Jan. 21, 1930. E. ELLINGSON 1,744,457

DOOR LATCH

Filed Jan. 24, 1928

Fig. 1.

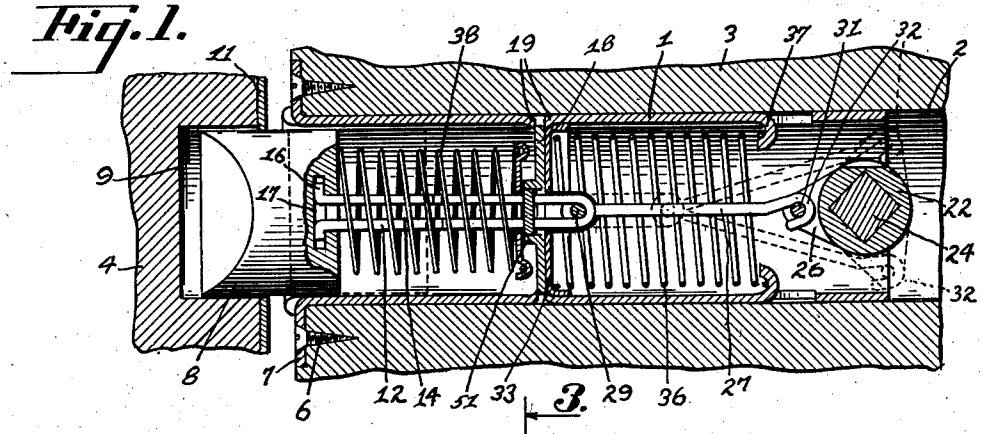


Fig. 2.

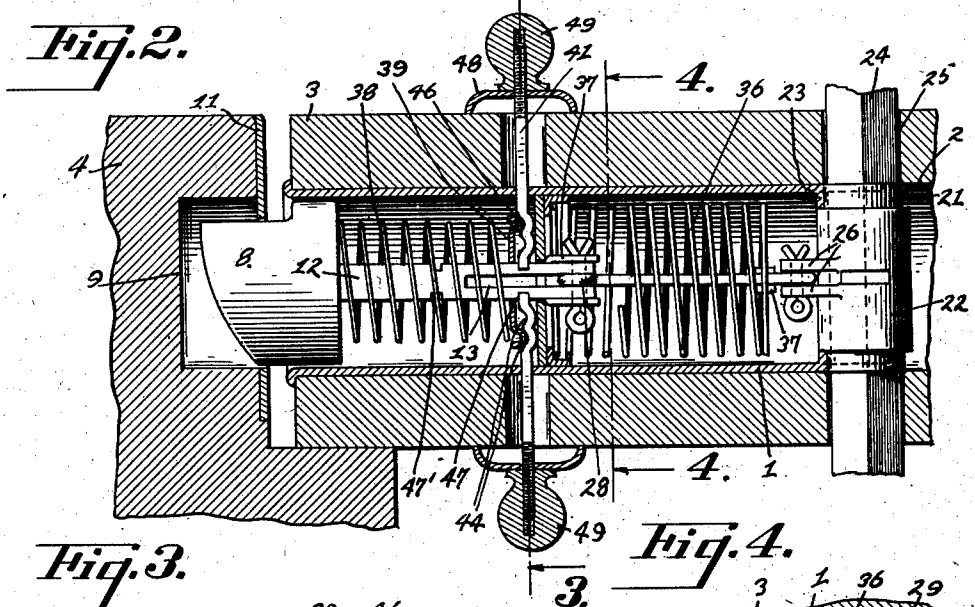


Fig. 3.

