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March 21, 1944. S. BRANTINGSON 2,344,532

DOOR LATCH

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Fig. 1.

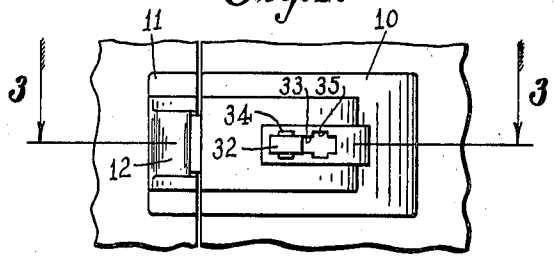


Fig. 2.

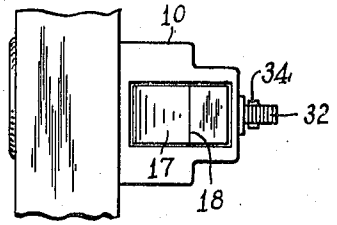


Fig. 3.

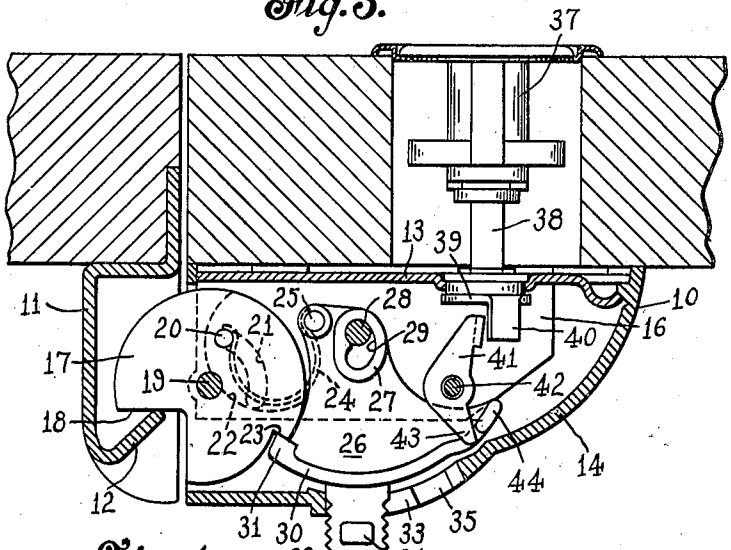
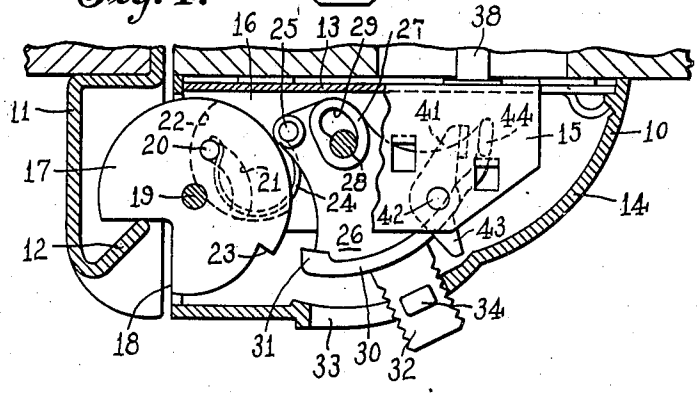


Fig. 4.



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Fig. 5.

