R. J. MALCOLM.

STOP AND WASTE COCK.

No. 170,576. Patented Nov. 30, 1875.

FIG. 1. FIG. 2. FIG. 3. FIG. 4.

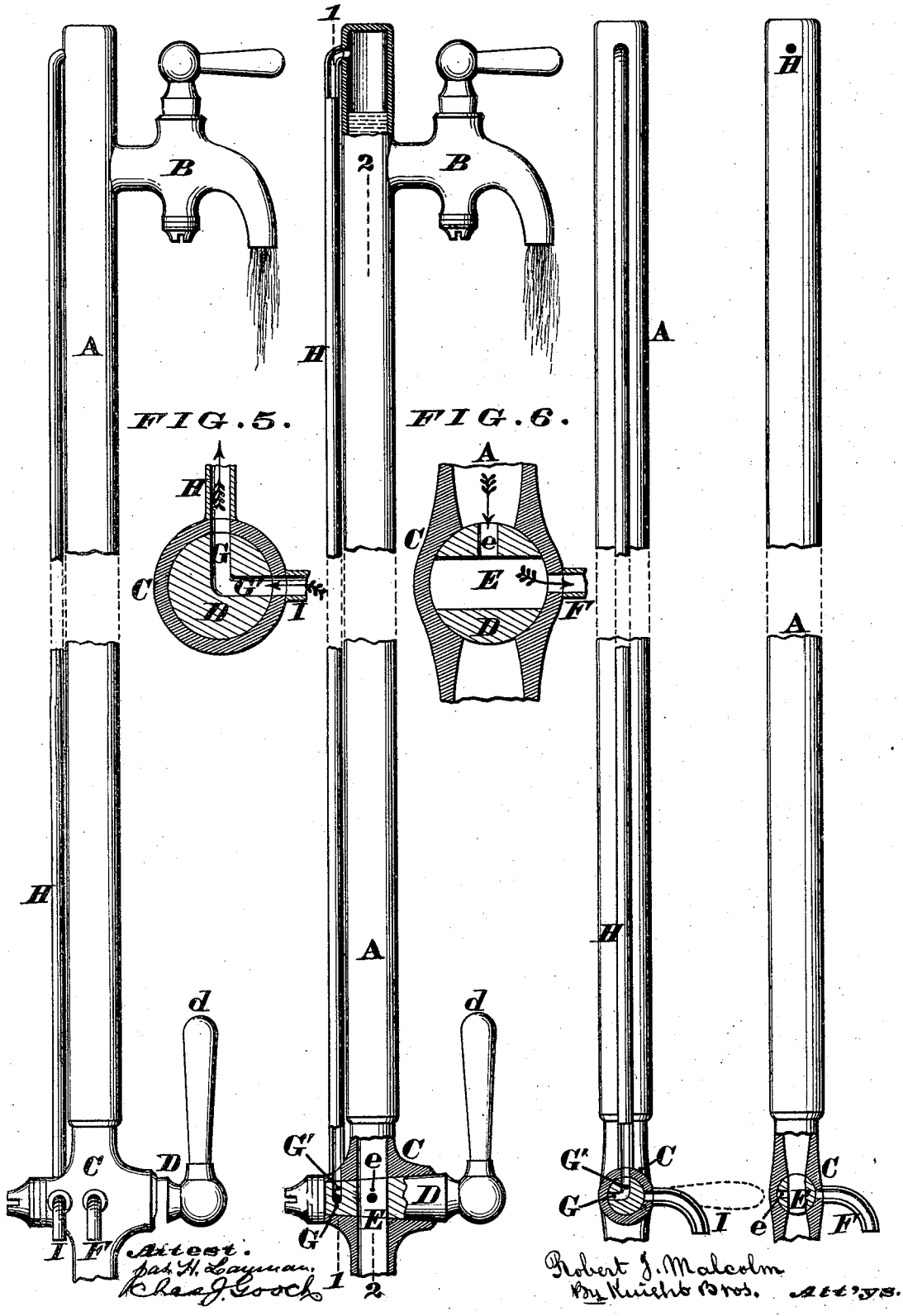

FIG. 5. FIG. 6.

Attest.
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UNITED STATES PATENT OFFICE.

ROBERT J. MALCOLM, OF CINCINNATI, OHIO.

IMPROVEMENT IN STOP AND WASTE COCKS.

Specification forming part of Letters Patent No. **170,576**, dated November 30, 1875; application filed October 6, 1875.

