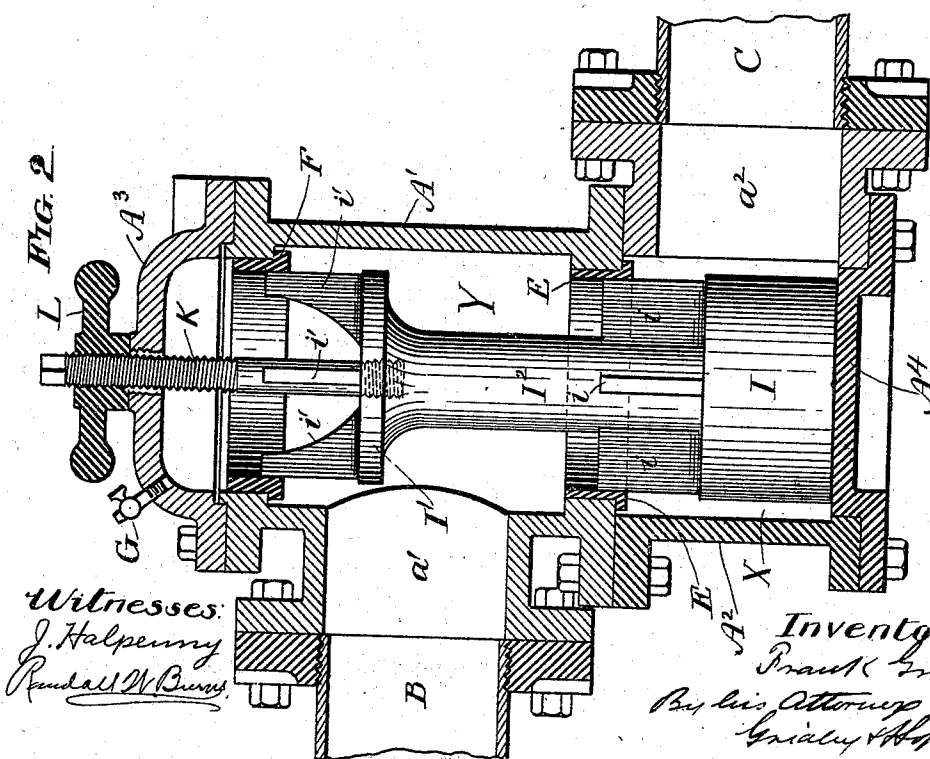
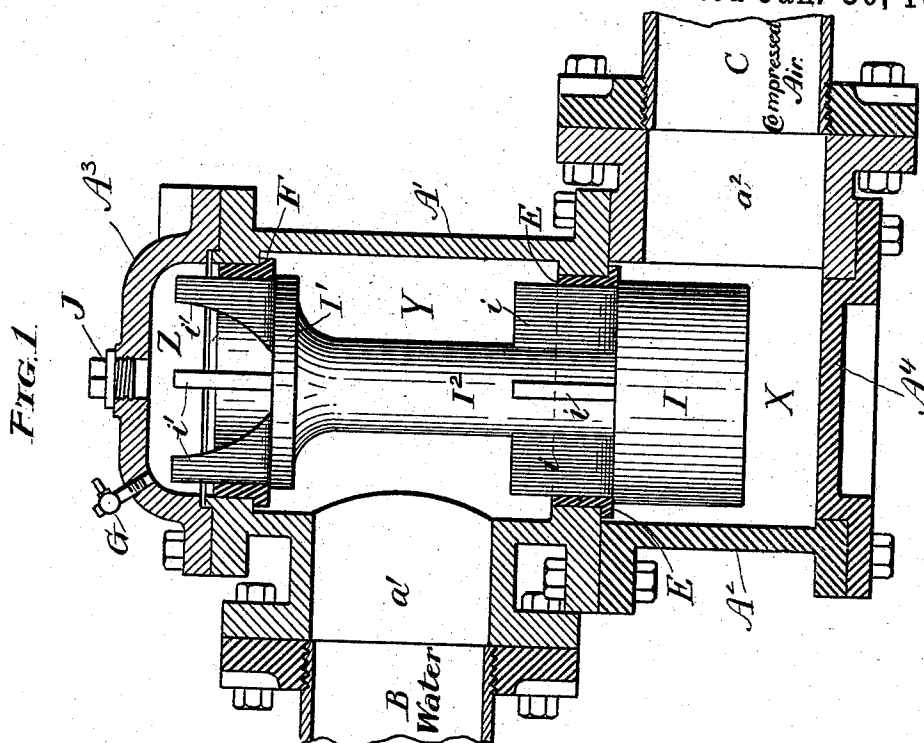


