

W. H. DURANT.  
SLIDING DOOR FASTENER.  
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953,740.

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Fig. 1.

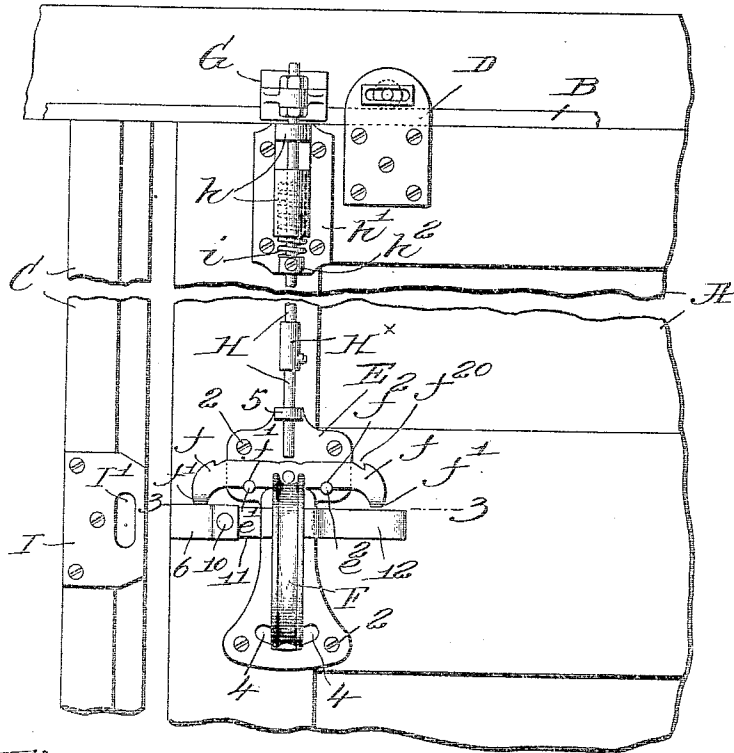


Fig. 2.

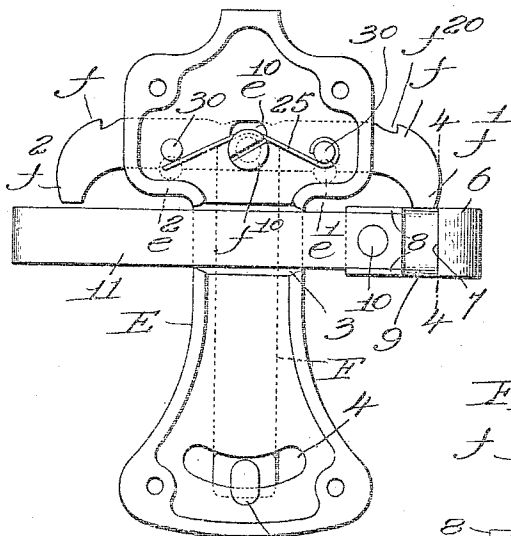


Fig. 3.

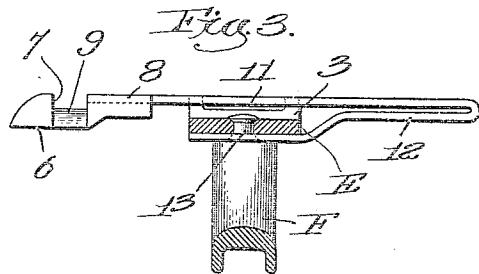
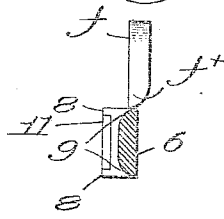


Fig. 4.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

WILLIAM H. DURANT, OF CONCORD, NEW HAMPSHIRE.

## SLIDING-DOOR FASTENER.

953,740.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed January 20, 1910. Serial No. 539,027.

*To all whom it may concern:*

Be it known that I, WILLIAM H. DURANT, a citizen of the United States, and resident of Concord, county of Merrimack, State of New Hampshire, have invented an Improvement in Sliding-Door Fasteners, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention has for its object the production of novel means for fastening a sliding door in closed position, applicable particularly to the sliding doors of mail, baggage, or express cars, and my present invention is an improvement on the mechanism shown and described in United States Patent No. 842,535 granted to me January 29, 1907. In said patent I have disclosed, in connection with the door-locking or fastening device, means to hold the door in a more or less open position, the handpiece which controls the operation of the fastening device being so arranged that the door is released from the control of its holding means whenever it is desired to lock or unlock the door.

While I show herein friction means to hold the door from sliding movement I make no claim thereto as the same forms the subject-matter of claims in my patent, the novel features herein relating more especially to the door-locking or fastening means and the means for operating the same.

The novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is an inner view, in elevation, partly broken out, of a sufficient portion of a car or other sliding-door and part of its framing, with my present invention applied thereto, the door being shown as unlocked and held in partly open position by the friction holding means; Fig. 2 is an enlarged view in rear elevation of the latch-supporting plate and the latch-releasing means mounted to swing at the front of the plate; Fig. 3 is an enlarged transverse sectional detail on the line 3—3, Fig. 1, looking down, to show more clearly the construction of the latch; Fig. 4 is a vertical sectional detail on the line 4—4, Fig. 2, looking to the left, showing the latch-releasing extension and the cam surface on the latch.

In Fig. 1 A is the sliding door, B a track,

C the door-jamb, D a suitable roller-hanger free to roll upon the track B in opening and closing the door, the latter being suspended from the hanger; G is a check-block or friction shoe adapted to engage the track when the door is to be held from movement, and H is a rod fixedly attached at its upper end to and depending from the shoe, all substantially as in my patent referred to, the rod passing loosely through a tubular guide *h* in a guide-plate *h'* secured to the door. Below the guide *h* said rod has an attached collar *h*<sup>2</sup> and between it and the lower portion of the guide is interposed an expansion spring *i*, coiled around rod H and normally acting to press the shoe G down upon the track B, to restrain the door from movement, the upper end of the spring extending within the guide. Herein I have shown the rod H in two parts, connected adjustably by a coupling H<sup>x</sup>, whereby the effective length of the rod can be readily and accurately adjusted.

The keeper or latch-plate I is herein shown as having an aperture I' to receive the latch-shoulder, and is fixedly attached to the door-jamb at the proper height.

The latch and the handpiece are mounted on a plate E, made as a casting, and attached to the door near its edge by suitable means, as screws 2, the back of the plate having a lateral recess 3, Figs. 2 and 3, and near the lower end the plate has a curved slot 4, while a perforated ear 5 projects frontward from the top of the plate, to loosely receive and guide the lower end of the depending rod H.

I have provided a latch comprising a head and a shank, the head 6 having an engaging shoulder 7 to coöperate with the aperture in the keeper and lock the door in closed position, and preferably the latch head is made as a malleable casting, case-hardened and formed with longitudinal parallel ribs 8 on the back, separated from the shoulder 7 by a transverse cam surface 9, Fig. 4.

The latch head is fixedly secured, as by a rivet 10, to the extremity of one leg or part 11 of a flexible, resilient shank, which is bent or folded over upon itself, as clearly shown in Fig. 3, and the free end of the shorter leg 12 is slightly offset and tightly riveted, at 13, to the front of the plate E, the lateral recess *e* receiving the leg 11, the plate limiting the releasing or "lifting" movement of the latch shank.

As shown the free ends of the shank are separated by the offset of the leg 12 to receive the plate between them and permit some flexure of the longer leg 11, the shank being sustained by the plate E in horizontal position, Fig. 1, the aperture I' of the keeper lying in the path of movement of the latch head when the door is moved to closed position. At such time the portion 11 of the shank is flexed as the latch head rides up onto the keeper I and snaps the latch-shoulder 7 into locking engagement with the edge of the aperture I' as will be obvious.

The lips or ribs 8 serve to accurately position the latch head on the shank, so that even with a single fastening rivet 10 the latch head cannot twist, and as the latch is the same top and bottom it can be used for right or left hand doors, as can the plate E, by a mere reversal of the latch shank from left to right, viewing Fig. 1.

The latch shank is in reality a leaf spring of the gun-lock or sear-spring type, and combines great strength and durability with the requisite flexibility and resiliency, its forward movement when flexed being limited by the overhanging part of the plate E, so that the shank cannot be readily bent out of proper position accidentally.

Herein I have provided a latch-releasing device very similar in general structure to what is termed the latch device in my patent, and comprising a handpiece F, Fig. 1, having preferably oppositely-projecting arms  $f$ ,  $f$  each having its under side notched, as at  $f'$ ,  $f''$ , to embrace projecting studs  $e'$ ,  $e''$  on the front of the plate E.

The extremities of the arms are shown as downturned to present beveled or wedge-like extensions  $f^*$ , and the lower end of the handpiece has a hooked lug  $f^3$  Fig. 2, which enters the slot 4 in the supporting plate E, to limit swinging movement of the handpiece and its adjuncts.

When the handpiece is in normal position, as illustrated, the arms  $f$  cooperate with both fulcrum studs, and the lower end of the rod H is nearly in contact with the upper edge of the arms at the center thereof, as in my patent, but when the handpiece is swung upon either stud as a fulcrum the rod H is lifted to thereby disengage the shoe G from the track B and release the door.

If the latch is in locking engagement with its keeper the handpiece F would be swung to the right, Fig. 1, on the stud  $e'$  as the fulcrum, and the beveled extension  $f'$  would thereby be forced down beneath the cam surface 9 of the latch head 6, pressing the latter forward far enough to withdraw its shoulder 7 from engagement with the keeper I, thus unlocking the door, and a pull on the handpiece to the right would open the door. When the handpiece is thereafter released the spring  $i$  acts through

rod H to restore the handpiece and its arms to normal position, assisted by the spring action of the latch shank acting through the cam surface 9 upon the releasing extension.

