(No Model.) 2 Sheets—Sheet 1.

W. GRAH, Jr.

ELECTRIC LOCK.

No. 421,567. Patented Feb. 18, 1890.

Fig. 1.

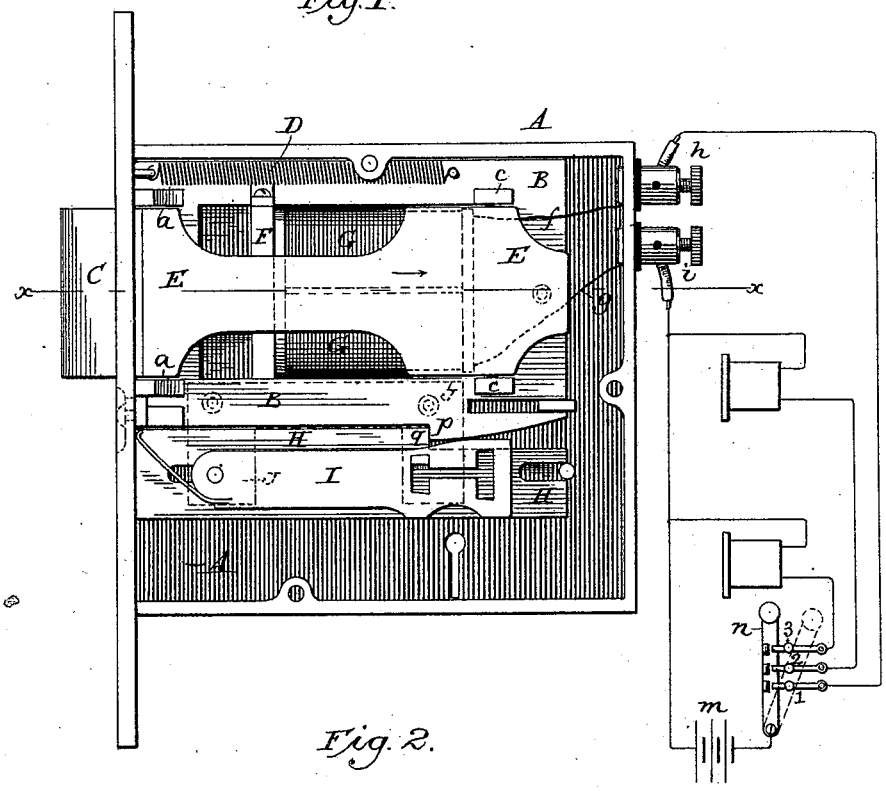


Fig. 2.

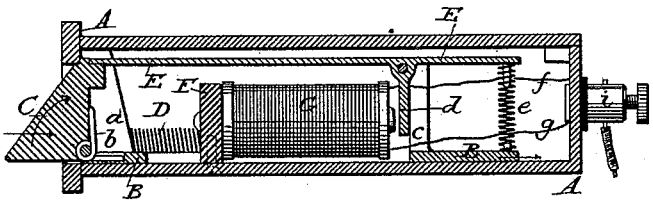
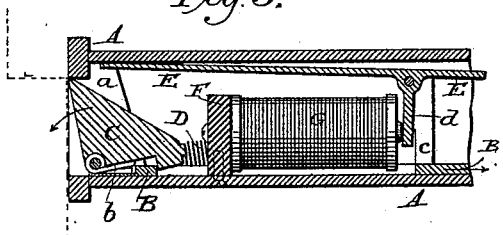


Fig. 3.



Attest:

Sidney P. Hollingsworth

Horace A. Dodge.

Inventor:

William Grah Jr.

