

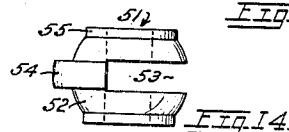
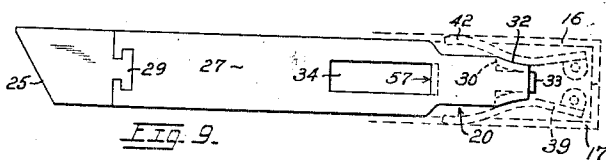
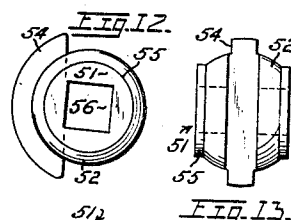
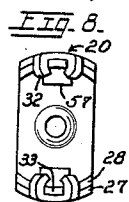
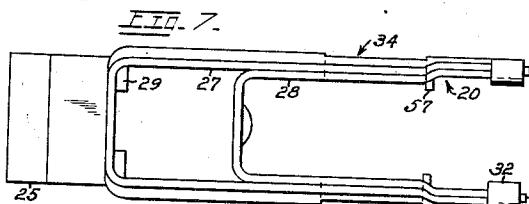
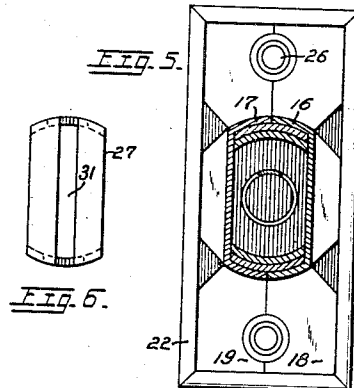
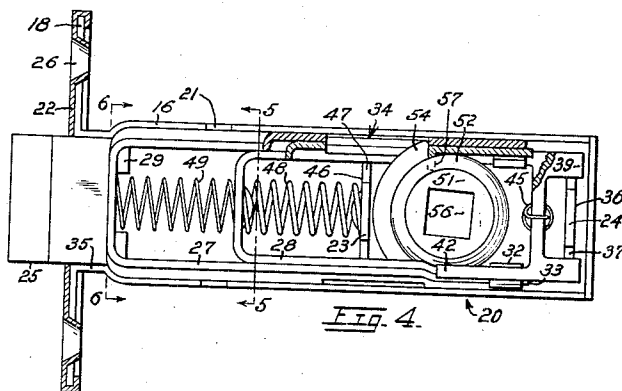
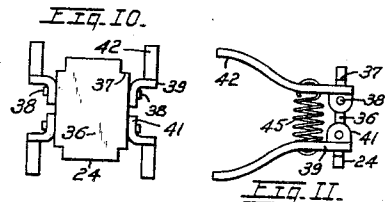
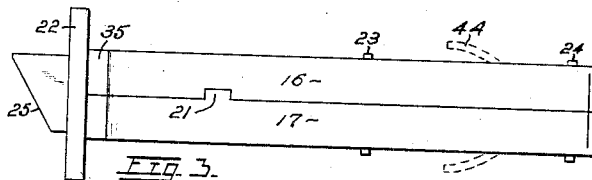
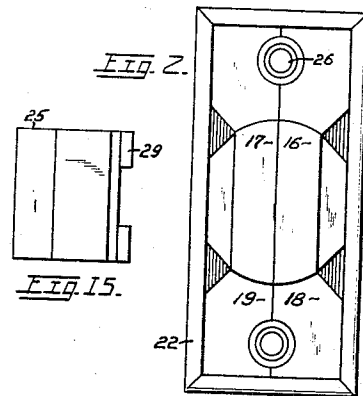
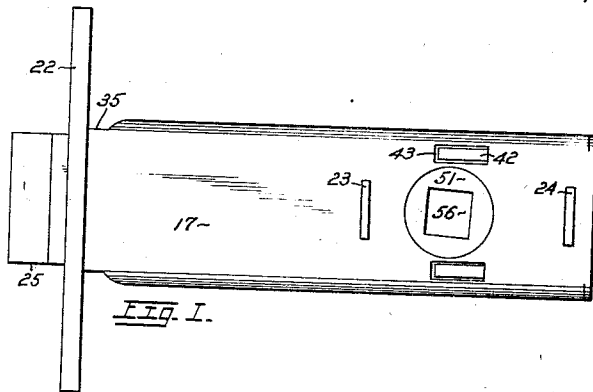
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2,177,948

