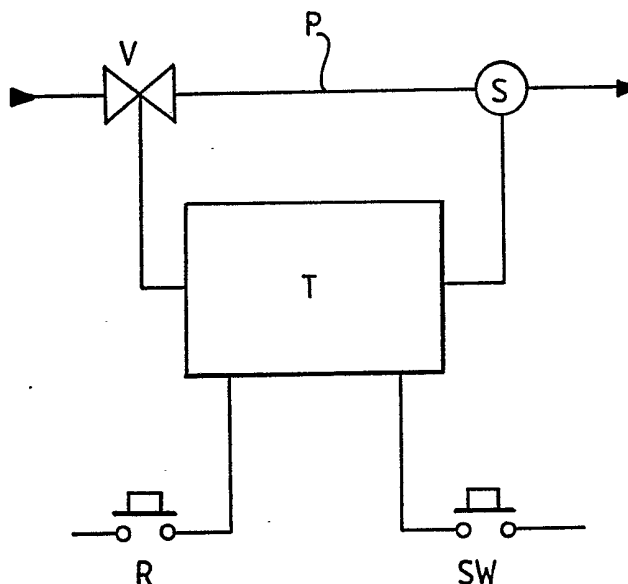


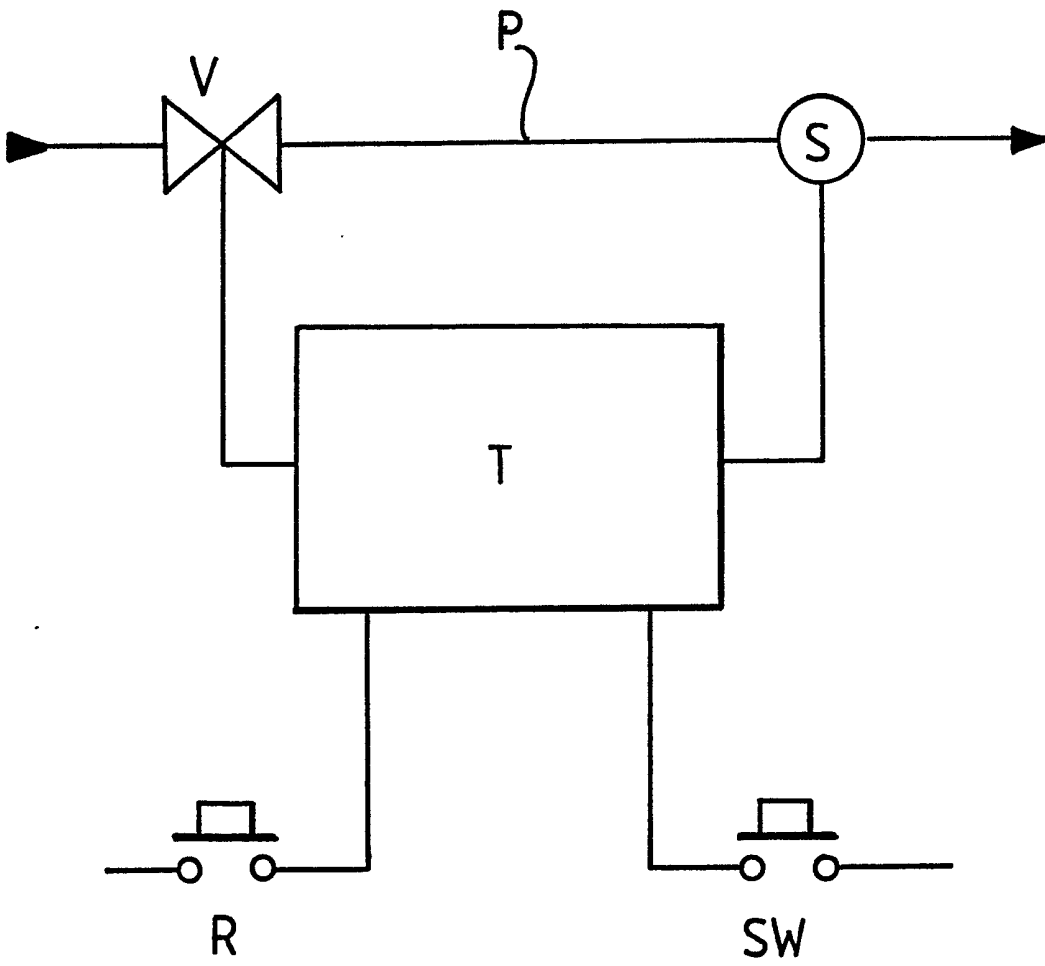
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(54) **Flood limiting device**