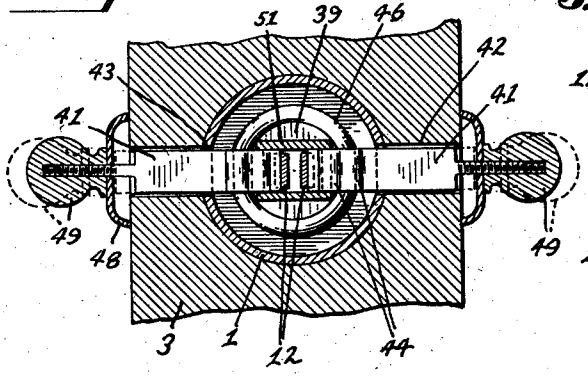
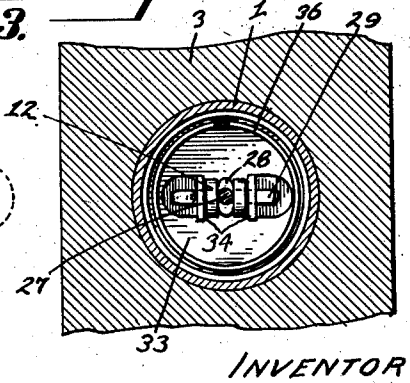


Fig. 4.



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UNITED STATES PATENT OFFICE

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DOOR LATCH

Application filed January 24, 1928. Serial No. 249,056.

My invention relates to improvements in door latches and the like wherein latch actuating means, arranged to be operated by turning a knob, is fully enclosed within a tubular casing set within a mortise bore, the latch being arranged to be moved independently of the knob for latching the door and being provided with means operable from either side of the door for securing the latch in latching or unlatching position.

The primary object of my invention is to provide an improved door latch.

Another object is to provide an improved and simplified construction which is extremely compact.

A further object is to provide an improved construction which will simplify and facilitate installation.

Another object is to provide an improved device of the character described which may be readily adapted to doors of various kinds and which may be provided with latch securing means operable from either or both sides of the door without altering the form or construction of the latch assembly.

A further object is to provide an improved latch which will be smooth and easy in its operation and in which a proper tension is maintained at all times upon both the latch and the knob.

A still further object is to provide an improved device of simple and economical construction, which is positive and effective in operation.

I accomplish these and other objects by means of the improved device disclosed in the drawings forming a part of the present application wherein like characters of reference are used to designate similar parts throughout the specification and drawings and in which—

Fig. 1 is a vertical section of my improved latch as installed in connection with a door and jamb;

Fig. 2 is a horizontal section of the device as shown in Fig. 1;

Fig. 3 is a transverse section taken upon the line 3—3 of Fig. 2 in the direction indicated; and

Fig. 4 is a transverse section taken upon the line 4—4 of Fig. 2 in the direction indicated.

Referring to the drawings, the numeral 1 is used to designate a tubular casing arranged to be set within a mortise bore 2 bored in the edge of a door 3 mounted adjacent a jamb 4. The casing 1 is arranged to be secured in the mortise by means of screws 6 applied through tabs 7 formed upon the outer end of the casing.

A latch bolt 8 is slidably mounted within the outer end of the tubular casing 1 and arranged to enter a recess 9 formed in the jamb 4 through an opening formed in a striker plate 11 secured upon said jamb in the ordinary manner. The latch 8 is provided with a latch arm 12 extending axially inwardly into the casing, said arm having longitudinal slots 13 and 14 intersecting at substantially right angles along the inner end of the arm. The arm 12 is preferably formed from a strip of flat metal having the slot 13 formed therein, said strip being then doubled to form parallel spaced portions forming the slot 14 therebetween, the bend of the arm 12 forms the inner end of the arm and the opposite end is secured to the latch, preferably by turning the tips of the strip outwardly as at 16 to engage a T groove 17 formed in the back of the latch 8.

A partition 18 is mounted within the middle portion of the casing 1, said partition consisting of a circular disc secured between inwardly struck detents 19 formed in the wall of the casing. The disc 18 is assembled by inserting the disc into the casing from one end of the casing and forcing it past the adjacent detents 19, said detents being adapted to be sprung outwardly to permit the disc to pass and thereafter to spring inwardly to permanently retain the disc. The disc 18 is apertured to receive the inwardly extending end of the arm 12 and to form a guide and support for said arm.

The inner ends of the casing 1 are recessed to receive the shouldered ends 21 of a sleeve 22, the edges of the recesses being inwardly flanged as at 23 to form bearings rotatably supporting the sleeve 22. The sleeve 22 is arranged to receive a square knob stem 24

extending through said sleeve and openings 25 in the door and arranged to receive door knobs, not shown, of any suitable type and form such as are in common usage. Crank lugs 26 are formed upon the sleeve 22.

