July 14, 1953 F. NETSCHERT 2,645,512

DEAD LATCHING DOOR LOCK

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Fig. 1

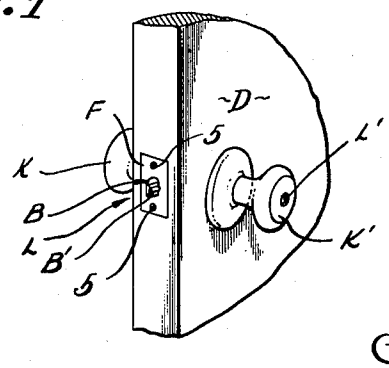


Fig. 3

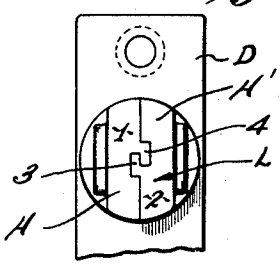


Fig. 2

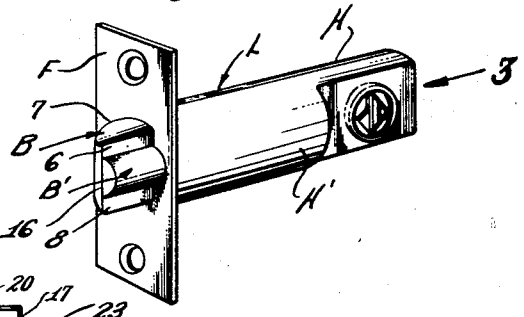


Fig. 4

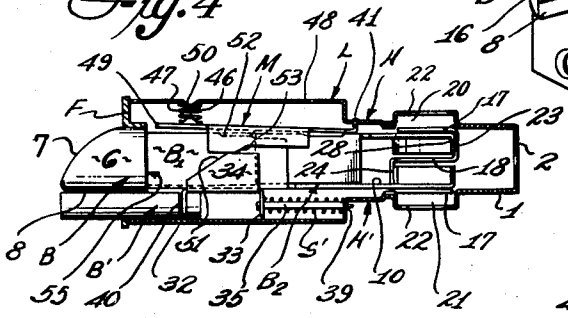


Fig. 5

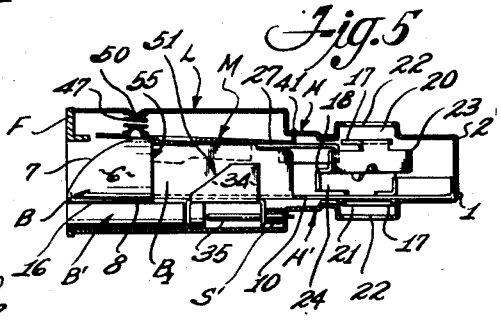
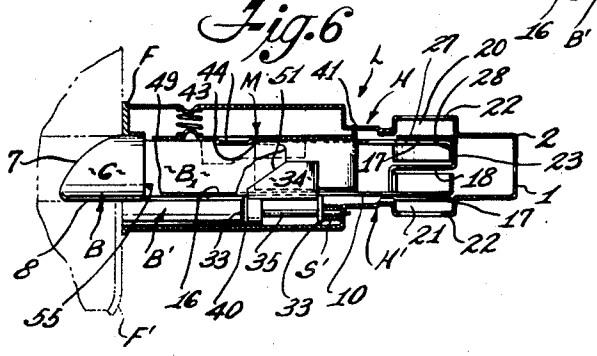


