July 12, 1927. A. W. MORRIS 1,635,724

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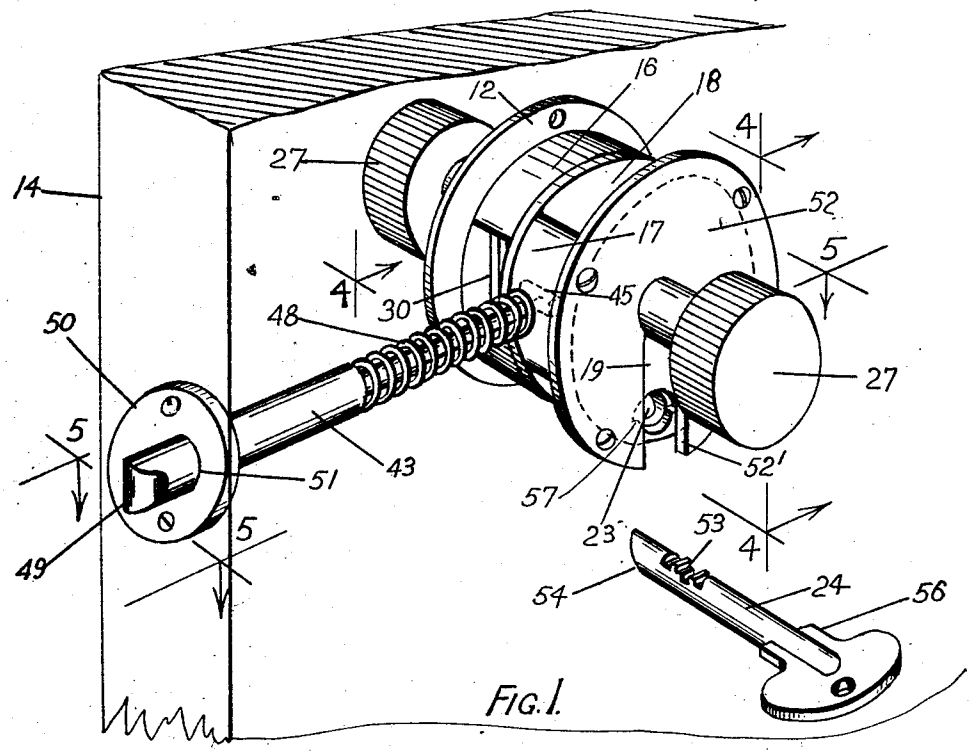


FIG. 1.

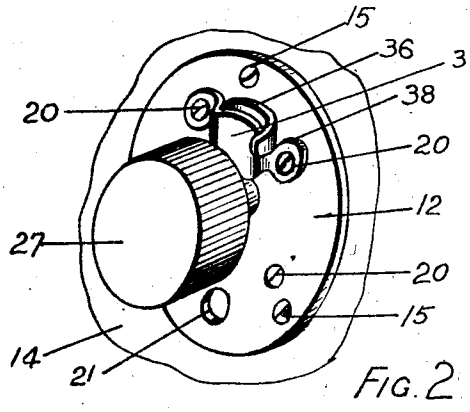


FIG. 2.

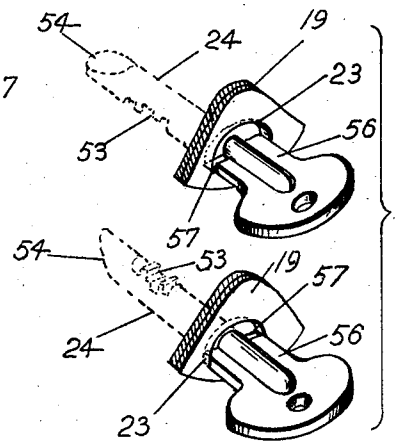


FIG. 3.

