

(No Model.)

2 Sheets—Sheet 1.

E. R. WILDER.
FIRE ALARM BOX.

No. 462,786.

Patented Nov. 10, 1891.

Fig. 1.

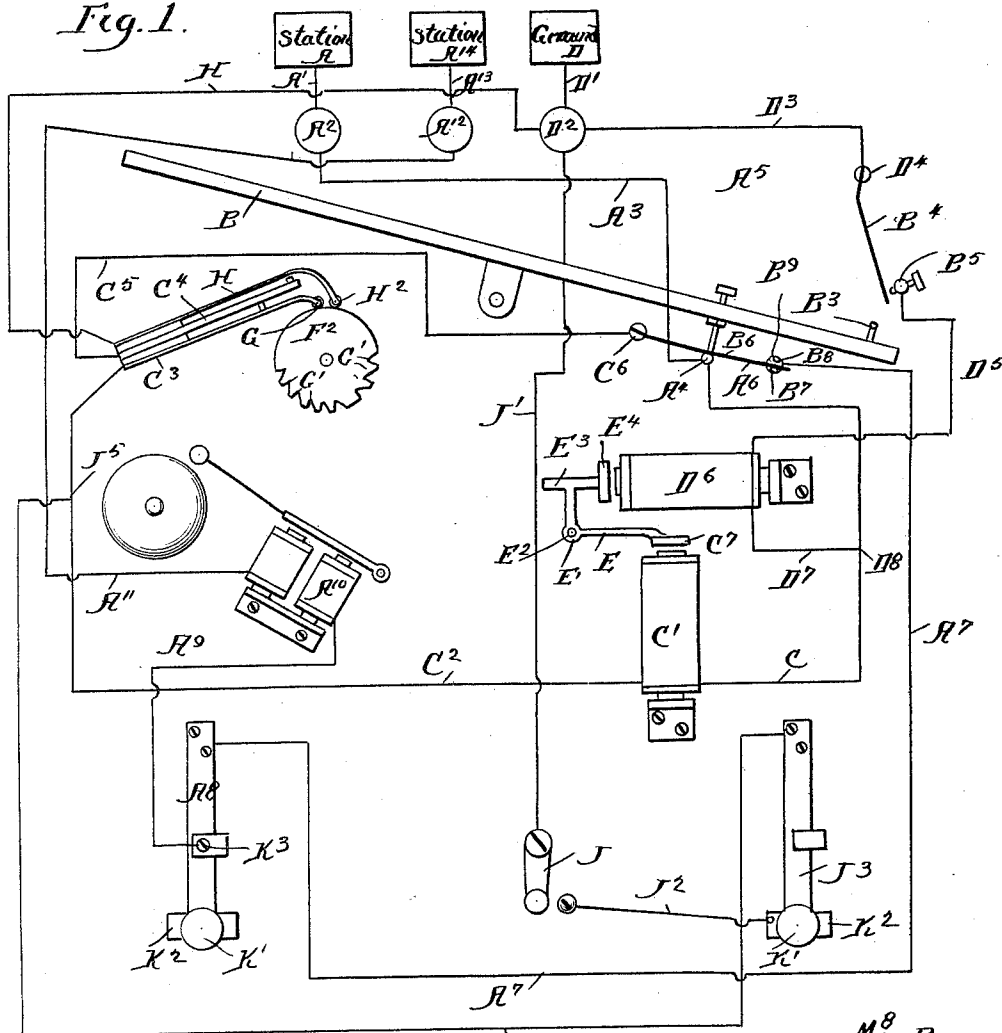


Fig. 4.

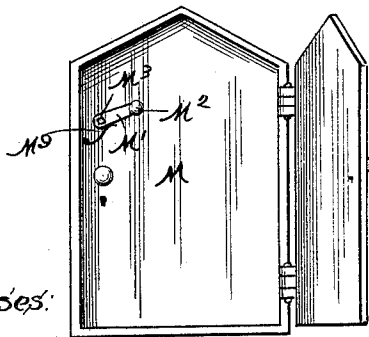


Fig. 5.

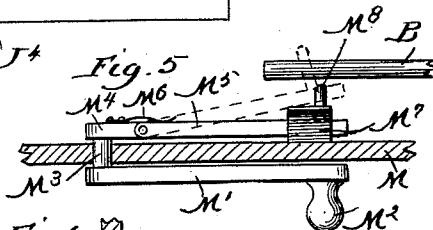
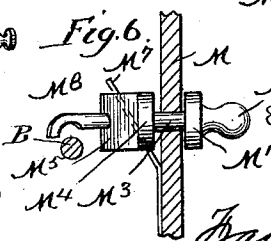


Fig. 6.



