

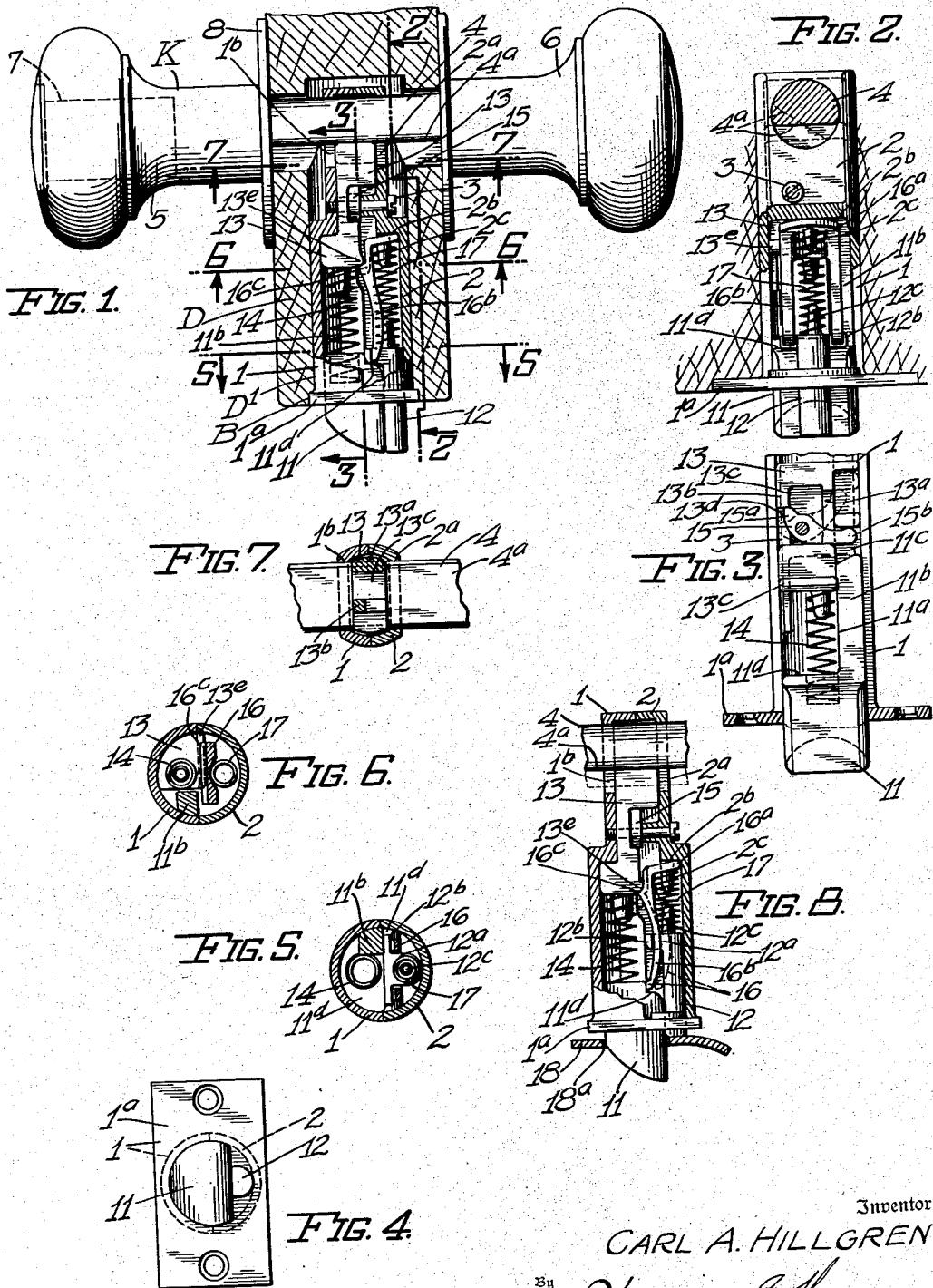
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DOOR LOCK

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DOOR LOCK

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My invention relates to a door lock, and particularly to one having a dead-locking mechanism.

