July 6, 1954 M. A. VAN DER SPEK 2,683,049

COMBINED DOOR LATCH AND LOCK

Filed Aug. 13, 1951

Fig. 1

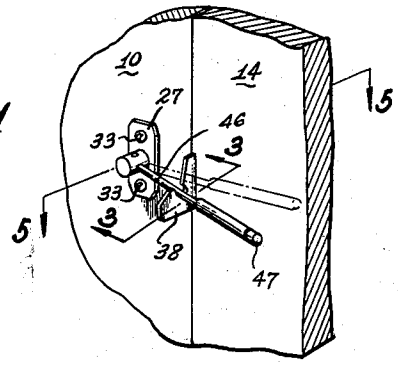


Fig. 2

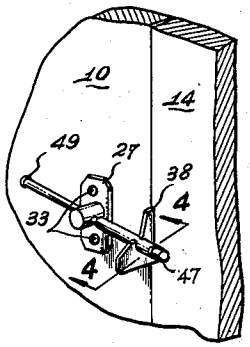


Fig. 3

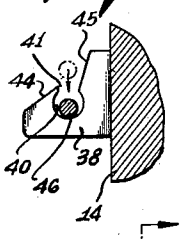


Fig. 4

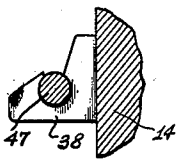


Fig. 5

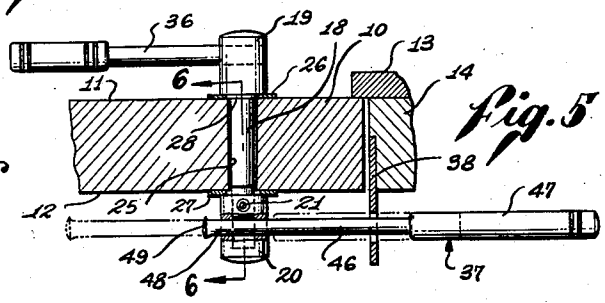


Fig. 6

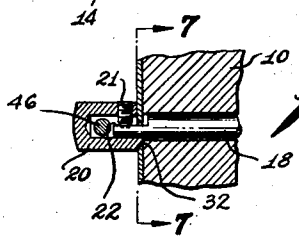


Fig. 7

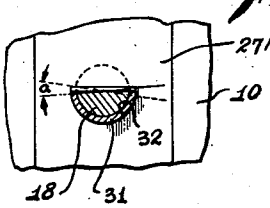


Fig. 8

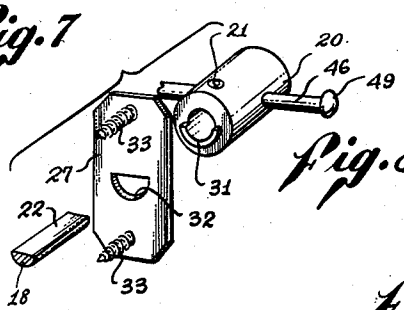


Fig. 9

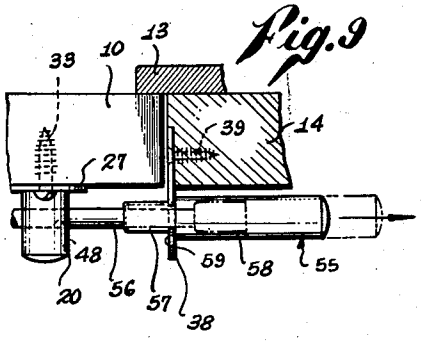
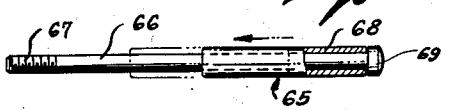


Fig. 10



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COMBINED DOOR LATCH AND LOCK

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Application August 13, 1951, Serial No. 241,520

8 Claims. (Cl. 292—207)

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This invention relates to fastening devices for doors, gates, and the like and more particularly is directed to a door latch that is adapted to serve alternately as a door lock when desired.

