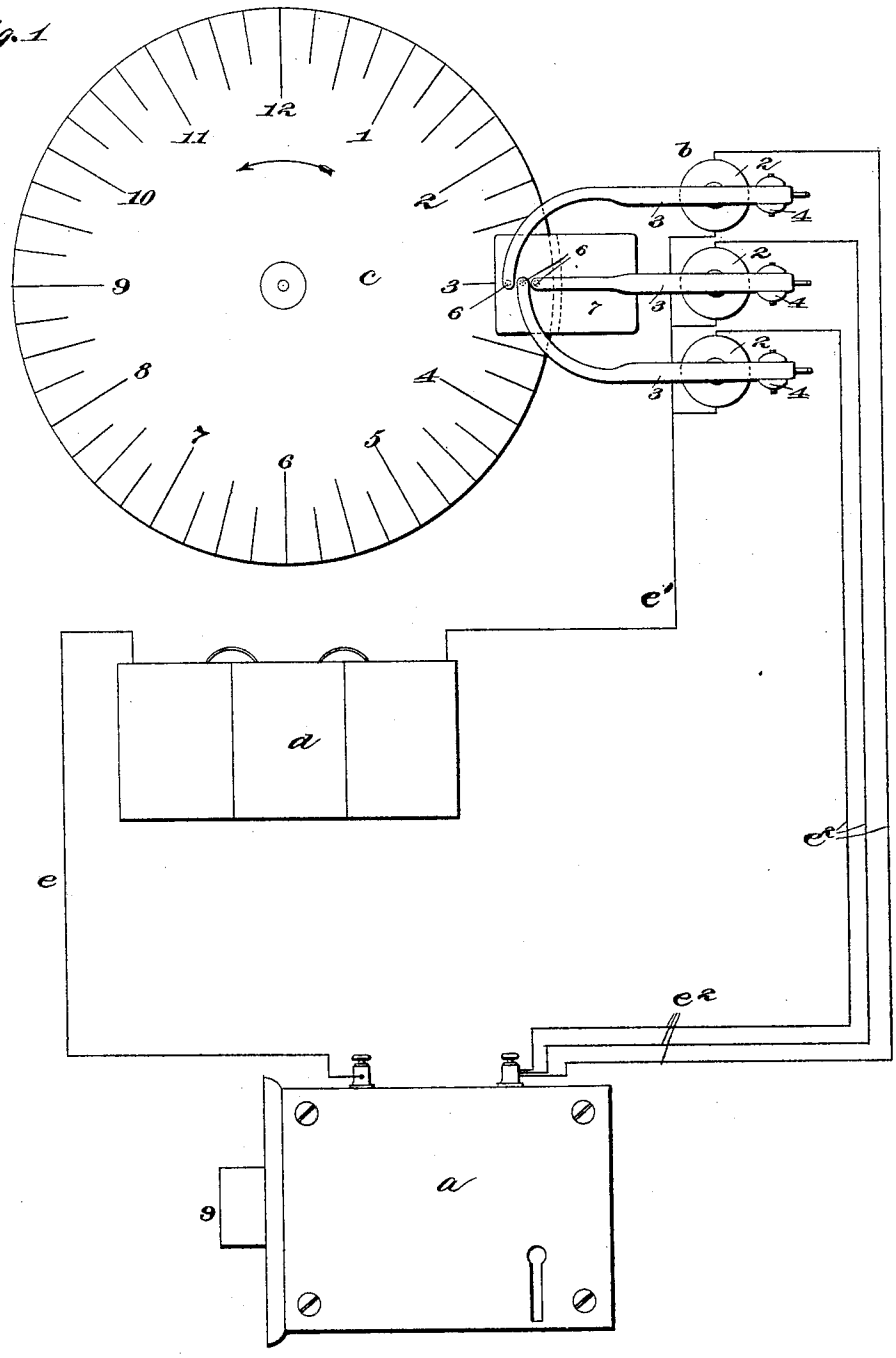
(No Model.) 2 Sheets—Sheet 1.

