

(No Model.)

3 Sheets—Sheet 1.

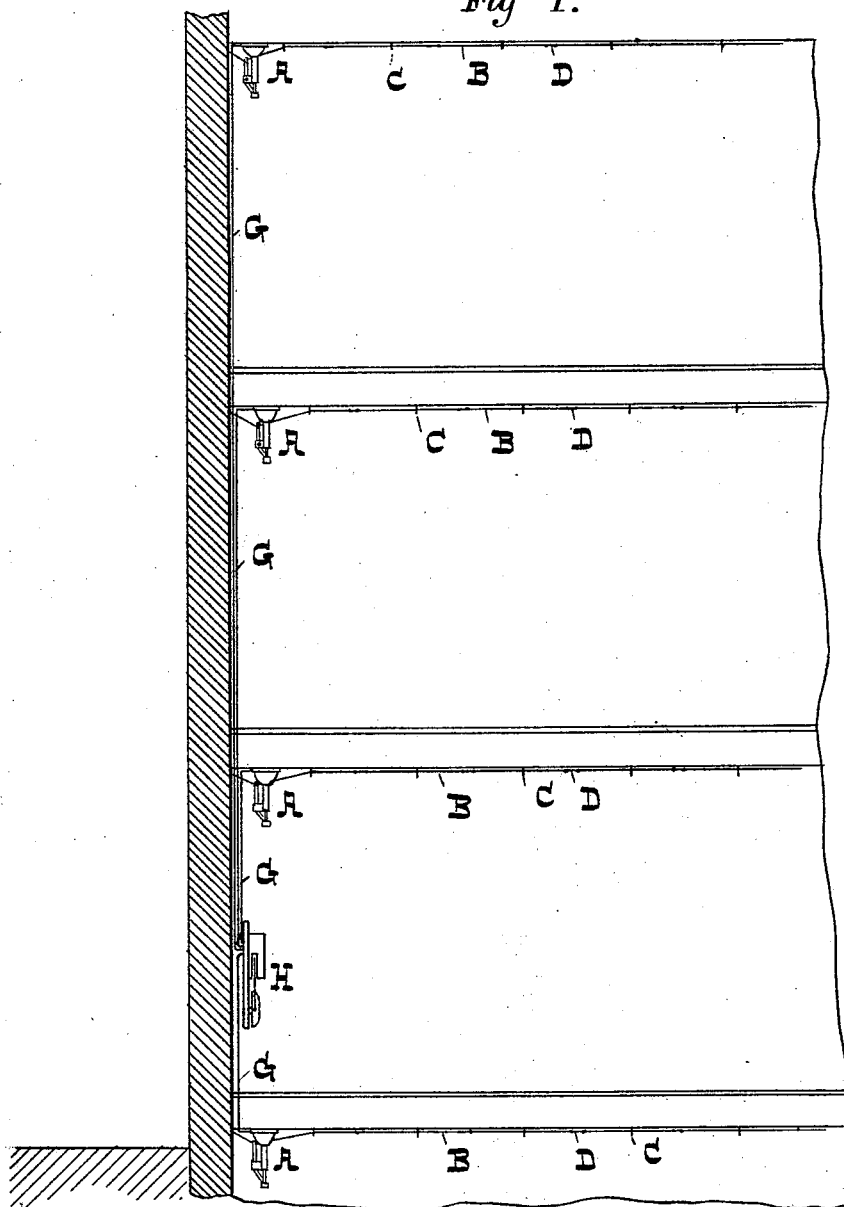
A. GOLDSTEIN.

PNEUMATIC FIRE ALARM TELEGRAPH APPARATUS.

No. 455,038.

Patented June 30, 1891.

Fig 1.



- WITNESSES -

David Fisher
Lewis Hooper

- INVENTOR -

Albert Goldstein,
by G. H. W. Howard,
att'y.

(No Model.)

3 Sheets—Sheet 2.

A. GOLDSTEIN.

PNEUMATIC FIRE ALARM TELEGRAPH APPARATUS.

No. 455,038.

Patented June 30, 1891.

Fig 2.

Fig 3.