(57) A flow sensor S is plumbed into an inlet pipe P, and the output of the sensor is fed to an electronic timer T. Whenever water flows through the pipe P the sensor produces an electrical output signal that actuates the timer to time the flow period. Should the flow continue for a prolonged period as in the case of a burst pipe, the counter eventually reaches a predetermined time limit and sends out an actuating signal to a shut-off valve V. As shown, this valve is connected upstream of the sensor S, and shuts off the flow of water through the pipe to minimise any flood damage, until reset by a reset switch R. An override switch SW may be provided to increase the timing period following which the valve V is actuated.





FLOOD LIMITING DEVICE

Flood damage caused by water pipes that have been damaged by freezing is a recurring problem each winter, and the present invention is directed towards the provision of a simple, low cost but nevertheless effective solution to this problem.

This invention provides apparatus for limiting flood damage in the event of a burst pipe, comprising a flow sensor for association with an inlet pipe of a water installation, timer means operable by the said sensor for separately timing each flow period during which water flows through the pipe, and a shut off valve for connection in the said inlet pipe and operable by the timer means to shut off flow of water to the installation should any individual flow period exceed a predetermined figure.

The timer means may comprise a mechanical timer but preferably comprises electronic timer means.

The invention will now be exemplified in the following description to be read in conjunction with the accompanying drawing which is a block diagram of a monitoring device in accordance with the invention.

In the drawing, pipe P represents the inlet pipe to a water installation, which will usually be the riser main of a domestic or commercial property. A flow sensor S of known form is plumbed into the pipe P, and the electrical output of the sensor is fed to an

electronic timer device T. Whenever water flows through the pipe P the sensor produces an electrical output signal that actuates the timer, and as long as water flows through the pipe and the sensor is actuated the timer T continues its timing operation.

If the water flow is being caused by normal operation of the installation, say the filling of a cistern or drawing water off from a tap, the flow will in due course cease and the output from the sensor S will stop so that the timer is reset ready to commence a new timing operation when water next starts to flow through the pipe. However, should the flow of water continue for a prolonged period as in the case of a burst pipe (say in excess of five minutes for example), the counter eventually reaches a predetermined time limit and sends out an actuating signal to a shut-off valve V. This valve is also connected in the pipe P, upstream or downstream of the sensor S, but preferably as far upstream as possible adjacent to the inlet to the building. Actuation of the valve thus shuts off the flow of water through the pipe minimising any flood damage that may occur. The actuating signal from the timer continues even after the flow of water through the pipe P ceases so that the valve V remains actuated until the device is reset by a reset switch R.

It is possible of course that under normal use water will need to be drawn off for more than the preset time limit, for example when watering a garden. To allow for such situations an override switch SW is provided. This may operate to shut off the timer or disconnect the valve V from the timer, but it is preferred that operation of the switch increases the preset time limit

to, say, one hour, following which the timer automatically resets to the normal time limit. Thus, the switch cannot inadvertently be left in the override position.

The timer may for example comprise a pulse generator driving a counter.

The preset time limit is preferably adjustable to suit the particular installation with which it is used. Also, in the case of larger water installations, say a block of flats or a factory, it may be necessary to divide up the installation into separate zones each individually protected by a separate monitoring device, since otherwise the operation of a number of different appliances might overlap causing a flow period to exceed the preset time limit.

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CLAIMS

1. Apparatus for limiting flood damage in the event of a burst pipe, comprising a flow sensor for association with an inlet pipe of a water installation, timer means operable by the said sensor for separately timing each flow period during which water flows through the pipe, and a shut off valve for connection in the said inlet pipe and operable by the timer means to shut off flow of water to the installation should any individual flow period exceed a predetermined figure.

2. Apparatus according to Claim 1, in which the timer means comprises an electronic timer.

3. Apparatus according to Claim 1 or 2, in which the shut off valve is located downstream of the flow sensor.

4. Apparatus according to any preceding claim, in which there is an override switch that operates to extend the predetermined flow period which, when exceeded, causes the shut off valve to operate.

5. Apparatus according to Claim 4, in which the predetermined flow period automatically reverts to the default period at the end of the extended flow period.

6. Apparatus for limiting flood damage in the event of a burst pipe, substantially as described with reference to the drawings.