Oct. 6, 1959 F. E. BEST 2,907,197

LOCK WITH LOCK CONTROLLED ASSEMBLY

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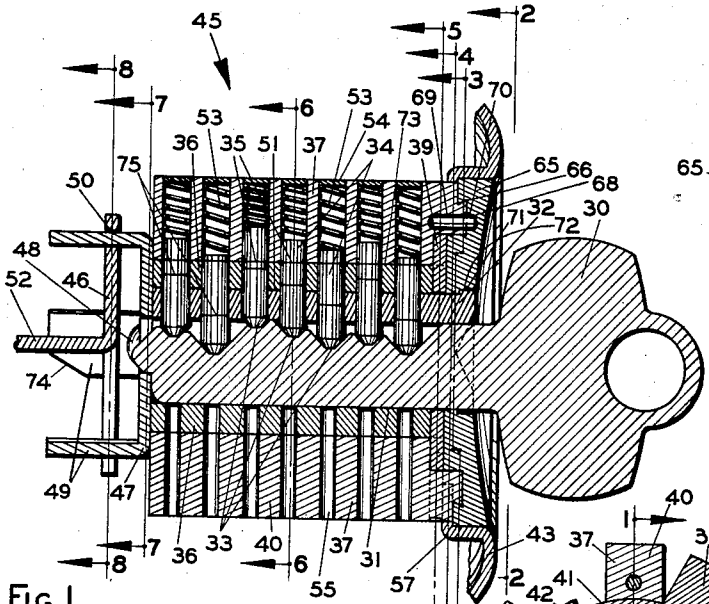


