July 23, 1957 G. W. WARDWELL, JR 2,800,347

DOOR LOCKS

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Fig. 1.

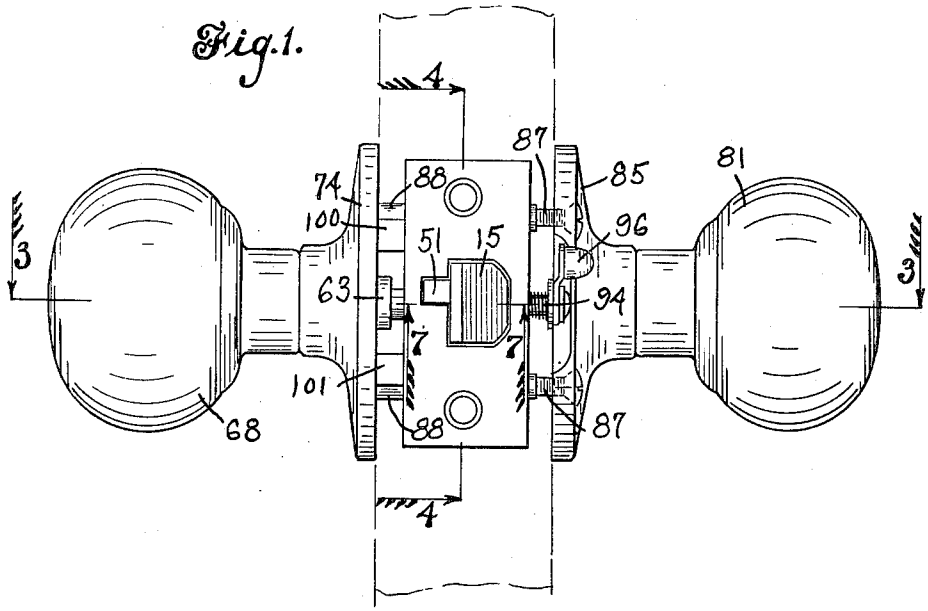
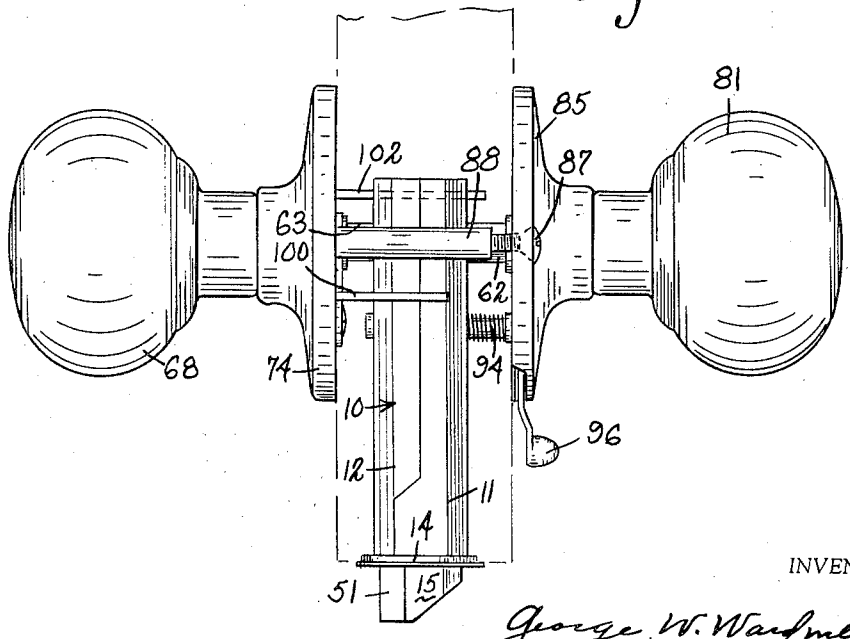


Fig. 2.



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Fig. 4.