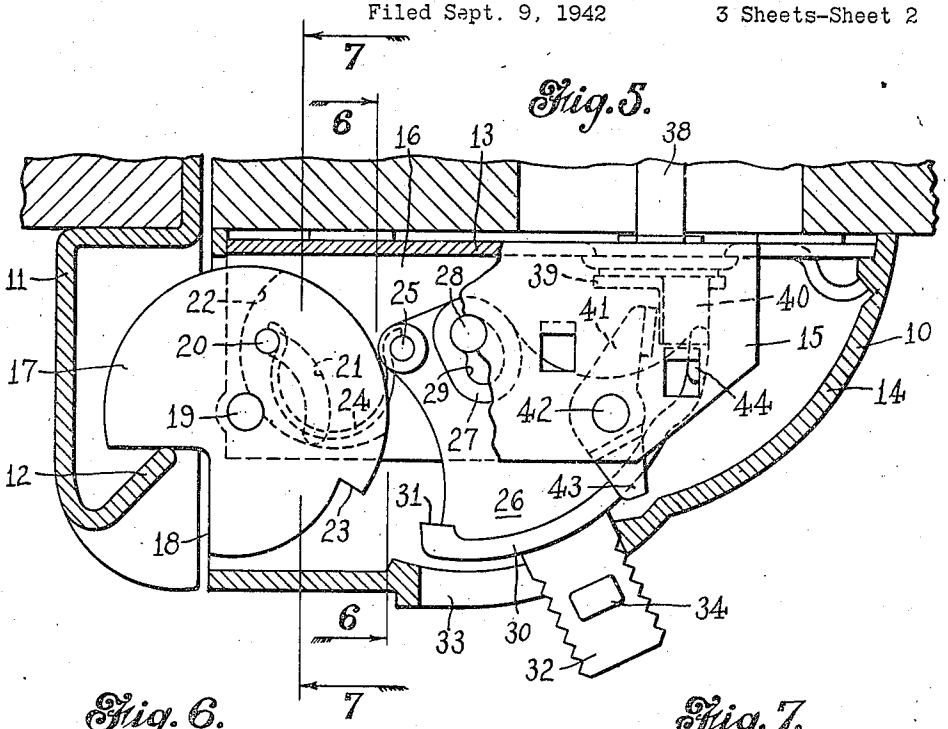


Fig. 6.

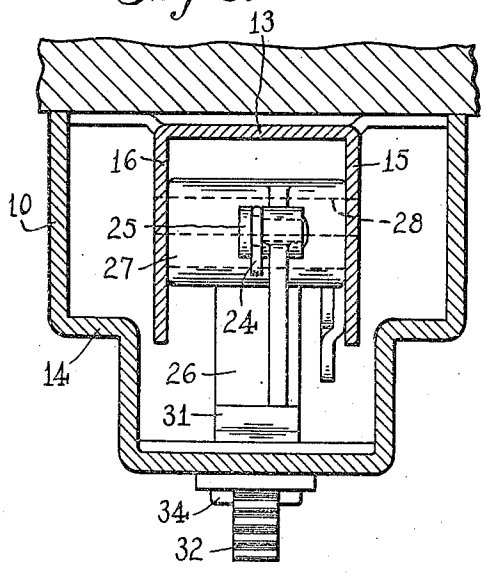
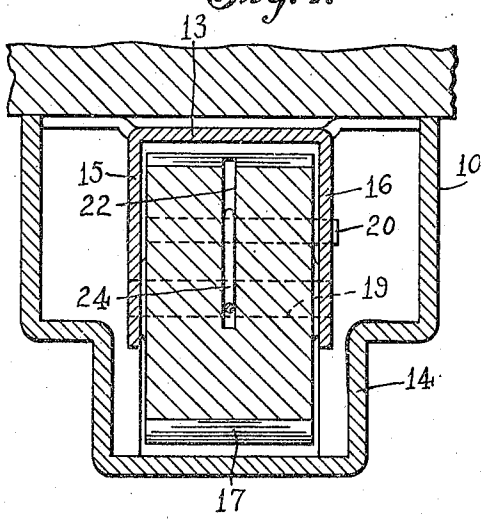


Fig. 7.



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Fig. 8.

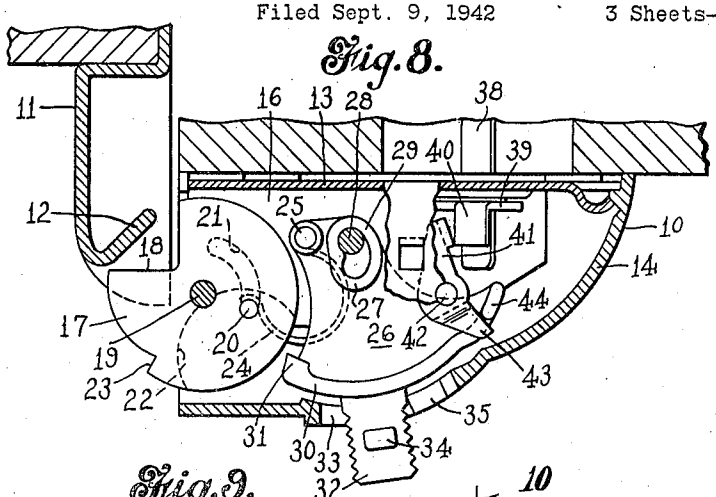


Fig. 9.

