B. E. TAYLOR.

DOOR LATCH.

APPLICATION FILED NOV. 20, 1916.

1,278,254. Patented Sept. 10, 1918.

2 SHEETS—SHEET 1.

Fig. 1

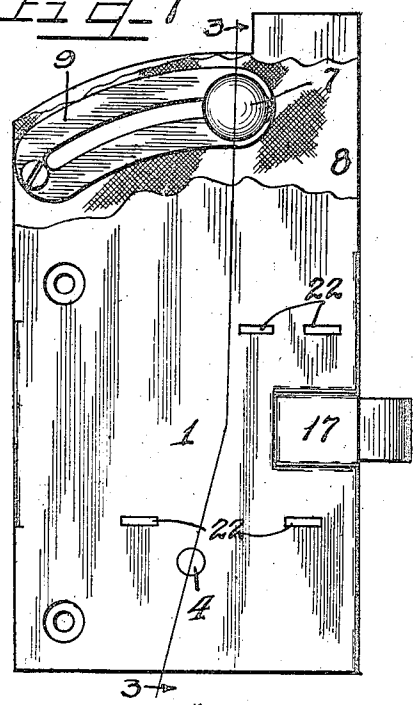


Fig. 2

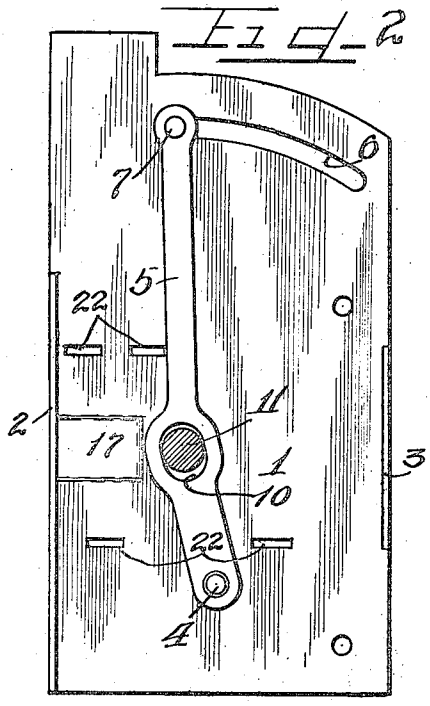


Fig. 3

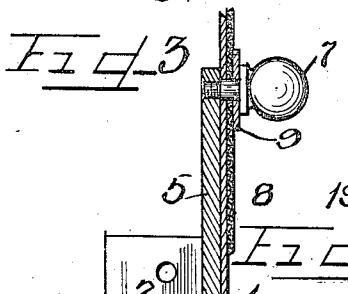


Fig. 9

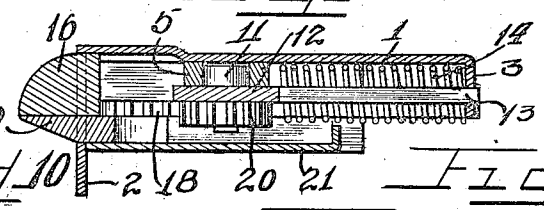
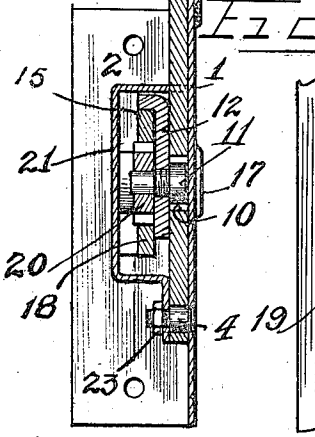


Fig. 10



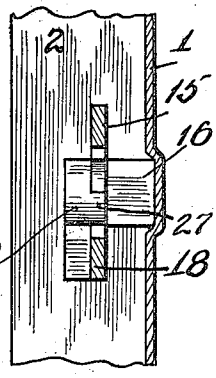


Fig. 11

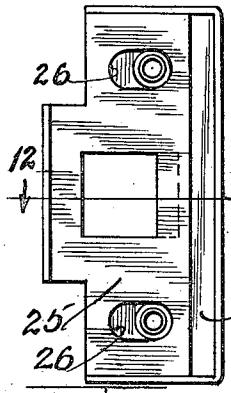
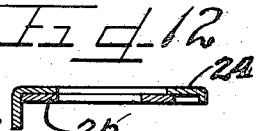


Fig. 12



Witnesses

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2 SHEETS—SHEET 2.

