

(No Model.)

2 Sheets—Sheet 1.

G. L. DAMON.  
ELECTRIC SAFE LOCK.

No. 437,682.

Patented Oct. 7, 1890.

Fig: 1.

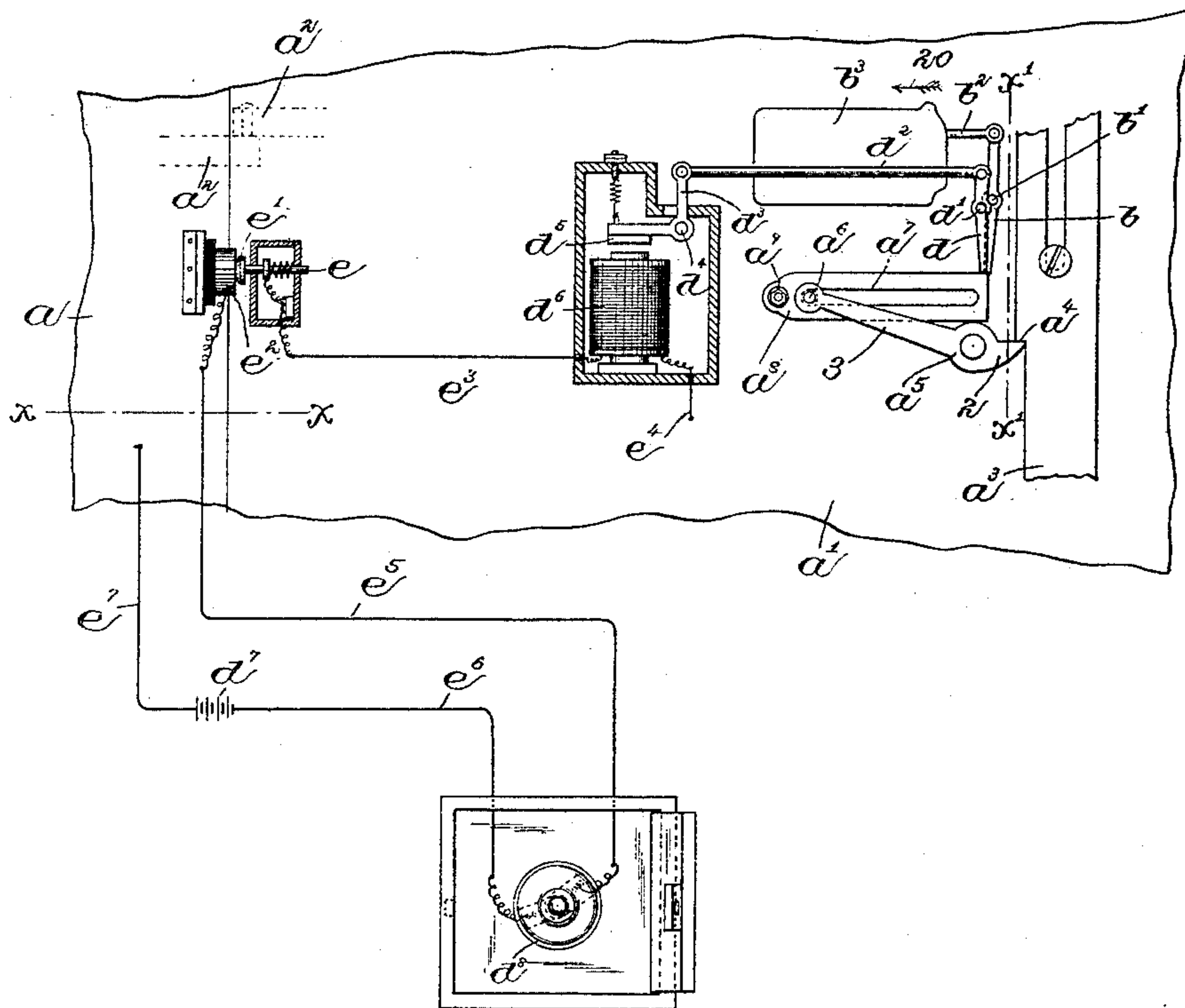


Fig: 3.

