Oct. 1, 1957 P. C. McCURDY 2,808,069

CUT-OFF AND DRAIN UNITS FOR PLUMBING SYSTEMS

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Fig. 2.

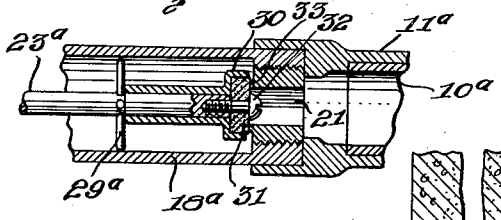


Fig. 1.

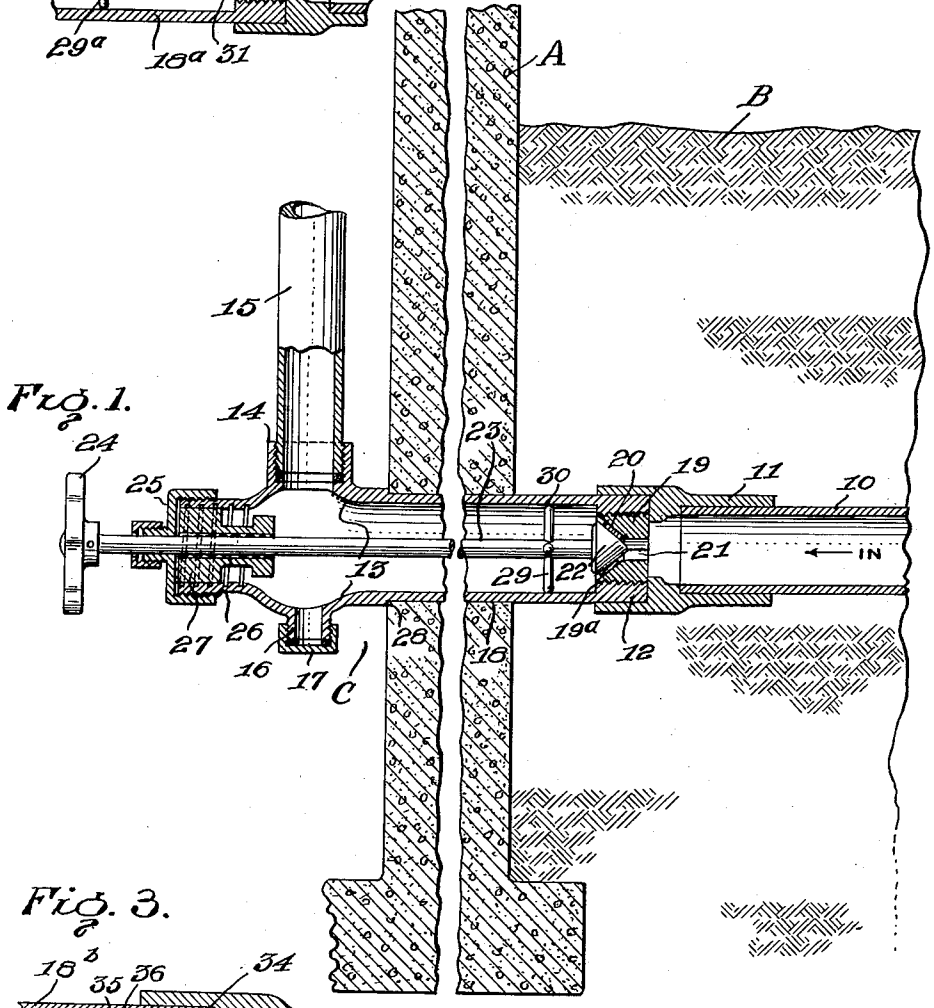
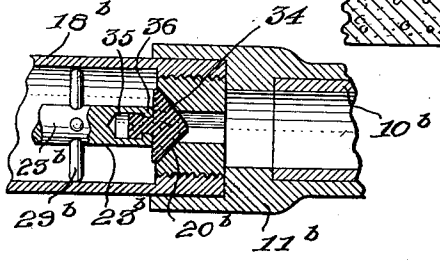


Fig. 3.



INVENTOR

Philip C. McCurdy.

BY Herbert M. Burch.

ATTORNEY

United States Patent Office

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CUT-OFF AND DRAIN UNITS FOR PLUMBING SYSTEMS

Philip C. McCurdy, Kensington, Md.

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4 Claims. (Cl. 137—236)

My present invention relates generally to plumbing systems. More particularly it relates to a novel improved arrangement and remote control valve device for not only completely draining all pipes inside the house, but also all the pipe connections within the building walls, as well as for a positive cut-off of all water supply at the exterior of the building wall and below the ground level and the frost line at the point of connection with the main water supply line before it feeds in through the usual eight to eighteen inches of building wall and pipe therein into the house plumbing line.

