

(No Model.)

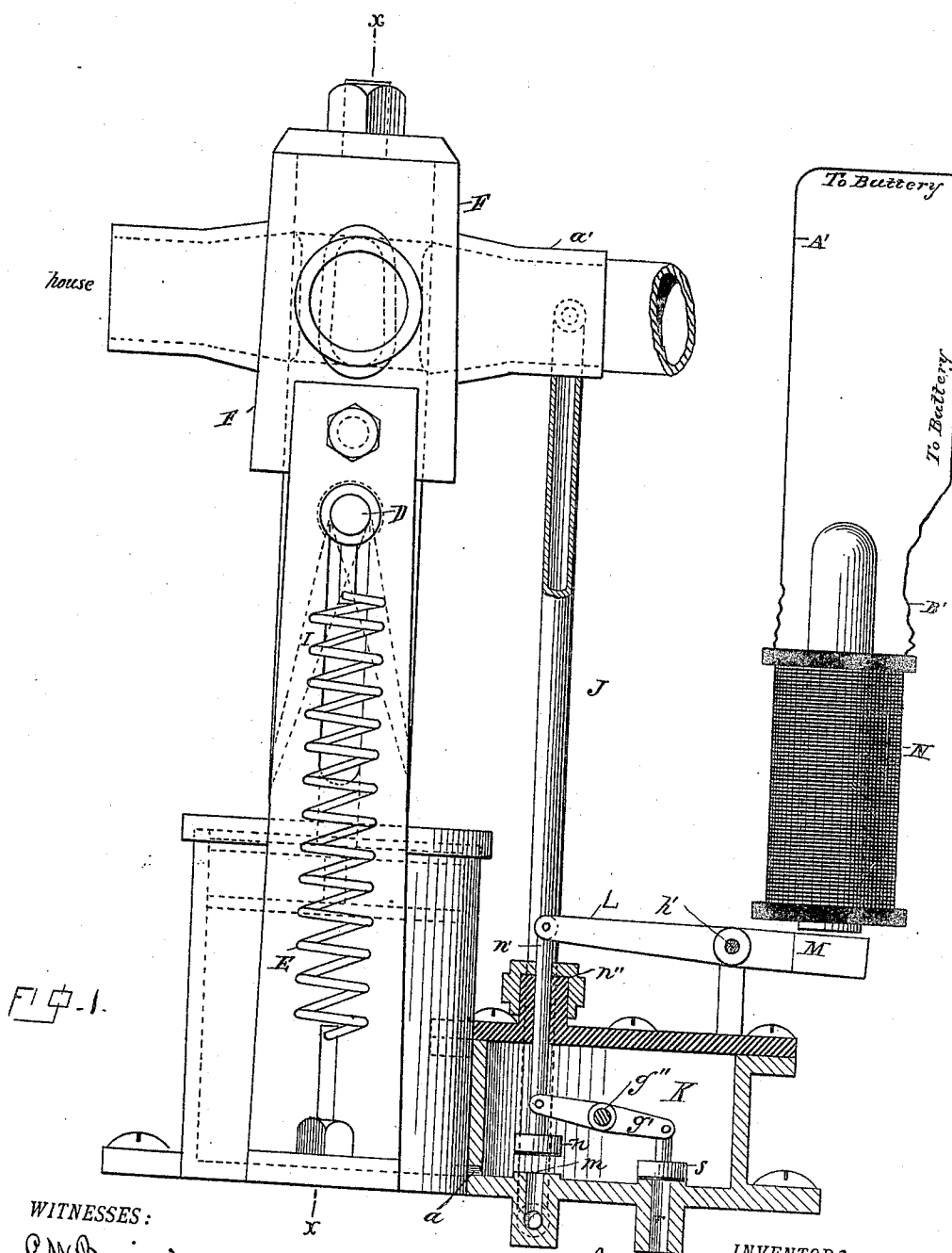
J. W. KENT & R. ORR.

3 Sheets—Sheet 1.

ELECTRICAL APPARATUS FOR VOIDING WATER PIPES.

No. 368,674.

Patented Aug. 23, 1887.



WITNESSES:

C. M. Benjamin
C. Percher

INVENTORS

James W. Kent
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BY
James A. Whitney
ATTORNEY

(No Model.)

