

April 14, 1953

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2,634,598

LOCKING MECHANISM FOR DOOR LATCHES

Filed June 29, 1950

2 SHEETS—SHEET 1

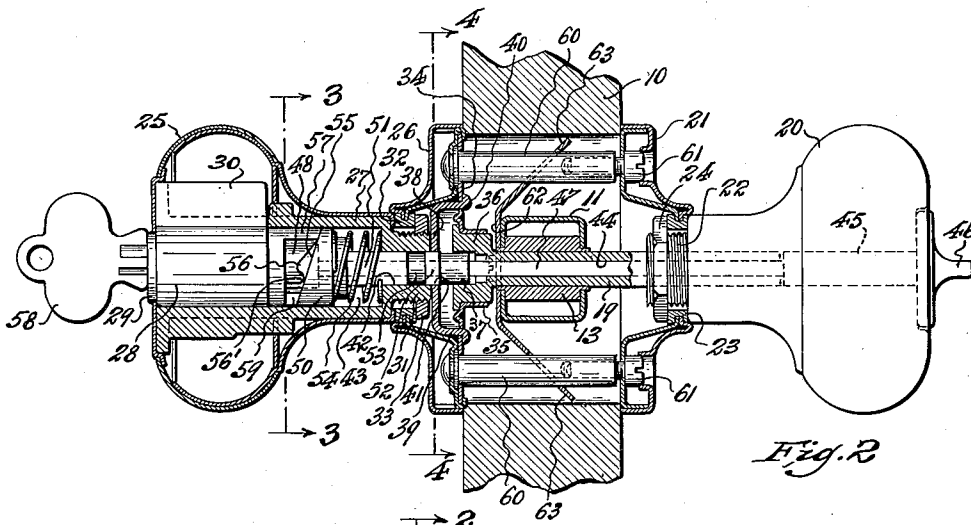


Fig. 2

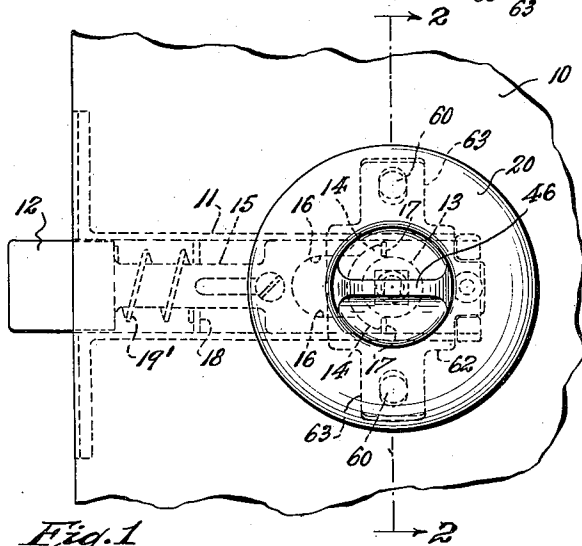


Fig. 1

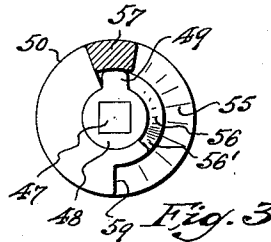


Fig. 3

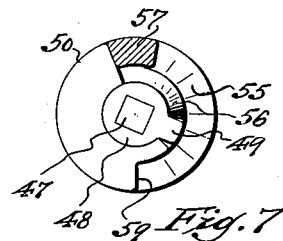


Fig. 7

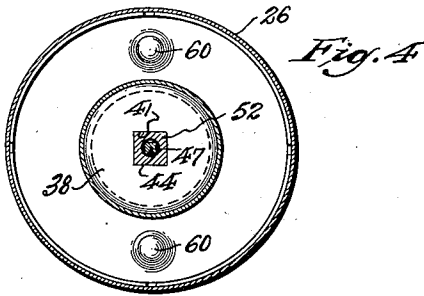


Fig. 4

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2 SHEETS—SHEET 2

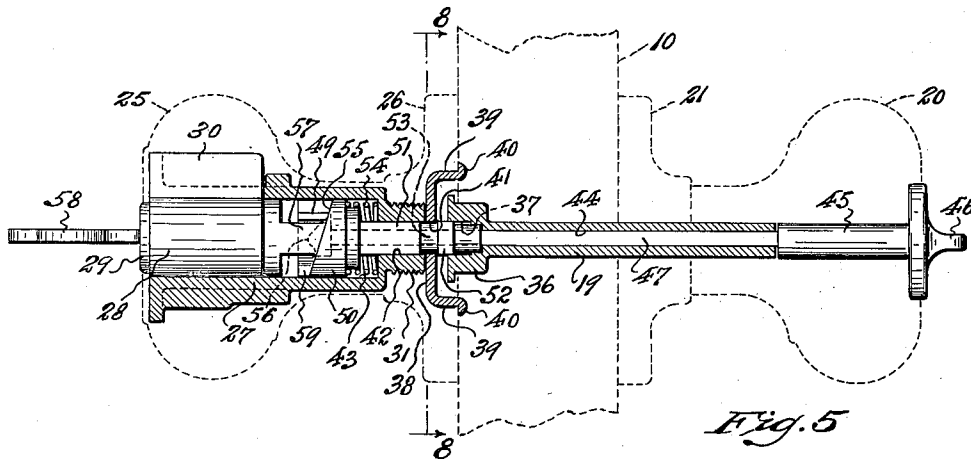


Fig. 5

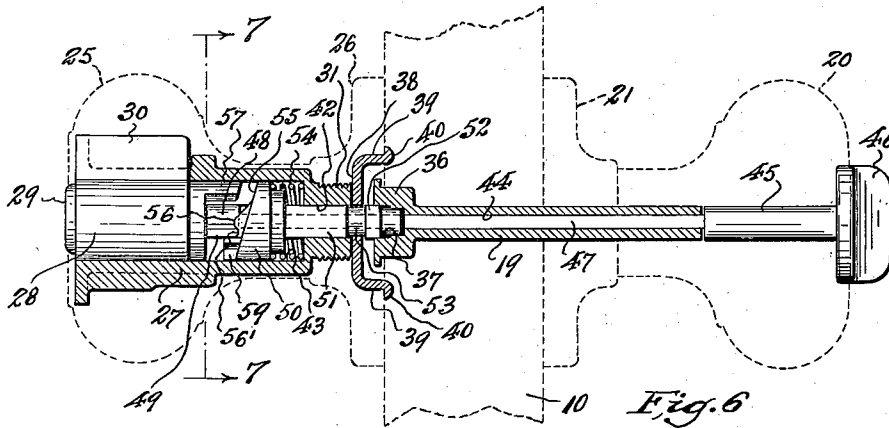


Fig. 6

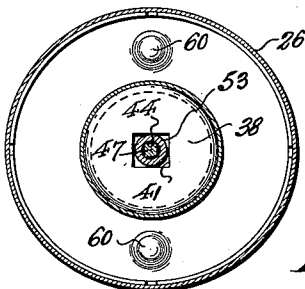


Fig. 8

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LOCKING MECHANISM FOR DOOR LATCHES

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This invention relates to improvements in door latch mechanism having manipulatable means operative from one side of the door, e. g. its inner side, for locking the latch mechanism against operation from the opposite side of the door, e. g. its outer side.

The invention has for an object to provide, in combination with a door latch mechanism of the kind contained in a casing mortised into the door body, novel means, associated with the inner door knob and its door latch mechanism actuating spindle, which is selectively manipulatable to lock the outer door knob against door latch mechanism actuation except by means of key operable means with which the outer door knob is equipped, or to couple the outer door knob to the door latch mechanism actuating spindle, whereby the latter can be freely operated by turning of the outer door knob.

The invention has for a further object to provide a locking mechanism for a door latch characterized as above stated which comprises a shiftable spindle clutch means associated with the outer door knob, said clutch means including a lock element which normally releasably engages a lock plate incorporated in the rose of said outer door knob, means being provided for shifting the clutch means so as to release the lock element from the lock plate and at the same time to operatively engage the clutch means with the door latch actuating spindle; said latter means being operable either by the manipulating means associated with the inner door knob or by key actuated means associated with the outer door knob.

Another object of the invention is to provide novel means for holding the door latch mechanism in fixed alignment and operative relation to the door knob devices and the actuating spindle operated thereby.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following description of the same.

