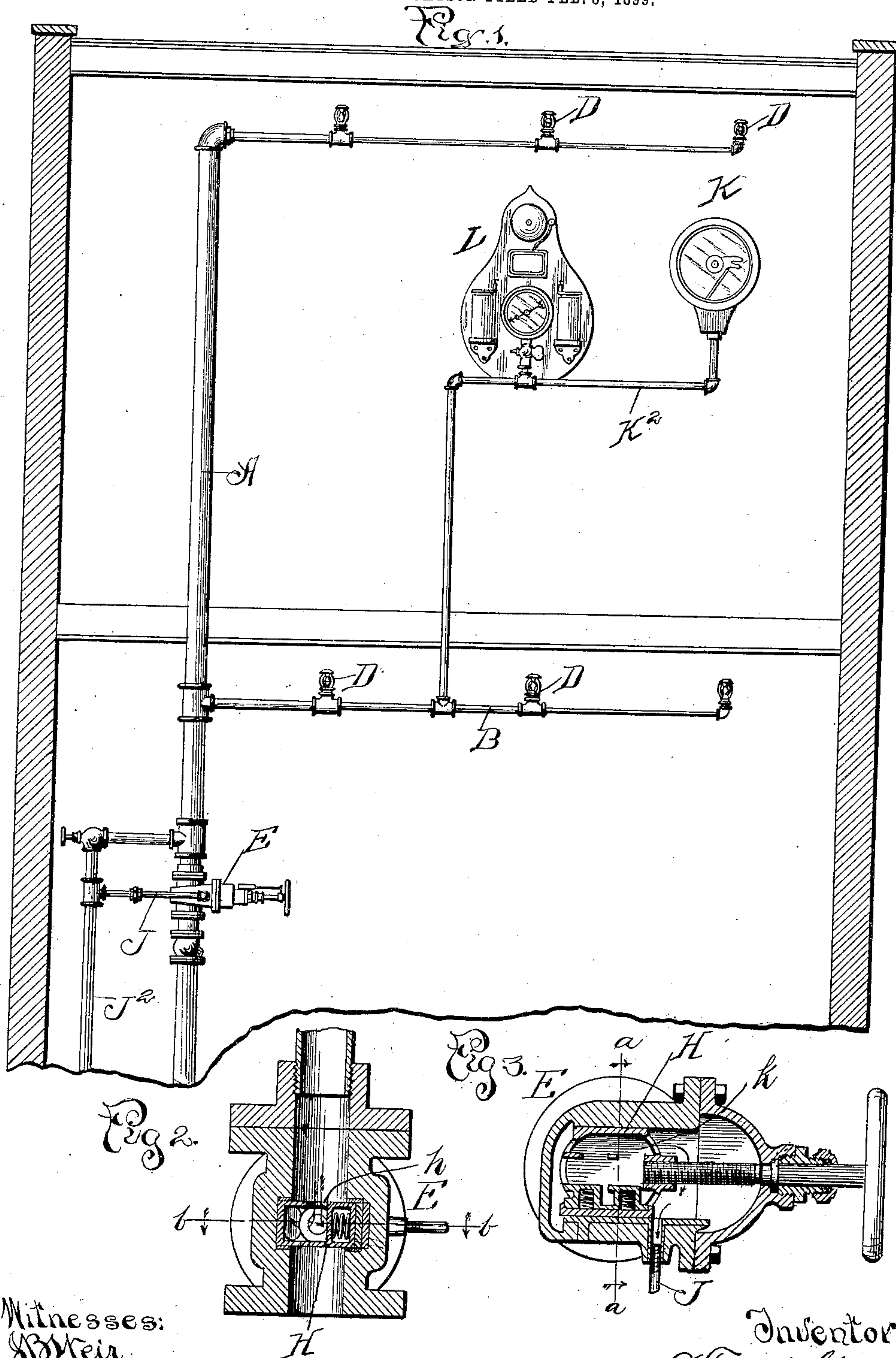


No. 896,823.

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PRESSURE MAINTAINING SYSTEM.

APPLICATION FILED FEB. 8, 1899.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## PRESSURE-MAINTAINING SYSTEM.

No. 896,823.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed February 8, 1899. Serial No. 704,878.

*To all whom it may concern:*

Be it known that I, FRANK GRAY, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Pressure-Maintaining Systems, of which the following is a specification.

My invention relates to certain improvements in those systems which employ a pressure which needs to remain undisturbed and in readiness for emergency use.

