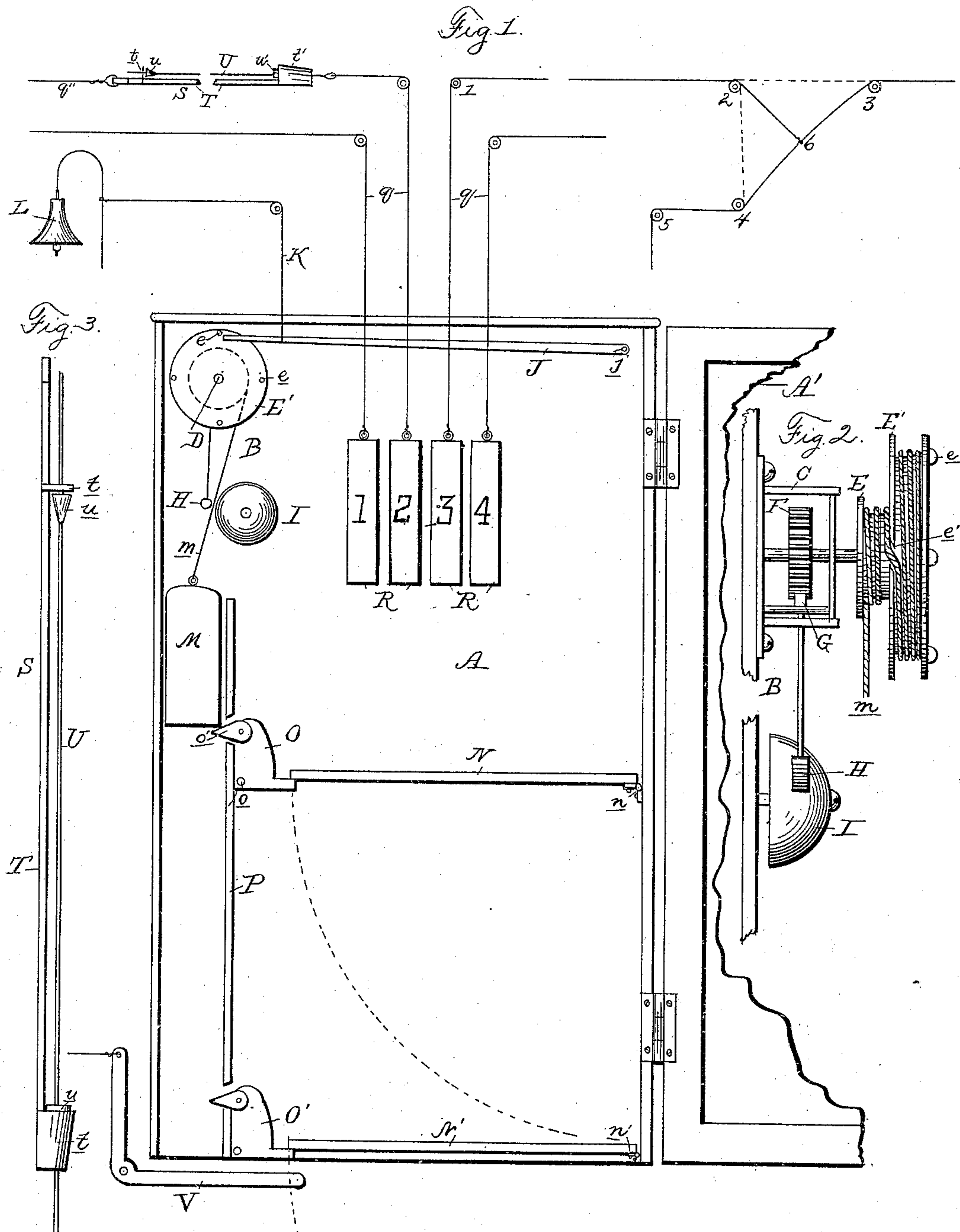


(No Model.)

J. B. DEEN.
AUTOMATIC FIRE ALARM.

No. 445,930.

Patented Feb. 3, 1891.



Witnesses
Thos. E. Robertson
Francis W. White

Inventor
John B. Deen
By J. W. Robertson
Attorney

UNITED STATES PATENT OFFICE.

JOHN B. DEEN, OF LOUISVILLE, KENTUCKY.

AUTOMATIC FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 445,930, dated February 3, 1891.

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To all whom it may concern:

Be it known that I, JOHN B. DEEN, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Fire-Alarms, of which the following is a specification, reference being had therein to the accompanying drawings.

This improvement relates to a fire-alarm designed to be cheaply constructed, sure in its action, and not likely to get out of order; and the invention consists in the peculiar arrangement, construction, and combination of parts hereinafter more particularly described, and then definitely pointed out in the claims.

In the accompanying drawings, Figure 1 shows an elevation of the alarm-box; Fig. 2, a side view of the bell-ringing mechanism detached; Fig. 3, a side view of the thermostat. Referring now to the details of the drawings by letter, A represents the case of the alarm, which is preferably provided with a framed glass door A'.