A connecting link 27 is conected between the crank lugs 26 and the inner end of the latch arm 12. The link 27 is provided with an eye 28 formed on one end thereof and arranged to receive a pin 29 inserted through the slot 14 of the arm 12 and slidably movable relative thereto. The opposite end of the link 27 is formed into a hook 31 arranged to engage a pin 32 inserted through apertures formed in the lugs 26, said hook engaging the pin 32 between the lugs. The sleeve 22 is held in assembled position across the inner end of the casing 1 by the link 27.

A plunger 33 is slidably mounted within the inner end of the tubular casing 1, said plunger being apertured to receive the arm 12 and having inwardly struck lugs 34 arranged to extend against the sides of said arm 12. The lugs 34 are apertured to receive the pin 29 whereby said plunger is arranged to be moved with the pin 29. A spring 36 is mounted within the inner portion of the casing 1, the inner end of said spring being engaged by inwardly turned lugs 37 struck inwardly from the casing wall. The opposite end of the spring bears against the plunger 33 and normally holds said plunger seated against the partition 18. A latch spring 38 is mounted within the outer end of the casing 1 to normally press the latch 8 outwardly from the end of the casing 1, the outward movement being limited by the bent end of the arm 12 engaging the pin 29 the movement of which is in turn limited by the plunger 33 engaging said pin. The inner end of the spring 38 is engaged by a member 39 slidably mounted upon the arm 12.

The latch 8 is arranged to be secured in latching or unlatching postions as desired by means of securing members 41 extending through openings 42 bored in the door and through slots 43 formed in the walls of the casing 1 just outwardly from the partition 18. The inner ends of the members 41 are indented to form detents 44 arranged to be engaged by an annular bead 46 formed upon the member 39 said bead being held in engagement with adjacent detents 44 by the pressure of the spring 38. The extreme inner ends of the members 41 are arranged to engage notches 47 and 47′ formed in the edges of the arm 12. The outer ends of the members 41 extend through cover plates 48 secured upon the faces of the door, and are threaded to receive knobs 49 whereby the members may be moved inwardly or outwardly to engage or disengage the arm 12.

In operation, my improved door latch, constructed and assembled as above described is installed upon a door by merely inserting the assembled device in the cylindrical mortise 2 bored in the door, transverse bores 25 and 42 being previously bored to receive the knob stem 24 and the securing members 41 as illustrated in the drawings. When the stem 24 is turned in either direction by its knobs, the sleeve 22 is turned and the connecting link 27 actuated by the crank lugs 26 and pin 32 to move the latch 8 and arm 12 inwardly to retract the latch as indicated in dotted lines in Fig. 1 of the drawings. The spring 36 maintains a firm pressure against the plunger 33 and the arm 12, and prevents any looseness of the knob and latch actuating mechanism. In retracting the latch, the resistance of the spring 36 combined with the resistance of the spring 38 provides a tension insuring a smooth firm operation of the knob.

The latch bolt 8 may be receded independently of the link 27 when the door is moved to a closed position, the arm being moved inwardly past the pin 29 by virtue of the slot 14 while the link 27 is received within the slot 13, the pin 29 and link 27 being held firmly by the plunger 33 and spring 36. The spring 38 is made relatively light so as to permit an easy retraction of the latch as it is moved against the strike plate 11 in the well known manner.

To secure the latch in a latching position, either or both of the securing members 41 are moved inwardly to engage the notches 47. As a member 41 is moved to securing position, as shown in full lines in Figs. 2 and 3 of the drawings, the outer indented detent 44 is engaged by the bead 46 and pressure from the spring 38 effectively holds the member 41 in securing position. To release the latch, the securing member, or members 41 are moved outwardly to the positions shown in dotted lines in Fig. 3, thereby disengaging the notches 47 and causing the inner detents 44 to be engaged by the bead 46 to secure the members 41 in releasing position. If it is desired to secure the latch 8 in an unlatching position, the latch is retracted by means of the knob and stem 24 and the securing members 41 moved to engage the notches 47′, said members 41 being retained by the bead 46 as above explained. It will be noted that the members 46 are independently operable from opposite sides of the door, thereby permitting the latch to be secured in latching position from either side of the door to prevent opening of the door from the opposite side of the door. This feature renders my device particularly useful in connection with doors placed between inter-communicating rooms whereby the door may be effectively locked from either side to prevent entrance from the opposite side.

