

Nov. 23, 1954

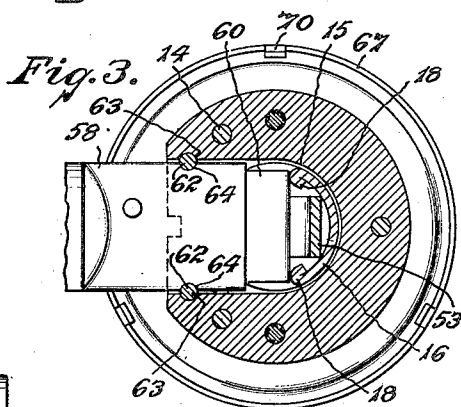
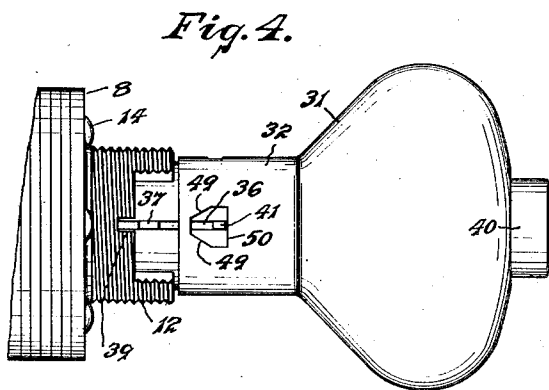
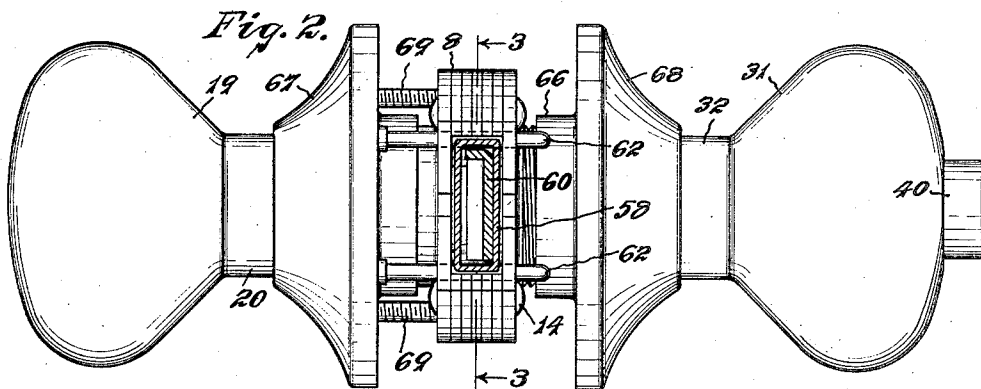
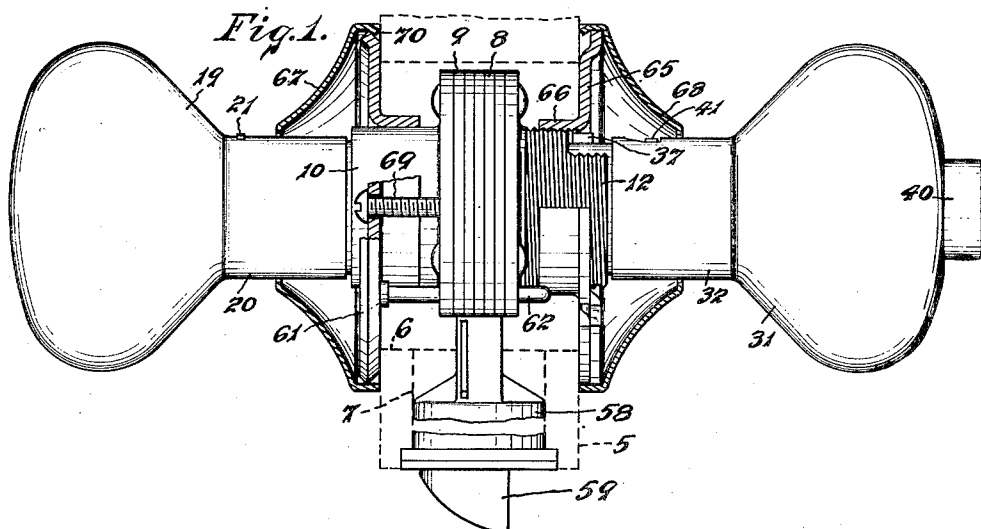
N. A. WELCH

2,694,918

DOOR LATCH OPERATING MECHANISM

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3 Sheets-Sheet 1



INVENTOR.
NICHOLAS A. WELCH.
BY
Louis V. Lucia.
ATTORNEY.

