

(No Model.)

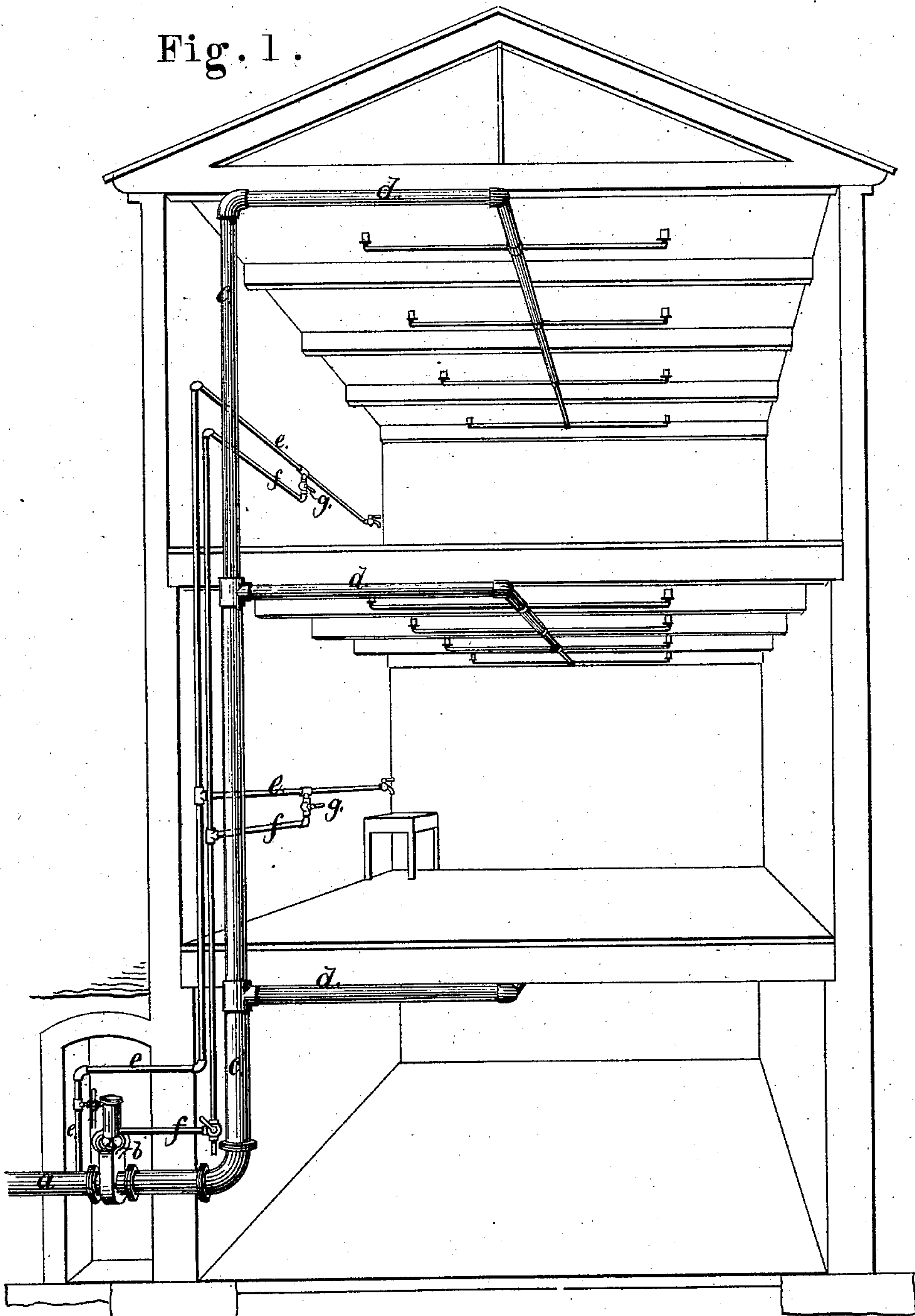
2 Sheets--Sheet 1.

F. GRINNELL.  
Fire Extinguisher.

No. 231,714.

Patented Aug. 31, 1880.

Fig. 1.