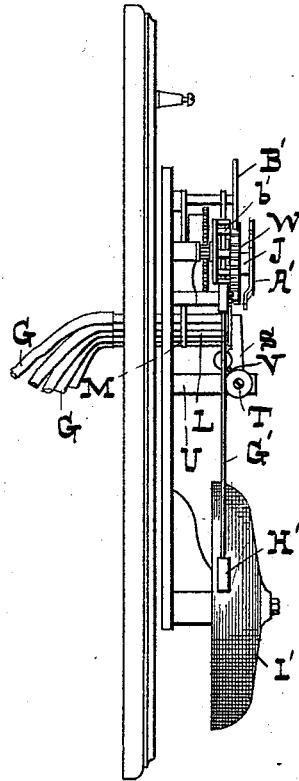
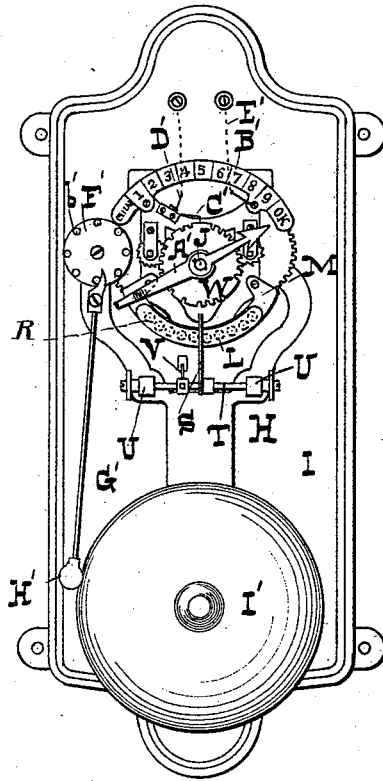
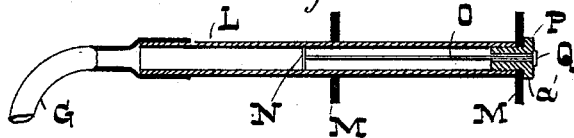


Fig 4.



-WITNESSES-

Sam'l Fisher
Lewis H. Foster

-INVENTOR-

Albert Goldstein,
by G. H. H. Howard,
att'y.

3 Sheets—Sheet 3.

PNEUMATIC FIRE ALARM TELEGRAPH APPARATUS.

No. 455,038.

Patented June 30, 1891.

Fig 5.

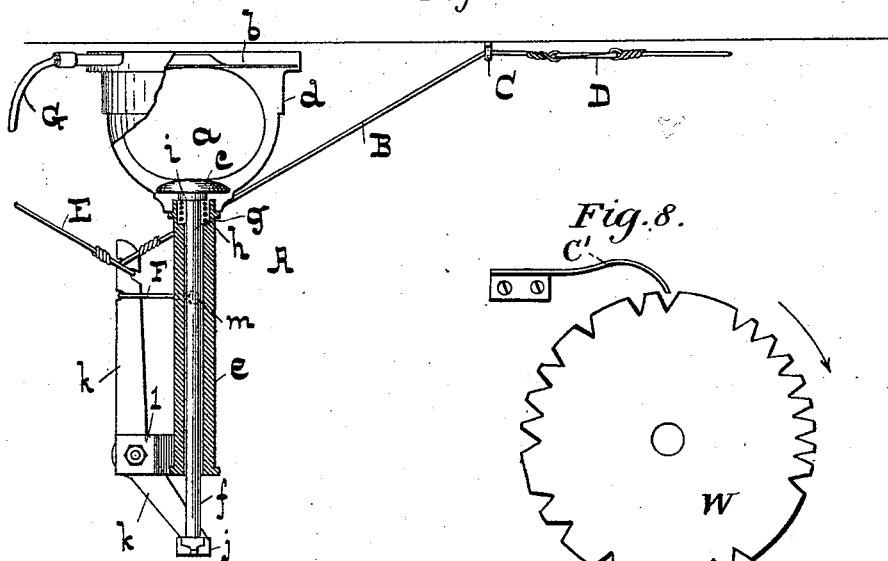


Fig. 8.