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Francis W. Parker,
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Witnesses:

Charles J. Chapman
Jean Elliott

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

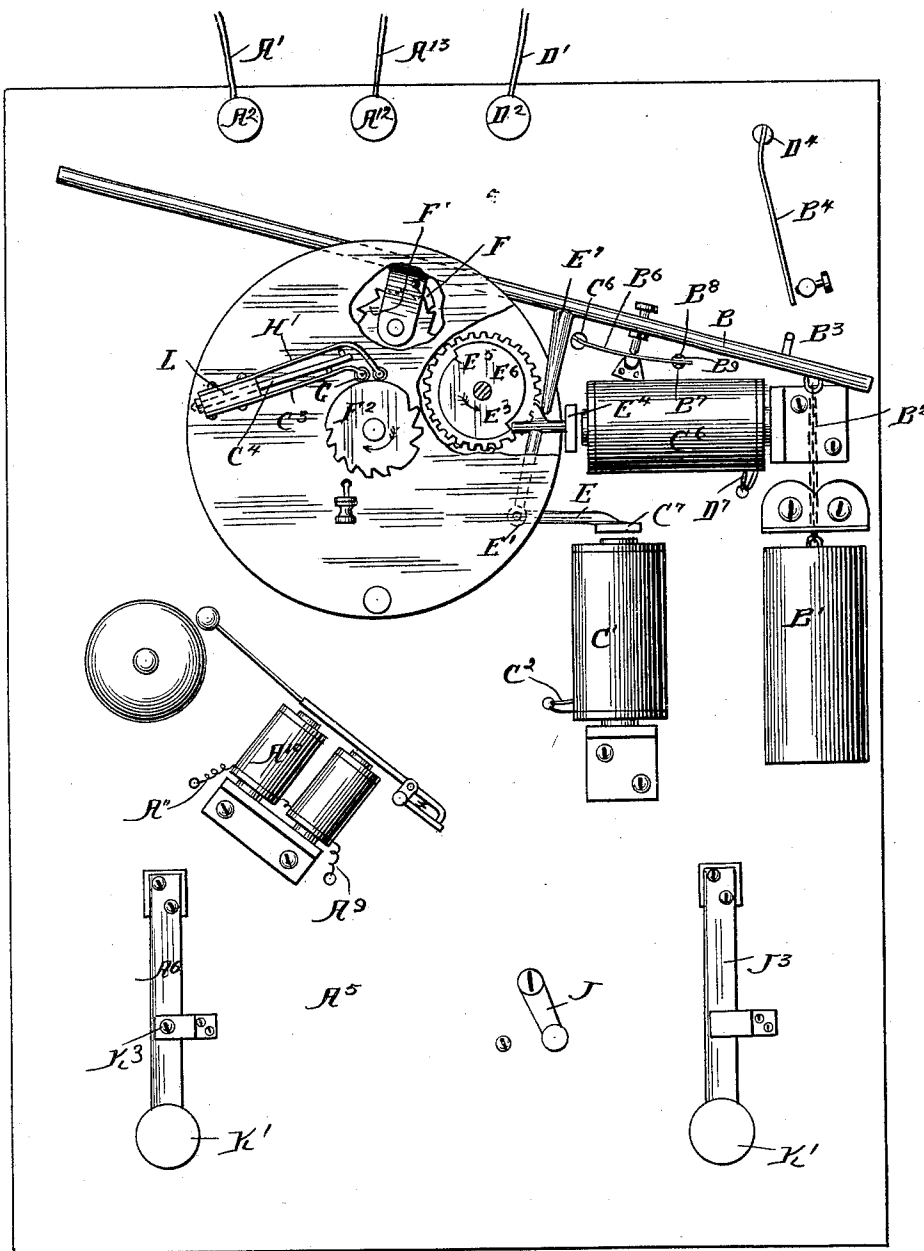


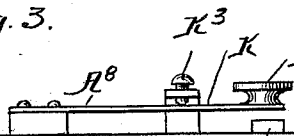
Fig. 3.

Inventor

Witnesses:

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Jean Elliott



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UNITED STATES PATENT OFFICE.

