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C. P. & F. E. HOWARD.

DOOR LATCH.

APPLICATION FILED NOV. 11, 1902.

NO MODEL.

Fig. 3

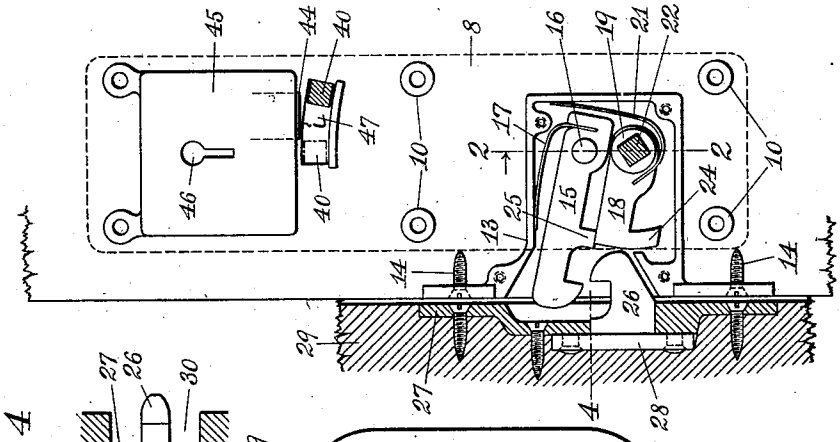


Fig. 4

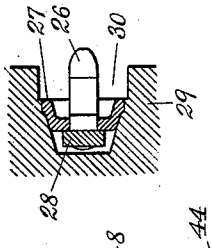
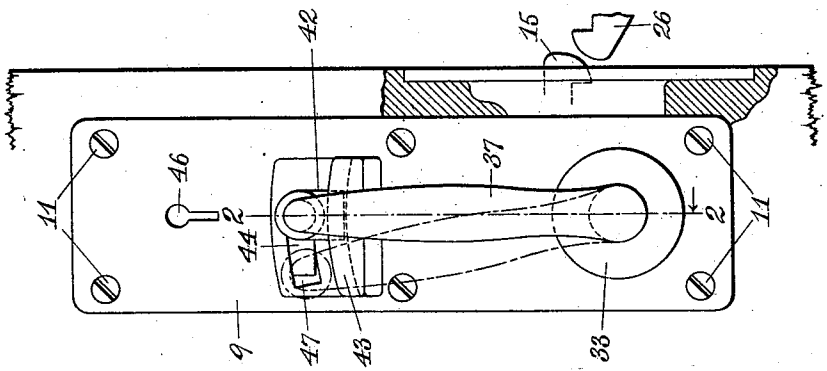


Fig. 2

Fig. 1



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UNITED STATES PATENT OFFICE.

CHARLES P. HOWARD AND FRANK E. HOWARD, OF HARTFORD, CONNECTICUT.

DOOR-LATCH.

SPECIFICATION forming part of Letters Patent No. 720,349, dated February 10, 1903.

Application filed November 11, 1902. Serial No. 130,928. (No model.)

To all whom it may concern:

Be it known that we, CHARLES P. HOWARD and FRANK E. HOWARD, citizens of the United States, and residents of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Door-Latches, of which the following is a full, clear, and exact specification.

This invention relates to improvements in latch mechanism for sliding doors, the object being to provide a simple, substantial, and durable device which is operated from the handle employed for moving the door and by the pressure exerted for moving the door in the desired direction.

A further object of the invention is to adapt it to be employed as a spring-latch which may be locked or thrown on while the door is open without interfering with the subsequent closing and automatic locking of the door.

Figure 1 is a side view of the lock device in position on the edge of a door. Fig. 2 is an end view relative to the door, a portion of the latch being shown in section through its spindle centers. Fig. 3 is a side view of the latch of Fig. 2 with the adjacent handle and its plate removed to show the interior of the latch mechanism. Fig. 4 is a plan view in section, taken on the line 4 of Fig. 3, showing the striker-plate, which is preferably employed with its latch.

