Dec. 29, 1931. J. M. WEAVER 1,838,340

LOCK

Filed Aug. 2, 1927

Fig. 1.

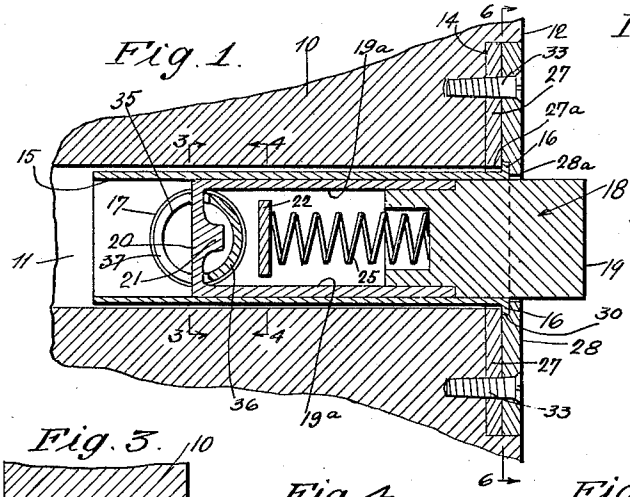


Fig. 2.

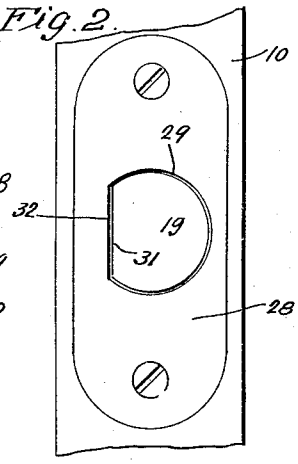


Fig. 3.

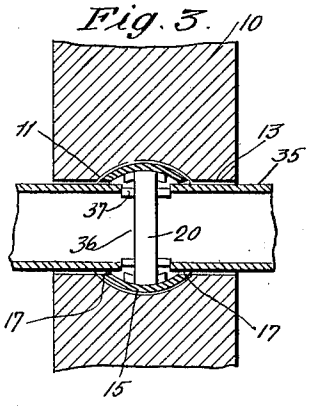


Fig 4.

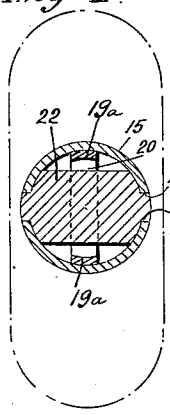


Fig. 5.

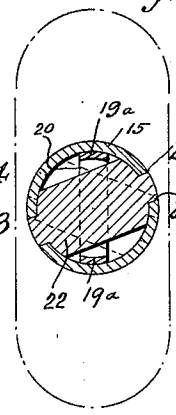


Fig. 6

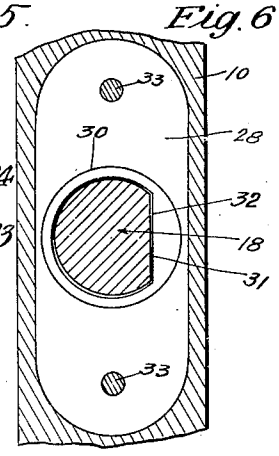
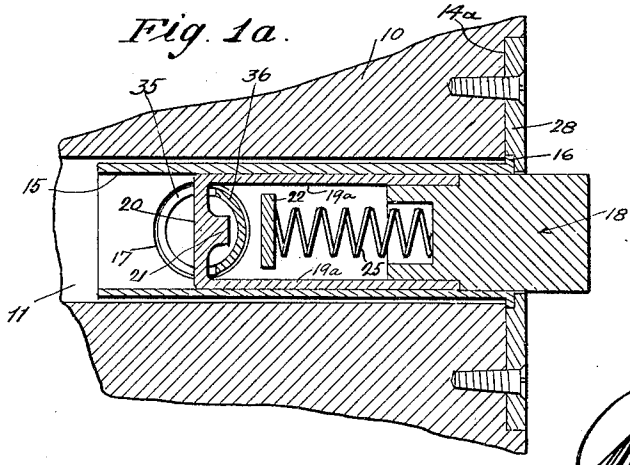


Fig. 1a.



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UNITED STATES PATENT OFFICE

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LOCK

Application filed August 2, 1927. Serial No. 210,039.

This invention has to do generally with locks and is particularly concerned with that type of locks including a tubular bolt housing adapted to be inserted in a bore opening to the edge of a door, and a rotatable spindle thrust through an axially perpendicular bore into operative assembly with the bolt.

The advantages of this type of lock, especially from the standpoint of installation, are well known to those skilled in the art.