EDMUND R. WILDER, OF KANSAS CITY, MISSOURI, ASSIGNOR TO THE WILDER
DUPLEX ELECTRIC BURGLAR ALARM AND MESSENGER COMPANY, OF
WEST VIRGINIA.

FIRE-ALARM BOX.

SPECIFICATION forming part of Letters Patent No. 462,786, dated November 10, 1891.

Application filed January 2, 1891. Serial No. 376,545. (No model.)

To all whom it may concern:

Be it known that I, EDMUND R. WILDER, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a certain new and useful Improvement in Fire-Alarm Boxes, of which the following is a full, clear, and exact specification.

My invention relates to fire-alarm boxes, and has for its object to provide a cheap and simple box which shall be non-interfering, so that when one call is given from one box it cannot be interfered with by a call from another box until its call is finished, whereupon the other box will give its call in due order, and other features of construction and operation hereinafter more specifically referred to.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a diagrammatic view showing the circuits. Fig. 2 is a plan view of the interior mechanism with the box-case removed. Fig. 3 is a detail of the double contact-key; and Figs. 4, 5, and 6 are details of the mechanism for pulling the box.

Like parts are indicated by the same letter in each of the figures.

Referring to Fig. 1, A is the station from which leads the conductor A' to the binding-post A² of the fire-alarm box. From this leads the conductor A³ to the projecting contact-post A⁴ on the insulation-base A⁵ of the box. Normally in contact with this post A⁴ is the spring-arm A⁶, along which the circuit may be traced to the conductor A⁷, thence to the key A⁸, thence by conductor A⁹ to the magnet A¹⁰, thence by conductor A¹¹ to the binding-post A¹², and by conductor A¹³ to the station at A¹⁴. Thus a complete metallic circuit from the station to the box is established through the key A⁸ and including the magnets A¹⁰. Over this circuit a continuous current passes. If now the operator at the box desires to signal the station, he does so by operating the key A⁸, and thus making and breaking this metallic circuit, so as to operate a suitable signaling mechanism in the central station. The return signal from the central station is given of course in the same manner by operating a key to make and break the circuit at the central station and sound-

ing the code-call on the bell or other signaling device connected with the magnet A¹⁰.

B is a pivoted lever adapted to be operated by a hook at one end and downwardly drawn at the other end by means of the weight B' on the chain B². When the box is to be operated, the lever B is pulled down in opposition to the weight until it reaches its highest position, whereupon the laterally-projecting pin B³ engages the spring B⁴ and forces the same over against the contact-post B⁵. By this action the spring B⁶ is freed from contact with the post A⁴, and by passing from the pin B⁷, on the post B⁸, over to the pin B⁹, its contact with such post B⁸ is momentarily broken. This operation changes the circuit last above traced so as to include another magnet and the signal-pen, and we will now trace the circuit as thus changed. Beginning at station A, we trace conductor A' to post A², conductor A³ to post A⁴, thence on conductor C to magnet C', along conductor C² to the pen C³, thence to the central contact-strip C⁴, thence on the conductor C⁵ to the post C⁶, to which the spring B⁶ is secured; thence on the spring B⁶ to the pin B⁹ on the post B⁸, thence along the conductor A⁷ to the key A⁸, then conductor A⁹ to magnet A¹⁰, thence on conductor A¹¹ to binding-post A¹², conductor A¹³, and back to the station at A¹⁴. Thus by the movement of pulling down the lever B against the action of its weight we have changed the metallic circuit going from the station within the box, so as to make it include the magnet C', the key A⁸, the magnet A¹⁰, and the pen C³, and this metallic circuit is traversed by a current. This current, however, is not of sufficient strength to pull down the armature C' of magnet C'.

The passage of the spring A⁶ from pin B⁷ to pin B⁹ of the post B⁸ momentarily breaks the metallic circuit leading from the box to the station and gives the signal at the central station, showing that a box has been pulled. As previously stated, the raising of the left end of the lever B in this manner forces the spring B⁴ against the contact B⁵ and forms a ground-circuit from the box to the station, the metallic portions of which ground-circuit may be either of the conductors A' or A¹³. This will now be traced. Beginning with the ground D at the box, a conductor D' leads to the binding-post D², thence leads the conductor

