D. M. TULLOCH AND W. BODGE.

LOCK.

APPLICATION FILED NOV. 9, 1920.

1,417,430. **Patented May 23, 1922.**

Fig. 1.

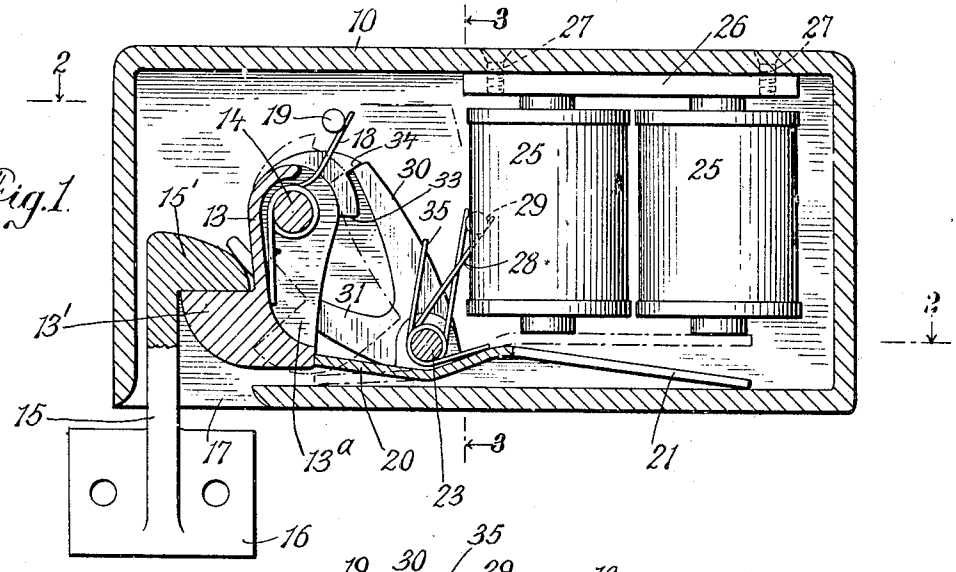


Fig. 2.

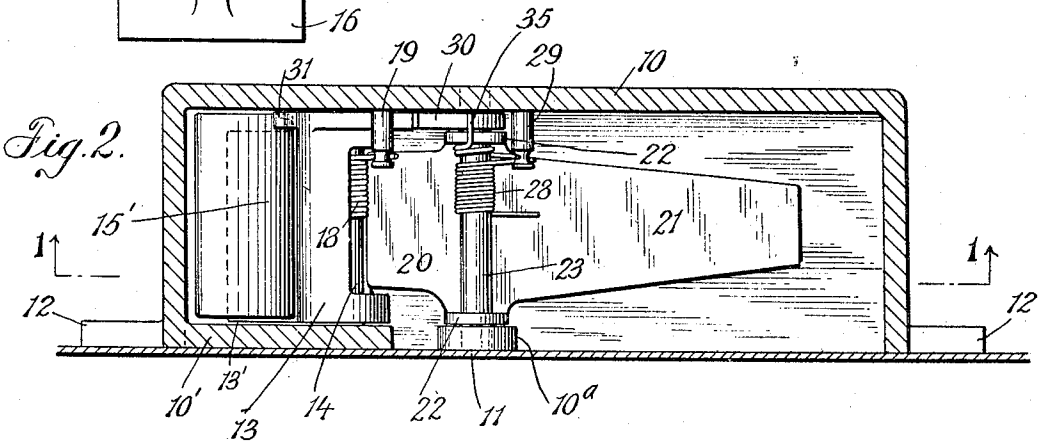


Fig. 3.