Fig. 6



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Fig. 7

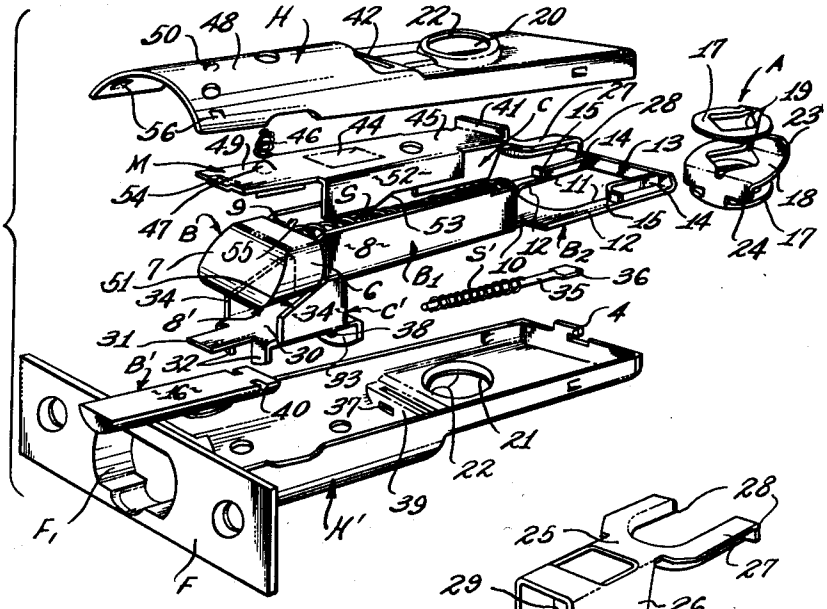


Fig. 7A

Fig. 10

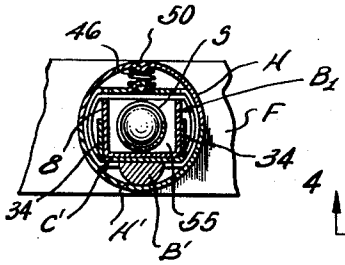


Fig. 8

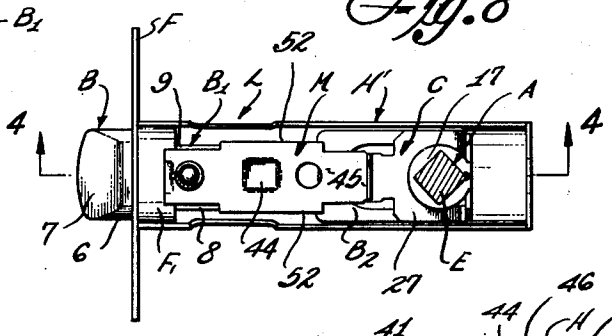
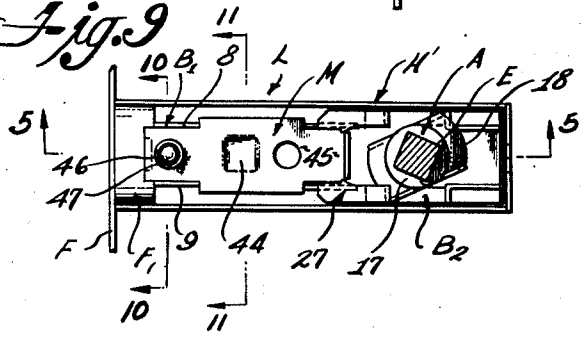


Fig. 9



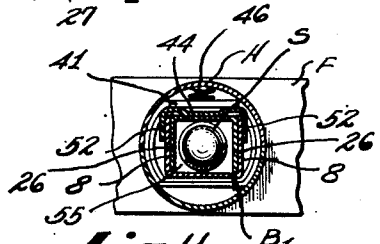


Fig. 11

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DEAD LATCHING DOOR LOCK

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Application May 20, 1949, Serial No. 94,276

3 Claims. (Cl. 292—169)

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This invention relates in general to door locking mechanism but more particularly to and has for an object the provision of a simple and effective "dead bolt" lock whereby the conventional bolt is automatically locked against opening of the door unauthorizedly as by manipulation of the bolt at its seat in the striker plate borne by the jamb for the purpose of retracting the bolt from its seat, while permitting authorized retraction of the bolt by the employment of a door knob or key.

In the production of door locks, various expedients have been employed for preventing unauthorized entry to premises by safeguards principally applied to and for locking the usual bolt retracting elements such as knobs and keys against operation, but in modern door locks frequently a bolt may be retracted by improvised implements entirely independent of the lock actuating means. Occasionally the bolt may be retracted by forcing a screw driver blade inwardly over the striker plate against the inclined side of the bolt, or by other means a door may be opened for unauthorized access of persons to the presumably locked premises.