The latch and its immediately-associated devices are mounted in a lock-frame 13, which is mortised in from the edge of the door in the customary way and is secured to the edge of the door by means of screws 14. This frame contains the latch 15, which is mounted upon a pivot-pin 16 and is provided with a spring 17, which bears against the upper edge of the case, tending to hold the latch downwardly to its closed position. (Shown in Fig. 1.) The latch is raised against the pressure of its spring by means of the tumbler or dog 18, having bosses 19 projecting from both sides supported and turning in holes in the side plates 20 of the lock-frame 13 in the usual way. The tumbler or dog is provided with a spring 21, which tends to press the tumbler downwardly in the same direction as that in which the spring 17 presses the latch 15. The tumbler 18 is provided with a squared axial opening for receiving the spindle 22, which is preferably square in cross-section and which projects outwardly from each side of the tumbler to receive the latch-actuating handles, as will be later described. The tumbler 18 is provided with a downwardly-extending projecting stop 24, which abuts against the bottom of the frame when the tumbler is in its lower position, and the latch 15 is provided with a similar stop 25, which abuts against the top of the tumbler. The outer end of the latch is of the usual hook form for engaging with the cooperating catch 26 of the striker-plate. The latch and its catch are preferably made of steel and case-hardened on account of the wear to which they are subjected, while the remaining and particularly the exposed portions of the latch mechanism are preferably made of brass or bronze. On account of the fact that it is desirable to harden the catch 26 it is made in a separate piece from the striker-plate 27, the catch being provided with a flange 28, which is riveted to the back of the striker-plate, as shown in Figs. 3 and 4, the catch portion projecting through a mortise of the striker-plate into proper cooperative relation with the latch 15. The striker-plate 27 is attached to the edge of the door-casing 29, which is usually and preferably recessed, as at 30, to receive the edge of the door, and this arrangement serves also to sheath to a considerable extent the projecting ends of the latch 15 and the catch 26.

The latch actuating and locking members are carried upon the plates 8 and 9, being so attached and secured to those plates that each plate may be attached to its own side of the door and secured together by screws 11, which pass through the bosses 10, projecting from the plates, the screws passing through the bosses of one plate and screwing into the bosses of the other plate, the doors being suitably mortised to receive the bosses and the other projecting portions of the respective plates.

The plates 8 and 9 are provided with bosses 32 and 33, respectively, located in concentric relation to the spindle 22 of the tumbler, and these are bored through to receive the lower

ends 35 of the handles 36 and 37, the handles being mounted to turn freely in the bosses and being secured therein against withdrawal by means of the nuts 38, seated in recesses counterbored from the inner ends of the bosses 32 and 33. The lower ends or bearings 35 of the handles are provided with squared seats for receiving the outer ends of the square spindle 22.

The handles 36 and 37 extend upwardly and project outwardly from their respective plates far enough to afford a good grasp for the hand of the operator, the upper ends of these handles being turned inwardly toward their plates, and those upper ends are recessed to receive the ends of a coupling-rod 40, which is preferably square and passes through the plates 8 and 9 and through the door and serves to couple the upper ends of the handles 36 and 37 together and preserve them in alinement. The rod 40 and the spindle 22 may each be secured to one of the handles 36 or 37 by means of a cross-pin or in any other convenient way, so as to prevent them from becoming accidentally detached and lost in unpacking the lock and before applying it upon the door. By this arrangement the handles 36 and 37 serve, when swung backwardly in a direction to open the door, to lift the tumbler 18 and the latch, after which the continuing pull upon the handle slides the door back. By pulling or pushing the handles in the reverse direction the door is closed; but the latch is free to be raised by the catch 26 when it collides therewith without moving the tumbler 18 or its attached handles 36 and 37.

In order to guard against the bending of the handles outwardly away from the door by unintelligent or unskilful manipulation, they are each provided at their upper end with a lip 42, which engages behind a shoulder 43, projecting from each of the plates 8 and 9. Those shoulders are extended, as shown in Fig. 1, through the entire sweep of the handles, so as to support them against outward pull in whatever position they may be.

The coupling-rod 40, in addition to its function of coupling and preserving in alinement the upper ends of handles 36 and 37, serves also as an abutment, by means of which the handles may be locked in their forward position, (shown in full lines in Fig. 1,) so as to prevent the handles from being swung backwardly to raise the latch. This is effected by means of the bolt 44 of an ordinary lock 45, which is or may be operated by means of a key through keyholes 46 from either side of the door. For most uses it is undesirable to fasten the latch in its raised or open position, and it is usually desirable to prevent the latch from being thus locked, since by inadvertence the latch might thus be locked open under the impression that it was closed. To prevent this, the bolt 44 may be made wide enough, as shown in Fig. 3, so that it will not pass down in front of the coupling-rod 40 when the latter is in its rearward position, (represented in that figure by full lines,) but will pass down behind that rod when in its forward position (represented by dot-and-dash outline) at the other end of the slot 47, which slot is provided in both plates and in the intervening portion of the door to permit the proper amount of swinging movement of the handles. The ends of these slots 47 serve as abutments against which the coupling-rod 40 bears when pushing the door open or shut by means of the handles 36 or 37.

Whenever it may be desired to lock the handles, and consequently the tumbler, to prevent the subsequent opening of the door from its closed position, the handles should be pushed to their forward position, (shown in full lines in Fig. 1,) thus bringing the coupling-rod 40 to the dot-and-dash position shown in Fig. 3, whereupon the bolt 44 may be thrown down behind that coupling-rod. On account of the fact that the latch 15 is free to rise away from the tumbler 18, even if the latter is locked down by the bolt 44, the mechanism may be locked when the door is opened as well as when it is closed, since upon the subsequent closing of the door the latch rides over the catch 36; but it cannot be again raised to open the door without retracting the bolt 44.

