

T. A. WATSON.
Telephonic Fire-Alarm.

No. 227,141.

Patented May 4, 1880.

Fig. 1.

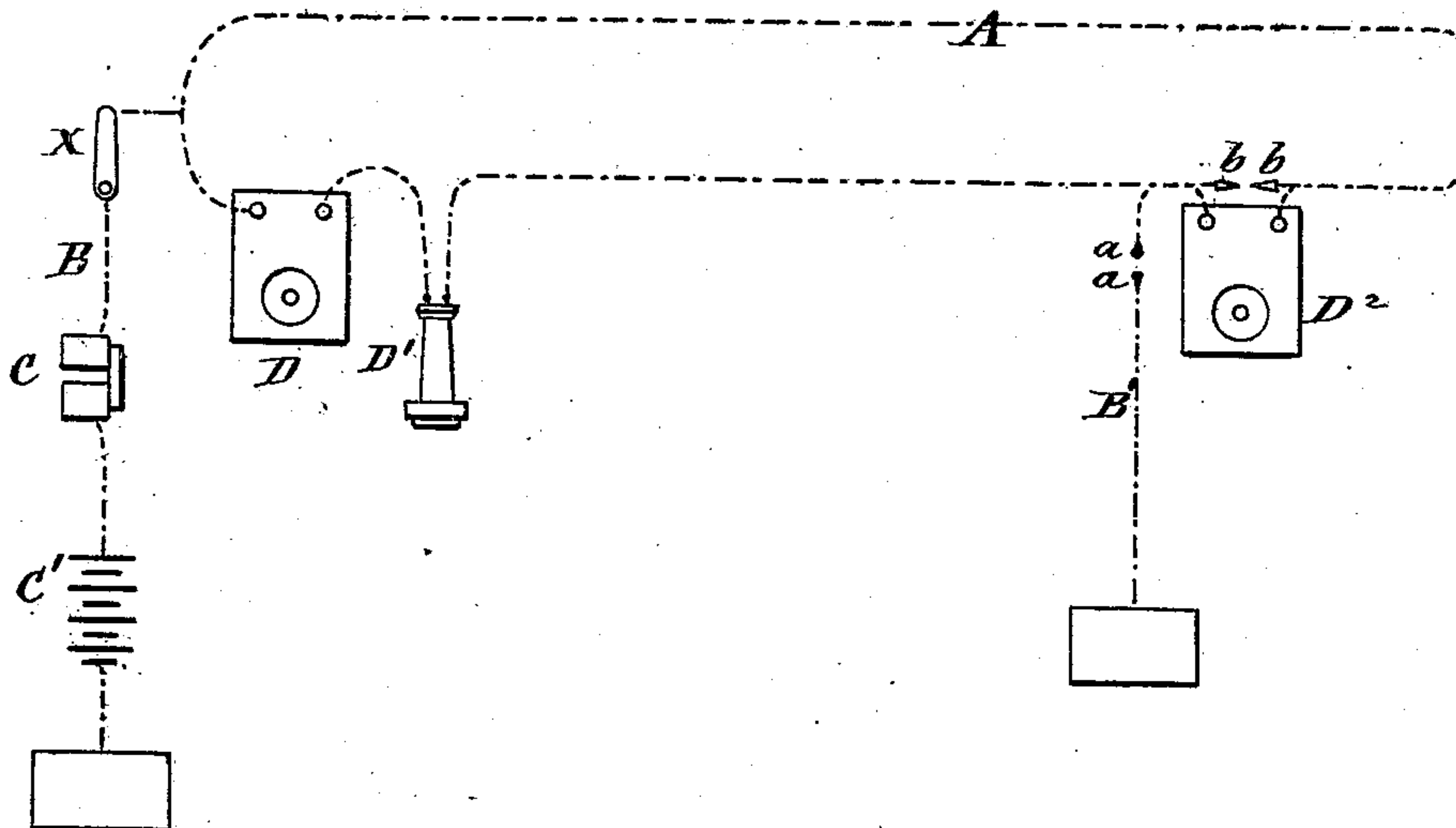
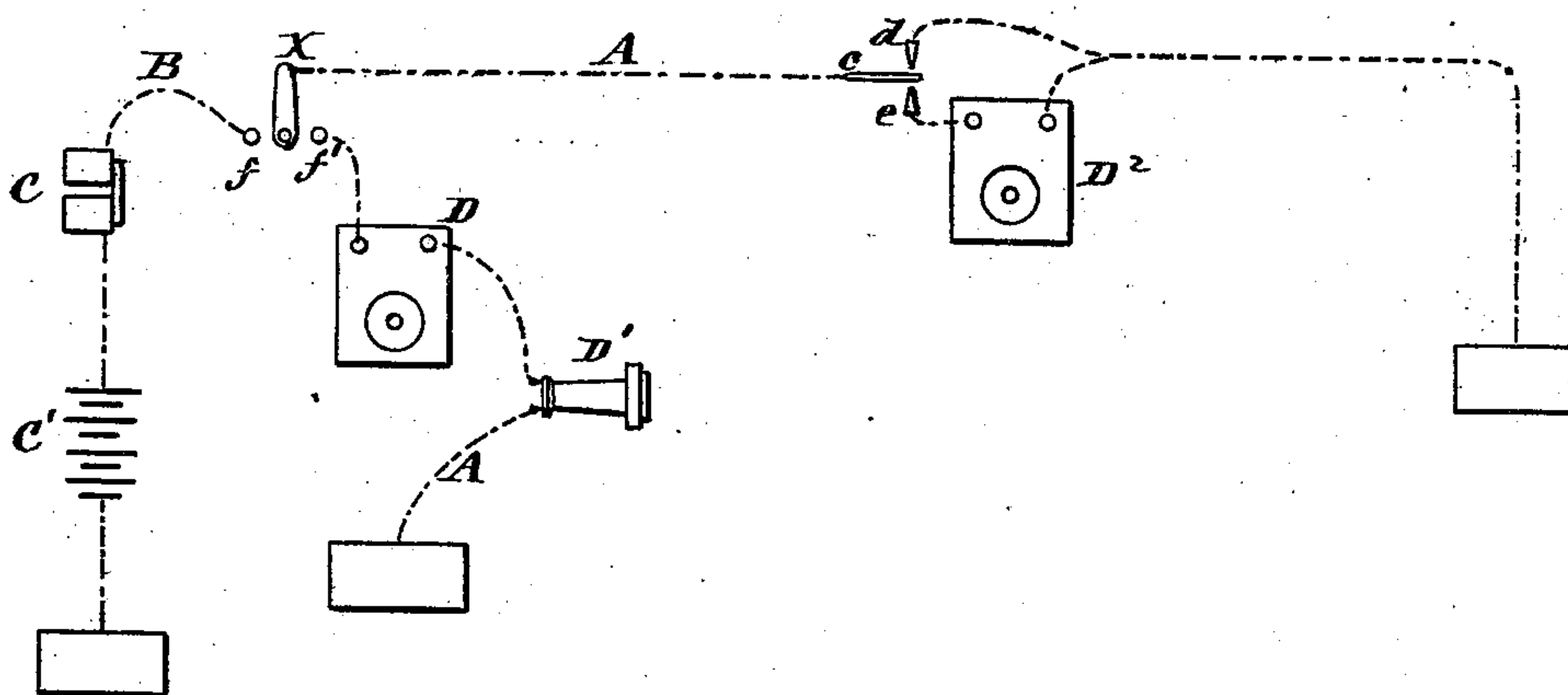