Where it is desired to mount the latch upon a door where it is necessary to provide a securing means from one side only, the bore 42 is formed only in one side of the door and

the opposite securing member 41 is omitted from the installation. In like manner, if the latch only is desired, without a means for securing the latch in latching position to bolt the door, both members 41 may be omitted. The omission of either or both securing members 41 does not affect the other elements of the latch in any manner and the casing assembly is constructed, assembled, and installed in the same manner regardless of whether the securing members 41 are used or not. The members 41 are inserted through the slots 43 by inclining the members from side to side in order to pass the detents 44 through the slots. When the covers 48 are secured upon the door the members are held in alinement and the defents 44 prevent the members from being fully withdrawn. Guides 51 are turned outwardly from the partition 18 to engage and support the members 41.

From the above explanation it will be seen that I have produced a simple and efficient latch which is extremely compact and easily installed, and which provides means for securing the latch to bolt or unbolt the door as desired. While I have illustrated and described only the preferred embodiment of the invention, the device is of course subject to modification in numerous details without departing from the spirit of my invention. I therefore do not wish to restrict myself to the specific details illustrated and described, but desire to avail myself of all modifications which may fall within the scope of the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is—

1. A door latch comprising a tubular casing arranged to be set within a mortise bored into the edge of a door; a latch bolt slidably mounted within the outer end of the tubular casing; a latch arm connected to the bolt and extending axially inwardly into the casing; a sleeve rotatably mounted within the inner end of the casing and arranged to receive a knob stem extending through the door; a crank arm carried by the sleeve; a link connected between the latch arm and the crank for moving the latch bolt within the end of the casing when the sleeve is turned; a latch spring mounted within the casing and arranged to normally hold the latch in a latching position; a pair of securing members extending into the casing from opposite sides of the door and movable to engage and disengage the latch arm whereby the latch may be secured in latching or unlatching position; and means actuated by the latch spring for engaging the securing members to normally hold said members in securing or releasing positions as desired.

2. A door latch comprising a tubular casing arranged to be set within a mortise bored into the edge of a door, said casing having oppositely disposed bearing recesses formed in the inner end thereof and opening outwardly at the extreme end of the casing; a sleeve mounted within the bearing recesses and provided with a crank arm within the casing; a knob stem extending through the sleeve, a latch bolt slidably mounted within the outer end of the casing and provided with a latch arm extending axially into the casing; a link connected to the crank arm and to the latch arm, said latch arm and latch bolt being arranged to be receded into the casing independently of the link; a partition mounted transversely within the casing and having an aperture to receive the latch arm; a plunger slidably mounted within the casing in back of the partition, said plunger being connected to the link and slidably engaging the latch arm; a main spring compressed between the plunger and the inner end of the cylinder to normally advance the link and to hold said link and the sleeve in assembled relation within the casing; and a latch spring arranged to normally hold the latch bolt in latching position.

3. A door latch comprising a tubular casing arranged to be set within a mortise bored into the edge of a door, said casing having oppositely disposed bearing recesses formed in the inner end thereof and opening outwardly at the extreme end of the casing; a sleeve mounted within the bearing recesses and provided with a crank arm within the casing; a knob stem extending through the sleeve; a latch bolt slidably mounted within the outer end of the casing and provided with a latch arm extending axially into the casing; a link connected to the crank arm and to the latch arm, said latch arm and latch bolt being arranged to be receded into the casing independently of the link; a partition mounted transversely within the casing and having an aperture to receive the latch arm; a plunger slidably mounted within the casing in back of the partition, said plunger being connected to the link and slidably engaging the latch arm; a main spring compressed between the plunger and the inner end of the cylinder to normally advance the link and to hold said link and the sleeve in assembled relation within the casing; a latch spring arranged to normally hold the latch bolt in latching position; said latch spring being compressible to permit the latch bolt to be receded independently of the link and being compressed simultaneously with the main spring when the bolt is receded by the link; a pair of securing members extending into the casing from opposite sides of the door and slidably movable to engage and disengage the latch arm whereby the latch may be secured from either side of the door in latching or unlatching position, and means actuated by the latch spring for retaining the securing members in securing or releasing positions as desired.