One of the principal objects of this invention is to provide a door lock with the dead-locking mechanism which is particularly simple and economical to manufacture, one having a minimum of simple operating parts, one which is positive in its action, and one which will not readily deteriorate or get out of order.

Another important object of this invention is to provide a simple and economically constructed dogging or dead-locking mechanism, and one which is simple and novel of operation.

An important object also of this invention is to provide a dogging or dead-locking mechanism whereby the outer portion of the main latch bolt may be directly locked against the bolt housing to prevent retraction or inward shifting of the latch bolt, until such dogging or dead-locking mechanism is released.

A further important object of this invention is to provide a novel and simple spring mechanism for urging the auxiliary or dead-locking bolt outwardly from the housing or beyond the door, and also for urging the dogging or dead-locking mechanism into engagement with the main latch bolt to prevent inward shifting of the same.

With these and other objects in view, as will appear hereinafter, I have devised a door lock of this class having certain novel features of construction, combination, and arrangement of parts and portions, as will be hereinafter described in detail, and particularly set forth in the appended claims, reference being had to the accompanying drawing, and to the characters of reference thereon, which form a part of this application, in which:

Fig. 1 is a transverse sectional view of the free edge of a door, showing my lock mounted therein, and the means for operating the same, a portion of the lock housing being shown in section to facilitate the illustration;

Fig. 2 is a sectional view thereof, taken through 2—2 of Fig. 1, and showing a portion of the front casing member broken away to facilitate the illustration;

Fig. 3 is a similar, but fragmentary sectional view thereof, with the section taken through 3—3 of Fig. 1;

Fig. 4 is an outer end elevation thereof;

Figs. 5 and 6 are sectional views thereof taken through 5—5 and 6—6 of Fig. 1;

Fig. 7 is a fragmentary sectional view thereof, taken through 7—7 of Fig. 1; and,

Fig. 8 is a similar but fragmentary sectional view of the lock similar to Fig. 1, but showing the auxiliary latch bolt in a retracted position and held in such position by the keeper for the main latch bolt.

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My door lock is installed, in the conventional manner, at the free edge portion of the door designated D. The lock consists essentially of a latch bolt unit B and an operating unit K.

5 The latch bolt unit B is enclosed in a housing consisting of the main housing member 1 and the housing cover member 2 which are held together by a unitary screw 3. These housing members 1 and 2, when secured together, are 10 cylindrical in shape, and fit into a cylindrical bore D¹ in the edge of the door. This housing may be secured in place by means of screws extending through holes in the plate 1^a at the outer end of the housing 1. If desired, the housing 15 may be held in place only by means of the door spindle 4 extending transversely through the rear portions of both housing members 1 and 2. The cross-section of the spindle 4 is preferably segmental, as shown in Fig. 2, for the purpose to 20 be hereinafter described. The diameter of the spindle is substantially that of transverse holes 1^b and 2^a at the inner ends of the housing members. Thus, the housing is held or secured in position within the door. At the opposite ends 25 of the spindle 4 are secured an outer knob 5 and an inner knob 6. The outer knob 5 being preferably provided with a key lock mechanism 7, shown diagrammatically in Fig. 1. The knobs 30 may be secured in position, if desired, by or against escutcheon plates 8.

Within the housing is reciprocally mounted a main latch bolt 11 and an auxiliary latch bolt 12, the former being shown as positioned near the outer side of the door while the latter is positioned nearer the inner side. The auxiliary latch bolt 12 is preferably semi-circular in cross-section and fits with its flat side against an inner flat side of the main latch bolt 11 which is more than semi-circular in cross-section. Within and 35 at the rear portion of the housing, and immediately behind the main latch bolt 11 is reciprocally mounted the bolt operating member 13. The operative connection with the latch bolt will be hereinafter described. The inner end of this 40 operating member 13 is normally positioned in engagement with the forward flat side 4^a of the segmental spindle 4.

