

May 7, 1935.

P. B. WEIS

2,000,111

KEYLESS LOCK MECHANISM

Filed July 28, 1933

2 Sheets-Sheet 1

Fig. 1

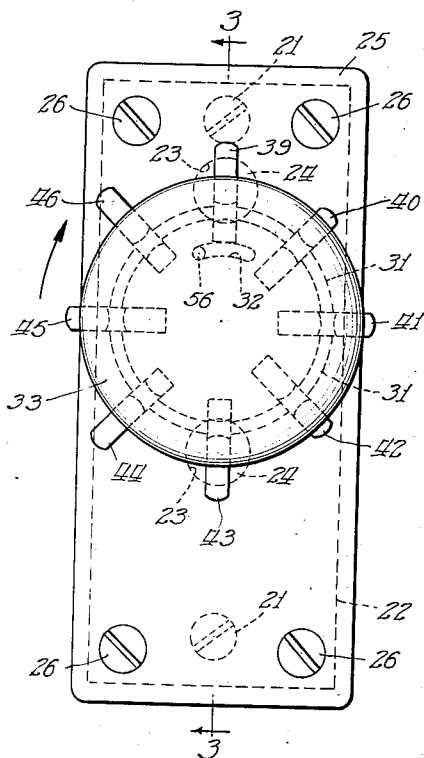


Fig. 4

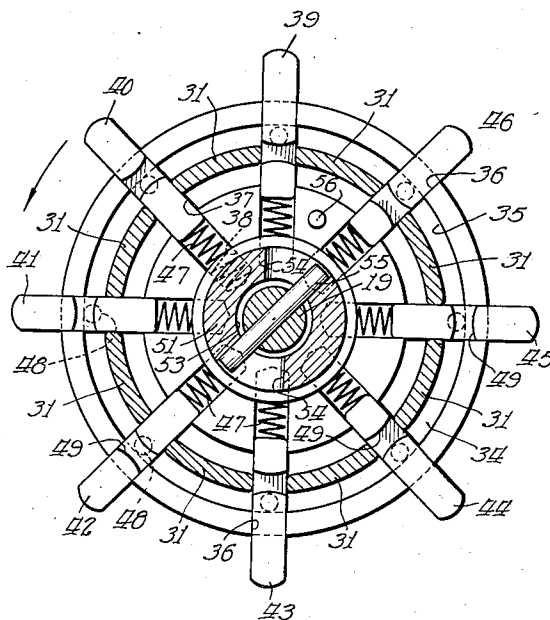
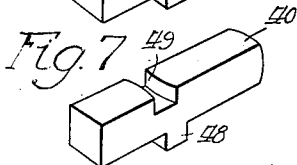
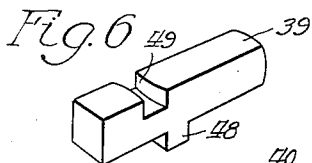
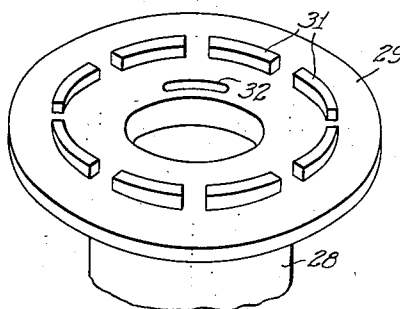