DOOR LOCK CONSTRUCTION

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2,177,948

DOOR LOCK CONSTRUCTION

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7 Claims. (Cl. 292—169)

My invention relates to door lock constructions which are operated by the turning of a square spindle or the equivalent; and whereof locking and unlocking is accomplished by laterally shifting a movable member which may be said spindle. The principal objects of the invention are; first, to provide a generally improved and highly satisfactory construction of this kind; second, to furnish means for preventing unintentional locking of a door, as by wind-slamming or other accidental closing, so that a user cannot lock himself out; and, third, to secure said results by the aid of relatively simple, dependable, and inexpensive construction. Other objects and advantages will appear from what follows:

My objects have been attained in the manner illustrated in the accompanying drawing; wherein no door knobs or connecting spindles have been illustrated, because they do not form any part of my present invention. Such things, however, necessarily are used cooperatively with my device, in ways that will be clearly apparent to those skilled in this art.

In the drawing—

Figure 1 is a side elevation of my improved lock assembly;

Figure 2 is an elevation of the right hand end thereof;

Figure 3 is a plan view of said device;

Figure 4 is a side elevation of my construction after the front half of the casing has been removed, certain portions of the internal parts being shown in central section;

Figure 5 is a cross-section of the device taken on the plane 5—5 of Fig. 4;

Figure 6 is an end elevation of one of the composite latch-bar elements, as it would appear if a cross section of the latch-bar assembly were taken on the plane 6—6 of Fig. 4;

Figure 7 is a side elevation of the complete composite latch-bar of the device;

Figure 8 is an elevation of the right hand end of this composite bar;

Figure 9 is a plan view of the composite latch-bar, and indicates normal relationship of the latch-releasing parts which co-operate therewith;

Figures 10 and 11 respectively are; a right-hand end view, and a corresponding plan view, of the composite element which I employ for laterally shifting whatever devices may be used to release the locking mechanism which cooperates with my invention;

Figures 12, 13 and 14 respectively are; a side elevation, a right-hand end elevation, and a plan view of the operating hub of my device; this

element being co-operative with a square spindle (not shown) connecting the two door knobs with which this form of my invention is employed; and

Figure 15 is a side elevation of the removable nose piece of the composite latch-bar of my device, by itself. A top view of this part is shown in the latch-bar assembly illustrated in Fig. 9.

Similar reference numerals refer to similar parts throughout the several figures of the drawing.

The particular form of my invention which has been selected for illustration, comprises a longitudinally split outer casing, formed as two halves shaped as shown at 16 and 17. These parts preferably are die-pressed from sheet steel; with flanges 18 and 19 at their forward ends, and with their rear ends closed. They may also be provided with any desired interlocking and aligning features, such as that indicated in Fig. 3 at 21. The casing halves are assembled partly by crimping the edges of a plate 22 (preferably of sheet brass) around the perimeters of abutting flanges 18 and 19, as is shown to best advantage in Figs. 2, 4 and 5; and also by riveting the extremities 23 and 24 of certain interior parts which extend through correspondingly formed holes in the casing walls. Plate 22, if of course, provided with a central opening through which nose piece 25 of the latch-bolt slidingly extends; and also with suitable countersunk portions 26, for accommodating the screws which are necessary for attaching the lock in place.

The composite latch-bolt of my device is shown by itself in Figs. 7, 8 and 9. This consists of a U-shaped outer member 27, having its legs shaped to slidingly fit the upper and lower inner walls of the casing; a similarly formed, but considerably shorter, U-shaped inner member 28, slidably fitted between the legs of the outer member; and the removable nose piece 25. The latter is provided with T-shaped extremities 29, adapted to snugly engage a slot 31 in the base of member 27 (Fig. 6), and corresponding adjacent T-shaped openings formed in the two legs of that member. This engagement is shown to best advantage in Fig. 9. The free ends of members 27 and 28 are narrowed, in the manner illustrated in Figs. 7, 8 and 9 at 20; the extremities of inner U-member 28 are formed with shoulders 30 and necks 33; and the extremities of outer U-member 27 are 50 turned back over necks 33, as at 32. This construction prevents the inner member from moving outwardly beyond the outer member; and, whenever the inner member is moved to the right, its shoulders 30 will constrain the outer member to 55

move in the same direction. However, the outer member may move to the right without necessarily moving the inner member. The utility involved in this functional capacity will appear later.