Fig. 2.



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E. A. Dick

Inventor:

Thomas A. Watson
by A. Pollok
his attorney

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Fig. 3. Patented May 4, 1880.

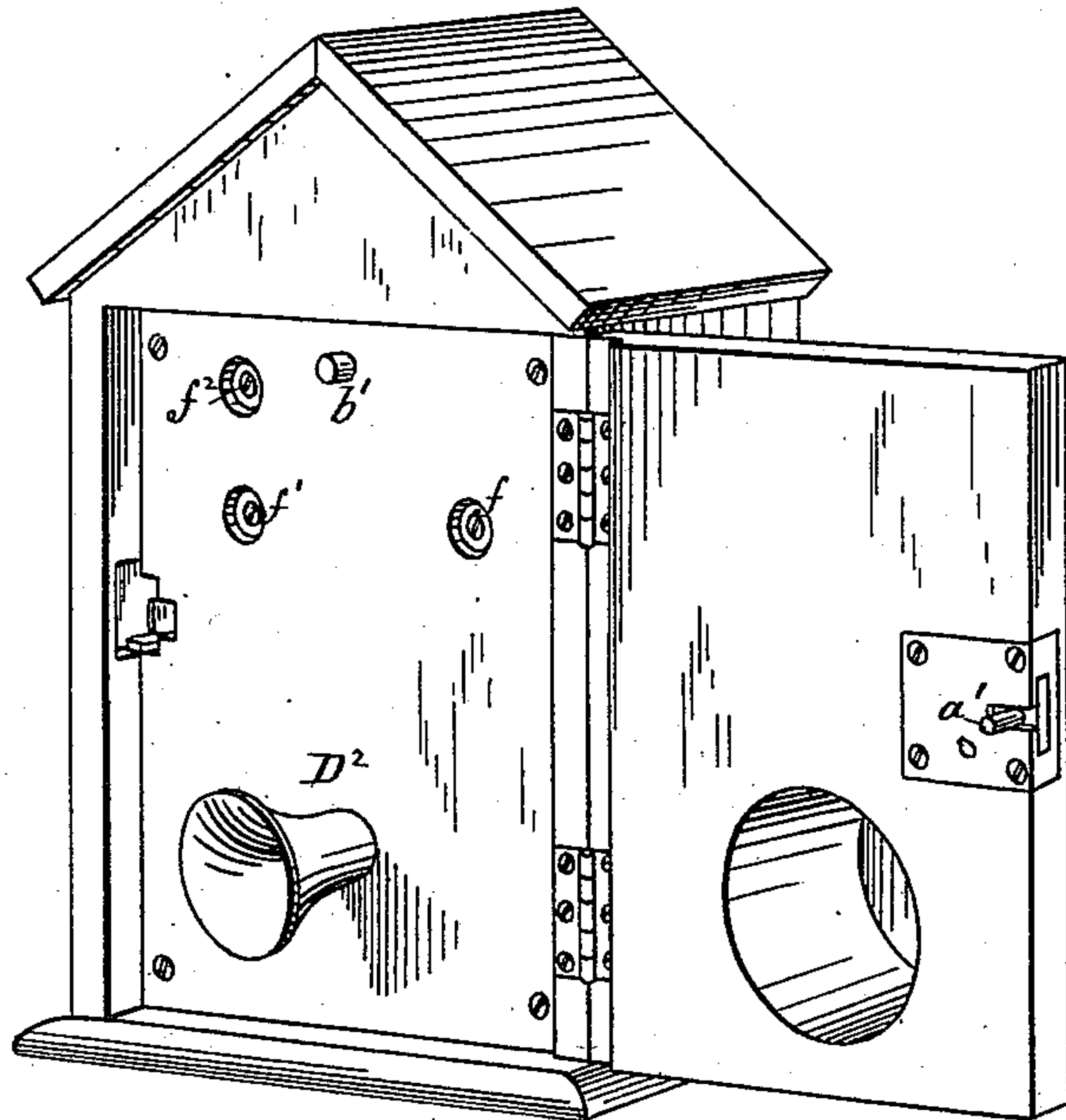
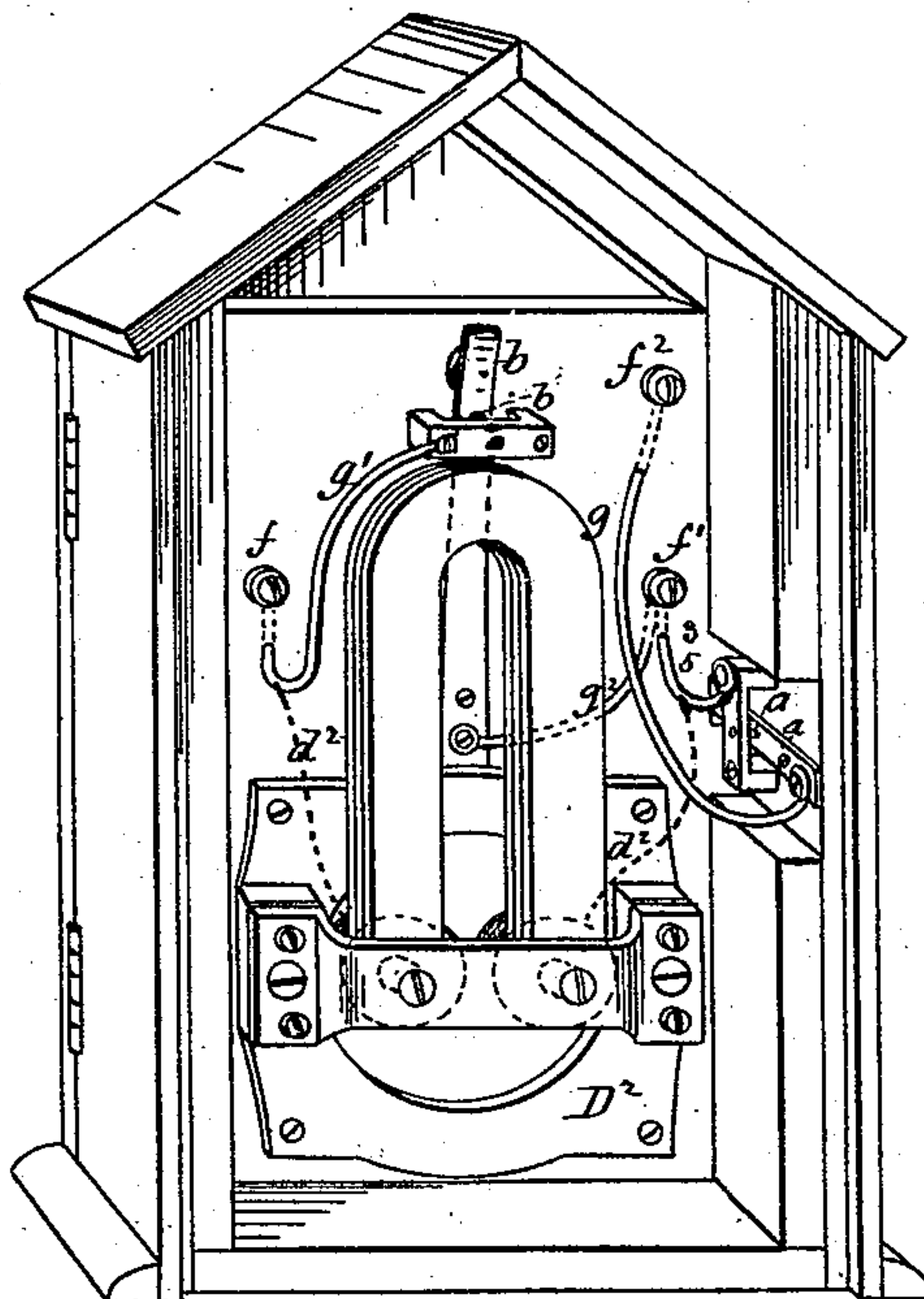


Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS A. WATSON, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO NATIONAL BELL TELEPHONE COMPANY.

TELEPHONIC FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 227,141, dated May 4, 1880.

Application filed June 2, 1879.

To all whom it may concern:

Be it known that I, THOMAS A. WATSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Telephonic Fire-Alarms, which improvement is fully set forth in the following specification.

This invention relates more particularly to a fire-alarm provided with telephonic communication between the various stations and a central station; but it may also be applied to other and similar uses.

The invention consists in the system of telephonic alarms or combined alarms and telephones, and also in the disposition and combination of the electric circuits and apparatus employed.

On a circuit is arranged a series of signal or alarm and telephone boxes, which are so connected with a central office that from any one of said boxes an alarm may be sounded at the office and telephonic communication had therewith. The alarm is operated by means of a battery located at the central office in a branch circuit, which may be connected or disconnected at pleasure by a switch, which may be automatic in its character. The boxes, provided with locked doors, are so arranged that the alarm is sounded in the act of unlocking or opening the door, when access is had to the telephone therein.

In some cases it may be desirable to employ magneto-electric generators or other means for sounding a call in the boxes, so that the battery may be dispensed with.

The following description will enable those skilled in the art to which it appertains to make and use my invention, reference being had to the accompanying drawings, which represent plan views of a fire-alarm provided with telephonic communication between one station and a central office.

In Figure 1 the telephones are shown arranged upon a metallic circuit, the alarm being operated by making a ground-connection, the telephone-circuit forming a part of the grounded circuit, and in Fig. 2 the telephone-circuit is itself grounded, the alarm being sounded by opening the circuit for a short

time. In both cases the telephone is preferably shunted when not in use. Figs. 3 and 4 represent, respectively, front and rear views of a signal-box made in accordance with this invention. In Fig. 4 the back of the box is removed.

The same letters always refer to like parts where they occur.

A is the telephone-circuit, which connects the various stations or boxes with each other and with the central office. At the latter is a branch wire, B, which leads through the alarm or relay C and battery C' to the ground. This branch wire may be connected or disconnected with the circuit through the boxes by a switch, X. D D' D² are telephones connected in the circuit. B', Fig. 1, is a ground wire or conductor at the signal-station.

Confining the description for the present to Fig. 1, which shows what is ordinarily the preferred construction, the signal-box, which has a box-telephone, D², in it, is so arranged that when the door is closed the circuit through the branch wire B' and ground is open and the telephone shunted or short-circuited by contact of the points *b b*. The act of unlocking the door brings together the two points *a a* and opens the points *b b*, thereby connecting the circuit to the ground through the wire B' and removing the shunt from the telephone. The circuit of the battery C' is thus completed, and it works the relay C, which rings a loud vibrating bell on a local circuit.

The operation is as follows: The person who has the key unlocks the signal-box, thereby closing the branch wire B' to the ground and ringing the bell at the central office. The operator there throws open the switch X, which stops the bell from ringing, and listens at the telephones D D'. The man at the signal-box has by this time got the door open, and, speaking into the mouth-piece of the telephone D², tells the location of the fire. The operator then transmits the alarm over another circuit to the engine-houses and other necessary points; or, instead of using separate circuits, the engine-houses may be included in the same circuit with the fire-alarm stations.

In the construction or modified system shown

in Fig. 2 the general operation is substantially the same. The circuit is ordinarily closed by the switch X in contact with the button f through the branch B and the battery, the telephone being shunted. In unlocking the signal-box the line is opened for an instant while the bolt is moving or the door opening, thereby producing an alarm at the central office, and it is then closed through the telephone, which is thus switched in circuit. To accomplish this a contact portion or tongue, c , in the signal-box may be made to rest on the point d when the box is closed or locked, and on the point e when open. In passing from d to e the line is opened long enough to operate the relay B or an alarm, as a bell, but preferably an annunciator-drop or indicator. The operator at the central station then turns the switch on the button f' so as to put the telephones D D' in circuit, and listens thereat.

In both constructions, in Figs. 1 and 2, the switch X may be made automatic, or to be operated by the act of lifting the hand-telephone D' from its support.

Although I have shown only one signal-box, their number may be increased as desired, means for grounding or interrupting the battery-current being used at each station. Where there are a number of these circuits running into the central office one set of telephones may be used for all of them by having an ordinary spring-jack in each circuit and having the telephones connected to a wedge which can be inserted in any one of the jacks, or any of the ordinary electric switches can be used for the same purpose.

