W. A. CRAWFORD.

Stop and Waste Attachment for Water-Pipes.

No. 206,090. Patented July 16, 1878.

Fig. 2.

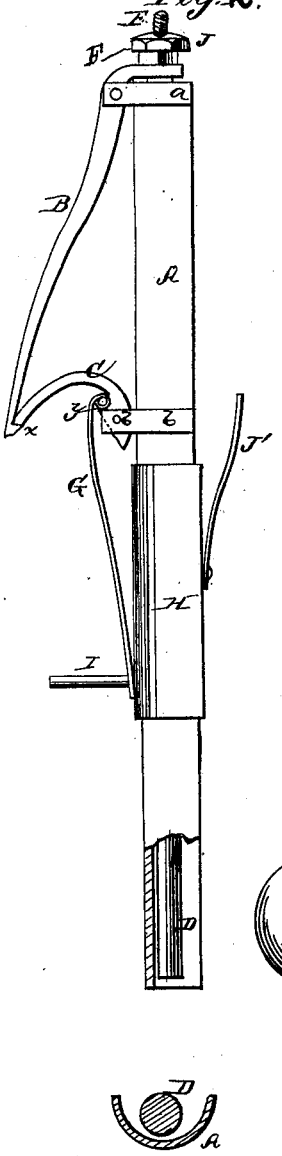


Fig. 1.

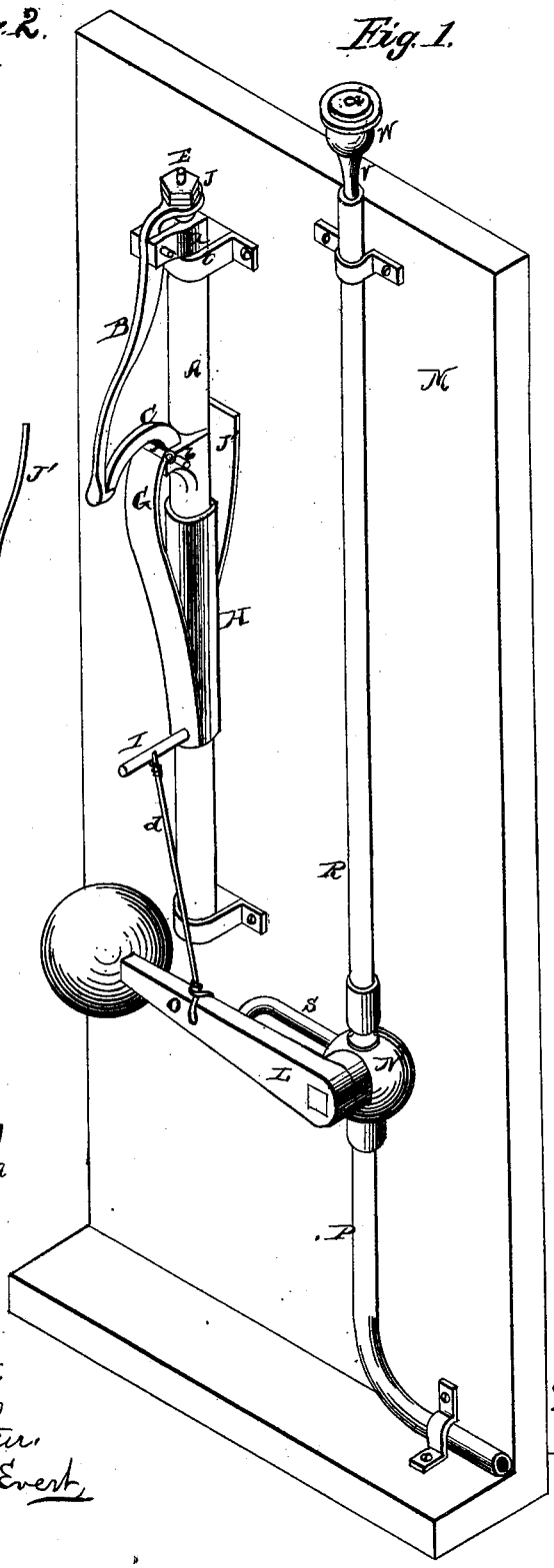
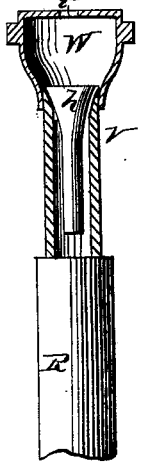


Fig. 3.



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UNITED STATES PATENT OFFICE.

WITSIUS A. CRAWFORD, OF TERRE HAUTE, INDIANA.

IMPROVEMENT IN STOP AND WASTE ATTACHMENTS FOR WATER-PIPES.

Specification forming part of Letters Patent No. **206,090**, dated July 16, 1878; application filed April 25, 1878.

To all whom it may concern:

Be it known that I, WITSIUS A. CRAW of Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Stop and Waste Attachments for Water-Pipes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The nature of my invention consists in the construction and arrangement of an apparatus designed to automatically empty any fluid from its receptacle at any predetermined degree of temperature; hence, having been properly connected to the water-pipe system of any building, and set to operate, say, at 32° Fahrenheit, the pipes will be protected from the bursting effects of freezing water by being emptied of their contents at that degree.