- 5 Rectangular longitudinal intermediate slots 34 are formed in both legs of members 27 and 28, and these slots register when the members are in the relative positions shown in Figs. 7 and 9. The composite latch-bar slidably fits within the walls of the assembled casing parts 16 and 17, and is guided thereby. The casing parts also are shaped, at 35, to form a slide guide for nose piece 25. The composite latch-bolt, as a whole, is given adequate longitudinal movement within the casing, to permit nose piece 25 to be sufficiently retracted; and outer U-member 27 thereof has adequate longitudinal movement with respect to inner U-member 28, to permit nose piece 25 to be fully retracted without necessarily moving member 28. The entire inside length of the casing is utilized for slide-guiding outer U-member 27.

- The composite element which is used for laterally shifting the cooperative unlocking devices 25 which are employed, is shown by itself in Figs. 10 and 11. It comprises a plate 36 having shoulders 37 adapted for accurately spacing casing parts 16 and 17; and the plate also has extremities 24, which are adapted to extend through correspondingly shaped and suitably positioned holes in the casing parts, to be riveted over for holding the casing parts in proper assembled position. Plate 36, moreover, is provided with oppositely extending opposed pairs of trunnions 38. A pair of U-shaped elements 39 (shown broken in side elevation in Fig. 4) have; ears 41 by which they are pivotally mounted upon trunnions 38; and spaced fingers 42, adapted to extend through narrow slots 43 in each of the two casing halves, as shown by dotted lines 44 in Fig. 3. These fingers are moved outwardly to the dotted positions whenever outer U-member 27 of the latch-bolt is retracted to its inner limit; and they are withdrawn within the external limits of the casing by a spring 45 (Fig. 11), whenever the outer member is in its normal extended position. This functioning will be obvious when the retracted structure, indicated by dotted lines in Fig. 9, is considered in connection with the full-line extended structure shown in Fig. 11. When U-shaped member 27 is moved to the right, its narrowed portions 32 enter the space between pivoted plate portions 39 of the composite latch-releasing device. This results in moving fingers 42 outwardly, to the positions shown in Figs. 10 and 11, and also as indicated by dotted lines 44 in Fig. 3. These fingers serve to shift, to unlocked position, the associated parts which are required to be moved for unlocking purposes. Thus each pair of fingers is adapted to engage diametrically opposite points on a collar attached to a square spindle, for shifting the spindle axially, when unlocking is accomplished in such manner.

- Suitable unlocking mechanisms which are adapted for actuation by fingers 42 of my device, are quite common, and are well known in the art. For instance, U. S. Patent #1,236,881 to Schalow, illustrates (in Fig. 1); a square spindle a^5 ; and an axially movable member f thereon, which has a square end f^2 adapted to fit square hole c^2 for locking purposes. The fingers 42 of my device are well adapted to engage the left hand end of member f of the Schalow construction, to push this member outwardly for unlocking purposes.

In the position shown in Fig. 1 of the Schalow patent, the latch is unlocked.

Another small plate 46 (Fig. 4), having shoulders 47, and riveting extremities 23, also is employed for assembling the casing. Additionally it serves as an abutment for the two helical compression springs which restore the latch-bar parts to their normal positions. One of these springs, designated 48, is relatively strong; and is adapted, by pressing against plate 46 and the base of U-shaped element 28, to effect the restoration of the square spindle of the lock to its normal position; even when there is a considerable unbalanced torque upon the spindle, such as occurs when an operating lever is used in place of the usual hand knob. The other spring, designated 49, is relatively weak; but is adapted, by pressing against the base of U-shaped element 27, to restore nose piece 25 to its normal projected position. This spring reacts against the base of U-shaped element 28, without sufficient force to move it against the pressure of spring 48. The described construction makes it possible to close a door to which my device is applied, without turning the operating mechanism of the lock.