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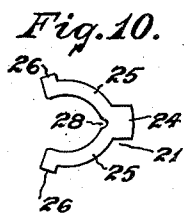
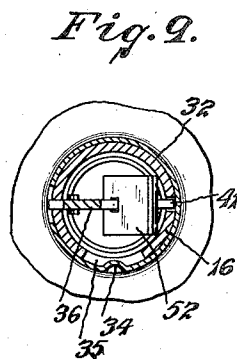
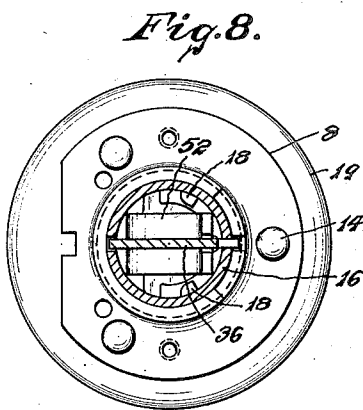
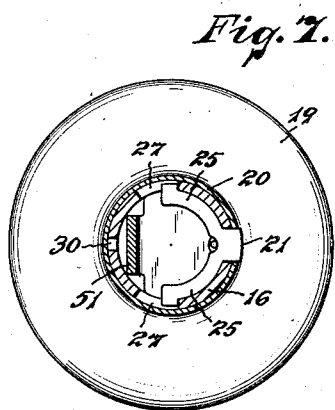
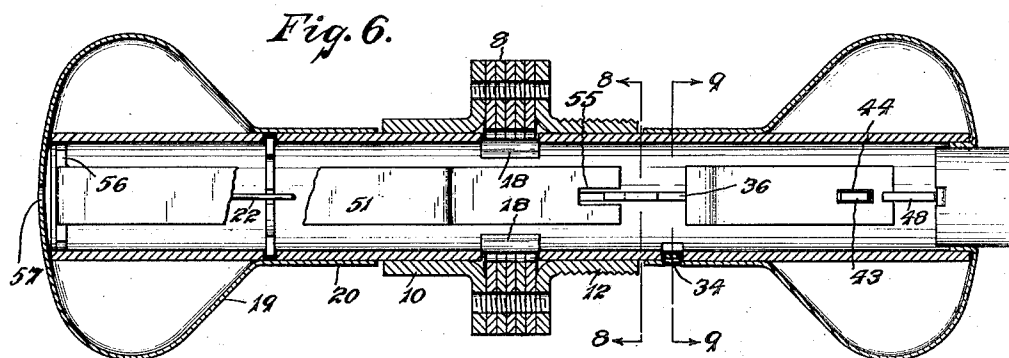
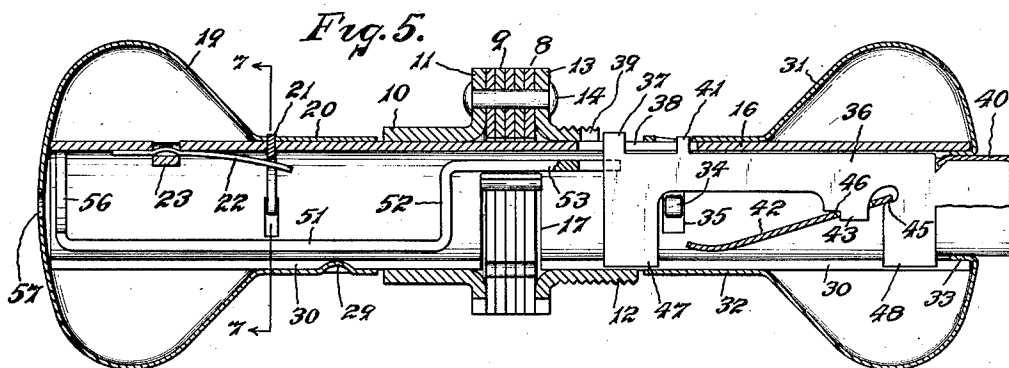
N. A. WELCH

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DOOR LATCH OPERATING MECHANISM

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3 Sheets-Sheet 2



INVENTOR.
NICHOLAS A. WELCH.
BY
Louis V. Lucia,
ATTORNEY.