Fig. 5



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2 Sheets-Sheet 2

Fig. 2

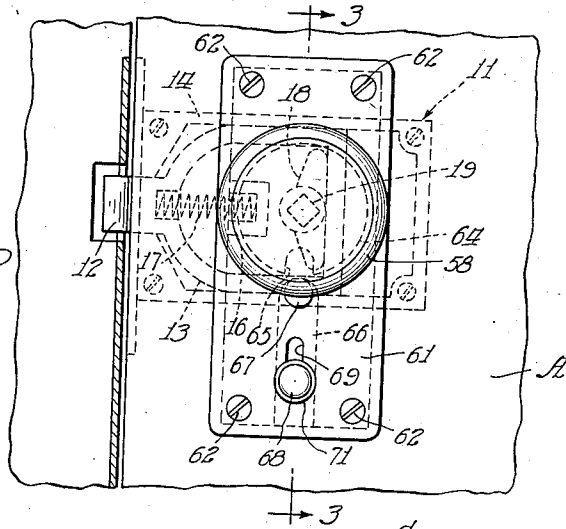
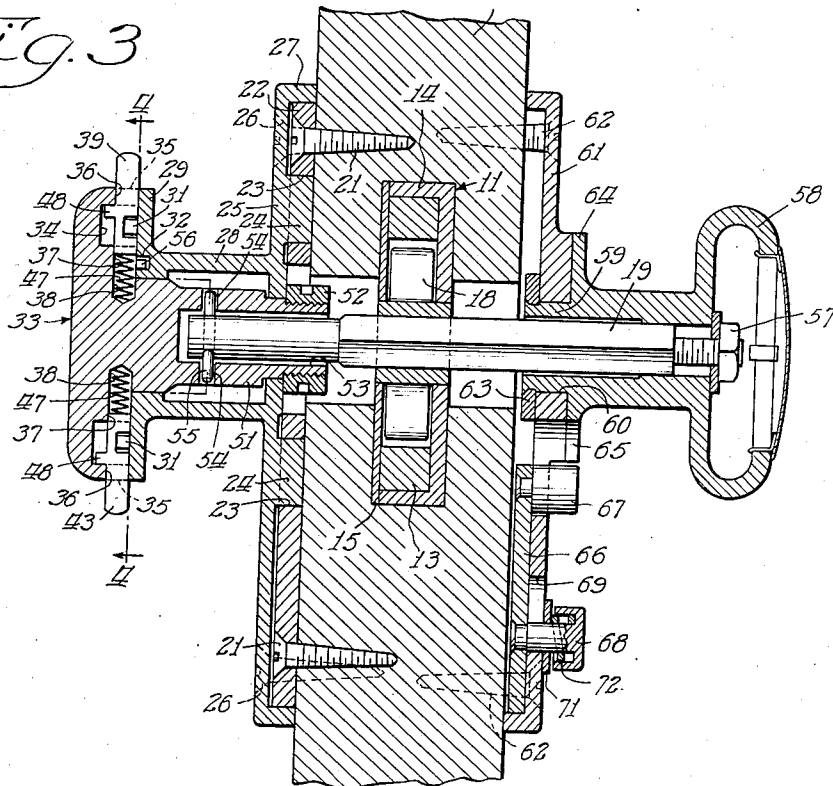


Fig. 3



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UNITED STATES PATENT OFFICE

2,000,111

KEYLESS LOCK MECHANISM

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Application July 28, 1933, Serial No. 682,603

4 Claims. (Cl. 70—58)

This invention relates to locking devices and particularly to keyless or combination locks for closures, such as doors, or the like, and which may be released by manual manipulation of certain locking elements associated therewith.

One object of the present invention is to provide a structure wherein the rotation of a knob or other actuating member is controlled by locking elements mounted in the knob.

Another object of the invention is to provide a structure wherein the locking elements and knob may be actuated by properly grasping the elements and knob with one hand.

Another object of the invention is to provide a structure wherein the inner knob may be rotated to actuate the latch even though the outer knob is locked against rotation.

Another object of the invention is to provide a structure wherein the inner knob may be secured against rotation in a manner to prevent movement of the latch although the locking elements in the outer knob may be manipulated to permit rotation thereof.

Another object of the invention is to secure the outer door plate against removal in an unauthorized attempt to actuate the latch by persons without knowledge of the lock releasing combination.

A further object of the invention is to provide a combination or keyless lock structure wherein the combination may be readily changed when and as desired.

A still further object of the invention is to improve devices of the character described in sundry details hereinafter referred to and particularly pointed out in the appended claims.

One embodiment of the present invention is shown for illustrative purposes in the accompanying drawings, in which

Fig. 1 is a face view of the outer knob of a door illustrating the application of my improved lock mechanism thereto, and showing the locking elements in position to permit rotation of the knob to actuate the latch;

Fig. 2 is a face view of the inner knob of the door illustrating portions of the lock mechanism associated therewith, and showing portions of the latch construction in dotted lines;

Fig. 3 is an enlarged sectional elevational view through the door and lock mechanism taken substantially as indicated by the lines 3—3 of Figs. 1 and 2;

Fig. 4 is an enlarged transverse sectional elevational view through the lock mechanism asso-

ciated with the outer knob taken substantially as indicated by the line 4—4 of Fig. 3;

Fig. 5 is a perspective view of the locking disc associated with the outer knob of the door; and

Figs. 6 and 7 are enlarged perspective views of different lock pins employed in my improved lock construction.

The illustrative embodiment of the present invention is shown, as illustrated particularly in Figs. 2 and 3, in conjunction with door latch mechanism indicated as a whole by the numeral 11 adapted to be positioned in a recess formed in a closure member such as a door A, or the like, and comprising a latch 12 and open yoke 13 therefor, slidably mounted in a casing 14 having a cover 15 secured thereto, the casing 14 being provided within the yoke 13 with a recessed lug 16 in which is mounted one end of a compression spring 17, the opposite end of which is adapted to engage a portion of the yoke 13 in a manner to normally urge the latch 12 into door securing position.

Mounted also within the yoke 13 is a double dog or cam member 18 shown, in the present instance, as keyed or splined to an actuating member shown, in the present instance, as a square shaft 19 by which the cam member 18 may be rotated to draw the latch 12 from door securing position against the action of the spring 17.