At B is a gong or bell ringer, consisting of a suitable frame C, in which is mounted a shaft D, having on its outer end two pulleys E E', one of which is considerably larger than the other. In practice I make them about one and a half and two and a quarter inches in diameter, respectively. On the same shaft is a spur-wheel F, such as is used in ordinary alarm-clock movements, which engages with pallets G, and thus operates the hammer H, causing it to strike the gong I. The pulley E is provided with a series of pins *e* projecting from its face, which operate lever J, pivoted at *j* to the case, and to this lever is connected a wire K, which runs to a bell L, located at some distance from the alarm-case. If, for instance, the alarm-case is set near the front of the house, the bell A may be at the rear, or if the alarm-case is at the rear the bell may be at the front, so that an alarm is given in two places at a considerable distance from each other, and one or the other is almost sure to be heard. The bell is preferably attached to a steel rod, to which the wire K is connected.

M represents a weight attached to a cord *m*, that is first wound on the large pulley and then on the small, the large pulley being provided with a slot *e'* to allow the cord to pass

from the small pulley to the groove of the large one, for reasons hereinafter given.

At N is shown a lever hinged to one side of the case at *n* and extending across the same, its free end resting on a trigger O, pivoted at *o*, and whose point *o'* projects through a hole in a board P, forming the side of a box or guide for the weight M. The trigger O and its point are so arranged that the weight M normally rests on the point, and is thus prevented from falling as long as the trigger retains its normal position, as shown in Fig. 1. At the bottom of the box is another similar trigger O', on which rests a lever N'. The pivot of this trigger should be rather tight, so that the friction will prevent the weight of the lever N' from operating it. This is unnecessary in the case of the pivot of the trigger O, as the weight M will hold the trigger and keep the lever N in a horizontal position.

R R represent weights set in the case, and the numbers thereon (painted with luminous paint) correspond to the floors with which they communicate by the cords or wires *q*, one for each floor. Detectors S are connected to the cords or wires, (one or more for each room,) consisting of a holder T and a wire U, the former being provided with a loop *t* and a conical thimble *t'* to receive the wire U. One end of the wire U is formed into a loop to receive the wire connected with the weight having a number corresponding to the number of the floor in which the detector under consideration is situated, and the wire running to another room is connected to the end of the holder, as shown at *q''*, Fig. 1. Around that portion of the wire inclosed in the thimble is firmly secured a button or knob *u* of fusible alloy of such composition as to soften at about 100° or 110° Fahrenheit, and about six inches above this is another knob of a higher melting-point—say about 140° or 150°.

In running the wires through the halls of a house to the different rooms it may sometimes be necessary to make turns to the right or left at right angles. To do this I usually, after connecting the wire *q* to a weight, pass it over pulleys 1 and 2 and connect it at 6 to a wire *q'*, which passes over pulleys 3, 4, and 5, and whose ends run to different rooms.

The operation is as follows: Suppose a stove

in a room becomes so hot as to exceed a safe limit, the lower knob of fusible alloy softens and the weight pulls the wire U through the thimble until the knob *u'* stops its further progress. The weight as it falls strikes upon the lever N, causing it to drop and move the trigger O, thus releasing the weight M and allowing it to fall and unwind the cord off of the small pulley which operates the gong I and bell L by means of the hammer H and lever J. The weight M is then caught by the trigger O' and is prevented from further action for the time. This I call the "danger-alarm," and if it has been heard the person hearing it looks through the glass door to discover, by seeing which weight has fallen, from which floor the alarm proceeded, and then takes such precautions as may be deemed necessary to prevent the breaking out of a fire. Should, however, no one hear the first alarm and the fire actually breaks out, the second knob of fusible alloy softens, allowing the weight to descend again and striking on the lever N' operates the trigger O' and allows the weight M to descend again, and as the cord attached to it is now acting on the large pulley the weight exerts great force and rings the gong and bell harder and quicker, so as to be sure to wake up the heaviest sleepers. Where there are city fire-alarm boxes convenient, the weight M or the lever N' may in descending operate a lever V, communicating with the alarm-box, and thus give notice at once to the fire department of the existence of a fire in the building.

In case the wires are arranged as shown by the numerals 1, 2, 3, 4, 5, 6, and 7, should the alloy on the thermostat at either of the ends of the wire *q'* be softened, the other end of the wire would form no impediment to the operation, as the wires would straighten out, as shown by dotted lines.

My apparatus will be found very useful and convenient and safe and will save much valuable property and still more valuable lives if adopted. It has the following advantages among others that may be named: First, it gives a "danger" alarm, thus preventing fires; second, alarms are given in two different places; third, two alarms are given at two different times; fourth, each of the two alarms are different, so as to indicate whether it is a "danger signal" or an actual fire.

