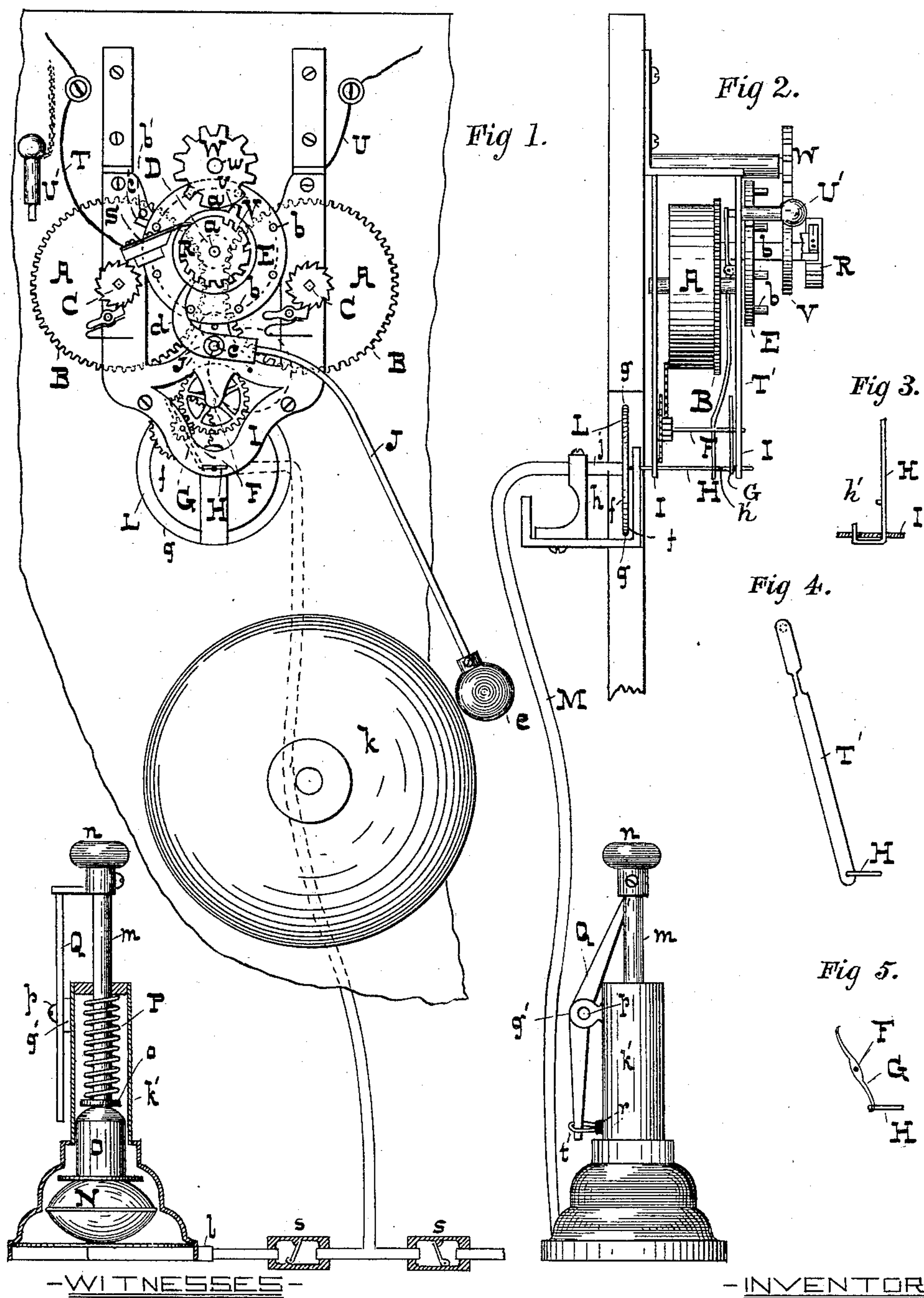


(No Model.)

A. GOLDSTEIN.
PNEUMATIC FIRE ALARM.

No. 446,863.

Patented Feb. 24, 1891.



-WITNESSES-

-INVENTOR-

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UNITED STATES PATENT OFFICE.

ALBERT GOLDSTEIN, OF BALTIMORE, MARYLAND.

PNEUMATIC FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 446,863, dated February 24, 1891.

Application filed April 7, 1890. Serial No. 346,876. (No model.)

To all whom it may concern:

Be it known that I, ALBERT GOLDSTEIN, of the city of Baltimore, in the State of Maryland, have invented certain Improvements in Pneumatic Fire-Alarms, of which the following is a specification.

In the description of the said invention which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a partly sectional view of the apparatus, looking toward the face of the alarm-striking mechanism; and Fig. 2, an exterior side view of the same. Figs. 3, 4, and 5 are details of the apparatus.

In the said drawings, A represents the spring-cases of a clock mechanism, and B the master-wheels on the periphery of the said cases.

C C are the winding-stems, and D is a pinion (shown only in dotted lines in Fig. 1) on a shaft *a* in gear with the master-wheels B.

E is a pin-wheel on the shaft *a*, the pins of which are denoted by *b*.

F is a small spindle driven rapidly by means of a train of gears (indicated in dotted lines in Fig. 1) from the shaft *a*. Some of these gears are shown in Fig. 2.