D³ to the post D⁴, thence passes the spring B⁴ to the contact B⁵, whence leads the conductor D⁵ to the magnet D⁶, whence leads the conductor D⁷ to the metallic circuit at the point D⁸. From this point the metallic portion of the ground-circuit may be continued from the box to the station over the conductor C, through post A⁴, conductor A³, binding-post A², conductor A¹, back to the station A, and thence to the ground at the station, or from the point D⁸ through the conductor C, through magnet C⁷, conductor C², pen C³, central contact-strip C⁴, conductor C⁵, post C⁶, spring B⁶, pin B³, post B⁹, conductor A⁷, key A⁸, conductor A⁹, magnet A¹⁰, conductor A¹¹, binding-post A¹², conductor A¹³, and back to the station at A¹⁴, and thence to the ground on the station. This circuit subsists in this manner only momentarily, for when the lever D is released its weight immediately proceeds to tilt it in the opposite direction or to pull it down at the right-hand side, thus disconnecting the pin B³ from the spring B⁴ and freeing the spring B⁴ from the post B⁵. The magnets C⁷ and D⁶ are releasing-magnets, and either or both constitute a releasing mechanism. One is in the metallic circuit, the other in the ground-circuit, and when by the breaking of the metallic circuit at the post B⁹, as hereinbefore stated, a signal is given at the central station to the effect that a box has been pulled, it is the duty of the operator at the central station to immediately throw into either the metallic circuit of the ground-circuit a sufficient battery to operate one or both of the releasing-magnets, and thus free or start the mechanism of the alarm-box. This battery may be switched into or out of these circuits in any convenient manner, but is designed only to be in circuit momentarily, as its work is finished when either of the magnets C⁷ or D⁶ has drawn down its armature and released the movement. This locking and releasing device for the driving mechanism of the alarm-box consists of the following: The armature C⁷ in front of the magnet C⁷, secured to the arm E of the elbow crank-lever E⁷, which is pivoted at E², and the opposite arm, which is secured to the bar E³, which carries the armature E⁴ of the magnet D⁶. The other end of this bar E³ is adapted to engage the shoulder E⁵ on the cam-wheel E⁶, which is secured to and rotates with the driving mechanism of the box. Normally this locking mechanism is securely held in position by means of the arm E⁷, which projects downwardly from the lever B, and when the lever B is tilted in its opposite position, as last above referred to, the arm E⁷ frees the locking mechanism and permits the same to be withdrawn by the operation of either the magnet C⁷ or D⁶, so as to permit the rotating wheel E⁶ and its associated mechanism to travel.

We have now traced the structure and operation of the box to a point where the driv-

ing mechanism has been released, the lever B has been tilted into the opposite position from that shown and the weight B⁷ is beginning to lower the lever B. On the lever B is a pivoted dog F, which engages the ratchet-wheel F⁷, which is geared to the mechanism of the box, so as to cause when rotated the signaling-disk F² to rotate in the direction indicated by the arrow. From this it is evident that as the weight descends the mechanism of the box is driven so as to rotate the disk F², as indicated by the arrow, until the pin or bar E³ engages the opposite shoulder E⁵ of the cam-wheel E⁶, and thus locks the box from further movement. This result, however, is only reached when the weight has reached its lowest normal position and when the disk has completed the desired number of revolutions so as to give the call, and at this moment the spring B⁶ again engages the post A⁴, cutting out all of the magnets except the signaling-magnet A¹⁰ and key A⁸. During all this operation, until the limit of motion has been reached, the metallic circuit from the station through the box has been closed through the pen C³, and therefore as the roller G on the end of this pen descends into the notches G⁷ G⁸ this circuit is broken, so as to give the desired signal at the central station over the metallic circuit.

Should one branch of the metallic circuit from the box to the station be broken or disconnected, we are still desirous of giving the signal, and this is accomplished over the ground-circuit as follows: from the ground at the station to the ground D at the box, thence along the conductor D⁷ to the binding-post D², thence along the conductor H to the pen H⁷, which is provided with the roller H², and is normally free from contact with the contact-strip C⁴, but engages the same when its roller H² drops into any one of the slots G⁷ on the disk F², whereupon the circuit is completed through such strip C⁴ along conductor C⁵ to post C⁶, along the spring-strip B⁶ to the pin B³ on the post B⁷, thence by conductor A⁷ to key A⁸, along conductor A⁹, through magnet A¹⁰ on conductor A¹¹ to binding-post A¹², by conductor A¹³ back to the office, and thence to the ground at the central office.