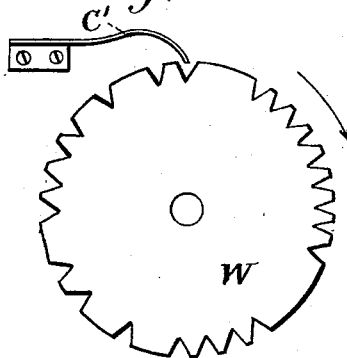


Fig 6.

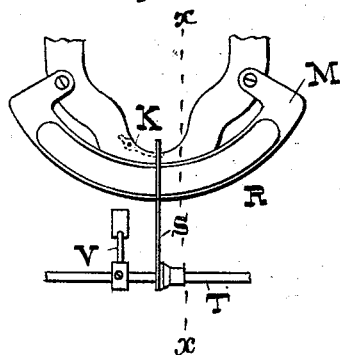
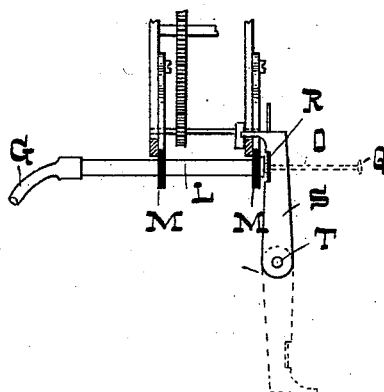


Fig 7.



- WITNESSES -

Dan'l Fisher
Lewis Hoxon

- INVENTOR -

Albert Holstein,
by E. H. R. Howard
att'y.

UNITED STATES PATENT OFFICE.

ALBERT GOLDSTEIN, OF BALTIMORE, MARYLAND.

PNEUMATIC FIRE-ALARM TELEGRAPH APPARATUS.

SPECIFICATION forming part of Letters Patent No. 455,038, dated June 30, 1891.

Application filed August 6, 1890. Serial No. 361,152. (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
5 Pneumatic Fire-Alarm Telegraph Apparatus, 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,
10 and in which—

Figure 1 is a sectional elevation of a part of a building illustrating the general arrangement of the apparatus forming the subject of the invention. Fig. 2 is an enlarged front view
15 of the signal apparatus, and Fig. 3 is a side view of the same. Fig. 4 is a detached view, on an enlarged scale, of the piston and cylinder, through the medium of which the clock mechanism is started. Fig. 5 is a similar view
20 of the air-compressing device. Fig. 6 is a front view, on an enlarged scale, of the stop for the clock mechanism and the means employed to actuate the stop. Fig. 7 is a sectional view of Fig. 6, taken on the line *x x*.
25 Fig. 8 is a detached view, on an enlarged scale, of the circuit-breaking disk and spring-pawl.

In the said drawings, A A are air-compressing devices situated at the ceiling of the
30 rooms to be protected. These air-compressing devices consist each of a hollow flexible ball *a*, having an outlet-pipe *b* attached thereto at the side next to the ceiling and an attached inverting button *c* at the opposite
35 side. The ball *a* is inclosed within a casing *d*, having a tube *e* leading therefrom, and a stem *f* bears against the button *c*. A spring *g*, confined in a recess *h* and endwise between the bottom of the said recess and a collar *i* on
40 the stem, serves to force out the stem, and through it and the button invert and empty the ball *a* of its contained air. A cross-head
45 *j* at the end of the stem *f*, and a lever *k*, pivoted to a bracket *l*, serve to keep the stem in the position shown in Fig. 5.

The lever *k* is held in the position shown in Fig. 5 by a wire *B*, which passes through eyes *C*, secured to the ceiling, and extend around or across the room, and is finally attached to
50 a stationary point. This wire is in sections or lengths connected by link *D*, formed of two pieces of wire united by solder which is fusi-

ble at a low temperature. Links of any other description, provided they are adapted to detach the lengths of wire at a moderate rise in
55 temperature, will answer the purpose described.

E is a stay-wire to hold the lever *k* in a vertical position during the stretching or leading of the wire *B*. *F* is a fusible link which connects the lever *k* to a stud *m* on the tube *e*. The melting-point of this link is lower than that of the links *D*, and while it prevents the tripping of the lever *k* by the accidental breakage of the wire *B* it will not prevent
65 the operation of the same by the application of heat.