WITNESSES:

*J. A. Miller*  
*Wm. L. Cooper*

INVENTOR:

*Frederick Grinnell*  
*by Joseph A. Miller atty*

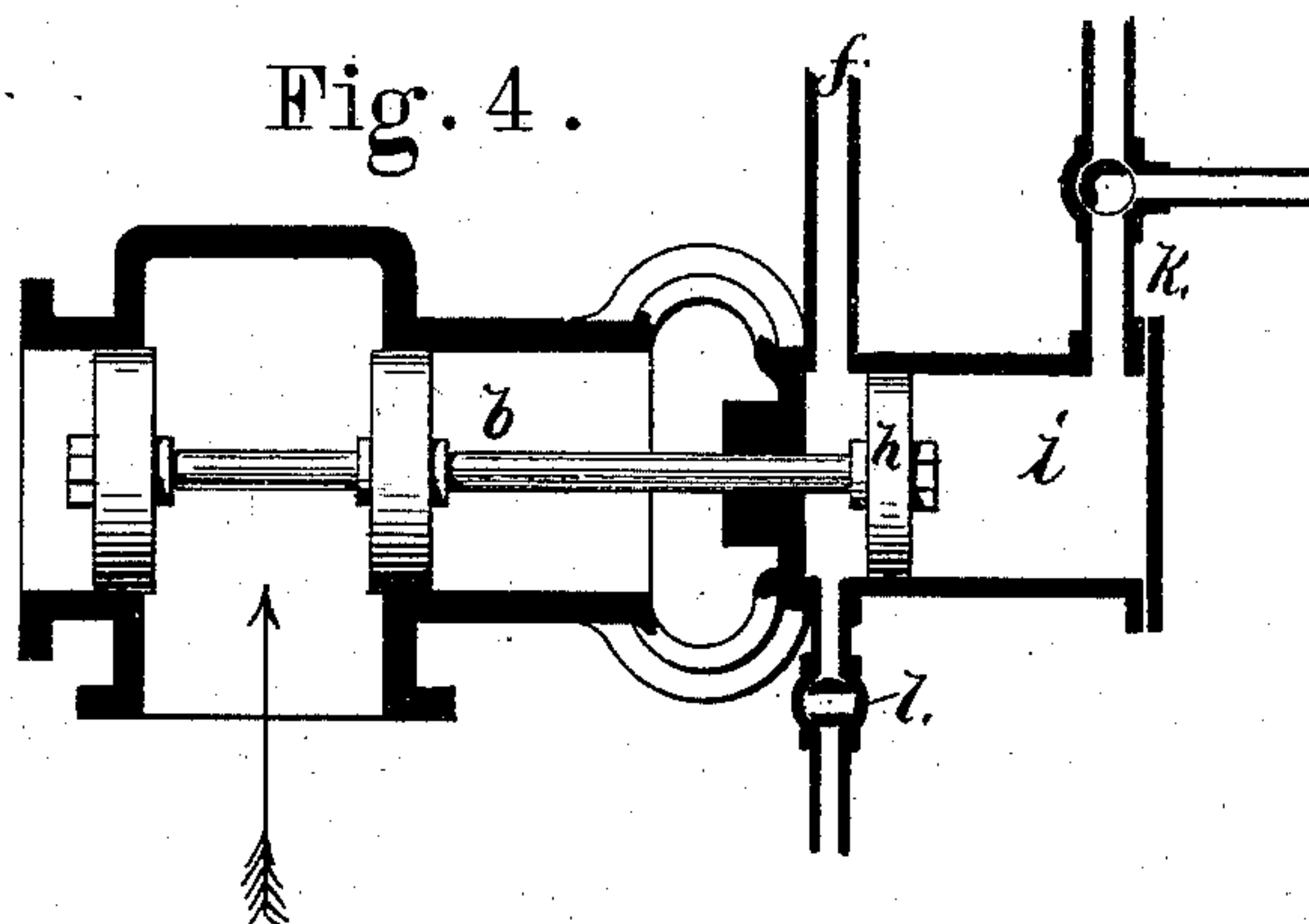