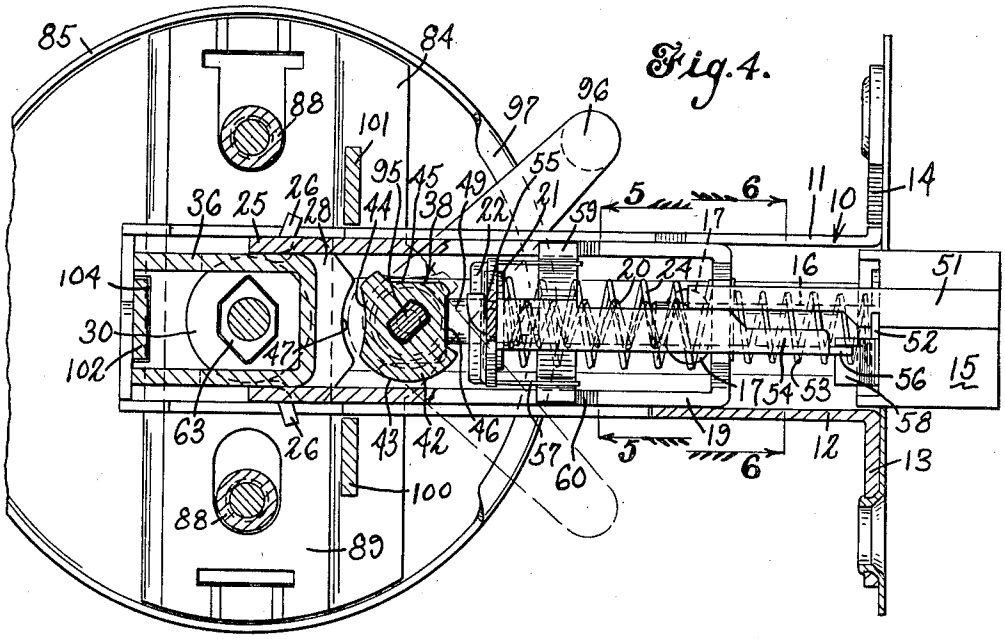


Fig. 5.

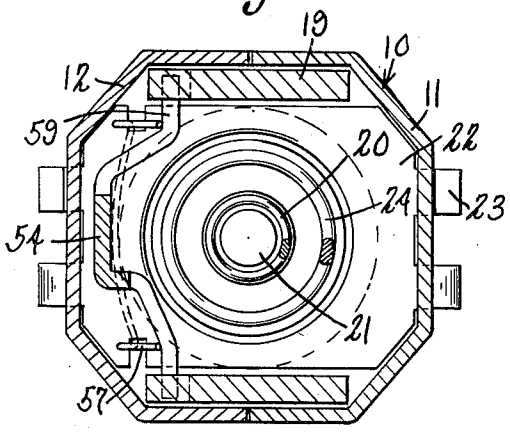
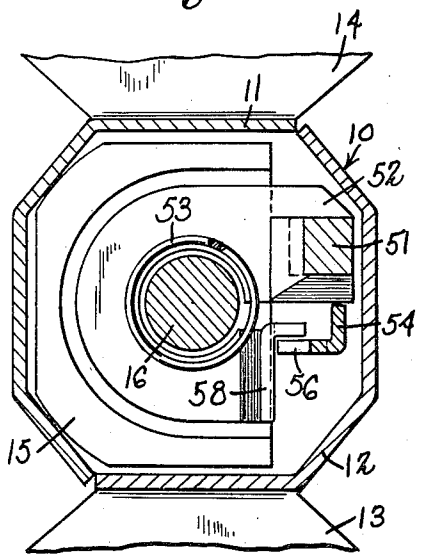


Fig. 6.



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DOOR LOCKS

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Fig. 9.

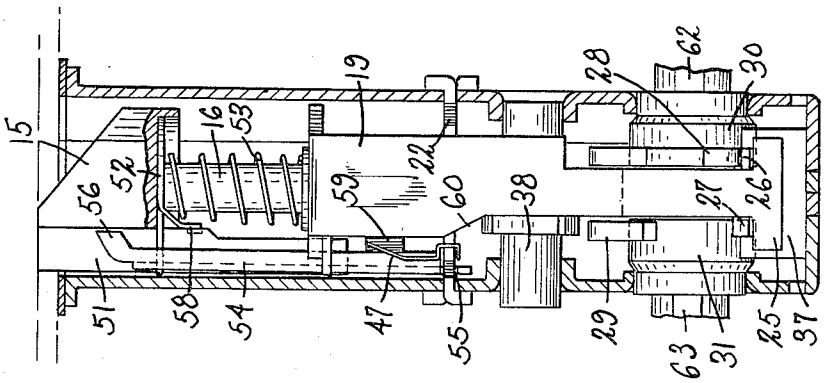


Fig. 8.