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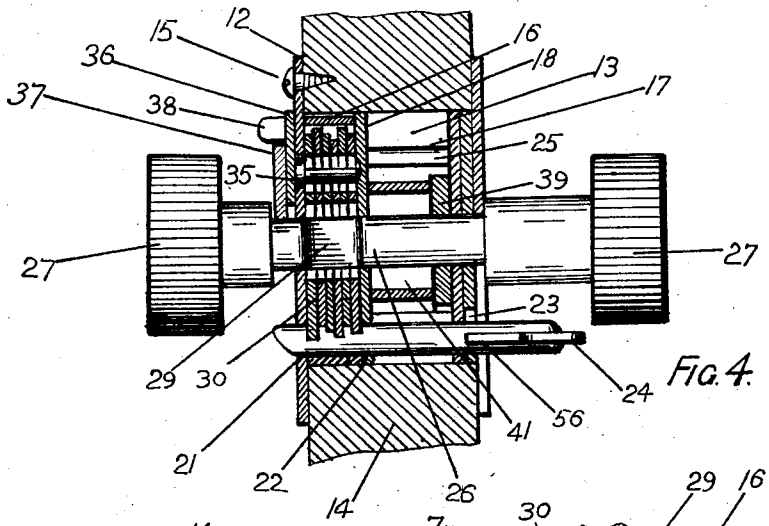


Fig. 4.

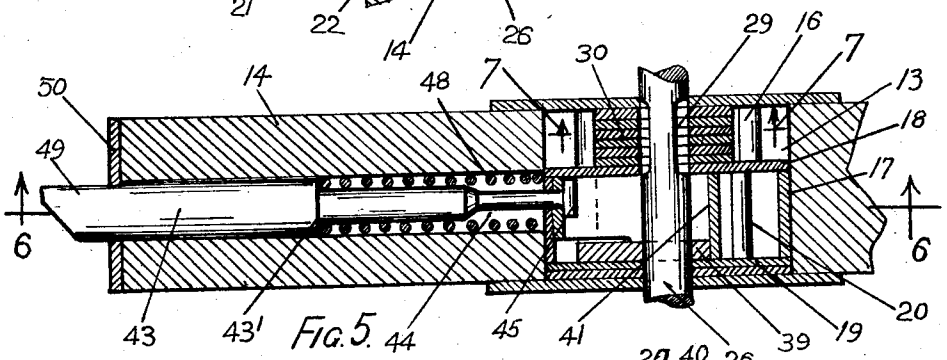


Fig. 5.

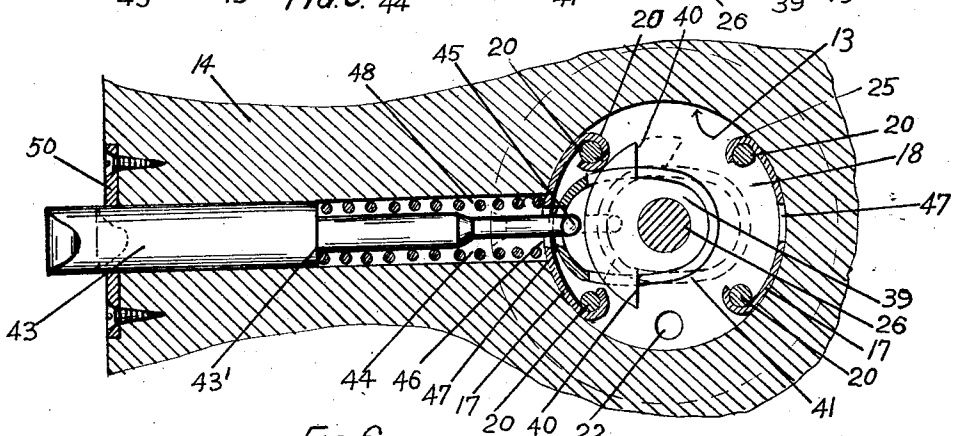


Fig. 6.

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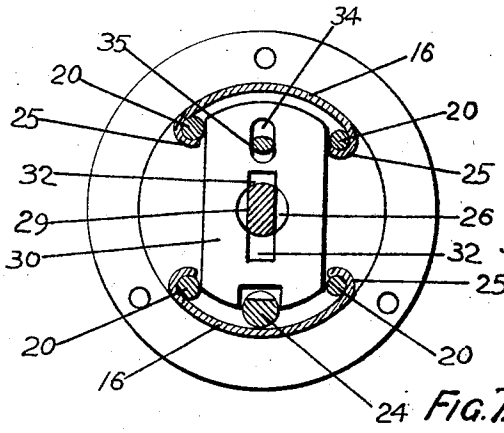


Fig. 7.

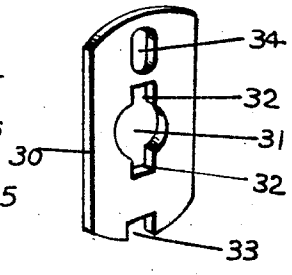


Fig. 8.

