevents any blow-back or leakage from the cup portion 28, the can being securely held between two spring biased supports which absorb any sudden motion of the can at the instant of pressure release.

By using a self-contained pressurized can which is discarded after use, pressure reservoirs and their associated valving are eliminated, together with the problem of recharging. The cans may be made and filled relatively cheaply, so that the cost per operation may be less than the cost of labor involved in using a snake or other mechanical device to clear pipes. An advantage of the addition of a small quantity of water in the can 60 should be noted, since it enables the employedment of a standard sized container to provide for a whole range of maximum pressures and a corresponding range in thrust duration, merely by variation of the amount of water in the container.

The operation of this invention will be clearly compre-

hended from a consideration of the foregoing description of the mechanical details thereof, taken in connection with the drawing and the above recited objects. It will be obvious that all said objects are amply achieved by this invention.

It is understood that minor variation from the form of the invention disclosed herein may be made without departure from the spirit and scope of the invention, and that the specification and drawing are to be considered as merely illustrative rather than limiting.

I claim:

1. Means for unblocking pipes, comprising: a rigid frame having a gas conducting spout at one end thereof and a pipe-engaging sealing member on said spout; a cup member axially slidably mounted on said spout; a manually operable plunger assembly mounted at the other end of said frame for sliding movement coaxially of said cup member; a rupturable, non-shattering container of pressurized gas; said plunger assembly having a pressure pad resiliently biased to engage said container and hold the same between said pressure pad and said cup member; said spout having a bayonet point adjacent to said cup and extending toward said plunger assembly to pierce said container when said plunger assembly is moved toward said bayonet point.

2. Means for unblocking pipes, comprising: a rigid frame having a base collar at one end; a guide collar at the other end of said frame coaxial with said base collar; a gas conducting spout fixed in said base collar and having a substantially resilient, pipe-engaging sealing plug fixed thereto outwardly of said frame; said spout having a bayonet portion at the end thereof disposed inwardly of said frame; a cup member slidably mounted on said spout; a rupturable, non-shattering container of pressurized gas having a neck end adapted to seat in said cup member in sealed relation therewith; a plunger assembly axially slidably mounted in said guide sleeve and engaging the other end of said container to hold the same in place; and a safety spring between said base collar and said cup member to hold said container clear of said cup member.

3. Means for unblocking pipes, comprising: a rigid frame having a base collar at one end; a guide collar at the other end of said frame coaxial with said base collar; a gas conducting spout fixed in said base collar and having a substantially resilient, pipe-engaging sealing plug fixed thereto outwardly of said frame; said spout having a bayonet portion at the end thereof disposed inwardly of said frame; a cup member slidably mounted on said spout; a rupturable, non-shattering container of pressurized gas having a neck end adapted to seat in said cup member in sealed relation therewith; a plunger assembly axially slidably mounted in said guide sleeve and engaging the other end of said container to hold the same in place; said plunger assembly including telescopically slidable sleeve elements having a preload spring therebetween biasing the elements apart; a pressure pad on one of said sleeve elements engageable with said container; a handle fixed to the other of said sleeve elements for manual compression of said preload spring; and a safety spring between said base collar and said cup member to hold said container clear of said bayonet portion.

4. Means according to claim 3 wherein said container is charged with freon gas and a small quantity of water.

5. Means according to claim 3 wherein said preload spring is stronger than said safety spring.

References Cited in the file of this patent

UNITED STATES PATENTS

2,300,319	Smith	Oct. 27, 1942
2,601,211	Neely	June 17, 1952
2,725,048	Koogle	Nov. 29, 1955

FOREIGN PATENTS

2,516	Great Britain	Feb. 20, 1886