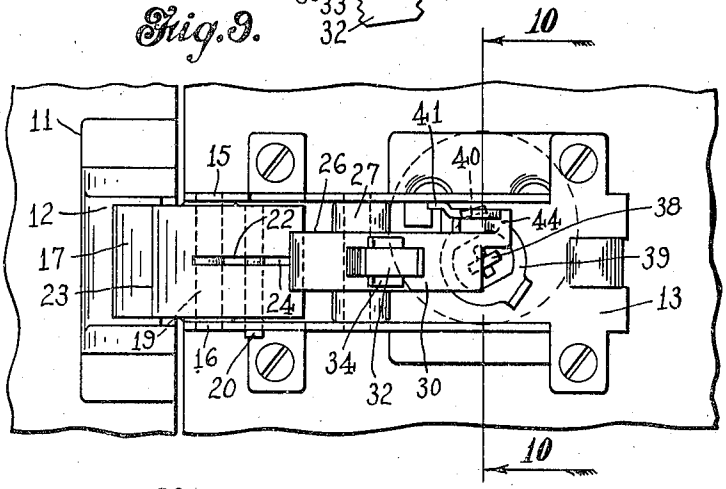
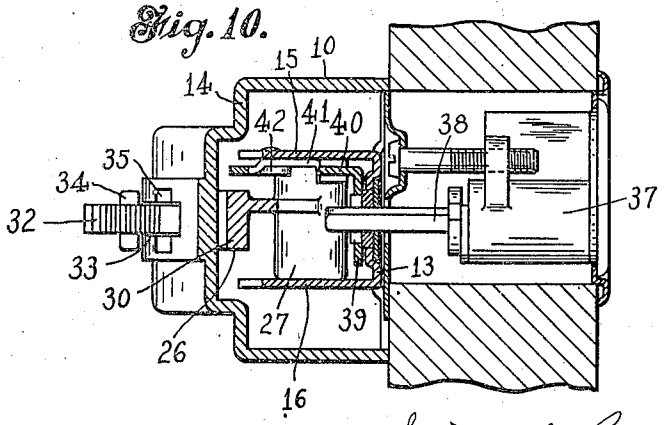


Fig. 10.



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UNITED STATES PATENT OFFICE

2,344,532

DOOR LATCH

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Application September 9, 1942, Serial No. 457,700

7 Claims. (Cl. 292—198)

This invention relates to door latches, and more particularly to the type usually referred to as a night latch. The construction embodies a casing, usually applied to the inside of the door, from which position the bolt may be dogged when the door is closed, and a key-operated lock positioned upon the outside of the door by which the door may be opened by means of the proper key.

As such latches have ordinarily been constructed in the past, it is usually necessary to retract the latch and dog it in retracted position from the inside of the door, thus requiring the use of both hands, or to hold the dogging means in an inoperative position and retract the latch, which also requires both hands of the operator.

The present invention has for one of its objects the provision of a door latch which may be readily operated by a user merely by an opening force applied to the door if the latch is not dogged, or, when the bolt is dogged by the movement of the dogging member to an inoperative position, and thereafter by an opening force applied to the door.

A still further object of the invention is the provision of a door latch of the character described which shall be of very simple construction, and at the same time positive and efficient in operation.

Still another object of the invention is the provision of a door latch having a rotating bolt to engage the door strike, this bolt being held in either locked or unlocked position by means of a spring so connected to the bolt that it passes a dead-center position when the bolt is moved from one position to the other.

A still further object of the invention is the provision of a door latch of the character described, having a rotating bolt and a pivoted dogging member, and a spring one end of which is connected to the bolt and the other to the dogging member in such a position that the spring will resist movement of the bolt whether the door is in open or closed position, and will likewise resist movement of the dogging member whether the latter is in the "on" or "off" position.