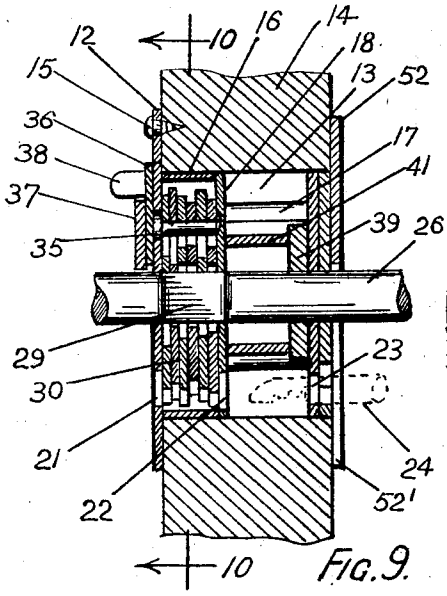


Fig. 9.

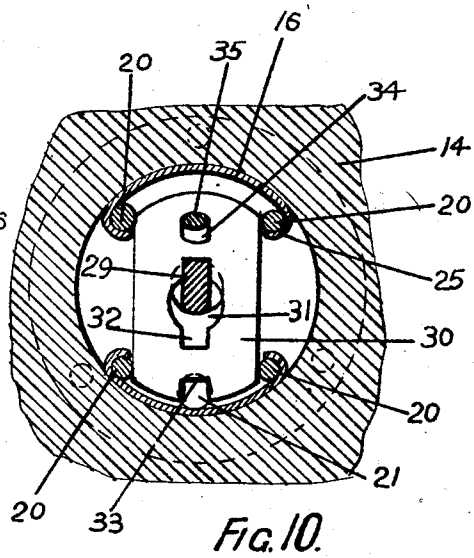


Fig. 10.

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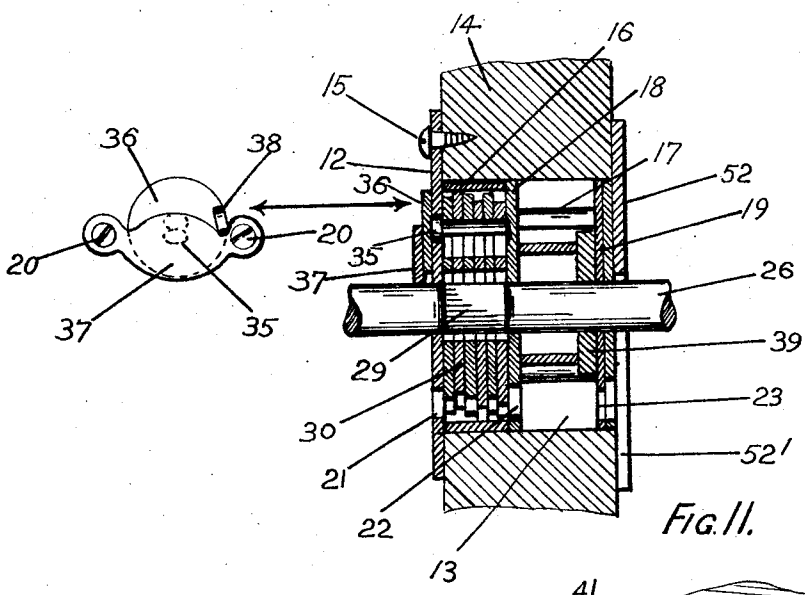


FIG. 11.

