H. G. VOIGHT.

LOCK MECHANISM.

APPLICATION FILED APR. 19, 1913.

1,093,810.

Patented Apr. 21, 1914.

3 SHEETS—SHEET 1.

Fig. 1.

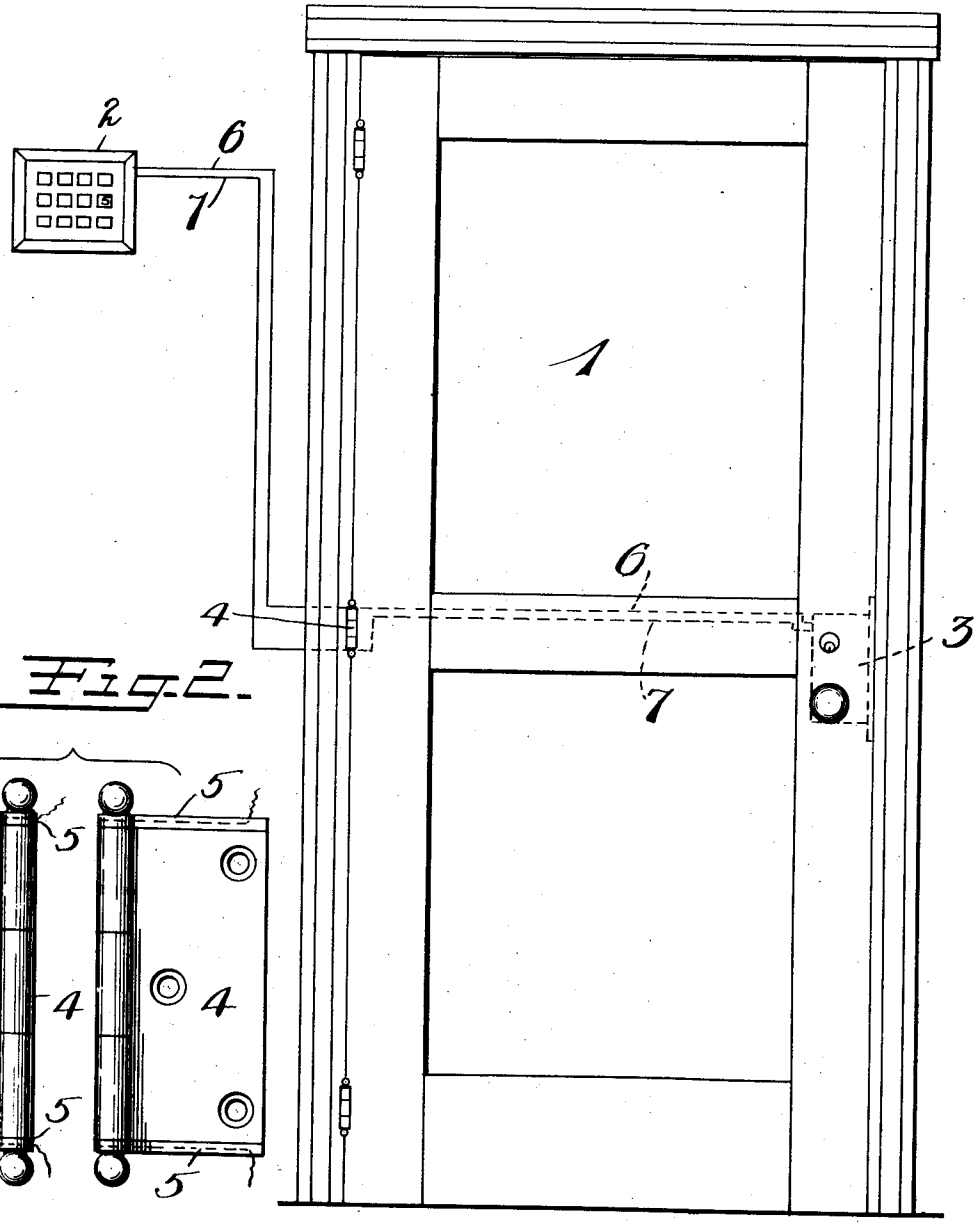


Fig. 2.

