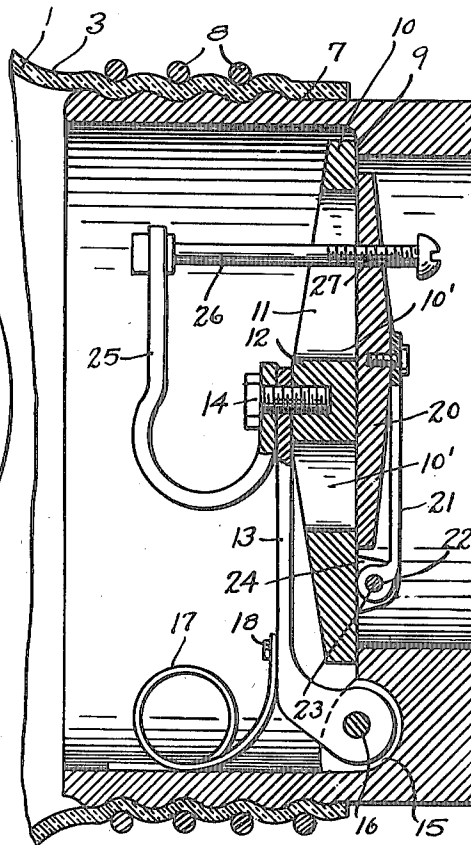
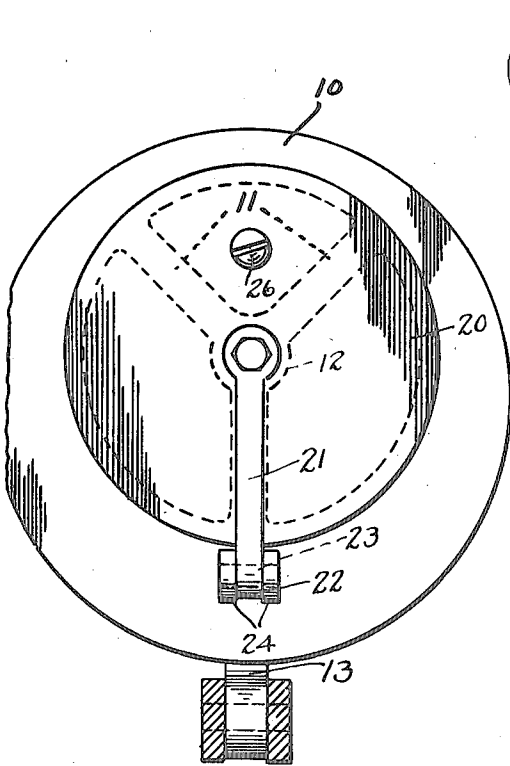
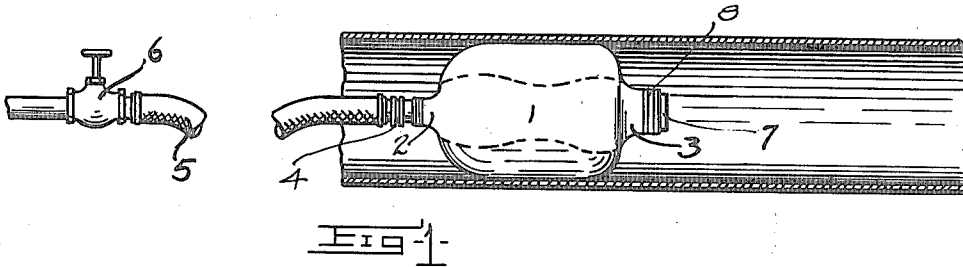


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 APPARATUS FOR TESTING PIPES OR THE LIKE.
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1,180,282.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HARRY BUNN, a citizen of the United States, residing at Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Apparatus for Testing Pipes or the like, of which the following is a specification.

My invention relates to improvements in expansible and contractible plugs or bags to be placed in pipes and plumbing fixtures, for testing or flushing them.

At the present time where pipe systems are to be tested out, a plug is inserted in the open end of the pipe and expanded by a hand screw, or other mechanical means, to fit the pipe snugly and to enable a pressure of water to be maintained in the portion of the pipe or system beyond the plug. The usual type of plug has a passageway or pipe through it enabling the water to be forced in from the outside when the plug is in place. These plugs are made up of different sizes to fit different sized pipes; each plug being adaptable to but one size of pipe. The plug in every case must be expanded by hand, and this is an annoying feature when the open end of the pipe is in some out of the way or restricted place.

An important feature of the invention is to provide means of the above mentioned character, which may be used in connection with pipes of different sizes.

A further object is to provide means for flushing sewer or like pipes when they become clogged by a gathering of foreign matter.

A further object of the invention is to provide a plug of the above mentioned character, which is simple in construction inexpensive to manufacture, and convenient in use.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which numerals are employed to designate like parts throughout the same, Figure 1 is a side elevation, parts being broken away, of apparatus embodying the invention, Fig. 2 is a side elevation of a check valve, and, Fig. 3 is a transverse section through the same.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 1 designates a circumferentially expansible and contractible bag, preferably formed of can-

vas covered with rubber or the like but this bag is longitudinally non-extensible. This bag is provided at its opposite ends with tubular necks 2 and 3, the neck 3 being a much greater diameter than the neck 2, as shown. The neck 2 carries a coupling 4, connected with a pipe 5. This pipe 5 has a cut off valve 6 of any well known or preferred construction, connected therein as shown. The pipe 5 has connection with a supply of water under a suitable pressure.