E. L. SMITH.

RECORDING DOOR LOCK.

No. 597,917. Patented Jan. 25, 1898.

Fig. 1



Witnesses.

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Fig. 2

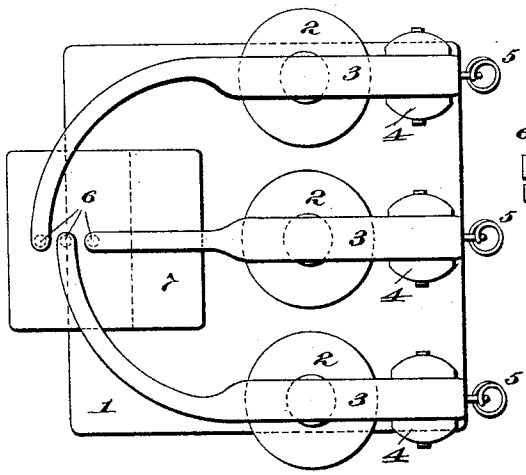


Fig. 3

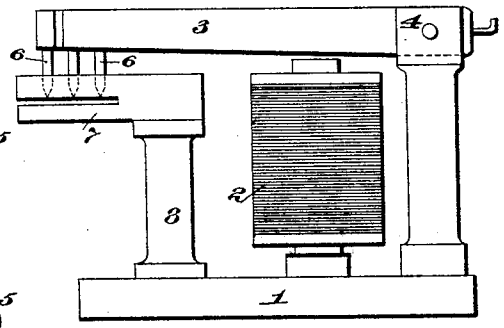


Fig. 4

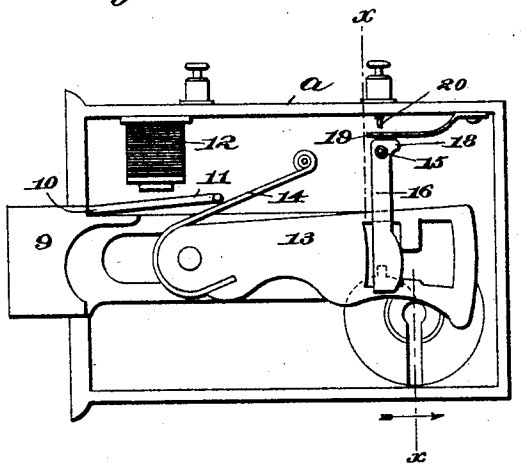
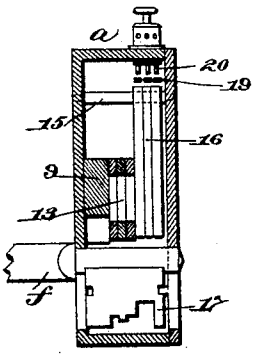


Fig. 5



Witnesses.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD L. SMITH, OF TORRINGTON, CONNECTICUT, ASSIGNOR TO JOHN F. ALVORD AND HERMAN W. HUKE, OF SAME PLACE.

RECORDING DOOR-LOCK.

SPECIFICATION forming part of Letters Patent No. 597,917, dated January 25, 1898.

Application filed October 15, 1897. Serial No. 655,333. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. SMITH, a citizen of the United States, residing at Torrington, in the county of Litchfield and State of Connecticut, have invented certain new and useful Improvements in Recording Door-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to recording door-locks; and the object of my invention is to enable a person, such as the proprietor of a store, to determine when and by whom the door to which the lock is applied has been unlocked.

To this end my invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a diagram of one form of lock comprised in my invention and of the recording-dial and punching mechanism, said figure also representing an electric battery and the circuit connections between the parts. Fig. 2 represents a plan view of the punching mechanism. Fig. 3 represents a side elevation of the mechanism shown in Fig. 2. Fig. 4 represents the lock with one plate removed. Fig. 5 represents a section of the lock on line *x x* of Fig. 4.

Similar reference-characters indicate similar parts in all the views.