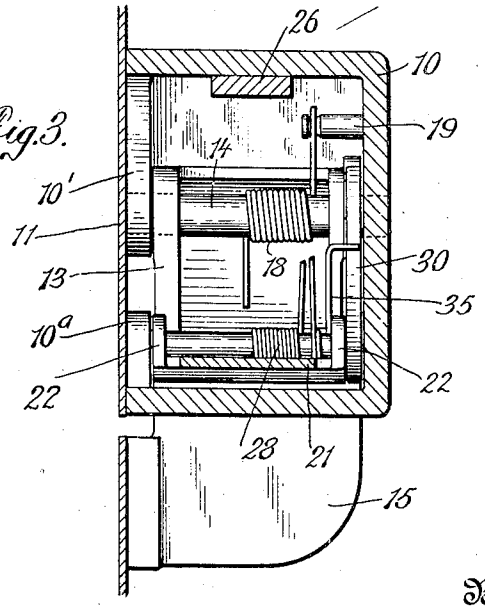
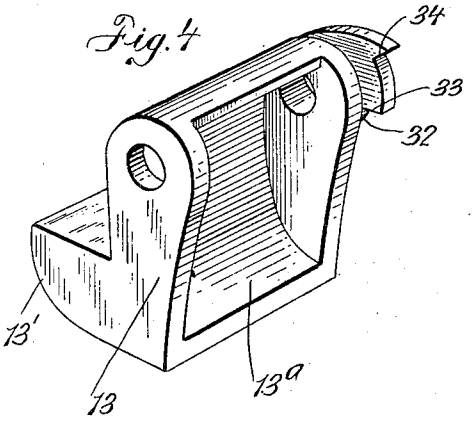


Fig. 4.



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UNITED STATES PATENT OFFICE.

DAVID M. TULLOCH, OF DUNELLEN, AND WILLIAM BODGE, OF NUTLEY, NEW JERSEY, ASSIGNORS, BY MESNE ASSIGNMENTS, TO BERTHA L. ARMSTRONG, OF DUNELLEN, NEW JERSEY.

LOCK.

1,417,430. Specification of Letters Patent. Patented May 23, 1922.

Application filed November 9, 1920. Serial No. 422,807.

To all whom it may concern:

Be it known that we, DAVID M. TULLOCH, and WILLIAM BODGE, both citizens of the United States, residing, respectively, at Dunellen, county of Middlesex, State of New Jersey, and Nutley, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Locks, of which the following is a specification.

This invention relates generally to locks, having more particular reference to an electrically releasable lock, the release of which may be effected by the closing of a circuit at any desired point therein.

The invention has for an object to provide a lock of this type characterized by simplicity and cheapness of construction, and by relatively great strength in proportion to its weight.

A further object is to provide a simple form of automatic device for holding the movable locking element in released position after the same has been withdrawn from engagement with the fixed locking element and until these parts are again brought together, so as to avoid unnecessary jarring or straining of any of the parts of the lock, or of the members locked together thereby.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

Fig. 1 of the drawings is a longitudinal vertical sectionel view of a lock constructed according to the invention, this view being taken on the line 1—1 of Fig. 2.

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1.

Fig. 3 is a transverse section on the line 3—3 of Fig. 1.

Fig. 4 is a detail perspective view of the latch.

Referring now to the drawings 10 indicates the casing of the improved lock which may be rectangular shape as shown. As here shown the casing has one face thereof open, this face being closed by the attachment of the casing to the part by which it is carried, for instance the hinged engine hood of an automobile, a portion of such a hood being indicated at 11, the casing being provided at opposite ends with lugs 12 suitably perforated to receive rivets or other fastening means.

Pivotally mounted in this casing 10, near one end thereof is a hooked latch 13 which is in the form of an arm pivoted at one end and having a lateral offset 13′ at its opposite end. This latch may be pivoted on a pin 14 fixed in and extending transversely of the casing 10, a lug 10′ extending partially across the said open face of the casing to receive one end of the pin, the latch extending substantially the full width of the interior of the casing. This latch is adapted to take under the hooked end 15′ of a fixed bolt 15 adapted to be secured in the present instance to a part of the automobile frame, the bolt being here shown as projecting integrally from a plate 16 adapted to be bolted or otherwise secured in place. An opening 17 is provided in one of the edge walls of the casing to permit of insertion and withdrawal of the bolt.