To all whom it may concern:

Be it known that I, ROBERT J. MALCOLM, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Stop and Waste Cocks, of which the following is a specification:

My invention relates to the combination in a stop and waste cock of certain parts, which are arranged in such a manner that the moment the plug is turned, so as to shut off water from the service-pipe, the upper end of said pipe will be opened to the atmosphere, so as to insure the complete draining of the pipe, and the consequent prevention of bursting by the action of frost.

In the accompanying drawing, Figure 1 is an elevation of a service-pipe, provided with my improvements, the stop-cock, and also one of the upper cocks being shown in their open condition. Fig. 2 is a vertical section through the same in the plane of the plug of the waste-cock. Fig. 3 is a section through the air-duct at the line 1 1. Fig. 4 is a section of the service-pipe at the line 2 2. Fig. 5 is a transverse section of the plug of the waste-cock at the line 1 1, said plug being turned so as to shut off water from the service-pipe, and allow air to enter at the upper end of the same. Fig. 6 is a transverse section of the aforesaid plug at the line 2 2, the waste-cock being so turned as to drain the water-pipe. Figs. 5 and 6 are to a larger scale than the other figures.

A represents a water-pipe. B represents the uppermost cock, valve, or bib. Coupled to the lower end of the pipe A is the shell C, of an ordinary stop and waste cock, said shell being traversed by a plug, D, having a handle, *d*, wherewith it is rotated, as occasion may require. This rotable plug is pierced with the customary port E and the usual wasteway *e*, which latter is brought in line with the discharge-spout F, when the water is turned off. Furthermore, said plug is furnished with a channel, G G′, whose formation is clearly shown in Fig. 5, in which illustration the channel is represented as affording communication between the air pipe or duct H and the nozzle I. This air-pipe, having quite a limited bore, may occupy either an internal or external position with respect to the water-pipe, from whose top it extends downward to the shell C. Where external to the pipe its small dimensions enable it to be conducted along corners practically out of sight and liability to accident.

The operation of my stop, waste, and vent cock is as follows: When the handle *d* is in the erect position, shown in Figs. 1 and 2, the port E of plug D is in line with the bore of pipe A, and consequently water is free to flow into said pipe and out of the faucet B as soon as the latter is opened. In this position of said plug the wasteway *e* is brought opposite the solid portion of shell C, as shown in Fig. 4, thereby preventing the escape of water through the waste-spout F. This position of the plug brings the end G of channel G G′ opposite another solid portion of shell C, as seen in Fig. 3, by which means communication between the air inlet I and pipe H is completely cut off. The apparatus now acts in the same manner as an ordinary hydrant, the water being drawn off from the faucet B, or from any other cock or valve in communication with the pipe A; but the moment the waste-valve is closed the action is essentially different. This closure of the waste-cock, which is effected by turning the handle *d* down to the position indicated by dotted lines in Fig. 3, causes the port E of plug D to assume the horizontal position shown in Fig. 6. The water contained in pipe A should now flow out through wasteway *e*, port E, and spout F; but in actual practice such a result will not always occur, in consequence of the water being imprisoned within the pipe by the external atmospheric pressure acting on the limited ventage of the wasteway F.

My arrangement effectually overcomes this difficulty, because the instant that the plug D is brought around to the wasting position, the channel G G′ opens communication between the inlet I and pipe H, as seen in Fig. 5. By this means air is automatically admitted to the upper portion of pipe A, and the immediate discharge of its contents is at once insured.

From the above description it will be seen that the act of draining the service-pipe is automatically effected by the mere closure of the stop-cock D, and this, without any necessity of opening the upper faucet B, to liberate the hydrostatic column.

With the old form of stop-valves it is always necessary to open the uppermost faucet of the service-pipe to insure complete drainage of the latter; but it frequently happens that this precaution is neglected, and the contents, becoming frozen, operate to burst the pipe.

As the necessity of this precautionary measure is entirely obviated by the use of my venting and wasting stop-cock it will reduce the risk and expense attendant on burst pipes. The nozzles F and I are to direct the waste water into the sink or drain without coming in contact with the shell C.

I claim as new and of my invention—

The combination, with a common water-pipe, A, of the stop, vent, and waste valve or cock C D E *e* G G′, exits F and I, and air-passage H, the whole being adapted to operate as set forth.

In testimony of which invention I hereunto set my hand.

ROBERT J. MALCOLM.

Attest:
GEO. H. KNIGHT,
JAMES H. LAYMAN.