There is, however, one difficulty of installation, and this I have overcome in the present invention. This difficulty arises by reason of the fact that the face plate applied to the edge of the door and through which the bolt is adapted to slide, normally is non-rotatable both with respect to the housing and to the bolt. Consequently, if the face plate be fixed to the door and the holes through the housing adapted to take the spindle happen to be out of line with respect to the axially perpendicular bore in the door, or if the bolt-receiving bore in the door be inclined with respect to the horizontal or, when viewed in plan, inclined with respect to the plane of the door, much readjustment of the housing and plate or even recutting of the door may be necessary. If such readjustment be not made the installation ordinarily is unsightly, does not operate smoothly, and may result in breakage of parts. Ordinarily, to circumvent this, time-consuming care is taken in lining up the housing and spindle before attachment of the face plate is made to the door.

I have overcome this difficulty by fashioning the elements of the assembly in such a manner that the bolt housing and face plate are capable of relative rotation, as are also the housing and bolt. The bolt and face plate, however, are held from relative rotation. By reason of these characteristics, the plate may be secured to the door with the bolt in proper position to register with the keeper on the door-frame, and then the housing may be rotated with respect to the face plate to bring the spindle-taking apertures of the housing and door into proper alinement. The installation of the bolt is thereby made a matter of ease, for if the bolt happens to be a little untrue or the attachment of the face plate to the door is such that it would normally bring the spindle-taking holes in the housing out of alinement with the corresponding holes in the door, it is a matter of ease to rotate the keeper into proper position.

The structural features which render the above possible, as well as other novel features and objects of the invention, will be pointed out in the following detailed description, reference being had to the accompanying drawings, in which:

Fig. 1 is a medial section through a lock embodying my invention and installed in a door;

Fig. 1*a* is a view generally similar to Fig. 1 but showing a slight variation in the assembly;

Fig. 2 is a side elevation of Fig. 1, as viewed from the right;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a section on line 4—4 of Fig. 1;

Fig. 5 is a view similar to Fig. 4 but showing certain parts thereof as having been moved relatively; and

Fig. 6 is a section on line 6—6 of Fig. 1.

In Figs. 1 and 3, numeral 10 designates an equipped door, there being a bore 11 drilled in from the forward edge 12 thereof, and a transverse bore 13 extending through the door from side to side, the axis of bore 13 being substantially perpendicular to and intersecting that of bore 11. Edge 12 is recessed as at 14 about the mouth of bore 11.

I will now describe the preferred make-up of a lock embodying my invention, though it will be understood this is not to be considered as limitative on the broader aspects thereof.

Numeral 15 designates a cylindrical, tubular bolt housing, having an external annular flange 16 at one end and having diametrically opposite apertures 17 near its other end. Adapted to be reciprocated longitudinally through housing 15 is a bolt generally designated at 18 and consisting of a nose portion 19 from which extend rearward, diametrically opposed arms 19ª terminating in a connecting bridge 20. Preferably, as shown in Fig. 3, bridge 20 is somewhat narrower than are

arms 19, and carries an inwardly projecting, central cam-lug 21.

Extending diametrically across the bore of housing tube 15 is a barrier plate 22, the plate extending between arms 19ª and being secured to the tube in any suitable manner; for instance, by means of terminals 23 held in sockets or slots 24.

It will be noted that the distance between arms 19ª is appreciably greater than the distance between top and bottom of barrier 22, and consequently the bolt and housing are capable of limited relative rotation. The housing and bolt are shown in full lines, Fig. 5, at one of such limits, it being appreciated that they may also be rotated relatively to the dotted line positions in that figure.

Interposed between barrier 22 and nose 19 is a spring 25 adapted normally and yieldingly to hold the bolt in extended position, engagement of lug 21 with the barrier limiting this movement of bolt extension prior to installation of the lock, through the spindle, to be described, limits this movement when the lock is fully assembled.

Preferably, though not necessarily, a backing plate 27 is rotatably mounted upon tube 15 and is adapted to be seated in recess 14.

The relative dimensions of the lock parts and the locations of the door holes are such that when flange 16 is shouldered against plate 27, housing apertures 17 and bore 13 may be brought substantially into axial alinement by rotation of the tube.

The face plate 28 is adapted to be seated in recess 14 over plate 27, said face plate having an aperture 29 through which bolt nose 19 is adapted to be reciprocated to and from extended or operative position. The inner face of plate 28 is preferably recessed as at 30 to take flange 16, it following that the face plate and housing are capable of relative rotation. The portion of plate 28 which is about aperture 29 may be considered as overlying flange 16. Preferably, one side of nose 19 is squared as at 31, aperture 29 having a complementary square-cut side 32, these square cut faces co-operating in a manner to prevent relative rotation between the bolt and face plate. Preferably, though not necessarily, recess 30 is of such a depth that when plates 27 and 28 are drawn tightly together and firmly into recess 14 by screws 33, the flange 16 is tightly confined and clamped between said plates in a manner to hold the housing and plates against relative rotation and to hold the housing against movement longitudinally in either direction through bore 11.