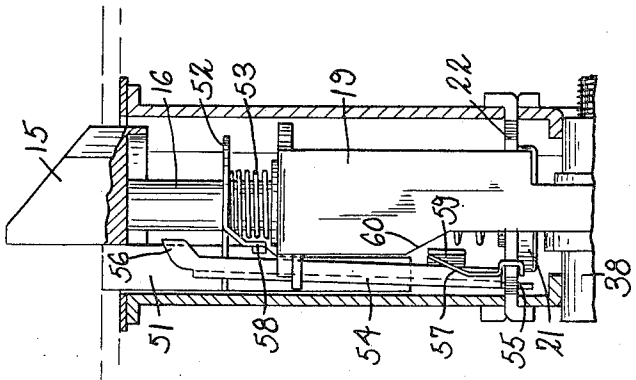
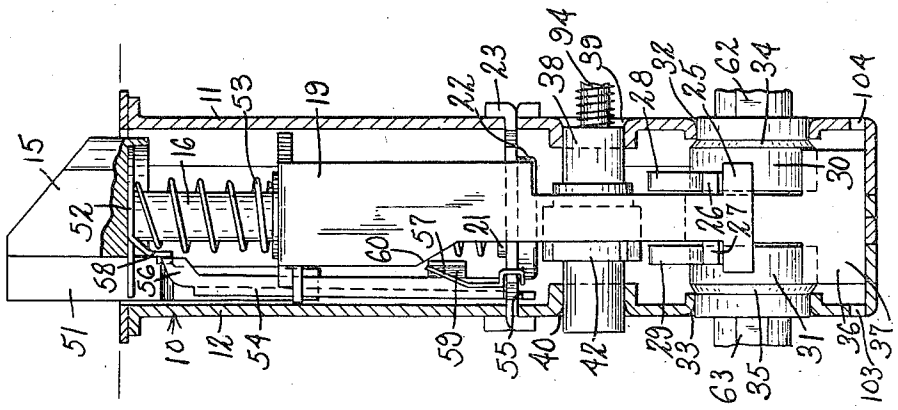


Fig. 7.



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DOOR LOCKS

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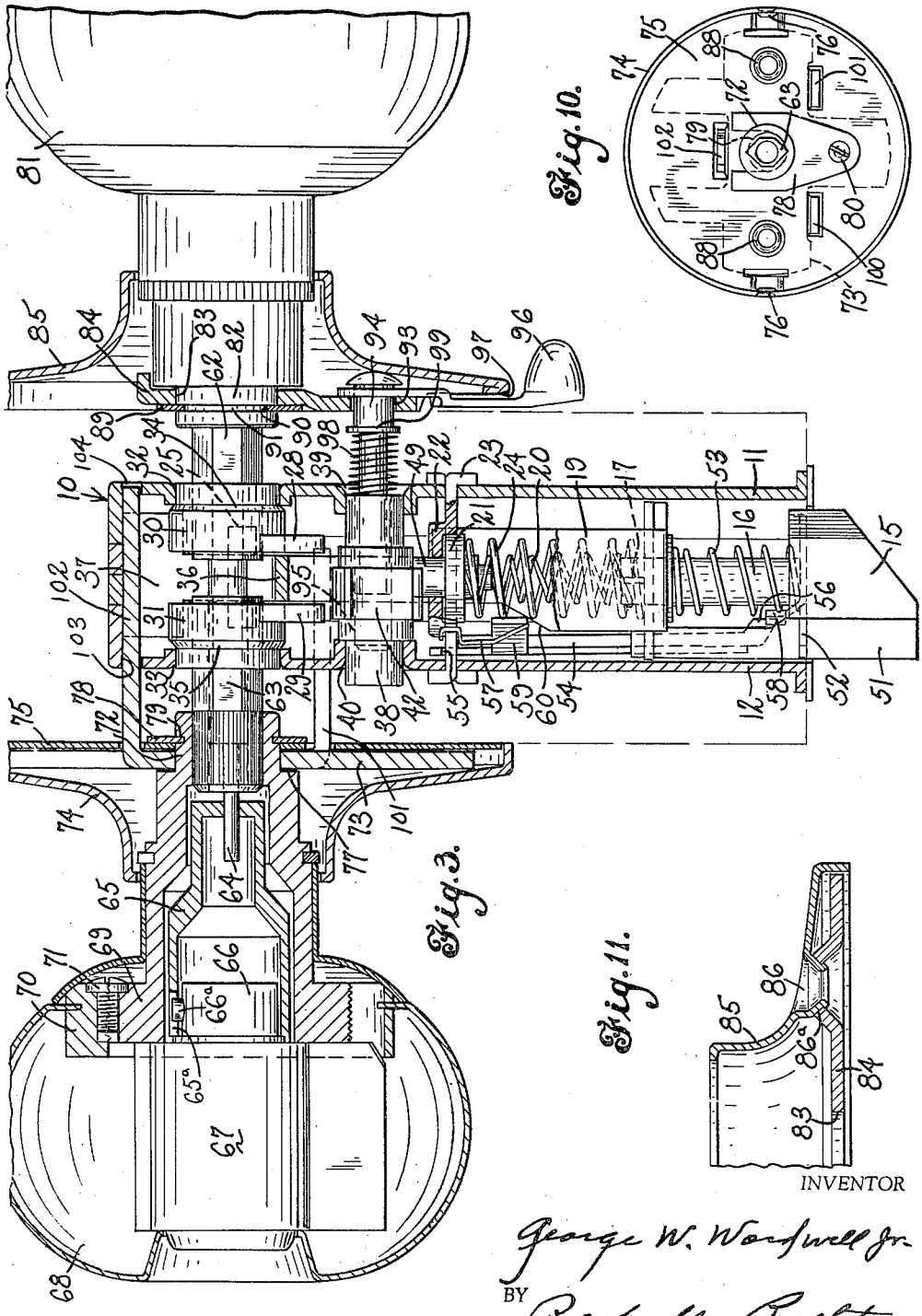


