

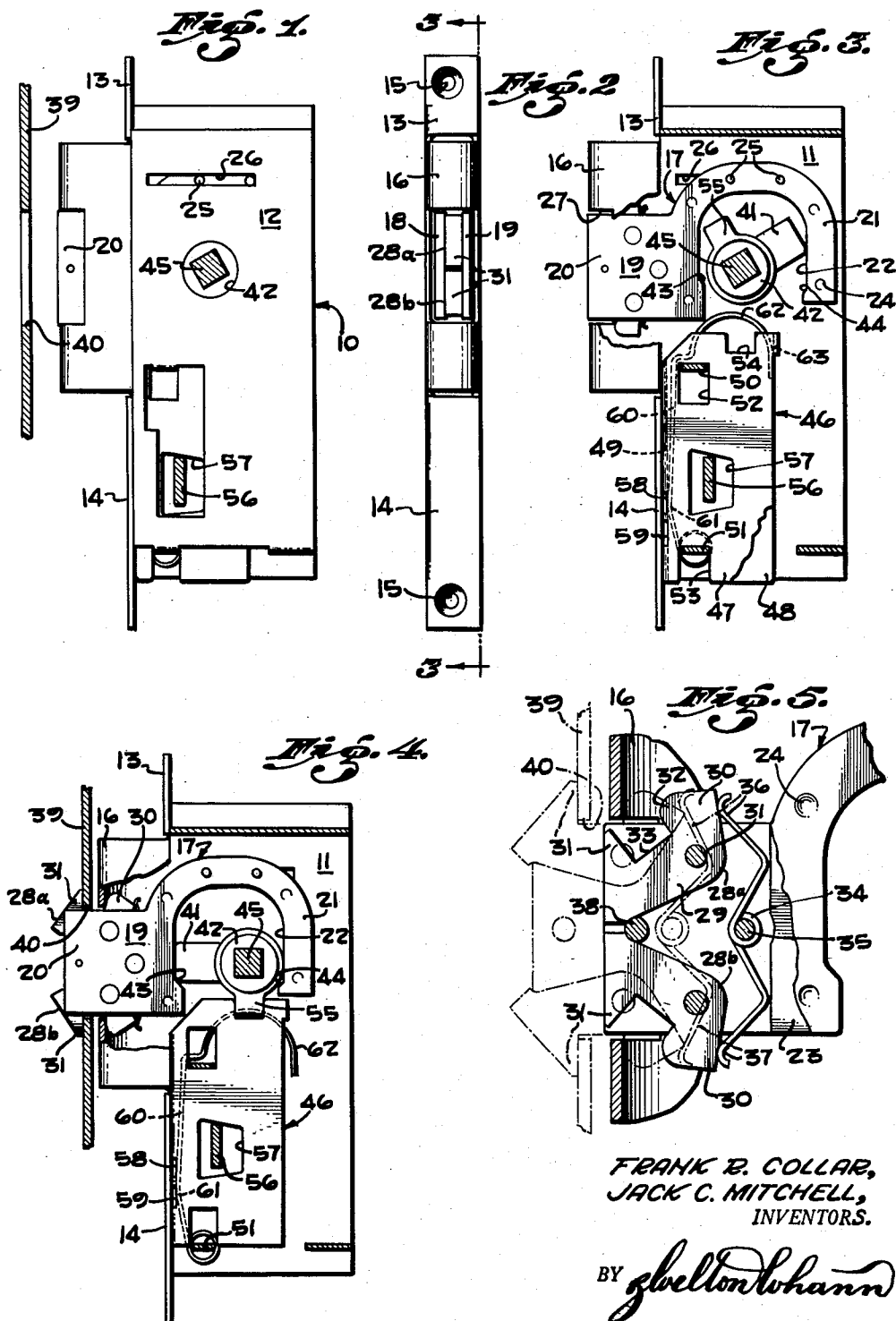
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LATCH MECHANISM

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LATCH MECHANISM

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1

The present invention relates generally to locks, and is more particularly concerned with a door lock for use with folding accordion type doors, sliding doors, and the like.

It is one object of the present invention to provide a lock structure of simple, compact construction, having a small number of moving parts, and which may be economically manufactured.

A further object has to do with the provision of a novel lock structure having a shielded reciprocally mounted bolt arranged to be protracted from a shielded position into interlocking engagement with a keeper, and which will be deadlocked in the keeper interlocking position.