(No Model.)

F. GRAY.
VALVE FOR AUTOMATIC FIRE EXTINGUISHERS.

No. 513,571.

Patented Jan. 30, 1894.



Witnesses:
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UNITED STATES PATENT OFFICE.

FRANK GRAY, OF CHICAGO, ILLINOIS.

VALVE FOR AUTOMATIC FIRE-EXTINGUISHERS.

SPECIFICATION forming part of Letters Patent No. 513,571, dated January 30, 1894.

Application filed October 23, 1893. Serial No. 488,887. (No model.)

To all whom it may concern:

Be it known that I, FRANK GRAY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves for Automatic Fire-Extinguishers, of which the following is a specification.

The present invention relates to that class of valves that are balanced, so far as the pressure of the water in the supply main is concerned, so that the valve will not be influenced by variations in said pressure, or by "water hammer," and the object of said invention is to so improve the construction of valves of this class as to simplify them and at the same time render their action more certain.

The present invention consists in certain features of novelty that are particularly pointed out in the claims hereinafter, and in order that it may be fully understood I will describe it with reference to the accompanying drawings which are made a part hereof and in which—

Figures 1 and 2 are vertical sections of a valve embodying the invention, the former showing the valve seated and in readiness for operation, the latter showing it open and the system in operation.

A represents the casing which may be of any desired construction but which is preferably constructed as shown in the drawings. As shown it comprises two sections A' and A² suitably flanged and bolted together end to end, and heads A³ and A⁴ closing the outer ends of said sections, respectively. The section A' is provided with an opening a' which constitutes the inlet opening of the casing and with which the water supply pipe B communicates, and the section A² is provided with an opening a² which constitutes the outlet opening of the casing and with which communicates the distributing pipe C of the system. This latter pipe, it will be understood, is kept normally filled with compressed air which is intended to be liberated only upon the firing of a head. Two rings E and F are so arranged within the casing as to divide its interior into three chambers X, Y and Z, and at the same time form seats for the valve proper. The pipes B and C communicate

with the chambers Y and X, respectively, and the chamber Z is provided with means for maintaining its interior normally at a lower pressure than is maintained in the chamber X.

The valve proper consists of two disks I and I' provided with guide-wings i and i', respectively, and united by a stem I². The disks are located at such distance apart that they may be simultaneously seated upon the rings E and F as shown in Fig. 1, and when in this position the valve effectually cuts off all communication between any two of the chambers. The disks I and I' are located in the chambers X and Y, respectively, and the disk I' has exactly the same area as has the opening of the ring E, so that both disks have the same area exposed to the water in the chamber Y. This being so the pressure of the water in one direction exactly equals the pressure of the water in the opposite direction, and the valve is therefore balanced, so far as water-pressure is concerned. The water-pressure being thus reduced to zero, so long as the pressure in the chamber X is sufficiently in excess of the pressure in the chamber Z to overcome the weight of the valve, the valve will be held seated. As soon, however, as the pressure in chamber X is reduced by the firing of a head, the weight of the valve causes it to fall away from its seat and open communication between the chambers as shown in Fig. 2.