It is, therefore, an object to provide in a door locking mechanism a secondary bolt freely extensible and retractable with the main bolt but unlike the main bolt in that it does not seat in the striker plate of the door. In fact, the secondary bolt engages the striker plates and is retracted into the lock housing while the main bolt seats in the striker plate and the retractive movement of the secondary bolt locks the main bolt against retraction except by the employment of a knob or key which when employed retracts the main bolt and unlocks the door for authorized entry.

Another object is to provide a dead bolt mechanism which is capable of economical production and readily applicable to different types of door latching mechanism.

A still further object is to provide a lock embodying a main bolt and a relatively slidable compression member between which a spring is compressed and which, when the latch is retracted, will be moved in a direction opposite to that of the latch for providing double tension on the latch in order to insure its complete retraction under all conditions.

Another object is to provide a lock embodying a main bolt and a secondary bolt normally extensible and retractable together when authorizedly operated, but arranged so that when the door is closed the main bolt will seat in the socket

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of the striker plate on the door frame while the secondary bolt will be automatically retracted as the door is closed and thereby latch the main bolt against unauthorized retraction by any means.

Other objects will appear hereinafter as the description of my improvements progresses.

I have shown a preferred mechanism in the accompanying drawing, subject to modification, within the scope of the appended claims, without departing from the spirit of the invention.

In said drawings:

Fig. 1 is a fragmentary view of a portion of a door equipped with my improved lock;

Fig. 2 is a perspective view of my lock detached from and disassociated with usual door opening and closing means;

Fig. 3 is a rear end view of the lock housing as seen in the direction of arrow **3** in Fig. 2;

Figs. 4 and 5 are similar sectional views on lines **4**—**4** and **5**—**5** of Figs. 8 and 9, respectively, and showing the bolts extended and retracted;

Fig. 6 is a sectional view in the plane of Figs. 4 and 5 but showing the main bolt extended while the secondary bolt is held retracted by the striker plate;

Fig. 7 is an exploded view of the lock housing and elements enclosed thereby showing clearly the form and details of all of the parts of the lock;

Fig. 7A is a perspective view of a compression member forming a part of my lock;

Figs. 8 and 9 are similar views of the lock mechanism with one half of the housing removed and with the bolts extended and retracted, respectively;

Figs. 10 and 11 are, respectively, cross sectional views of the lock on lines **10**—**10** and **11**—**11** of Fig. 9.

My locking mechanism L is unitary and is adapted to be seated in a recess of a door D in operative relationship with a desired type of door opening and closing means controlled by an inside knob K, an outside knob K′ and a key operated lock L′, as illustrated in Fig. 1.

All of the elements of the lock are supported in and enclosed by a housing formed of two substantially similar mating sections H and H′ which are secured together at their rear ends by means of interlocking portions **3** and **4** as shown in Fig. 3 and near their front extremities are suitably affixed to a face plate F mounted on door D as by screws **5** and adapted to be positioned opposite a striker plate F′ shown only in Fig. 6 and affixed to the door jamb.

Said housing forms a support for a main bolt

B and a secondary dead bolt B' which are extensibly and retractably mounted in the housing, the main bolt for latching the door under control of knobs K, K' or key operated lock L', and the secondary bolt for locking the main bolt against retraction except by said knobs or lock L'.

Main bolt B has a usual striker head 6 with an inclined outer side 7 and a flat inner face 8 so that when the door is closed, the inclined face 7 will engage striker plate F' and be thereby retracted until the bolt B registers with and seats in an aperture of plate F'. Thus, in a conventional manner, the bolt B serves to latch the door against access except by operation of knobs K and K' or lock L'. Bolt B is formed on or suitably affixed to a tail extension having an intermediate channeled section B_1 with sides 8 and 9 and a bottom 10, and a yoke section B_2 which is formed with an elongated aperture 11 in bottom 10 and defined by lateral portions 12, 12 flatwise of said bottom and an upturned end 13. Portions 12, 12 also have upturned flanges 14, 14 flush with the opposite margins of aperture 11 and with outwardly bent inner end portions 15, 15 (Fig. 7). Bolt B is constantly urged to extended position from plate F by a compression spring S arranged as hereinafter described.

Secondary bolt B' is arranged as shown with its flat side 16 in sliding contact with the adjacent flat side 8' of bolt B and is constantly urged to extended position with bolt B by a compression spring S' and arranged as hereinafter described.