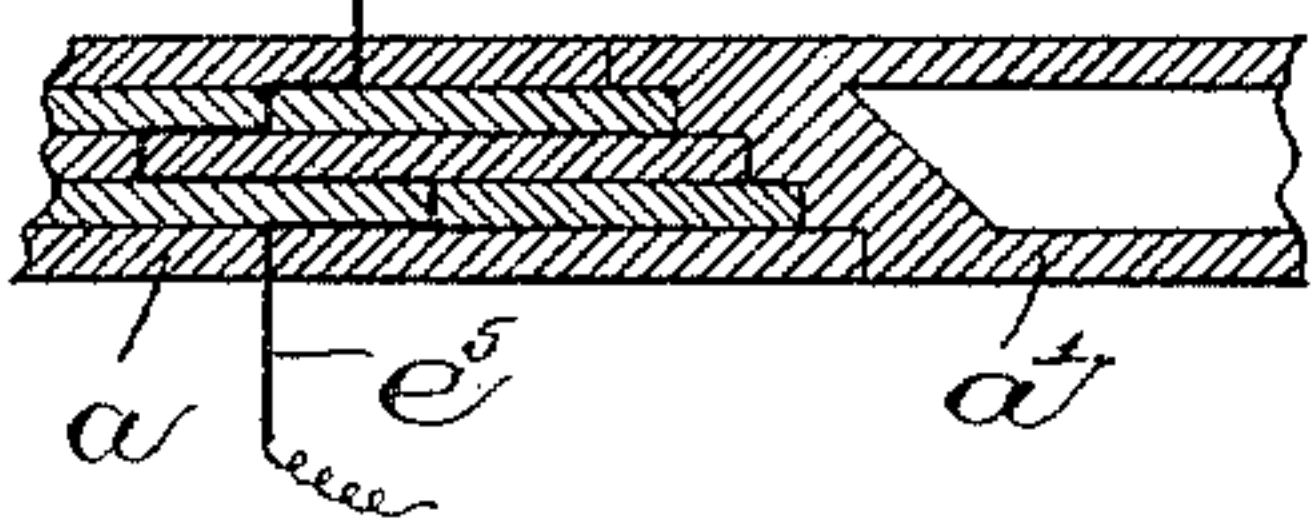
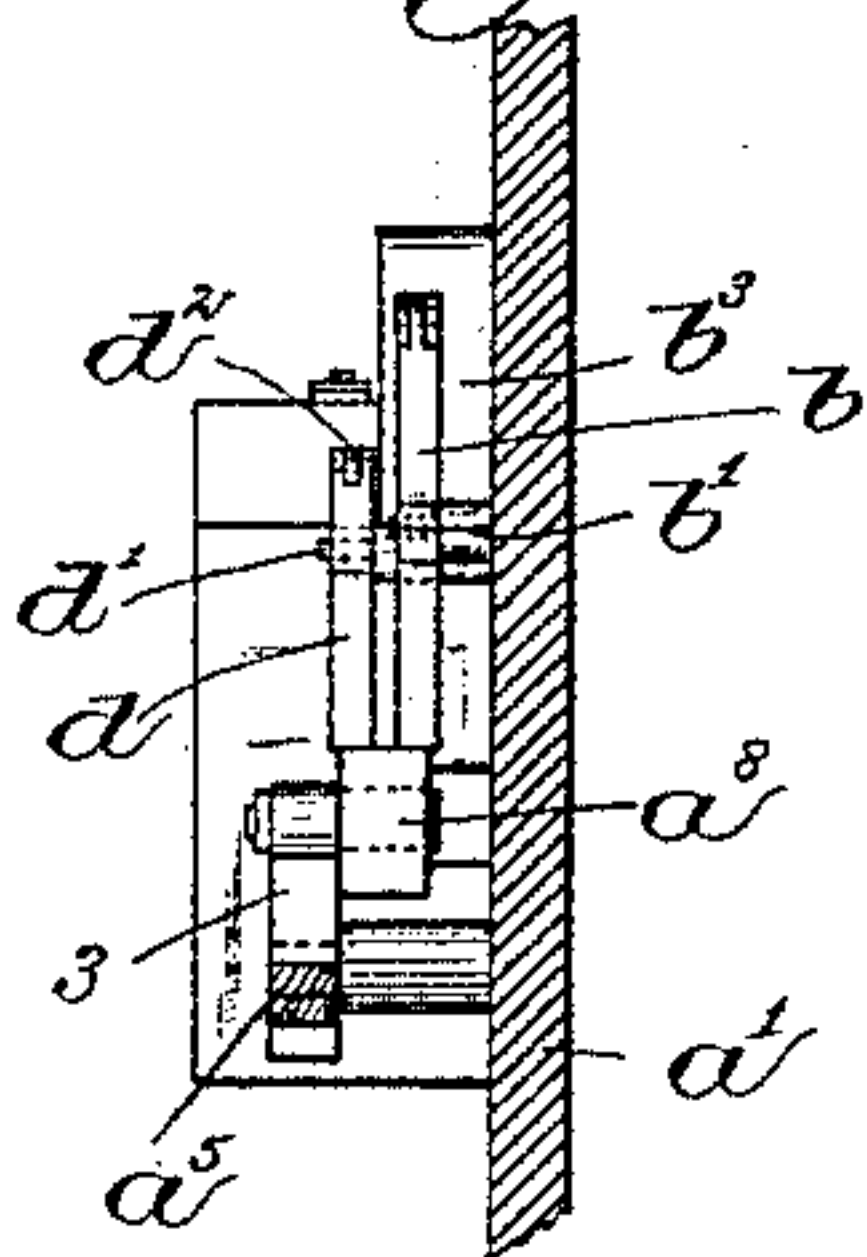


