

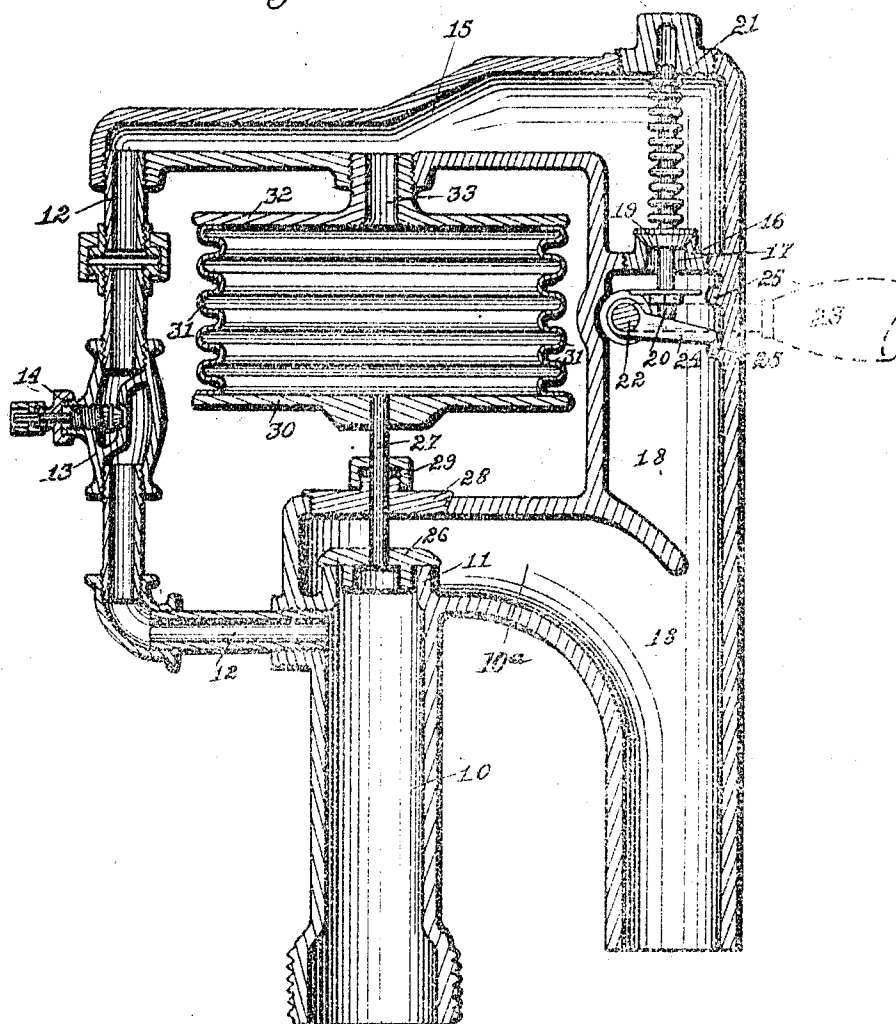
1,048,228.

A. A. SUTHERLAND.
CLOSET FLUSHING DEVICE.
APPLICATION FILED NOV. 12, 1909.

Patented Dec. 24, 1912

2 SHEETS-SHEET 1.

Fig. 1.