An illustrative embodiment of the invention is shown in the accompanying drawings, in which—

Figure 1 is a fragmentary inside face view of a door which is equipped with the latch mechanism and novel locking means therefor according to this invention; Fig. 2 is a vertical cross-sectional view, taken on line 2-2 in Fig. 1, the locking means shown in condition whereby to prevent actuation of the door latch mechanism by the outer knob unless released by the key operable means with which said outer knob is

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provided; Fig. 3 is a fragmentary cross-sectional view, taken on line 3-3 in Fig. 2; and Fig. 4 is a cross-sectional view, taken on line 4-4 in Fig. 2.

Fig. 5 is a view similar to that of Fig. 2, but showing the locking means as released by the operation of the key operable means with which the outer door knob is provided, the knobs and their roses being shown in dotted outline.

Fig. 6 is a view, also similar to that of Fig. 2, but showing the locking means as released by means associated with the inner door knob, the door knobs and their roses being also shown in this view in dotted outline.

Fig. 7 is a fragmentary cross-sectional view, taken on line 7-7 in Fig. 6; and Fig. 8 is a fragmentary cross-sectional view, taken on line 8-8 in Fig. 5.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

Referring to the drawings, the reference character 10 indicates a door equipped with a latch mechanism and locking means therefor according to this invention. Mounted in a mortised opening, which extends into the door body from its free end, is a casing 11 in which is housed the normally projected door latch bolt 12. Journaled in and between opposite side walls of the casing 11 is the hub 13 of a rotary cam piece which is shaped to provide oppositely extending cam elements 14. Unitary with said latch bolt 12, to extend from the inner end thereof within the casing 11, is a pull member 15 which terminates at its rearward end in spaced apart legs 16 adapted to straddle the hub 13 of the cam piece. Said legs 16 of the pull member 15 are provided with angular terminal portions 17 which are suitably shaped for operative engagement by the cam elements 14. The pull member 15 extends through a transverse partition member 18 with which the interior of the casing 11 is provided at a point intermediate the cam piece and latch bolt. The latch bolt and its pull member is yieldably urged to latch bolt projecting position by a compression spring 19' which is engaged around the pull member between the inner or rear end of the door latch 12 and said partition member 18.

The means for actuating the above described latch mechanism comprises a spindle 19 of square section which is affixed to and extends inwardly from the inner door knob 20 through an inner rose structure 21, and thence through the cam piece hub 13 which is adapted to be rotated by said spindle. The inner door knob is rotatably supported by said inner rose structure. The

shank of said inner knob terminates in an externally screw-threaded axial boss 22 of reduced diameter which extends through a journal piece 23 which is rotatably journaled by the rose structure. Said journal piece 23 is secured to the inner knob shank by a fastening nut 24 which is screwed onto the boss 22.

The outer door knob 25 is rotatably supported by an outer rose structure 26. Fixedly mounted within the interior of the outer door knob is an outwardly open chambered core block 27, within the outer end portion of which is mounted the casing 28 of a pin lock which is provided with a rotatable key actuated barrel 29. Said core block 27 is slotted to embrace the radially projecting pin housing 30 of the pin lock, whereby the pin lock casing 28 is also affixed to the outer door knob 25 against rotation relative thereto. The core block 27 extends into the shank of the outer knob 25 and terminates in an axially projecting, externally screw-threaded boss 31 of reduced diameter. Said boss 31 extends through a journal piece 32 which is rotatably journaled by said outer rose structure 26; said journal piece being secured to the outer knob shank by a fastening nut 33 which is screwed onto the boss 31.

The outer rose structure 26 is provided with a back plate 34 which is suitably secured thereto. Said back plate 34 is provided with a central bearing sleeve 35. Unitary with the inner end of the spindle 19 is an annular female clutch piece 36 which is rotatably supported by said bearing sleeve 35. This clutch piece 36 is provided with an outwardly open clutch socket 37 of square cross-section.

Mounted on the back plate 34, in alignment with the spindle 19 and its clutch piece 36, so as to be located within the interior of the outer rose structure 26, is a lock plate 38, the annular skirt 39 of which abuts said back plate 34 and is provided with clenching lugs 40 which extend through and are clenched over the back plate, thus affixing the lock plate to the latter. The lock plate is provided with a central square lock aperture 41 which corresponds to and is aligned with and in outwardly spaced offset relation to the clutch socket 37 of the clutch piece 36. The boss 31 of the core block 27 within the outer door knob 25 is provided with an axial slideway 42 of square cross section. This slideway 42 leads into the chambered interior 43 of said core block. The slideway 42 is opposed to the lock aperture 41 of lock plate 38 in aligned relation thereto.