Fig: R.



Witnesses.  
Howard F. Eaton.  
Maurice L. Emery-

Inventor:  
George L. Damon,  
by Lerouby & Gregory  
Attys.

(No Model.)

2 Sheets—Sheet 2

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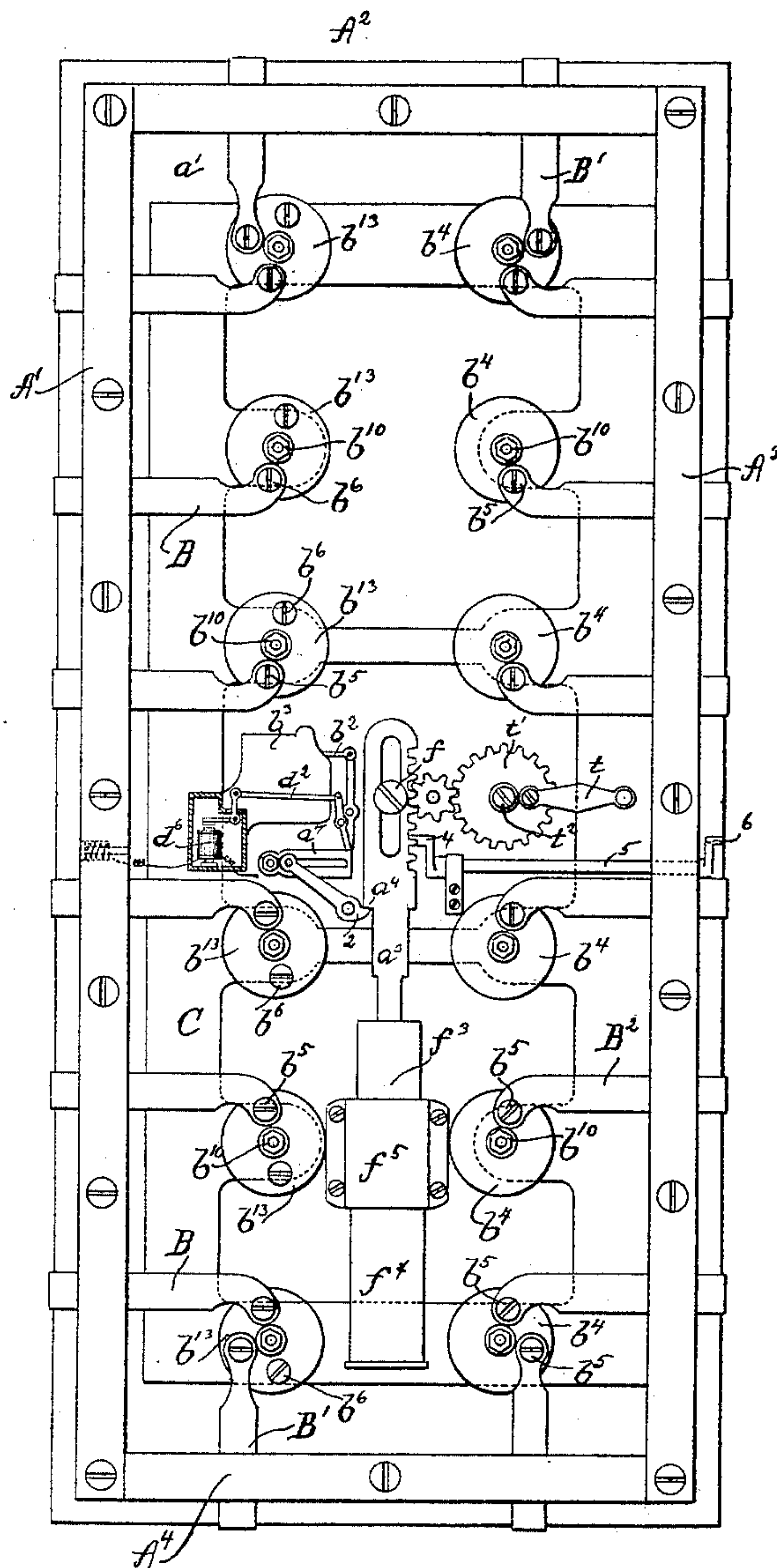


Fig: 4.