The signal-box shown in Figs. 3 and 4 is intended more particularly to be used in the circuit illustrated in Fig. 1. The telephone-coils are connected by the wires d^2 with the posts $f f'$, with which the ends of the metallic circuit A are connected. Connection with the grounded wire B' is made by the post f^2 . These circuit and grounded wires are passed through holes in the back of the box. The points $a a$ are furnished by a stationary piece or conductor connected by a wire, g^3 , with the post f' and a metallic spring, the elasticity of which causes it to press against the said stationary piece, connected by a wire, g , with the post f^2 . The spring is held out of contact when the door is locked by the pin a attached to the bolt of the lock. The points $b b$ are furnished by a stationary piece or conductor connected by a wire, g' , with the post f , and an elastic spring connected with the post f' by a wire, g^2 . The elasticity of the spring tends to keep it out of contact with the stationary piece. Contact is made by pressing upon the pin b' , Fig. 3, attached thereto. The height of this pin is such that the door of the signal-box, in closing, pushes it in and brings the points $b b$ into contact.

It will be readily seen that when the door is closed and locked the circuit A is completed from the post f' , through the wire g^2 ,

contact-points $b b$, and wire g' , to the post f , and that the telephone is shunted and the connection with the grounded wire B' broken.

When the bolt of the lock is thrown back the points $a a$ are brought into contact, and the battery-circuit is complete through the grounded wire B', and the signal given.

When the door is opened the telephone-coils are placed in circuit, the shunt through the points $b b$ being opened.

The signal-box described may be readily modified for use in the system shown in Fig. 2. For example, dispensing with one of the springs, the other corresponding with the piece c Fig. 2, may be made to pass from one point, corresponding with d when the door is closed or locked, to another, corresponding with e when the door is opened or unlocked, being released by the pin b' or a' , Fig. 3. Two binding-posts only would then be necessary, with which the ends of the line-wire are connected, one of said posts being connected by a wire with the spring corresponding to c , Fig. 1, and the other with the point d directly and with the point e through the telephone-coils.

Various mechanism may, however, be used instead of that described. One end of the line-wire being in electrical connection with the bolt of the lock, when this is thrown back into the position for unlocking it may be made to effect the changes of contact required. One end being in contact with a point corresponding to b , Fig. 1, or d , Fig. 2, when it is thrown back the other end may be made to come into contact with a point corresponding to a , Fig. 1, or e , Fig. 2.

In locking the box the operations will be reversed and the circuit restored to its first condition.

By suitable connections the circuit may be changed by the insertion of the key or by the turning of the same in the lock.

A skillful electrician and mechanic could devise other modes of effecting the closing of the circuit or opening the shunt at the proper time.

Instead of closing the battery-circuit in unlocking the box, as illustrated in Figs. 3 and 4, connection might be made by opening the door.

When the engine-houses are maintained in the same circuit, or when it is desired to have an alarm at different places, I place the alarms in the telephone-circuit and provide the different places having alarms with switches, so that the alarms may be cut out of the circuit when the telephones are used.

By placing the alarm or relay at the central office in a side circuit, and providing switches, so that it may be placed in the battery-circuit or thrown out, while keeping a closed circuit, through the branch wire B and telephones D D', the battery might be used, so that carbon or other telephones requiring the use of a battery may be used. The telephone-circuit would

then be the same as the battery-circuit in both Figs. 1 and 2.

As I have before stated, in some cases it may be deemed desirable to use magneto-electric generators or other means for sounding a call in the signal-boxes, and thus dispense with a battery altogether. They could be used with either grounded or metallic circuits, and be operated by hand or by opening the door. Opening or unlocking the door may be made also to switch the generator in circuit and break the short circuit through the box. This is accomplished with the signal-box shown in Figs. 3 and 4 by dispensing with the post f^2 and connecting the magneto-electric generator with the wire g on one side, and on the other with the post f by a suitable wire, and the introduction of a switch to be operated by the person giving the alarm, the other connections and points remaining the same as before described.