by Dodger Sons

Attys

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4

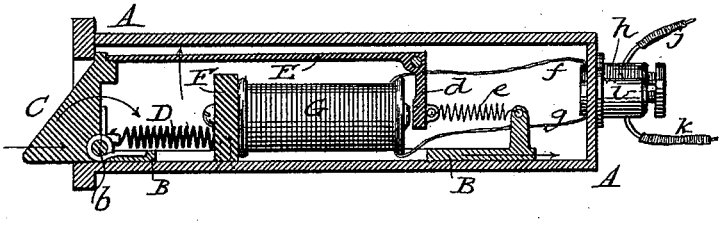


Fig. 5

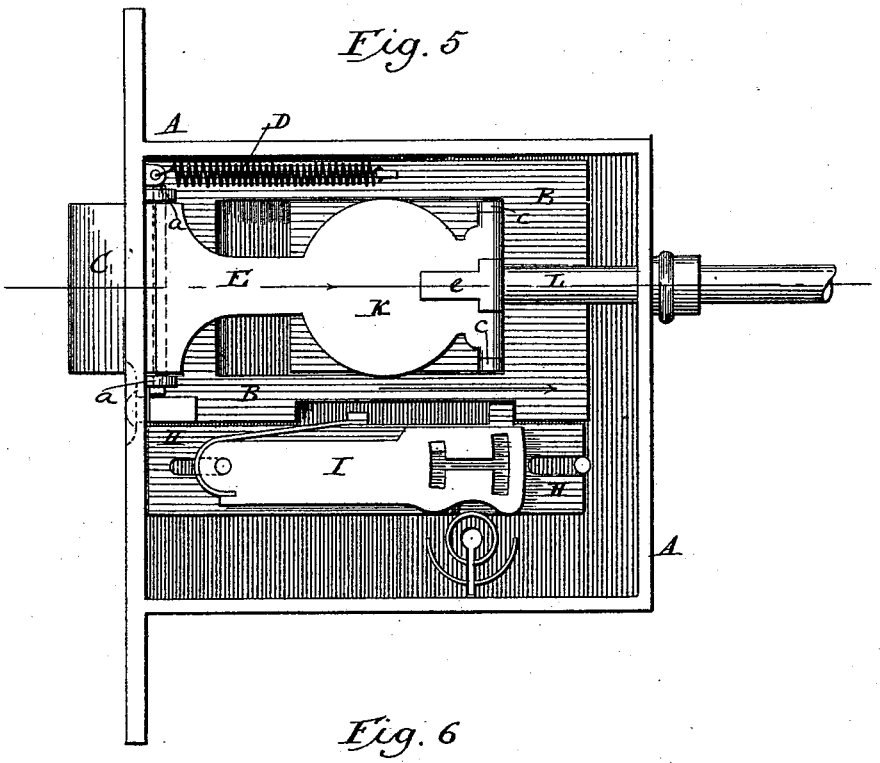
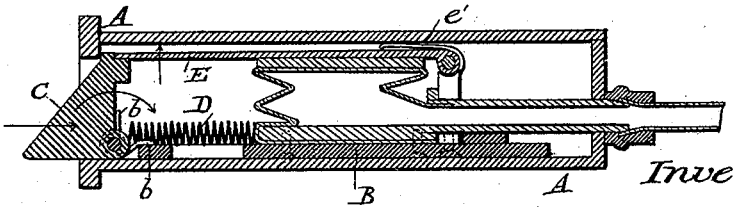


Fig. 6



Attest:

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Horace A. Dodge

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UNITED STATES PATENT OFFICE.

WILLIAM GRAH, JR., OF TOLEDO, OHIO.

ELECTRIC LOCK.

SPECIFICATION forming part of Letters Patent No. 421,567, dated February 18, 1890.

Application filed May 18, 1888. Serial No. 274,237. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GRAH, Jr., of Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Locks, of which the following is a specification.

My invention relates to locks, and has reference more particularly to that class in which the nose-piece of the sliding bolt is pivoted and adapted to swing backward.

The invention consists in a novel means for releasing or dogging the pivoted nose-piece, all as hereinafter set forth and claimed.

In the drawings, Figure 1 is a face view of a lock with the side plate removed, showing the bolt projected, and also showing a series of locks connected and adapted to be operated or controlled either separately or together from a central station. Fig. 2 is a sectional view on the line *x x;* Fig. 3, a similar view showing the nose of the bolt thrown backward; Fig. 4, a view illustrating a slight modification of the arrangement of the dogging mechanism, and Figs. 5 and 6 views illustrating a pneumatic device in place of the electro-magnet for releasing the pivoted nose-piece.

In warehouses and other large buildings where an elevator-shaft is used it is desirable to be able to control one or all of the doors from a central station and to permit the door or doors to be opened from the inside of the shaft without a key or other special device, or to permit such door or doors to close automatically. In either event the doors should be provided with spring-hinges, so that the moment the pivoted nose-piece of the sliding bolt is released the spring may open or close the doors, as the case may be.

Referring again to the drawings, A indicates the case or shell of the lock, and B indicates the sliding bolt, which in the present instance is made, preferably, in the form of a rectangular plate open at its center. At its forward end the bolt is provided with upright arms *a a*, to which is pivoted the beveled nose-piece C, which is adapted to swing inward within the case or shell, as shown in Fig. 3, but which is held in its normal position by means of a coiled spring *b*, as shown in Figs. 1, 2, and 3.

D indicates a spring secured at one end to the bolt or plate B and at the other end to the case or shell A, as shown in Fig. 1, the said spring serving to keep the bolt normally projected.

Near the rear end of the plate or bolt B are uprights *c c*, in which is journaled an elbow-lever E, which acts as a dog for the pivoted nose-piece C, the latter being notched or recessed on its rear face, as shown in Figs. 2 and 3, to form a shoulder against which one end of the lever or dogging-plate E engages.

Secured to the shell or case of the lock A, and projecting upwardly through the bolt B, is a block F, to which is secured a pair of electro-magnets G, the coils of which extend outward in proximity to the downwardly-projecting end *d* of the elbow-lever or dog E, the end *d* being provided with or forming an armature for the electro-magnets. The longer arm of the elbow-leyer or dog E is extended backward in rear of its pivot, as shown in Figs. 1, 2, and 3, and a spring *e* interposed between said extension and the plate or bolt B. Instead of thus extending the plate or dog E rearwardly, the spring may be connected to the downwardly-turned end *d*, as shown in Fig. 4.