*Witnesses.*

Fred. S. Greenleaf  
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George I. Damon,  
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# UNITED STATES PATENT OFFICE.

GEORGE L. DAMON, OF BOSTON, MASSACHUSETTS.

## ELECTRIC SAFE-LOCK.

SPECIFICATION forming part of Letters Patent No. 437,682, dated October 7, 1890.

Application filed December 13, 1889. Serial No. 333,626. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE L. DAMON, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Safe-  
5 Locks, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to locks for safes, vaults, and other depositories for valuables, and has for its object to provide an electrically-actuated mechanism to be used in connection with a time-lock, whereby the door of the safe or vault may be maintained locked  
15 after the time-lock has operated.

My invention therefore consists in the combination, with the door of a safe or vault and its bolt-operating mechanism and a time-lock, of an electrically-actuated mechanism co-operating with the time-lock to maintain the safe-door locked after the time-lock has operated, substantially as will be described.

Other features of my invention will be pointed out in the claim at the end of this  
25 specification.

Figure 1 represents a sufficient portion of a safe or vault, its bolt-operating mechanism, the time-lock, and the electrically-actuated mechanism to enable my invention to be understood; Fig. 2, a sectional detail through the safe-door on line  $x'x'$ , Fig. 1; and Fig. 3, a sectional detail on line  $xx$ , Fig. 1. Fig. 4 is an inner side view of a door with my improvements added, the bolts being thrown outward, the said door being suitable for a safe or vault.  
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The safe or vault  $a$  is provided with the door  $a'$ , secured thereon, as by hinges  $a^2$ , the bolt-operating mechanism being preferably constructed and operated by gravity, substantially as shown and described in United States Patent No. 356,547, granted to me January 25, 1887, as assignee to O. E. Pillard, such construction being best shown in Fig. 4 of this application, wherein the bars  $A'A^2$  and  $A^3A^4$ ,  
40 bolts  $B B' B^2$ , and the carrying-bar  $C$ , weight  $f^3$ , arms 4 and 6, and rock-shaft 5 are lettered as in said patent to indicate like parts, and need not be further described herein.

The bar  $a^3$  is provided, as herein shown, with a shoulder  $a^4$ , normally engaged by the short arm 2 of one lever  $a^5$  of a compound lever, the lever  $a^5$  being pivoted to the safe-

door and having its long arm provided with a stud  $a^6$ , extended into a slot  $a^7$  of the other lever  $a^8$  of the compound lever, the lever  $a^8$  being pivotally supported, as at  $a^9$ , by the  
55 safe-door.

The lever  $a^9$  is normally engaged by one end of a lever  $b$ , pivoted as at  $b'$ , and having connected to it one end of a link  $b^2$ , having its other end operatively connected to a time-lock mechanism  $b^3$ , which may be of any usual or well-known construction such as now commonly used on safes.

The bolt-operating bar  $a^3$  is held elevated when the door is locked by the lever  $a^5$ , the latter being held stationary by the pivoted bar  $a^8$ , which in turn is maintained in the position shown by the lever  $b$ , connected to the time-lock.  
65 70

As now commonly constructed the bolt-operating bars are permitted to descend by gravity, as described in the patent referred to, wherein the bar  $f'$  corresponds to the bar  $a^3$ , herein shown, or are otherwise moved, when the lever  $b$  is moved out of engagement with the pivoted slotted bar  $a^8$ , by the operation of the time-lock, which in practice is set to operate at a predetermined time.  
75

In some instances it may be desirable to keep the door locked after the time-lock has operated—as, for instance, the president or other duly-authorized officer of a bank or safe-deposit may wish the opening of the safe-door to be absolutely under his control. To accomplish this object, I have provided an electrically-actuated mechanism consisting, as herein shown, of a lever  $d$ , pivoted, as at  $d'$ , and having one end adapted to engage the pivoted bar  $a^8$  and its other end connected by a link  $d^2$  to an elbow-lever  $d^3$ , pivoted, as at  $d^4$ , and having secured to or forming part of it an armature  $d^5$  of an electro-magnet  $d^6$ , connected in circuit, as herein shown, with a battery  $d^7$  and with a switch or circuit-controller, (herein shown as a push-button  $d^8$ ), which in practice is located outside of the safe, and may be at any desired or distant place or station—for instance, at the president's office or house.  
80 85 90 95 100

