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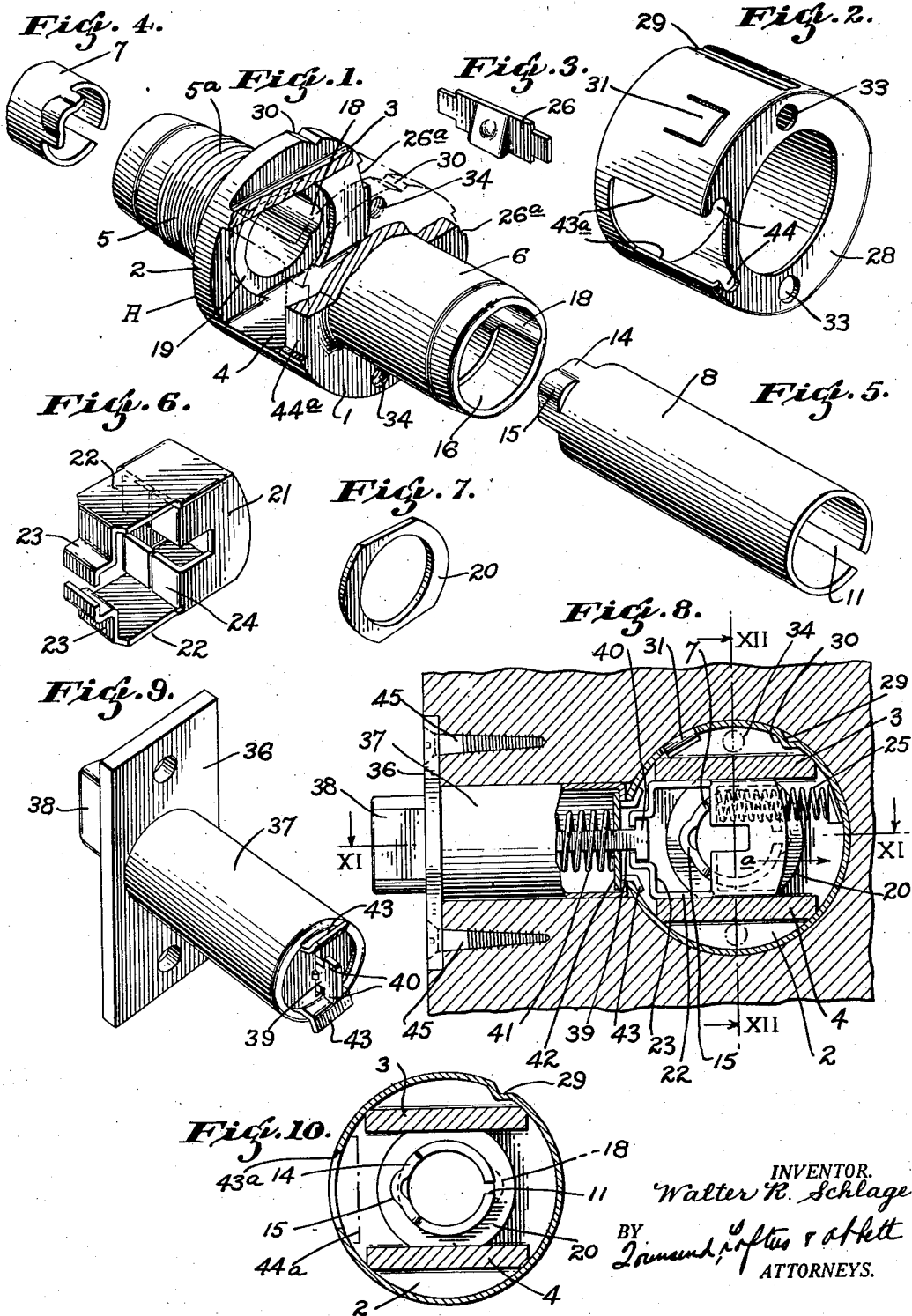
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DOOR LATCH

