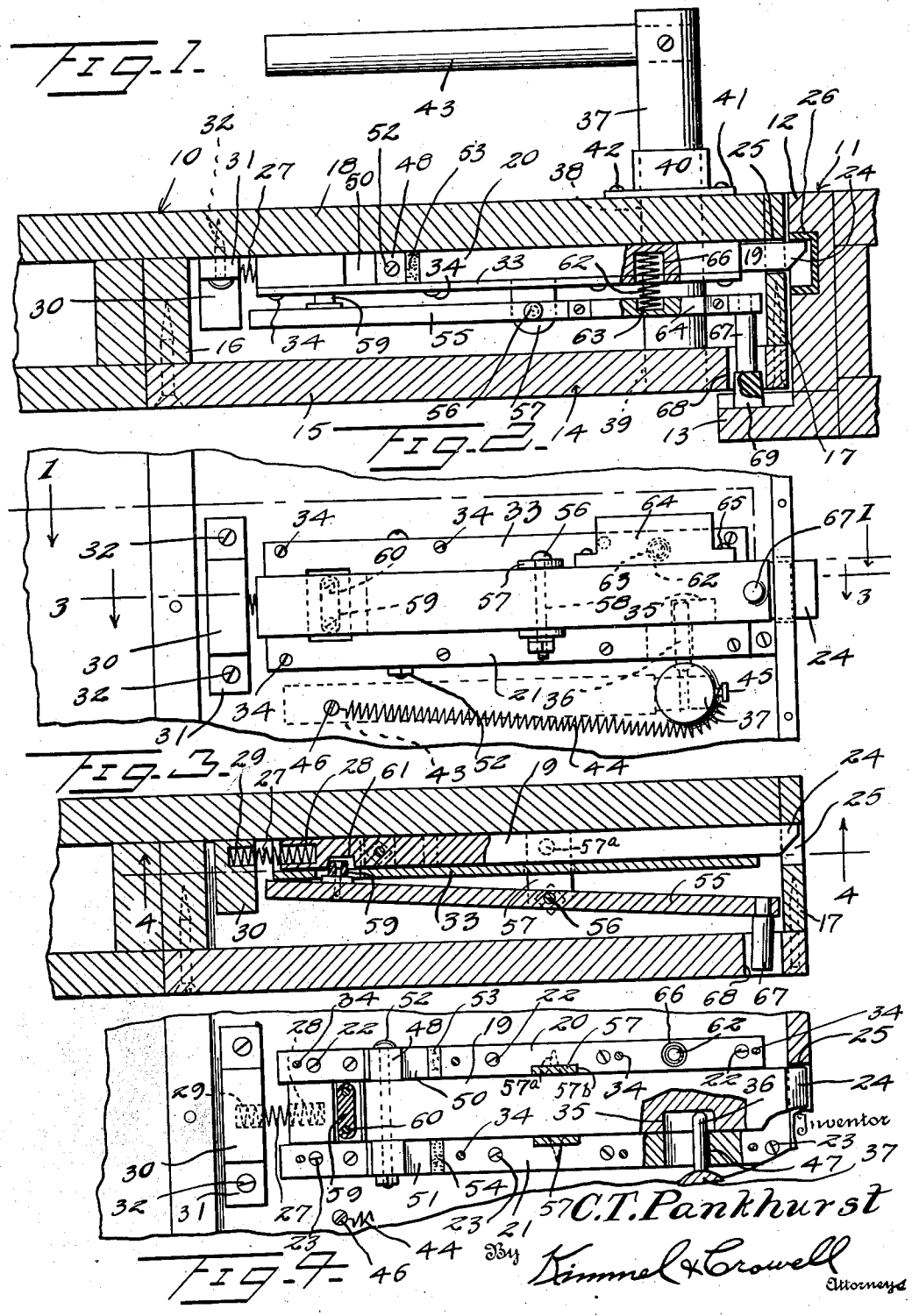
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DOOR LATCH

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DOOR LATCH

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1 Claim. (Cl. 292—335)

This invention relates to door latches.

An object of this invention is to provide a door latch having a bolt tripping mechanism which is adapted to hold the bolt in a retracted position when the door is opened, and which upon closing of the door is adapted to release the bolt for movement to a latching position.

Another object of this invention is to provide a door latch which is so constructed that the closing of the door will trip the bolt holding mechanism so that the bolt may move to a latching position.

