

A. ARMEL & C. M. LEGRAND.  
ELECTRICALLY CONTROLLED LOCK.  
APPLICATION FILED MAR. 26, 1908.

924,126.

Patented June 8, 1909.  
2 SHEETS—SHEET 1.

Fig. 3.

Fig. 1.

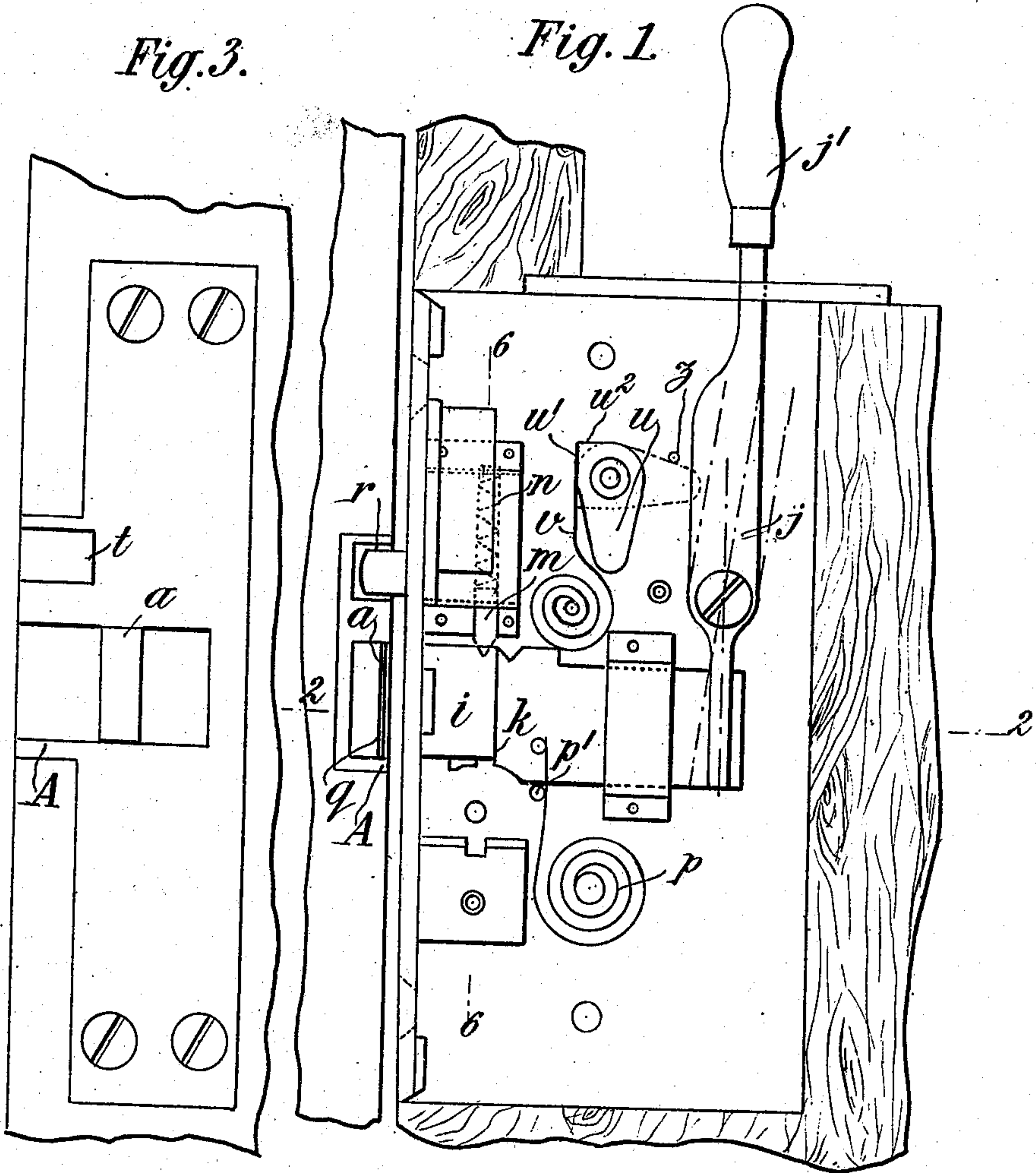
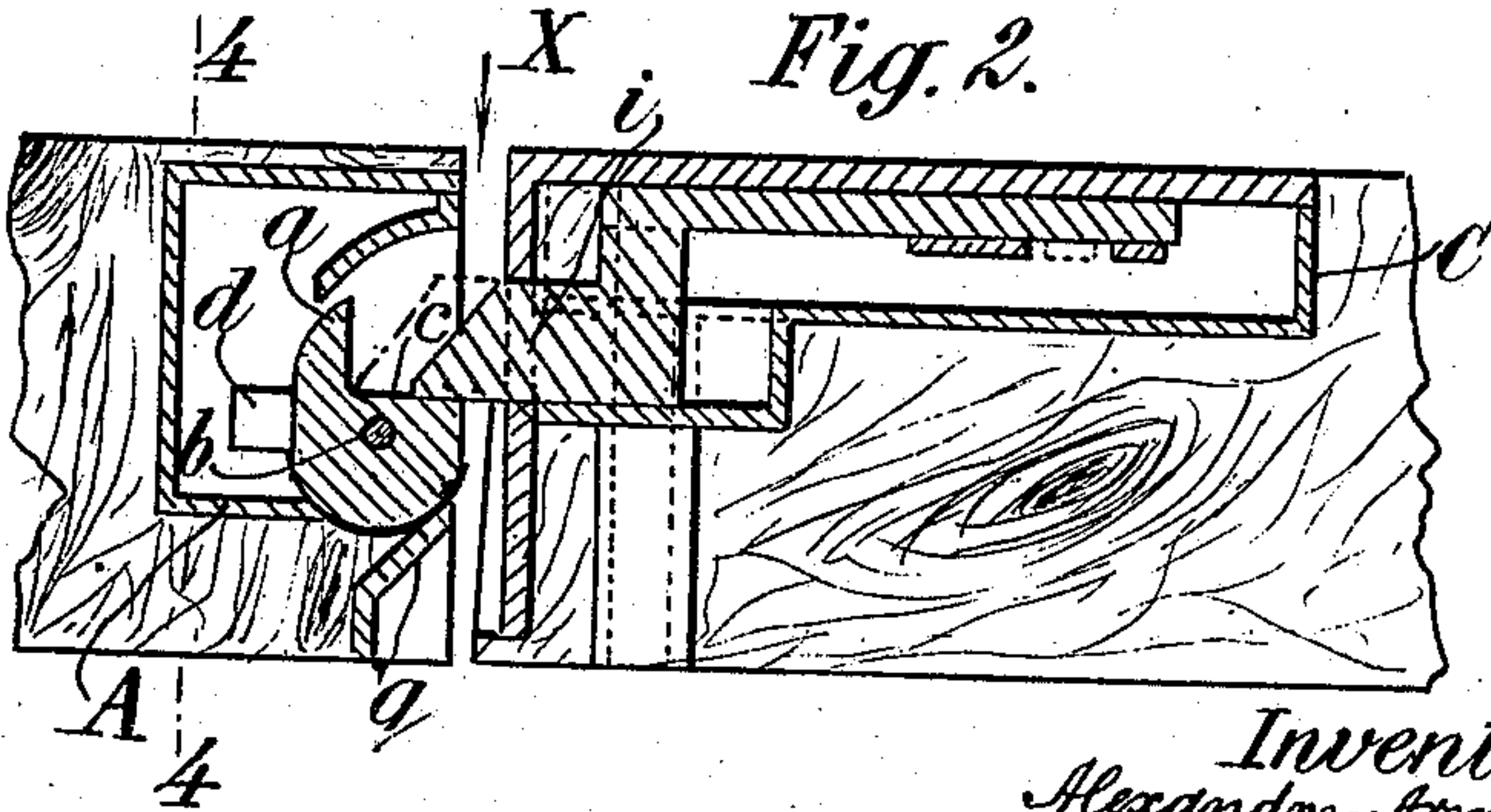


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 4.