Fig. 3.

Fig. 10.

Fig. 11.

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2,800,347

Patented July 23, 1957

2,800,347

DOOR LOCKS

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Application June 28, 1954, Serial No. 439,528

7 Claims. (Cl. 292—169)

This invention relates to a door lock and more particularly to a lock either for an inside or outside door. As illustrated the mechanism is such that it may be installed by boring one opening through the edge of the door and a second transverse opening from one face of the door to the other. The lock mechanism is enclosed in a casing which may be inserted in the opening through the edge of the door, and the knob structure may then be applied to the faces of the door, the knob spindles passing through the transverse opening to slidably and nonrotatably engage rollbacks rotatably mounted in the casing.

The knob structure at one side of the door (the outside as illustrated) is provided with aligning means to engage the lock case and align it both as to its vertical and horizontal positions within the opening bored through the edge of the door.

The lock mechanism is reversible so that it may be applied to a door of either hand or opening in either direction and the knobs (inside and outside knobs) may be employed upon either side of the lock case. This is a particular feature of the present lock in that dogging mechanism is provided in the lock case so that the outside knob may be dogged when desired. The operating means for the dogging mechanism is associated with the inside knob but the dogging mechanism itself is symmetrical with respect to the door case so that the operating mechanism associated with the inside knob may be engaged with the dogging mechanism at either side of the lock case.

Moreover, the dogging mechanism is shiftable in the case so that the dogging member may engage either one of the two rollbacks. It is, of course, desirable for it to engage the outside rollback, and the shifting of the dogging member to the proper rollback is automatically effected by the application of the knobs to the case. That is to say, the operating mechanism which is associated with the inside knob, when applied to the door, serves to shift the dogging member so that it will engage the rollback upon the side opposite that knob.

The invention also relates to a lock mechanism which may be economically constructed and comprised of relatively few parts. Also a latch bolt dogging mechanism is provided which, when the door is closed, will prevent the latch bolt from being forced by a tool applied to the outside of the door between the door and the door frame. This latch dogging mechanism is of novel construction and is one of the features of the present invention.

One object of the invention is the provision of a door lock mechanism which may be economically manufactured and which will at the same time be durable and efficient in operation.

A still further object of the invention is the provision of a door lock mechanism of the character described having knob structures associated therewith, the arrangement being such that the knobs may be applied at either side of the lock case and may be turned through an angle of 180 degrees about their axes and still be in a position in which the knob spindles will be properly engaged with the rollbacks to operate the latter.

A still further object of the invention is the provision of a novel means to dog the outside knob or more correctly the rollback which is operated by the outside knob. If desired, a key-operated lock may be installed in the outside knob, the key barrel of which is connected with the spindle of the inner knob so that even when the outside rollback is dogged, the latch bolt may be retracted by the key through the operation of the spindle of the inside knob.