Witnesses:

Chas. A. Peard

Ida M. Kinzikes.

Inventor

H. G. VOIGHT

By his Attorneys

Bartlett, Brownell & Mitchell

H. G. VOIGHT.

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3 SHEETS—SHEET 2.

Fig. 4.

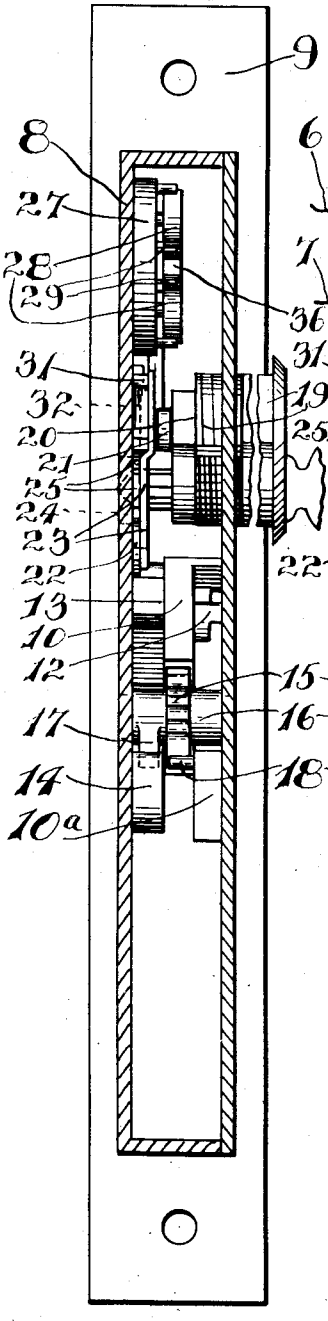
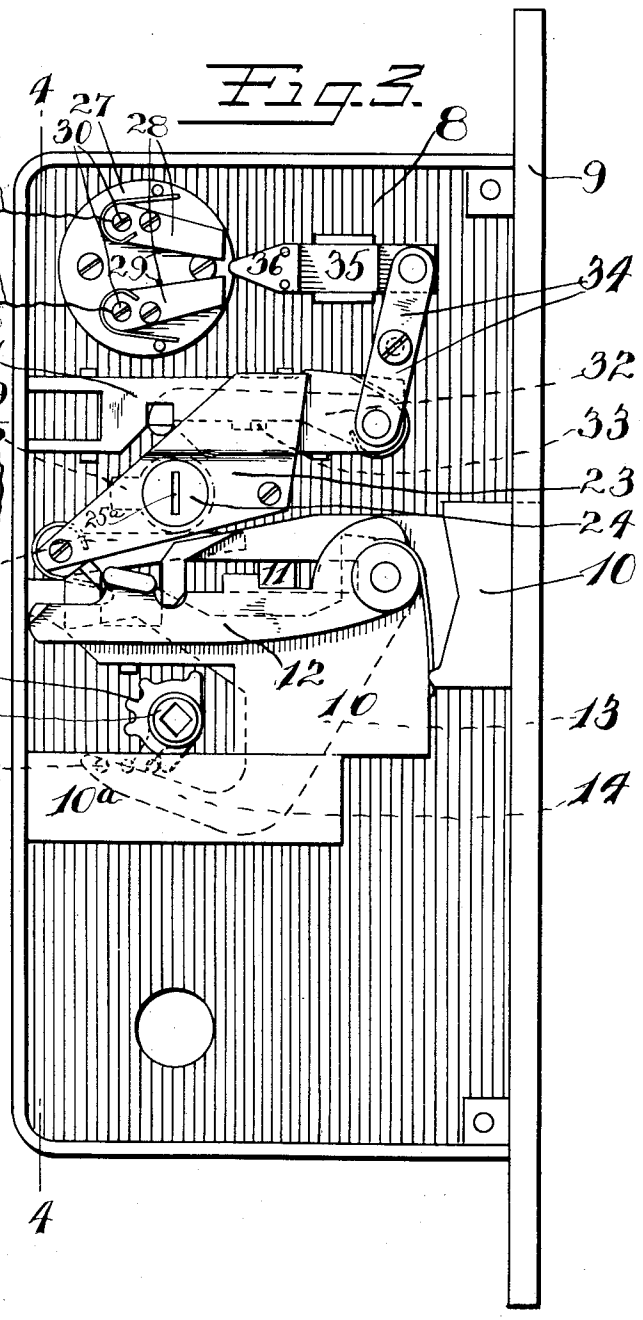