The operation is essentially the same, except that the unlocking of the box puts the magneto-electric generator in circuit, and this is to be cut out and the telephone put in circuit by the switch after the signal has been given.

The operation of the generator could, however, be effected in opening the door through the medium of gearing or other connection, and the generator could be automatically cut out and the telephone put in circuit, when the door is opened fully or to a certain definite extent, by a suitable pin or lever attached to the door and operating upon a spring or other contact-piece or switch.

It is evident that a part of the benefits of my invention may be obtained by using a part thereof. For example, the closed metallic telephone-circuit, with a grounded connection for operating an alarm, might be used without inclosing or boxing the telephones.

It is obvious, also, that various modifications other than those above indicated may be made in the details of the apparatus and connections without departing from the spirit of this invention.

Instead of keeping the telephonic circuit always substantially the same, a grounded circuit through the telephone might be formed at the time of unlocking or opening the doors of the signal-box to give the alarm at that particular station, the operator at the central station switching the alarm, and also, if desired, the battery, out of circuit, as before explained; but the method shown in Figs. 1 and 2, and before described with reference thereto, is much preferred as being more efficient and useful.

The signal-box itself, which may be otherwise of the ordinary or any suitable construction, contains the telephone, and is provided with binding-screws or other devices for making the necessary connections and means for shunting and putting said telephone in circuit.

When a battery is used for operating the

alarm it is also provided with means for closing a ground-connection, or opening for a time the line-circuit, by unlocking or opening the door of the box.

When a magneto-electric generator is used the box is provided with means for shunting or putting the same in circuit.

Having thus described my said invention and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is as follows:

1. A system of telephone-alarms consisting of a telephone-circuit with a central office and one or more signal-boxes located on said circuit, in combination with means for sounding an alarm at said central office in the act of unlocking or opening the doors of said boxes to get access to the telephones located therein, substantially as described.

2. A system of telephone-alarms consisting of a telephone-circuit with a central office and one or more signal-boxes located on said circuit, in combination with means for sounding an alarm at said office and putting the telephones in circuit in the act of unlocking or opening the doors of said boxes, the telephones at the signal-stations being shunted when the boxes are closed, substantially as described.

3. A telephonic fire-alarm box composed of a closed box with a door and lock, a telephone located therein, connections for attaching wires to complete an electric circuit through said box, and means for shunting and placing in circuit the telephone, and for altering the electrical condition of the circuit passing through said box to give an alarm in the act of unlocking or opening the door of said box, substantially as described.

4. In a telephonic alarm, the telephones inclosed in lock-boxes provided with connections for completing an electric circuit there-through, and also with means for altering the electrical condition of said circuit to operate an alarm by unlocking or opening said boxes, substantially as described.

5. A system of telephonic alarms in which the telephones are placed in a closed metallic circuit and the alarm is operated by current traversing a ground-circuit, of which said telephone-circuit forms a part, substantially as described.

6. The combination, with a closed metallic circuit and telephones placed in said circuit, of a branch circuit in which a battery is placed, connected with the metallic telephone-circuit and with the ground, and means for completing the battery or ground circuit at one or more stations on the metallic telephone-circuit, and for shunting the resistance of the telephones when not in use, substantially as described.

7. The combination, with a series of closed signal-boxes and telephones located therein, a circuit passing through the said boxes and connecting the same with a central office, a branch wire or circuit at the central station, a

battery placed in said branch wire, an alarm,
and a switch for establishing or breaking the
connection of said branch wire with the tele-
phone-circuit, of devices for closing or open-
5 ing at any one of said boxes the circuit through
the said battery, branch wire, switch, and tele-
phone-circuit to operate the aforesaid alarm,
substantially as described, the said signal-
boxes being with or without means for shunt-

ing the telephones when not in use, as set
forth.

In testimony whereof I have signed this
specification in the presence of two subscrib-
ing witnesses.

THOMAS A. WATSON.

Witnesses:

J. B. ANTHONY,
B. D. CHASE.