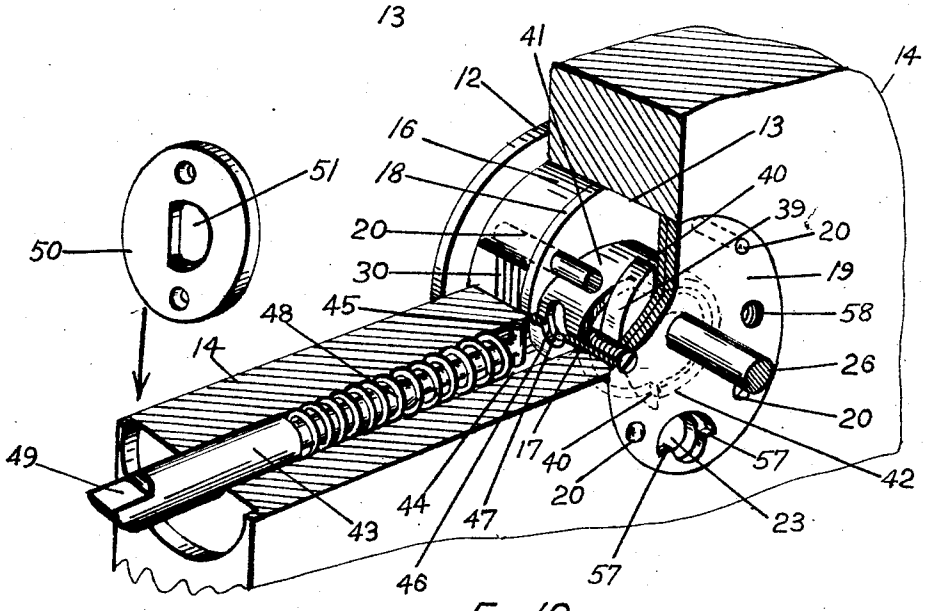


FIG. 12.

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UNITED STATES PATENT OFFICE.

ARCHIBALD WILLIAM MORRIS, OF KULARA, VIA CAIRNS, QUEENSLAND, AUSTRALIA.

LOCK.

Application filed March 27, 1925, Serial No. 18,910, and in Australia April 3, 1924.

This invention relates to fastenings for doors and its object is to provide a simply constructed and efficient lock applicable to any door, in which the bolt may be caused to function as both a locking bolt and a latch, which may by simple adjustment be converted from right hand to left hand, and which is equipped with means (operatable from the inside of the door) whereby it is converted from a lock to a latch, that is to say it may be manipulated from without by merely turning the outside handle, the use of a key under these circumstances being unnecessary, but which when set to act as a lock (automatically effective on closure of the door) cannot be opened from the outside except by the use of an appropriate key.

The invention consists in a lock including the novel features and combinations of parts hereinafter described with reference to the accompanying drawings in which

Fig. 1 is a perspective front view of the lock complete affixed to a door and also showing the key separately.

Fig. 2 is a perspective view of the rear or inside end of the barrel of the lock.

Fig. 3 illustrates different positions of the key when inserted.

Fig. 4 is a transverse sectional elevation through the barrel of the lock, on plane 4, 4, of Fig. 1, showing key inserted and turned, the parts of the lock being in the unlocked position.

Fig. 5 is a longitudinal sectional plan on the horizontal plane 5, 5, of Fig. 1.

Fig. 6 is a sectional elevation on line 6, 6, of Fig. 5, and

Fig. 7, a similar view of the barrel of the lock taken on line 7, 7, of Fig. 5, showing the key inserted and the parts disposed to permit the turning of the spindle.

Fig. 8 is a perspective view of one of the ward plates contained within the barrel of the lock.

Fig. 9 is a sectional view similar to Fig. 4, but with key withdrawn, thus showing the parts in the locked position.

Fig. 10 is a sectional elevation on line 10, 10 of Fig. 1.

Fig. 11 is a sectional view similar to Fig. 4, and accompanied by a view of the latch attachment.

Fig. 12 is a sectional perspective view illustrating the manner in which the lock is fitted to a door.

The barrel of the lock comprises a rear or inside end plate 12 which is preferably circular and is of a larger diameter than the aperture 13 provided for the reception of the barrel in the door stile 14, said rear plate being secured to the door by screws 15. Spaced from the rear plate 12 by means of two pairs of distance pieces 16 and 17 respectively are a circular division plate 18 and a circular front end laminated plate 19; the diameter of the plates 18 and 19 approximates to that of the orifice 13 so as to fit snugly therein.

The plates 12, 18 and 19 together with the pairs of distance pieces 16 and 17 are rigidly held in proper relation by screw bolts 20 extending from the rear plate and screwed into the front plate 19. The plates 12, 18 and 19 have apertures 21, 22 and 23 respectively to form a passage or guide for the key 24.

The distance pieces 16 and 17 are of segmental shape and have turned in ends 25 taking around the bolts 20, said pieces thus being firmly secured in position.