G is an arm on the spindle F, and H a wire which passes through the frames I of the clock mechanism. The outer end of the wire H is bent into the form of a staple, (see Fig. 3,) and the short limb of the staple passes through the front frame I and comes in contact with and stops the rotation of the arm G and its spindle F. When the wire is moved outward, the arm G is released and the clock-work is put in motion.

J is a hammer-arm attached to one end of a lever J', pivoted on the stud *c*. The other end *d* of the lever is curved and engages with the pins *b* of the pin-wheel E. The hammer-arm J carries a hammer *e*, adapted to strike a gong *k* as the pin-wheel revolves.

L is a circular distensible air-receptacle formed of two flexible diaphragms *f* and the circular rim *g*. The rear diaphragm is secured to a bracket *h* by means of a tube *j*, to which the main air-pipe M is connected. The front diaphragm is in contact with the wire H. Consequently when air is forced between the diaphragms they are separated or distended, and

the front one being the loose one is driven outward and pushes the wire H forward and releases the clock mechanism, and an alarm is struck, as before described.

The means for furnishing air under pressure consist of a hollow compressible rubber ball N, secured in a casing *k'*, having a nozzle *l*, to which the air-pipe M is attached. Resting on the ball N is a piston O, and on this piston is a stem *m*, which extends through the head of the casing *k'* and is provided with a button *n* at the top. A spring P, confined between a collar *o* at the lower end of the stem *m* and the head of the casing *k'*, serves to force down the piston O, and thereby collapse the ball N, which has the effect of driving the air from the ball to the space between the diaphragms *f*, releasing the clock-work, and sounding an alarm.

Q is a lever fulcrumed at *p* to a bracket *g'*, projecting from the casing *k'*. The upper end of the lever Q is adapted to pass under a projection on the button *n*, and thereby hold the piston O in its highest position and allow of the inflation of the ball N. To hold the upper arm of the lever in the position described, the lower arm is connected to a stud *r* by means of a link *t* of a readily-fusible metal wire. When this fusible-metal link is melted by a dangerous rise of temperature from fire, the lever Q fails to support the piston O, and the same falls and compresses the ball N, and the air being compressed between the diaphragms, as before stated, an alarm is sounded.

When two or more air-compressing balls are applied to a single alarm mechanism, the branch pipes are fitted with valves *s* (shown in section in Fig. 1) to prevent the operation of one mechanism affecting any of the others.

When the apparatus as described is used in connection with others and connected by electric wires to an exchange or to a fire-alarm station, the shaft *a* of each machine is provided with a notched wheel or disk R, and an insulated spring S forms the terminal of one of the leading-wires T. The other leading-wire U is attached to any part of the frame. The notched disk R and the spring complete the electric circuit, and in the revolution of the said disk the current is broken at each notch, and if the wires are connected to a recording-machine the number of the machine

sending in the alarm may be ascertained, as is common in fire-alarm mechanism. The disk shown in the drawings is arranged with notches to give the alarm-number, as 712, which represents the number of the machine.

V is a plain disk on the shaft *a*, having a finger *v*, and W is a disk on a stud *w*, with, say, ten peripheral teeth and a block-tooth *a'*.

In winding the clock mechanism the shaft *a* will make ten revolutions, and then the finger *v* will come in contact with the block *a'*, which prevents further winding. As the clock-work runs down in the striking operation the shaft *a* will make the same number of revolutions—ten—but of course in a direction contrary to that caused by the operation of winding, and the movement will cease when the finger *v* again comes in contact with the block-tooth *a'*. It will be understood that the position of the block-tooth is such that when it is in contact with the finger *v* the spring S will bear on the circumference of the notched disk R and not be over one of the notches. Consequently the electric circuit is never left open.

In order that the apparatus may be operated by hand to strike the signal only once instead of a number of times, as before described, a spring-lever T' is fulcrumed to the inner surface of the front frame I with its upper end directly over a hole *b'* therein. The lower end of this lever T' engages a lug *h'* on the wire II.

U' is a post or plug attached by a chain to a stationary part of the machine, adapted for insertion in the hole *b'*, and of such length as to press back the upper end of the lever

T', with which it comes in contact. In this application of the plug U' the wire II is thrown out and the striking mechanism set in motion. The pin-wheel E is provided with a stop *c'*, which as the said wheel makes a revolution comes in contact with the plug and prevents further operation of the machine. This single call may be utilized to give any message prearranged—as, for instance, a call for the police. At the termination of the one revolution of the notched disk R the plug U' is withdrawn and the wire II pushed in by hand to prevent any further movement. This adapts the apparatus for the ordinary fire-alarm before described.

I claim as my invention—

1. In combination with a striking mechanism, a revolving arm, a movable stop with which said arm engages, a diaphragm connected to said stop, a collapsible air-holder, a pipe connecting the diaphragm with the air-holder, a device adapted to compress the air-holder, and a fusible metallic loop to hold the compressor from the air-holder, substantially as described.

2. The air-compressing device, which consists of the hollow air-ball, a casing for the ball, a plunger in the said casing, a stem leading from the plunger, a spring to compress the ball, a button on the stem, a lever to support the plunger when the stem is extended, and fusible link to sustain the lever, substantially as specified.

ALBERT GOLDSTEIN.

Witnesses:

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