Fig. 3.



Witnesses:

Chas. A. Pond

Ida M. Hungiker

Inventor

H. G. VOIGHT

By his Attorneys

Bartlett, Morrill & Mitchell

H. G. VOIGHT.

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3 SHEETS—SHEET 3.

Fig. 11.

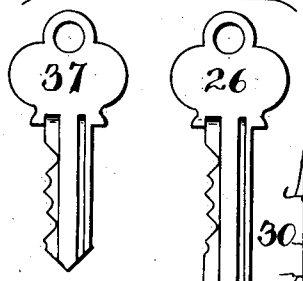


Fig. 5.

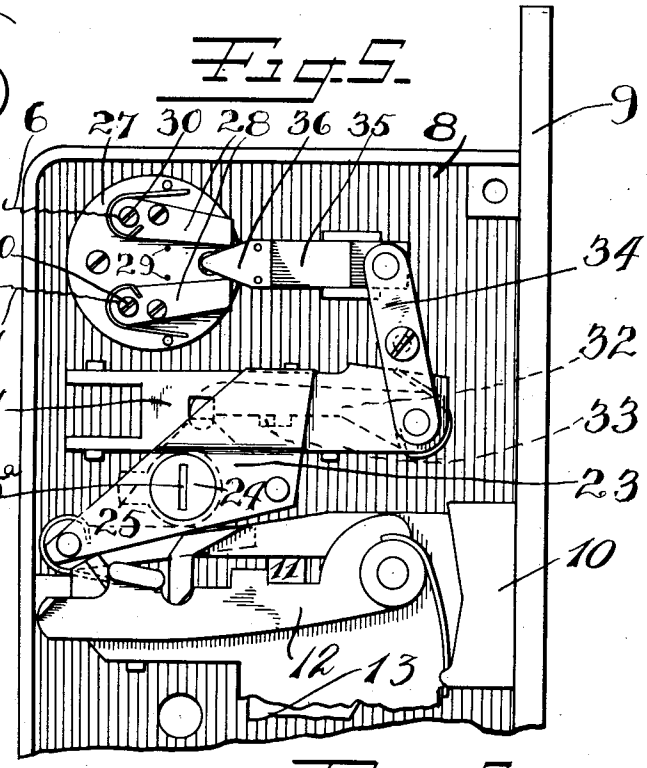


Fig. 6.

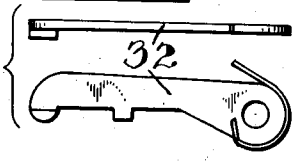


Fig. 7.

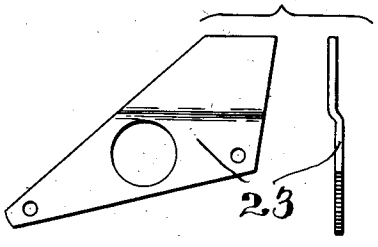


Fig. 8.

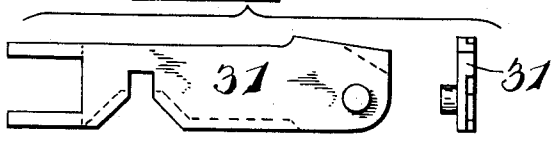


Fig. 9.