Filed Dec. 12, 1927

2 Sheets-Sheet 1



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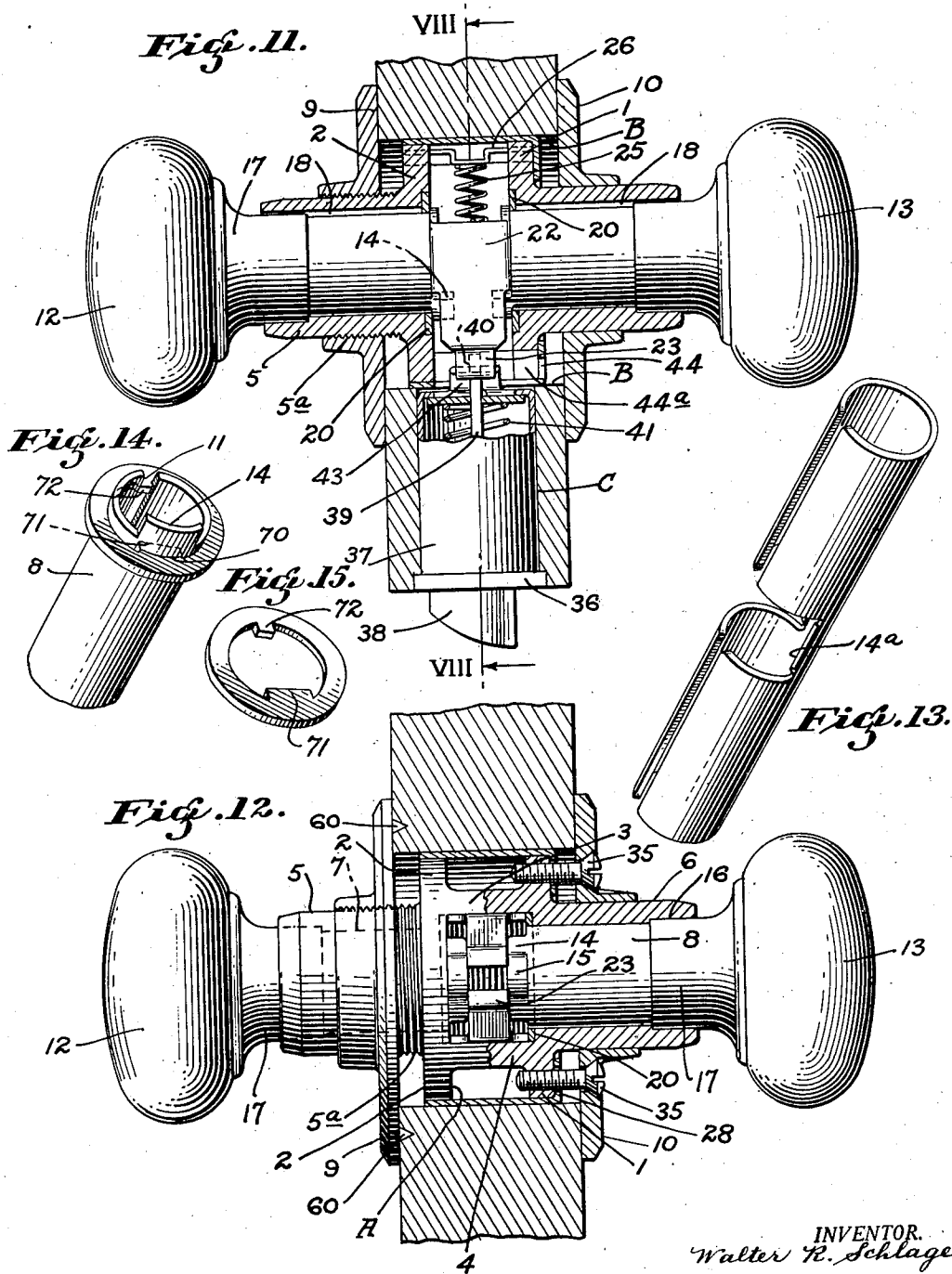
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DOOR LATCH

Application filed December 12, 1927. Serial No. 239,380.

This invention relates to a door latch and especially to a modified form of the door latch disclosed in my co-pending applications entitled "Door lock," filed August 8, 1923, Serial No. 656,335, and "Door lock," filed August 20, 1923, Serial No. 658,245.

The door latches shown in my co-pending applications referred to are so constructed that the parts forming the respective mechanisms may be made by punch and die operations and while they are entirely satisfactory for most installations such as the interior doors of a building, they are a little light, i. e., not quite rugged and heavy enough for large front doors and like installations.