Secured to the outer side of the door A by means of screws 21 is a locking plate 22 having apertures 23 formed therein adapted to receive studs 24 formed on a cover or outer door plate 25 to prevent relative side or endwise movement of the plates, the door plate 25 being secured to the door by means of screws 26 passing through apertures formed in the locking plate 22, and being provided with a flange 27 surrounding the plate 22 in a manner to further prevent relative side or endwise movement of the plates.

Formed integrally with the door plate 25 is a spacing portion 28 and disc 29, the disc 29 having annularly spaced aligned arcuate segments 31 formed on one side thereof and an arcuate groove 32 formed in said side adjacent the segments.

Mounted adjacent the disc 29 and adapted to be rotated with respect thereto is a knob indicated as a whole by the numeral 33 having an annularly recessed portion 34 and an annular flange 35 in which is formed a plurality of annularly spaced notches 36, the hub portion of the knob being provided with a plurality of notches 37 terminating in pockets 38, the notches 36 and 37 being adapted to receive and guide a plurality of annularly spaced radially slidable manually

actuated lock pins designated by the numerals 39 to 46, inclusive, the pins being engaged by springs 47 positioned, respectively, in the pockets 38 for urging the lock pins, normally, in an outward direction, each of the pins being provided with stop lugs 48 adapted to move in the recess 34 and engage the flanged portion 35 of the knob in a manner to limit their outward movement.

Each of the lock pins are provided with transversely extending slots or recesses 49 formed in one side thereof adjacent the disc 29, and it will be noted by reference to Figs. 1, 3, 4, 6 and 7 that certain of the pins as, for example, 39, 43, 44 and 46 have their grooves 49 positioned closer to their inner ends than are the grooves 49 formed in the pins 40, 41, 42 and 45, and that, normally, the grooves 49 formed in the pins 39, 43, 44 and 46 occupy a position in annular alignment with the segments 31 formed on the disc 29, while the grooves 49 formed in the pins 40, 41, 42 and 45 are normally out of alignment with the segments 31 as clearly shown in Fig. 4. By such an arrangement, it will be noted that the pins 40, 41, 42 and 45 mounted in the notches 36 and 37 of the knob 33 are positioned with a portion of their body located between certain of the segments 31 of the disc 29, thereby locking the knob 33 against relative rotary movement with respect to the disc. It will be noted also that by pressing the pins 40, 41, 42 and 45 inwardly against the action of the springs 47 as shown in Fig. 1, the grooves 49 of these pins may be brought into alignment with the segments 31, thereby permitting the knob 33 to be rotated with respect to the disc 29, it being understood that the grooves 49 of the pins 39, 43, 44 and 46 are normally in alignment with the segments 31 and therefore, these last mentioned pins will offer no resistance to the rotation of the knob 33.

It will be noted that the lock pins 39 to 46, inclusive, are of substantially similar construction, particularly in cross section, and are interchangeable, and that by changing the positions of the respective lock pins, various different combinations may be obtained by which the device may be operated.

Rotatably mounted in bearings formed in the disc 29 and door plate 25 is a shank portion 51 formed on the knob 23 and provided on its inner end with a spanner nut 52 adapted to bear against a shoulder on the shank portion 51 and against the inner face of the plate 25 to secure the knob against axial endwise movement with respect to the spacing portion 28 and disc 29.

Formed in the shank portion 51 is an axially disposed recess 53 adapted to receive one end of the shaft 19, and formed in the shank portion 51 adjacent the recess are radially disposed elongated annularly extending slots 54 adapted to receive opposite ends of a pin 55 mounted in the adjacent end of the shaft 19.

It will be observed from the foregoing description that by pressing the lock pins 40, 41, 42 and 45 inwardly as shown in Fig. 1, the knob 33 may be rotated in the direction indicated by the direction arrows of Figs. 1 and 4, and that the engagement of the shank portion 51 of the knob 33 at one end of the slots 54 with the pin 55, as shown in Fig. 4, will rotate the shaft 19 and cam member 18 in a manner to withdraw the latch 12 from its socket and permit the door to be opened, and upon releasing the knob, the spring 17 will move the latch to its extended position, and restore the cam member 18, shaft 19 and knob 33 to their initial or normal position, at which time the pins

40, 41, 42 and 45 are brought into registry with their respective spaces between the segments 31 of the disc 29 and the springs 47 will move pins 40, 41, 42 and 45 outwardly into locking position as shown in Fig. 4, thereby securing the knob 33 against movement until the pins 40, 41, 42 and 45 are again depressed, the rotary movement of the knob in both directions being limited by a pin 56 mounted in the knob and extending into the arcuate groove 32 formed in the disc 29.