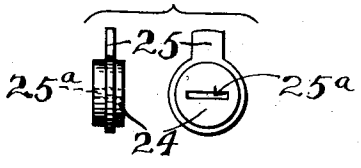
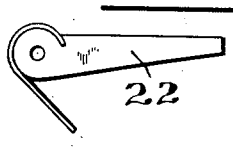


Fig. 10.



Witnesses:

Chas. A. Reynolds

Isaac McNunziker.

Inventor

H. G. VOIGHT

By his Attorneys

Bartlett, Brownell & Mitchell

UNITED STATES PATENT OFFICE.

HENRY G. VOIGHT, OF NEW BRITAIN, CONNECTICUT.

LOCK MECHANISM.

1,093,810. Specification of Letters Patent. Patented Apr. 21, 1914.

Application filed April 19, 1913. Serial No. 762,213.

To all whom it may concern:

Be it known that I, HENRY G. VOIGHT, citizen of the United States, residing at New Britain, Hartford county, State of Connecticut, have invented certain new and useful Improvements in Lock Mechanism, of which the following is a full, clear, and exact description.

This invention relates to lock mechanism and is designed to provide a lock mechanism adapted to electrically indicate by suitable annunciators or signals when a bolt has been retracted and again projected by means of mechanism controlled by a certain key. A practical application of such a structure may be seen in the case of the locks on corridor doors of hotels. It is frequently desirable to keep a record of the movements of the maids in such cases and of the time which they occupy in attending to each room in the hotel. By such a mechanism as I have provided, the person in charge of each floor or of a series of floors may, by means of suitable electrically controlled indicating mechanism, be informed and record the time elapsing between the retraction of a bolt by means of a particular key and the subsequent projection of said bolt, the elapsing time indicating the time spent by the particular maid in caring for the particular room designated by the electrically controlled signaling or annunciator system. To this end I have provided the mechanism described in detail in the following specification, which mechanism is shown as operating in conjunction with a standard lock of the type used in connection with the corridor doors of hoteds, and a preferable embodiment of which is illustrated in the accompanying drawings forming part of this specification and in which,

Figure 1 is a view in elevation of a door and casing showing diagrammatically the electrical connections of an indicator or annunciator operating in conjunction therewith. Fig. 2 shows views in side and end elevation of a door hinge by means of which the connection between the lock and the electrically controlled annunciator is maintained at all times. Fig. 3 is a view in elevation of the interior of a lock casing embodying lock mechanism constructed in accordance with the present invention, the electric circuit controlling mechanism being shown in non-operated or circuit-open position. Fig. 4 is a vertical section through the lock casing on the line 4—4 of Fig. 3. Fig. 5 is a fragmentary view in elevation of the interior of the lock casing, the electric controlling mechanism being shown in circuit closing position with the dead bolt retracted. Figs. 6–10 inclusive show details of the lock mechanism. Fig. 11 illustrates two of the keys used in the operation of the lock, including the special key for operating the electric controlling mechanism thereof.

Referring to the drawings by numerals, 1 indicates a door to which a lock mechanism embodying my present invention may be applied, and 2 an electric annunciator or other signaling system of any standard form.

3 designates generically the lock casing as applied to said door, and 4 one of the hinges of the door used as a means of electrically connecting the lock and the annunciator. Such a hinge is preferably provided with insulated portions 5 extending transversely of its leaves.

6 and 7 represent conducting wires leading from a circuit closer contained in the lock case 3 to and through the insulated portions of the hinge and thence to the appropriate terminals of the electric signaling device 2. The circuit closer to which these wires are connected is operated by a particular key being inserted in the lock and being operated to retract the dead bolt, this operating to close the circuit and operate the appropriate indicating mechanism. As long as the bolt remains retracted, the circuit through said circuit closer will be closed, but when the door after being initially opened, is closed, and the dead bolt projected, the circuit through said circuit closer will be broken and the indicating mechanism appropriately affected thereby, or vice versa.