The casing of the lock is indicated at *a*, and I may state here that my invention is not limited to any particular details of construction of the locking bolt and tumblers, as my invention may be readily adapted so as to include any form of lock employing a key. I have, however, shown in the drawings and will describe hereinafter some of the details of a form of lock well known. It is to be understood, however, that by the term "lock" I do not intend to include a device which is operated by means of a key, but which does not employ a bolt or an equivalent thereof for securing two parts together, such as a door in its casing.

The punching mechanism is indicated as a whole at *b*, and *c* represents a dial which is preferably made of paper or other suitable material which may be easily perforated by a punch. The dial is marked with figures to indicate hours and other suitable divisions of time and is to be rotated by any suitable clock mechanism. (Not shown.) Preferably the dial and its operating mechanism will be inclosed in one case with the punching mechanism and will be located in any distant and convenient part of the store or other building that may be desired. As the dial is a movable one, operated by clock mechanism, it may properly be termed a "clock," since time may be read thereon according to the positions of its figures relatively to some fixed point, such as the punching mechanism presently described.

A suitable battery *d* or other source of electrical energy is connected with a magnet in the lock-casing and with the punch-operating magnets, respectively, by wires *e* and *e'*. The punching mechanism comprises a base 1, supporting a suitable number of electro-magnets 2, (three, as illustrated.) The armatures of these magnets are carried by or form parts of levers 3, which are pivotally connected with standards 4, attached to the base, and are provided with springs, as at 5, (see Fig. 2,) adapted to normally hold the levers in position shown in Fig. 3. The outer end of each lever carries a punch 6, adapted to perforate or impress the edge of the dial, which is received in a guide 7, carried by a post or standard 8. This guide is shown as consisting of a block having a dial-receiving slot in one edge and having suitable holes through which the punches operate.

Referring now particularly to Figs. 4 and 5, I will describe only such details of the lock as may be necessary to explain my invention.

The bolt 9 is formed with a recess or shoulder 10, and a lever 11 is pivoted to the casing *a*, and its end is adapted to engage said shoulder to prevent the withdrawal of the bolt into the casing when the parts are in position shown in Fig. 4. This detent-lever forms or carries the armature for a small electromagnet 12 within the casing.

13 indicates the tumblers, and 14 their

springs, these forming no part of my invention, but being illustrated as parts of one form of lock. Above the tumblers are several movable pieces, shown herein as arms 16, pivoted on a pin 15, there being as many of these as there are punches employed, these arms hanging freely on one side of the tumblers and side by side, so as to be in the path of movement of one or more lugs 17, carried by the key *f*. Each arm is provided with a projection or cam 18 at one side of its upper end, said cam being adapted when the arm is swung in the proper direction by the key to press a contact-spring 19 against a contact point or terminal 20. In the drawings there are illustrated three such springs which are supported by the casing and three points or terminals which are of course in practice insulated from each other. Each terminal is connected to one of the magnets 2 by a wire e^2. (See Fig. 1.)

In connection with this invention a plurality of keys are employed, one being indicated at *f*, all being alike in those parts which operate the tumblers and bolt, but different in the lugs which operate the arms 16. With the devices as illustrated there may be three keys, each having a lug 17 so located as to operate a different arm 16, and there may be other keys having more than one lug or a lug so shaped as to operate different combinations of the arms 16. These keys are to be given to different employees in the store, the possessor of each being known to the proprietor, and the lock is placed on the entrance-door. Whenever one of these keys is used to open the door, its use in the usual manner first lifts the tumblers, and its lug 17 swings an arm 16, so as to cause the cam 18 of the latter to press its proper spring 19 against a terminal 20. This operates the particular lever 3 and its punch or marker 6, the circuit being complete through wire *e*, magnet 12, casing *a*, spring 19, point 20, wire e^2, magnet 2, and wire *e'*, thus energizing the proper magnet 2 of the series in the punching mechanism. At the same time the magnet 12 is energized and the armature lever or detent 11 is lifted, so that the bolt 9 is free to be retracted by the continued movement of the key in the usual manner. Each punch 6 differs from the others and can only be operated by a particular key, or if a key has a combination of lugs 17 it will operate the corresponding combination of punches. Therefore the dial will always show the time when the door was unlocked, and also whose key performed the operation, and will indicate who first arrived and opened the door and also by whose key the door might have been opened at any unauthorized time.