The thermometer or controlling device in my invention is, essentially, made of ebonite and cast-iron, the first-named substance having a comparatively high rate of contraction and expansion for cold and heat, and the last-named a low rate, the difference between the two affording the power for its operation.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a perspective view of my invention attached to a water-pipe. Fig. 2 is a side elevation of the thermometer; and Fig. 3 is a detail view of my air-valve.

A represents a segmental tube of iron, having two lugs cast on or secured to it at *a* and two at *b*, for the support of the two levers B and C, which are pivoted between their respective lugs, as shown.

The cross-section of the tube A is almost a semicircle, open in the back, for the reception of an ebonite rod, D, which is secured to the tube at the bottom end in any suitable manner, and the upper end of said rod provided with a metallic thimble or head, E, extended above and threaded to receive a jam-nut, F, by which the device is adjusted to empty the pipes at any degree desired.

The upper end of the lever B is bent so as to come under the nut F, the contraction of the ebonite rod D thus moving the lower end of the lever B away from the body of the tube A. The lever B has a projection, *x*, at its lower end, which engages with the lever C, and holds it in position until the lever B is thrown out by the contraction of the ebonite rod.

The lever C is curved substantially as shown, having its fulcrum at *b*, near one end, and the other end engaging with the lever B. In the lever C is a notch, *y*, or depression, nearly over its fulcrum, in which a hook-shaped spring, G, engages, said spring being secured to a sleeve, H, which slides freely on the tube A. The sleeve H is also provided with a perforated handle, I, in which the cord *d* is attached; and at the back of the sleeve is attached a spring, J′, which serves to retard the fall of the sleeve, and is useful only in keeping the connecting-cord *d* taut and in position where it passes over pulleys.

The thermometer thus constructed is mounted on a suitable back, M, and a portion of the tube A may be inclosed for protection in a metal hood or case, open at the bottom to admit the spring G, and the whole secured permanently at some convenient point as much exposed to the weather as any part of the water-pipe system; or it may be put anywhere else, and so adjusted as to empty the pipes before the temperature falls to the freezing-point at any place in the building. Thus it may be placed directly in connection with the stop and waste valve, as represented in the drawing.

L is the key of the stop and waste valve N, and to this is secured the weighted arm O in such a manner that, when suspended from the thermometer, the water is admitted from the supply-pipe P to the service-pipe R, and the waste-pipe S is closed, while, when released from the thermometer, the service-pipe is opened into the waste-pipe and the supply-pipe is closed.

At the head of every line of pipe is preferably placed an air-valve, to admit air on a removal of pressure, to allow the pipes to drain completely. This air-valve consists of a cup, V, screwed into the upper end of the service-pipe, and provided with a cap or cover, W,

screwed thereon, and provided with an air-hole, *i*. Within the cup V is an inverted cup-shaped valve, *h*, which is raised by the pressure of the water to close the air-hole, and as soon as the pressure is removed the valve drops and allows the air to enter.

The operation of the device where attached to pipes connected with the public water system is as follows: The spring G being raised and held by the lever C, and this lever held by the lever B, the cord *d* holds the weighted arm O in such a position that the water has free access to the service-pipes R. Then, when the temperature falls to that degree at which the thermometer has been adjusted to, the contraction of the ebonite rod will have moved the lower end of the lever B away from the lever C enough to allow the spring G to clear, by the partial revolution of the lever C, caused by the weight O, through its connections, exerting a pull on the sleeve H and spring G. On the release and fall of the sleeve the weighted arm descends, thereby draining all the pipes above the valve N. On raising the handle I the reverse takes place, and, if the temperature has raised to a higher degree than that required to operate the lever C, engages with the lever B, on account of the ebonite having expanded sufficiently to allow the lower end of the lever B to resume its former position, and remains suspended, ready for the next freeze.

If the temperature has not risen to the proper degree, then the levers B and C will not engage, and the weighted arm O will not remain suspended any longer than the handle I is held up.

The operation of the device when attached to pipes connected to a tank is the same, except that there are two valves to be operated, one at the tank, for a stop-valve, and one at the bottom of the pipes, for a waste-valve, each valve having a weighted arm, connected by cord, wire, or chain to the handle I on the thermometer, the weighted arms being so connected to the valves that the fall of the upper arm closes that valve, and the fall of the lower one opens the lower valve, and the raising of said arms reverses the action. The object is to so connect the handle of the thermometerto the weighted arms that the release and fall of the sleeve F shall cause the service-pipes to be drained, and the raising of the sleeve F by its handle I shall operate to fill them.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a stop attachment for water-pipes, the combination of an ebonite and a cast-iron attachment, which, by the variable contraction of the two, will operate a stop-valve, for the purposes set forth.

2. The combination of an adjustable releasing-thermometer, connecting wire, cord, or chain, weight or spring, and arm with a stop and waste valve, or similar valve or valves, in the manner and for the purposes herein set forth.

3. The combination of an adjustable releasing-thermometer, connecting wire, cord, or chain, weight or spring, and arm, and air valve or valves with a stop and waste or other valve or valves, in the manner and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WITSIUS A. CRAWFORD.

Witnesses:
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