The object of the present invention is to generally improve and simplify the construction and operation of door latches; to provide a door latch which may be constructed to provide a heavier and more rigid mechanism; to reduce the number of parts required in a door latch of this character; and further, to provide a door latch mechanism which permits a wide range of adjustment to take care of doors of different thickness. The door latch is shown by way of illustration in the accompanying drawings, in which:

Fig. 1 is a perspective view of the main latch housing, said view being partially broken away and being partially shown in section,

Fig. 2 is a perspective view of the latch housing cover,

Fig. 3 is a perspective view of the spring supporting plate,

Fig. 4 is a perspective view of one end of one spindle,

Fig. 5 is a perspective view of the opposite spindle,

Fig. 6 is a perspective view of the retractor,

Fig. 7 is a perspective view of one of the lock washers,

Fig. 8 is a partial longitudinal vertical section taken on line VIII—VIII, Fig. 11,

Fig. 9 is a perspective of the bolt unit,

Fig. 10 is a central vertical cross section of the main lock housing, showing the cover housing in position and also showing one of the spindles and lock washers when inserted,

Fig. 11 is a horizontal longitudinal section

taken on line XI—XI, Fig. 8, parts of the mechanism being shown in full, and parts in section,

Fig. 12 is a section taken on line XII—XII, Fig. 8, parts of the mechanism being shown in section and parts in full,

Fig. 13 is a perspective view showing a modified form of spindle which may be employed,

Fig. 14 is a perspective view showing a modified form of spindle structure,

Fig. 15 is a perspective view of the locking collar used in conjunction with the spindle shown in Fig. 4.

Referring to the drawings in detail and particularly Fig. 1, A indicates in general the main latch housing. This housing consists of two circular discs 1 and 2 spaced apart as shown, and connected together by means of two parallel webs, such as shown at 3 and 4 (see Figs. 1 and 10). Each disc has formed integral therewith, a hub member, one hub being indicated at 5 and the other at 6, these hub members forming bearings for the spindles 7 and 8 and for the escutcheon plates 9 and 10, as will hereinafter be described. The spindles are substantially identical in construction to the spindles disclosed in my co-pending applications, i. e., they are tubular in construction as shown in Fig. 5 and they are slotted from end to end, as indicated at 11, said slots forming keyways to secure the knobs 12 and 13 against rotation. The inner end of each spindle is projected to form a rollback lug, as indicated at 14 and each rollback is provided with a radially projecting lug 15 which serves the function of securing the spindles against endwise removal when inserted in the latch housing. Each hub member has an interior bore to form a journal and support for the spindle when inserted but the outer end of each hub is slightly enlarged, as at 16, to receive the hubs 17 of the respective door knobs, this being best illustrated in Figs. 1 and 13. The radial lugs 15 projecting from the rollbacks would prevent insertion of the spindles due to the snug fit maintained and it is, accordingly, necessary to provide longitudinal grooves interior of each hub, as in-

5 indicated at 18 (see Figs. 1, 10 and 11). Thus when the spindles are to be inserted, the lugs 15 are placed in alignment with the grooves 18 and the spindles may thus be inserted endwise and when they are completely inserted, the spindles are rotated so as to bring the lugs 15 out of alignment with the grooves 18. It should also be noted that the inner faces of the discs 2 and 3 are recessed as indicated at 19 (see Figs. 1 and 11) to receive lock washers, such as shown at 20 in Fig. 7. These lock washers are slipped over the ends of the spindles when they are inserted and lock washers are then pushed back into the recesses 19 and when the spindles are rotated, the lugs 15 will engage the inner faces of the washers and the spindles will, accordingly, be locked against endwise removal.

20 The main latch housing does not only form a support for the spindles and the escutcheon plates but it also forms a support for the retractor which is shown in Fig. 6. The retractor shown in this instance is substantially identical to the retractor shown in my co-pending applications. It is constructed by punch and die operations from sheet steel. It consists of cylindrical side plates 21 and end plates 22, the end plates being longitudinal and being bent at right angles at their outer ends, as shown in Fig. 6, to form retractor fingers 23. The upper ends of the side plates 21 are bent inwardly, as shown at 24, and these inwardly bent portions 24 are engaged by the rollback lugs 14 when one or another of the spindles are rotated. A spring 25 is inserted between the retractor and a spring supporting plate 26, such as shown in Figs. 3, 8 and 11. This spring holds the plates 24 of the retractor in continuous engagement with the rollback lugs 14 (see Fig. 8). When the spindle is rotated, the retractor is moved in the direction of arrow *a* (see Fig. 8) and the spring 25 is compressed, and when a spindle is rotated in the opposite direction, the spring returns the retractor. The retractor is completely guided by the web members 3 and 4, as shown in Fig. 8, and it is also guided by the inner surfaces of the discs 2 and 3, i. e., the end plates 22 of the retractor engage the webs 3 and 4 while the side plates 21 of the retractor engage the inner surfaces of the discs 2 and 3. The spring supporting plate, shown in Fig. 3, is supported in recesses 26a in the periphery of the discs 2 and 3 of the main latch housing and it is thus secured against removal by the housing cover, shown in Fig. 2. The housing cover is also made by punch and die operations. It is cylindrical or cup-shaped as shown, one end being completely open while the opposite end is partially closed by an annular inward flange 28. The cylindrical portion is longitudinally depressed, as indicated at 29, to form a key which engages notches 30