The spindle 19 is provided with an axial bore 44. Journaled in the inner door knob 20 is the shank 45 of a turn button 46. Said turn button 46 is rotatably supported by the inner door knob 20 so as to be exposed at the end face thereof. Extending axially from the shank 45 of the turn button 46 through the bore 44 of the spindle 19 is a longitudinal stem 47. This stem 47 extends through the lock plate 38 and slideway 42 into the chambered interior 43 of the outer door knob core block 27, and affixed to the free end portion of this stem is a hub 48 having a radially projecting thrust tongue 49, the purpose of which will be hereinafter explained.

Slidably supported upon the stem 47, behind the hub 48 and its thrust tongue 49, is a shiftable outer door knob lock and spindle clutch means. This means comprises a cam head 50 which is housed in the chambered interior of the outer door knob core block 27. Extending rearwardly from said cam head 50 is a square shank 51, the free end of which is slidably engaged in the slideway 42.

Said shank 51 terminates in a combined lock and male clutch piece 52 of square conformation, which is normally engaged in the lock aperture 41 of the lock plate 38. Outwardly of said lock and clutch piece 52, the shank 51 is provided with a cylindrical release portion 53. The outer door knob lock and spindle clutch means is yieldably held in an outwardly shifted normal position, wherein its lock and clutch piece 52 is engaged in the lock aperture 41 of the lock plate 38, by means of a compression spring 54 which is mounted around the same between the inner end of the chambered interior 43 of the core block 27 and the cam head 50. The cam head 50 is provided on its external face with an outer annular oblique cam face 55, and concentric thereto with an inner cam nosing 56, the latter lying in the path of rotary movement of the thrust piece 59 which is carried by the hub 48 with which the turn button manipulatable stem 47 is provided.

To the inner end of the key actuated barrel 29 of the pin lock, with which the outer door knob 25 is provided, is affixed a thrust tongue 57 which impinges upon the cam face 55 of the cam head 50. The barrel 29 is adapted to be actuated by a key 58 which, when entered therein, controls the pins (not shown) of the pin lock, so that the barrel can be rotated by the key. The cam head 50 is provided, at the end of the cam face 55 with a shoulder 59 which is adapted to be engaged by the thrust tongue 57 at proper times, whereby to transmit to the shiftable outer knob lock and spindle clutch means the rotary movement imparted to the key barrel 29 by the key 58.

The rose structures 24 and 26 are affixed to the respective interior and exterior faces of the door 10 by means of internally screw-threaded tie-members 60 which extend from the outer rose structure 26 through the door toward the inner rose structure 24, fastening screws 61 being engaged through said inner rose structure so as to screw into said tie-members 60, thus securely affixing the rose structures in place, and in such manner that removal thereof cannot be accomplished from the exterior side of the door.

Novel means is provided whereby the door knob mechanism and the door latch mechanism are retained against displacement from their mutually cooperative assembled relationship, and in properly aligned condition. This means comprises an aligning coupler plate 62 which is affixed to the door latch bolt casing 11. The coupler plate 62 is provided with oppositely extending perforate arms 63 through which pass the tie-members 60 in extension between the rose structures, thus retaining the door latch mechanism and the door knob mechanism in proper cooperative relation.

Referring to Figs. 2, 3 and 4, the locking mechanism for the door latch is shown in the condition whereby the outer knob 25 is locked against manipulation operative to draw and release the door latch bolt 12. In this condition, the turn button 46 operating through the stem 47 disposes the hub 48 and thrust tongue 49 in the normal position shown in Fig. 3, so that the compression spring 54 yieldably holds the cam head 50 and shank 51 in outward position abutting the thrust tongue 57 of the pin lock barrel 29. When the cam head 50 and its shank 51 are thus disposed, the combined lock and male clutch piece 52 is lodged in the lock aperture 41 of the lock plate 38, and consequently turning of these parts is prevented, whereby the outer door knob 25 is also secured against turning. Under these circumstances, the only way in which the door latch