Another object of this invention is to provide a silently acting door lock or latch mechanism which will operate very easily and with an absolute minimum of any noise or sound and by reason of which a door or other closure may be noiselessly closed in locked or latched position.

Another object of this invention is to provide a door lock or latch mechanism so constructed and capable of being arranged as to permit perfect streamlining of the door or other closure to which it may be applied.

A further object of this invention is to provide a latch construction of this kind which embodies a minimum number of parts so that it will not readily get out of order and so that it may be manufactured at a low cost.

To the foregoing objects and others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawing, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawing:

Figure 1 is a horizontal sectional view taken substantially on the line 1—1 of Figure 2 showing a door latching mechanism constructed according to an embodiment of this invention,

Figure 2 is a detail inner elevational view of the device with the cover removed,

Figure 3 is a sectional view taken on the line 3—3 of Figure 2, and

Figure 4 is a sectional view taken on the line 4—4 of Figure 3.

Referring to the drawing the numeral 10 designates generally a swinging door which is mounted in a door frame generally designated as 11. The door frame 11 is provided at one side thereof with a vertically disposed jamb 12, and an abutment 13 is carried by the inner edge portion of the jamb 12 and against which the door 10 is adapted to engage so as to limit the swinging movement of the door 10 in one direction relative to the frame 11.

A door latching mechanism generally designated as 14 is secured to the door 10 adjacent the free or swinging end thereof, and the latching mechanism 14 includes a housing formed with an inner wall 15, a rear wall 16, and a forward wall 17. Upper and lower walls (not shown) are adapted to be interposed between the inner wall 15 and the outer wall 18 which constitutes a portion of the door 10 so as to provide a completely closed housing within which the operating mechanism of the improved latch is adapted to engage.

A horizontally slidable bolt member 19 is slidable between upper and lower guide members 20 and 21 which are fixed by fastening devices 22 and 23 respectively to the inner face of the outer wall 18 of the door 10. The bolt 19 is of substantially rectangular configuration in transverse section so as to be freely slidable between the parallel guide members 20 and 21, and is formed at its outer end with a latching bill 24. The bill 24 is slidable through an opening 25 which is formed in the forward wall 17 of the housing 14 and is adapted to engage in a keeper or recess 26 lined with vulcanized rubber which is formed in the frame member 12. The bolt 19 is constantly urged to an extending or latching position by means of an expansible spring 27. The spring 27 at one end engages in a socket or recess 28 which is formed in the inner or rear end of the bolt 19 and the opposite or rear end of the spring 27 engages in a recess or socket 29 which is formed in a plate 30. The plate 30 is provided with a pair of ears 31, and the ears 31 are secured by fastening devices 32 to the inner side of the wall 18 of the door 10. A cover or plate 33 engages against the inner sides of the guide members 20 and 21 and is secured thereto by fastening devices 34. The bolt 19 adjacent the forward end thereof and at a point spaced inwardly from the bill 24 is formed with a downwardly opening notch 35 within which a bolt operating pin 36 loosely engages. The pin 36 is fixed to a horizontally disposed shaft 37 which is journalled in an opening 38 formed in the outer wall 18 of the door 10 and also an opening 39 formed in the plate or inner wall 15 of the housing 14. A bearing 40 which is carried by an annular flange 41 fixed by fastening devices 42 is secured to the outer side of the outer wall 18 and encompasses the shaft 37 so as to rotatably support the outer portion of the shaft 37.

The shaft 37 at its outer end is provided with a handle 43 of suitable configuration so that the shaft 37 may be rotated in order to effect retraction of the bolt 19 by engagement of the pin 36 against the rear wall of the notch 35. The shaft 37 is constantly urged to a bolt extending position by means of a spring 44 which at one end is secured to a pin 45 fixed to the shaft 37 within the housing 14, and the opposite end of the spring 44 is fixed to a stationary pin 46 which may be fastened to the inner side of the outer wall 18 of the door 10. The spring 44 as here shown is a coil spring and is partly wrapped or extended about the periphery of the shaft 37 as shown in Figure 2, so as to constantly urge the shaft 37 to rotate in a direction to extend the bolt 19. The pin 36 is adapted to limit the rotation of the shaft 37 in a direction to extend the bolt 19 by engagement of the pin 36 with the forward end of an opening 47 which is formed in the lower guide member 21.