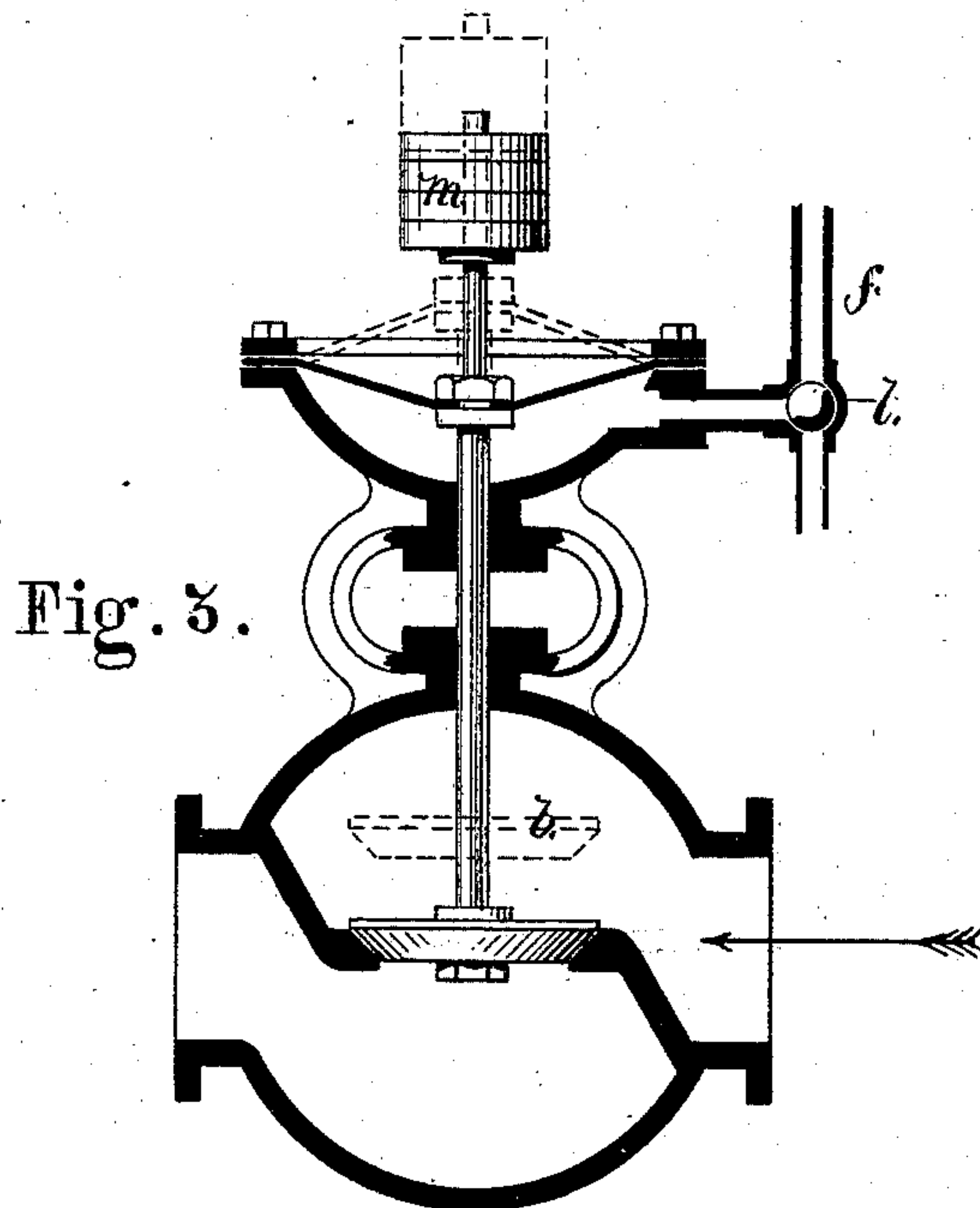
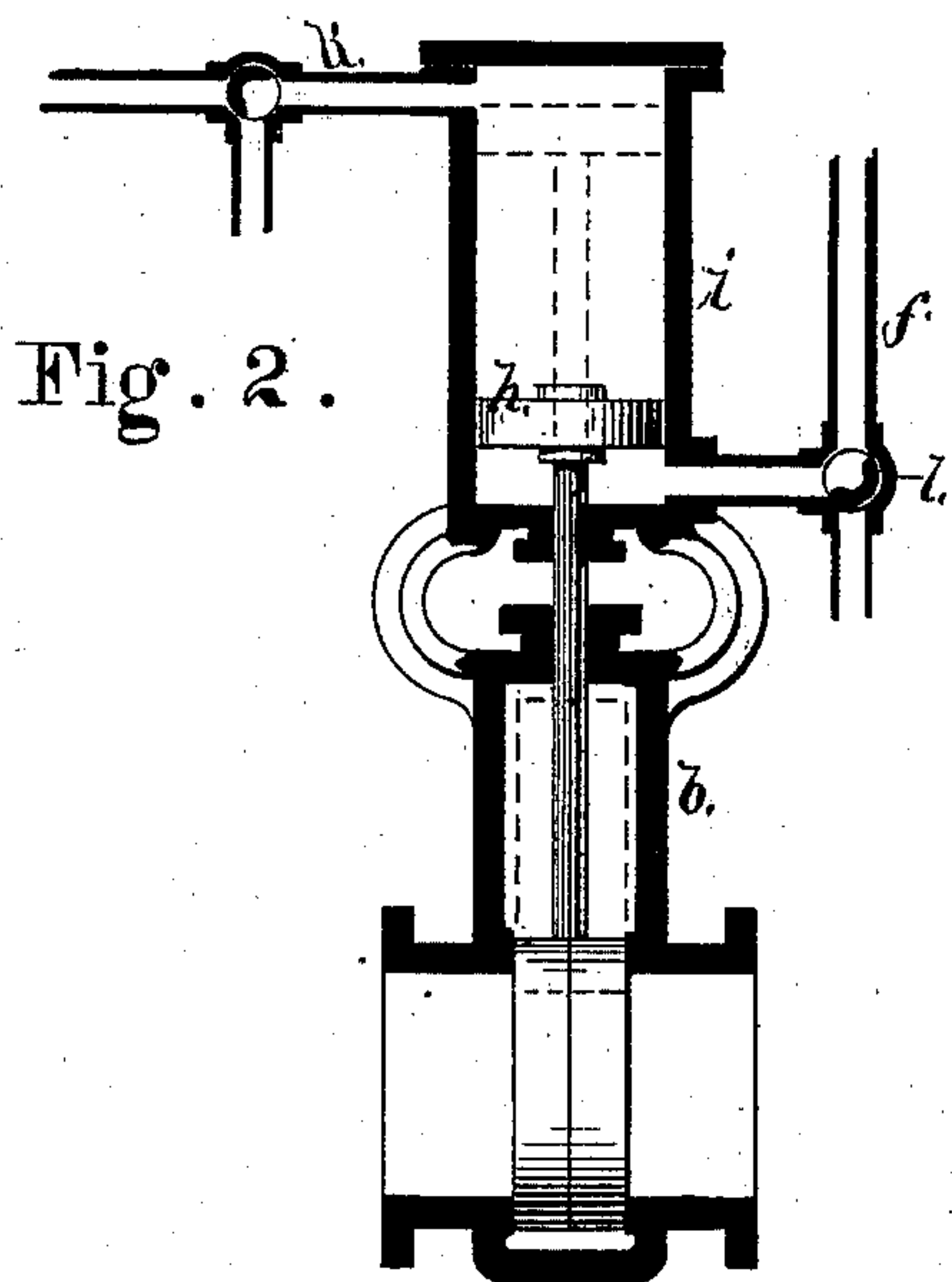
(No Model.)