The general object of the invention is to provide such a latch that is efficient for its purpose, relatively simple in construction and easy to operate.

A more particular object of the invention is to provide a fastening device of this character that may be shifted in a simple manner from its latching function to its locking function and vice versa, but at the same time avoids any likelihood of the door being locked inadvertently. A feature of the invention is that this particular object is obtained in a simple manner by designing the mechanism with an inherent gravitational tendency to seek a position to carry out its latching function as distinguished from its locking function.

The door fastening mechanism of the invention includes the usual rotary assembly that extends through the body of the door for manual operation from either side of the door. The latching arrangement is on the inner side of the door and comprises an arm or handle that rotates about the axis of the rotary assembly to move into and out of a recess provided by a latching plate or other suitable recess means. The latching recess has a restricted throat or entrance and a portion of the handle of relatively small cross section moves readily through this restricted throat for latching or unlatching the door. When it is desired to lock the door on the inside an enlargement carried by the handle is shifted into the recess of the latch plate and since the enlargement is greater in cross section than the throat or entrance to the recess, the enlargement engages the latch plate in a positive manner and thereby locks the door in a positive manner.

The desired gravitational tendency for the handle on the inside of the door to serve as a latch rather than a lock is provided by arranging for the locking position of the handle enlargement to be higher than the latching position. Thus the door fastening mechanism normally serves as a simple latch and operates as a lock only when the operator deliberately intends for it to do so and takes the trouble to shift the handle enlargement to its locking position.

The various objects and advantages of the invention will be understood from the following detailed description taken with the accompanying drawings.

In the drawings, which are to be regarded as merely illustrative,

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Figure 1 is a perspective view showing the door fastening mechanism serving as a simple latch;

Figure 2 is a similar view showing the mechanism serving as a positive lock;

Figure 3 is a transverse section taken as indicated by the line 3—3 of Figure 1;

Figure 4 is a transverse section taken as indicated by the line 4—4 of Figure 2;

Figure 5 is a horizontal section on an enlarged scale taken as indicated by the line 5—5 of Figure 1;

Figure 6 is a longitudinal section through the rotary assembly taken as indicated by the line 6—6 of Figure 5;

Figure 7 is a transverse section taken as indicated by the line 7—7 of Figure 6;

Figure 8 is an exploded view of a portion of the rotary assembly;

Figure 9 is a view similar to Figure 5 showing a modified form of latching handle that may be employed; and

Figure 10 is a view partly in section and partly in elevation of another form of handle that may be employed.

By way of example, the drawings show an embodiment of my invention for use in conjunction with a door 10 having an outer face 11 and an inner face 12. The door swings inward from its closed position and at its closed position the outer face 11 abuts a doorway strip 13 (Figure 5) that is mounted on the fixed door jamb 14.

The rotary assembly of the door fastening mechanism that extends through the body of the door 10 may comprise a shaft 18 carrying a knob or body 19 on its outer end and a second knob or body 20 on its inner end. One of the two knobs may be permanently mounted on the shaft 18 with the other knob movable to permit the rotary assembly to be installed in a door. In the arrangement shown in the drawings, the knob 19 is permanently mounted on the shaft 18 and the other knob 20 is removably mounted on the shaft being normally secured thereon by a suitable set screw 21. Preferably the inner end portion of the shaft 18 is cut away to semi-circular cross-sectional configuration, thereby providing a flat face 22 against which the set screw 21 abuts.

The rotary assembly extends through a bore 25 in the door 10 and in the particular practice of the invention exemplified by the drawings, an outer face plate 26 and an inner face plate 27 are mounted on the opposite faces of the door at the opposite ends of the bore 25 for the purpose of journaling the rotary assembly. As may be seen in Figure 5, the knob 19 is provided on its inner

face with an annular flange 28 that rotatably fits into a circular opening in the outer face plate 26, and as may be seen in Figures 7 and 8, the inner face of the knob 20 has a semi-circular flange 31 that is rotatable in a semi-circular opening 32 in the inner face plate 27. The two face plates are mounted on the door 10 by suitable fastening means such as wood screws 33.

