(No Model.)

A. GOLDSTEIN.

PNEUMATIC FIRE ALARM.

No. 562,130. Patented June 16, 1896.

Fig. 1.

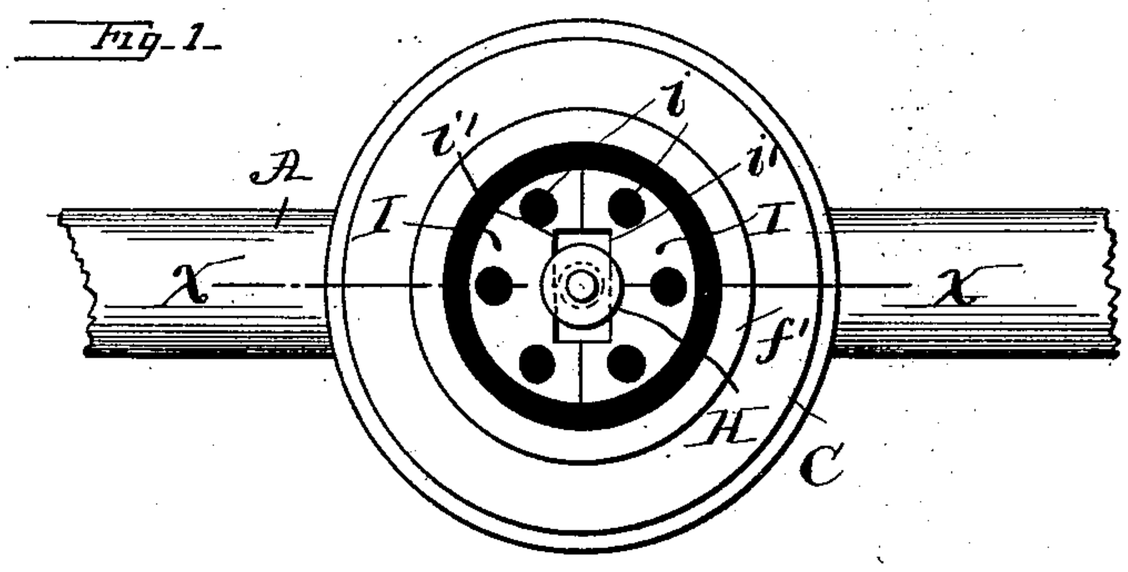


Fig. 2.