I will now describe a lock of standard construction with which my form of electric signal controlling mechanism may be used. 8 indicates the lock casing and 9 the face plate thereof. In this casing is mounted a dead bolt 10 suitably guided therein and of suitable construction, this dead bolt being provided preferably with primary and secondary tumbler mechanism gated as usual and coöperating therewith and with a fixed fence 11 carried by the lock case. 12 indicates a tumbler pivotally carried by the dead bolt and forming the primary tumbler mechanism, and 13 a second tumbler posi-

tioned in a different plane and forming the secondary tumbler mechanism and provided with a downward extension terminating in a thumb turn arm 14. 15 designates a toothed segment carried on the hub 16 of a thumb turn (not shown) and 17 designates an arm likewise carried by said hub and arranged to coöperate with the arm 14 of the secondary tumbler mechanism. The segment 15 cooperates with rack pins 18 carried by the lower end 10ª of the dead bolt structure. 19 designates a cylinder lock mechanism having a primary relatively fixed roll-back 20 designed to coöperate with the primary latch mechanism and project and retract the dead bolt 10. 21 designates a second and relatively movable roll-back positioned in the rear of and carried by the first, said second roll-back being normally inoperatively positioned by a spring but being arranged to be moved into the plane of the secondary tumbler mechanism by the end of a certain key somewhat longer than the other key or keys of the series so that this longer key may rotate both roll-backs to operate the primary and secondary tumbler mechanisms hereinbefore referred to and retract the dead bolt from the outside when it has been projected from the inside by the thumb turn mechanism. This thumb turn mechanism operates both primary and secondary tumbler mechanisms when it is moved to project the bolt so that said bolt may not be retracted by a key which operates only the primary tumbler mechanism. These parts of the lock mechanism I have only described briefly inasmuch as, specifically, they are not essential to the operation of the present invention, but illustrate a lock of the type with which the invention may be used, substantially the same structures being shown and described in detail in my co-pending applications Serial Nos. 759,183 and 755,101.

The electric signal-controlling mechanism is adapted to be operated through one particular key which is the longest key of the series of keys employed in conjunction with the lock so that this key only may operate the circuit controlling mechanism. To this end and in alinement with the cylinder lock 19 I provide a plate 23 suitably secured to the lock case and serving as a bearing for the hub 24 of a third roll-back 25 positioned in alinement with the first and second roll-backs of the lock mechanism and in rear thereof, this hub 24 being provided with a slot 25ª therein to receive a longitudinal axial end of the particular and longest key, as 26, (Fig. 11) of the series of keys. This third roll-back is mounted independently of the first and second roll-backs but rotates therewith when the particular key 26 is inserted so that the first and second roll-backs are rotated to operate the tumbler mechanism of the dead bolt and so that the third roll-back is rotated to accomplish the circuit opening and closing operation.

27 designates a disk or plate fixedly secured to the lock casing and carrying two pivoted spring-pressed contact fingers 28 which are maintained out of engagement by stop pins 29. These spring-pressed fingers are suitably insulated from the lock case and are provided with suitable binding posts 30 to which the wires 6 and 7 of the electric signaling device are connected and from which they extend to said device as heretofore described. Of course, the stop pins 29 are also arranged to insulate the fingers 28 from the lock case.

31 designates a reciprocating slide suitably guided in the lock case. The lower edge of this slide 31 is notched and carries on its under side a spring-pressed latch 32 gated to coöperate with a fixed post 33 and having its end projecting to the notched edge of the slide 31. This "slide" and its latch are in line with the third roll-back 25. The reciprocating movement of this slide 31 is utilized to make and break the circuit through the spring fingers 28. A walking beam 34 connects the end of this slide with a reciprocating contact member 35 whose forward end is provided with a contact head 36 insulated from the body of the contact-member and designed to enter between and engage the opposing edges of the spring fingers 28 to complete the circuit through said fingers and through the wires 6 and 7 to the annunciator. It will be, of course, understood that a suitable source of electric current will be provided in conjunction with the electric signaling device so that when the contact head 36 engages the spring fingers 28, the circuit will be completed and the signal operated.