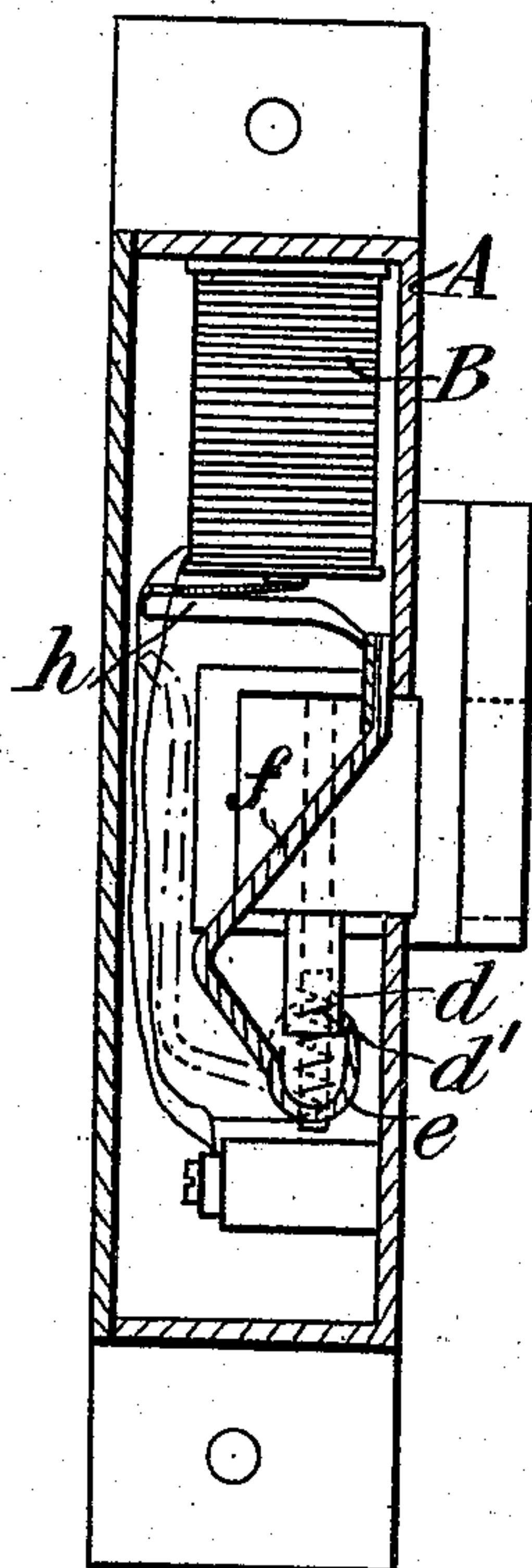


Fig. 5.

