(No Model.) 2 Sheets—Sheet 1.

H. A. SKINNER.

AUTOMATIC SHUT-OFF FOR WATER PIPES.

No. 418,900. Patented Jan. 7, 1890.

Fig. 1.

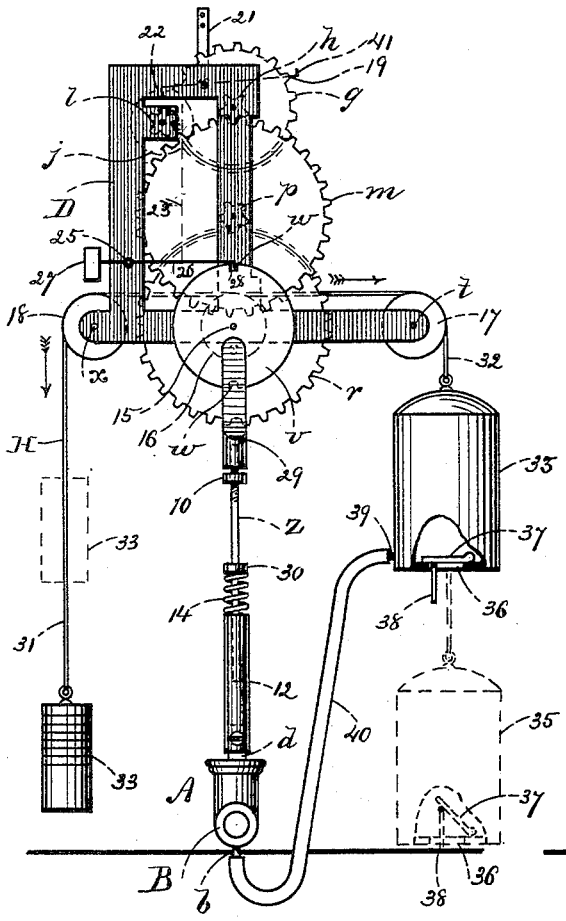
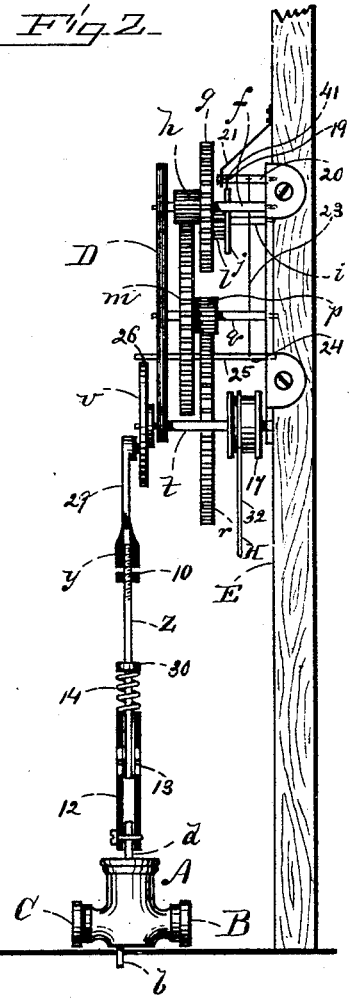


Fig. 2.



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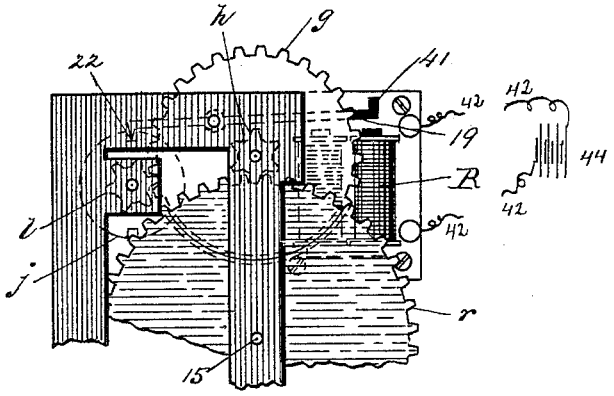
(No Model.) 2 Sheets—Sheet 2.

H. A. SKINNER.

AUTOMATIC SHUT-OFF FOR WATER PIPES.

No. 418,900. Patented Jan. 7, 1890.

Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY A. SKINNER, OF GREENFIELD, MASSACHUSETTS.