Fig 4

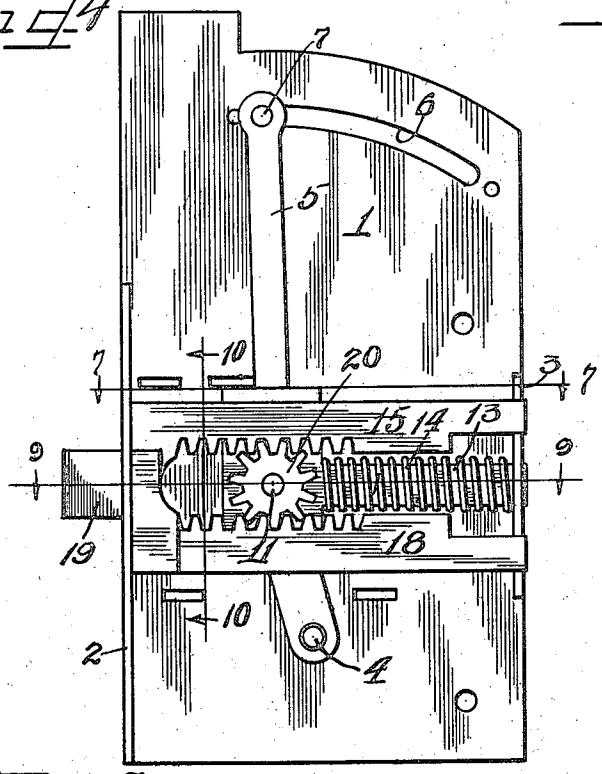


Fig 5

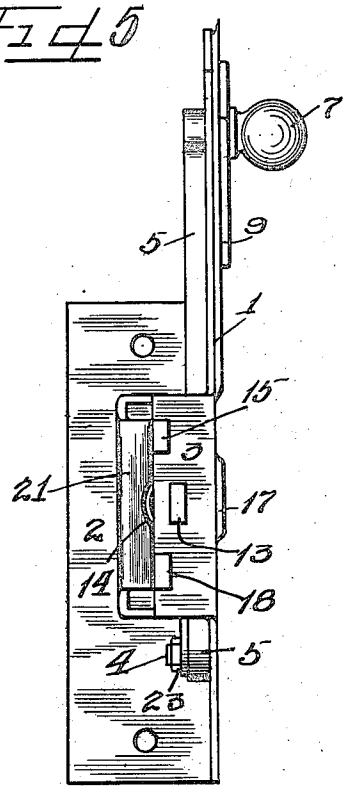


Fig 7

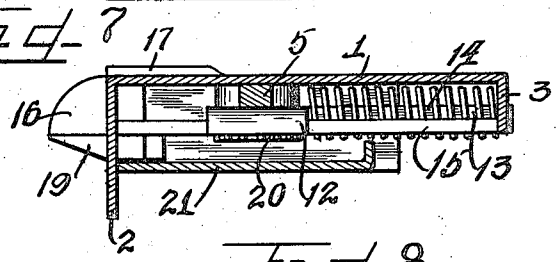


Fig 6

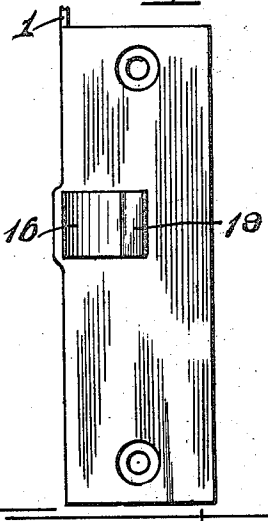
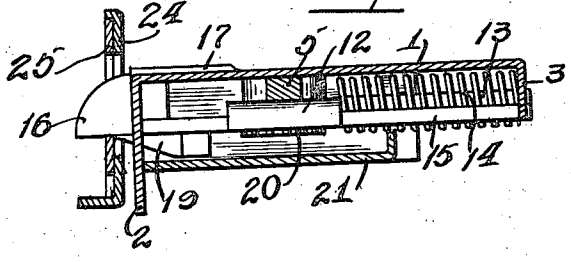


Fig 8



Witnesses

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UNITED STATES PATENT OFFICE.

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DOOR-LATCH.

1,278,254. Specification of Letters Patent. Patented Sept. 10, 1918.

Application filed November 20, 1916. Serial No. 132,455.

To all whom it may concern:

Be it known that I, BAYARD E. TAYLOR, a citizen of the United States, and a resident of the town of Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Door-Latches; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to a latch particularly adapted for use upon doors, although, of course, well adapted for use in any manner wherein a latch is capable of serving the purpose required. This latch is more particularly designed for use on automobile doors, inasmuch as it operates automatically with a wedging action to latch the door snugly and tightly with the strike plate on the door frame, thereby preventing looseness and rattling of the door in the frame. All door locks, latches or fastenings now on the market have the common fault in that there is no means provided for compensating for wear and other effects from use affecting the adjustment of the door in the frame so that the door does not latch snugly closed.

It is a common expedient, particularly on motor car bodies, to provide the door frame with resilient bumpers which are compressed when the door is closed, thus allowing the door to latch and the bumpers then acting to hold the door snugly and tightly latched and free from rattling. The objection, however, to using such a construction is that, after a short time, the bumpers lose their resiliency or become worn, or acquire a permanent set and do not function properly to impose sufficient resilient action