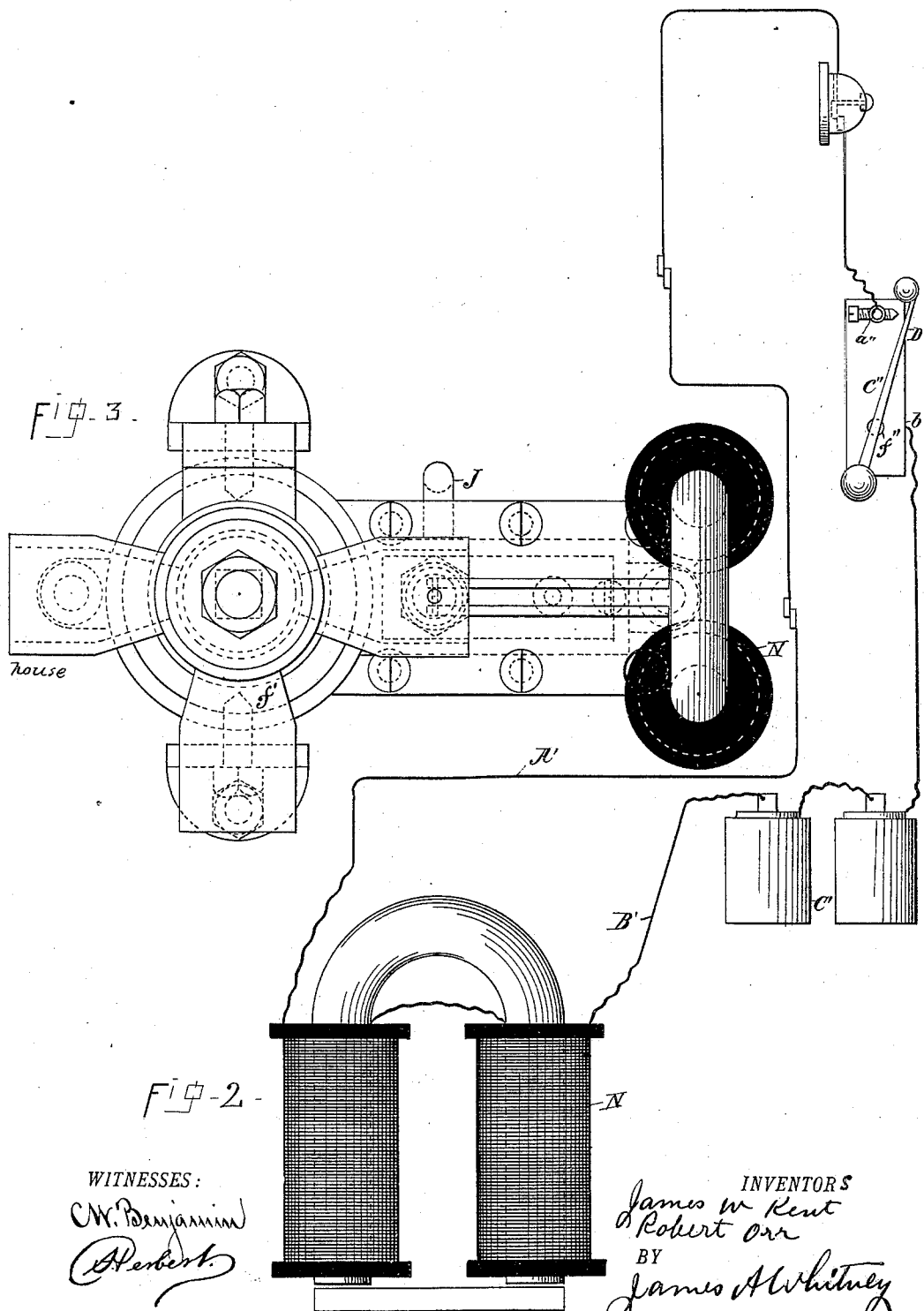
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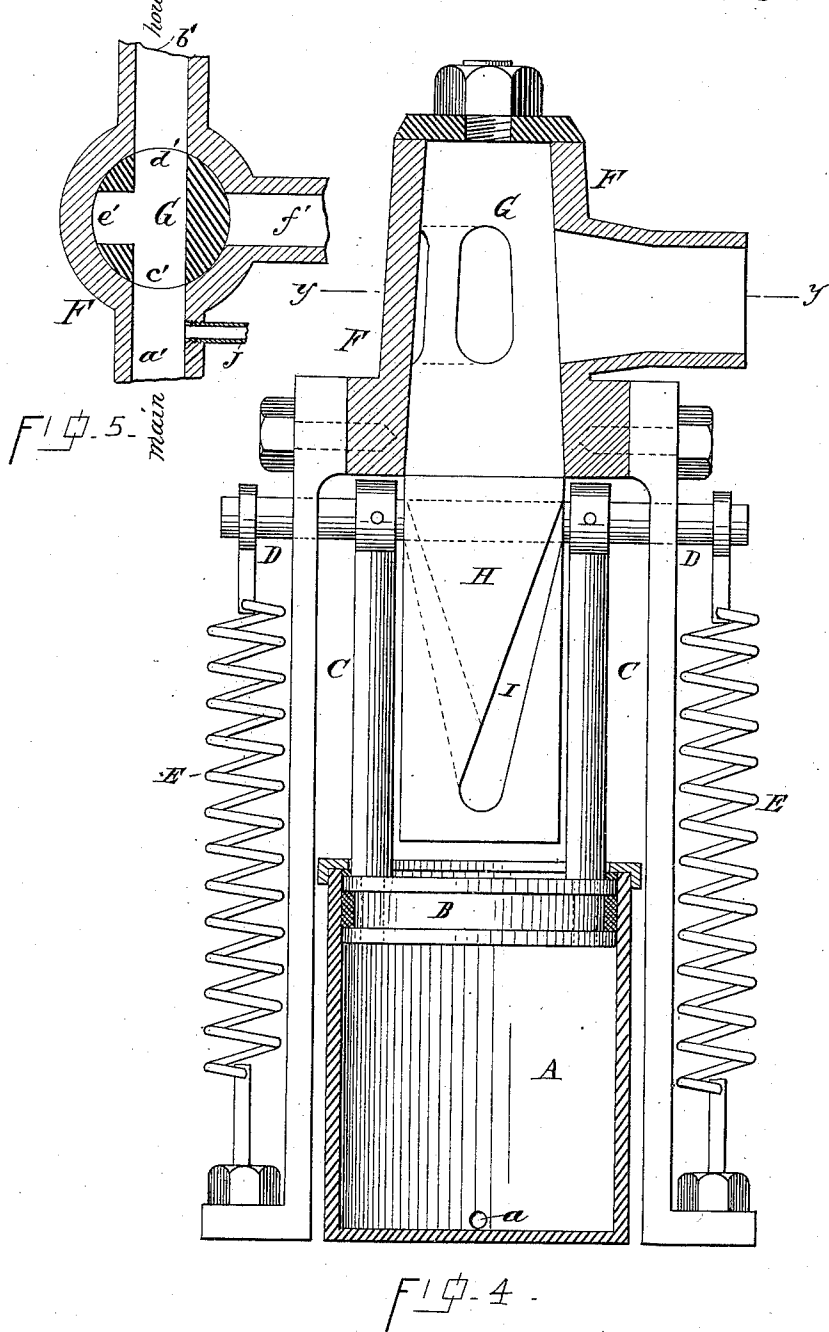
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UNITED STATES PATENT OFFICE.