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bolt 12 can be drawn, to release the door for opening from the outside, is by use of the key 58. To accomplish this, the key 58 is inserted in the key barrel 29 so as to condition the pins of the pin lock to permit turning of the key barrel. By turning the key barrel with the key, the thrust tongue 57, which moves with the key barrel, is caused to first ride over and thrust against the outer cam face 55 of the cam head 50, thus sliding inward the cam head and its shank 51 against the tension of the compression spring 54 as shown in Fig. 5. Such inward movement of the shank 51 moves the combined lock and male clutch piece 52 out of the lock aperture 41 of the lock plate 38 and into the socket 37 of the female clutch piece 36, thereby coupling the outer door knob 25 through the core block 27 to the spindle 19, and at the same time aligns the cylindrical release portion 53 of shank 51 with the lock aperture 41 of the lock plate 38, whereby to permit rotative movement of the shank 51 relative to the lock plate (see Fig. 5). Thereafter, continued rotation of the key barrel 29 causes the thrust tongue 57 to impinge upon the shoulder 59 of the cam head 50, whereupon continued rotation of the key barrel imparts rotary movement to the cam head 50, its shank 51, the outer door knob 25, and the male clutch piece 52, such rotary motion being transmitted by the latter to the spindle 19, whereby the cam piece 13-14 of the latch bolt mechanism is actuated to draw back the pull member 15 and thus to retract the latch bolt 12 to door releasing position, so that the door 10 can thereupon be swung open from the outside.

If it is desired to set the locking mechanism for the door latch so that the latch bolt mechanism can be actuated by the turning of the outer door knob 25 to permit free opening of the door from the outside, the turn button on the inner door knob 20 is given a quarter or ninety degree turn to the position shown in Fig. 6. Such movement of the turn button 46, operating through the stem 47, rotates the hub 48 and thrust tongue 49, thereby causing the latter to ride over and thrust against the inner cam nosing 56 of the cam head 50 thus sliding inward said cam head and its shank 51. At the end of its thrusting movement, the thrust tongue 49 drops into and comes to rest in a notch 56', thereby retaining the cam head 50 and shank 51 in said inwardly thrust position. The inward movement of the cam head 50 and shank 51 carries the combined lock and male clutch piece 52 out of the lock aperture 41 of the lock plate 38 and into engagement with the female clutch piece of the spindle 19 while the release portion 53 is moved into alignment with said lock aperture 41 of the lock plate 38, thus freeing the cam head and its shank and male clutch piece for rotation (see Fig. 6). Under these conditions, it will be obvious that the outer knob 25 will be coupled to the spindle 19 so that the latter may be operated to retract the latch bolt 12 by means of the outer knob, when hand rotation of said knob is transmitted through the core block 27 to the square shank 51 of the clutch piece 52, which, under said conditions, is engaged in the clutch socket 37 of the spindle carried female clutch piece 36.

When the turn button 46 is in the position shown in Fig. 2, the clutch piece 52 is engaged in the lock aperture 41, and consequently prevents rotation of the shank 51, and since the core block 27 with the outer knob 25 are non-rotatable relative to said shank 51, the outer knob 25 cannot

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be hand turned, and the door latch bolt 12 cannot be actuated from the exterior side of the door except by the key controlled means with which the outer knob 25 is provided, when said key controlled means is manipulated in the manner shown in Fig. 5. Nevertheless, under these conditions, the door latch bolt 12 can be actuated by hand turning the inner knob 20, the shank of which is directly keyed or secured to the spindle 19, since the female clutch piece 36 is free to rotate relative to the stationary shank 51.

When the turn button 46 is rotated 90° to the position shown in Fig. 6, the hub 48 and thrust tongue 49 are simultaneously turned against the inner cam nosing 56 of the shank 51, whereby to shift said shank 51 so as to withdraw the clutch piece 52 from the lock aperture 41 and enter the same in the female clutch piece 36 of the spindle 19. Under these conditions, the spindle 19 can be turned to actuate the door latch bolt 12 by hand turning either the inner knob or the outer knob.

Having now described my invention, I claim:

1. Latch mechanism for a door comprising a casing including a latch bolt and actuating means therefor, an inner rose mounted on the inner side of the door, an inner knob journaled in said inner rose, a spindle extending from the inner knob to operatively engage the latch bolt actuating means, an outer rose mounted on the outer side of the door, an outer knob journaled in said outer rose, means to engage the outer knob with said spindle, upper and lower tie means affixed to the roses for extension therebetween in straddling relation to the latch bolt casing, a coupler plate affixed to said latch bolt casing, and said coupler plate having oppositely extending perforate arms through which said upper and lower tie means respectively extend, whereby to retain the latch bolt actuating means and the door knobs in cooperatively aligned relation.