upon the door to hold it snugly in its frame. Then too, where bumpers are used, it is necessary to slam the door closed in order that it will be given sufficient travel to permit the latch to interlock with the strike plate on the door frame, and obviously such usage is detrimental to the door structure. It is readily apparent that by the use of resilient bumpers upon a door frame, that proper latching of the door in the frame is restricted, and may, in some instances, be prevented unless extreme care is taken in closing a door.

It is an object therefore of this invention to provide a door latch wherein by simply closing the door, an unretarded free entrance of the latch bolt into the frame strike plate on the jamb is permitted, and a supplementary wedge member then moves into operative position with respect to the latch bolt and strike plate to wedge the door latch and prevent rattling in the event that there is any play whatever between the latch bolt and the strike plate by which the door is held closed.

It is also an object of this invention to construct a door latch comprising a spring actuated latch bolt adapted to be automatically retracted upon contact with the strike plate on the door jamb when the door is closed, and to spring into the strike plate recess upon registering therewith as the door is closed, and with an auxiliary wedge plate or bolt automatically projected under spring stress between the flat surface of the latch bolt and the edge of the strike plate recess if any space or play exists therebetween which would permit the door to hang loosely in the frame.

It is also an object of this invention to construct a door latch wherein the latch bolt usually provided has mounted in contact with the flat surface thereof a thin wedge plate or bolt, which, in the event of any play existing between the latch bolt and its recess in the strike plate on the door frame, is moved therebetween with a wedging action to effectually hold the door from rattling.