formed in the peripheral edge of the discs 2 and 3 of the main latch housing, i. e., the cover housing is slipped endwise over the main latch housing and the key member 29 by aligning with the notches 30 secures the housing against rotation. After the housing has been applied, a lug 31 is depressed, as shown in Figs. 2 and 8. This lug engages the inner face of the disc 3 and thus secures the housing cover against removal. The inner flange of the housing cover is perforated, as shown at 33, and the inner disc 3 of the latch housing is similarly perforated and threaded, as indicated at 34. The openings 33 and 34 align and they are perforated for the reception of screws 35 whereby the inner escutcheon plate 10 is secured. In fact, the entire lock mechanism is secured by these screws from the inner face of the door and the lock mechanism cannot be removed without removal of the screws. The bolt or latching unit of the mechanism is best illustrated in Figs. 8 and 9. It consists of an outer plate 36, to which is secured a tubular housing 37. Slidably mounted in the tubular housing and projecting through the plate 36 is a bolt or latch 38. Attached to the inner end of the latch is a bar 39 which will hereinafter be referred to as the retractor bar. This terminates in a pair of lugs 40 which are engaged by the fingers 23 of the retractor and as the retractor proper is reciprocated by means of one or another of the spindles, the bolt or latch 38 will similarly be projected or retracted, a spring 41 being interposed between the latch and an end plate 42 to momentarily project the latch. The inner end of the tubular member terminates in a pair of fingers 43. The housing cover, shown in Fig. 2, is cut away to form a pair of interspaced flanges 43a and the end flange is cut away and undercut, as indicated at 44, to permit insertion of the fingers 43, i. e., an interlock is formed between the longitudinal flanges 43a and the fingers 43, and the latch units shown in Fig. 9 are thus secured against endwise removal, the screws shown at 45 being more or less unessential in view of the interlock formed between the cover housing and the inner end of the latch unit. The latch unit, by the way, is identical to the latch unit shown in my co-pending applications. The interlocking mechanism between the latch unit and the cover housing is also identical and so is the connection which is formed between the retractor bar and the retractor. The description submitted is, accordingly, more or less brief.

The preparation of a door for the installation of a door latch such as here illustrated consists in boring two holes, one transversely through the door, as indicated at B (see Fig. 11) to receive the main latch housing and one hole at right angles thereto through the edge of the door, as indicated at C, to receive the

latching unit. The mechanism is assembled as follows:

The two spindles are first inserted and after insertion, the lock washers, shown at 20 in Fig. 7, are slipped over the inner ends of the spindles and they are then forced into the recesses 19, so as to form annular shoulders with which lugs 15 on the rollback engage to secure the respective spindles against endwise removal. The retractor shown in Fig. 6 is then slipped endwise between the connecting webs 3 and 4 and is placed in a position where the plates 24 thereof will be engaged by the rollbacks. The spring 25 is next inserted and the spring supporting plate 26, shown in Fig. 3. The cover housing shown in Fig. 2 is then slipped endwise over the main housing and it is there secured by bending the retaining lug 31 inwardly. This completes the assembly of the main unit which I prefer to refer to as the latch actuating unit.