A further object of the invention is the provision of a door latch of the character described, having a pivoted bolt-dogging member so arranged that the bolt may be moved bodily upon its pivot to an inoperative position, where it will be held until freed by the user.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a front elevational view of a door latch embodying my invention, applied to a door;

Fig. 2 is a face view of the latch structure;

Fig. 3 is a sectional view on line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 3 but showing the parts in another position;

Fig. 5 is an enlarged view similar to Fig. 3 but showing the parts in still another position;

Figs. 6 and 7 are sectional views on lines 6—6 and 7—7, respectively, of Fig. 5;

Fig. 8 is a view similar to Fig. 3, showing a further position of the parts;

Fig. 9 is a view of the parts of the latch with the cover of the casing removed; and

Fig. 10 is a sectional view on line 10—10 of Fig. 9.

To illustrate a preferred embodiment of my invention, I have shown a door latch comprising a casing designed generally by the numeral 10, adapted to be mounted upon the door, and a strike member 11 adapted to be mounted upon the door jamb. As shown in Fig. 3 of the drawings, the strike member 11 is of hollow form, and is provided with a strike plate 12 which makes an acute angle with the rear face of the strike 11, and which is adapted to be engaged by the bolt to hold the door in closed position, as will be hereinafter described.

The casing 10 comprises a supporting plate 13 adapted to be secured to the door, and a cover 14 designed to cover the operating parts of the mechanism. The plate 13 supports the latch structure, and for this purpose is provided with two outwardly projecting flanges 15 and 16, thus making the central part of this plate substantially of U-shaped form, and the operating structure of the latch is designed to be carried by these plates.

The latch bolt 17 is, as shown, of generally circular form, having a sector-shaped opening 18 within which the strike plate 12 is adapted to lie when the door is closed, as shown in Figs. 3, 4 and 5. The sides of this opening are generally transverse to each other so that, whether the bolt is in the position shown in Figs. 3, 4 and 5, as when the door is closed, or whether it is in the position shown in Fig. 8, as when the door is open, a flat side of the opening will be engaged by the strike plate. The bolt is rotatably mounted in the case by means of the pivot pin 19 secured to the bolt and rotatably mounted in the flanges

15 and 16. Also mounted in the bolt is a pin 20 disposed eccentrically with respect to the pin 19, which pin is adapted to move in a slot 21 in the flange 16 to limit the movement of the bolt to the positions shown in Figs. 3 and 8, for example.

Intermediate the flat faces of the bolt the latter is provided with a slot or kerf 22, through which the pin 20 passes, which slot, as shown in Fig. 4, generally faces rearwardly and is of substantially semi-circular form. Also at one side the bolt is provided with a projecting shoulder 23, which, as will be hereinafter explained, is adapted to be engaged by a dogging member to hold the bolt in closed position. A spring 24 is mounted in the slot 22, and one end of this spring reacts against the pin 20, as shown in Figs. 3, 4 and 5. The other end of this spring reacts against a pin 25 secured adjacent the inner end of a dogging member 26. The body portion of this dogging member is of plate-like form, and adjacent its inner end it is provided with an elongated hub portion 27 pivoted upon a pin 28 secured to the flanges 15 and 16. It will be noted that the hub 27 is provided with an elongated opening 29 which receives the pin 28, so that this dogging member not only is capable of a pivotal movement with respect to the pin, but also of a bodily movement from the position shown in Fig. 3, in which the pin lies at the inner end of the slot 29, to the position shown in Fig. 4, in which the pin lies at the outer end of the slot 29.

Adjacent its outer end the pivoted dogging member 26 is provided with a flange 30 having an extended or projecting edge 31 to engage the shoulder 23 on the bolt, as shown in Fig. 3, to prevent movement of the bolt when the door is closed.

The dogging member is also provided with a finger piece 32, by which it may be swung upon the pivot 28, and also moved outwardly or inwardly upon the pivot. The member 32 is adapted to ride in a slot 33 formed in the cover 14 of the casing, and upon the upper and lower sides of this member are formed projections 34 which are adapted to engage in recesses 35 formed in the edges of the slot 33. In other words, when this dogging member is swung rearwardly from the position shown in Fig. 3 to the position shown in Fig. 5, the members 34 do not engage any part of the casing 14. When, however, the member 32 is pushed inwardly from the position shown in Fig. 5 to the position shown in Fig. 4, the members 34 engage in the recesses 35 and prevent movement of the dogging member about its pivot until it has been again moved outwardly to the position shown in Fig. 5.