As my invention is particularly adapted for use in automatic fire extinguishing systems known respectively as wet and dry pipe sprinkler systems I shall illustrate and describe my invention in connection with one of said systems, to wit, the wet pipe system. In this system a series of pipes are extended throughout a building to be protected and secured to and communicating with these pipes, at suitable intervals, are the automatic sprinklers, adapted to fuse under ordinary heat and permit the exit of the water held under pressure in the pipes. A main valve controls and holds the water in the pipes under pressure. The main valve is so constructed that, when manipulated, the water is permitted to drain out of the pipes of the system to reduce or remove the water pressure. It is frequently the case that persons maliciously or negligently turn the valve into a position to drain off the water, reduce the pressure and render the system ineffectual for an emergency. It is frequently the case that the attendant in charge of the system turns the valve into a position to drain the system, and either immediately or after the lapse of considerable time, discovers the mistake and seeks to remedy it by again reestablishing the pressure. Under such circumstances, for a certain period of time, the system has been rendered inoperative.

It is the object of my invention to provide means whereby to automatically record each instance when the system is rendered ineffectual or inoperative, either carelessly or maliciously, and to automatically record the length of time that the system remains in such a condition.

Reference may now be had to the accompanying drawing, illustrating my invention in which:

Figure 1 is a view showing the interior of a building protected with an automatic extinguisher system. Fig. 2 is a section on the line *a—*a** of Fig. 3. Fig. 3 is a section on the line *b—*b** of Fig. 2.

The piping of the system is shown distributed throughout the building, the main riser of which is designated at A, having branches therefrom designated at B. The automatic sprinkler heads D are secured to and have communication with these branch pipes at intervals.

The main valve of the system, designated at E is located, as shown, in the main riser A at some suitable point. This main valve E is of such construction that when turned, in a particular manner, it permits the water pressure in the main riser A and the branches B to drain and thus reduce the pressure in the pipes. Should any person maliciously or negligently turn the main valve E into a position to drain the pipes of the system it is evident that the system as a whole is rendered inoperative and incapable of automatically extinguishing a fire in an emergency.

The main valve E, which is, however, of ordinary construction, comprises a chambered slide valve H having a port *h* opening into the main riser A, through which the water pressure passes into the chambered interior *j* of the slide valve H and when said valve is in the position as shown in Figs. 2 and 3 the water pressure passes out from the chambered interior *j* of the valve through the port *k* and from thence through the interior of the valve casing to the connecting drain pipe J which communicates with the main drain pipe J<sup>2</sup>.

The recorder or recording apparatus is designated at K connected to and communicating with the branch pipe K<sup>2</sup> of the system. This recorder is of ordinary construction and it is adapted to become operated by a reduction of pressure in the pipes of the system. This recording apparatus will indicate and record or register the reduction of pressure in the pipes of the system and will maintain this record for inspection. Should the main valve be closed to drain, maliciously or carelessly, and the pressure reduced the recording apparatus K will immediately act to register the fall of pressure and the extent of such fall of pressure. It will also be evident



that this register or recording apparatus will indicate, incidentally, the length of time that the system remains inoperative.

I have also illustrated, although it constitutes no part of this invention, an alarm apparatus described and claimed in a patent numbered 693,322, granted to me on the 11th day of February, 1902, and this apparatus is designated generally at L.

From the foregoing description it will be observed that I provide a main valve, or shut-off valve, which controls the pressure in the system and which valve is of such construction that when closed it opens a passage to drain or release the pressure of the system above or beyond the valve and also in combination therewith a recording apparatus, or several recording apparatuses, located at convenient points, which shall serve to indicate that the system has been tampered with in some manner to drain or reduce the pressure and the extent of reduction is also indicated and recorded for future inspection. By this means it is possible to determine at any time whether the system has been rendered inoperative. It will be further observed that by the employment of the apparatus or combination of parts above described a record is made of the fact that the main valve has been closed or partially closed, so as to shut off or reduce the flow of water through the valve to the distributing pipe, in case a sprinkler should open while the valve was in that position, and that by such closing or partial closing of the main valve the operativeness of the system had been thereby destroyed or impaired. It will be further understood that the reduction of pressure in the distributing pipe produced by the closing or partial closing of the main

valve is in itself of no particular importance, but that such reduction of pressure so produced constitutes the means by or through which the closing or partial closing of the main valve serves to operate the recording device. When the recording device is provided with time mechanism, said recording device will serve to record not only the fact that the main valve has been closed or partially closed and the flow of water to the distributing pipe thereby cut off or impaired, but will also record the time when said valve was thus closed or partially closed and the length of time it has remained in that condition.

Having thus described my invention what I claim as new therein and desire to secure by Letters Patent is:

In an automatic fire extinguisher system, the combination of a main pipe, suitable distributing pipes, a valved drain pipe connected with the main pipe, a valve located in the main pipe below the drain pipe and provided with a by-pass connection with the said drain pipe, said by-pass connection being adapted to be opened and closed by the valve in the main pipe, so as to allow fluid to pass around the valve in the drain pipe, and a recording device involving time mechanism and adapted to record movements of said valves, said valve in the main pipe being adapted, in addition to controlling said by-pass, to open and close communication between the distributing pipes and the source of fluid pressure.

Signed by me at Chicago, Cook county, Illinois, this 6 day of February, 1899.

FRANK GRAY.

Witnesses:

CHAS. C. BULKLEY,  
L. M. BULKLEY.