The spindle 26 of the lock is fitted at its ends respectively with knobs 27, and is generally of circular section, but has portions cut away to form a waist 29 of substantially rectangular cross section and, when the parts are assembled, located between the rear plate 12 and division plate 18; and between these two plates are a plurality of ward-plates 30 individually arranged to slide freely and vertically between the plates 12 and 18. These ward plates are prevented from rotation by the bolts 20 which are in close proximity to their vertical edges and constitute guides for them (see Figs. 7 and 10).

Each ward plate 30 has a circular aperture 31 to accommodate the spindle 26 and extending from each aperture 31 are oppositely disposed radial rectangular slots 32 formed to make a sliding fit with the waist 29 of the spindle 26. The ward plates 30 have at their lower edges rectangular notches 33 of various depths, whilst in their upper portions are oval apertures 34 arranged at various distances from the upper edges of the plates respectively.

Passing through the apertures 34 in the plates 30 is a cam spindle 35 constituting

a crank pin to a rotatably mounted disc 36, said crank pin 35 having bearings in the plates 12 and 18; the disc 36 is retained in position by a bracket 37 which is secured to the rear plate by two of the bolts 20, which pass through it. Projecting from the disc 36 is a fingerpiece 38 affording means for rotating the disc and also arranged to contact with the edges of the bracket and thus limit the rotation of the disc in either direction.

Fixed upon the spindle 26 between the division and front plates 18 and 19 and preferably immediately behind the latter is a flat metal claw plate 39 which has a pair of teeth or claws 40 formed upon its edge and arranged diametrically opposite one another. The oval shaped floating yoke or sleeve 41 surrounds the spindle 26 between the plates 18 and 19 and has a portion of its wall cut away to form a pair of shoulders 42 diametrically opposite to one another and with which the teeth 40 of the claw plate 39 engage.

The bolt 43 slides within a hole 44 bored from the edge of the door to meet the aperture 13 at a right angle. The bolt 43 has on its inner end a T-head 45 which passes through one of the elongated slots 46 in one of the distance pieces 17 and thence through another elongated slot 47 in the yoke 41; the bolt 43 is then given a quarter turn to couple it to the yoke 41. A helical spring 48 is arranged around the reduced portion of the bolt 43 and bears against the distance piece 17 and the shoulder 43′ of the bolt, said spring tending to force the bolt outwardly. A flat 49 is provided on the outer end of the bolt where it passes through a keeper plate 50 in which is a D-shaped aperture 51 preventing the bolt from being turned and released from the yoke 41.

The distance pieces 17 each have an elongated hole 47 as hereinbefore mentioned, and the yoke 41 has an elongated hole at each end to enable the lock to be adjusted for right or left hand fitting as desired. That is to say the bolt may be arranged to project radially from either side of the barrel.

A cover plate 52 may be used so as to give a set off appearance to the lock when affixed to a door, and this plate is formed with a slot 52′ (registering with the keyhole in the plate 19) which enables it to be fitted after the lock has been otherwise completely fitted.

To facilitate the attachment of the bolt to the yoke 41, the latter is temporarily held in position by a temporary screw 55 (see Fig. 12) taking into one of the screw threaded holes 58 in the plate 19. The barrel of the lock is inserted into the hole 13 in the door 14, and then the bolt 43 with its coil spring 48 is inserted in the hole 44 in the door stile, the T-head 45 passing through the elongated apertures 46 and 47. The bolt is given a quarter turn and the keeper plate 50 secured into position. The temporary screw 55 then extracted, and finally the cover plate 52 is attached.

To enable the lock to be opened from without when it is not set to function as a latch only, but functions as a lock, a specially constructed key is required. Such a key is depicted in part of Fig. 1, in Figs. 3 and 4 and in dotted lines in Fig. 9. The key comprises a stem 24 formed with steps or wards 53 and bevelled at its end as at 54. Shoulders or fins 56 are provided to determine the longitudinal position of the key in the lock which must be such that the wards 53 underlie the ward plates 30 when the key is pushed fully home through the holes registering 23, 22 and 21 in plates 19, 18 and 12 respectively, as shown in Fig. 4. The hole 23 in the outer lamination of plate 19 is, as regards its upper portion, made larger than the hole in the inner lamination, and is formed to provide shoulders 57 as clearly shown in Fig. 12. When the key is pushed home the longer of the fins 56 enters the enlarged upper portion of the hole in the outer lamination of plate 19 and abuts against the inner lamination. The shoulders 57 constitute stops limiting the turning movement of the key. The key is inserted with the bevel 54 facing upwardly and the wards or steps 53 downwardly as shown in the upper part of Fig. 3.