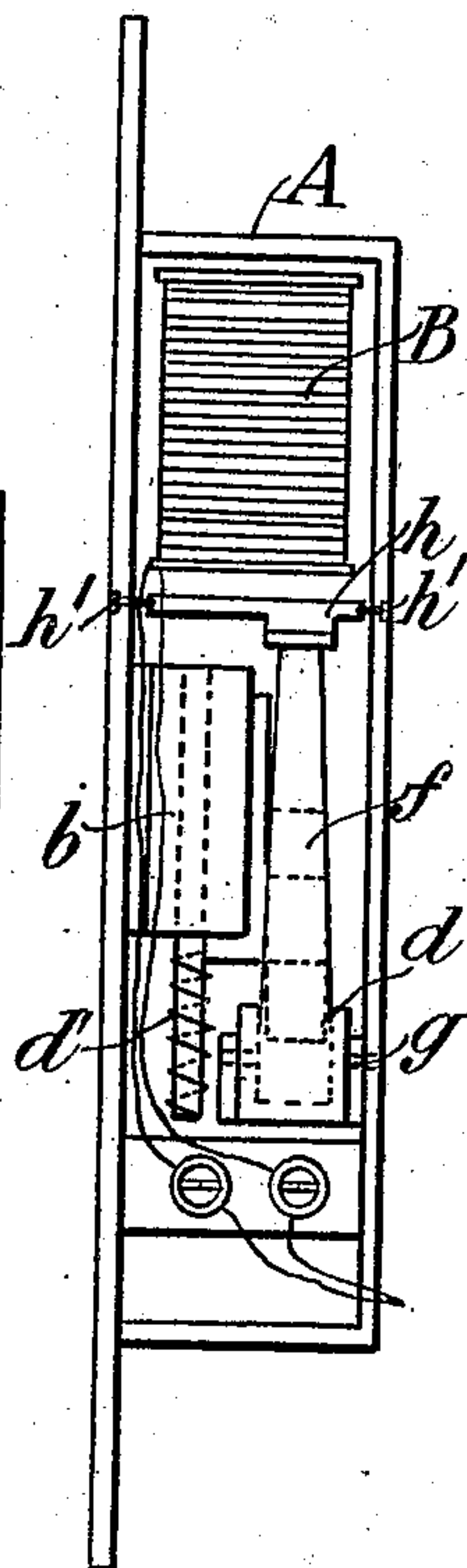


Fig. 6.

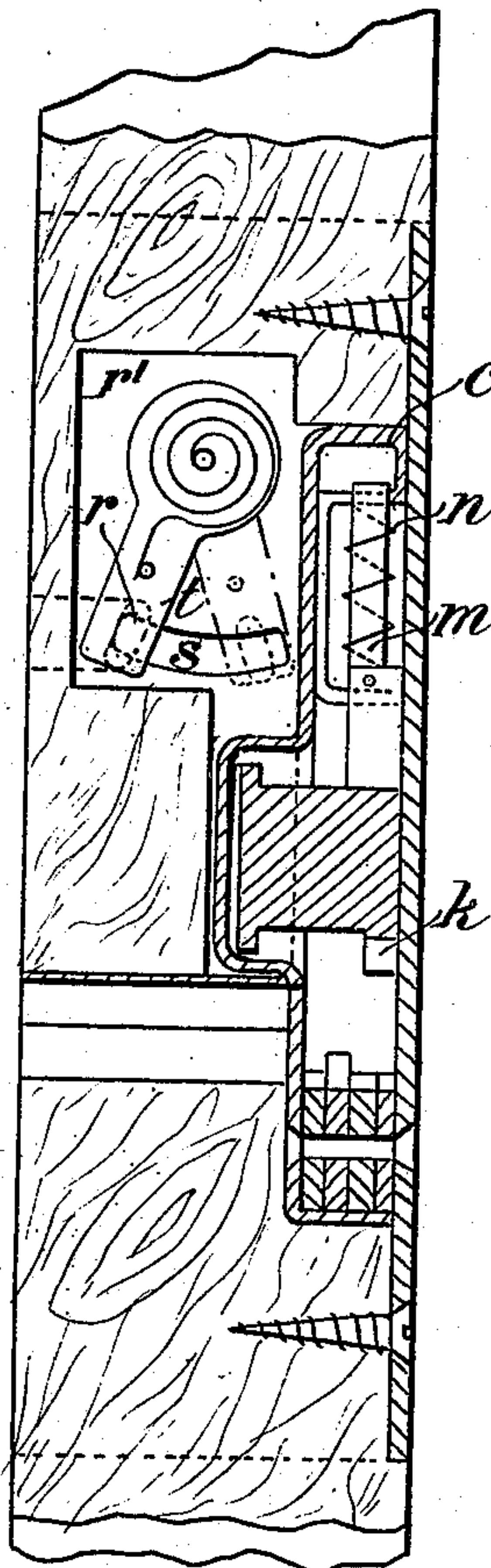


Fig. 7.