Wires or conductors *f* and *g* extend from the electro-magnets to suitable binding-posts *h* and *i*, secured to the case or shell A, as shown in Figs. 1 and 2, and from these binding-posts wires *j* and *k* extend to a central office, where there is a battery *m*, a switch-lever *n*, and a series of spring-fingers 1 2 3, one for each lock. This lever *n* is always in circuit, and by pressing any one of the spring-fingers down in contact with the lever *n* the lock with which the particular spring-finger is connected will be operated. If it should be desired to operate all the locks simultaneously, the lever *n* will be swung over to the position indicated in dotted lines in Fig. 1, (in which figure three locks are included in the circuit,) the spring-fingers being all brought into contact with the lever *n*.

Various other forms of circuit-closers or switch mechanisms may be substituted for that herein shown.

The plate or bolt B is notched or slotted on its lower edge to form a shoulder or lug *p*, with which a lug *q* on a sliding plate H is adapted to engage, as clearly shown in Fig.

1, the said plate being in turn moved to operate the bolt by means of a key, as is common in locks.

In order to hold the tumbler I and the plate H in proper position close to the case or shell A, a plate J (shown in dotted lines in Fig. 1) will advisably be secured to the bolt B, and which will project over and lie closely upon the tumbler.

From the foregoing construction it will be seen that the bolt may be retracted by means of a key through the intervention of the plate H and the lugs *p q*, secured, respectively, to the bolt and the plate, and it will also be seen that the bolt may be retracted by simply closing the door, the bevel-nose of the bolt forcing said bolt inward, as is common in the ordinary spring-locks.

Should it be desirable to permit the closed door to open or the open door to close, it is only necessary to energize the electro-magnet. When the electro-magnet is thus energized, its armature will be attracted, and in thus swinging upon its pivot the end of the dog or lever E will be raised out of engagement with the pivoted nose-piece C and the nose permitted to fall backward within the shell or case, as clearly shown in Fig. 3. After the door has swung open or closed, as the case may be, the spring *b* will return the pivoted nose to its normal position, and the spring *e* will throw the elbow-lever or dog E into its normal position.

In Figs. 5 and 6 I have shown an arrangement in which I dispense with the electro-magnet and employ in lieu thereof a bellows K, to which air is supplied through a pipe L extending out through the side of the lock case or shell. This bellows is arranged directly beneath the pivoted dogging-plate E, and it will be observed that when air is forced into the bellows it will be dilated and cause the plate or dog E to rise out of engagement with the pivoted nose-piece.

While I have shown and described the invention as applied to a bolt having a pivoted nose-piece, I do not wish to be understood as limiting myself to such a construction, for it is obvious that the dog may be arranged in combination with an ordinary sliding bolt not having the pivoted nose-piece, and also that mechanism herein shown and described may obviously be used, not only to dog but to actuate an ordinary sliding bolt.

Having thus described my invention, what I claim is—

1. In combination with a sliding bolt, a nose-piece pivoted thereto, a dog or catch for locking said nose-piece in position, and means, substantially such as shown, for operating or releasing the dog or catch.

2. In combination with a sliding bolt, a nose-piece pivoted thereto, a dog or catch also pivoted to the bolt and adapted to engage the nose-piece, and means, substantially such as shown, for operating or releasing the dog.

3. In a lock, the combination, with the sliding bolt B, of an inclined nose-piece pivoted to the bolt at the corner opposite the inclined face.

4. The combination of a two-part bolt, one part movable with relation to the remainder, with a holder by which the movement of one part relative to the other is prevented, and an electro-magnet and its armature co-operating with said holder, by which it is moved to permit the movement of one part of the bolt relative to the other, substantially as described.

5. In a lock, a two-part bolt, the projecting portion of which may yield by a movement of the whole bolt or by a movement with relation to the remainder of the bolt, combined with a movable holder which in one position prevents movement of one part of the bolt relative to the other, and in its other position permits such movement, substantially as and for the purpose described.

6. In combination with a series of locks each provided with a sliding bolt having a pivoted nose-piece, and a dog or catch to prevent the nose-piece from rocking, an electro-magnet in each of said locks for operating or releasing the dog, an electric circuit in which all said magnets are included, and means for completing the circuit.

7. In combination with the sliding bolt B, having the pivoted nose-piece, a magnet G, and elbow-lever armature E, pivoted to the bolt and adapted to engage the nose-piece.

8. In combination with sliding bolt B, provided with uprights *a* and *c*, nose-piece C, pivoted in uprights *a*, lever E, pivoted in uprights *c* and adapted to engage the nose-piece, an electro-magnet, and spring *e*.

9. In a lock, the combination, with a sliding bolt, of a nose-piece pivoted thereto, a dog or catch to engage the nose-piece, means, substantially such as shown, for operating the dog, and a spring to return the nose-piece to its normal position.

In witness whereof I hereunto set my hand in the presence of two witnesses.

WILLIAM GRAH, JR.

Witnesses:
CARL H. BECKHAM,
EBEN W. NEWTON.