Arranged within the tubular neck 3 of the bag 1 is a tubular member or ring 7, held therein with a section of wire 8 or the like, which is wound thereon. The tubular member 7 is provided with an inwardly extending flange 9, constituting a valve seat, for a main inwardly opening check valve 10. This check valve has its inner portion open or provided with openings 10' and has inwardly extending spaced arms 11, carrying a head or hub 12.

The numeral 13 designates a swinging support arm, the upper end of which is rigidly secured to the hub 12 by means of a bolt 14 or the like. The lower end of the support arm 13 is arranged with a recess 15 and is apertured for receiving a pivot element 16. A suitable stiff coil spring 17 has one end engaging the tubular member 7 and its opposite end attached to the support arm 13, as shown at 18. This spring is slight and is just sufficiently strong to support the main valve 10, in the closed position.

The inwardly opening check valve 10 has an auxiliary opening valve 20 arranged with its outer side, to engage therewith, and cover the openings 10', as shown. This check valve is rigidly mounted upon the upper end of a swinging support or arm 21, having its lower end provided with an apertured knuckle 22, receiving a pivot element 23, passing through apertured knuckles 24 preferably formed integral with the main check valve 10.

The numeral 25 designates a leaf spring, rigidly attached to arm 13 by means of bolt 14. This spring is stiff and set to withstand a certain pressure, such as five pounds, more or less. Having swiveled connection with the upper end of the leaf spring 25 is a bolt 26, having a screw threaded portion 27, engaging a screw threaded opening in the outwardly opening auxiliary check valve 20. It is thus apparent that by rotating the bolt 26 the tension on spring 25 may be regulated.

The operation of the apparatus is as follows: The bag 1 is inserted in a deflated condition in the end of the pipe to be tested. The valve 6 is opened, allowing the passage of water under pressure to enter the bag. This bag is inflated and circumferentially expanded until its sides firmly engage the inner wall of the pipe thus holding it firmly in place. The water which is being fed into the bag 1 does not escape therefrom until a maximum pressure is reached in the bag, for instance, five pounds more or less. When this pressure is reached, the spring 25 is overcome and the outwardly opening auxiliary check valve 20 swung from its seat, whereby the water passes through the openings 10' into the system of piping to be tested, the spring 25 automatically closing the valve 4 when the pressure in the bag 1 tends to drop below a predetermined degree. In this manner the system becomes filled with water under suitable pressure and the valve 6 is closed. The inwardly opening main check valve 10 is now free to swing to the open position, when the pressure in the system exceeds the pressure in the bag 1, retaining the two pressures equal, preventing the bag from slipping. When it is desired to drain the system the interior of the pipe 5 is placed in communication with the atmosphere. The water pressure in the system will now unseat the main check valve 10, the bag 1 remaining inflated because the bore of the neck 2 is substantially smaller in diameter than the bore in the neck 3, thus maintaining pressure in the bag until the system is partly or wholly drained. The advantage of this lies in the fact that while the usual type of testing plug is entirely withdrawn when the test is completed, allowing the water to flood out uncontrolled my system allows the water to be drained off entirely under control without removing the bag 1.

Where foreign matter has clogged a sewer pipe or the like, the bag 1 will be inserted in front of the obstacle through the cleanout plug and water admitted through the pipe 5. The bag 1 will form a dam due to its tightly filling the sewer pipe so that the flushing water will be forced toward the obstacle, not allowing the flushing water to be directed back to the pipe 5 by reason of the obstacle forming a dam.

It is understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of the parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:—

1. In apparatus of the character described, a circumferentially expansible and contractible bag provided near its ends with outlets having different diameters, a conduit leading into the outlet having a smaller diameter, and inwardly and outwardly opening check-valves arranged within the outlet having the larger diameter, substantially as described.

2. In apparatus of the character described, an expansible and contractible bag, a conduit connected with the bag, and inwardly and outwardly opening check valves connected with the bag.

3. In apparatus of the character described, an expansible and contractible bag, a conduit connected therewith, a tubular member secured to the bag, a main check valve connected with the tubular member and opening in one direction, an auxiliary check valve connected with the main check valve and opening in the opposite direction, and spring means to regulate the opening movement of the auxiliary check valve.

4. In apparatus of the character described, an expansible and contractible bag, a conduit connected therewith, a tubular member secured to the bag and having a valve seat, an arm pivotally connected to the tubular member, a main check valve carried by the arm, to engage with the valve seat and opening inwardly and having an opening formed therethrough, a spring to move the main check valve toward its seat, a support arm pivotally connected with the main check valve, an auxiliary arranged upon the outer side of the main check valve and connected with the support arm to engage the main check valve and opening outwardly, a spring connected with the arm carrying the main check valve, and a bolt connected with the last named spring and having screw threaded engagement with the auxiliary check valve.

5. In an apparatus of the character described, an expansible testing plug, expanded by fluid admitted thereto, means for admitting said fluid to said testing plug, valve means in the ends of said testing plug for allowing said fluid to pass through either end of said plug and in either direction when a predetermined pressure of said fluid is reached within said testing plug.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY BUNN.

Witnesses:

H. E. SCANTLEBURY,
OTTO F. WEILE.