Witnesses.
W. A. Loftus
A. G. Hague

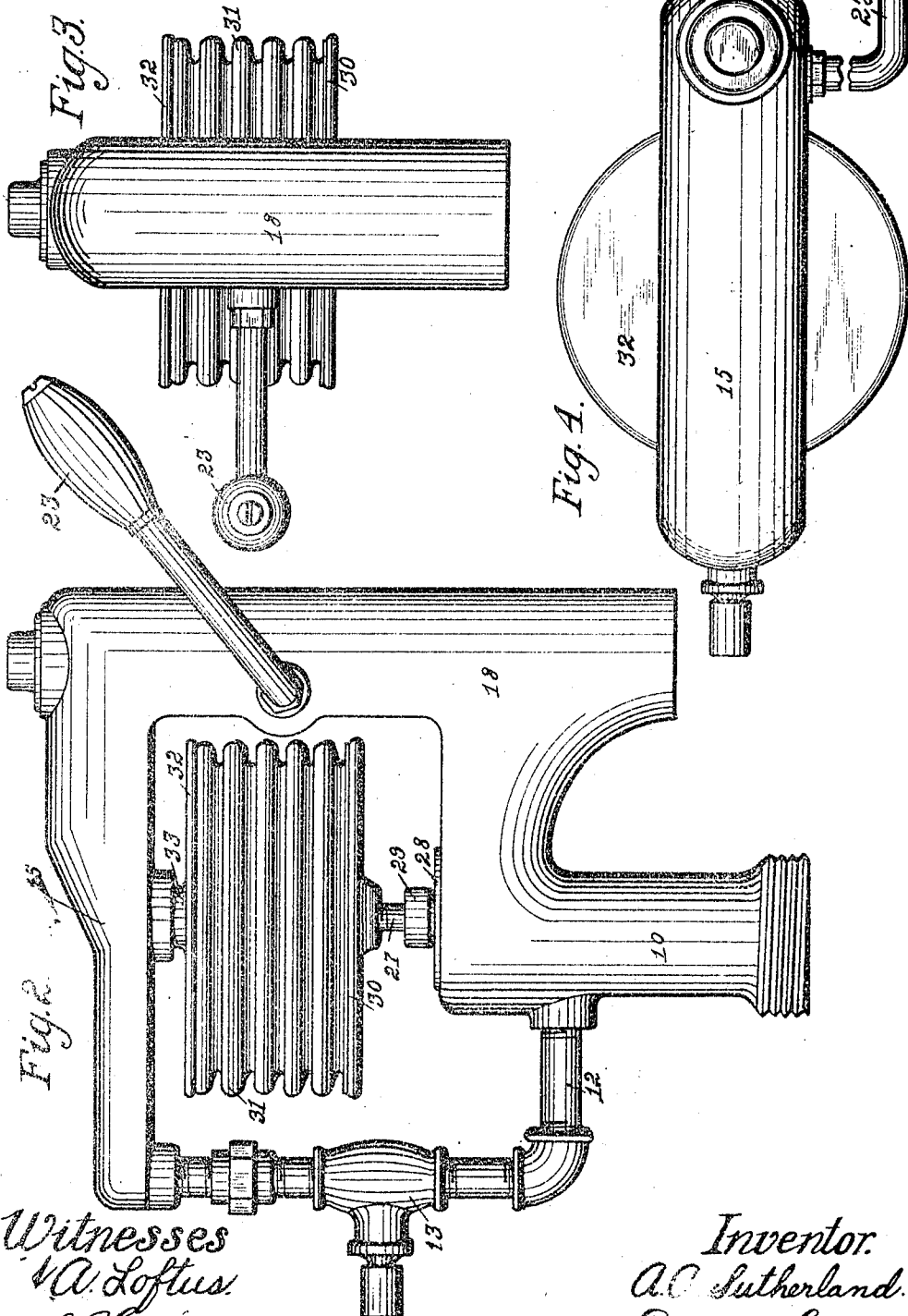
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by Orwig & Lane attys

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UNITED STATES PATENT OFFICE.

AUSTIN A. SUTHERLAND, OF DES MOINES, IOWA.

CLOSET-FLUSHING DEVICE.

1,048,228.

Specification of Letters Patent.

Patented Dec. 24, 1912.

Application filed November 12, 1909. Serial No. 527,622.

To all whom it may concern:

Be it known that I, AUSTIN A. SUTHERLAND, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Closet-Flushing Device, of which the following is a specification.

My invention relates to that class of closet flushing devices in which a slow closing valve is employed, which valve is operated to close by the pressure of water within the device, and which is operated to open by manually opening a valve to relieve the water pressure that tends to close the main valve.

My object is to provide a closet flushing device of this class, of simple, durable, and inexpensive construction, in which there is a minimum of wear and friction and in which all of the parts are readily accessible for purposes of repair or adjustment.

A further object is to provide a device of this kind in which the expansion chamber is exposed on all sides so that the operator may detect leaks therein and in which the said expansion chamber and connected parts may be readily and easily removed or replaced.

A further object is to provide a by-pass leading from the intake pipe to the expansible valve closing chamber, said by-pass being provided with a regulating valve readily accessible, that may be easily and conveniently adjusted by hand so that, if it should become clogged or interrupted, it may be easily opened so that the water may clean out any obstructions in the valve seat.

My invention consists in the construction, arrangement, and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawings, in which—

Figure 1 shows a central, sectional view through a closet flushing device embodying my invention. Fig. 2 shows a side elevation of a complete closet flushing device embodying my invention. Fig. 3 shows an edge view of same, and Fig. 4 shows a top or plan view of same.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate the intake pipe. This is designed to be connected with a water supply pipe containing water under pressure. The in-

take pipe is provided at its upper end with a valve seat 11, and below the valve seat there is a pipe 12 communicating with the intake pipe to serve the purpose of a by-pass. In this pipe 12 is a valve chamber 13 having a screw-valve 14 to engage the valve seat thereof so that the valve may be readily and easily adjusted by hand toward and from the valve seat to thereby regulate the passageway through the by-pass and thus control the flow of water through the by-pass. The said by-pass pipe 12 communicates at its upper end with a water chamber 15, which chamber is provided with a valve seat 16 and with a passageway 17 leading to the discharge pipe 18, which discharge pipe also communicates by means of a passage 10' with the upper end of the intake pipe 10. I have provided a valve 19 for the valve seat 16, fixed to a vertically movable valve stem 20. A spring 21 is provided for normally holding the valve 19 to its seat and means are provided for manually elevating the valve stem 20 as follows: 22 indicates a shaft having a handle 23 fixed on one end and an arm 24 on the other. This arm is normally in engagement with the lower end of the valve stem 20, and limiting stops 25 are provided for the said arm 24. Obviously, the handle 23 may be manipulated to raise the valve 19 above its seat and the spring 21 will tend to normally close the valve after the handle has been released. The said valve 19 serves the function of releasing the pressure of water within the water chamber 15 and, therefore, is hereinafter referred to as a relief valve.