Prior to this invention, to drain a house water system, the main water supply could only be cut off within the house, i. e., inside the exterior building wall, and the usual drain plugs then removed to drain the water from the interior piping. However, the sections of pipe inside the exterior building wall do not drain, but remain full of water as they are not cut-off from the main supply line and if the weather should be cold enough the water in these wall-mounted pipe sections and connections will freeze, burst the pipe and cause damage and require repair or replacement.

It is an object of the invention to provide novel means, whereby the main water supply line buried below ground level and the freeze line may be cut off outside the building wall before it enters the building through the wall.

Another object is to provide a novel unit comprising a valve and remotely positioned operating handle, said valve seating in the end of an elongated pipe section extensible through the thickness of a building wall for coupling with the main water supply line buried below the freeze line in the ground, which is operable within the building.

A further object is to provide in a novel remote cut-off unit a replaceable valve seat adapted to be removed and readily replaced from inside the building wall without disturbing the pipe connections either within or outside the wall.

A further object is to provide a valve that is self-compensating for wear as it is used.

Still a further object is to provide a valve formed with a replaceable and self-adjusting head portion.

The above and other objects and advantages of my invention will appear more fully hereinafter from a consideration of the detailed description which follows, taken with the accompanying drawings wherein three embodiments of my invention are illustrated. It is to be understood that the drawings are for the purpose of illustration only and are not intended to define the limits of my invention. Reference should be had to the appended claims to determine the limits or scope of the invention.

In the drawings wherein like reference characters refer to like parts throughout the several views:

Figure 1 is a cross section view of a section of building wall of standard thickness, illustrating a cross section view of one embodiment of my invention mounted therein;

Figure 2 is a second embodiment of valve structure utilizable; and

Figure 3 is a third embodiment of the valve structure.

Referring in detail to the drawing and first with particular reference to Figure 1, there is illustrated a building wall A extending below a ground level B and with a main water supply pipe line **10** buried in the ground below the frost line. Coupled to the outlet end of the line **10** is a coupler element **11**, which is suitably coupled by welding or shrink-fitting within the end bore thereof to the end **12** of the outer diameter or circumference of my novel combination drain and remote cut-off unit C.

The unit C includes a body with a globe portion **13** formed with an interiorly threaded water supply outlet nipple **14**. In this nipple is connected the end of any suitable water pipe **15**, which leads off as is well known to the usual house water piping, not shown. Radially displaced from the nipple **14** is a drain opening defined by exteriorly threaded drain nipple **16**, which may be closed by an internally threaded cap **17** or other means, such as a needle valve or petcock operable for draining the pipe system **15** inside the house.

Extending from the globe part **13** of the body from inside the wall A to the outside thereof, is a reduced elongated tubular portion, such as the cylinder or tube **18** with the previously referred to interiorly threaded end **12**, which is coupled to the exterior water supply pipe line **10** buried in the ground below the water freeze line outside the wall A. Fixed within the end **12** of the cylinder **18** is a bushing **19**, including a valve seat **20**, a key wrench hexagonal socket **21** and an exteriorly threaded circumference **19***a*. The valve seat **20** coacts with a valve **22** formed on the end of a valve actuator shaft **23**, which shaft extends longitudinally through the complete unit C from an operating handle **24** inside the wall A to the main water line **10** outside wall A.

The valve actuator shaft **23** extends through a packing gland assembly **25**, which is threaded into a bearing nipple **26**, which is internally threaded so as to rotatably and reciprocably mount a threaded bearing sleeve or bushing **27** keyed to the valve shaft **23**.

As illustrated in Figure 1, the handle **24** and the globe portion **13** with the drain **16** and lead in nipple **15** are all inside the building wall A. The wall engaging part of the globe **13** may be formed with a stop in the form of an annular abutment or shoulder **28**, and at this shoulder the globe **13** reduces into the elongated tube or cylinder **18**. This tube **18** is longer than the thickness of the wall A to permit the valve end **12** of the tube to be coupled to the main water feed line **10** outside the wall A below the ground level freeze line.

The valve actuator shaft **23** and its valve head **22** are centered with respect to the bore of the tube **18** and the bore of the valve bushing **19** by suitable centering means, such as radially extended pins **29** formed from the shaft or otherwise affixed thereto. The respective ends **30** of these pins engage the interior bore of the tube **18**, and the ends are preferably rounded to reduce friction and permit greater freedom of turn when the valve is being actuated from the handle **24**.