Nov. 23, 1954

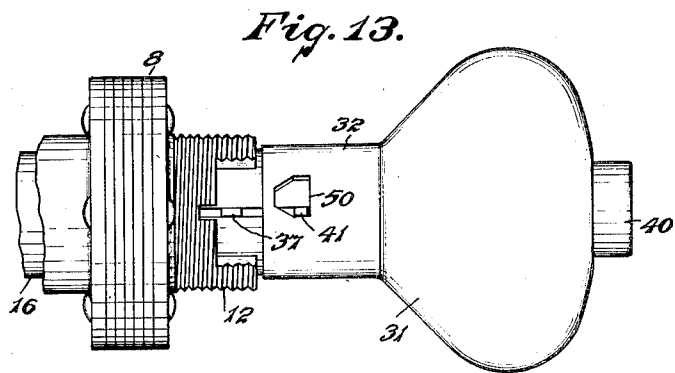
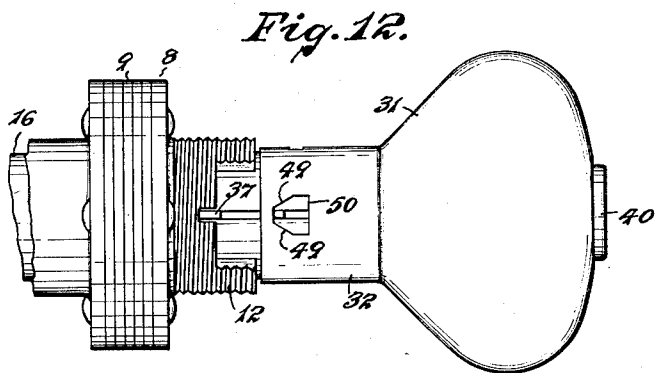
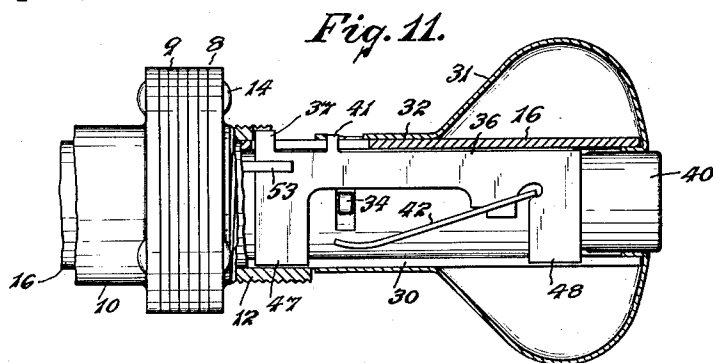
N. A. WELCH

2,694,918

DOOR LATCH OPERATING MECHANISM

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3 Sheets-Sheet 3



INVENTOR.
NICHOLAS A. WELCH.
BY
Louis V. Lucia
ATTORNEY.

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2,694,918

DOOR LATCH OPERATING MECHANISM

Nicholas A. Welch, West Hartford, Conn., assignor to The American Hardware Corporation, New Britain, Conn., a corporation of Connecticut

Application August 14, 1952, Serial No. 304,409

13 Claims. (Cl. 70—210)

This invention relates to a door latch operating mechanism and more particularly to a mechanism of the cylindrical type which is adapted to be mounted in an opening bored through the face of a door for operating a latch unit extending through an opening in the edge of the door.

An object of the present invention is to provide a latch operating mechanism of novel construction which is particularly adapted for economical manufacture and which will afford important advantages over such mechanisms heretofore produced.

Another object of this invention is the provision of a door latch operating mechanism having novel means for dogging and undogging the operating spindle thereof.

A further object of the invention is the provision of such a mechanism in which the dogging member thereof is moved to undogging position by cam means contained in the inner knob.

A still further object is to provide such a mechanism with novel means for securing a latch unit thereto.

Further objects and advantages of this invention will be more clearly understood from the following description and from the accompanying drawings in which:

Fig. 1 is a plan view, partly in central horizontal section, of a mechanism embodying my present invention.

Fig. 2 is a side view of said mechanism with a portion of the latch bolt unit being shown in section.

Fig. 3 is a sectional end view on line 3—3 of Fig. 2; a portion of the latch bolt unit being shown in elevation.