2. Latch mechanism for a door comprising a latch bolt and actuating means therefor, an inner door knob and a rose for rotatably supporting the same, an outer door knob and a rose for rotatably supporting the same, a spindle rotatable with the inner knob to extend axially therefrom into operating engagement with the latch bolt actuating means, said spindle terminating outwardly of the latter in a female clutch piece, a slidably shiftable combined lock and male clutch piece axially mounted within and rotatable with the outer knob, an apertured lock plate fixed within the supporting rose of the outer knob, means to yieldably hold the lock and male clutch piece normally engaged with said lock plate and disengaged from the female clutch piece of the spindle, a pin lock and its key rotatable barrel mounted in the outer knob, a cam head on the outer end of said lock and male clutch piece, said cam head having concentric outer and inner cam portions, means connected with the key rotatable barrel for cooperation, upon key rotation of said barrel, with the outer cam portion of the cam head, whereby to disengage the lock and male clutch piece from the lock plate and engage the same with the female clutch piece of the spindle, thus freeing the outer knob for spindle actuating rotation, and manipulatable means rotatably mounted in connection with the inner knob, said manipulatable means including means cooperative with the inner cam portion of the cam head, whereby, upon rotation of said manipulatable means, to disengage the lock and male clutch piece from the lock plate

and engage the same with the female clutch piece of the spindle, thereby freeing the outer knob for spindle actuating rotation without necessity for pin lock operation.

3. Latch mechanism for a door comprising a latch bolt and actuating means therefor, an inner door knob and a rose for rotatably supporting the same, an outer door knob and a rose for rotatably supporting the same, a spindle rotatable with the inner knob to extend axially therefrom into operating engagement with the latch bolt actuating means, said spindle terminating outwardly of the latter in a female clutch piece, a slidably shiftable combined lock and male clutch piece axially mounted within and rotatable with the outer knob, an apertured lock plate fixed within the supporting rose of the outer knob, means to yieldably hold the lock and male clutch piece normally engaged with said lock plate and disengaged from the female clutch piece of the spindle, a pin lock and its key rotatable barrel mounted in the outer knob, a cam head on the outer end of said lock and male clutch piece, said cam head having concentric outer and inner cam portions, means connected with the key rotatable barrel for cooperation, upon key rotation of said barrel, with the outer cam portion of the cam head, whereby to disengage the lock and male clutch piece from the lock plate and engage the same with the female clutch piece of the spindle, thus freeing the outer knob for spindle actuating rotation, manipulatable means rotatably mounted in connection with the inner knob, said manipulatable means including means cooperative with the inner cam portion of the cam head, whereby, upon rotation of said manipulatable means, to disengage the lock and male clutch piece from the lock plate and engage the same with the female clutch piece of the spindle, thereby freeing the outer knob for spindle actuating rotation without necessity for pin lock operation, and said inner cam portion of the cam head including detent means for releasably retaining the lock and male clutch piece in shifted spindle clutching position.

4. Latch mechanism for a door comprising a latch bolt and actuating means therefor, an inner door knob and a rose for rotatably supporting the same, an outer door knob and a rose for rotatably supporting the same, a spindle rotatable with the inner knob to extend axially therefrom into operating engagement with the latch bolt actuating means, said spindle terminating outwardly of the latter in a female clutch piece, a slidably shiftable combined lock and male clutch piece axially mounted within and rotatable with the outer knob, an apertured lock plate fixed within the supporting rose of the outer knob, means to yieldably hold the lock and male clutch piece normally engaged with said lock plate and disengaged from the female clutch piece of the spindle, a cam head on the outer end of said lock and male clutch piece, said cam head having concentric outer and inner cam portions, a pin lock and its key rotatable barrel mounted in the outer knob, an axially offset thrust tongue projecting from the inner end of said barrel and rotatable therewith to operatively engage the outer cam portion of the cam head, whereby, upon key rotation of said barrel, to disengage the lock and male clutch plate from the lock plate and engage the same with the female clutch piece of the spindle, thus freeing the outer knob for spindle actuating rotation, an

external turn button mounted on the inner knob, a stem extending from said turn button axially through a bore with which the spindle is provided and thence through a bore with which the lock and male clutch piece is provided, a hub affixed to the free end of said stem to project outwardly of the cam head, and said hub having a radial thrust tongue to operatively engage the inner cam portion of the cam head, whereby, upon rotation of said stem, to disengage the lock and male clutch piece from the lock plate and engage the same with the female clutch piece of the spindle, thus freeing the outer knob for spindle actuating rotation without necessity for pin lock operation.