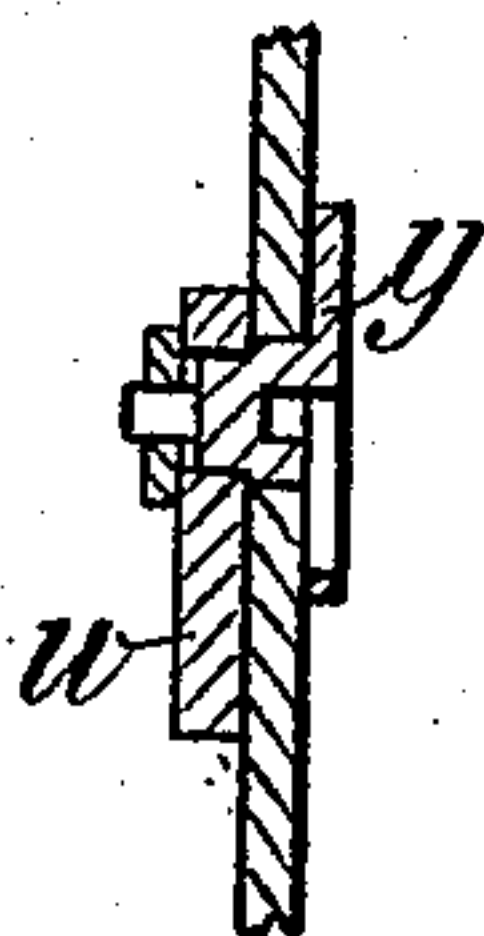


Fig. 8.

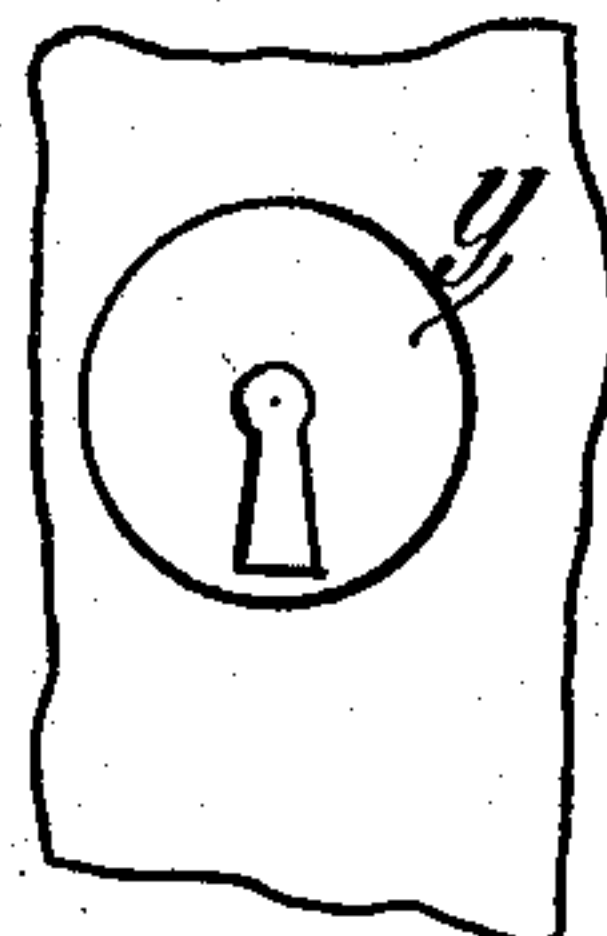


Fig. 9.