Fig. 4 is a rear view of the inner portion of the mechanism.

Fig. 5 is a plan view of the operating unit in central horizontal section illustrating the dogging mechanism in normal position.

Fig. 6 is a side view thereof in central vertical section.

Fig. 7 is a sectional end view on line 7—7 of Fig. 5.

Fig. 8 is a similar view on line 8—8 of Fig. 6.

Fig. 9 is a sectional end view on line 9—9 of Fig. 6.

Fig. 10 is a plan view of the knob retainer member in its original condition.

Fig. 11 is a plan view of the inner portion of the mechanism, partly in central horizontal section illustrating the dogging mechanism in dogging position.

Fig. 12 is a view similar to Fig. 4, but showing the mechanism in dogged condition.

Fig. 13 is a similar view illustrating the operation of the inner knob.

In the embodiment of my invention which is illustrated in the drawings, the numeral 5 denotes the stile of a door having therein the required bored holes 6 and 7 for receiving the latch operating mechanism and the latch bolt unit, respectively.

The latch operating mechanism illustrated herein is particularly intended for use on bathroom or bedroom doors and includes a casing 8 which is preferably constructed of a series of suitably formed laminations 9, a sleeve member 10 having a flange portion 11, and a threaded sleeve member 12 having a flange 13; the said sleeve members and laminations being axially aligned and secured together by suitable fastening means such as rivets 14. When thus secured together, the said laminations and sleeve members form a casing having a recess 15 located between the flanges 11 and 13 and opening at one side of the casing, as clearly shown in Fig. 3 of the drawings.

A tubular spindle 16 extends through the said casing and is rotatably supported in the sleeves 10 and 12 and

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extends beyond the opposite sides of said casing. The central portion of the spindle is cut out, as at 17, and has inwardly bent edge portions which provide rollbacks 18—18 for operating the latch bolt.

An outer operating knob 19 is mounted upon the outer end of the spindle 16 by means of its shank 20 and the said knob is secured to the spindle by a retainer 21 which extends through a slot in the spindle into an opening in the shank 20 and is yieldingly urged outwardly from the spindle by means of a spring 22 which is secured to the spindle by an ear 23 that is bent inwardly from the wall thereof.

The said retainer member 21 is constructed of sheet metal and originally produced in the contracted form illustrated in Fig. 10 and has a retaining projection 24 with leg portions 25—25; each having an outwardly extending finger 26 thereon. The said retainer member is assembled to the spindle by inserting it into the bore of the spindle and passing the projection 24 through the hole in the wall of said spindle. A suitable tool is then inserted into the spindle for spreading the leg portions 25—25, to the position shown in Fig. 7, and thereby projecting the fingers 26—26 into elongated opposed openings 27—27 in the said spindle. After the said retainer is in position, the spring 22 is assembled to the spindle and it will rest in the notch 28 which is provided therefor in the retainer.

The operating knob 19 is prevented from rotating relatively to the spindle 16 by means of a projection 29 which is extended inwardly from the shank 20 into a slot 30 running longitudinally in the spindle.

The inner end of the said spindle is provided with an inner operating knob 31 having a shank 32, which is rotatable upon the exterior of the spindle, and an inwardly extending annular flange 33 which rotatably fits within the end of the spindle. The said operating knob is rotatably secured to the spindle by means of a boss 34 which extends inwardly from the shank 32 into a circumferential slot 35 in the spindle to permit limited rotation of the operating knob and prevent said knob from moving longitudinally of said spindle.

A dogging bar 36, preferably in the form of a flat plate, is slidably carried within the inner end of the spindle and has a dogging finger 37 which projects through an elongated slot 38 in the spindle and is adapted to enter a notch 39 in the end of the sleeve 12 for dogging the spindle against rotation. The said bar 36 has a push button 40 secured to the end thereof which projects from the knob 31 and an operating finger 41 which extends through the slot 38 for slidably moving the bar within the spindle as will be hereinafter more fully explained.

Movement of the dogging bar 36 relatively to the spindle is resisted by a flat spring member 42 which is secured at one end to the said bar and with its other end frictionally engages the inner surface of the spindle wall. The said spring member is preferably secured to the dogging bar by means of a projection 43, which extends through an elongated hole 44 in the spring member, and an abutment 45 that engages the end of the said spring member and retains it in contact with a shoulder 46 against which the said member is fulcrumed.