Secured to the inner or opposite end of the shaft 19 by means of a nut and washer 57, and in a manner to rotate therewith, is an inner knob 58 having a bearing portion 59 rotatably mounted in an opening 60 formed in an inner door plate 61 secured to the inner side of the door A by means of screws 62, the knob 58 being held against axial or endwise movement with respect to the plate 61 by means of a washer 63 secured to the portion 59 on one side of the plate 61 and a flange 64 on the opposite side of the plate.

It will be observed from the arrangement just described that owing to the elongated arcuate form of the slots 54 formed in the shank portion 51 of the knob 33, the inner knob 58 may be rotated to actuate the latch operating cam member 18 even though the lock pins 40, 41, 42 and 45 may be in outer knob-locking position, the slot and pin arrangement 54-55 being such as to permit rotation of the inner knob 58 and shaft 19 without interference by the locked condition of the outer knob 33, thereby permitting the door to be readily opened from the inside.

For securing the latch 12 against operation even though the lock pins 40, 41, 42 and 45 are properly positioned to permit rotation of the outer knob 33, the flange 64 of the inner knob 58 is provided with a recess 65, and slidably mounted in the inner door plate 61 is a bolt member 66 having a stud 67 mounted thereon adapted to be moved into the recess 65 of the flange 64, thereby securing the flange 64, inner knob 58 and shaft 19 against rotation. Mounted on the bolt member 66 is a finger piece 68 extending through a slot 69 formed in the door plate 61, the finger piece 68 being surrounded by a washer 71 and having a spring 72 adapted to urge the washer 71 against the face of the plate 61 to provide a frictional engagement therewith for maintaining the stud 67 in raised position and in engagement with the recess 65 of the flange 64.

It will be observed from the foregoing description that the present invention provides a keyless lock which may be actuated from the outside only by manipulating certain of the lock pins, and that the outer door plate 25 is secured against removal or other tampering even though its holding screws 26 may be removed. Also, that the inner knob 58 may be rotated even though the lock pins are in locking position, and that the inner knob and latch operating cam member 18 may be secured against movement even though the lock pins are manipulated to permit rotation of the outer knob 33. It will be observed also that various combinations may be obtained by merely changing the positions of the various locking pins 39 to 46, inclusive, with respect to the disc 29 and knob 33.

Obviously, the present invention is not limited to the precise construction and arrangement shown and described as the same may be variously modified. Moreover, all the features of the invention need not be used conjointly as the same may be used to advantage in variously different combinations and sub-combinations.

What I claim as new and desire to cover by Letters Patent is:

1. In a keyless lock, the combination with a closure member and latch therefor, of a locking plate secured to said member, a cover plate adapted to cover said locking plate and having means engageable with the locking plate to prevent relative movement of said plates, a disc formed integrally with said cover plate, a knob rotatably mounted with respect to said disc, manually actuated locking means operatively related to said knob and disc for preventing relative movement thereof, a shaft connected to said knob and latch, and means for securing said shaft and knob against endwise movement with respect to said member.

2. In a keyless lock, the combination with a closure member and latch therefor, of a locking plate having apertures formed therein secured to said member, a cover plate adapted to cover said locking plate and having studs engageable with said apertures to prevent relative movement of said plates, a disc formed integrally with said cover plate, a knob rotatably mounted with respect to said disc, manually actuated locking pins carried by said knob and engageable with portions of said disc for preventing relative movement of said knob and disc, a shaft connected to said knob and latch, and means for securing said shaft and knob against endwise movement with respect to said member and cover plate.

3. In a keyless lock, the combination with a closure member and latch therefor, of a locking plate having apertures formed therein secured to one side of said member, a cover plate having a flange and adapted to cover said locking plate, said

cover plate having studs engageable with said apertures to prevent relative movement of said plates, a disc formed integrally with said cover plate, a knob rotatably mounted with respect to said disc, locking pins slidably mounted in said knob and engageable with portions of said disc for preventing relative movement of said knob and disc, said pins being manually actuated to permit said knob to be moved relatively to said disc, a shaft connected to said knob and latch, and means connected to said shaft on the opposite side of said closure member for securing the shaft and knob against endwise movement with respect to said member and plates.

4. In a keyless lock, the combination with a door and latch therefor, of a locking plate secured to the outer side of said door, a door plate adapted to cover said locking plate and having means engageable with the locking plate for preventing relative movement of said plates, a disc formed integrally with said door plate, an outer knob adjacent said disc, a plurality of locking pins slidably mounted in said knob and engageable with portions of said disc for preventing relative movement of the knob and disc, said pins being manually actuated to permit said knob to be moved relatively to said disc, a hollow shank portion on said knob rotatably mounted in said door plate and disc and having a radially disposed annularly extending slot formed therein, a shaft operatively related to said latch, a pin carried by said shaft and extending into said slot, and an inner knob secured to the inner end of said shaft and rotatable therewith.

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