AUTOMATIC SHUT-OFF FOR WATER-PIPES.

SPECIFICATION forming part of Letters Patent No. 418,900, dated January 7, 1890.

Application filed September 10, 1889. Serial No. 323,514. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. SKINNER, of Greenfield, in the county of Franklin, State of Massachusetts, have invented a certain new and useful Improvement in Automatic Shut-Offs for Water-Pipes, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of my improved device; Fig. 2, a sectional side elevation of the same, and Fig. 3 a sectional elevation showing the magnet and armature.

Like letters and figures of reference indicate corresponding parts in the different figures of the drawings.

My invention relates especially to means for automatically shutting off the water in the main supply-pipe from any portion of a building; and it consists in certain novel features, as hereinafter fully set forth and claimed, the object being to produce a simpler, cheaper, and more effective device of the character than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents a valve-body, which is provided with a vertically-sliding valve *d*, a coupling B for the main supply, and a similar coupling C at the opposite side for the discharge-pipes. A drip-pipe *b* opens into the bottom of the valve-body. A frame D is secured to a standard E or a wall adjacent to the valve A. An arbor *f* in said frame bears a gear *g* and pinion *h*. A shaft *i* bears a wheel *j*, to which a pinion *l* is secured, said pinion meshing with the gear *g*. A large gear *m* is mounted on an arbor *q* and meshes with the pinion *h*. A pinion *p* on the arbor *q* meshes with a large gear *r* on a shaft 15, which bears a crank-disk *v* on its outer end, said disk having two diametrically-opposite notches *w* in its periphery. Two shafts *t x* are journaled in the frame in the same horizontal plane as the shaft 15 and, respectively, on opposite sides thereof. The shaft 15 bears a barrel 16, and each shaft *t* and *x* has a similar barrel 17 and 18 in alignment with said barrel 16. A horizontal lever 19 is secured on an arbor 20, journaled in a bracket 21 in the frame, the short arm of said lever being provided with a hook which takes in a notch 22 in the periphery of the plain wheel *j*. A vertical rod 23 is pivoted to the outer end of a horizontal rod on said arbor. The lower end of said rod is pivoted to a horizontal lever 24 on an arbor 25, journaled in the lower portion of the frame. To the outer end of the arbor 25 a horizontal lever 26 is secured, said lever being provided on its long arm with a hook 28, adapted to rest normally in a notch *w* of the crank-disk *v*. A crank-rod 29 is pivoted by one end eccentrically to the face of the disk *v*, the lower end of said bar being provided with a socket *y*, into which the threaded end of a rod *z* is turned. A check-nut 10 prevents said rod rotating in said socket. A tube 12 is hinged by its lower end to the stem of the valve *d*, the lower end of the rod *z* working vertically in said tube and prevented from being withdrawn by a pin 13, which works in vertical slots in the walls thereof. A coiled spring 14 is disposed around the rod *z*, between the top of said tube and a stud or flange 30 on said rod. A cord H is passed around the central barrel 16, its ends 31 and 32, respectively, passing in opposite directions over the barrels 18 and 17. To the end 31 a weight 33 is secured, and from the opposite end 32 a water-tank 35 is suspended. The tank has a discharge-opening 36 in its bottom closed by a hinged valve 37. A pin 38, hinged to the under side of said valve, projects through said opening in position to operate said valve when the tank comes in contact with the floor P. A nipple 39 opens into said tank near its bottom and is connected by a flexible pipe 40 with the drip *b* in the valve A.

The different rooms of the building are connected by wires 42 with an electric battery 44, forming an electric circuit, ordinary push-buttons being disposed in said rooms, whereby said circuit may be closed. An ordinary electric magnet R is disposed in said circuit and in such position that a head 41 on the outer

end of the lever 19 will form an armature therefor.

With the parts in the position shown in Fig. 1 the water is shut off between the supply B and discharge C.

The arrangement of the gears described is similar to the ordinary striking mechanism of a clock.