I do not limit myself to the exact construction shown in the drawings, as it may be varied by skillful mechanics and yet be in the scope of my invention, one of the main features of which I believe to be the combination, with a fire-alarm, of a differential ringer or mechanism for giving the striking mechanism two distinctly different rates of speed, so that one accustomed to the sound will be able to distinguish the "danger" from the "fire" alarm. This being, to the best of my belief, the first apparatus ever made in which this feature is shown, I intend my claims to cover not only

the exact devices shown, but any equivalents therefor.

The point of each of the triggers may be in one piece with said trigger, or it may be pivoted thereon, as desired.

The detector, it is to be understood, forms parts of the lines of wire, which lines usually run along under the ceilings of the rooms on the different floors, each floor having a line running through the different rooms thereon, and as the weights on the end of the wire will keep the line taut but few fastenings will be necessary to keep the wire in position.

Although I deem it desirable, I do not consider it actually necessary, that there shall be a gong and bell, both operating simultaneously, as either may be dispensed with, if thought advisable.

I have given the temperature at which I consider it advisable that the stops or knobs of fusible alloy shall melt, but do not limit myself thereto, as they may be made to soften at higher or lower temperatures. In winter-time, for instance, the "danger" signal may be made to soften at 80°; but this would of course have to be changed in summer-time.

For convenience in making the claims I shall refer to the knobs of fusible alloys as "stops," because they act as stops to prevent the descent of the weight. I shall also refer to the device used for operating the hammer at two marked different rates of speed as a "differential ringer," meaning to claim thereby not only the device shown, but others intended to accomplish the same purpose of ringing the same bell with a marked difference of speed on different occasions.

While I prefer the particular form of detector I have shown, I do not limit myself to this, as part of my invention may be used with a different form of detector.

What I claim as new is—

1. The combination, with the wires, detectors, and ringing device of a fire-alarm apparatus, of pulleys E E', weight M, and cord *m* for operating said ringing device at different speeds, substantially as described.

2. The combination, with the wires and detectors of a fire-alarm apparatus, of a differential ringer having pulleys E, weight M, and cord *m* for operating said ringer at different speeds in succession, and two stops set in the path of said weight to hold the same at different heights, substantially as described.

3. In a fire-alarm apparatus, the combination, with a bell or gong ringing device operated by a weight, of a detector governing the motion of said weight, provided with two stops adapted and constructed to soften at different degrees of heat, and means, as the triggers O O', for holding said weight at different heights, substantially as described.

4. The combination, in a fire-alarm apparatus and with the ringing device thereof and a weight for operating the same, of a detector comprising a holder and a wire or rod held

in said holder and having stops of fusible alloy softening at different degrees of heat, and means, as the triggers O O', for holding said weight at different heights, substantially as described.

5 The combination, in a fire-alarm apparatus, of a detector, a weight suspended by a strained wire from the same, and two sets of levers N N', and triggers O O' for retaining said
10 levers, both of said triggers being constructed and arranged to be struck successively by said weight, substantially as described.

6 The combination, in a fire-alarm apparatus, of a detector, an alarm operated by a
15 weight, a trigger supporting said weight, a lever resting on the trigger, a second weight suspended from a strained wire from the detector and released thereby, and arranged to fall on the lever and thus release the weight
20 of the alarm, substantially as described.

7 The combination, in a fire-alarm apparatus, of a detector, an alarm operated by a weight, a trigger supporting said weight, a lever resting on said trigger, another trigger
25 and lever set at a lower plane, and a weight connected to the detector and released thereby, and arranged to operate the levers successively, substantially as described.

8 The combination, in a fire-alarm apparatus and with a suitable detector holding a weight in suspension, of two sets of levers and triggers arranged on different planes, and a ringing device operated by a weight
30 normally held out of operation by the upper trigger, substantially as described.

9 The combination, in a fire-alarm apparatus and with a suitable detector holding a weight in suspension, of two sets of levers and triggers arranged on different planes be-
40 neath the weight, and a ringing device nor-

mally held out of operation by said triggers and arranged to give different alarms in succession, substantially as described.

10 The combination, in a fire-alarm apparatus and with a suitable detector, of a ring- 45 ing device operated by a weight hung from a cord wound on pulleys of different diameters to give said ringing device two different speeds, and intermediate connections between the detector and the ringing device, 50 substantially as described.

11 The combination, in a fire-alarm apparatus and with a fusible detector and a weight suspended by a wire from said detector, of two sets of levers and triggers on 55 different horizontal planes to be operated by said weight, and a connection with a fire-alarm box operated through the descent of the weight, substantially as described.

12 The combination, in a fire-alarm apparatus, of a case A, a gong I, a lever J, a bell connected with the lever, and a ringer B, having a series of pins in one of the wheels for operating the lever J continuously until the
60 ringer runs down, substantially as described. 65

13 The combination, in a fire-alarm apparatus and with a weight suspended from a wire, of a detector connected to said wire and consisting of a holder provided with a conical thimble, and a wire running through 70 the same having a stop inclosed in said thimble, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 19th day of April, 1890.

JOHN B. DEEN.

Witnesses:

JAMES T. A. BAKER,
A. Y. SMITH.