5. Latch mechanism for a door comprising a latch bolt and actuating means therefor, an inner door knob and a rose for rotatably supporting the same, an outer door knob and a rose for rotatably supporting the same, a spindle rotatable with the inner knob to extend axially therefrom into operating engagement with the latch bolt actuating means, said spindle terminating outwardly of the latter in a female clutch piece, a slidably shiftable combined lock and male clutch piece axially mounted within and rotatable with the outer knob, an apertured lock plate fixed within the supporting rose of the outer knob, means to yieldably hold the lock and male clutch piece normally engaged with said lock plate and disengaged from the female clutch piece of the spindle, a cam head on the outer end of said lock and male clutch piece, said cam head having concentric outer and inner cam portions, a pin lock and its key rotatable barrel mounted in the outer knob, an axially offset thrust tongue projecting from the inner end of said barrel and rotatable therewith to operatively engage the outer cam portion of the cam head, whereby to move the lock and male clutch piece to spindle clutching engagement with the female clutch piece during initial rotative movement of said barrel, said outer cam portion having a terminal shoulder adapted to be abutted by said thrust tongue, whereby to transmit rotary movement to the clutched spindle upon continued rotative movement of said barrel, an external turn button mounted on the inner knob, a stem extending from said turn button axially through a bore with which the spindle is provided and thence through a bore with which the lock and male clutch piece is provided, a hub affixed to the free end of said stem to project outwardly of the cam head, said hub having a radial thrust tongue to operatively engage the inner cam portion of the cam head, whereby to move the lock and male clutch piece to spindle clutching position by manipulation of the inner knob turn button, and said inner cam portion having a terminal notch to receive said radial thrust lug, whereby to releasably retain the lock and male clutch piece in said spindle clutching position.

6. A latch mechanism according to claim 5 wherein the lock plate is provided with a square aperture, and the combined lock and male clutch piece is of corresponding square cross section and is provided with a cylindrical release portion adapted to register with said lock plate operative when said lock and male clutch piece is moved into clutching engagement with the female clutch piece, whereby to permit spindle actuating rotation of said lock and male clutch piece by the outer knob means.

7. Latch mechanism for a door comprising a

latch bolt and actuating means therefor, an inner door knob and supporting rose, an outer door knob and supporting rose, a spindle extending from the inner knob to operatively engage the latch bolt actuating means, said spindle terminating outwardly of the latter in a female clutch piece, a shiftable combined lock and male clutch piece mounted within and rotatable with the outer knob, an apertured lock plate fixed within the rose of the outer knob, means to yieldably hold the lock and male clutch piece normally engaged with said lock plate and disengaged from said female clutch piece, a pin lock and its key actuatable barrel mounted in the outer knob, means operable by the pin lock barrel for shifting the combined lock and male clutch piece to female clutch piece engaging position, said means comprising a cam head on the outer end of the lock and male clutch piece, said cam head having an outer cam surface, an axially offset thrust tongue affixed to the inner end of said barrel to engage said outer cam surface, means connected with the inner knob for shifting the combined lock and male clutch piece comprising a turn button mounted on the inner knob,

a stem extending from the turn button axially through a bore with which the spindle is provided and thence through a bore with which the lock and male clutch piece is provided, a hub having a radial thrust tongue affixed to the end of said stem, said cam head having an inner cam surface engageable by said radial thrust tongue, and said inner cam surface including a stop notch to receive said radial thrust tongue, whereby to releasably retain the lock and male clutch piece in shifted spindle clutching position.

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References Cited in the file of this patent
UNITED STATES PATENTS

Number	Name	Date
1,086,837	Montgomery	Feb. 10, 1914
1,164,017	Reutter	Dec. 14, 1915
1,686,406	Caplan	Oct. 2, 1928
2,264,239	Hirsh	Nov. 25, 1941
2,450,840	Milligan	Oct. 5, 1948
2,482,926	Milligan	Sept. 27, 1949
2,484,961	Russell et al.	Oct. 18, 1949