The main latch bolt has a cut-out portion 11^a at its inner end, providing at one side a portion 50 or tongue 11^b which extends backwardly into a cut-out portion 13^a at one side of the operating member 13. Thus, the main latch bolt and the operating member overlap each other.

Within the cut-out portion 11^a is located a 55 compression spring 14 which normally operates the main latch bolt and the operating member urging the former outwardly to its normal latching position, and the latter inwardly against the flat side of the spindle.

60 Within the portion 13^b of the operating mem-

ber 13, which is located along side the cut-out portion 13^a and which extends into the cut-out portion 11^a, is a longitudinal slot 13^c through which extends the screw 3.

A rocker 15 is pivoted to the shank of the screw 3 and may be supported by its opposite ends which rest on flat faces of the walls forming the opposite sides of the slot 13^c. This rocker is shown as having diametrically opposed arms 15^a and 15^b, the former extending into a transverse notch 13^d in the outer wall forming one side of the longitudinal slot. The other and longer arm 15^b extends into a transverse notch 11^c in the tongue or projection 11^b of the main latch bolt. As the operating member 13 is forced outwardly by the rotation of the spindle 4, the shoulder, forming the inner side of the notch 13^d, engages the short arms of the rocker 15 and forces the end of the longer arm 15^b, which is bent backwardly slightly against a corresponding shoulder forming the inner side of a notch 11^c, thereby withdrawing or retracting the bolt.

The auxiliary latch bolt 12 has, at its inner end, a portion 12^a which extends towards the main latch bolt 11, and this portion 12^a has laterally extending or opposed lugs 12^b which when the auxiliary latch bolt is in its outermost position, as shown in Fig. 1, engage a shoulder 11^d at the adjacent side of the latch bolt 11, which shoulder is positioned at the inner end of the locking bolt portion and which is, at all times, located within the housing. At the same side of the main latch bolt is located a dogging member 16 which provides the dead-locking element for my lock. The rear portion of the dogging member has a laterally and slightly angularly extended portion 16^a which is fitted against a shoulder 2^b of the housing member 2, and this end of the dogging member is held in this position by a lug or prong 2^c in the housing member 2. The opposite end portion of the dogging member is bifurcated, as shown best in Fig. 2, and the furcations, designated 16^b, are located at the opposite sides of the auxiliary bolt 12. When the auxiliary bolt 12 is in its retracted position, as shown in Fig. 8, the ends of the furcations engage the shoulder 11^d of the main latch bolt.

The lugs 12^b are located between the furcations and the main latch bolt, as shown in Figs. 1 and 8. When the auxiliary latch bolt is in its outermost position, as shown in Fig. 1, the lugs 12^b hold the ends of the furcations clear of the shoulder 11^d, but when the lugs 12^b are withdrawn inwardly, as shown in Fig. 8, the ends of the furcations are allowed to engage the shoulder 11^d, and thereby prevent retraction or inward shifting of the main latch bolt.

Between the inner end of the auxiliary latch bolt 12, and the outer side of the lateral extension 16^a of the dogging member, is positioned a compression spring 17, this spring being located by a lug or prong 12^c at the inner end of the auxiliary latch bolt and the lug or prong 2^c on the cover member 2, referred to above. The compression spring 17 performs two functions, namely, that of urging the auxiliary latch bolt 12 outwardly and of causing the dogging member 16 to be rocked about its inner end, urging the free ends of the furcations toward the latch bolt 11 and behind the shoulder 11^d thereof. For the purpose of causing rocking about such lateral extension 16^a, the latter portion is positioned at an angle, as described above and as shown best in Figs. 1 and 8.