Assuming that the dead bolt has been projected, as by a guest on leaving his room, through a short key 37 operating the primary tumbler mechanism, and assuming that the electric signal controlling parts of the lock remain in the position shown in Fig. 3: The person utilizing the longest or special key 26, as the maid, then inserts said key and operates the tumbler mechanism of the dead bolt to retract the same. This long key 26 will at the same time engage in the slot in the hub 24 of the third roll-back and will cause the arm of the roll-back 25 thereof to operate the latch 32 and move the slide 31 forwardly from the position shown in Fig. 3 to that shown in Fig. 5. This through the walking beam 34 will move the contact member 35 rearwardly to the position shown in Fig. 5, the contact head 36 entering between and engaging the opposing edges of the spring fingers 28 and completing the electric circuit through said spring fingers and through the wires 6 and 7 to the electric

signaling device, whereupon a signal will be operated showing that the maid, for instance, has entered the room. When the maid finishes her work and leaves the room, she will project the dead bolt through the long key 26, which will, of course, operate the ordinary roll-backs of the lock mechanism and will at the same time operate the third roll-back 25, latch 32 and slide 31 to move the contact member 35 from the position shown in Fig. 5 to that shown in Fig. 3, breaking the electric circuit and operating the electric indicator to show that the maid has finished her work and has left the room. I have not shown any specific form of electric indicator as any of the standard types now on the market may be utilized in conjunction with my device, one such type being a drop annunciator having a reset magnet operated by the breaking of the circuit to reset the specific annunciator which has been dropped by the closing of the circuit. The elapsed time between the dropping and the resetting of the specific annunciator drop will indicate the time occupied by the maid in attending to the room.

In order that slot 25ª in the hub 24 of the third roll-back may be properly positioned in line with the key slots of the first two roll-backs and be retained against movement from the position it occupies when the longest key 26 is withdrawn, I provide a spring pressed friction brake 22 pivoted to the under face of the plate 23 and engaged by its spring with the periphery of hub 24.

In illustrating the signal-operating mechanism of the present invention in conjunction with the specific form of lock mechanism, I do not desire it understood that the invention is limited to such combination by any means, for as a matter of fact, it is applicable to various types of locks and may be modified structurally and in relative arrangement of parts within the spirit of the invention and the scope of the appended claims.

What I claim, therefore, and desire to secure by Letters Patent is:

1. In a lock, a locking mechanism in combination with an electric signaling mechanism, said signaling mechanism including a circuit making and breaking device associated with the lock, said locking mechanism including a bolt and means controlled by a plurality of keys, for projecting and retracting said bolt, said plurality of keys including a certain key having a longitudinal end extension and means controlled by said end extension of said certain key and operable by bolt actuating movement of said key to operate said making and breaking device.

2. In a lock, a locking mechanism in combination with an electric signaling mechanism, said signaling mechanism including a circuit making and breaking device associated with the lock, said locking mechanism including a bolt and a controlling tumbler therefor, said tumbler and bolt being operable through a plurality of keys including a certain key having an axial end extension; and means controlled by said end extension of said certain key and operable by bolt actuating movement of said key, to operate said circuit making and breaking device.

3. In a lock, a locking mechanism in combination with an electric signaling mechanism, said signaling mechanism including a circuit making and breaking device associated with the lock, said locking mechanism including a bolt and means controlled by a plurality of keys, for projecting and retracting said bolt, said keys including a certain key having longitudinal end extension, a movable controlling means for said make and break device having at least two circuit controlling positions relative thereto, said controlling means being controlled by said end extension of said certain key and being moved thereby into circuit controlling positions upon bolt actuating movements of said key, and means associated with the lock and coöperating with said controlling means to retain said means in one circuit controlling position until said bolt is again actuated and in the reverse direction by said certain key.