JAMES W. KENT AND ROBERT ORR, OF BROOKLYN, NEW YORK.

ELECTRICAL APPARATUS FOR VOIDING WATER-PIPES.

SPECIFICATION forming part of Letters Patent No. 368,674, dated August 23, 1887.

Application filed December 11, 1886. Serial No. 291,263. (No model.)

To all whom it may concern:

Be it known that we, JAMES W. KENT and ROBERT ORR, both of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Apparatus for Voiding Water-Pipes, of which the following is a specification.

The object of this invention is to automatically empty the water-pipes of dwellings and other buildings when the temperature approaches the freezing-point, in order to prevent the freezing of the water within the pipes and the consequent liability of damage to the latter; also, to provide for the automatic turning on of the water to and into said pipes when the temperature rises to a point at which no danger of freezing may be apprehended.

The said invention comprises certain novel means whereby these objects are effectually secured.

Figure 1 is a side elevation and partial sectional view illustrating, in connection with Fig. 3, the construction and operation of our said invention. Fig. 2 is a plan view of the parts represented in Fig. 1 and of a portion of those represented in Fig. 3. Fig. 3 is an elevation or side view, but regarded from a line of sight at right angles to Fig. 1, in connection with which latter it should be read. Fig. 4 is a central vertical sectional view taken substantially in the line *xx* of Fig. 1, and in a plane at right angles to said figure. Fig. 5 is a horizontal sectional view taken in the line *yy* of Fig. 4.