Another object of the herein described invention is to provide a unique keeper interlocking mechanism which is automatically moved into interlocking and released positions with respect to the keeper in response to protraction and retraction movements of the bolt.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

Referring to the accompanying drawings, which are for illustrative purposes only:

Fig. 1 is a side elevational view of a lock embodying the features of the present invention;

Fig. 2 is an edge elevational view of the same;

Fig. 3 is a sectional view, portions being broken away to show certain details, the bolt being in retracted position, taken substantially on line 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 3, except that the lock is shown with the bolt in protracted keeper engaging position, and is locked against opening; and

Fig. 5 is an enlarged fragmentary view illustrating the operative action of the bolt keeper engaging jaws.

Referring now to the drawings, the lock structure of the present invention is shown as being embodied in an enclosing casing, as generally indicated by the numeral 10, having spaced apart side walls 11 and 12.

The side wall 11, as shown in Figs. 2 and 3 is deformed along a marginal edge to provide spaced apart face mounting flanges 13 and 14 which respectively are provided with mounting screw receiving apertures 15 by which the casing and as-

2

sociated lock mechanism may be mounted in a door edge.

Between the flanges 13 and 14, the wall 11 is extended and turned back upon itself to provide a U-shaped projecting portion 16 which forms a shield for one end of the lock bolt 17 which will hereinafter be described in detail. The transverse configuration of the projecting portion 16 is such that it will conform with the shape of an abutment strip placed along the door edge.

The bolt 17 is of laminated construction, being composed of side plates 18 and 19, having a straight portion 20 at one end and an integrally formed U-shaped portion 21 at its other end which defines a side opening recess 22. The plates 18 and 19 are held in spaced apart relation by means of a spacer plate 23, as shown in Fig. 5, which generally conforms to the U-shaped end portion 21 of the side plates. The side plates are secured to the spacer plate by conventional means, and in the present instance is shown as being spot welded at spaced points as indicated by the numeral 24.

The bolt 17 is supported for reciprocal movement in the casing, spaced pins 25—25 being carried by the side plates 18 and 19, these pins being arranged to extend into an adjacent slot 26 of the side wall 11 or 12 as the case may be. Thus, the bolt is positioned with its straight end portion 20 extending into the projecting portion 16, the bridging portion thereof being provided with a slot 27 through which the end portion 20 may be moved to protractile and retractile positions.

In the straight portion 20 of the bolt, between the spaced plates 18 and 19, right and left hand keeper engaging jaws 28a and 28b are mounted. These jaws are of similar construction, each having divergent arms 29 and 30 extending outwardly from a pivot pin 31 placed intermediate the ends of the jaw. As shown in Fig. 5, the arm 29 is laterally extended in its edge margin to form a hook defining tooth 31. The arm 30 is laterally extended in the direction of the tooth 31 to form a rounded protuberance 32, the tooth 31 and protuberance 32 being spaced apart and cooperating to form a notch or recess 33 therebetween.

The two jaws are mounted in back-to-back position with their teeth 31—31 extending outwardly in opposite directions. A wing shaped spring 34 is anchored at its midportion by a pin 35 extending between the adjacent portions of

3

plates 18 and 19. This spring has one of its ends, as indicated by numeral 36, bearing against arm 30 of the jaw 28a, and its other end, as indicated by numeral 37, bearing against the arm 30 of jaw 28b. The action of the spring 34 is such that the jaw 28a is biased in a counterclockwise direction, and the jaw 28b in a clockwise direction until the arms 29 of the jaws respectively strike against a common stop pin 38.

In the last described position, it will be seen that the teeth 31 of the jaws are positioned within the perimeter of the adjacent end portion of the bolt, whereas the arms 30 of the jaws project beyond the side edges of the adjacent portion of the bolt, with the protuberance 32 facing the bridging portion of the projecting portion 16. If the bolt is now reciprocated so as to cause the straight portion 20 to be protracted beyond the portion 16, this movement will act to rotate the jaws in opposite directions and cause the teeth 31 thereof to be moved to positions projecting beyond the periphery of the straight portion 20, as shown in dotted lines in Fig. 5.

When associated with a properly formed keeper, as shown at 39, having an opening 40 therein adapted to receive the end portion of the bolt therethrough, the teeth 31 will act to interlock and secure the bolt to the keeper and hold the bolt and door against movement away from the keeper as long as some means are provided for deadlocking or otherwise preventing reversed movement of the bolt towards retracted position.