4. In a lock, a locking mechanism, in combination with an electric signaling mechanism, said signaling mechanism including a circuit making and breaking device associated with the lock, said locking mechanism including a bolt and means controlled by a plurality of keys for projecting and retracting said bolt, said keys including a certain key having a longitudinal end extension, movable controlling means for said device having at least two circuit controlling positions relative thereto and positioned for movement into said positions through the end extension of said certain key and upon bolt retracting and projecting movements of said key, and means associated with the lock and coöperating with said movable controlling means to lock said means against movement from one circuit controlling position to the other, until said bolt is again operated through said certain key.

5. In a lock, a locking mechanism in combination with an electric signaling mechanism, said signaling mechanism including a circuit making and breaking device associated with the lock, said locking mechanism including a dead bolt, means, including a plurality of keys for projecting and retracting said bolt, a certain one of said plurality of keys having a longitudinal end extension, controlling means for said make and break device positioned in front of the key-passage, the end extension of said certain

key being arranged to engage and operate said controlling means, and another of said keys being arranged to operate said bolt without operating said controlling means.

6. In a lock, a locking mechanism in combination with an electric signaling mechanism, said signaling mechanism including a circuit making and breaking device associated with the lock, said locking mechanism including a dead bolt, means for projecting and retracting said bolt including a plurality of keys, a certain one of said keys having a longitudinal end extension, controlling means for said make and break device positioned in front of the key-passage and having at least two circuit controlling positions relative to said device, said certain key being arranged to engage and operate said controlling means as well as the bolt, and another of said keys being arranged to operate said bolt without operating said controlling means, and means associated with the lock and coöperating with said controlling means to hold the same in one circuit controlling position until said bolt and controlling means are moved to another circuit controlling position through said certain key.

7. In a lock, a locking mechanism in combination with an electric signaling mechanism, said signaling mechanism including a circuit making and breaking device, said device including a movable circuit making and breaking member and a latch therefor, said locking mechanism including a bolt and means controlled by a plurality of keys, including a certain key having a longitudinal axial end extension for projecting and retracting said bolt, controlling means for said contact member and its latch positioned in front of the key-passage and arranged to be operated by the end extension of said certain key, coincidentally with bolt actuating movement of said key.

8. In a lock, a locking mechanism in combination with an electric signaling mechanism, said signaling mechanism including a circuit making and breaking device associated with the lock, said device embodying a movable contact making and breaking member and a latch therefor, said locking mechanism including a dead bolt, primary and secondary tumbler mechanisms therefor, positioned in different planes and coöperating therewith, primary and secondary tumbler operating means, said primary means being controlled by one of a series of keys, including a certain key having a longitudinal end extension, said secondary means being operable by another key of said series to actuate its tumbler mechanism and said bolt, and means positioned in front of the key-passage and coöperating with said contact member and its latch, said means being controlled and operated through the end extension of said certain key to move said contact member.

9. In a lock, a locking mechanism in combination with an electric signaling mechanism, said signaling mechanism including a circuit making and breaking device associated with the lock, said device embodying a movable contact making and breaking member and a latch therefor, said locking mechanism including a dead bolt, primary and secondary tumbler mechanisms coöperating with said bolt and positioned in different planes, a cylinder lock mechanism embodying a rotatable element controlled and operable by a series of keys, including a certain key having a longitudinal end extension, and provided with an operating member controlled by one key of said series of keys and positioned to rotate in a plane to operate one of said tumbler mechanisms and said bolt, and provided further with a second and relatively movable operating member controlled by another of said series of keys, and positioned by said other key in a plane to operate said other tumbler mechanism and bolt, a thumb turn mechanism operable from the side of the lock opposite said cylinder lock mechanism and adapted to operate both said primary and secondary tumbler mechanisms and said bolt, and a movable operating member positioned in front of said key-passage and coöperating with said contact member and its latch, said member being engaged and moved by the end extension of said certain key, to in turn move said contact member.

HENRY G. VOIGHT.

Witnesses:
GWENDOLINE A. JACKSON,
CHAS. E. RUSSELL.