The said dogging bar is retained in position transversely to the bore of the spindle by means of projections 47 and 48 thereon which extend into the longitudinal slot 30 in the spindle.

The dogging bar 36 is moved into its dogging position, wherein the dogging finger 37 enters the notch 39, when the push button 40 is forced inwardly, and the said bar is moved into undogging position when the operating knob 31 is rotated, relatively to the spindle, by means of cam shoulders 49—49 in an opening 50 in the shank, through which the operating finger 41 projects.

In the embodiment illustrated in the drawings, there is provided an emergency release bar 51 which is slidably contained within the outer end of the spindle 16 and is adapted to be moved longitudinally in said spindle by the insertion of a rod or other common tool through an opening in the outer knob.

The said emergency release bar 51 has a transverse portion 52 which offsets a longitudinal portion 53 of the said bar so as to clear the rollbacks 18—18 of the spindle

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and permit rotation of the spindle without interference therefrom. The inner end of said bar has a notch 55 which receives the end of the dogging bar 36 to retain the emergency bar in operative relation with the said dogging bar. The outer end thereof has a transverse portion 56 disposed adjacent to a hole 57 in the outer knob 19.

As shown in Figs. 1 to 3, the opening 15 in the casing 8 is adapted to receive the housing 58 of a reverse acting latch unit that contains a latch 59 and an operating member 60 which projects rearwardly from the said latch unit and engages the roll-back portions 18—18.

The operating mechanism also includes an outer mounting plate 61 which has a pair of spaced anchoring pins 62—62 that extend inwardly from said plate and are adapted to be inserted through openings 63—63 in the casing and fit within notches 64—64 in the housing 58 to thereby secure the latch unit to the casing. The said anchoring pins are sufficiently long to extend beyond the opposite side of the casing and thereby permit the adaptation of the latch operating mechanism to doors of different thicknesses wherein the plate 61 may be located at different distances from the casing.

At the inner end of the said mechanism there is provided a securing plate 65 which has a sleeve portion 66 that is threaded to the sleeve 12 so as to secure the mechanism in position on the door in the manner well known by those skilled in the art.

Each of the plates 61 and 65 is covered by means of rosettes 67 and 68, respectively, and the rosette 68 also covers the opening 50 in the shank of the operating knob 31.

My improved latching operating device is installed in a door having the holes 6 and 7 therein by first depressing the retainer 21 and then removing the knob 19, the plate 61 and the rosette 67 from the device. The casing 8 is then inserted into the hole 7 from the inner side of the door and centered in said opening by adjusting the securing plate 65 upon the sleeve 12. The bolt unit is then inserted into the hole 7 and positioned so that the housing 58 will project into the opening 15 in the casing and the latch operating member 60 will be engaged by the rollback portions 18—18, as shown in Fig. 3. The pins 62—62 on the plate 61 are then inserted through the openings 63—63 in the casing and through the notches 64—64 in the latch unit housing and the plate 61 is placed against the outer side of the door. The screws 69—69 are then passed through holes which are provided for them in the plate 61 and threaded to the casing to firmly secure said casing in position within the hole 6. The rosette 67 is then replaced on the plate 61 and is retained thereon by inwardly extending projections 70 which overlie the edge of said plate. The knob 19 is then pushed over the end of the spindle until the retainer 21 enters the opening in the shank of the knob and secures the knob to the spindle.

When the parts are assembled as above described, the pins 62—62 will secure the latch unit to the casing and permit operation of the operating member 60 by the rollback in the manner fully described in my co-pending patent application, Serial No. 306,606, filed August 27, 1952.

The operation of my improved latch operating mechanism is as follows:

Assuming that the said mechanism is installed in a bathroom or bedroom door, for which the embodiment herein described is particularly intended, the said door may be opened from the outside by rotating the knob 19 in either direction which will rotate the spindle and cause operation of the member 60 by one of the rollbacks 18 on said spindle to effect retraction of the latch 59.

When it is desired to condition the mechanism so that the spindle 16 cannot be rotated, the push button 40 is forced inwardly relatively to the knob 31. This will move the dogging bar 36 outwardly within the spindle and carry the dogging finger 37 into the notch 39. Rotation of the spindle by the outer knob 19 will then be prevented and the device is therefore in its dogged condition as illustrated in Figs. 11 and 12.