When the door is closed, the main latch bolt 75

11 is forced inwardly by the keeper 18, carrying the auxiliary latch bolt 12 to the inward position of the former. When the end of the main latch bolt is located opposite the bolt receiving opening 18^a in the keeper, the bolt is forced to its extended position by the main spring 14, but the auxiliary latch bolt is held in its inward position, as shown in Fig. 8. When in the latter position, the outer or free ends of the furcations 16^b of the dogging member 16 are permitted to be shifted to the solid line position shown in Fig. 8, by the spring 17. This prevents the inward shifting of the main latch bolt 11 from the outer end, such as by means which may be employed by an unauthorized person attempting to enter the room behind the closed door. If, however, the spindle 4 is rotated by either of the knobs, or the lock 7 in the outer knob 5, the operating member 13 is forced outwardly. The initial outward movement of the operating member causes a ridge 13^c, at the outer end of such operating member, to engage an inclined face 16^c at the adjacent side and near the inner end of the dogging member, causing the dogging member to be rocked about its pivot or about the end of the laterally extended portion 16^a, against the action of the spring 17, freeing the ends of the furcations from the shoulder 11^d. Further rotating effort on the part of either of the knobs will cause the main latch bolt 11 to be drawn freely inwardly by reason of the rotation of the rocker 15, mentioned above.

Though I have shown and described a particular construction, combination, and arrangement of parts and portions, I do not wish to be limited to the same, but desire to include in the scope of my invention the construction, combination, and arrangement substantially as set forth in the appended claims.

I claim:

1. In a door lock, a latch housing, a main latch member movably mounted therein, a retractor, an auxiliary latch member associated with the main latch member and adapted to be retracted therewith and also to be shifted inwardly independently thereof, a dogging member pivoted within the inner end of the housing adapted to be shifted by the movement of the auxiliary latch member, with its free end into dogging engagement with the inner end of the main latch member, an operating member slidably mounted at the inner end of the housing and shiftable by the retractor, and a rocker pivotally mounted intermediate its ends within and on the housing and engageable at its opposite ends by the main latch member and the operating member, said operating member engaging the dogging member whereby the free end of the latter is shifted from the path of movement of the main latch member to allow retraction of the latter.

2. In a door lock, a latch housing, a main latch member movably mounted therein, a retractor, an auxiliary latch member associated with the main latch member and adapted to be retracted therewith and also to be shifted inwardly independently thereof, a dogging member pivoted within the inner end of the housing adapted to be shifted, by the movement of the auxiliary latch member, with its free end into dogging engagement with the inner end of the main latch member, an operating member slidably mounted at the inner end of the housing and shiftable by the retractor, and a rocker pivotally mounted intermediate its ends within and on the housing and engageable at its opposite ends by the main latch

member and the operating member, the outer end of the operating member engaging the dogging member near its pivoted end whereby the free end of the latter is shifted from the path of movement of the main latch member to allow retraction of the latter.

3. In a door lock, a latch housing, a main latch member movably mounted therein, a retractor for retracting the latch member into the housing, an auxiliary latch member associated with the main latch member and adapted to be retracted therewith by the retractor and also to be shifted inwardly independently thereof, a dogging member pivoted within the inner end of the housing adapted to be shifted by the movement of the auxiliary latch member, with its free end into dogging engagement with the inner end of the main latch member, a single spring positioned between the inner ends of the auxiliary latch member and the dogging member for normally urging ejection of the auxiliary latch member and also engagement of the free end of the dogging member with the inner end of the main latch member, and means associated with the retractor for engaging the dogging member whereby the free end of the latter is shifted from the path of movement of the main latch member to allow retraction of the latter.

4. In a door lock, a latch housing, a main latch member movably mounted therein, a retractor for retracting the latch member into the housing, an auxiliary latch member associated with the main latch member and adapted to be retracted therewith by the retractor and also to be shifted inwardly independently thereof, a dogging member pivoted within the inner end of the housing adapted to be shifted by the movement of the auxiliary latch member, with its free end into dogging engagement with the inner end of the main latch member, a single spring positioned between the inner ends of the auxiliary latch member and the dogging member for normally urging ejection of the auxiliary latch member and also engagement of the free end of the dogging member with the inner end of the main latch member, and means associated with the retractor for engaging the dogging member near its pivoted end whereby the free end of the latter is shifted from the path of movement of the main latch member to allow retraction of the latter.