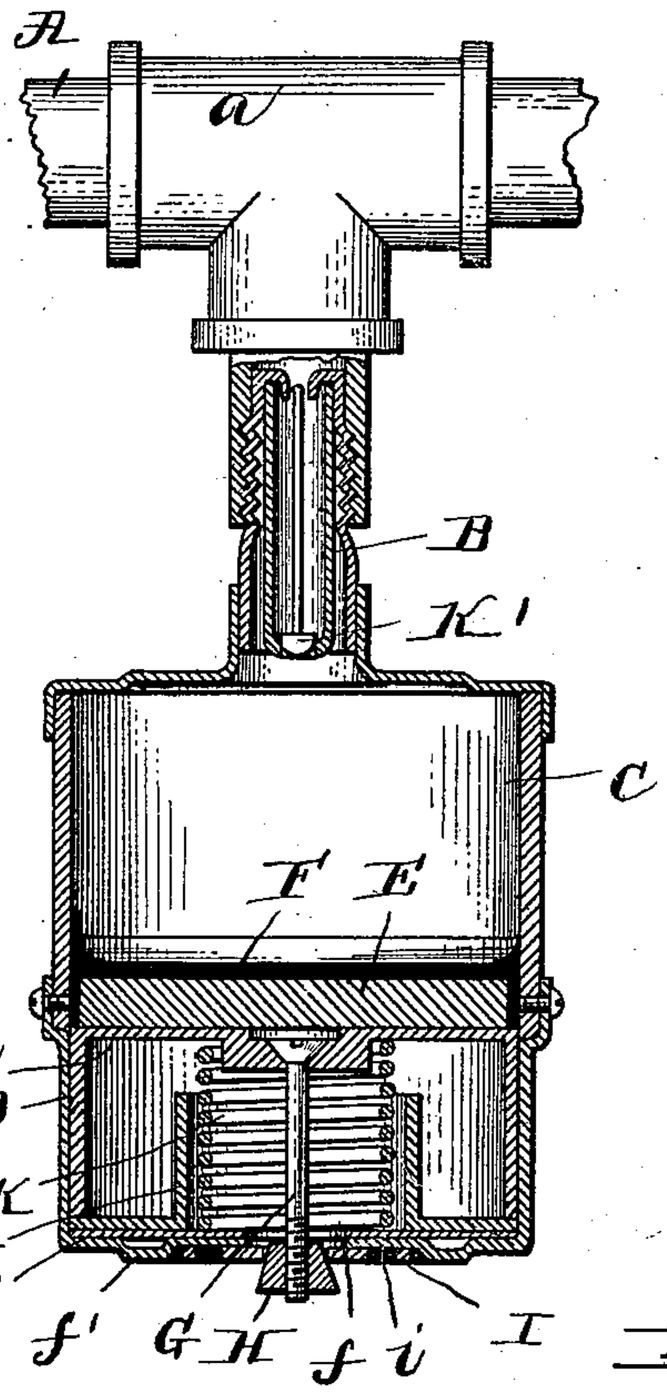


Fig. 4.

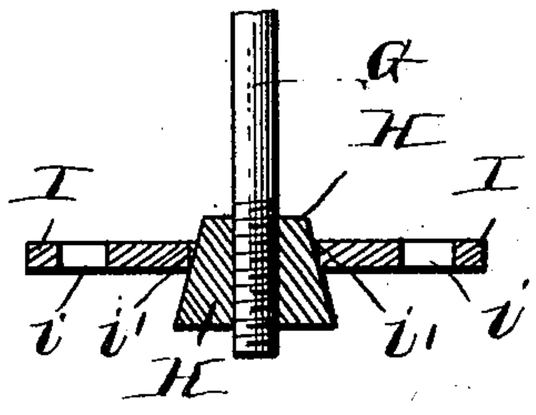
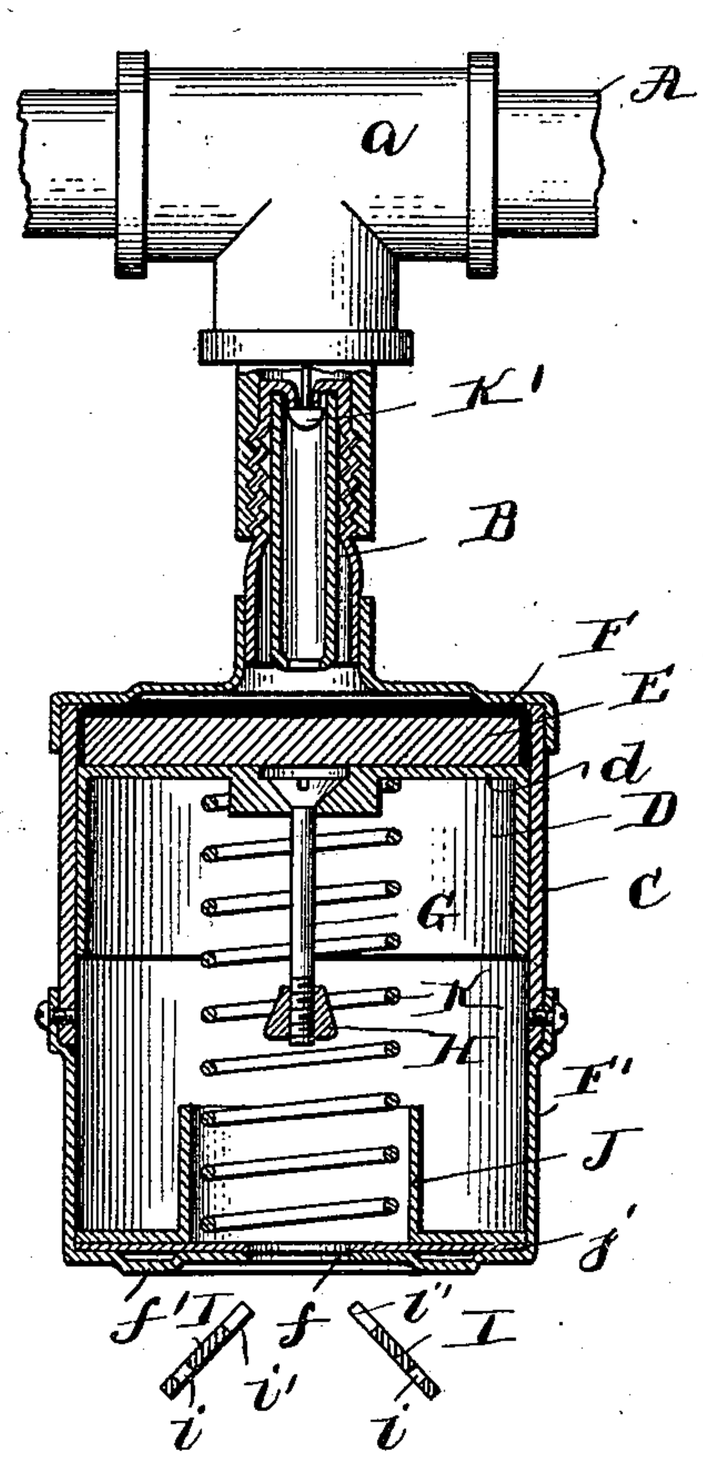