The retraction of bolts B and B' is effected by means of an actuator A and a compression member C and the locking of bolt B by bolt B' is effected by a locking member M, which elements are formed and arranged in the following manner. Actuator A is of S cross section with similar flat portions 17, 17 and an intermediate flat portion 18 uniformly spaced apart and in parallel planes and each having a square aperture 19 for commonly receiving a spindle E to which knobs K and K' are also connected. As shown in Fig. 7, upper portion 17 of the actuator A seats in an annular seat 20 of housing member H and lower portion 17 seats in a similar seat 21 of housing member H', said seats having concentric round apertures 22, 22 through which spindle E extends and in which it is freely rotatable while actuator A is fixed to and rotates with the spindle. Portion 18 has an upwardly turned transverse rib 23 connecting the upper portion 17 therewith and a similar but diametrically opposite and parallel rib 24 connects the portion 18 with lower portion 17. It will be noted that the ribs 23 and 24 are tangential to a common circle concentric with the axis of spindle E.

Compression member C is of channeled cross section and has a flat top portion 25 and depending sides 26, 26 adapted to slidably engage section B_1 of bolt B internally of sides 8 and 9 and overlying main spring S. Member C has a yoke 27 at its rear end with downwardly bent ears 28, 28 at the ends of the yoke furcations. As shown in Figs. 4, 5 and 6, said ears engage the forward sides of portion 23 of the actuator while portions 15 of the main bolt yoke B_2 engage the rear side of portion 24 of the actuator. Member C has a depending rib 29 between which and head 6 of bolt B the main spring S is compressed so as to constantly urge bolt B to extended latching position. Thus, by reason of the engagement of the yoke B_2 of bolt B and yoke 27 of member C with actuator A in the manner described, the rotation of spindle E in either direction will simultaneously retract bolt B and move member C in an opposite direction, and because main spring S is compressed between the bolt and member C, the power of the spring is doubled for urging the retraction of the bolt and by the same movement of the spindle as would produce only one half of the effort, as when otherwise arranged.

Bolt B' is connected with a slide C' of channeled cross section and having a flat bottom 30 with a forwardly projecting tongue 31 adapted to overlie side 16 of the belt, with spaced depending ears 32, 32 at the front end of its channel, a depending flange 33 at the rear end of the channel and spaced upturned sides 34, 34 which with bottom 30 form the channel in which sides 8 and 9 of bolt B are slidable. Said slide C' is tensioned by spring S' in the following manner. Said spring S' is carried on a pin 35 which has a head 36 adapted to seat in an aperture 37 in the bottom of housing member H' and the front end of the pin seats in a hole 38 in flange 33 of member C'. Thus, spring S' is compressed between member C' and a transverse portion 39 of the housing member and constantly applies tension to bolt B' for urging the bolt into extended position, the ears 32, 32 of member C' being seated in lateral portions of a transverse groove 40 on the rear end of bolt B'.

A dead bolt latch M is provided in housing member H adjacent and overlying the sides 8 and 9 of bolt extension B_1. Said latch is held stationary on the housing by an outwardly turned flange 41 which seats in a transverse slot 42 in housing member H and is slightly tiltable on the forward portion 43 of the compression member C which it also overlies, member M having an indentation 44 which deforms the flat body 45 of the latch on its inner side so as to provide a fulcrum midway of its end on which the latch may be tilted.

A short spring 46 is compressed between the wall 48 of member H and the forward end portion 49 for constantly urging the forward portion of the latch downwardly. Spring 46 is held in place by an extrusion 47 on the latch and a similar extrusion 50 on wall 48 of the housing.

Sides 34 of slide C' have inwardly inclined cam edges 51 and latch M has sides 52, 52 with correspondingly inclined edges 53 adapted to engage as bolts B and B' are slidably moved for regulating and effecting the tilting of the latch in the following manner. When the bolts B and B' are normally extended, as shown in Figs. 2 and 4, the cam edges of slide sides 34 and latch sides 52 will be so engaged as to elevate the front end portion 49 out of the plane of the rear edge 55 of bolt head 6 thereby permitting retraction of both bolts B and B'. As shown in Fig. 5, with both bolts completely retracted the head 6 of bolt B has moved beneath and holds latch M tilted to unlatching position as long as they remain retracted as when a door is open.