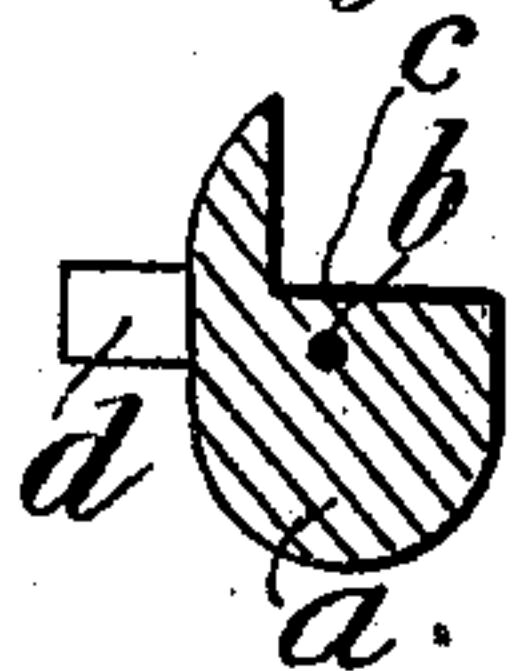


Fig. 10.



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# UNITED STATES PATENT OFFICE.

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## ELECTRICALLY-CONTROLLED LOCK.

No. 924,126.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed March 26, 1908. Serial No. 423,471.

*To all whom it may concern:*

Be it known that we, ALEXANDRE ARMEL and CHARLES MARIE LEGRAND, both citizens of the Republic of France, and residing in Paris, France, have jointly invented certain new and useful Improvements in Electrically-Controlled Locks, of which the following is a specification.

This invention relates to a safety lock having an electrically controlled catch which can easily be operated from a distance; it is particularly suitable for carriage doors, especially the doors of motor-cars, doors of rooms, or the like.

The construction of the lock is such that when it is adapted to a carriage door the latter opens automatically without the necessity for operating the handle, simply under the action of the push exerted by a spring situated in the lock when the catch bolt has been liberated by the action of the electric current, so that the locking bolt can be disengaged from it by the said push.

This lock is very secure for carriages, because it is impossible for a stranger to open the door and enter the carriage, the lock being controlled, for example, by a push-button situated near the driver. By means of a small suitable key the door can be opened from the outside, and the electric control can be put out of action from the inside by simply turning a small lever which also permits operation of the lock by the person within the carriage independently of the electrical control. A locking cam adapted to be operated from inside the carriage and incapable of being meddled with from the outside, constitutes a third control, in that it puts the whole mechanism out of action and prevents the door from being opened either from the inside or from the outside. Thus this lock presents absolute safety, whether the carriage be at rest or traveling; it avoids disagreeable surprises from strangers and accidents to children or others who may be in the carriage. The electrically operated catch of this lock presents certain peculiarities which render this operation absolutely certain. One of these consists in the arrangement of a long armed lever which, when it is engaged by the armature of the electromagnet, prevents the movement of the rotary catch bolt. The action of this long armed lever is much more effective than that of the very short levers used hitherto in electric

catches. The rotary catch bolt is also arranged in such a manner that it permits the locking bolt being disengaged or not accordingly as the said locking bolt is partly or completely in engagement with the notch of the catch bolt.

The construction and operation of this lock will now be described with reference to the accompanying drawings, which show as an example a lock particularly adapted for a carriage door.

Figure 1 is a front elevation of the lock and the catch, the covering plate having been removed. Fig. 2 is a horizontal section on line 2—2 of Fig. 1. Fig. 3 is a side elevation of the electrically controlled catch. Fig. 4 is a vertical section through the catch on line 4—4 of Fig. 2. Fig. 5 is a rear elevation of the catch. Fig. 6 is a vertical section through the lock on line 6—6 of Fig. 1. Figs. 7 and 8 show a detail in vertical section and front elevation respectively. Fig. 9 is a section through the rotary catch bolt, and Fig. 10 is a section through a modification of this catch bolt, especially applicable to locks for doors of rooms or the like.