The purpose of providing the semi-circular flange 31 in cooperation with the semi-circular opening 32 in the face plate 27 is to limit the range of rotation of the rotary assembly to a restricted range of rotation such as represented by the angle *a* in Figure 7. The circumferential extent of the semi-circular boss or annular flange 31 of the inner knob 20 is sufficiently less than the circumferential extent of the surrounding semi-circular opening 32 to permit the rotary assembly to rock through the angle *a*.

The outer knob 19 may be of a suitable configuration for convenient manual manipulation but in the present arrangement is provided with a suitable radial handle 36 for this purpose. The handle 36 extends in the direction away from the edge of the door 10. The inner knob 20 on the other side of the door is provided with a handle generally designated 37 that extends in the opposite direction beyond the edge of the door for cooperation with a latch plate 38 that is mounted on the jamb 14 by suitable screws 39 (Figure 9).

The latch plate 38 is cut away to provide an upwardly extending recess 40 that preferably is circular in general configuration and has entrance or throat 41 that is substantially less in width than the width or diameter of the recess. As may be seen in Figure 3 the latch plate 38 is cut away for convenient access to the recess 40 from the outer edge of the plate and is formed with an outer inclined shoulder 44 that leads upward to the entrance 41 of the recess. On the other side of the recess 40 the latch plate 38 forms a steep shoulder 45 that inclines downward to the entrance 41.

In the particular construction of the handle 37 shown in Figures 1, 2 and 5, the handle has a shank 46 of relatively small circular cross sectional dimension with a longitudinally extensive enlargement 47 fixedly mounted on the outer end of the shank. The enlargement 47 is the handle proper that is grasped for manual operation of the mechanism from the inner side of the door. This enlargement 47 is dimensioned to fit into the recess 40 of the latch plate 38 but is substantially larger in cross sectional dimension than the entrance 41 of the recess. To permit the enlargement 47 to be shifted axially or longitudinally into the recess 40 the shank 46 is slidingly mounted in a cross bore 48 in the knob 20, the inner end of the shank being peened or upset to provide a head 49 that prevents retraction of the shank from the bore.

The manner in which the described door fastening device operates may be readily understood from the foregoing description. In the normal use of the device as a simple latch that holds the door 10 in closed position, the inner handle 37 is at its extended position shown in Figure 1 with its shank 46 normally resting in the recess 40 of the latch plate 38. The door may be unlatched from the inside by lifting handle 37 or may be opened from the outside by turning handle 36. It may be noted in Figure 1 that this normal position of the handle 37 is inclined downward from the horizontal so that gravity continually urges the enlargement 47 outward away from the recess 40.

When the door is opened either from the inside or from the outside the handle 37 is rotated upward to lift the shank 46 clear of the latch recess 40, the shank 46 readily passing through the entrance 41 of the recess. Since it is desirable that the rotary assembly be biased to cause the shank 46 to rest normally in the recess 40 the arrangement is such that the rotary assembly is overbalanced in the desired direction, and for this purpose the extended handle 37 outweighs the oppositely positioned handle 36 on the outside of the door.

When it is desired to lock the door it is necessary merely to slide the shank 46 longitudinally through the cross bore 48 thereby to move the handle 37 to the position shown in dotted lines in Figure 5, the enlargement 47 then being positioned in the recess 40 as shown in Figure 2. Since the enlargement 47 is greater in cross-sectional dimension than the throat 41 of the recess 40 the handle 37 engages the latch plate 38 in a positive manner, thereby locking the door. The inclination of the handle 37 is so slight and the fit of the enlargement 47 within throat 40 so close that there is no gravitational tendency of the enlargement to creep out of the recess. To unlock the door it is merely necessary to retract the handle 37 to the position shown in Figure 1.