2 Sheets--Sheet 2.

F. GRINNELL.  
Fire Extinguisher.

No. 231,714.

Patented Aug. 31, 1880.



WITNESSES

*J. A. Miller Jr.*  
*Wm. L. Coop.*

INVENTOR:

*Frederick Grinnell*  
*by Joseph A. Miller*  
*att'y.*



# UNITED STATES PATENT OFFICE.

FREDERICK GRINNELL, OF PROVIDENCE, RHODE ISLAND.

## FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 231,714, dated August 31, 1880.

Application filed May 31, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK GRINNELL, of the city and county of Providence, State of Rhode Island, have invented a new and useful  
5 Improvement in Fire-Extinguishers, (Case E;) and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.  
10 This invention has reference to an improvement in fire-extinguishers; and it consists in the combination, with a series of distributing-pipes communicating with a supply-pipe and  
15 of a system of pipes connecting the system of service-pipes of the building and said regulating-valve and cocks or valves, whereby the pressure of water in the service-pipes may be utilized in opening the regulating-valve and  
20 admit a supply of water to the distributing-pipes.  
Figure 1 is a perspective view, showing the interior of a building provided with mains and  
25 branches for distributing water in case of a fire, a valve controlling the supply of water to the system for extinguishing fire, a system of pipes connected with the main water-supply arranged to supply water to the various parts  
30 of the building, and a system of pipes connected with the valve controlling the water-supply and with the water-pipes, so that the full pressure of the water may be let on at points distant from the main valve, and the valve opened by the water-pressure. Fig. 2 is  
35 an enlarged sectional view of the valve controlling the water-supply to the system of fire-extinguishers, showing the operation of the water on a piston for raising the gate or valve. Fig. 3 is a sectional view of a valve operated  
40 by the water acting upon a diaphragm. Fig. 4 is a sectional view of a balanced valve provided with a hydraulic cylinder constructed to operate the valve from a distant point by turning the water onto either side of the piston.  
45 In the drawings, *a* is the water-supply main. *b* is the valve or gate controlling the water-supply. *c* is the rising main, from which the branch pipes *d* extend to the distributing-pipes. These distributing-pipes may be per-  
50 forated pipes, or they may be provided with

branches, on the ends of which distributors are placed, which open automatically when the heat of the room is raised above a fixed temperature.

*e e* are the pipes furnishing the water-sup- 55 ply to the building. They are connected with the water-main outside of the valve *b*, and are therefore always supplied by water under pressure.

*f* represents a system of pipes extending 60 over the building, one end of which is connected with a suitable arrangement, such as a cylinder containing a piston, a diaphragm, or other device constructed to operate the valve  
65 by the pressure of water.

*g g* are valves by which at various parts of a building the water from the pipes *e e* may be turned onto the pipes *f*, and the pressure exerted will raise the valve controlling the water- 70 supply, so that the water will enter the main *c* and branches *d* to be discharged from the distributors.

If, therefore, a fire breaks out in any part of the building, the opening of any one of the valves *g* will connect the pipes *f* with the wa- 75 ter-main, and the full water-pressure will be exerted to open the water-supply no matter where the valve *b* is located. It is obvious that the pipes *f* may be carried any desired dis- 80 tance to reach the valve, and also that the water-supply to the sprinklers may be connected with a cistern in the higher portion of the building, and the pipes *e* with any source of water-supply under pressure, such as the street- 85 mains.

The building may also be divided into di- 85 visions, each controlled by a separate valve, and each valve may be connected with a system of pipes, *f*, which at one or more places can be connected with the water-pipes, so that the 90 opening of a cock or valve will cause the water-pressure to open the proper valve.

Various kinds of devices may be used to operate the valves by hydraulic pressure, some of which are shown in the drawings.

Fig 2 is a gate-valve, the stem of which is 95 provided with the piston *h*, placed in the cylinder *i*. The pipe *f*, extending from any part of the building, enters the cylinder under the piston, and as soon as opened will raise the 100



same, and with it the gate, and the water will thus be let onto the whole or any part of the building controlled by the valve *b*.

The upper end of the cylinder *i* may be open, 5 or it may have an opening, for the escape of air; or the pipe *k* may be connected with the end of the cylinder and provided with a valve, so that the gate may be closed by hydraulic pressure when the three-way cock *l* is opened 10 to discharge the water from the cylinder below the piston *h*.

The valve *b* (shown in Fig. 3) is an ordinary globe-valve, the stem of which is connected with a diaphragm under which the water from 15 the pipe *f* enters, and the raising of the diaphragm also raises the valve. To allow the valve to close readily the weight *m* is placed on the valve-stem, and when the three-way cock *l* is turned to close the pipe *f* and open 20 the outlet the valve will close as the water is discharged.

In Fig. 4 a balanced valve is represented, provided with the piston *h* and cylinder *i*, the inlet-pipe *f*, for opening the valve, and the pipe 25 *k*, for closing the same by hydraulic pressure.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a system of distributing-pipes communicating with a supply-pipe and a valve for regulating the flow of water to said distributing-pipes, of a system of pipes connecting the system of service-pipes of the building and said valve, and cocks or valves for allowing the pressure of water in 35 the service-pipes of the building to be utilized in opening the valve governing the flow of water to the system of distributing-pipes, substantially as set forth.

2. The combination, with the main *a* and a 40 system of sprinklers, of the valve *b*, operated by water-pressure, the pipes *e e*, pipes *f f*, and the valves or cocks *g*, constructed to operate the valve by connecting the pipes *e* and *f*, as described.

FREDERICK GRINNELL.

Witnesses:

JOSEPH A. MILLER,

J. A. MILLER, Jr.