The effect of the spring 48 not only outwardly presses the bolt 43, but, as the result of such outward pressure, the yoke 41 is pulled laterally and the shoulders thereon bear evenly against the claws 40 on plate 39, thus normally holding the spindle 26 so that the waist thereof is in register with the slots 32 in the ward plates 30. Normally the ward-plates are in their lowest positions with the upper slots 32 engaging the waist of the spindle as shown in Fig. 10. The entry of the key in the notches 33 in the lower edges of the ward-plates raises the latter, but as the notches 33 are of various depths, some of the ward plates are raised sufficiently to bring their circular apertures 31 into register with the spindle, while others are raised to such an extent that the lower slots 32 engage the waist and prevent the turning of the spindle at this stage. On the key being given a half turn anti-clockwise to the position shown in the lower part of Fig. 3, the wards or steps thereon are brought into position underlying the ward-plates which drop into said steps respectively. The ward-plates, the apertures therein and the wards or steps of the key are so relatively constructed and arranged that when in their co-operative positions the circular apertures 31 in the ward-plates are all in alignment and in register with the

spindle so that the latter may be rotated in either direction, such rotation, by the coaction of the claw plate 39 and yoke 41, retracting the bolt 43 and permitting the door to be opened. The key is now given a half turn in reverse direction and withdrawn from the lock, the parts of the latter re-assuming their normal or locking positions.

To enable the spindle to be rotated from inside the door and also, if desired, from the outside without using the key, the catch device is provided. When the disc 36 is turned to its limit in one direction the crank pin 35 is disposed in its lowest position as shown in Fig. 9 and does not have any effect on the ward-plates 30, but when the disc is turned to the other extreme position the crank pin is in its uppermost position and the effect is to raise the ward-plates so that their circular apertures 31 are in register with the spindle 26 and the latter may be turned in either direction. The apertures 34 in the ward-plates respectively are so arranged that this effect is obtained. On returning the disc to the first mentioned position the ward-plates are free to return to their locking positions.

What I claim and desire to secure by Letters Patent is:

1. A lock including a barrel portion to fit in a hole bored transversely through a door, and a bolt movable radially to and from the barrel portion and outwardly pressed by a spring, said barrel portion comprising a pair of end plates and an intermediate division plate all maintained in spaced parallel relation, a rotatable spindle passing through said end plates and division plate and having bearing in the end plates, said spindle being fitted at each end with means for rotating it and being cut away on opposite sides to provide a substantially rectangular waist portion located between the division plate and one of the end plates, a plurality of ward-plates individually slidable in guides in a plane at right angles to the spindle, each of said ward-plates having a clearance aperture (permitting the passage and rotation of the spindle) and a pair of oppositely disposed radial slots extending from the clearance aperture, one of said slots in each plate normally engaging the waist of the spindle to prevent the latter being rotated until by the operation of an appropriate key the ward-plates are moved to bring their clearance apertures into alignment and in register with the axis of the spindle, a floating yoke about the spindle formed with shoulders and with means for connecting the inner end of the bolt thereto, and, fixed on the spindle, a claw plate having claws co-operating with said shoulders to move the yoke and retract the bolt when the spindle is rotated.

2. A lock including in combination a barrel portion comprising a pair of end plates and an intermediate division plate each having registering apertures to admit a key, distance pieces spacing said plates and through screws holding them in fixed relation, a rotatable spindle passing axially through said plates and having a flat-sided waist portion and handles at its ends respectively, a plurality of movable ward-plates each having a clearance aperture and a pair of radial slots oppositely disposed and in alignment with the normal angular position of the waist portion of the spindle, means operated from that end of the barrel portion presented to the inside of the door for moving the ward-plates to disengage their radial slots from the waist portion of the spindle, a bolt disposed radially to the spindle, a floating yoke formed with shoulders and with means for attaching to it the inner end of said bolt, and a claw plate fixed on the spindle and co-operating with the shoulders on the yoke to move the latter and retract the bolt when the spindle is rotated.

Signed at Cairns aforesaid this seventeenth day of February A. D. 1925.

ARCHIBALD WILLIAM MORRIS.