G is a pipe, of lead or other suitable material, which leads from the air-discharge pipe *b* to the signaling apparatus, which, as a unit,
70 is denoted by *H*. This apparatus consists of a board *I*, carrying a clock mechanism, whereby a shaft *J* is revolved. The wheels which lead from the springs to the shaft *J* need no description herein, as they form only a train
75 of gearing common in such apparatuses.

K is a revolving arm forming a part of the clock-movement, with which the stop herein-after described for stopping the same comes
80 in contact.

L L are small cylinders arranged in a segment of a circle at the lower part of the clock-work and supported by means of the plates
85 *M*, projecting from the frame of the clock-work. Each one of these cylinders is connected by means of a pipe *G* to the discharge-tube *b* of an air-compressor.

Referring particularly to Fig. 4, *N* is a piston in the cylinder *L*, having a stem *O*, which passes through a head *P* and is provided
90 with a button *Q* at its end.

R is a segmental plate carried by a lever *S*, which is attached to a shaft *T*, arranged to vibrate easily between the brackets *U*. This segmental plate covers the buttons *Q* of the
95 piston-stems *O*, and the end of the lever *S* when thrown in engages with the revolving arm *K* and stops the clock mechanism.

A weighted lever *V* serves to keep the segmental plate *R* in contact with the buttons *Q*,
100 as shown particularly in Figs. 2 and 6.

W is a disk or circuit-breaker secured on a shaft *J*, and *A'* is a cross-arm fastened to the said shaft. One end of this cross-arm is

adapted as an index-finger and the other is arranged to come in contact with any one of the stems O which is projected outward from its cylinder.

5 B' is a segmental plate having numerals or indicating-marks which correspond with the numbers or marks of the different floors or rooms in which the air-compressing devices and the wires with fusible links are situated.

10 The periphery of the disk W is notched after the manner of those used in open or closed circuit-signal calls.

C' is an insulated spring-pawl connected to one wire D' of an electric circuit, and the 15 other wire E' is attached to any part of the clock mechanism. Electric contact is broken as the spring-pawl enters each one of the notches. Consequently in the revolution of the disk or circuit-breaker when the apparatus is 20 electrically connected to one or more recording instruments or registers at the receiving-stations the number of the instrument is recorded, showing the building affected. The disk is also notched, so that the number of 25 the floor or apartment in which the particular air-compressing device has been automatically set in operation may be indicated.

In the present case the segmental plate B' is marked so as to record the cellar and nine 30 floors or rooms, and it has in addition a space to which the index-finger has to point when the apparatus is properly set, and which is marked "O K."

The method of securing the cylinders L to 35 the front plate M is shown in Fig. 4, and it consists in clamping the said plate between the flange a' of the head P and end of the cylinder. To remove any one of the cylinders, it is only necessary to unscrew its head, which 40 may then be withdrawn with its piston and stem, and the cylinder can be taken out from the rear.

F' is a disk driven in any suitable manner from the clock mechanism, having pins b' on 45 its face.

G' is a lever with a hammer H' at its end, and I' is a gong against which the hammer strikes. This gong, which is sounded in accordance with the alarm, is not necessary and 50 may be omitted from the apparatus.

The operation of the invention is as follows: When the signaling apparatus is in the position indicated in Fig. 2, it is at rest and ready to transmit a signal when the clock-work is 55 set in motion. A closed circuit is used, and the signals are transmitted by the intermittent breaking of the circuit. So long as the spring-pawl C' is in contact with the disk W the circuit will be closed and no signal transmitted. Suppose a fire occurs upon the sixth 60 floor, or, say, room 6, the wire in that room is severed by the melting of one of the nearest fusible links in the wire, which releases the particular air-compressing device upon the ceiling of the floor or apartment affected, and 65 the consequent sudden compression of the air-ball causes the stem of cylinder No. 6