In installing the lock, the housing and plates are moved into the position shown and screws 33 taken up enough to hold the plates approximately in final position but not to prevent relative rotation between the housing and plates. Plate 27 is fixed, of course, so it holds bolt nose 19 in a position properly to register with the keeper (not shown) on the door frame (not shown). While the bolt is thus held non-rotatably with respect to the door, it will be seen that housing 15 may be revolved, within limits, with respect to the face plate, due to the fact that the bolt and housing are capable of limited rotation. Accordingly, the housing may be reached through bore 13 to rotate it sufficiently to bring holes 17 into exact alinement with bore 13.

Bolt 18 is then pushed back manually until lug 21 clears openings 17. Thereupon, the tubular cylindric spindle 35 is thrust endwise through openings 13 and 17 until its throwing bar 36, formed by cutting the spindle away as at 37, is in line with bridge 20. The bolt is then released, allowing spring 25 to move it to extended position, the extent of this movement being limited by engagement of lug 21 with throwing bar 36. Screws 33 may then be taken up to clamp flange 16 between plates 27, 28 and thus hold the housing rigidly in proper position, it being assured that spindle 35 is then so lined up that it will not bind. It will be seen that rotation of spindle 35 serves to retract the bolt 18 against the action of spring 25, due to the coaction between the edges of bar 36 and bridge 20.

While I have spoken of the flange 16 as finally being clamped immovably between plates 27 and 28, I have shown in Fig. 1*a* a variation wherein backing plate 27 is omitted, flange 16 in this case shouldering directly against the bottom defining wall 14*a* of recess 14 to limit the movement of housing 15 to the left in this figure. The rest of the mechanism may be exactly the same as that described above, it being noted that flange 16 is clamped between wall 14*a* and plate 28 to prevent longitudinal movement of the housing to the right, and also, if desired, to prevent rotation of the housing with respect to the face plate after openings 17 have been lined up properly with openings 13.

Preferably, there is appreciable annular clearance, as at 27*a*, between plate 27 and housing 15, and, as at 28*a*, between plate 28 and bolt 18. By reason of this provision, the plates may be secured to the door edge, in proper parallelism therewith, even though the bore 11, and consequently the housing and bolt, be inclined with respect to the horizontal or, when viewed in plan, inclined with respect to the plane of the door.

It will be readily understood from the above that it is a matter of ease to assemble this lock, for no particular care is necessary in fitting the face plate to the door is order to insure that the holes in the housing tube line-up properly with the transverse bore 13 to admit of such entry of the spindle as will insure smooth, unbinding action.

It will be understood the drawings and description are to be considered merely as illustrative of and not restrictive on the broader claims appended hereto, for various changes in design, structure and arrangement may be made without departing from the spirit and scope of said claims.

I claim:

1. In combination with a door having a bore extending inwardly from one edge thereof, a tubular bolt housing rotatably mounted in said bore, a bolt adapted to be reciprocated through the housing, an apertured plate on said edge and taking said housing for rotation in its aperture, a shoulder on the housing adapted to engage the outer face of the plate to limit movement of the housing longitudinally in one direction, and a face plate engaging the housing and capable of movement with respect thereto and applied to the door in a manner to limit the movement of the housing longitudinally in the opposite direction.

2. In combination with a door having a bore extending inwardly from one edge thereof, a tubular bolt housing rotatably mounted in said bore, a bolt adapted to be reciprocated through the housing, an apertured plate on said edge and taking said housing for rotation in its aperture, a shoulder on the housing adapted to engage the outer face of the plate to limit movement of the housing longitudinally in one direction, a face plate engaging the housing and capable of movement with respect thereto and applied to the door in a manner to limit the movement of the housing longitudinally in the opposite direction, and coacting means on the face plate and bolt adapted to hold them against relative rotation.

3. In combination with a door having a bore extending inwardly from one edge thereof, a tubular bolt housing rotatably mounted in said bore, a bolt adapted to be reciprocated through the housing, an apertured plate on said edge and taking said housing for rotation in its aperture, a face plate adapted to be applied to the door adjacent the first-mentioned plate and capable of movement with respect to the housing, said face plate being apertured to allow longitudinal passage of the bolt, and an external flange on the housing adapted to be clamped between the two plates.

In witness that I claim the foregoing I have hereunto subscribed my name this 24th day of June, 1927.

JAMES M. WEAVER.