The relatively small angle *a* to which the movement of the rotary assembly is restricted, prevents the latching handle 37 on the inner side of the door from dropping excessively when free from the latch plate 38. If desired, the inclined shoulder 44 of the latch plate may be extended downward to the lowermost free position of the shank 46 of the handle, so that the inclined shoulder will serve as a cam to lift the handle into the recess 40 when the door is forced shut without manipulation of either door handle.

The modified form of the invention shown in Figure 9 is largely identical with the first-described form as indicated by the use of corresponding numerals to identify corresponding parts. The modification consists in the substitution of a handle generally designated 55 for the previously described handle 37. The handle 55 has a shank 56 like the previously described handle shank 46 and has an enlargement 57 that enters the recess 40 to lock the door in the same manner as previously mentioned enlargement 47. The enlargement 57, however, is provided with a further enlargement 58 that forms a stop shoulder 59 that abuts the face of the latch plate 38 to limit the locking movement of the handle. Thus the handle 55 locks and unlocks the door with a relatively short longitudinal shift as indicated by the dotted lines in Figure 9.

Figure 10 shows another handle generally designated 65 that may be substituted for the first mentioned handle 37. The handle 65 has a shank 66, the inner end of which has screwthreads 67 to permit the handle to be fixedly mounted on the knob 20 of the rotary assembly. The shank 66 carries an enlargement in the form of a sleeve 68 that is slidingly mounted on the shank, the outer end of the shank being formed with a head 69 to limit the outer movement of the sleeve. Normally, the sleeve enlargement 68 is at the outer end of the shank 46 as shown in full lines in Figure 10, so that only the shank 66 enters the recess 40 of the latch plate 38. When it is desired to lock the door, the sleeve enlargement 68 is moved slidingly along the shank 66 to the

dotted position shown in Figure 10 to place the enlargement sleeve in the recess 40 of the latch.

My detailed description of specific forms of the invention will suggest to those skilled in the art various departures from my disclosure that properly lie within the scope and spirit of my appended claims.

Having described my invention, I claim:

1. A latch mechanism for fastening a door to a jamb mounting a keeper means having an upwardly presented recess with a restricted entrance, comprising: a rotary shaft adapted for mounting in the door to extend from the inner face of the door to the outer face; means on the outer end of said shaft for manual rotation thereof; a shank extending laterally from the inner end of said rotary shaft to swing about the axis of the shaft into and out of said recess through said entrance to latch and unlatch the door; and an enlargement carried by said laterally extending shank, said enlargement being smaller in cross sectional dimension than said recess but larger than the entrance to the recess, said enlargement being longitudinally movable from a retracted position into the recess thereby to engage the keeper means in a positive manner to lock the door.

2. A latch mechanism as set forth in claim 1 in which said laterally extending shank, when seated in said recess, has its retracted position of the enlargement lower than its locking position.

3. A latch mechanism as set forth in claim 1 in which said enlargement is fixedly carried by said laterally extending shank and said laterally extending shank is movably mounted on said rotary shaft for bodily movement relative thereto to carry said enlargement into said recess.

4. A latch mechanism as set forth in claim 1, in which said enlargement is slidingly mounted on said laterally extending shank for movement thereon into and out of said recess.

5. A latch mechanism as set forth in claim 1 in which said enlargement has a shoulder to limit its movement into said recess.

6. A latch mechanism as set forth in claim 1 in which said rotary shaft is gravitationally biased by said laterally extending shank together with said enlargement to urge said shank into said recess.

7. A latch mechanism as set forth in claim 6 which includes stop means to limit the gravitational rotation of the rotary shaft.

8. A latch mechanism as set forth in claim 1 in which said keeper means includes an inclined surface to lift said laterally extending shank into said recess.

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