It is also an important object of this invention to construct a door latch comprising a latch bolt, spring impelled outwardly and retractable by a suitably pivoted handle, and provided with a rack bar in mesh with a pinion which is also in mesh with another rack bar mounted upon a wedge plate which is movable over the flat surface of the latch bolt, so that a differential sliding movement may be effected between the respective rack bars, and with resilient means normally impelling said handle and the pinion mounted thereon together with the rack bars, latch bolt, and wedge plate outwardly whereby the wedge plate serves to project itself into any space existing between the flat surface of the latch bolt and its strike plate on the door jamb to wedge the latch bolt therein and prevent rattling of the door in the frame.

It is furthermore an important object of

this invention to construct a door latch comprising a slidable latch plate having a rack bar associated therewith and a slidable wedge plate having a rack bar associated therewith, both of said rack bars in mesh with a pinion which is pivotally mounted upon a plate which is pivoted upon an actuating handle for retraction of the latch bolt and wedge plate, but permitting a differential movement therebetween whereby the wedge plate may be impelled between the flat surface of the latch bolt and its recess in the strike plate on the door frame if any play or space exists therebetween to wedge the door tightly closed in its frame, and yet by actuation of the handle, effecting a simultaneous retraction of the latch bolt and wedge plate in the usual manner to release the door.

It is finally an object of this invention to construct an improved type of door latch wherein a supplementary wedge plate is provided for co-action with the latch bolt in wedging with the latch bolt in the recess in the strike plate provided therefor when the door on which the device is mounted, is closed in its frame.

The invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a front elevation of a latch for a door embodying the principles of my invention, showing fragmentarily a strip of leather and a guard plate attached thereover through which the actuating handle on the interior extends for actuation of the door latch bolt.

Fig. 2 is a reverse view of the casing shown in Fig. 1, with all the elements omitted excepting the pivoted handle actuating lever of the device.

Fig. 3 is a detail section taken on line 3—3 of Fig. 1, with parts in elevation.

Fig. 4 is a rear elevation of the mechanism shown in Fig. 1, with the rear casing section detached.

Fig. 5 is a rear edge view of the mechanism shown in Fig. 1.

Fig. 6 is a view of the mechanism at the other end thereof, with parts omitted.

Fig. 7 is a detail section taken on line 7—7 of Fig. 4.

Fig. 8 is a similar view illustrating the parts in another position of adjustment.

Fig. 9 is a detail section taken on line 9—9 of Fig. 4.

Fig. 10 is a fragmentary detail section taken on line 10—10 of Fig. 4.

Fig. 11 is an inner face view of the adjustable strike plate for the door frame.

Fig. 12 is a detail section on line 12—12 of Fig. 11.

As shown on the drawings:

The device consists of a flat casing plate 1, a portion of one margin of which is flanged inwardly and is denoted by the reference numeral 2, and a portion of the other margin which is opposite thereto is flanged inwardly and is denoted by the reference numeral 3. Pivoted upon a stud 4, projecting inwardly from the inner surface of the plate 1, is a long lever 5, and connected upon the upper end thereof and projecting outwardly through a curved slot 6, provided for the purpose, is a finger knob 7. A strip of upholstery fabric or leather 8, is shown attached over the outer surface of the frame plate 1, and attached thereover and to the plate 1, is a curved slotted guide plate 9, the slot of which is in register with the slot 6, of the frame plate, thus affording a finished appearance to the guide-way for the finger or handle knob 7.

As clearly shown in Fig. 2, a slot 10, is provided in the lever 5, and loosely engaged therein is the rounded extension of a stud 11, which is secured to and through a plate 12, with the other end of said stud projecting beyond the opposite surface of said plate, as clearly shown in Fig. 3. Said plate 12, is provided with a long bar extension 13, which extends slidably through a rectangular aperture provided therefor in the inturned marginal edge 3, of the frame plate 1, as clearly shown in Figs. 5 and 9. Coiled about said bar extension 13, is a compression spring 14, which bears at one end against the inturned marginal edge 3, of the frame plate 1, and at its other end behind said plate 12, acting thereby to resist retractive movements of said plate 12, as well as the actuating lever 5, by which said plate 12, is moved. Slidably mounted flat against the surface of the plate 12, is a rack bar 15, the rear end of which slides in a notch therefor provided in the inturned marginal portion 3, of the frame plate, and the forward end of which has formed integral therewith a latch bolt 16, which is slidable through an aperture therefor in the inwardly turned marginal portion 2, of the frame plate, and which, when retracted inwardly by rearward movement of the rack bar, moves in a shallow channel formed by an outwardly struck portion 17, of the frame plate 1.