The valve *d* being depressed, as shown in the drawings, and the water shut off from the building, the waste water in the pipes throughout said building flows through the drip-pipe *b* into the tank 35, filling said tank sufficiently to overcome the weight of the counter-balance 33. When it is desired to let on the water again, a push-button is operated to close the circuit, thereby charging the magnet. The armature 41 is attracted, thereby moving the lever 19 and releasing the wheel *j*. The long arm of the lever 26 connected therewith, as described, is thus elevated until its hook 28 is disengaged from the notch *w* in the disk *v*. This frees the arbor 15. The weight of the tank 35 containing the water, being greater than the weight 33, at once causes it to descend, and the arbor 15, bearing the barrel 16, on which the cord H is wound, to rotate and the train of gears to move. As the arbor 15 revolves, its disk *v* elevates the rods connecting it with the valve *d* and opens said valve. The electric circuit having been broken immediately the push-button was released, the hooks of the levers 19 and 26 engaged the peripheries of the wheel *j* and disk *v* as they rotate. At a semi-revolution of said disk and wheel said hooks respectively fall into the notches on the opposite sides thereof and at once stop the mechanism, thus holding the valve *d* open. The weight 33 has now been elevated into the position shown by the dotted lines in Fig. 1, and the tank 35 fallen a corresponding distance. The pin 38 of its valve 36, coming into contact with the floor or other suitably-disposed object, elevates said valve and permits the water to flow from the tank until empty.

When it is desired to shut off the water again, the mechanism having been released by the magnet, as before, the weight 33, being heavier than the empty tank, will revolve the disk a semi-revolution in the opposite direction and close said valve, the parts assuming the position shown in the drawings, after which the tank will fill with the waste water and be in condition to operate the device for again opening the valve. A spring may be substituted for the weight 33 and effect the same result.

Having thus explained my invention, what I claim is—

1. In a device of the character described, a valve in the water-pipe, a drip-pipe in the valve-chamber, a crank mechanism for operating said valve, a cord for actuating said crank having a weight at one end and a tank at the opposite end adapted to receive the water from said drip, an escapement for the crank mechanism, and an electric circuit having a magnet for releasing said escapement when the circuit is closed, substantially as described.

2. In a device of the character described, a valve, a crank mechanism actuated by a weight to close the valve, and a vessel containing the waste water from the pipes to open said valve, and an escapement for said mechanism adapted to be released by an electro-magnet, substantially as described.

3. In an automatic shut-off for water-pipes, a rotary crank-disk, an escapement therefor adapted to be released by an electro-magnet, a cord for reciprocating said disk provided with a weight at one end and a tank at the opposite end, a crank-rod connecting the disk and a valve in the water-pipe, and a flexible pipe connecting the drip of said valve with said tank, substantially as described, and for the purpose set forth.

4. In an automatic shut-off for water-pipes, a sliding valve, a drip therefor, a rotary crank-disk, a rod connecting the disk and valve-stem, a cord on the arbor of said disk for reciprocating the same, a weight on one end of said cord and a tank at the opposite end, a flexible tube connecting the valve-drip with the tank, and a valve in the tank for emptying it when the pipe-valve has been opened, substantially as described.

5. A device for automatically operating the valve of a water-pipe, comprising a rotary crank-disk connected with said valve, an escapement therefor adapted to be released by an electro-magnet, a cord for reciprocating the disk, said cord having a weight at one end rotating the disk to close the valve, and a tank at the opposite end for receiving the waste water from the pipes and rotating the disk to open said valve, substantially as described.

6. The valve A, provided with the drip *b*, in combination with the disk *v*, fitted to rotate in the frame D, the barrel 16 on the disk-shaft, the cord H, weight 33, tank 35, and tube 40, and an escapement for said disk actuated by an electro-magnet, substantially as described.

7. The valve A and crank-disk *v*, in combination with an escapement for the disk, mechanism for automatically reciprocating said disk, and the bar 29, rod *z*, and tube 12, connecting said disk with the valve-stem, substantially as described.

8. In an automatic shut-off for water-pipes, a rotary crank-disk connected with the valve, an escapement therefor released by an electro-magnet, a cord and weight for rotating the disk to close the water-valve, a tank connected with the waste-drip, and a cord for rotating the disk in the opposite direction to open said valve, substantially as described.

9. The combination of the valve A, provided with the drip *b*, the frame D, the rotary

crank-disk v, journaled in said frame and connected with said valve, the cord H on the shaft of said disk, the weight 33 and tank 35 on said cord, the valve 36 in said tank, the pipe 40, connecting the tank and drip, an escapement for said disk, and a magnet in an electric circuit adapted to release said escapement when the circuit is closed, substantially as described.

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