When, as shown in Fig. 6, the door is closed, bolt B' strikes the plate F' and remains retracted while bolt B is extended into the socket of said plate, thereby effecting the depression of the forward end portion 49 into latching position by the power of spring 46. At the forward end of the latch is a depressed portion 54 which abuts the inner edge 55 of the bolt head 6 and because the latch is anchored to the housing, the retraction of bolt B is impossible except by operating the knobs K or K' or lock L'.

Face plate F has a circular flange F_1 to which one of the housing members as at H' is permanently attached as by welding or otherwise and

the other housing member, as at H, is detachably secured as by means of ears 56 bent inwardly at points near the front of the housing which may seat in suitable apertures in flange F_1, in order that one of the housing members may be locked in position but readily removable for affording access to the enclosed mechanism.

It is therefore apparent that I have provided an improved lock in which, except for minor structural improvements, the novelty resides in at least two main characteristics: first, the improved tensioning means which maximizes the tension applied to the main bolt by simultaneously retracting the bolt while advancing a compression member through the instrumentality of a single knob controlled actuator, and, second, by providing means for normally extending and retracting the main and secondary bolts together as when the door is ajar but automatically latching the main bolt by retracting the secondary bolt when the door is closed.

I claim:

1. A door lock comprising: a housing; a spindle rotatable thereon; an actuator fixed to and for rotation with the spindle; a main bolt and a secondary bolt extensible from and retractable in the housing; a compression member slidable longitudinally of said main bolt, said main bolt being connected with and for retraction by said actuator and said compression member being connected with and slidably moved by the actuator simultaneously with but in an opposite direction to that in which the main bolt is moved; a spring compressed between the bolt and the compression member so that upon retraction of the main bolt said spring will be compressed to a maximum extent by a minimum movement of the main bolt and the compression member, a latch anchored to the housinng at its rear end and resiliently held depressed at its forward end in position to engage and lock the main bolt against retraction, said secondary bolt and said latch having right angularly bent flanges extended over opposite sides of said main bolt and adapted to engage for moving the latch into unlatching relationship with the main bolt as the bolts are extended together and to release the latch for movement into latching position when the main bolt is extended and the secondary bolt is held retracted.

2. A door lock comprising: a housing; a spindle rotatable thereon; a main bolt extensibly and retractably mounted on the housing to lockingly engage a striker plate with the door frame; a secondary bolt also extensible and retractable in the housing with the main bolt; an actuator in the housing fixed to and for rotation with the spindle means for tensioning said bolt so as to constantly urge the same to extended position said main bolt having a stem within said housing and of channelled cross section, a latch overlying the web of said bolt stem with right angularly bent flanges overlying the flanges of said bolt stem said latch being anchored to the housing against longitudinal movement with the bolt and having its forward end movable into and from locking engagement with the head of the bolt said secondary bolt having flanges overlying opposite flanges of said bolt stem and at times engageable at their edges with edges of the flanges of said latch so that when the main bolt is lockingly engaged with said striker plate the forward end of the latch will lockingly engage the head of said main bolt to prevent unauthorized retraction thereof.

3. A door locking comprising: a housing; a spindle rotatable thereon; a main bolt extensibly and retractably mounted on the housing to lockingly engage a striker plate with the door frame; a secondary bolt also extensible and retractable in the housing with the main bolt; an actuator in the housing fixed to and for rotation with the spindle means for tensioning said bolt so as to constantly urge the same to extended position said main bolt having a stem within said housing and of channelled cross section, a latch overlying the web of said bolt stem with right angularly bent flanges overlying the flanges of said bolt stem said latch being anchored to the housing against longitudinal movement with the bolt and having its forward end movable into and from locking engagement with the head of the bolt said secondary bolt having flanges overlying opposite flanges of said bolt stem and at times engageable at their edges with edges of the flanges of said latch so that when the main bolt is lockingly engaged with said striker plate the forward end of the latch will lockingly engage the head of said main bolt to prevent unauthorized retraction thereof, and a spring compressed between a wall of said housing and the forward portion of said latch to hold said latch in locked engagement with the main bolt head upon retraction of the secondary bolt by reason of its engagement with said striker plate.

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