FIG. 1

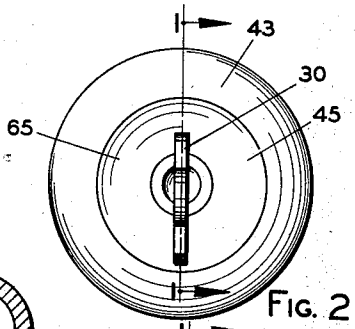


FIG. 2

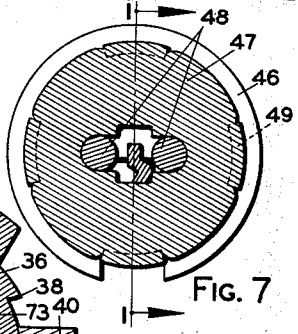


FIG. 7

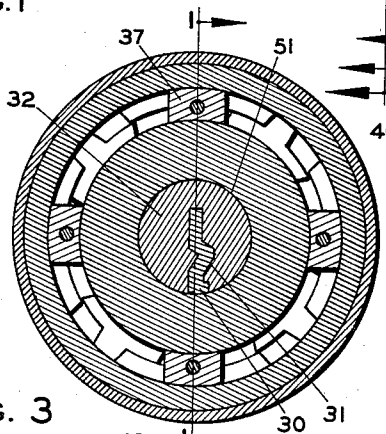


FIG. 3

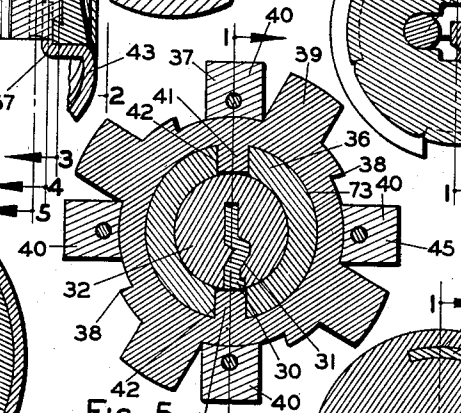


FIG. 5

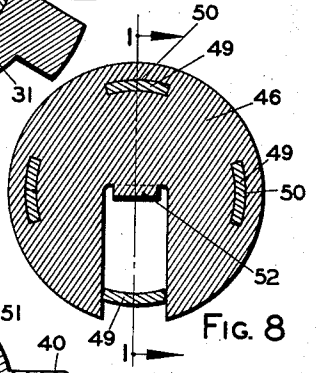


FIG. 8

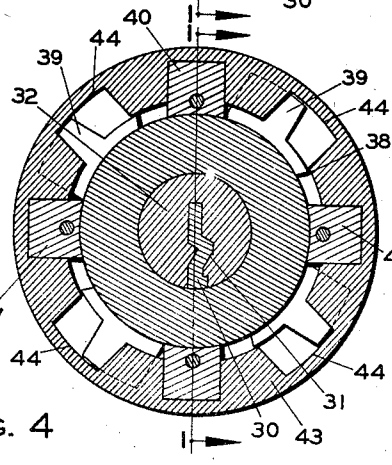


FIG. 4

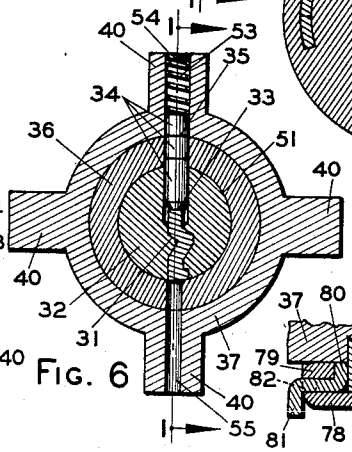


FIG. 6

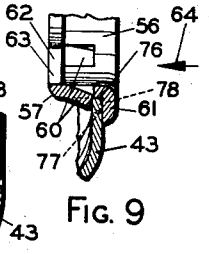


FIG. 9

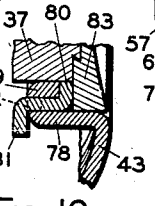


FIG. 10

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LOCK WITH LOCK CONTROLLED ASSEMBLY

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5 Claims. (Cl. 70—369)

My invention pertains to multiple shear line, key operable, pin tumbler locks having the lock-controlled assembly feature in which one shear line serves to give restrictive rotary motion to a sleeve which carries a front end breech plate for releasably securing a lock core mechanism in a secondary lock mechanism; and in which another shear line serves to give rotary motion to a key plug for operating the ordinary lock tumbler of the secondary lock.

The principal object of my invention is to provide a front end breech-locking means for releasably retaining a lock core, by control key operation, in such structures as the face of a door knob.

Other objects of my invention are to simplify and beautify the adaptation of a lock core of the type described to door knobs and the like and at the same time greatly reduce manufacturing costs thereof.

Other objects will become obvious as the description unfolds.

A preferred embodiment of my invention is illustrated in the accompanying views in which:

Fig. 1 is an enlarged longitudinal vertical section through the center of the core and knob with its bitted control key inserted but before any turning action takes place, as taken on line 1—1 of Fig. 2.

Fig. 2 is a face view of the knob and core face as taken on line 2—2 adjacent Fig. 1 shown in approximate normal size.

Figs. 3 to 8 inclusive are vertical transverse sections as taken in lines 3—3 to 8—8 respectively of Fig. 1.

Figs. 9 and 10 show alternate mounting means, to that shown in Fig. 1, using adapter rings between the core and the knob face, or frame member.

Similar reference numerals refer to the same or similar parts throughout the several views.

Control key 30, Fig. 1, inserted in keyway 31 of plug 32 is bitted at 33. This bitting is arranged with pins 34 so that a separation 35 between pins 34 occurs on the control shear line 73. This will allow the sleeve 36 to rotate within body 37. The breech plate 39 has lugs 41 projecting inwardly into slot 42 cut across the head of sleeve 36, thus locking the sleeve 36 and the breech plate 39 together rotatively. Upon the clockwise rotation of the breech plate 39, Fig. 5, the projection 38 engages the extensions 40 of the body 37. Then the breech plate 39 and the breech openings 44 will be aligned, Fig. 4, and the whole core assembly 45 can be removed longitudinally from the frame 43. Breech plate 39 is best shown breech-locked behind the frame 43 in Fig. 4.

When the core 45 is removed from the frame 43, extensions 49 of key stop 47 are pulled away from the clutch plate 46, Fig. 1. Before reinsertion of the core 45 in the frame 43, the breech plate 39 is rotated slightly clockwise so as to align with the breech hole 44. This also rotates the key stop 47 a like amount, for the key stop 47 is riveted to the plug 32 by rivets 48. Before insertion, the clutch plate 46 is found resting in the position rotatively as shown in Fig. 8. However, with the

plug 32 and breech plate 39 rotated to allow the breech plate 39 to pass the breech opening 44, then the extensions 49 of the keystop 47 are not in direct alignment with the slots 50 in the clutch plate 46. Therefore a bevel 74 is provided on the extensions 49 so as to pick up and rotate slightly the clutch plate 46 as the extensions 49 are moved longitudinally into the slots 50 of the clutch plate.

After the core 45 has been inserted into the frame 43, the control key 30 is rotated counter clockwise to the vertical position as shown in Fig. 1 in which position the control key 30 is removable. After the control key 30 is removed an operating key, not shown, of different bitting may be inserted into the plug 32. This bitting then will raise the pins 34 to a different arrangement, but one which will align the pins 34 so that the separations 75 between the pins 34 will be on the operating shear line 51. Then the plug 32 is free to turn in the sleeve 36. The plug 32 in turn can then rotate the key stop 47 which in turn rotates the clutch plate 46, and the spindle extension 52 of clutch plate 46 so as to operate the secondary locking mechanism not shown.