By providing the two arms  $f$  the releasing device can be used with doors which slide either to the right or left to shut, as will be obvious.

The handpiece is positively connected with the plate E by means of a headed stud  $f^{10}$ , Fig. 2, screwed into the back of the handpiece F near its upper end and passing loosely through a hole  $e^{10}$  in the plate, and to prevent rattling of the handpiece a bent spring-wire 25 is interposed between the plate and the head of said stud and held at its ends by lugs 30.

As shown in Fig. 2 the casting E is cored out at its back to provide recessed portions for the stud head and spring wire, and also for the hooked lug  $f^3$ .

I have shown the upper edges of the arms  $f$  as notched at  $f^{20}$ , for a convenience when it is desired to prevent either the shoe G or the latch to operate, as for instance when the side doors of a car are shut and the loading is completed through the end doors. When that is to be done the handpiece F is first swung to release the shoe and to retract the latch, and a piece of wire is wrapped around the latch and the cooperating arm  $f$ , the notch  $f^{20}$  holding the wire in place. Now the door can be slid into closed position and locked from the outside with a padlock, the latch being held inoperative, and the loading of the car is completed, but when its destination is reached the car can be unloaded through the side door by removing the padlock, for as neither the shoe G nor latch head 6 are operative the door can then be opened from the outside.

By the construction described I combine the advantageous features of a spring-latch with great strength and durability while providing for the quick and instant release of the latch when it is desired to unlock the door.

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

1. In a sliding-door fastener, a plate having a lateral recess in its back, a latch having an elastic shank extended through the recess past the plate and folded back upon itself and fixedly attached to said plate, a keeper to be engaged by the latch, a handpiece fulcrumed on the front of said plate, a rigid arm extended from the handpiece, and a projection on said arm adapted to pass under and press the latch forward to disengage it from the keeper when the handpiece is swung.

2. In a sliding-door fastener, a latch having a shank consisting of an elongated flat spring folded upon itself and fixed at one

of its ends and carrying the keeper-engaging part of the latch at its other end, a keeper to be engaged by the latch, a handpiece provided with an arm extended at an angle therefrom and having a fulcrum-notch, a fixed stud embraced by the notch and acting as a fulcrum for the arm and handpiece, and a beveled extension on the arm, swinging movement of the handle causing said extension to pass under and press the latch outward against the action of the spring, to disengage the latch from the keeper.

3. The combination, with a swinging handle having oppositely extended arms each provided with a beveled extension, fixed fulcrum, one for each of said arms, a keeper, a cooperating latch provided with a cam surface, and also provided with an elongated resilient shank folded upon itself and fixedly mounted at one of its ends and carrying the keeper-engaging part of the latch at its other end, said shank extending laterally adjacent the arms of the handpiece with the cam surface thereof in position to be engaged by one of the beveled extensions when the handpiece is swung, to disengage the latch from the keeper.

4. In a device of the class described, a latch comprising a head and a supporting portion, the head having a transverse shoulder and longitudinal, parallel ribs, and a cam surface between said shoulder and ribs, and the supporting portion consisting of a resilient and elongated leaf spring folded upon itself to present unequal arms separated at their free ends and having the free end of the longer arm interposed between the ribs of and fixedly attached to the head of the latch.

5. In a sliding-door fastener, a plate laterally recessed in its back and having a projecting stud on its face, a latch having an elongated resilient shank folded upon itself to present separated portions of unequal length, the longer portion extending through

the recess in said plate and the shorter portion fixedly attached to the plate at the front thereof, a keeper to be engaged by the latch, a depending handpiece having at its upper end a lateral arm fulcrumed on the stud and provided with a beveled extension to pass under and press forward the latch, to disengage it from the keeper, and a sliding connection between the lower end of the handpiece and said plate.

6. In a sliding-door fastener, in combination, a plate, a latch and its keeper, said latch having a flexible, resilient shank fixed at one end on said plate and folded upon itself to permit movement of the latch into and out of engagement with the keeper, a handpiece fulcrumed near one end on said plate and at its other end slidably connected therewith, and a bevel-ended arm carried by the handpiece and moved into position beneath the latch to flex the latch-shank when the handpiece is swung, to thereby disengage the latch from the keeper.

7. In a sliding-door carrier, in combination, a plate having a laterally recessed back, a keeper, a latch having an elongated resilient shank folded upon itself and having one end rigidly attached to the plate, the recessed part of the latter being interposed between the folded portions of said shank, a swinging handpiece fulcrumed on said plate and having a bevel-ended arm to cooperate with the latch and release it from the keeper, the recess in the plate permitting flexure of the shank at such time, and a spring cooperating with the handpiece to press it yieldingly against the plate and prevent rattling.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WILLIAM H. DURANT.

Witnesses:

J. B. COLBY,  
JOSEPH BENTON.