Also slidably mounted over the surface of the plate 12, is another rack bar 18, the rear end of which is slidable in a notch in the flanged margin 3, of the frame plate, and the forward end of which is provided with an integral offset wedge plate 19, the flat surface of which lies flat against the flat surface of the latch bolt 16. Journaled upon the projecting end of the stud 11, over the surface of the plate 12, is a pinion 20, which meshes with both of the respective rack bars 15 and 18, thus permitting a differential movement therebetween, or in the case of no relative movement between the pinion

and either of its rack bars, causing shifting of both thereof as a single unit.

Attached over the mechanisms which are mounted upon the frame plate 1, is a channel shaped casing section 21, provided with suitable lug extensions which engage in slots 22, provided therefor in the frame plate 1. Said casing section 21, is held secured to the frame plate 1, due to the fact that the stud 4, extends through an aperture in said casing section 21, and a nut 22, is threaded on the end of the stud over the casing section to hold the same secured thereon, as shown in Fig. 3.

The strike plate for attachment upon the door frame or jamb to receive the latch bolt projected into engagement therewith is of novel construction. The latch plate, as shown in Figs. 11 and 12, consists of an outer plate 24, with a rectangular aperture therethrough, and an inner plate 25, having a rectangular aperture of less length slidable over the inner surface of said outer plate, and at its upper and lower ends, provided with slots 26, through which the attaching screws extend which are used to attach said associated plates upon the door jamb. Before the attaching screws are tightened, the inner adjustable plate 25, is shifted so that the edge of the latch bolt recess afforded thereby is in close alinement with the flat surface of the latch bolt 16, which engages thereover in the usual manner. A projection 27, is formed on the inner end of the wedge plate 19, against which the inner end of the latch bolt strikes to thrust the wedge plate rearwardly when the latch bolt is retracted and the wedge plate is in extended position, such as shown in Figs. 7 and 9.

The operation is as follows:

In closing a door upon which a latch embodying the principles of my invention is connected, the rounded or beveled end of the latch bolt 16, contacts with the edge of the strike plate 24, on the door jamb, so that the latch bolt 16, and wedge plate 19, are thrust inwardly into the latch casing against the stress of the spring 14. Before the latch bolt contacts the strike plate, both the latch bolt and the wedge plate 19, are in their outer extreme position, such as for instance, shown in Figs. 4 and 9, and upon the latch bolt being thrust inwardly, the inner end thereof strikes against the projection 27 on the inner end of the wedge plate, thereby positively retracting the wedge plate therewith. As the door is closed in its frame, however, the latch bolt 16, is projected into engagement with the aperture therefor in the associated strike plates 24 and 25, and the wedge plate 19, also tends to move outwardly therewith, but ordinarily strikes against the locking edge of the associated strike plates and is prevented from further inward movement. A differential action then takes place between the latch bolt 16, and wedge plate 19, whereby the bolt continues its inward movement so that the rack bar 15, rotates the pinion 20, which will roll on the rack bar 18, the rack bar 15, moving forwardly with the lever 5, under the impulse of the spring 14. The latch bolt being in advance of the wedge plate and free to move forward without the wedge plate, the moment that the latch bolt overlaps the edge of the aperture therefor in the strike plate, the coiled spring 14, advances the bolt with considerable force into engagement with the recess in the strike plate. The latch bolt having completed its movement into engagement with the associated strike plates, the spring tends to drive the wedge member into any space existing between the flat surface of the latch bolt and the edge of the associated strike plates if such space exists, and since a slight amount of play between the bolt and strike plates generally does exist, the wedge member will be forcibly driven thereinto an amount sufficient to wedge between the bolt and the strike plate so that the door is held rigidly closed in its frame.