With the door drilled or bored out and if it is desired to insert and assemble the mechanism, it is first necessary to insert the latch unit, shown in Fig. 9, this being accomplished by merely inserting it endwise through the hole 6. The latch actuating unit as assembled is then slipped endwise through the transverse hole B and when so inserted, an interlock is formed between the flanges 43a of the cover housing and the fingers 43 of the latch housing, an interlock being similarly formed at the same time between the retracting fingers 43 and the lugs 40 on the inner end of the latch retracting bar. The escutcheon plate indicated at 9 is then applied. This has a threaded engagement with the hub member 5, as indicated at 5a, and as such may be adjusted inwardly or outwardly along the hub, depending upon the thickness of the door as it is desired to maintain the hole C centrally of the edge of the door. When the escutcheon plate 9 is properly adjusted, the escutcheon plate 10 is applied and so are the screws 35. These project through the openings 33 of the cover housing and are screwed into the threaded openings 34 of the main housing. A pull or clamping action is thus obtained and the escutcheon plate 9 is pulled tight and snugly up against the outer face of the door, it being there retained against turning movement on the threaded connection 5a by means of spurs 60 formed on the inner face (see Fig. 12) which dig into the wood. Insertion and tightening up of the screws substantially completes the operation of assembling and installing the lock, as the only other operation necessary is that of applying the knobs 12 and 13. These may obviously be applied whenever desired and they may be secured by set screws or otherwise.

The interlock between the latch actuating unit and the latching unit is a sliding interlock. A certain amount of space is required in the latch actuating unit for the reception

of the fingers 43 and the retractor bar lugs 40, and it is for this reason that the cut away portion 44 is formed in the end flange 28 on the cover housing. A similar space must obviously be provided in the disc 3 of the main housing. It is for this reason that the peripheral edge of the disc 3 is cut away, as indicated at 44a (see Figs. 1 and 10).

In actual practice, I prefer to cast the main housing shown in Fig. 1 as this forms a heavier and more rugged construction. I also prefer to employ the type of escutcheon plates shown in Fig. 11 and the method of adjusting and attaching the same as this also forms a more rugged construction. Furthermore, it permits a wider range of adjustment when doors of different thickness are encountered, and it might also be stated that the mechanism is simplified by this method of construction and the number of parts required are reduced, the general method of installation and operation being otherwise substantially identical to the latch units disclosed in my co-pending applications.

While the specification and drawings show and describe two spindles, such as indicated at 7 and 8 (see Figs. 4 and 5), I wish it understood that a single spindle, such as indicated in Fig. 13 may be employed, i. e., independent rotation of the knobs is obtained by using two spindles, as shown in Figs. 4 and 5, while unitary rotation of the knobs is obtained by using a single spindle as shown in Fig. 13. The rollback member used with a single spindle is indicated at 14a. This rollback member connects the spindle sections and an integral single spindle is thus obtained.

By referring to Figs. 4 and 5, it will be noted that the spindles are provided with lugs 15 which in conjunction with the washers 20 serve the function of securing the spindles against endwise removal when placed in position in the latch housing. By referring to Fig. 14, it will be noted that a modified form of spindle structure is disclosed wherein the same result is obtained. The spindle is slotted, as indicated at 70, rearwardly of the rollback member 14. A locking collar such as shown in Fig. 15 is employed. This collar is provided with two inwardly extending lugs 71 and 72. The lug 71 is inserted in the slot 70 of the spindle and the lug 72 enters the split portion of the keyway of the spindle. The locking collar when so inserted serves the same function as the lug 15 and washer 20, as it secures the spindle against endwise removal when placed in position, and it furthermore, eliminates the necessity of forming the grooves 18 in the housing bearings 5 and 6.

While certain features of the present invention are more or less specifically described, I wish it understood that various changes may be resorted to within the scope of the appended claims. Similarly, that the

materials and finishes of the several parts employed may be such as the manufacturer may decide or varying conditions or uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. The combination with a door having a transverse opening formed therein of a housing insertable in the opening, a hub member on each end of the housing and projecting beyond opposite faces of the door, an escutcheon plate supported by one hub member and having a threaded engagement therewith to permit it to be adjusted inwardly or outwardly of the hub member, said escutcheon plate engaging one face of the door and having teeth formed on its inner face which are adapted to be embedded in the face of the door to secure the escutcheon plate against rotation on its threaded connection, an escutcheon plate slidably mounted on the other hub member and engageable with the opposite face of the door, and clamping screws extending through the last-named escutcheon plate and having a threaded engagement with the housing.
2. In a latch mechanism of the character described, a main housing comprising a pair of interspaced disc-shaped members, parallel interspaced web members connecting said discs and forming a retractor guide, a pair of aligned hub members, one on each disc, a cylindrical-shaped cover housing adapted to enclose the disc members and the space formed between the same, an end flange on the cover housing securing the cover housing against endwise movement on the main housing in one direction, and other means to secure the cover housing against endwise movement in the opposite direction.
3. In a latch mechanism of the character described, a main housing comprising a pair of interspaced disc-shaped members, parallel interspaced web members connecting said discs and forming a retractor guide, a pair of aligned hub members, one on each disc, a cylindrical-shaped cover housing adapted to enclose the disc members and the space formed between the same, an end flange on the cover housing securing the cover housing against endwise movement on the main housing in one direction, and a lug on the cover housing adapted to be bent inwardly to engage one of the disc members so as to secure the cover housing against endwise movement in the opposite direction.
4. In a latch mechanism of the character described, a main housing comprising a pair of interspaced disc-shaped members, parallel interspaced web members connecting said discs and forming a retractor guide, a pair of aligned hub members, one on each disc, a cylindrical-shaped cover housing adapted to enclose the disc-shaped members and the con-