A is a cylinder or chamber, which, as hereinafter explained, communicates with the water-main or water-supply pipe by an inlet, *a*, at or near the bottom thereof. In this chamber or cylinder A works a piston, B, of any suitable construction, and from which extend upward or outward piston-rods C C, which connect at their top with a cross-rod, D. This cross-rod D is moved downward or inward by suitable springs, E. The normal pressure of the water from the main is sufficient to force outward the piston B as against the action of the springs E. When the pressure of water from the main is removed from behind the piston B, the springs E force inward the cross-rod D with a corresponding movement of the said piston.

F is the chest of a three-way cock or valve, of which G is the plug, *a'* being the inlet port or passage which connects in the usual manner of a connecting-pipe with the main. *b'* is the corresponding port or passage which connects with the pipe or system of pipes of the dwelling or other structure.

When the ports *c'* *d'* of the plug G are coincident with the passages *a'* *b'*, as shown in Fig. 4, the water will pass direct from the main to said system of pipes to supply said dwelling or structure; but when the port *d'* is brought coincident with the passage *f'* of the chest F, with the port *c'* coincident with the passage *b'*, the inlet of water to the pipe or system of pipes of the dwelling or structure will be shut off and the water contained in said pipe or system of pipes will, as hereinafter explained, descend and pass out to the passage *f'*.

The plug G is constructed with a downward or inward extension, H, through which is an oblique or spiral slot, I, through which is passed the cross-rod D, said slot I being so shaped and proportioned that the action of the said rod when brought inward or outward will act upon the surfaces of the said slot to give an axial or turning movement to the plug G in such manner that when moved outward to its limit the plug will be so turned that the ports *c'* and *d'* thereof will be coincident with the passages *a'* and *b'*, and when brought inward to its limit the plug will be so turned that the port *d'* will be coincident with the passage *f'*, and the port *c'* will be coincident with the passage *b'*.

The port *a'* is connected by a pipe, J, with a valve-chamber, K, by an inlet-passage, *m*, (shown in Fig. 1,) and this chamber K communicates with the cylinder A by means of a passage or opening, *a*, hereinbefore referred to. The water-chamber K thus communicates by means of the passage *m* and pipe J and port *a'* with the street-main or source of supply of the water under pressure. Placed in suitable relation with this inlet *m* is a valve, *n*. The chamber K is provided with an outlet, *r*, which by any suitable means may connect with the waste-pipe or with the sewer, or may lead elsewhere. Placed in suitable relation to this outlet *r* is a valve, *s*. The valves *n* and *s* are so connected as to move in unison.

As represented in the drawings, the valve-stems to the said two valves are pivoted to the opposite ends of a lever, g' , the pivot or fulcrum of which is indicated at g'' . The valve-stem n' of the valve n passes through a suitable stuffing-box, n'' , and is connected with the end of a lever, L , the pivot or fulcrum of which is shown at h' , and which has at its opposite end an armature, M .

10 When the valve n is operated to open the inlet-passage m , the valve s is operated to close the outlet-passage r , and the water under pressure entering the water-chamber K passes through the opening or passage a into the cylinder A , behind the piston B , and, moving the latter outward, causes the rod D to actuate the plug G , as hereinbefore explained, to bring the ports c' and d' coincident with the passages a' and b' , respectively. When the valve n is operated to close the inlet-passage m , and the valve s is operated to open the outlet-passage r , the access of water under pressure to the chamber K is, of course, shut off, and the water flows downward from the cylinder A through the chamber K , and thence away through the outlet r , thereby releasing the piston B from the water-pressure behind it and permitting the springs E to draw inward the rod D , thereby actuating the plug G to bring the port d' coincident with the passage f' , and the port c' coincident with the passage b' , whereupon the water from the pipe or system of pipes from the dwelling reflows or returns through the ports c' and f' to the sewer or other desired outlet from the building.