The bolt 19 is also limited in its outward or latching movement by means of a pair of opposed lugs 48 which are secured to the opposite or upper and lower edges of the bolt 19 at a point adjacent the rear end of the bolt 19, and the lugs 48 are slidable in elongated slots 50 and 51 which are formed in the guide members 20 and 21 respectively. The lugs 48 may, if desired, be cast integral with the bolt 19 or may be secured thereto by means of a common fastening device 52. The forward ends of the notches or slots 50 and 51 have mounted therein resilient bumpers 53 and 54 respectively, so as to cushion the engagement of the lugs 48 and eliminate any noise when the lugs 48 stop the forward movement of the bolt 19 under the action of the spring 27.

The bolt 19 is adapted to be releasably held in a retracted position by means of a releasable trip lever or bar 55. The bar 55 is rockably mounted for horizontal swinging movement on a vertically disposed pivot 56. The pivot 56 engages through a pair of inwardly extending ears 57 which extend from the guide members 20 and 21, and the pivot member 56 is engageable in a vertical opening 58 which is formed in the lever 55. The ears 57 are secured by means of fastening devices 57^a in recesses 57^b formed in opposite sides of the guides 20 and 21. The lever 55 adjacent the rear end thereof and on its forward side has secured thereto an elongated bolt trip or holding member 59 which is preferably made of vulcanized rubber and which is secured to the lever 55 by fastening devices 60. The bolt 19 is formed in its inner face with a notch or recess 61 within which the trip member 59 is adapted to releasably engage.

The lever 55 is constantly urged to a bolt engaging position by means of a spring 62 which at its inner end engages in a socket or recess 63 carried by an upstanding plate 64 secured by fastening devices 65 to the upper edge of the lever 55. The opposite or forward end of the spring 62 engages in a socket or recess 66 which is formed in the upper guide member 20 adjacent the forward end of this member. The lever 55 at its forward end has secured thereto a right angularly disposed and inwardly extending pin 67. The pin 67 loosely extends through an opening 68 which is formed in the inner wall 15 of the housing 14, and the inner end of the pin 67 is disposed in a position for engagement with a lever tripping button or abutment 69. The button or abutment 69 is carried by the stop member or flange 13 of the frame 11. In practice the opening 68 is a small round opening and the button or abutment is adapted to loosely extend into the inner end portion of the opening 68 when the door 10 is moved to a closed position. In Figure 3 the latching lever 55 is shown in a bolt holding position with the tripping pin 67 extended at its inner end a slight distance into the opening 68, so that when the door 10 is moved to a closed position, the abutment or button 68 will contact with the pin 67 and swing the lever 55 to a bolt released position.

In the use and operation of this latching mechanism the bolt 19 when in a latched position will be extended from the forward wall 17 of the housing 14 as shown in Figures 1 and 2. When it is desired to open the door, the handle 43 is rocked to shift the bolt 19 inwardly of the housing 14. When the bolt 19 is shifted inwardly of the housing 14 or to the left is viewed in the drawings, the spring 62 will cause the holding or tripping member 59 to engage in the recess or keeper 61 of the bolt 19 and thereby hold the bolt 19 in a retracted position. The bolt 19 will be held in the retracted position until the door 10 is closed whereupon the button 69 will engage the pin 67 and rock the lever 55 to a bolt releasing position. As soon as the holding member 59 is moved out of engagement with the keeper 61, the spring 27 will shift the bolt 19 to a latching or extended position.

What is claimed is:

A door latch for mounting on a swinging door comprising an endwise movable bolt having a slot in one edge thereof and a keeper formed in one side thereof adjacent the inner end, a housing for said bolt, spring means constantly urging said bolt to an extended position, means for shifting said bolt to a retracted position, a bolt holding rock lever, means pivotally supporting said lever between the ends of the latter, a resilient bolt holding member carried by said lever and engageable with said keeper for releasably holding said bolt in retracted position, an upstanding plate carried by said lever, guide means for said bolt, a spring engageable with said plate and said guide means for constantly urging said lever to a bolt holding position, an arm fixed to said lever on the side thereof opposite from said holding member and adjacent the end of said lever opposite from said holding member, said door having an opening in which said arm loosely engages, the outer end of said arm being inwardly from the adjacent face of the door when said lever is in latched position, and a resilient button fixed to the door frame engageable with said arms within said opening for rocking said lever to a bolt releasing position upon closing of the door.

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