Mounted on the valve seat 11 is the flushing valve 26 connected to the valve stem 27, which extends through a screw plug 28 provided with a stuffing box 29. At the upper end of the valve stem 27 is a disk 30, and connected with the disk 30 is a cylindrical, expansible water chamber 31 having its sides made of resilient sheet metal provided with annular corrugations. The upper end of the sheet metal is connected to a stationary disk 32 which is provided with a passageway 33 communicating with the interior of the chamber 15. The corrugated, resilient sides are designed to serve the purpose of normally holding the disk 30 in an elevated position to retain the valve 26 above its seat, and when water under pressure is admitted into the interior of the expansible chamber, it will press downwardly

upon the disk 30 with sufficient force to firmly hold the valve 26 to its seat against the upward pressure of water upon the valve 26 within the intake pipe 10.

5 In practical operation, and assuming that the intake pipe 10 is connected with a source of water supply under pressure, then, obviously, the water will flow upwardly through the opening at the top of the pipe
10 10 into the discharge pipe 18 and also through the by-pass 12. As soon as the water flowing through the by-pass 12 fills the expansible chamber 31, then, on account of the large area of the disk 30, the pressure
15 within the expansible chamber will cause the disk 30 to be lowered and the valve 26 closed. The pressure of water within the expansible chamber will tend to hold said valve firmly against its seat to prevent leak-
20 age.

Assuming that it is desired to flush a closet connected with the discharge pipe 18, the operator grasps the handle 23, and by
25 manipulating it causes the valve 19 to be elevated from its valve seat thus relieving the water pressure within the chamber 15 and within the expansible chamber because the water can flow out through the opening
30 17 much more rapidly than it can flow through the by-pass. As soon as the water pressure is relieved, the pressure upwardly of the water upon the valve 26 will tend to open it and permit the water to flow in large
35 volume into the discharge pipe 18. The resiliency of the sides 31 of the expansible chamber will also tend to hold the valve 26 elevated. As soon as the handle 23 is released, the relief valve 19 will be closed by
40 its spring and the water flowing through the by-pass will slowly close the flushing valve.

One of the important advantages of my invention is that a by-pass is provided of comparatively large area so that it cannot
45 become clogged by particles of rust or scale or the like, and the quantity of water flowing through it may be regulated and controlled by means of the screw-valve 14, and in the event that any foreign substances
50 should become lodged between the valve 14 and its seat, the operator may readily and easily open the valve sufficiently to permit the water flowing through the valve seat to

clean out any such foreign matter, where-
upon the valve 14 may be again carefully re- 55
adjusted. This may be done, obviously, without taking apart any of the pipes or fittings of the device. Furthermore, by hav-
ing an expansible chamber directly connect- 60
ed with the stem of the flushing valve, friction and wear upon the parts are minimized and sufficient pressure may be applied to the
flushing valve by the water to firmly hold it
to its seat.

An expansible chamber of the kind herein 65
shown and described is not likely to become broken or worn out, and, hence, should last a long time without repair or adjustment. Furthermore, by having an expansible
chamber of this kind formed with corruga- 70
ted, sheet metal sides, I dispense with all packing devices or friction joints.

I claim as my invention:

In a device of the class described, the combination of a body portion cast complete 75
in one piece and comprising an intake pipe having a valve seat at its top, a passageway communicating with the upper end of
the intake pipe, a discharge pipe communi- 80
cating with said passageway, and a water chamber at the top of the casting spaced above said passageway and communicating
with the discharge pipe, at one side of the
casting, a valve seat between the water 85
chamber and the discharge pipe, a screw plug in the top of the said passageway above the valve seat in the intake pipe, an
expansible chamber having its upper end 90
secured to the water chamber and communicating therewith, a valve stem fixed to the lower part of the expansible chamber and
extended through said screw plug, a valve 95
on the lower end of the valve stem designed to coact with the valve seat on top of the intake pipe, a by-pass communicating with
the intake pipe below the valve seat there- 100
in and communicating with the water chamber at the top of the casting, an adjustable reducing valve in said by-pass, a spring-
closed valve on the valve seat between the
water chamber and the discharge pipe, and
means for manually opening said valve.

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Witnesses:

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