Still another object of the invention is the provision of a rollback dogging member which may be shifted laterally so as to be engaged with either of the two rollbacks provided in the lock case, the shifting taking place automatically upon the application of the inside door knob which carries the operating mechanism for the dogging member.

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 lock embodying my invention, a portion of the door to which the lock is applied being shown in dotted lines;

Fig. 2 is a top plan view of the door lock mechanism;

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

Fig. 4 is a sectional view on line 4—4 of Fig. 1;

Figs. 5 and 6 are sectional views on lines 5—5 and 6—6 respectively of Fig. 4;

Fig. 7 is a sectional view of the lock case showing the inner mechanism in the position in which the parts stand when the door is open;

Fig. 8 is a view similar to Fig. 7 showing the position of the latch bolt and the dog controlling plunger when the door is closed;

Fig. 9 is a similar view showing the position of the parts as the bolt is being withdrawn by the rotation of one of the knobs;

Fig. 10 is an inside view of the outer knob assembly; and

Fig. 11 is an enlarged sectional view of a part of the inner rose assembly.

To illustrate a preferred embodiment of my invention, I have shown a door lock structure comprising a lock case 10, the case being preferably made in two parts 11 and 12 which parts may be secured together after the mechanism is assembled within one of the casing parts. The two parts of the casing may be provided at their front ends with wing members 13 and 14 by which the case may be secured to the face edge of the door.

The mechanism comprises a latch bolt 15 having a stem 16, the stem being provided with lugs 17 at each side thereof, which lugs are adapted to be engaged by the rear face of the front portion of a U-shaped latch retractor 19. As will be hereinafter explained, when the retractor is moved rearwardly by the rollbacks, this will effect retraction of the bolt 15 into the case.

A latch bolt spring 20 bears against the lugs 17 and tends to hold the latch bolt in projected position. The rear end of this spring bears against a spring stop 21 guided against a retaining member 22 fixed to the casing. This retaining member may be provided with tongues 23 which extend through openings in the case and are bent thereover, as shown in Fig. 3 to hold it in position.

A second spring 24 surrounds the first spring 20 and bears at its forward end against the retractor yoke 19 and also bears at its rear end against the spring stop 21. It will be understood that with this arrangement when the latch bolt is cammed into the case by the closing of the door, only the tension of the spring 20 must be overcome, but when the bolt is withdrawn by the retracting yoke 19, both springs must be compressed.

The latch retracting yoke **19** is of U-shaped form as described above, and each of the legs is provided at its rear end with a laterally projecting cross head **25** which carries projecting lugs **26** and **27**. One of these lugs on each leg may be engaged by the rollback **28** and the other by the rollback **29**, which rollbacks are respectively mounted on hubs **30** and **31**, which hubs are rotatably mounted in openings **32** and **33** in the casing, as shown more particularly in Figs. 3, 7 and 9. Thus when either of the rollback hubs is turned in either direction, the latch retractor will be moved toward the rear of the case and will serve to retract the latch, moving it from the position shown in Fig. 7 to that shown in Fig. 9.

The rollback hubs **30** and **31** are provided with shoulders **34** and **35** adapted to engage from the inside of the case the edges of the openings **32** and **33**, and these hubs are held in spaced relation against inward movement by a U-shaped spacer member **36** positioned in the case between these hubs. Each of the legs of this U-shaped member is also provided with a laterally projecting rear end portion **37** so that when the rollbacks are operated and the latch is retracted, the rollback hubs will engage the front edge of the laterally projecting member **37**, and this latter member will thus serve as a stop to limit the turning of the rollbacks and likewise the turning of the knobs. The member **36**, therefore, not only serves as a spacer for the rollback hubs, but also serves to limit rotation of the rollbacks and thus takes the strain applied to the knob from the retractor.

The dogging mechanism for a selected one of the rollbacks **28** or **29** is shown more especially in Figs. 3, 4 and 7. This mechanism comprises a member **38** slidably mounted in openings **39** and **40** in the case so that it may be shifted transversely of the case. Secured to this member is a cam-shaped part **42** (Fig. 4). This member is provided at one of its peripheral edges with a convex arcuate portion **43** and at another peripheral edge with a concave or recessed arcuate portion **44**. The other two peripheral edges of this member are substantially flat as shown at **45** and **46**.

Each of the rollbacks **28** and **29** are provided on their forward faces with recesses **47** of arcuate shape, and it will be understood that the thickness of the cam **42** in a direction transverse of the lock case is such that it will engage with only one of the rollbacks at one time, as is shown, for example, in Fig. 7.