The spindle may be undogged and the latch retracted from the inner side of the door by rotating the inner knob 31 in either direction. It will be noted that the lost motion connection provided by the boss 34, on the knob shank 32, which projects into the slot 35 in the wall of the spindle 16 permits limited rotation of the

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knob independently of the dogged spindle. This limited independent movement of the knob is sufficient to bring one of the cam portions 49 in the opening 50 into engagement with the finger 41 and, on continued rotation of said knob, force said finger inwardly, as shown in Fig. 13, to move the bar 36 and withdraw the finger 37 from the notch 39 to thereby undog the spindle. Further rotation of the knob is transmitted to the spindle through the engagement of the boss 34 with the end of the notch 35 to permit rotation of the spindle and retraction of the latch.

In the event of an emergency, such as when a child is locked in a room by accidental operation of the push button 40, or a person becomes stricken and is incapable of reaching and operating the knob 31, the device may be undogged by inserting a common instrument, such as a nail or wire, through the hole 57 in the outer knob to force the emergency bar 51 inwardly and thereby cause the said bar to move the dogging bar 36 to its undogged position.

I claim:

1. In a door latch operating mechanism including a casing, and a spindle extending from and rotatable in said casing, an operating member on said spindle, a dogging bar slidable within said spindle and having a dogging finger projecting through the wall of the spindle and engageable with a notch in the casing, means projecting through the operating member for operation of the dogging bar to move the said finger into dogging position, and cam means carried by said operating member and operable to move the dogging bar into undogged position to permit rotation of the spindle by the operating member.

2. In a door latch operating mechanism including a casing having a bearing sleeve extending therefrom, and a spindle rotatable in said sleeve, an operating member rotatable on said spindle, a dogging bar longitudinally slidable in said spindle and having a dogging finger extending therefrom through the wall of the spindle and engageable with a notch in the sleeve for securing the spindle against rotation, and cam means carried by said operating member exteriorly of the spindle and operable for moving the dogging bar to disengage the dogging finger from the notch to permit rotation of the spindle by the operating member.

3. In a door latch operating mechanism including a casing having a bearing sleeve extending therefrom, and a spindle rotatable in said sleeve, an operating knob on said spindle having a shank rotatable upon the exterior of the spindle, a dogging bar contained within the spindle and having a dogging finger projecting therefrom through an elongated slot in the spindle and engageable with a notch in the end of the bearing sleeve, a separate operating finger projecting from said dogging bar through the wall of said spindle, and cam means in the shank of the operating knob engageable with said operating finger for moving the bar into undogged position.

4. In a door latch operating mechanism including a casing, and a spindle rotatable in said casing and extending therefrom, an operating knob on said spindle having the shank portion rotatable over the exterior of the spindle, a dogging bar longitudinally slidable in said spindle and having a projection at one side of said bar extending into a longitudinal slot in the spindle for guiding the bar therein, a dogging finger projecting through a slot in the opposite side of the spindle and engageable with a notch in the casing for dogging the spindle against rotation, an operating finger projecting from said bar through the wall of the spindle into an opening in the shank of the operating knob, and cam means at the sides of the said opening engageable with said operating finger upon the rotation of the knob in either direction for moving the dogging bar to undogging position.

5. In a door latch operating mechanism including a casing, and a spindle rotatable within said casing, an operating knob having a shank rotatably carried on said spindle, a dogging bar longitudinally slidable within said spindle and having a dogging finger projecting therefrom through an opening in the wall of the spindle and engageable with a notch in the casing for dogging the spindle against rotation, means carried by said shank for moving the dogging bar into undogging position to permit rotation of the spindle by the operating knob, projections on said dogging bar extending into a longitudinal slot in the wall of the spindle opposite said opening for mov-

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ably positioning the dogging bar within the spindle, and a spring member carried by said dogging bar and slidably engaging the spindle for forcing the bar toward said opening.