The latch arm 13 may be hollowed out or recessed on one side as at 13ª, this recess serving both to lighten the arm and to accomodate a spring 18 which normally urges the latch toward engaging position with the bolt 15, the spring 18 being coiled around the pin 14 and bearing at one end on the arm 13 and at its opposite end against a stud 19 fixed in the casing wall.

The contacting faces of the latch 13 and bolt 15 are so arranged that when the hood 11 is lifted, or the other parts to which the lock may be applied are separated, the bolt end 15′ will act as a cam on the latch end 13′ and swing the latch on its pivot pin 14 to one side and allow the bolt to be withdrawn, an electrically controlled holding member, or abutment member preventing movement of the latch when the lock is operating.

The holding member which has been devised to act in conjunction with the latch comprises a lever fulcrumed between its ends, one arm 20 of the lever being adapted to project behind the end of the latch 13 while the opposite arm 21 constitutes the armature of an electro-magnet. This lever may be conveniently made from a single piece of metal with upturned ears 22 formed thereon whereby it is fulcrumed on a pin 23 fixed in, and extending transversely of, the casing 10, a second lug 10ª being formed on the open side of the casing to receive one end of this pin. When in locking position the latch arm 13 and lever arm 20 extend sub-

stantially at right angles to one another and the lever arm lies approximately in a line extending between its pivot point and its point of engagement with the latch, so that any pressure tending to swing the latch to unlocking position acts as a practically direct thrust endwise against this arm 20 and onto the pin 23.

As previously stated the lever arm 21 acts as the armature for the releasing electro-magnet which may be of any well known type, the one here shown comprising a pair of coils 25 carried on a metal bar 26 secured as by the screws 27 to one of the edge walls of the casing 10, it being understood of course that an electro-magnet comprising only a single coil may be employed if desirable.

To cause the lever to normally assume its locking position with the arm 20 engaging behind the latch 13, any suitably arranged spring device may be employed, a spring 28 being here shown as coiled around the pin 23 with one arm bearing on the armature arm 21 of the lever, and its opposite end held by a stud 29 projecting from the wall of the casing 10.

In connection with the improved lock means are preferably provided for retaining the latch in its retracted, or releasing, position after withdrawal of the bolt and until the latter again enters the casing, this means being automatically rendered inoperative when the bolt re-enters the casing. As here shown a forked member consisting of two prongs or arms 30 and 31 is pivoted at its apex upon the pin 23 between the lever ear 22 and the adjacent closed wall of the casing 10, the two arms projecting on opposite sides of the pin 14 on which the latch is pivoted, and close to one edge of the latter. The arm 30 acts as a pawl or detent to hold the latch drawn back and the arm 31 acts as an operating lever to release the detent arm 30.

Formed on the pivoted end of the latch 13, at the side thereof adjacent which the fork 30, 31 is located, is a hub-like projection 32 which lies in a common plane with the said fork, this projection presenting a radially disposed shoulder 33 with which the end of the arm is adapted to engage to hold the latch in its retracted position. This projection may also have a second shoulder 34 formed thereon and projecting radially beyond the shoulder 33 to limit the forward movement of the latch. The arm 31 is adapted to be operated by the bolt 15 whose hooked end projects at one side beyond the latch into registry with the said arm. The fork 30, 31 is normally urged in a direction to press the arm 30 against the hub-like projection 32 on the latch, suitable means for this purpose being provided, such as the spring 35 coiled around the pin 23 and bearing at one end on the arm 30 and at its opposite end on the stud 29.