When the cam member **42** stands in the position shown in full lines in Fig. 4, its recessed edge **44** stands opposed to the forward recessed edge **47** of one of the rollbacks **28** or **29** so that the rollback is permitted free rotation and the rollback and knob which operates it will not be dogged but will be free for rotation to retract the bolt. However, if the cam member **42** is rotated in a clockwise direction through an angle of 90 degrees, its convex edge **43** will stand in the recess **47** of one of the rollbacks and will dog the rollback and associated knob against movement and, therefore, dog the latch bolt against being retracted by this knob.

The spring stop member **21** (Fig. 3) is provided with a plunger **49** which bears against the flat face **46** of the cam member **42** when the latter is in the full-line position shown in Fig. 4 so as to releasably hold this cam member in this position. It will be understood that the stop member **21** is loosely mounted in the retaining member **22** so that it may be cammed forwardly against the tension of the springs **20** and **24** when the cam member **42** is rotated. When the cam member **42** is in a position shown in dotted lines in Fig. 4, the plunger **49** stands against the flat surface **45** of the cam and releasably holds the latter in that position. It will be seen, therefore, that the springs **20** and **24** serve the double purpose of releasably holding the cam member **42** in the position to which it is moved and also serve to urge the latch bolt and latch retractor to protracted positions.

Means are provided to guard the latch bolt against being retracted by a tool inserted between the face of the door and the door jamb, which means includes a guard bolt **51** slidably mounted in the case at the back of the latch bolt. Secured to this guard bolt, as shown in Figs. 7, 8 and 9, is a guide plate **52** slidably mounted upon the stem **16** of the latch bolt. A spring **53** surrounds the stem of the latch bolt between the guide plate **52** and the forward end of the retracting yoke **19** so as to normally urge the guard bolt to a protracted position shown in Fig. 7.

A guard or dogging lever **54** is disposed in the case adjacent the guard bolt **51**. The rear end of the member **54** is pivoted at **55** to the retaining member **22** so that the forward end of the lever **54** may swing inwardly and outwardly toward and from the latch bolt. The forward end of this member **54** is turned inwardly, as shown at **56**, so that in the position shown in Fig. 8 this end normally lies behind a portion of the latch bolt to dog it against retraction.

A spring **57** (Fig. 8) normally urges the dogging member inwardly to the position shown in this figure where it lies behind the latch bolt and dogs the latter against retraction, but when the guard bolt **51** is in its projected position, shown in Fig. 7, this member is held outwardly by the engagement with the part **56** of a rearwardly projecting lug **58** of the guide plate **52**. The spring **57** acts against a pair of laterally extending arms **59** on the lever **54**, and these arms, as shown more especially in Fig. 4, extend laterally over the legs of the retracting yoke. The yoke legs are provided with cam surfaces **60** adapted when the yoke is retracted to engage the arms **59** and cam the dogging lever **54** to an outer position shown in Fig. 9, where it no longer engages rearwardly of the latch bolt but will permit retraction of the same.

As shown in Fig. 7, when the door is open both guard bolt and latch bolt stand in protracted positions and the forward end **56** of the guarding or dogging lever **54** rests upon the surface of the lug **58** and thus is held out of the path of the latch bolt so that when the door is closed the latter may be cammed rearwardly by its engagement with the strike plate of the door, carrying with it the guard bolt **51**.

When the door has been closed, the latch bolt springs outwardly, as shown in Fig. 8, but the guard bolt **51** is held in retracted position by engagement with the strike plate of the door. In this position of the parts the end **56** of the guard lever **54** is moved inwardly by the spring **57** so that it is in position to dog the bolt against retraction by a tool inserted between the door and the jamb. However, when the latch bolt is retracted by the knob-operated retracting yoke the guard lever will be cammed outwardly by the surfaces **60** on the legs of the yoke and thus permit retraction of the latch bolt, as shown in Fig. 9. This provides a simple and inexpensive guard mechanism for the bolt and one which may be accommodated in a relatively small space.