The catch comprises a box A containing a rotary catch bolt *a* turning on a vertical pivot *b*. The bolt is cut away to form a right angled notch in which the locking bolt engages more or less according to circumstances. The pivot *b* of this catch bolt *a* is so situated relatively to the aforesaid notch that when the locking bolt is only partly engaged in the latter, as is shown in Fig. 2, resting against the plane surface *c*, the catch bolt can turn, but if the locking bolt extends right into the notch as shown in dotted lines in Fig. 2, the catch bolt cannot turn because the pressure exerted on the surface *c* both to the right and to the left of the pivot is virtually the same. In this position of the parts, therefore, the lock cannot be opened by electrical control. The latter is due to the following parts:—At its lower end the catch bolt carries an arm *d* which is engaged in a claw *e* carried by a lever *f* turning on a pivot *g*. The other end of this lever is normally retained by the armature *h* of an electromagnet B. When a person within the carriage, or the driver, transmits a current through the magnet from an accumulator, for example, by pushing a switch button, the armature *h* is attracted, the lever *f* is disengaged, and the catch bolt *a* can be turned. If, at this moment, the locking



bolt, partially engaged in the notch as shown in Fig. 2, exerts a sufficient pressure upon the surface *c* of the catch bolt in the direction of the arrow X, the outer edge of the catch bolt will yield and assume an inclined position so that as the pressure continues the door may be forced open, the inclined plane of the surface *c* causing the locking bolt *i* to be forced inward. If the locking bolt extended completely into the notch it would have been impossible to turn the catch bolt, and the transmission of the electric current would not have enabled the door to be opened. A spring *d'* brings back the catch bolt and the lever *f* to their normal positions.

The lock, of which the parts are protected by a casing C, is fixed on the door. The locking bolt *i* may be moved by a lever *j* having a handle *j'* within the carriage, or by means of a key adapted to engage a notch *k* in the bolt. This key may be adapted to be operated solely from without the carriage. The locking bolt has at its upper part two notches in either of which may engage a bolt *m* subject to the action of the spring *n*, and serving as a stop. These notches correspond with the two positions of the locking bolt brought about by a single turn of the key or by a double turn respectively. A spiral spring *p* acting on the bolt keeps it in the position corresponding with one turn of the key, the action of the spring being limited by the stop *p'*.

In order to close the door it is only necessary to push it firmly; the locking bolt then slides upon an inclined plane *q* formed in the box of the catch and upon the convex surface of the catch bolt. It is thus pushed inward, to be returned again by the spring *p* so that it engages in the notch of the bolt *a*. It is then possible, if desired, to push the locking bolt still farther into the notch of the catch bolt either by the key or the lever *j*, and thus to render the electric control inoperative.

A cam *u*, which can be operated solely by a person within the carriage by means of a key, determines the putting out of operation of the whole mechanism, so that the door cannot be opened either from within or from without. The cam *u* has two flat surfaces *u'* *u''* against either of which a spring *v* is adapted to bear, so as to prevent the cam from moving. Fixed to the cam is a piece *y* adapted to be turned by a key so that the cam is turned until it engages the stop *z*; the latter position of the cam is shown in dotted lines in Fig. 1, and prevents the movement of the lever *j* and therefore of the bolt *i*.

On the side of the casing C there is an arm *r* which determines the automatic opening of the door when an electric current is transmitted through the electromagnet B. This arm *r* moves in a groove *s* under the action of a strong spiral spring *r'*. When the door is

closed, the arm *r* abuts against the end of a cavity *t* in the box A of the catch, the spring *r'* being then under strong tension. The door being closed, the locking bolt *i* is engaged in the catch bolt. If the locking bolt is in the half-shot position, that is to say in semi-engagement with the catch bolt *a*, when an electric current is passed through the magnet B the catch bolt will be liberated in the manner already described and the locking bolt *i* will be disengaged on the catch bolt owing to the pressure produced by the action of spring *r'* exerted through the arm *r* against the bottom of the cavity *t* in the catch box.