The remaining undescribed element of my invention, is the operating hub 51, shown by itself in Figs. 12, 13 and 14. This is an integral element of the shape shown. It has incomplete spherical surfaces 52, which are spaced partly by a gap 53, and partly by a circular segmental flange 54. Co-axial cylindrical surfaces 55 serve as journals, and are rotatable in corresponding opposed holes in casing parts 16 and 17. Opposed square holes 56 extend co-axially through the spaced body portions, and are adapted to slidably engage the square operating spindle by which this particular form of my lock is operated. The extremities of circular segmental flange 54 extend into slots 34 of the two U-shaped members 27 and 28, and are given a proper cam shape for engaging the inner ends of these slots to shift the composite latch-bolt, no matter which way the hub element is turned upon its axis. I prefer to form a short flange at the inner ends of the inner slots 34, to provide a larger surface for this engagement, as is indicated at 57 in Figs. 4, 7 and 9. The diameter of spherical surfaces 52 is such that they may slidably engage the inner cylindrical surfaces of the two arms of U-shaped element 28, to maintain the spacing of these arms.

As indicated above, my invention is well adapted for use with partially rotatable square spindles or the like, for operating purposes; where locking and unlocking is accomplished by laterally shifting a movable member, as for instance, by axially sliding said spindle. Locking means of this kind are well known and commonly used.

Obviously many substitutions of equivalent elements may be made within the scope of my invention. Thus; a splined or feathered spindle may be substituted for the square spindle described; and other known forms of locking devices may be used in place of any kind of axially slidable spindle. Lock releasing fingers 42 are adapted to cooperate with a large number of such mechanisms. Therefore, since my invention may be embodied in many forms, I do not limit its scope except as it is defined in the appended claims.

I claim as my invention:

1. Door lock construction comprising; a straight casing; and a composite latch-bolt which includes nested U-shaped mutually slidable members, whereof the inner member is relatively short,

is prevented from materially over-travelling the outer member, and the member bases are variably spaced by a compression spring therebetween; said inner member being adapted to straddle internal rotary parts of the lock to permit utilizing the full length of opposed internal walls of the casing as slide guides for said outer member; said rotary parts having a cam engagement with the inner member whereby both members may be moved to their fully retracted positions; and said rotary parts being further adapted to maintain the leg-spacing of the inner member in all of its positions.

2. Door lock construction comprising; a straight casing; and a composite latch-bolt which includes nested U-shaped mutually slidable members, whereof the inner member is relatively short, is prevented from materially over-travelling the outer member, and the member bases are variably spaced by a relatively weak compression spring therebetween; and a relatively strong compression spring tending to project said inner U-member outwardly; said inner U-member being adapted to straddle internal rotary parts of the lock to permit utilizing the full length of opposed internal walls of the casing as slide guides for said outer U-member; said rotary parts having a cam engagement with the inner U-member whereby both U-members may be moved to their fully retracted positions; and said rotary parts being further adapted to maintain the leg-spacing of the inner U-member in all of its positions.

3. In combination with construction as set forth in claim 1; an additional element which is normally within the confines of the casing; and means, operable by retraction of the latch-bolt, for projecting said element through an opening in the casing, in a manner adapted for applying actuating force to associated mechanism.

4. In combination with construction as set forth in claim 1; an additional element which is resiliently constrained to be normally within the confines of the casing; and means, operable by retraction of the latch-bolt, for projecting said element through an opening in the casing, in a manner adapted for releasing associated locking mechanism.

5. In combination with construction as set forth in claim 1; an opposed pair of laterally movable members; resilient means for constraining said members to normally remain within the confines of the casing; and means, operable by retraction of the latch-bolt, for projecting said members through respective lateral openings in the casing, in a manner adapted for releasing associated locking mechanism.

6. In combination with construction as set forth in claim 1; an opposed pair of laterally movable members; a tension spring connecting said members and constraining them to normally remain within the confines of the casing; and means, operable by retraction of the latch-bolt, for projecting said members through respective lateral openings in the casing, in a manner adapted for releasing associated locking mechanism; said spring being suited for restoring said members to their normal positions within the confines of the casing, when the latch-bolt is projected.

7. In combination with construction as set forth in claim 1; an additional element which is normally within the confines of the casing; and means, operable by retraction of the outer U-member of the latch-bolt only, for projecting said element through an opening in the casing, in a manner adapted for applying actuating force to associated mechanism.

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