The rollback hubs **30** and **31** are as usual provided with openings of polygonal or noncircular shape to receive the knob spindles. The spindle of the inner knob is shown at **62** and that of the outer knob is shown at **63**. Both of these spindles are slidably received in the hubs so that they may be adjusted outwardly or inwardly with the associated knobs depending upon the thickness of the door. The inner knob spindle **62** is provided with an integrally formed reduced end **64** (Fig. 3) which extends entirely through the spindle **63** of the outer knob. This end **64** of the inner spindle is of noncircular shape so as to be nonrotatably engaged with an actuating member **65** having a lost-motion connection with the key barrel **66** of a cylindrical lock **67** disposed within the outer knob **68**. This connection comprises a slot or recess **65a** in the member **65**, and a pin **66a** on the key barrel. The portion **64** of the inner spindle is rotatable within the outer knob spindle **63** so that even when the outer knob and

the associated rollback are dogged, the inner knob spindle may be rotated by a key inserted in the lock **67** to retract the latch bolt.

The shank **69** of the outer knob to which the spindle **63** is nonrotatably secured is threadedly connected to a member **70** to which the knob shell **68** is secured, and a set screw **71** screws the shank against reverse rotation so that it is rigidly secured to the knob. The shank **69** is provided with a reduced inner end **72** and a bearing for this end of the shank is provided by a circular opening in an aligning plate **73**. This aligning plate is disposed in a rose **74** which is telescopically received over the knob shank, and it is secured to the rose by a retaining plate **75** placed flatwise against the plate **73** and held in place by having portions of the rose staked over its periphery, as shown at **76** in Fig. 10. This holds the plate **75** assembled with the rose and also the aligning plate **73**.

The knob shank is telescopically inserted in the rose assembly as described above until the aligning plate **73** lies against the shoulder **77** on the shank. In this position a substantially U-shaped key **78** may be inserted into an annular groove **79** in the knob shank so as to hold the parts in assembled position and at the same time permit rotation of the knob shank with respect to the rose assembly, the aligning plate **73** of this assembly furnishing the bearing for the knob shank.

The key **78** may be retained in place by a retaining member such as the screw **80** screwed into the aligning plate **73**.

The inside knob structure is shown more particularly in Figs. 3 and 4, and comprises a knob shell **81** to which may be secured the shank **82** in any suitable manner. The spindle **62** is rigidly secured to this shank so as to be rotated by the knob.

The bearing for the knob shank is provided by an opening **83** in a bearing plate **84**, this plate being secured within a rose structure **85** which telescopically receives the shank of the knob and, as will be explained, is adapted to be secured at one side of the door. The rose **85** and bearing plate **84** are provided with registering openings **86** and **86a** respectively to receive screws **87** (Figs. 1 and 2), these screws being adapted to be received in threaded sleeves **88** secured to the aligning plate **73** of the outside knob. These screws secure the knob and rose assemblies to each other and to the door.

In order to secure the rose assembly to the inner knob, the bearing plate **84** is secured to the rose **85** by riveting the edges of the opening **86** in the rose over the registering opening **86a** in the bearing plate **84**. After the knob shank has been inserted into the opening in the rose and the reduced end **82** of the shank inserted through the opening **83** of the bearing plate, a slotted retaining plate **89** is slipped into place. This plate has an opening **90** of keyhole shape to receive the knob shank **82** and when moved into place the edges of the smaller end of the opening will enter the annular groove **91** in the shank and retain the knob assembly and the rose assembly in assembled relation.

The rollback dogging cam **42** previously described is manually operated by means attached to the rose of the inner knob, and means is provided to shift this dogging member from one side to the other automatically depending upon which side of the door the inner knob is mounted. To this end the bearing member **84** is provided with an opening **93** at one side thereof in which is rotatably mounted an operating pin **94**, the inner end **95** of which pin is of noncircular shape and is slidably received in a noncircular bore in the hub member **38** which carries the dogging cam **42**. A handle **96** is rigidly secured to the pin **94** and extends outwardly through a recess **97** (Fig. 4) in the rose so that it may be rotated through an angle of approximately 90 degrees.

A spring **98** surrounds the pin **94** and is compressed between the end surface of the hub member **38** and a collar **99** on the pin so as to urge the hub member **38** away from the inside rose. For example, as the parts are shown in Fig. 3, when the knob and rose assembly is applied to the door, the spindle **62** inserted through the rollback hubs, and the inner end **95** of the pin **94** inserted into the hub member **38**, the spring **98** will force this hub member to the left, if it is not already in its left-hand position, so that the dogging cam **42** will be in position to dog the rollback of the outside knob. If, however, the two knobs are reversed so that the inside knob is placed at the other side of the door, the spring **98** will automatically force the rollback hub **38** to the right so that the dogging cam lies opposite the rollback at the other side of the case which would then be the outside of the door.