5. In a door lock, a latch housing, a main latch member movably mounted therein, a retractor, an auxiliary latch member associated with the main latch member and adapted to be retracted therewith and also to be shifted inwardly independently thereof, a dogging member pivoted within the inner end of the housing adapted to be shifted by the movement of the auxiliary latch member, with its free end into dogging engagement with the inner end of the main latch member, an operating member slidably mounted at the inner end of the housing and shiftable by the retractor, a rocker pivotally mounted intermediate its ends within and on the housing and engageable at its opposite ends by the main latch member and the operating member, a spring normally separating the main latch member and the operating member, and a second spring positioned between the inner ends of the auxiliary latch member and the dogging member for normally urging ejection of the auxiliary latch member and also engagement of the free end of the dogging member with the inner end of the main latch

member, said operating member engaging the dogging member whereby the free end of the latter is shifted from the path of movement of the main latch member to allow retraction of the latter.

6. In a door lock, a bolt housing, a main and an auxiliary latch bolt mounted in and extending beyond one end thereof, a retractor for retracting the bolts, the auxiliary latch bolt being also shiftable inwardly independently of the main latch bolt, a dogging member located longitudinally of the housing and pivoted at its inner end therein, the outer end of the dogging member being bifurcated, the inner portion of the main latch bolt having a shoulder engageable either by the inner end of the auxiliary latch bolt or by the free ends of the furcations of the dogging member, a spring normally urging the ejection of the main latch bolt, and a second spring lying between the furcations of the dogging member for normally urging the ejection of the auxiliary latch bolt, said auxiliary latch bolt, when shifted outwardly, being capable of disengaging the free ends of the furcations of the dogging member from the shoulder of the main latch bolt to allow retraction of the latter by the retractor.

7. In a door lock, a bolt housing, a main and an auxiliary latch bolt mounted in and extending beyond one end thereof, a retractor for retracting the bolts, the auxiliary latch bolt being also shiftable inwardly independently of the main latch bolt, a dogging member located longitudinally of the housing and pivoted at its inner end therein, the outer end of the dogging member being bifurcated, the inner portion of the main latch bolt having a shoulder engageable either by the inner end of the auxiliary latch bolt or by the free ends of the furcations of the dogging member, a spring normally urging the ejection of the main latch bolt, and a second spring lying between the furcations of the dogging member and between the pivoted portion of the latter and the auxiliary latch member, for normally urging ejection of the latter and also for urging engagement of the free ends of the furcations of the dogging member with the shoulder of the main latch bolt.

8. In a door lock, a bolt housing, a main and an auxiliary latch bolt mounted in and extending beyond one end thereof, a retractor for retracting the bolts, the auxiliary latch bolt being also shiftable inwardly independently of the main latch bolt, a dogging member located longitudinally of the housing and pivoted at its inner end therein, the outer end of the dogging member being bifurcated, the inner portion of the main latch bolt having a shoulder engageable either by the inner end of the auxiliary latch bolt or by the free ends of the dogging member, a spring normally urging the ejection of the main latch bolt, and a second spring lying between the furcations of the dogging member and normally urging the ejection of the auxiliary latch bolt, said auxiliary latch bolt also lying between the furcations of the dogging member, the portion of the inner end of the auxiliary latch bolt engageable with said shoulder consisting of laterally extended dogs positioned between the furcations and the inner portion of the main latch bolt, said dogs, when said auxiliary latch bolt is ejected, being capable of disengaging the free ends of the furcations from the shoulder of the main latch bolt to allow retraction thereof by the retractor.

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