As shown in Fig. 3 of the drawings, the key-operated lock 37 may be mounted at the outside of the door, the key barrel of which is provided with the usual spindle 38 passing into the lock case and having secured at the inner end thereof a rollback or disk 39 provided with a laterally projecting lug 40. This lug, when the spindle 38 is turned by the key, is adapted to engage one end of a lever 41 pivoted at 42 in the case, and the other end 43 of this lever is adapted to engage a lug 44 formed on the dogging member 26, so as to move the dogging member from the position shown in Fig. 3 to the position shown in Fig. 8, to permit rotation of the bolt 17.

The operation of the parts will now be described. When the parts are in the position shown in Fig. 4, the dogging member 26 has been pushed inwardly with respect to the pivot 28, and the projections 34 are engaged with the recesses 35 to hold the member in this position. If an opening force is applied to the door upon either side thereof, the pressure of one edge of the opening 18 in the bolt 17 upon the portion 12 of the strike plate will cause the bolt to rotate about the pivot 19 to the position shown in Fig. 8, thus permitting the door to open freely. Likewise the door may be freely closed by a force applied thereto in the proper direction, the outer end of the portion 12 of the strike plate striking the bolt, as shown in Fig. 8, and effecting its rotation to the position shown in Fig. 4. As shown in Fig. 4, when the door is closed the pin 20, upon which the spring 24 bears, lies upon one side of the pivots 19 and 25, and hence the action of the spring will tend to turn the bolt in an anti-clockwise direction, as shown in Fig. 4, in other words, hold the bolt against the edge of the strike plate and thus hold the door in closed position, the movement of the bolt being limited, of course, by the slot 21. On the other hand, when the door is in open position, as shown in Fig. 8, the pin 20 has moved to the other side of a line joining the members 19 and 25, and the spring will at this time act to move the bolt in a clockwise direction, or to hold the pin 20 against the opposite end of the slot 21. The spring, therefore, in passing from one side of a dead-center position to the other, tends to resist movement of the bolt during the initial part of its movement from one position to the other, but tends to assist the movement of the bolt during the later part of such movements.

If it is desired to lock the door, the member 32 is pulled outwardly from the position shown in Fig. 4, and moved to the left, as shown in that figure, to the opposite end of the slot 33, where it will engage the shoulder 23 and thus dog the bolt against movement from its closed position. The door cannot now be opened unless the dogging member 26 is moved from engagement with the shoulder 23, either by the key-operated lock 37 from the outside of the door by means of the lever 41, or manually from the inside of the door by means of the member 32. If the member 26 is moved by the key, it is moved only a short distance, as shown in Fig. 8, and while permitting the door to open, will immediately upon release of the key be moved against the bolt 17 by the spring 24, so that it will be in position to again engage the shoulder 23 when the door is closed.

If the dogging member 26 is moved from the position shown in Fig. 3 to the position shown in Fig. 5 by the manual member 32, it will remain in the latter position due to the action of the spring 24. As will be apparent, the point 25, which is the point of application of the spring to the member 26, will lie on one side of the points 20 and 28 when the parts are in the position shown in Fig. 3, and will lie upon the other side of a line joining these two points when the parts are in the position shown in Fig. 5, so that this spring will act to hold the member 26 in either position, as it passes from one side of dead center to the other during movement of the dogging member 26 from one end of the slot 33 to the other.

If, however, the member 26 is swung to the position shown in Fig. 5 by a person at the inside of the door, and left in this position (that is, not pushed inwardly, as shown in Fig. 4), the door may now be opened by an opening pull, but when the bolt reaches the open position, as shown in Fig. 8, the pin 20 will have been moved to such a position that the point 25 lies upon the opposite side of a line joining the points 20 and 28, and the

dogging member **26** will be swung by the spring against the bolt, ready to engage behind the shoulder **23** when the door is again closed. In other words, a person at the inside of the door may move the dogging member to non-dogging position and open the door to leave the building, and upon the closing of the door the bolt will be dogged, as shown in Fig. 3, in which position it can be opened from the outside only by the key.