In the present instance, the bolt is reciprocally moved in opposite directions by means of a cam-arm 41 which is mounted on a bushing 42 having its ends rotatably supported in the side walls 11 and 12 respectively. The cam-arm 41 is positioned within the recess 22 so that upon clockwise rotation it will impinge against one side of the recess and move the bolt to retracted position, whereas rotation of the cam-arm in the opposite direction will move the bolt to projected position. Rotational movement of the cam-arm 41 is arrested at diametrically opposite positions parallel to the reciprocal movement of the bolt by stop shoulders 43 and 44 at the entrance to recess 22. Thus, in each extreme position of the cam-arm 41, the bolt will be deadlocked against movement. Provision is made for rotating the cam-arm 41 by a shaft or bar 45 positioned in the bushing 42. This bar may be fitted with a suitable manually engageable handle or knob for convenience of operation.

Under certain conditions it may be desirable to lock the cam-arm against rotation, particularly when it is in a position to hold the bolt in protractile position. For such purpose, a locking bar structure, as generally shown at 46 is provided.

The locking bar structure is fabricated from plate material which is folded or otherwise formed into a substantially U-shaped structure having spaced walls 47 and 48 interconnected by a bridging edge portion 49 along one side. The part thus formed is mounted with the edge portion 49 bearing against the inner surface of the mounting face flange 14, and guided for longitudinal reciprocal movements by posts 50 and 51 positioned in elongate wall slots 52 and 53 respectively. The upper end of the locking bar structure has registering end notches 54 formed therein, these notches facing the opening to recess 22 of the bolt. The notch 54 is arranged

4

to cooperatively receive therein a cam-arm 55 which is likewise carried by the bushing 42 and is positioned in right-angled relation to the cam-arm 41, so that when the bolt is actuated to protractile position, the cam-arm 55 will be at the side opening into recess 22 in a position extending into the notch 52 upon movement of the locking bar structure to locking position.

Reciprocal movement of the locking bar is accomplished through the actuation of a suitable bar 56 positioned within wall notches 57 of the locking bar structure.

The edge portion 49 is cut out to form spaced notches or openings 58 and 59 therein, which serve as dwell points for the locked and unlocked positions of the locking bar. For resiliently retaining the locking bar at these dwell points or positions, there is provided an elongated spring member 60 having a bend point 61 adapted to enter the respective openings upon movement of the bar. Pressure is applied to this spring by looping one of its ends around the post 51, while its other end is formed into a loop portion 62 which is engaged behind a lug 63 on the wall 47 of the locking bar structure. The point 64 of the spring is thereby resiliently pressed against the edge portion 49 and forms a resilient detent upon entering the openings 58 and 59.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of the present invention, and, hence, we do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

We claim:

1. A lock for doors of the folding type, comprising a casing having a side slot therein; a bolt having a straight portion at one end positioned for movement in said slot, and a transverse shoulder at its other end; a rotatable arm positioned adjacent said shoulder and cooperable therewith to reciprocally move said bolt, said arm being movable into a position normal to said shoulder so as to positively hold said bolt against inward movement; jaws carried by said one end for engaging a keeper when the bolt is reciprocated to a predetermined position of extension from said slot; means for manually rotating said arm; a shouldered part connected to said arm in projecting relation thereto and so as to rotate therewith; and a locking member movably supported by said casing so as to be moved toward and away from said shouldered part and having a shouldered portion positioned so as to engage said shouldered part when said arm is in a position normal to said shoulder, thereby locking said arm in said position.
2. A lock for doors of the folding type, comprising: a casing having a side slot therein; a bolt having a straight portion at one end positioned for movement in said slot, and a side opening U-shaped recessed portion at its other end, one side of said opening being defined by a shoulder transverse to the line of movement of said bolt; a rotatable arm positioned in the recessed portion and cooperable therewith to reciprocally move said bolt, said arm being positioned so that it may be rotated into a position normal to said shoulder to positively prevent retraction of said bolt; jaws carried by said one end for engaging a keeper when the bolt is reciprocated to a predetermined position; means for manually rotating said arm; an arm member projecting from said rotatable arm at an angle of substantially ninety degrees therefrom, so as

5

to occupy a position projecting laterally of said U-shaped recessed portion when said arm is in said position normal to said shoulder; a locking member supported by said casing in a position adjacent said recessed portion of said bolt and so as to be movable toward and away from said recessed portion, said locking member having a shouldered portion positioned so as to engage said arm member when it is in said position projecting laterally of said recessed portion, and to thereby lock said rotatable arm in said position normal to said shoulder.

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6

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