Should the conductor A¹³ be broken or disconnected, then the circuit is as follows: from ground D to the contact-strip C⁴ of the pen, as in the circuit last described, thence to the pen C³ and on conductor C², through magnet C⁷ on conductor C to post A⁴, along conductor A³ to binding-post A², along conductor A¹, back to the station at A, and thence to the ground at the station. Thus the signal is given in by the operation of the box over a ground-circuit the metallic branch of which may be either conductor A¹ or A¹³.

When the box is in normal position and not giving the signal, and if the metallic circuit is broken and the operator at the box desires to communicate with the central station by a code of signals, he throws in the

switch J, so as to close the following circuit: Through the ground-post D² to conductor J', to switch J, thence on conductor J² to key J³, thence on conductor J⁴ to the metallic circuit at the point J⁵, so that a circuit can thus be made including the ground and either of the metallic conductors A' and A³, which connect the box and station. By operating the key J³ the operator at the box can communicate by a code of signals with the central station, notwithstanding the breaking down of the line.

The keys A⁸ and J³ are similar, and the key A⁸ is illustrated in Fig. 3, where it consists of the spring K with the thumb-piece K', the contact K², and the opposed contact K³.

The circuits are formed principally on the back of the insulating base-plate A⁵.

L is a body of insulation separating and supporting the pens C³ and H' and the central contact-strip C⁴.

M is the door of the box through which projects the crank-lever M', having the knob M², and supported on the pivot M³, to the other end of which is secured the short piece M⁴, to which is hinged the bar M⁵ with a spring M⁶, which tends to force the bar M⁵ toward the lever M' or toward the inside of the door. The door lies between the pieces M⁴ and M'.

M⁷ is a spring-cam inwardly turned at its upper end and secured upon the door.

M⁸ is a hook projecting from the piece M⁵ and adapted to engage the lever B.

M⁹ is a heavy spring tending to keep the hook and its associated parts in their highest position.

When the person at the box desires to use the same, he pulls down upon the knob M² against the spring M⁹, and since the hinged portion M⁵ is inwardly thrown by reason of its engagement with the upper inwardly-turned end of the spring-cam bar M⁷, the hook M⁸ will overreach and engage the lever B, which is carried downwardly at its left end. As soon as the knob M² is released, the parts are immediately retracted to their normal position, except that the bar B remains down, rising gradually as the signal is given by the box. If now the operator at the box in his excitement prematurely pulls the knob again, he will not interfere with the operation of the box, because the hook M⁸ in its descent will not engage the lever B until the lever B has reached its highest position, and this is only after the entire signal has been given.

In practice the hooked pull is not curved so much as shown in the drawings.

I claim as new and desire to secure by Letters Patent—

1. In a fire-alarm box, the combination of a circuit connecting the box with the central station, a signaling device in such circuit, a driving mechanism for the same, a locking device for such driving mechanism, a portion of which device is in said circuit, a generator connected and normally supplying a constant current of a given quantity to such circuit, means for adding to such current in the same circuit, said releasing mechanism adapted to respond to such changes in the strength of the current thus applied to such circuit, said locking device containing an electro-magnet, an armature, and a wheel with a notch, a stop for the driving mechanism controlled by such electro-magnet, and a mechanical stop adapted to be moved by the operator when the box is set in motion.

2. In a fire-alarm box, the combination of an exterior pull with an interior operating-lever, an electric circuit connecting the box with the station, a signaling device in such circuit, a driving mechanism for such device, a driving connection between the lever and such driving mechanism, a weight upon such lever, whereby the driving mechanism is operated to give the signal, a hook connected with the pull and adapted to engage the lever when the same is at its highest position only, whereby the pull when operated raises the weight and permits the same to descend until such weight is returned to its normal position.

3. In a fire-alarm box, the combination of an operating-lever with an electric circuit connecting the box with the station, a signaling device in such circuit, a driving mechanism for such device, a driving connection between the lever and such driving mechanism, a weight upon such lever, whereby the driving mechanism is operated to give the signal, and a locking device adapted normally to lock the driving mechanism and keep the same from motion, said locking device provided with an arm projecting from the lever, which normally stops the driving mechanism, and an electro-magnet, which when the lever is raised frees the locking mechanism.

Signed this 12th day of December, 1890.

EDMUND R. WILDER.

In presence of—

CELESTE P. CHAPMAN,
FRANCIS M. IRELAND.