Adjacent to the armature M of the lever L , which actuates the valve n , as aforesaid, is placed an electro-magnet, N , which is represented in Figs. 1 and 3, and the positive and negative wires A' and B' of which connect with a battery, C' , which latter is shown in Fig. 2. These wires are normally operated—that is to say, broken or disconnected, the end of one terminating, as at a'' , in an insulated screw-wire. The other connects with a metallic or conducting plate, which in its turn is connected with the metallic stem c'' of a thermostat, D' . This thermostat may be of any suitable construction, but, as represented in the drawings, comprises a hollow stem pivoted at f'' , and with a hollow bulb at its upper and lower ends, the device being provided internally with mercury in such proportion that at temperatures above the freezing-point its weight will be so distributed with reference to the pivot f'' that the upper arm of the tube or stem c'' will be swung away from the screw or contact-point a'' , thereby breaking the circuit through the wires A' and B' ; but when the mercury has contracted its volume, as when the temperature approaches the freezing-point, it will be more concentrated toward the lower end of the tube c'' , so that its gravity will swing the upper end of the thermostat in contact with the screw or point a'' , and thus, by connecting the wires A' and B' , complete the circuit, put in operation the elec-

tro-magnet N , and cause the latter to actuate the armature M , which in its turn gives motion to the lever L to close the valve n upon the inlet-passage m , and opening the valve s with reference to the outlet-passage r , thereby putting in operation the mechanism to turn the plug G to close the passage a' , and open the passage f' in connection with the passage b' , to permit the outflow of water from the pipe or system of pipes, as hereinbefore explained, so that a fall of the temperature in the atmosphere to a degree approaching the freezing-point will automatically cause the pipe or system of pipes of the dwelling or structure to be emptied.

What we claim as our invention is—

1. The combination of a three-way cock, a water-cylinder, A , a piston, B , arranged to operate within the said cylinder, mechanism for connecting the said piston with the three-way cock, a water-chamber, K , connected with the said cylinder by a passage or opening, and constructed with the inlet and outlet passages m and r , valves n and s , an electro-magnet, and armature M , mechanism for connecting said armature with said valves n and s , and a thermostat arranged to break and complete the circuit with the said electro-magnet, all substantially as and for the purpose herein set forth.

2. The combination of a three-way cock, an obliquely-slotted extension, H , provided to the plug of the said three-way cock, a rod, D , passed through the said slot, a water-cylinder, A , a piston, B , connected with the said rod D , springs E , also connected with the said rod D , a water-chamber, K , communicating with said cylinder by a passage or opening, a , and provided with inlet and outlet passages m and r , valves n and s , mechanism for operating said valves in unison, an electro-magnet, and a thermostat, all substantially as and for the purpose herein set forth.

3. The combination of a three-way cock, an obliquely-slotted extension, H , provided to the plug of the said three-way cock, a rod, D , passed through the said slot, a water-cylinder, A , a piston, B , connected with the said rod D , springs E , also connected with the said rod D , a pipe, J , a water-chamber, K , communicating with said cylinder by a passage or opening, a , and provided with inlet and outlet passages m and r , valves n and s , mechanism for operating said valves in unison, an electro-magnet, and a thermostat, all substantially as and for the purpose herein set forth.

4. The combination of a three-way cock, an obliquely-slotted extension, H , provided to the plug of the said three-way cock, a rod, D , passed through the said slot, a water-cylinder, A , a piston, B , connected with the said rod D , springs E , also connected with the said rod D , a pipe, J , a water-chamber, K , communicating with said cylinder by a passage or opening, a , and provided with inlet and outlet passages m and r , valves n and s , armature M , electro-magnet N , and devices for breaking

and closing the circuit through the wires of said magnet, all substantially as and for the purpose herein set forth.

5 5. The combination of a three-way cock, an obliquely-slotted extension, H, provided to the plug of the said three-way cock, a rod, D, passed through the said slot, a water-cylinder, A, a piston, B, connected with the said rod D, springs E, also connected with the said
10 rod D, a water-chamber, K, communicating with said cylinder by a passage or opening, *a*, and provided with inlet and outlet passages *m* and *r*, valves *n* and *s*, the armature M, mechanism for transmitting motion from said arma-
15 ture to said valves *n* and *s*, an electro-magnet, and devices for breaking and closing the circuit through the wires of the said magnet, all substantially as and for the purpose herein set forth.

6. The combination of a three-way cock, an 20 obliquely-slotted extension, H, provided to the plug of the said three-way cock, a rod, D, passed through the said slot, a water-cylinder, A, a piston, B, connected with the said rod D, springs E, also connected with the said 25 rod D, a water-chamber, K, communicating with said cylinder by a passage or opening, *a*, and provided with inlet and outlet passages *m* and *r*, valves *n* and *s*, an electro-magnet, the armature M, and a thermostat arranged to 30 break and close the circuit through the wires of the said magnet, all substantially as and for the purpose herein set forth.

JAMES W. KENT.

ROBERT ORR.

Witnesses:

A. C. AUBERY,

CHARLES A. HERBERT.