necting webs, and a spring supporting plate insertable between the cover housing and the disc-shaped members and adapted to be retained against removal by the cover housing.

5. In a latch mechanism of the character described, a main housing comprising a pair of connected interspaced disc-shaped members, a bearing hub on each disc-shaped member, a spindle journaled in each hub, a rollback on the inner end of each spindle, a lug on each rollback to secure each spindle against endwise removal, and a lock washer interposed between the inner face of each disc-shaped member and the lugs on the spindles.

6. In a latch mechanism of the character described, a main housing comprising a pair of connected interspaced disc-shaped members, a bearing hub on each disc-shaped member, a spindle journaled in each hub, a rollback on the inner end of each spindle, a lug on each rollback to secure each spindle against endwise removal, a lock washer interposed between the inner face of each disc-shaped member and the lugs on the spindles, said spindle lugs projecting beyond the peripheral surface of each spindle, and said bearing hubs having grooves formed therein and extending from end to end thereof with which the spindle lugs are adapted to align and through which the lugs pass when the spindles are inserted.

7. The combination with a door having a transverse opening formed therein of a housing insertable in the opening, a hub member on each end of the housing and projecting beyond opposite faces of the door, an escutcheon plate supported by one hub member and having a threaded engagement therewith to permit it to be adjusted inwardly or outwardly on the hub member, said escutcheon plate engaging one face of the door, an escutcheon plate slidably mounted on the other hub member and engageable with the opposite face of the door, and adjustable means securing the last named escutcheon plate to the housing.

8. In a latch mechanism of the character described a main housing comprising a pair of connected interspaced disc shaped members, a bearing hub on each disc shaped member, a spindle journaled in each hub, a rollback on the inner end of each spindle, a lug on each roll back to secure each spindle against endwise removal, a lock washer interposed between the inner face of each disc shaped member and the lugs on the spindles, and means securing the lock washers against rotation with relation to the spindles.

9. In a latch mechanism of the character described a main housing comprising a pair of inter-connected interspaced disc shaped members, a bearing hub on each disc shaped member, a spindle journaled on each hub, a roll back member on the inner end of each spindle, a lock washer disposed on the inner end of each spindle, and means securing the

lock washer against endwise movement with relation to the spindle, said means also securing the spindles against endwise movement with relation to the hubs.

5 10. The combination with a door having a transverse opening formed therein, of a housing insertable in the opening, a hub member on each end of the housing and projecting beyond opposite faces of the door, an es-
10 cutcheon plate supported by one hub member and having a threaded engagement therewith to permit it to be adjusted inwardly or outwardly on the hub member, said escutcheon
15 plate engaging one face of the door, an escutcheon plate slidably mounted on the other hub member and engageable with the opposite face of the door, adjustable means securing the last named escutcheon plate to the housing, an auxiliary housing enclosing the
20 first named housing, a latch unit, and means whereby an interlock is formed between the latch unit and the auxiliary housing.

11. In a latch actuating mechanism of the character described, a pair of aligned inter-
25 spaced hub members, a pair of parallel interspaced members connecting the hubs and forming a retractor guide, an auxiliary housing disposed between the hub members and enclosing the retractor guide, a latch unit,
30 and means whereby an interlock is formed between the auxiliary housing and the latch unit.

12. In a latch mechanism of the character described, a main housing comprising a pair
35 of interspaced disk shaped members, parallel interspaced web members connecting said disks and forming a retractor guide, and a bearing member formed in each disk.

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