From the foregoing, it is believed clear that by turning the handle **24** bushing **27** is caused to rotate and travel linearly to thereby impart reciprocation to valve actuator shaft **23**, and its operatively associated valve **22**. Thus the valve **22** may be closed or opened at the exterior of the wall A to control the water supply from pipe **10**.

For example, when the water is to be cut off the valve **22** is seated to cut off the water and the drain plug or cap **17** may now be removed to drain the system including all water in the wall mounted tube **18** as well. Thus there is no water inside the walls of the house to freeze under any conditions, as it is cut off by the valve **22** remotely positioned below the ground freeze line outside

the house, usually at a depth of approximately three to four feet.

The fact that the globe portion **13** is made larger than the bore of tube **18** provides better drainage from the bore of tube **18**, and also because the bore of tube **18** is relatively larger than the bore of the inlet pipe **10**, there is no appreciable reduction in flow when the valve is open.

The valve bushing **19** may become worn with use, and accordingly it is made removable and replaceable by means of an elongated key wrench, not shown, engageable with the hexagonal socket **21**. The removal of the valve bushing is accomplished by first cutting off the street water supply and then removing the valve shaft glands **25** and bearing sleeve **27** with the shaft **23**, after which the key wrench may be extended through the unit body into the socket **21** for its removal. Preferably the valve seat bushing is made of non-corrosible material, such as brass, stainless steel and the like.

A second form of valve and valve seat bushing is illustrated in Figure 2, wherein the valve head **30** includes the usual washer **31** and holding bolt **32**, and the valve seat is an annular rib or collar **33**. Otherwise the structure is substantially the same as in Figure 1, and such like parts are given the same numerals with a sub-reference "*a*."

A third form of valve with a valve seat bushing is illustrated in Figure 3. In this embodiment, the valve head **34** is removable and is held loosely in a socket **35** formed in the end of actuator shaft **23***b*, by means of turned over flange **36**.

With this mounting of the valve head **34**, it is permitted to be turned with the actuator shaft **23***b* when said shaft is turned and while the head is free of the valve seat **20***b*. However, when the head is in contact with the seat it is guided and held against turning even though the shaft **23***b* may still be rotated for small number of turns. This non-turning in the seat prevents excessive wear of the valve head **34** and permits the head to be made of a synthetic plastic or other hard plastic material in lieu of metal.

Without further description it is believed that the foregoing is sufficiently complete, clear, concise and exact in terms to enable any person skilled in the art to practice this invention. However, it is to be expressly understood that although only three forms of my invention are described and illustrated in detail, that other parts, arrangements and combinations of parts, which may now occur to others are likewise intended to be covered hereby. To determine the scope of the invention, reference should be had to the appended claims.

What is claimed is:

1. A cut-off and drain unit for plumbing systems comprising a body having a hollow globe portion with a drain outlet and water outlet nipple disposable inside a building wall, an elongated cylinder extendable through said wall with the bore thereof in communication with the interior of said globe portion, said cylinder having a valve seat in the end of the elongated bore remote from said globe portion, a hollow boss formed from the globe portion, a rotatable and reciprocable mounting for a valve shaft in the bore of the boss, a closure for said drain nipple, an elongated valve actuator shaft projecting from outside said globe portion through said boss bore to adjacent said valve seat, said shaft being keyed in said mounting and being rotatable and reciprocable therewith, a valve on the end of said shaft in the cylinder bore adjacent said valve seat, a coupling means on the end of the said cylinder for coupling to a water supply pipe at a point exterior of said wall and below the frost line, and manual means for moving said shaft to open and close said valve.

2. The cut-off and drain unit described in claim 1, wherein said valve seat is of less external diameter than the internal diameter of said cylinder for removal thereof through the opposite end of the cylinder and wherein said cylinder is coupled to said water supply pipe.

3. The cut-off and drain unit described in claim 1, wherein said valve seat is formed in an exteriorly threaded bushing threadably mounted in the valve end of the said cylinder, said bushing including an axially aligned hexagonal socket adapted to be engaged by a socket type wrench for removal and replacement thereof.

4. A building wall mounted cut-off and drain unit for connecting to a water supply pipe buried below the water freeze level, comprising an elongated tube extending through the wall and projecting from both the interior and exterior sides thereof, said wall extending below the ground level and below the water freeze level on the exterior side, said tube being coupled to a buried water supply pipe beyond the exterior side of the wall, a remotely controlled valve means in the tube bore at said exteriorly coupled end, a hollow globe portion connected to the portion of the tube projecting from the interior side of the wall with a main pipe connection and a drain means, shaft means extending through said globe portion and said elongated tube carrying said valve means on the end thereof, and means for moving said shaft to open or close said valve means to cut-on the water from said water supply pipe projecting from the globe portion on the interior side of the wall.

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