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

ALBERT GOLDSTEIN, OF PHILADELPHIA, PENNSYLVANIA.

PNEUMATIC FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 562,130, dated June 16, 1896.

Application filed April 24, 1895. Serial No. 546,983. (No model.)

To all whom it may concern:

Be it known that I, ALBERT GOLDSTEIN, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Pneumatic Fire-Alarms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

The object of this invention is to provide a certain and quick-acting operative device for pneumatic fire-alarms; and it consists in certain combinations of mechanisms whereby the result is obtained.

I will first describe the embodiment of my invention as illustrated in the drawings, and then particularly point out the invention in the claims.

Figure 1 is an inverted plan view of the operative device and portion of pipe leading to signal. Fig. 2 is a front elevation, partially in section, on line *x x* of Fig. 1, the operative device being shown previous to action. Fig. 3 is a view similar to Fig. 2, the operative device being shown after action. Fig. 4 is an enlarged sectional view showing the plunger-rod with a wedge-shaped locking-bolt and locking-plates.

A is the pipe extending through the building or room to be protected and leading to the signal. At desired points unions *a* are provided, and with which is secured the threaded end of the pipe B of the operative device. This pipe B terminates in the cylinder C, in which is the piston D. This piston is adapted for work in one direction only, and on one side of the piston-head *d* I place a ring or washer E of flexible material, preferably asbestos, which is boiled in a lubricant, which, when cold, is a solid, but fuses at comparatively low temperature. I prefer to use paraffin. Above this ring or washer E, I place a seal F, which when cold is a solid, but readily fusible at low temperature, and for this I prefer also to use parffin, and which when cold hermetically seals the chamber at the piston, preventing any leakage of air around the piston.

F′ is a case which surrounds the piston and forms a guide for its movement.

G is the piston-rod, which at its free end has secured to it the wedge-shaped head H, and in the bottom of the case F′ is an orifice *f* of such size as to allow the head H to pass freely, and upon the bottom case is a ridge or projection *f′*.

I I are the disks, semicircular in form, but with a portion of each removed, as at *i′*, so as to form half of a rectangle, and when placed in position on the bottom of the case F and brought together, close the orifice *f* sufficiently to prevent the wedge-shaped end H passing through. (See Fig. 2.) These disks I I are provided with orifices *i*, and are of such size that when placed in position upon the bottom of the case F a slight space is left between their periphery and the ridge *f′*, the space being such that if the two disks were separated a distance to cause them to reach the ridge *f′* the orifice *i′* would be enlarged sufficiently to allow the wedge H to pass through. Solder is poured in the orifices *i* and between the exterior of the disks and the ridge *f′*. Within the casing at the lower end rests the spring-box J and its disk *j*.

K is a spiral spring, one end of which is connected to the piston-head *d*, and when the piston D is at the end of the cylinder C the spring is compressed in the box J, and its action tends to force the piston D in the cylinder C. This spring is normally prevented from acting by reason of the taper-head H being held by reason of the disks I contracting the orifice; but the wedge end H exerts a pressure tending to spread the disks apart, which is resisted by the solder connection between the disks and the bottom of the casing and the ridge *f′* through the medium of the solder between it and the periphery of the disks. When, however, by reason of a fire the solder becomes heated so as to be melted, the disks become free from the bottom of the case, and free to move sidewise, and the wedge H forces them apart and the spring acts to force the piston D to the position shown in Fig. 3, compressing and forcing the air through the pipe A to the signal.

The gravity-valve K′ in the pipe B prevents any air coming into the cylinder C if any other such device acts at some other point, and thus all the air passes through pipe A to signal and none is spent in passing to other piston devices on the line of pipe A.