to be projected outward. This stem in its outward movement throws out the segmental plate R, which is attached to the lever 70 S, and the end of the lever is detached from the revolving arm K of the clock mechanism, which is thus allowed to revolve. The disk W and cross-arm A' will also revolve and the revolution continue until one 75 end of the arm A' comes in contact with the projecting stem of cylinder No. 6. During the revolution of the disk W as the notches therein come opposite the pawl C' the circuit will be broken and a signal transmitted for 80 each notch. In the present case the disk is notched to indicate 214 as the number of the instrument, these notches being duplicated in order to sound or record that number twice. They are followed by nine notches equidistant, intended to indicate the number of the 85 floor or room. When, therefore, the stem of cylinder No. 6 is driven out, the disk W will revolve, transmit the signal 214 twice, and then six consecutive signals, when the clock- 90 work will be stopped by one end of the cross-arm coming in contact with the projecting stem. The other end of the cross-arm A' will then point to the figure 6 on the segmental plate B', thus indicating on the apparatus the 95 number of the room or floor affected. Any sudden jar of the instrument of sufficient violence to throw back the segmental plate R, and thus release the clock mechanism, will be indicated by a continuous operation of the 100 apparatus and a constant repetition of the signal indicating the number of the instrument and, as in the present case, the arbitrary number 9. This will continue until the clock mechanism runs down or the plate R is 105 returned to its normal position. The repetition of such a signal by way of several revolutions also serves as a test-signal both for the particular instrument as well as for the condition of the outside circuit, and the arbitrary number 9 when finally concluded also 110 serves as an automatic signal of "O K" upon every register connected to the line in respect to such instrument, being again set in its normal position as to circuit when the test is concluded, thereby avoiding any occasion for the otherwise dangerous practice of cutting out certain registers in cases of tests to obviate such test-signals being confounded with regular fire-alarm signals. 120

I claim as my invention—

1. In a fire-alarm telegraph apparatus, a series of air-compressors, a clock mechanism, a stop to control the movement of the clock mechanism, and a series of tubes leading from 125 the air-compressors to convey air to actuate the stop and release the clock mechanism, combined with a recording-instrument in an electric circuit with the clock mechanism, and a circuit-breaker also in said circuit, 130 adapted to be operated by the clock mechanism to intermittently break the circuit and thereby transmit a signal to the recording-instrument, substantially as described.

2. In a fire-alarm telegraph apparatus, a recording-instrument, a clock mechanism in an electric circuit with the recording-instrument, and a stop to control the movement of the clock mechanism, combined with an air-compressor adapted to be operated by the action of heat, a cylinder, a piston within said cylinder adapted to actuate the said stop to release the clock mechanism, and a tube leading from the air-compressor to the cylinder to convey air to move the piston, substantially as specified.

3. In a fire-alarm telegraph apparatus, a clock mechanism adapted to operate an electric-alarm apparatus and a stop to control the movement of the clock mechanism, combined with a cylinder, a piston within the cylinder and having a stem adapted to operate the stop to release the clock mechanism, and a tube leading from an air-forcing device to the cylinder to convey air to move said piston, substantially as described.

4. In a fire-alarm telegraph apparatus, a clock mechanism adapted to operate an electric-alarm apparatus, a stop-lever to control the movement of the clock mechanism, and a plate attached to said stop-lever, combined with a series of air-compressors, a series of cylinders, each cylinder having a piston with a stem adapted to engage the said plate, and a series of tubes leading from the air-compressors to the cylinders to convey air from

the former to the latter to move the pistons, whereby the stop-lever is caused to release the clock mechanism for the purpose specified, the arrangement being such that the stop-lever can be operated by either one of the series of air-compressors, substantially as set forth.

5. In a fire-alarm telegraph apparatus, a series of air-compressors located in different parts of a building, a clock mechanism remote from said air-compressors, a stop to control the movement of the clock mechanism, a series of pistons having stems to actuate the stop to release the clock mechanism, and a series of tubes leading from said air-compressors to convey air to move the pistons, combined with a plate having distinguishing-marks on it to identify the several air-compressors, and an arm adapted to be revolved by the clock mechanism, the arrangement being such that when either of the pistons is moved to start the clock mechanism one end of the revolving arm will eventually come in contact with the stem of said piston and stop the clock mechanism and its other end will indicate the distinguishing-mark of the air-compressor which actuated the piston, substantially as and for the purpose specified.

ALBERT GOLDSTEIN.

Witnesses:

JNO. T. MADDUX,
WM. T. HOWARD.