Springs 53 are held into the body 37 by core caps 54. Knock out holes 55 are provided for recombinating purposes.

The body 37 is held onto the face 65 by swedging a portion of the body extensions 40 outwardly into the annular groove 66 on the rear of face plate 65. Dowel pins 68 are set in holes 69 of the body extensions 40 and holes 70 of face plate 65 prior to assembly so as to hold the body 37 and face plate 65 locked together rotatively. The plug 32 is retained longitudinally by the key stop 47 on one end of the core 45 and the shouldered head 71 of plug 32 in counterbore 72 of the core face 65.

An alternate method of securing the core 45 to the frame 43 is by the use of adapter rings, two such methods being shown in Figs. 9 and 10. Point 57 is in the same relative position in both Fig. 1, and Fig. 9. The method shown in Fig. 9, employs an adapter ring 56 that is made as a shallow punch press cup with the flange 61 on the top of the cup and the breech opening 62, of Fig. 4, punched out of the bottom of the cup as shown at 63.

This adapter ring 56 is pressed into the round hole 76 in the frame 43. As it is pressed into the frame 43, in the direction of arrow 64, the spring tabs 60 are depressed until they pass the frame member 43, then they snap out as shown in Fig. 9, so that the adapter ring 56 cannot be removed. The core 45 then breech-locks into this adapter ring. To keep the adapter ring 56 from rotating, a number of notches 77 are cut outwardly from the inside diameter of the frame hole 76. Extension 78, shown dotted, Fig. 9, on a number of spring tabs 60 lock into the notches 77 to lock the adapter ring 56 to the frame member 43 rotatively.

Fig. 10 shows another method of using an adapter ring. In this instance frame 43 has an annular ring 78 formed around into an inner annular ring 79. Adapter ring 80 has a number of projections 81 projecting through holes 82 in frame 43 between annular rings 78 and 79. These projections are bent outwardly to secure the adapter ring from longitudinal removal. These extensions also lock the adapter ring 80 to the frame 43 rotatively. Core body 37 has an enlarged face plate 83 to properly conceal the adapter ring 80.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a pin tumbler lock embodying a primary and a secondary lock, a frame; a face plate rotatable in said

frame; a body having a cylindrical bore therethrough; a sleeve rotatively carried in said bore; a plug rotatively carried in said sleeve and having a keyway therethrough; said body, sleeve, and plug having radially alignable holes therethrough opening into said keyway; pin tumblers of multiple pin lengths slidably carried in said holes; said pin tumblers having breaks between adjacent pin ends alignable on a secondary shear line defined between said sleeve and said body, and said pin tumblers having additional breaks between other adjacent pin ends alignable on a primary lock shear line defined between said plug and said sleeve; means retaining said plug against axial travel in said sleeve; a breech plate carried by said sleeve adjacent said face plate; means interengaging the breech plate with said sleeve whereby the breech plate turns with the sleeve upon rotation thereof; circumferentially spaced apart extensions on said body extending across peripheral portions of said breech plate and fixedly engaging said face plate; breech plate members radially extending at circumferential ends of said peripheral portions between said body extensions, each of said plate members having a circumferential length less than the spacing apart of said body extensions; a breech plate retaining member carried by and fixed to said frame extending radially between said breech plate members and said face plate and between said body extensions; said retaining member having openings therethrough to which said breech plate members may be turned upon said first pin breaks having been aligned on said secondary shear line, and the breech plate members pulled through said retaining member openings to remove said plug and sleeve and body through and from said frame.

2. The structure of claim 1 in which said means for interconnecting said breech plate with said sleeve comprises a slot across the end of the sleeve adjacent the face plate, and lugs on the breech plate entering said slot, the breech plate being a part separate from the sleeve but drivingly connected therewith through said lugs and slot.

3. The structure of claim 1 in which there is a projection on said breech plate located to strike one of said body extensions upon rotation of said sleeve thereby aligning said breech plate members with said retainer member openings.

4. The structure of claim 1 in which said retaining member is a flange integral with said frame having a general opening to receive said body therethrough, and said retaining member openings opening into said general opening.

5. The structure of claim 1 in which said retaining member is an adapter ring fitted in said frame; and there are means holding said ring against rotation in the frame and preventing withdrawal therefrom.

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