

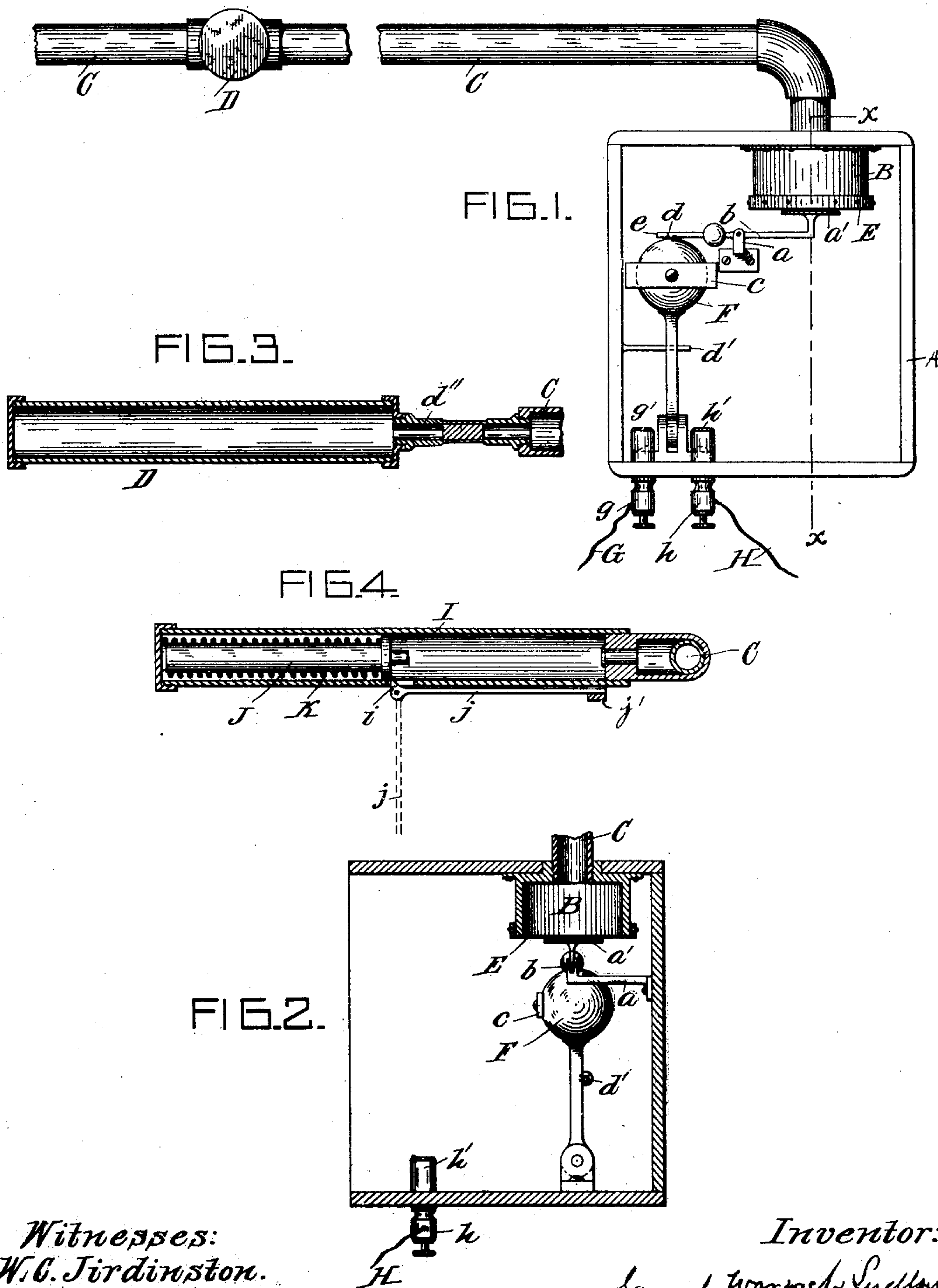
(No Model.)

S. W. LUDLOW.

FIRE ALARM APPARATUS.

No. 502,734.

Patented Aug. 8, 1893.



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UNITED STATES PATENT OFFICE.

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FIRE-ALARM APPARATUS.

SPECIFICATION forming part of Letters Patent No. 502,734, dated August 8, 1893.

Application filed November 1, 1892. Serial No. 450,691. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL WARWICK LUDLOW, a citizen of the United States, residing at Madisonville, county of Hamilton, and State of Ohio, have invented a certain new and useful Improvement in Fire-Alarm Apparatus, of which the following is a clear and exact description, reference being had to the accompanying drawings, forming part of this specification.

My improvement relates to that class of fire alarm apparatus in which the heat of the burning object causes the mechanism to automatically close a circuit conveying to the fire alarm or telephone station notice of fire upon the premises upon which my apparatus may be placed.

While my invention is adapted for use in connection with any suitable system of pipes in a building, it is especially intended to be applied to the ordinary illuminating gas-pipe system in a building, thereby saving the expense of additional lines of pipe and producing the new and novel result of using the contents of said pipes for illuminating and fire-alarm purposes at one and the same time, the alarm actuating device at one point being set in operation through the medium of the contents of such pipes, by means of a pressure-inducing device or devices at other points in the building, when a fire takes place.