It is apparent that the force of the spring is in both of these movements transmitted to the latch bolt and wedge plate through the pinion and racks, thus permitting a differential action to take place therebetween and yet impelling both forwardly under spring stress. At all times when the door is closed, spring stress is operating behind the wedge, causing it to take up any slack which may occur between the latch bolt and the associated strike plates. The wedge angle of the wedge plate is so small that there is no tendency for the wedging action to tend to cause retraction of the wedge plate and its latch bolt 16, that is, the wedge angle of the wedge plate is too slight to overcome the stress of the compression spring 14.

Furthermore, in the event that the wedge member itself were retracted against the spring stress of the spring 14, the differential action taking place between the rack 18, of the wedge plate, and the rack 15, of the latch bolt, would cause the latch bolt 16, to be further projected into engagement with the recess in the associated strike plates, so that there would be no possibility of unlatching the door in this manner. That is to say, the latch bolt cannot be retracted or moved inwardly by an inward movement of the wedge plate 19.

In order to unlatch the door, the handle actuating member 7, is retracted, which swings the lever 5, rearwardly about its pivot 4, carrying the pinion 20, rearwardly therewith, and due to the engagement of the latch bolt with the projection 27, both the wedge plate 19, and latch plate 16, are simultaneously retracted as a unit, said lever

5, acting in its retractive movement, against the stress of the spring 14. Of course, the action of the wedge plate 19, is sufficient to take up any play, looseness or slack occurring between the latch bolt and the strike plate on the jamb, but in order to provide a means of adjustment to facilitate attachment of the entire lock upon the door, as shown, the strike plate is constructed of two plates, one an inner supplementary plate 25, slidably adjustable with respect to the main or outer strike plate 24, so that before the attaching screws for the strike plate on the jamb are tightened up, the inner plate 25, may be adjusted to bring the latching edge of the recess in the associated strike plates into close alinement with the flat surface of the latch bolt when projected thereinto. By utilizing the upper end of the main frame plate 1, for attachment of the outer slotted finishing plate 9, thereto, over the upholstery or other covering, a neat appearance and substantial construction is provided at the point of projection of the handle actuation member 7, of the lock.

I am aware that various details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

I claim as my invention:

1. In a door latch, a latch bolt, a wedge plate for coaction therewith, a mechanism for automatically impelling said latch bolt and wedge plate outwardly together in a locking operation and rack bars and pinion connecting the latch bolt and wedge plate adapting said latch bolt and wedge plate to move relatively of each other.

2. In a door latch of the class described a spring impelled latch bolt, a wedge plate slidable over the surface of the latch bolt, rack bars and pinion for actuating the latch bolt and wedge plate to move together and differentially with respect to each other to wedge the wedge plate against the latch bolt when the door latch is in locking position and a spring for impelling the latch bolt and wedge plate outwardly to latching position.

3. In a door latch of the class described, the combination with a strike plate, of a latch bolt adapted to be projected thereinto, a wedge plate movable between the latch bolt and the edge of the strike plate to wedge the latch bolt securely therein and means connecting the latch bolt and wedge plate to move forwardly together and adapted to move the wedge plate forwardly independently of the latch bolt.

4. In a door latch of the class described, the combination with a strike plate, of a latch bolt for projection thereinto, a wedge plate adapted to be projected between the latch bolt and the edge of the strike plate in the event of play therebetween to wedge the latch bolt in the strike plate, and a rack bar and pinion connection between the latch bolt and wedge plate whereby the wedge plate and latch bolt move together and the wedge plate is differentially adjustable with respect to the latch bolt.