The aligning plate **73** is provided with three aligning prongs **100**, **101** and **102** which project through the plate **75**. The prongs **100** and **101** lie above and below the lock case **10** respectively so as to align the case vertically with the knob and rose assemblies. The prong **102**, as shown in Fig. 3, extends through openings **103** and **104** in the lock case and aligns the latter horizontally with the knob and rose assemblies so that the knob spindles will properly register with the openings in the inside and outside rollbacks **30** and **31**.

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 within the scope of the claims.

What I claim is:

1. A dogging means for either of a pair of spaced rollbacks in a door lock mechanism having a casing and a reciprocating bolt therein, said dogging means comprising a member rotatably mounted in the casing for rotatable movement about an axis transverse to the movement of the bolt to and from a position to engage and dog one of said rollbacks against movement, means for mounting said dogging member in the casing for shifting movement in the direction of its axis to a position to engage either of said rollbacks, an operating member for said dogging member, a rose secured to the face of the door, and said operating member being rotatably carried by the rose and having a part telescopically engaged with the dogging member.

2. A dogging means for either of a pair of spaced rollbacks in a door lock mechanism having a casing and a reciprocating bolt therein, said dogging means comprising a member rotatably mounted in the casing for rotatable movement about an axis transverse to the movement of the bolt to and from a position to engage and dog one of said rollbacks against movement, means for mounting said dogging member in the casing for shifting movement in the direction of its axis to a position to engage either of said rollbacks, an operating member for said dogging member, a rose secured to the face of the door, said operating member being rotatably carried by the rose and operatively engaged with the dogging member, and means carried by said operating member to urge said dogging member in a direction away from the rose.

3. A dogging means for either of a pair of spaced rollbacks in a door lock mechanism having a casing and a reciprocating bolt therein, said dogging means comprising a member rotatably mounted in the casing for rotatable movement about an axis transverse to the movement of the bolt to and from a position to engage and dog one of said rollbacks against movement, means for mounting said dogging member in the casing for shifting movement in the direction of its axis to a position to engage either of said rollbacks, an operating member for said dogging member, a rose secured to the face of the door, said operating member being rotatably carried by the rose and operatively engaged with the dogging member, and a spring carried by said operating member and engaging said dogging member to urge it in a direction away from the rose.

4. A dogging means for either of a pair of spaced rollbacks in a door lock mechanism having a casing and a reciprocating bolt therein, said dogging means comprising a member rotatably mounted in the casing for rotatable movement about an axis transverse to the movement of the bolt to and from a position to engage and dog one of said rollbacks against movement, means for mounting said dogging member in the casing for shifting movement in the direction of its axis to a position to engage either of said rollbacks, an operating member for said dogging member, a rose secured to the face of the door, said operating member being rotatably carried by the rose and having a part telescopically engaged with said dogging member, and a spring carried by said operating member to act upon said dogging member and move it away from the rose upon such telescopic engagement.

5. A dogging means for either of a pair of spaced rollbacks in a door lock mechanism having a casing, the rollbacks being mounted in the casing for rotation about a common axis, said dogging means comprising a dogging member, means mounting said member in the casing for rotatable movement to engage and dog one of said rollbacks and for shifting movement in a direction parallel to the axis of the rollbacks to a position to engage one or the other thereof when the dogging member is rotated, a knob structure having an operating member carried thereby telescopically engaged with the dogging member, and a spring on said operating member tending to shift said dogging member in one direction.

6. A dogging means for either of a pair of spaced rollbacks in a door lock mechanism having a casing and a reciprocating latch bolt therein, said means comprising a dogging member mounted in the casing for rotatable

movement about an axis transverse to the movement of the bolt to and from dogging position with respect to one of said rollbacks, a retaining member to engage and releasably hold said dogging member in position to which it is rotated, and a spring acting on said retaining member to urge it to holding position and also acting on the latch bolt to urge the latter to a protracted position.

7. A dogging means for either of a pair of spaced rollbacks in a door lock mechanism having a casing, a reciprocating bolt therein and a retracting yoke connected to the bolt to retract the same, said dogging means comprising a rollback-dogging member mounted in the casing for rotatable movement to and from dogging position with respect to one of said rollbacks, a retaining member to engage and hold said dogging member in position to which it is rotated, and a spring acting between the yoke and retaining member to urge the former forwardly in the casing and urge the retaining member toward the dogging member.

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