Figure 1 is a front view of a box containing my device with the lid removed and the various parts of my mechanism in place for operation. Fig. 2 is a section on the line $x-x$ of Fig. 1. Fig. 3 is a section of the device for producing concussion. Fig. 4 is a view, corresponding to Fig. 3, showing a modification.

Similar letters of reference indicate identical parts.

Referring to the drawings, A is a suitable box within which is placed various parts of my invention.

B is a drum attached to the inside of the box at the top.

C is a pipe, gas or air pipe screwed into the upper part of said drum, and D is a thermostat attached to the pipe C. The bottom or diaphragm E of the drum B is formed of some air and water tight material of a flexible nature preferably oiled silk that can

readily be expanded by compression or concussion in the pipe C.

Pivoted upon a bracket a attached to the back of the box is a lever b one end of which is bent upward and formed into a disk or button a' normally resting against the diaphragm E.

F is a ball weight hinged to the bottom of the box having secured to it the metallic plate c . On the top of the ball is a stud or pin d engaging with the end e of the lever b and preventing the fall of the weight until released by the downward pressure of the diaphragm E upon the disk a' . The weight F is slightly out of the perpendicular and is prevented from falling backward by a stop d' attached to the box.

G and H are ground and main wires respectively forming part of a fire alarm system, and g and h are binding posts to which said wires are attached. g' and h' are contact points forming part of the posts g and h . When the ball F is released by the diaphragm E, it falls upon and closes the circuit through the contacts g', h' .

The thermostat D is a cylinder filled with a volatile fluid readily expanded by heat and has secured to it at one end a smaller pipe or cylinder d'' partly filled or plugged with an ordinary fusing metal to prevent the escape of the fluid in the cylinder D until melted by the heat of the fire and is secured to the pipe C. These thermostats are placed at intervals upon the pipes throughout the building, in which my apparatus is placed, in such position as to be readily acted upon by the heat of a fire.

I may also employ for the operation of my apparatus, instead of the thermostat above described, a tube or cylinder I containing a plunger or firing bolt J actuated by a coiled spring K, as shown in Fig. 4. The firing bolt J is held back in position by a lug i upon the hinged edge of a lever j said lever being held up against the pressure of the spring K by wax, fusing metal or the like holding at j' its free end against the cylinder I. The cylinder I when in position for use is secured to a projection upon the pipe C holding in a suitable vent a cartridge L as shown.

The operation of my device is as follows:

When a fire occurs in a building fitted with my apparatus, the heat reaching the thermostat melts the fusing metal in the small pipe *d* and expands the fluid in the cylinder
 5 D. This fluid on its release by melting of the fusing metal rushes into the pipe C compressing the contents and causing the bottom or diaphragm E of the drum B to press downward upon the disk *a'* depressing the disk end
 10 of the lever *b* and raises the end *e* of said lever out of engagement with the stud or pin *d* on the weight F releasing said weight which falls with the metallic plate *c* upon the contact points *g'* and *h'* closing the circuit and
 15 causing an alarm to be sounded at the fire station at the other end of the wire H. Where the device shown in Fig. 4 is employed a similar result is obtained by the heat of the fire melting the wax or fusing metal *j'* holding the lever *j* which drops, as shown in dotted lines releasing the spring K from engagement with the lug *i* said spring forcing the firing bolt J violently against the cartridge in the projection upon the pipe C, causing it
 20 to explode, the concussion producing the result upon the mechanism in the box A as above described.

I have shown two forms of thermostat and others might be designed, which employ
 30 means set in operation by abnormal heat, to induce pressure in the gas pipe. It is obvious that any form of pressure inducing thermostat may be employed for effecting the desired result, therefore, I do not wish to limit
 35 myself to the particular form or arrangement of the apparatus shown.

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

40 1. In a fire-alarm, the combination of the gas pipes containing illuminating gas in the building to be protected, means for giving an alarm exposed to pressure of said gas, pressure-inducing devices connected at various
 45 points with the pipes containing said gas, and

means for holding said pressure-inducing devices normally inert till heated, whereby the gas becomes the medium for actuating the alarm by transmission of impulses imparted by the pressure-inducing device, substantially
 50 as set forth.

2. In a fire-alarm, the combination of air or gas pipe, an alarm-actuating device operating by concussion, connected to said pipe and a thermostat containing an expansible medium
 55 having communication with the pipe and held normally inactive by a fusible medium, whereby upon melting of the fusible medium, the expansible medium is set in operation and an impulse is imparted through the pipe by
 60 compression or concussion of its contents, substantially as explained.

3. In a fire-alarm, the combination of gas or air pipes, thermostats attached to said gas or air pipes, which when actuated by heat causes
 65 a compression or concussion in the contents of said pipes, the drum B having a diaphragm E exposed to the pressure in said pipes, the lever *b* having a button *a* resting against said diaphragm, the weight *f* normally retained by
 70 said lever, contact points *g'*, *h'* forming terminals in an alarm circuit and upon which the weight is adapted to fall and close the circuit, substantially as described.

4. A fire-alarm consisting of gas or air
 75 pipes, thermostats attached to said gas or air pipes in combination with the drum B having a flexible diaphragm E, the lever *b* actuated by said diaphragm the weight or ball F, having a stud or pin *d* and metallic plate *c*, and
 80 the contact for connection with an electric circuit and upon which the weight falls to close said circuit, all substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing
 85 witnesses.

SAMUEL WARWICK LUDLOW.

Witnesses:

JEPHTHA GARRARD,
 GEO. E. CRUSE.