This carriage lock does not require interior and exterior handles which project as in the ordinary carriages, since it is only necessary to provide an electric push button within the carriage or beside the driver to determine the opening of the door. Thus it is not necessary to soil one's hands, although if required the handle *j'* may be used. As already explained, this handle also serves as a safety handle, since when it is pushed to the end of its stroke the locking bolt is completely engaged in the notch of the catch bolt so that the carriage cannot be opened from outside by a stranger.

In the lock which has just been described, the catch bolt has its pivot between the front and rear ends of the notch for the purposes explained.

When the lock is to be modified for a stationary door which must be opened from a distance, such as a gate, the catch bolt may have the form shown in Fig. 10, that is to say the pivot *b* is behind the inner end of the notch.

Having thus described the nature of said invention, and the best means we know of carrying the same into practical effect, we claim:—

1. An electrically controlled lock including a rotary catch bolt, a pivot upon which said catch bolt turns, said catch bolt having a face *c*, said pivot being between the front and rear ends of said face, and a locking bolt adapted to engage said face to a greater or less extent so as to prevent or permit a rotation of the catch bolt.

2. An electrically controlled lock, comprising an electromagnet, means for transmitting electric current through the said magnet, a rotary catch bolt, a pivot upon which the said bolt turns, a notch in the said bolt, the relative position of the said pivot and the said notch being such that the pivot is between the front and rear ends of the said notch, a locking bolt adapted to engage in the said notch to a greater or less extent, an arm on the said catch bolt, a lever adapted to engage the said arm at one end, and an armature to the said electromagnet adapted to engage the other end of the said lever.



3. An electrically controlled lock, comprising an electromagnet, means for transmitting an electric current through the said magnet, a rotary catch bolt, a pivot upon which the said bolt turns, a notch in the said bolt, the relative position of the said pivot and said notch being such that the pivot is between the front and the rear ends of said notch, a locking bolt adapted to be engaged in the said notch, an arm on the said catch bolt, a lever engaging the said arm at one end, and an armature to the said electromagnet adapted to engage the other end of the said lever.

4. An electrically controlled lock, comprising an electromagnet, means for transmitting an electric current through the said magnet, a rotary catch bolt, a lever engaging the said catch bolt at one end, an armature to the said electromagnet adapted to engage the other end of the said lever, a locking bolt, a notch in the said catch bolt with which the said locking bolt is adapted to engage to a greater or less extent, a pivot on which the said catch bolt turns and situated between the ends of the said notch, a pivoted arm carried by one part of the lock, a spring adapted to urge the said arm against the other part of the lock in such a manner that when the said locking bolt is partly engaged in the said notch and the said electromagnet is energized the said arm pushes open the lock.

5. An electrically controlled lock comprising an electromagnet, means for transmitting an electric current through the said magnet,

a rotary catch bolt, a locking bolt, a notch in the said catch bolt with which the said locking bolt is adapted to engage to a greater or less extent, means for determining the greater and the less engagement of the locking bolt with the said notch, a lever engaging the said catch bolt at one end, and an armature to the said electromagnet adapted to engage said lever at its other end.

6. An electrically controlled lock comprising an electromagnet, means for transmitting an electric current through the said magnet, a rotary catch bolt, a locking bolt, a notch in the said catch bolt with which the said locking bolt is adapted to engage to a greater or less extent, means for determining the greater and the less engagement of the locking bolt with the said notch, a lever engaging the said catch bolt at one end, an armature to the said electromagnet adapted to engage said lever at its other end, a pivoted cam, a spring adapted to hold the said cam in either of two positions, a key adapted to turn the said cam into a position in which it engages the said lever connected with the locking bolt.

In witness whereof, we have hereunto signed our names in the presence of two subscribing witnesses.

ALEXANDRE ARMEL.  
CHARLES MARIE LEGRAND.

Witnesses:

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GABRIEL BELLARD.