The construction of the striker-plate 27 and its catch 26 enables these parts to be made as separate parts, each adapted in material, form, style, and finish to the divergent requirements of these two important members of the mechanism. The catch should be of relatively harder metal, preferably steel, case-hardened, and may be hardened and finished before being attached to the striker-plate. The latter when made without the integral catch is more readily cast and more easily finished, especially upon its front face, which is exposed at the edge of the door when in position, the absence of the projecting catch making it easier and cheaper to polish or otherwise finish that face. Moreover, having thus made a separate piece of the only member subject to extreme wear the striker-plate 27 may be of any suitable softer metal, such as brass or bronze, to correspond with the lock mechanism or to harmonize with the other fittings or trimmings of the door or its surroundings.

We claim as our invention—

1. The combination in door-latch mechanism, of a swinging latch, a tumbler therefor, a pair of handles mounted upon opposite sides of the door, and operatively connected with the tumbler to raise the latch by swinging the handles in the direction of the opening movement of the door, and a coupling-rod connecting the outer swinging ends of the handles to swing together.

2. The combination in door-latch mechanism, of a swinging latch, a swinging tumbler mounted adjacent to and bearing against the

latch to open it, a pair of swinging handles for operating the tumbler, mounted on opposite sides of the door to swing concentrically with the tumbler and in the direction of the opening movement of the door when opening the latch, and a coupling-rod extending through the door, and connecting the outer swinging ends of the handles.

3. The combination in door-latch mechanism, of a swinging latch, a tumbler mounted adjacent to and bearing against the latch to open it, an axial spindle extending through the tumbler, a pair of handles mounted upon opposite sides of the door to swing concentrically with the tumbler and engaging with the spindle, and a coupling-rod extending through the door, and connecting the swinging ends of the handles.

4. The combination with a sliding door, of a latch mechanism, comprising a frame mortised into the edge of the door, a swinging latch, and a tumbler therefor, mounted in the frame, a pair of handle-plates attached upon opposite sides of the door, a pair of oppositely-projecting handles mounted to swing upon the plates in a concentric relation to the swinging tumbler, and an operating-spindle for the tumbler, located at the common axis of the handles and the tumbler, and operatively coupling them to swing together.

5. The combination with a sliding door, of a latch mechanism, comprising a frame mortised into the edge of the door, a swinging latch, and a tumbler therefor, mounted in the frame, a pair of handle-plates attached upon opposite sides of the door, a pair of oppositely-projecting handles mounted to swing upon the plates in a concentric relation to the swinging tumbler, an operating-spindle for the tumbler, located at the common axis of the handles of the tumbler, and operatively coupling them to swing together, and a coupling-rod extending through the door and connecting the swinging ends of the handles.

6. The combination in latch mechanism, of a swinging handle, provided with a sustaining-lip adjacent to its outer or swinging end, and a shoulder appurtenant to the door, with which the lip of the handle engages throughout its swinging movement, to sustain it against outward strains away from the door.

7. The combination with a sliding door, of a latch mechanism, comprising a swinging latch, a handle-plate mounted upon the side of the door, a swinging handle mounted upon the plate and operatively engaging with the latch, a sustaining-lip adjacent to the outer or swinging end of the handle, and a sustaining-shoulder appurtenant to the plate, and engaging with the lip throughout the swinging movement of the handle, to sustain it against outward strain.

8. The combination in latch mechanism, of a swinging latch, a pair of handles projecting on opposite sides of the door, and engaging with the latch to raise it by swinging the handles in the direction of the opening movement of the door, a coupling-rod extending through the door and connecting the swinging ends of the handles, and a locking-bolt adjacent to the path of swing of the coupling-rod, for locking the rod in a predetermined position.

9. The combination with a sliding door, of latch mechanism, comprising a swinging latch, a swinging tumbler for lifting the latch, a pair of handle-plates mounted upon opposite sides of the door, a pair of oppositely-projecting handles journaled in the respective plates in concentric relation with the axis of the swinging tumbler, an operating-spindle for coupling the handles and the tumbler substantially at their common axis of swing, a coupling-rod extending through the door and through the slots in the plates, and connecting the swinging ends of the handles, a sustaining-lip adjacent to the end of each handle, and a sustaining-shoulder appurtenant to each plate, for engaging with the said lips of the handles throughout their swinging movement to sustain them against outward pull, away from the door.

Signed at Hartford, Connecticut, this 3d day of November, 1902.

CHARLES P. HOWARD.
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Witnesses:
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