The head A³ is provided with an opening, normally closed by a plug J, for giving access to the valve for setting it.

To set the valve the plug J is removed and a rod K is inserted through the opening in the casing and screwed into a threaded opening provided for it in the top of the valve. This rod is threaded and onto it is turned a nut L. By turning this nut it may be brought to bear upon the top of the casing, and the valve thereby drawn up until its two disks are firmly seated. Compressed air and water may then be admitted to the chambers X and Y, respectively, and after removing the rod K and replacing the plug J the valve is seated and ready for operation. It will be understood, of course, that in order that the air pressure upon the under side of the valve may hold it seated and sustain its weight, it is necessary to maintain a sufficiently low pressure in the chamber Z. At the time the

valve is set as above described the pressure in this chamber is atmospheric, and if the valve disk I' is properly seated said pressure will continue to be atmospheric, even though the chamber be permanently closed. It is not to be expected that any leakage past this disk will take place, but as a safeguard against any possible accumulation of pressure within the chamber, the pet cock G is provided.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a valve for automatic fire extinguishers, the combination with the casing having communicating chambers X and Y, the former being located below the latter, the water inlet opening communicating with the chamber Y, the main outlet opening communicating with the chamber X, a valve-seat surrounding the opening through which said chambers communicate, a valve having equal opposing areas exposed to the water in chamber Y whereby the valve is balanced so far as the pressure in said chamber is concerned, said valve having a disk located in chamber X and adapted to seat toward the chamber Y whereby the pressure of the fluid in chamber X, acting upon said disk, will hold it normally seated, and whereby the weight of the valve itself will unseat it upon a reduction of said pressure, substantially as set forth.

2. In a valve for automatic fire extinguishers, the combination with the casing having communicating chambers X and Y, the former being located below the latter, the water inlet opening communicating with the chamber Y, the main outlet opening communicating with the chamber X, a valve-seat surrounding the opening through which said chambers communicate, a valve having equal opposing areas exposed to the water in chamber Y, whereby the valve is balanced so far as the pressure in said chamber is concerned, said valve having a disk located in chamber X and adapted to seat toward the chamber Y whereby the pressure of the fluid in chamber X, acting upon said disk, will hold it normally seated, and whereby the weight of the valve itself will unseat it upon a reduction of the pressure in said chamber X, the valve being

located entirely within the casing, and without a stem or other part extending through the casing, substantially as set forth.

3. In a valve for automatic fire extinguishers, the combination of a casing having a chamber X with which the main outlet opening communicates, a chamber Y with which the inlet opening communicates, said chamber Y being located directly above the chamber X and communicating therewith through a suitable opening, a valve-seat surrounding said opening, a chamber Z located directly above the chamber Y and communicating therewith through a suitable opening, a valve-seat surrounding said opening, and a valve having a disk I located in chamber X, a disk I' located in chamber Y, and a stem connecting said disks being adapted to seat toward the chambers Y and Z, respectively, and close the openings through which the three chambers communicate, said disks having equal opposing areas exposed to the water in chamber Y whereby the valve is balanced so far as the pressure in said chamber is concerned, and whereby the pressure of the fluid in chamber X, acting upon the disk I, holds the two disks normally seated in opposition to the weight of the valve, the valve being adapted to be unseated by gravity upon a reduction of the pressure in chamber X, substantially as set forth.

4. In a valve for fire extinguishers, the combination with a casing having a chamber X for containing compressed air, a chamber Y for containing water, and a chamber Z for containing pressure lower than that in the chamber first aforesaid, of the valve-seat E arranged between the chambers X and Y, the valve-seat F arranged between the chambers Y and Z, and a valve having a disk I located in the chamber X a disk I' located in the chamber Y and the stem I² connecting said disks, said valve having equal opposing surfaces exposed in the chamber Y, substantially as set forth.

FRANK GRAY.

Witnesses:

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J. HALPENNY.