It will be apparent from the above description that, by moving the dogging member **26** to the inoperative position in which it is retained as shown in Fig. 4, the door may be freely opened and closed. When, however, the member **32** is pulled outwardly, as shown, for example, in Fig. 5, it will be retained in this position as long as the door remains closed, but will immediately swing to the left when the door is opened, ready to engage behind the shoulder **23**, as shown in Fig. 3, when the door is again closed. It may be moved from this position to permit the opening of the door, either from the inside of the door by the member **32**, or from the outside of the door by the key-operated spindle **38**.

While I have shown and described a preferred embodiment of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and the scope of the claims.

What I claim is:

1. A latch structure comprising a casing, a bolt rotatably mounted therein and provided with an opening to engage the latch strike, said bolt occupying one position when the door is closed and another position rotatably displaced from the first position when the door is open, a dogging member pivotally mounted in the casing and movable to and from a position to dog the bolt against movement when the door is closed, and a spring engaged at one end with the bolt and at the other end with the dogging member, the point of engagement of the spring with said dogging member passing a dead-center position when the bolt is moved from one position to the other.

2. A latch structure comprising a casing, a bolt rotatably mounted therein and provided with an opening to engage the latch strike, said bolt occupying one position when the door is open and another position rotatably displaced from the first position when the door is closed, a dogging member pivotally mounted in the casing and rotatably movable to position to dog the bolt against movement when the door is closed, and a single spring connected to the bolt and to the dogging member to resist movement of both said members, and the connection of said spring with said dogging member being moved past dead-center position upon rotation of either bolt or dogging member.

3. A latch structure comprising a casing, a bolt rotatably mounted therein and provided with an opening to engage the latch strike, said bolt occupying one position when the door is open and another position rotatably displaced from the first position when the door is closed, a dogging member pivotally mounted in the casing and movable to position to dog the bolt against movement when the door is closed, and a spring connected to the bolt and also to the dogging member, the point of connection of the spring with said dogging member passing a dead-center position when the latter is moved from non-dogging to dogging position.

4. A latch structure comprising a casing, a bolt rotatably mounted therein and provided with an opening to engage the latch strike, said bolt occupying one position when the door is open and another position rotatably displaced from the first position when the door is closed, a dogging member movably mounted in the casing and movable to position to engage and dog the bolt when the door is closed, said dogging member also being movable to non-dogging position when the door is closed, and a spring resisting movement of the dogging member from said latter position, said spring being connected to said bolt whereby when the bolt is rotated by the opening of the door said spring will be moved to position to urge said dogging member toward dogging position.

5. A latch structure comprising a casing, a bolt rotatably mounted therein and provided with an opening to engage the latch strike, said bolt occupying one position when the door is open and another position rotatably displaced from the first when the door is closed, and a dogging member pivotally mounted in the casing and movable to position to engage and dog the bolt when the door is closed, said pivotal mounting consisting of a pin and slot connection whereby the dogging member may be moved bodily relatively to its pivot to an inoperative position.

6. A latch structure comprising a casing, a bolt rotatably mounted therein and provided with an opening to engage the latch strike, said bolt occupying one position when the door is open and another position rotatably displaced from the first when the door is closed, a dogging member pivotally mounted in the casing and movable to position to engage and dog the bolt when the door is closed, said pivotal mounting consisting of a pin and slot connection whereby the dogging member may be moved bodily relatively to its pivot to an inoperative position, and means engaging said dogging member when so moved to retain it in inoperative position.

7. A latch structure comprising a casing, a bolt rotatably mounted therein and provided with an opening to engage the latch strike, said bolt occupying one position when the door is opened and another position rotatably displaced from the first position when the door is closed, a bolt-dogging member mounted in the casing, pivot means for said member about which it moves to and from a position to engage and dog the bolt, means for effecting a translatory movement of said member on said pivot means to a position where said member is inoperative to dog said bolt, and means to retain said member in said last-named position.

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