I do not limit myself to the precise details of construction as shown and described. For instance, instead of employing dial-markers 6 which punch the material I may employ markers which print on the dial by impression or otherwise, and obviously the time-indicator instead of consisting of a rotary dial may be a rotary drum or a suitably-divided strip moved by clockwork, these devices being commonly employed in analogous inventions as substitutes for dials.

Having thus described my invention, I claim—

1. Recording door-lock mechanism comprising a time-indicator, a marker therefor, a locking-bolt adapted to be operated by a key, a movable piece independent of the bolt and adjacent thereto and adapted to be moved by a part of said key, an electromagnet for operating the marker, and electrical connections whereby the magnet is energized by the actuation of the movable piece by said key.

2. The combination with a lock adapted to be operated by a key, of a detent for preventing the withdrawal of the bolt of the lock, means for making a record of the time when the lock is used, and means for withdrawing the said detent when the record is made.

3. Recording door-lock mechanism comprising a time-indicator, a plurality of markers therefor differing from each other, a locking-bolt adapted to be operated by a key, a plurality of movable pieces located side by side, and connections between each of the markers and one of the movable pieces whereby movement of the latter by said key will operate a marker.

4. Recording door-lock mechanism comprising a time-indicator, a plurality of markers therefor differing from each other, a locking-bolt adapted to be operated by a key, a plurality of movable pieces located side by side, electromagnets for operating the markers, contact-makers operated by said movable pieces and electric connections including said magnets and contact-makers, whereby the turning of said key to operate the bolt will actuate one of said movable pieces and cause a record to be made.

5. Recording door-lock mechanism comprising a time-indicator, a plurality of markers therefor differing from each other, a locking-bolt, a plurality of movable pieces located side by side, electromagnets for operating the markers, contact-makers operated by said movable pieces, a detent for the locking-bolt, an electromagnet for removing the detent and electric connections including said magnets and contact-makers.

6. The combination with the lock-case containing a bolt and a series of movable pieces located side by side, of a time-indicator, markers therefor, and electromagnets and connections whereby operation of either of said movable pieces by a key energizes a particular magnet and distinctively marks the indicator.

7. In a recording door-lock mechanism, the combination with a rotary dial, of the slotted guide 7 for the edge of the dial, the plurality of levers 3 carrying markers or punches movable across the slot of the guide, electromagnets for operating the levers, and means in-

cluding a lock and key and electric connections whereby movement of a key in the lock operates one or more of said levers 3.

8. In a recording door-lock mechanism, the combination with the lock-case and its bolt and tumblers, of the pivoted arms 16 located at one side of the tumblers, a time-indicator, markers therefor, electromagnets for operating the markers, and electric connections adapted to be controlled by the said arms 16.

9. In a recording door-lock mechanism, the combination with a rotary dial, of the slotted guide 7, the punch-levers 3 and electromagnets for operating them, the lock-casing containing the tumblers and the pivoted arms 16 having cams 18, the contact-springs 19 and terminals 20, and electric connections between the terminals and magnets, substantially as and for the purpose set forth.

10. In a recording door-lock mechanism, the combination with the rotary dial, of the slotted guide 7, the punch-levers 3, and electromagnets for operating them, the lock-casing containing the tumblers, the bolt 9 having a shoulder 10, the detent-lever 11, the magnet 12 for operating the lever 11, the pivoted arms 16 having cams 18, the contact-springs 19, terminals 20, and electric connections including the magnets and adapted to be controlled by the operation of the cams 18 against the springs 19, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD L. SMITH.

Witnesses:

H. G. WADHAMS,

H. T. CARPENTER.