4. A door latch comprising a tubular casing arranged to be set within a mortise bored into the edge of a door, said casing having oppositely disposed bearing recesses formed in the inner end thereof and opening outwardly at the extreme end of the casing; a sleeve mounted within the bearing recesses and provided with a crank arm within the casing; a knob stem extending through the sleeve; a latch bolt slidably mounted within the outer end of the casing and provided with a latch arm extending axially into the casing; a link connected to the crank arm and to the latch arm, said latch arm and latch bolt being arranged to be receded into the casing independently of the link; a partition mounted transversely within the casing and having an aperture to receive the latch arm; a plunger slidably mounted within the casing in back of the partition, said plunger being connected to the link and slidably engaging the latch arm; a main spring compressed between the plunger and the inner end of the cylinder to normally advance the link and to hold said link and the sleeve in assembled relation within the casing; a latch spring arranged to normally hold the latch bolt in latching position, said latch spring being compressible to permit the latch bolt to be receded independently of the link and being compressed simultaneously with the main spring when the bolt is receded by the link; a pair of securing members extending into the casing from opposite sides of the door and slidably movable to engage and disengage the latch arm whereby the latch may be secured from either side of the door in latching or unlatching position; and a plate slidably mounted within the outer portion of the casing and engaged by the inner end of the latch spring, said plate being arranged to engage detents formed upon the securing members whereby either member may be secured in either securing or releasing position as desired.

5. A door latch comprising a tubular casing arranged to be set within a mortise bored into the edge of a door; a latch bolt slidably mounted within the outer end of the casing; a transverse partition secured substantially midway of the casing; a latch arm connected to the bolt and extending axially inwardly through the partition; a sleeve rotatably mounted across the inner end of the casing and provided with a crank arm; a link connected at one end to the crank arm and having the other end engaging the latch arm, said link being adapted to actuate the latch arm when the sleeve is turned and to permit the latch bolt and latch arm to be moved inwardly independently of the link; a main spring mounted within the inner end of the casing around the latch arm and the link; means secured to the latch arm and normally seating against the inner side of the partition to engage the main spring and normally hold the link in a latching position; and a latch spring mounted within the outer end of the casing around the latch arm between the latch bolt and the partition, said latch spring operating to normally hold the latch bolt in a latching position and being compressible independently of the main spring to resist independent inward movement of the latch bolt and also being compressible simultaneously with the main spring when the latch arm is moved inwardly by the link.

6. In a door latch, a latch bolt comprising a bolt member, and a latch arm comprising a strip of metal having a longitudinal slot formed therein and having its ends doubled into spaced parallel relation to form slots intersecting longitudinally along the axis of the arm, the ends of the doubled strip being adapted to be secured in engagement with the bolt member.

7. In a door latch, a latch member comprising a bolt portion, and a latch arm comprising a strip of metal having a longitudinal slot formed therein and having its ends doubled into spaced parallel relation to form slots intersecting longitudinally along the axis of the arm, the ends of the doubled strip being turned outwardly at substantially right angles and adapted to engage a recess formed in the bolt portion to secure the arm upon said bolt portion.

8. In a door latch, the combination with a casing, a latch bolt provided with a latch arm extending axially into the casing from the outer end thereof, and means for actuating the latch arm and bolt by a turning of a door knob, of a pair of securing members slidably mounted within the door and movable transversely into the casing and into independent engagement with the latch arm from opposite sides of the door to secure the latch bolt in latched or unlatched position, said members having detents formed upon the inner end thereof; and a spring actuated member adapted to engage the detents to hold the securing members in securing or releasing positions as desired.

In witness whereof, I hereunto set my signature.

ELLING ELLINGSON.