The great value of the piston-tripping mechanism is its absolute certainty of action. The value of flexible ring or washer for the piston is that the device is not normally in use and is called into use but seldom, and if the piston-head (which of course requires to be a close fit in cylinder in order to avoid leakage) should be made of metal, corrosion or other cause might affect its operation; but with the flexible washer a piston may be used which does not make a tight fit, and with the fusible lubricating exterior, when heated as it is when going into action, fills the space and makes it air-tight, and the fusible lubricant washer makes certain the intent that there shall be no leakage in the cylinder.

While I have described a spring as the power or force acting on the piston, I do not intend to limit myself to the use of the spring as the only means of power, as any other means adapted to move the piston and which is restrained from acting by the wedge and disks I consider within my invention; nor do I intend to limit myself to asbestos as the material for the washer, as any other flexible material capable of being used may be substituted—such, for instance, as paper or leather or a fibrous material.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. An operative device for pneumatic fire-alarm, consisting of an air-chamber, with inclosed air at normal pressure, a conduct-pipe, connection between said air-chamber and conduct-pipe, a plunger or piston adapted to disturb or excite the inclosed air in said chamber, means to move said piston in said chamber, a piston-rod provided with a wedge-shaped end, an end plate with an orifice therein, disks provided with cut-away portions detachably secured by fusible material, and adapted when in position to restrain the movement of the piston-rod by engagement with the wedge-shaped end thereof.

2. An operative device for pneumatic fire-alarm, consisting of an air-chamber, with inclosed air at normal pressure, a conduct-pipe, connection between said air-chamber and conduct-pipe, a plunger or piston adapted to disturb or excite the inclosed air in said chamber, means to move said piston in said chamber, a piston-rod provided with a wedge-shaped end, an end plate with an orifice therein, disks provided with cut-away portions detachably secured by fusible material, and adapted when in position to restrain the movement of the piston-rod by engagement with the wedge-shaped end thereof, a projection or ridge upon said plate, and fusible material interposed between the disk and ridge.

3. An operative device for pneumatic fire-alarm, consisting of an air-chamber, with inclosed air at normal pressure, a conduct-pipe, and connection between said chamber and conduct-pipe, a plunger or piston adapted to disturb or excite the inclosed air in said chamber, means to move said piston in said chamber, a piston-rod provided with a wedge-shaped end, an end plate with an orifice therein, a device detachably secured by fusible material and adapted when in position to restrain the movement of the piston-rod by engagement with the wedge-shaped end thereof.

4. An operative device for pneumatic fire-alarm, consisting of an air-chamber, with inclosed air at normal pressure, a conduct-pipe, and connection between said chamber and pipe, a plunger or piston adapted to disturb or excite the inclosed air in said chamber, means to move said piston in said chamber, a piston-rod provided with a wedge-shaped end, an end plate with an orifice therein, a device in operative relation thereto and detachably secured from lateral movement and adapted when in position to restrain the movement of the piston-rod by engagement with the wedge-shaped end thereof.

5. An operative device for pneumatic fire-alarm, consisting of an air-chamber, with inclosed air at normal pressure, a conduct-pipe, and connection between said chamber and pipe, a plunger or piston adapted to disturb or excite the inclosed air in said chamber, means to move said piston in said chamber, a piston-rod, an end plate with an orifice therein, a device detachably secured by fusible material, and adapted when in position to restrain the movement of the piston-rod.

6. An operative device for pneumatic fire-alarm, consisting of an air-chamber, with inclosed air at normal pressure, a conduct-pipe, and connection between said chamber and pipe, a plunger or piston adapted to disturb or excite the inclosed air in said chamber, means to move said piston in said chamber, a piston-rod, an end plate with an orifice therein, a device in operative relation thereto and detachably secured from lateral movement and adapted when in position to restrain the movement of the piston-rod.

7. An operative device for pneumatic fire-alarm, consisting of an air-chamber, with inclosed air at normal pressure, a conduit-pipe, and connection between said chamber and pipe, a plunger or piston adapted to disturb or excite the inclosed air in said chamber, the chamber at the piston-head being hermetically sealed with fusible material, means to move said piston in said chamber, and a device adapted normally to prevent the movement of said piston.

8. An operative device for pneumatic fire-alarm, consisting of an air-chamber, with in-

closed air at normal pressure, a conduct-pipe, and connection between said chamber and pipe, a plunger or piston adapted to disturb or excite the inclosed air in said chamber, the chamber at the piston-head being hermetically sealed with fusible material, by a sealing-disk of fusible material in front of said piston-head, means to move said piston in said chamber, and a device adapted normally to prevent the movement of said piston.

In testimony of which invention I have hereunto set my hand.

ALBERT GOLDSTEIN.

Witnesses:

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