

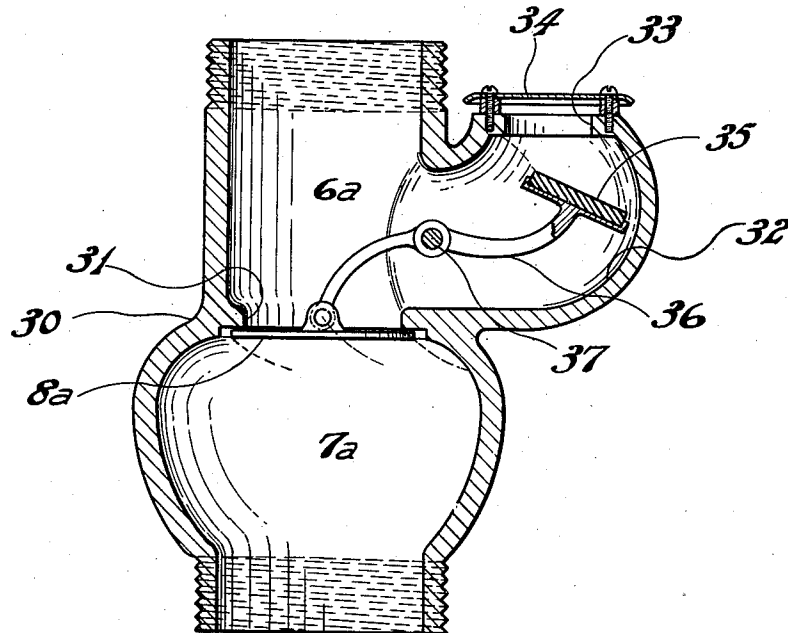
Feb. 25, 1941.

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2,233,200

VACUUM BREAKING DEVICE FOR FLUSHING VALVES

Filed April 10, 1939



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UNITED STATES PATENT OFFICE

2,233,200

VACUUM BREAKING DEVICE FOR FLUSHING VALVES

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Union of South AfricaApplication April 10, 1939, Serial No. 267,102. In
the Union of South Africa February 7, 1939

1 Claim. (Cl. 277—61)

This invention relates to an improved vacuum-breaking device for use in conjunction with a flushing valve, and applies more particularly to that type of flushing valve designed for direct connection to a water supply main such as the valve described in my earlier U. S. A. Patent No. 2,177,099.

Flushing valves of the above referred to type, have previously suffered from a defect in that, in the event of the water mains being emptied for repairs or other purposes, the partial vacuum created by the outgoing volume of water, tends to cause contaminated air, and even sewage, to be sucked into the water mains with serious consequences as regards the health of the community being served by the mains. The object of the present invention is to provide a device which, by automatically admitting pure air to break any partial vacuum which may be created in the flush pipe, overcomes the above described rather serious defect.

According to the invention, a vacuum-breaking device adapted for use in conjunction with a flushing valve of the type described, consists of a casing adapted for connection in series with the flush pipe, a check valve in said casing normally held in the closed position, but adapted to be opened by the stream of flushing water, and an inwardly opening valve-controlled air admission aperture in said casing communicating with that part of the interior space thereof which is on the upstream side of the check valve.

More particularly the interior space of the casing is divided by a holed partition wall into upper and lower chambers adapted for connection to the flushing valve and flush pipe respectively. A downwardly opening check valve is located in the lower chamber, and forms a closure for the hole in said partition wall, while an inwardly-opening valve-controlled air admission aperture communicates from the atmosphere with the upper chamber.

It is to be understood from the foregoing, that the valve-controlled air admission aperture is arranged at a level above the level of the check valve. This arrangement besides ensuring the admission of pure air obviates any leakage of residual flush water through the said air admission apertures.

In a presently-preferred embodiment of the invention, the check valve is interconnected by means of a pivoted lever with a single air valve forming the closure for an air admission aperture or apertures, located in a passage communicating with the upper chamber, the arrangement being such that said check valve is held in the closed position by the action of gravity due to a counterbalancing effect produced by said air valve or the pivoted lever to which it is attached.

To enable the invention to be more clearly understood and carried into practice, reference is now made to the accompanying figure of drawing showing a vertical section through the aforesaid preferred embodiment of the invention.

According to this embodiment, all springs may be eliminated and the force of gravity used instead thereof. A casing 30 is divided by a holed partition wall 31 into upper and lower chambers 6a and 7a respectively. A passage 32 communicates with the chamber 6a, and an air admission aperture 33 protected by a dust cover 34, is provided in its upwardly directed end. A check valve 8a and an air valve 35, are attached to opposite ends of an intermediately pivoted lever 36. The air valve 35 forms a closure for the air admission aperture 33 and the arrangement is such that the clockwise counter-balancing moment about the axis of the pivot 37, is always greater than the anti-clockwise moment about this axis, so that the check valve 8a is at all times biased towards its closed position. This is simply accomplished by weighting the air valve 35 or its lever arm. The check valve 8a may be pivotally connected to its lever arm as shown, to facilitate seating.

During normal operation the check valve 8 or 8a is opened by the force and weight of the flushing water descending upon it and, in the case of the device of Fig. 7 such opening causes the air valve 35 to close the air admission aperture 33. In the event of a partial vacuum being created in the mains and subsequently, when the flushing valve is operated, in the chamber 6 or 6a, the check valve 8 or 8a prevents contaminated air passing into the mains from the flush pipe while the air admission apertures 12, 20, 23 or 33 open and permit pure air to enter the mains so as to break the partial vacuum and restore normal conditions.

What I claim is:

A vacuum-breaking device comprising a casing defining a conduit for the passage of a stream of fluid therethrough, a non-return check valve in said casing intermediate the ends of said conduit, said casing being further provided with an inwardly-opening air admission aperture communicating with that part of the said conduit which is on the upstream side of said check valve, an air valve controlling said air admission aperture, and a lever in said casing pivoted intermediate the ends thereof and interconnecting said check valve and air valve for simultaneous movement so that the opening of one effects the closing of the other and vice versa, and means holding said check valve normally in closed position, said check valve being openable by the force of said stream of fluid.

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