The manner of use of the lock will be readily understood from the foregoing description, the parts assuming the position shown in full lines when locked, disengaging movement of the bolt from the latch being prevented by the lever arm 20, as will be apparent. When the magnet is energized the lever arm is swung away from engagement with the latch and the bolt and latch may then be pulled apart, by reason of the cam action above referred to. As the bolt moves out of the casing it swings the latch to the position shown in dot and dash lines in Fig. 1, the shoulder 33 moving past the end of arm 30, which moves thereunder under the influence of spring 35 and prevents the latch from swinging forward again. When the bolt is again entered into the casing it first moves past the hooked end 13′ of latch and then engages the arm 31 which lifts the detent arm 30 from the shoulder 33 and allows the latch to swing forward, under the influence of spring 18, with its hooked end engaging under the hooked end 15′ of the bolt, the shoulder 34 finally engaging the arm 30 and limiting the forward movement of the latch and preventing the laterally directed blow or thrust which would otherwise occur between the member on which the casing 10 is mounted and that on which the bolt 15 is carried.

It is to be understood, of course, that the casing may be carried on the fixed member, and the bolt on the movable member, the application to an automobile hood in the manner set forth being merely indicative of one use of the invention.

Having thus described our invention what we claim as new and desire to protect by Letters Patent of the United States is as follows:—

1. In a lock, a bolt, a latch adapted to interlock with said bolt, a device holding said latch in locking position with respect to said bolt, means for releasing said device to permit the retraction of said latch, and means adapted when said latch is retracted to automatically hold said latch in retracted position, said means being adapted to automatically release the latch from its retracted position when said bolt is in interlocking position with respect to said latch.

2. In a lock, a latch including a hinged arm, an electro-magnet, a lever fulcrumed between its ends, one of the arms of the lever constituting the armature of the electro-magnet, the other arm of the lever being adapted to engage and hold the latch in locking position.

3. In a lock, a latch including a hinged arm, an electro-magnet, a lever fulcrumed between its ends, one of the arms of the lever constituting the armature of the elec-

tro-magnet, the other arm of the lever being adapted to engage and hold the latch in locking position; said last arm of the lever lying substantially in a line extending from its point of engagement with the latch to the pivot point of the lever.

4. In a lock, a pivotally mounted latch, a bolt cooperating with said latch, a pivotally mounted device holding said latch in locking position, a forked member hingedly mounted on the pivot of said locking device, one arm of the forked member being adapted to engage a shoulder formed on the latch to hold the latter in a retracted position, the other arm being adapted to be engaged by the said bolt to release the first arm from the shoulder formed on said latch.

5. In a lock, a latch, a releasing electro-magnet, a lever fulcrumed between its ends and having one end forming an abutment for said latch, and its other end forming an armature for said electro-magnet.

6. In a lock, a latch, a releasing electro-magnet, a lever fulcrumed between its ends and having one end forming an abutment for said latch, and its other end forming an armature for said electro-magnet, the said lever and latch being arranged to transmit the thrust of the latch along the line of the lever to its fulcrum point.

7. In a lock, a spring-pressed latch including a hinged arm, a part co-operating therewith to hold the locked members together, a releasable abutment member for said latch, a hub-like projection on said latch arm formed to present a shoulder, a forked member pivotally mounted adjacent its crotch, one arm of the fork being adapted to engage the said shoulder when the latch is retracted to hold the latch in retracted position, the other arm being adapted to be engaged by the said co-operating part to release the first arm from the said shoulder when the said part is again brought into juxtaposition to the latch.

8. In a lock, a spring-pressed latch including a hinged arm, a part co-operating therewith to hold the locked member together, a releasable abutment member for said latch, a hub-like projection on said latch arm formed to present a shoulder, a forked member pivotally mounted adjacent its crotch, one arm of the fork being adapted to engage the said shoulder when the latch is retracted to hold the latch in retracted position, the other arm being adapted to be engaged by the said co-operating part to release the first arm from the said shoulder when the said part is again brought into juxtaposition to the latch, the said projection having a second shoulder adapted to engage the first mentioned arm of the forked member to limit the movement of the latch to locking position.

Signed at New York, in the county of New York and State of New York, this 5th day of November, A. D. 1920.

DAVID M. TULLOCH.
WILLIAM BODGE.