6. In a door latch operating mechanism including a casing, and a spindle rotatable in said casing, an operating knob carried upon said spindle and having a shank rotatable upon the exterior of the spindle, the said knob being secured to the spindle by a lost motion connection to permit limited rotation of the knob and shank relatively to the spindle, a dogging bar slidable within the spindle, a dogging finger projecting therefrom through an elongated slot in the wall of said spindle at one side thereof; the said finger being engageable with a notch in the casing to dog the spindle against rotation, an operating finger extending from said dogging bar through the wall of said spindle, cam means in the shank of said knob engageable with the said operating finger for moving the bar into undogged position upon rotation of the knob, a manually engageable portion on said dogging bar projecting from the end of the operating knob for moving the said dogging bar into dogging position, spaced projections on said dogging bar extending into an elongated slot in the opposite side of the spindle for movably positioning the bar relatively to the spindle, and a spring member carried by the dogging bar and engageable with the inner wall of the spindle to urge the said dogging bar into operative position against the opposite side of the spindle relatively to said longitudinal slot.

7. In a door latch operating mechanism including a casing, and a spindle rotatable in said casing, an operating knob on said spindle having a shank extending therefrom and rotatable upon the exterior of the spindle, a lost motion connection between said shank and spindle permitting limited rotation of the operating knob relatively to the spindle, a dogging bar slidable within said spindle and comprising a flat member of sheet metal having a dogging finger projecting therefrom through an opening in the spindle and engageable with a notch in the casing for dogging the spindle against rotation, an operating finger projecting from said dogging bar, cam means carried within an opening in said shank and engageable with the said operating finger, upon rotation of said knob relatively to said spindle, for moving the dogging bar to undogged position to permit rotation of the spindle by the knob, projections on the opposite side of the dogging bar extending into an elongated slot in the respective side of the spindle for guiding the said dogging bar within the spindle, a manually engageable portion extending from said dogging bar through the end of the operating knob for moving the dogging bar into dogging position, and means between said dogging bar and spindle for frictionally positioning the bar relatively to the spindle.

8. The subject matter set forth in claim 7 wherein means are included in the opposite end of the spindle for moving the dogging bar into undogging position independently of the cam means.

9. In a door latch operating mechanism including a casing, and a spindle extending from and rotatable in said casing, an operating member on said spindle, a dogging member slidable within one end portion of said spindle and engageable with a notch in the casing for dogging the spindle against rotation, cam means located exteriorly of the spindle for moving the dogging bar out of dogging position to permit rotation of the spindle by the operating member, and an operating bar slidably contained within the opposite end of the spindle and op-

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erable to move said dogging member out of dogging position, the said operating bar having a notch in its end to receive the dogging member and retain the operating bar operatively connected thereto.

10. In a door latch operating mechanism comprising a casing, a spindle rotatable in said casing, a dogging bar slidable within one end portion of said spindle and engageable with a notch in the casing for dogging the spindle against rotation, and manually operable means projecting from the said end of the spindle for moving the dogging bar into dogging position; an operating bar slidable within the opposite end of the spindle for moving said dogging bar out of dogging position, the said operating bar including an elongated portion slidable along one side of the spindle and an offset portion disposed at the opposite side of the spindle and having a notch therein in engagement with the dogging bar for positioning the operating bar relatively thereto, and a transverse portion extending perpendicularly from the end of the said operating bar and operable with an instrument insertable through a hole in the operating knob adjacent to the said transverse portion for moving the said operating bar for an undogging operation.

11. In a door latch operating mechanism including a casing, and a spindle extending from and rotatable in said casing, an operating member rotatable on said spindle, a dogging member carried by said spindle, means for moving said dogging member into dogging position wherein rotation of said spindle is prevented, and means operable upon rotation of said operating member relatively to the spindle to move the dogging member out of dogging position to permit rotation of said spindle.

12. In a door latch operating mechanism including a casing, and a spindle extending from and rotatable in said casing, an operating member rotatable on said spindle, a dogging member carried by said spindle, means for moving said dogging member to dogging position wherein rotation of said spindle is prevented, cam means on said operating member engageable with a portion of said dogging member, upon rotation of the operating member relatively to the spindle, to urge said dogging member out of dogging position to permit rotation of the spindle.

13. In a door latch operating mechanism including a casing, and a spindle extending from said casing and rotatable therein, an operating member rotatable on said spindle, a dogging member movable within said spindle and adapted to dog said mechanism against operation whereby rotation of said spindle is prevented, means for moving said dogging member into dogging position, a projection on said dogging member extending through an opening in the wall of the spindle and into an opening in the operating member; said opening in the operating member having cam means disposed at the opposite sides thereof adjacent said projection whereby, upon rotation of the operating member relatively to the spindle when said spindle is dogged, said cam means will engage said projection and urge the dogging member out of dogging position to permit rotation of said spindle.

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