The circuit of the electro-magnet is preferably provided with a switch or circuit-controller, which is normally open when the safe-door is open, the said circuit-controller being



herein shown as a spring-actuated rod *e*, provided with a head *e'*, adapted to be brought into contact with a metallic block or disk *e<sup>2</sup>*, secured to but insulated from the safe. One end *e<sup>3</sup>* of the wire of the electro-magnet *d<sup>6</sup>* is connected to the spring-pressed rod *e*, and the other end *e<sup>4</sup>* of the said wire is secured to the door. The block *e<sup>2</sup>* is connected by wire *e<sup>5</sup>* to one terminal of the push-button *d<sup>8</sup>*, and the other terminal of the said push-button is connected by wire *e<sup>6</sup>* to one pole of the battery *d<sup>7</sup>*, the other pole of the said battery being joined to the safe by wire *e<sup>7</sup>*.

In operation the time-lock moves the link *b<sup>2</sup>* in the direction of arrow 20, Fig. 1, and thereby throws the lower end of the lever *b* out of the path of movement of the pivoted bar *a<sup>8</sup>*; but the latter is prevented from being moved by the lever *d*, and the safe-door remains locked until the circuit of the electro-magnet *d<sup>6</sup>* is closed at the normally-open circuit-controller or push-button *d<sup>8</sup>*. As soon as the circuit is closed the magnet is energized and its armature attracted by it, thereby moving the link *d<sup>2</sup>* in the direction of the arrow 20 and turning the lever *d* on its pivot, so as to move its end out of the path of movement of the pivoted bar *a<sup>8</sup>*, thus leaving the bolt-operating bars free to drop and unlock the safe. As shown in Figs. 1 and 4, the door is locked. When the levers *b* and *d* have been moved out of engagement with the bar *a<sup>8</sup>*, as described, the lever *a<sup>5</sup>* is released, it in turn releasing the bolt-operating bar *a<sup>8</sup>*, which falls by the action of the weight *f<sup>3</sup>*, attached thereto, (see Fig. 4,) causing the pinion *t* to rotate ninety degrees to move the carrying-bar C, as described in the patent referred to, to withdraw the bolts and unlock the door.

The carrying-bar C has in it a series of slots, (not shown,) through which are extended studs *b<sup>10</sup>*, screwed into the door-plate *a'* and preferably provided with a roller en-

tering said slot to guide the bar in its horizontal reciprocations to throw or draw the bolts. The studs *b<sup>10</sup>* have mounted loosely thereon disks *b<sup>13</sup>* *b<sup>4</sup>*, each of which has attached loosely thereto by a screw *b<sup>5</sup>* one of the bolts referred to, the disks *b<sup>13</sup>* having extended therethrough studs *b<sup>6</sup>* to enter openings in the carrying-bar, said openings being at right angles to the slots referred to and being longer than the diameter of the studs *b<sup>6</sup>*. The screws *b<sup>5</sup>*, connecting the bolts to the disks *b<sup>4</sup>*, are extended through said disks and enter similar openings.

When the carrying-bar is moved in one or the other direction by the link *t* and gear *t'*, the disks *b<sup>13</sup>* *b<sup>4</sup>* are rotated in the proper direction by the operation of slots and openings and studs therein to thrust the bolts out or draw them in.

I claim—

The combination, with a safe-door, bolt-operating mechanism including the bolt-operating bar *a<sup>3</sup>*, having a shoulder *a<sup>4</sup>*, a compound lever consisting of a lever *a<sup>5</sup>* to engage said shoulder and maintain the bar *a<sup>3</sup>* in position to keep the door locked, and a slotted lever *a<sup>8</sup>*, connected to the lever *a<sup>5</sup>*, of a lever *d* to engage said slotted lever, an electro-magnet having its armature connected to lever *d*, a circuit-controller located in an electric circuit connected to the electro-magnet, and an electric generator in circuit with said electro-magnet to remove the lever *d* from engagement with the lever *a<sup>8</sup>*, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE L. DAMON.

Witnesses:

JAS. H. CHURCHILL,  
E. J. BENNETT.