5. In a device of the class described, a latch bolt, a wedge plate, a lever, means on said lever for adjusting the latch bolt and wedge plate together and adapted to permit relative movement between the latch bolt and wedge plate, a member pivotally connected with the lever and a spring thereon for automatically adjusting the latch bolt and wedge plate to latching position.

6. In a device of the class described the combination with associated adjustable strike plates, of a door latch embracing a latch bolt adapted to engage therewith, wedging means adjustable with, and differentially movable with respect to said latch bolt, adapted to engage between the latching edge of the strike plates and the bolt in the event of play existing therebetween and a pinion and rack bars connected with the door latch and wedging means for adjusting the same together and differentially.

7. In a device of the class described a casing plate provided with a curved slot, a lever pivoted thereto at one end, a finger knob on the other end of the lever projecting through the curved slot, a guide plate having a curved slot through which the knob extends, an actuating means carried by the lever, and a latch bolt and wedge plate adapted to be extended or retracted by said means independently of each other or together as a unit in either direction.

8. In a device of the class described, a pivoted lever, a pinion mounted thereon, a pair of slidable rack bars in mesh with said pinion, a latch bolt on one of said rack bars, and a wedge plate on the other thereof for co-action with the latch bolt when the same moves into interlocking relation with a strike plate.

9. In a device of the class described, the combination with a strike plate, of a latch bolt for co-action therewith, spring impelled means for actuating the latch bolt into latching relation with the strike plate, a wedge plate slidable over the surface of the latch bolt movable with, and movable differentially with respect to said latch bolt to engage between the same and the edge of the strike plate in the event of play therebetween, a rack bar associated with the latch bolt, a rack bar associated with the wedge plate, an actuating lever, and a pinion mounted thereon in mesh with both of said rack bars affording a differential connection therebetween.

10. In a door latch of the class described, a spring impelled latch bolt, a lever for re-

tracting the same, a wedge plate for wedging co-action against the latch bolt and mounted adjacent thereto, said wedge plate and latch bolt movable simultaneously in either direction and movable differentially with respect to one another, mechanism retracting the latch bolt and wedge plate as a unit, and means permitting retraction of the wedge plate without retraction of the latch bolt.

11. In a device of the class described the combination with a strike plate, of a door latch comprising a latch bolt for projection into engagement with the strike plate, a wedge plate slidable over the surface of the latch bolt adapted to wedge between the same and the edge of the strike plate in the event of play therebetween, rack bars connected to said latch bolt and wedge plate, a pinion in mesh therewith permitting differential movement therebetween, a pivoted lever, a plate loosely pivoted thereon on which said pinion is journaled, a bar extension on said plate, and a spring coiled thereabout acting to resist movement of said lever and serving normally to project said latch bolt and wedge plate forwardly into co-acting relation with the strike plate.

12. In a latching device, a casing, a spring impelled latch bolt therein, a wedge plate for coacting wedging operation with said latch bolt mounted within said casing and differentially interconnected for positive movement with and without said latch bolt, and means normally impelling said latch bolt and wedge plate in wedging relation into locking position.

13. A latch comprising a slidable bolt, a wedge member coacting therewith, and means connecting said bolt and wedge member to advance and retract as a unit and adapting the wedge member to both advance and retract independently of movement of the bolt.

14. A latch for doors comprising a slidable bolt, a wedge member coacting therewith, and means for advancing the bolt and wedge member together into latching position and adapted to further advance the wedge member independent of the bolt to wedge the door shut.

15. A latch for doors comprising a plate provided with a curved slot, a finishing plate having a complemental slot and secured to the plate, a lever pivoted to the plate, actuating means movable over the face of the finishing plate having engagement with the lever through the slots, a locking bolt, a wedging bolt and means carried by the lever for projecting and retracting the bolts together or differentially.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

BAYARD E. TAYLOR.

Witnesses:
CHARLES HILL, Jr.,
EARL M. HARDINE.