Nov. 16, 1926. 1,607,263

J. LEDWINKA

LATCH MECHANISM

Filed Oct. 3, 1921 2 Sheets-Sheet 1

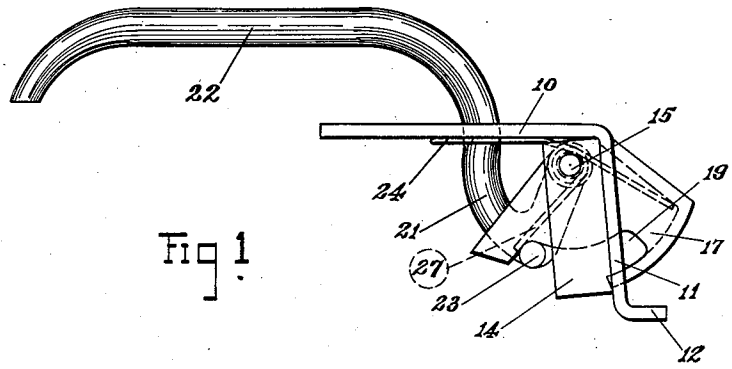


Fig 1.

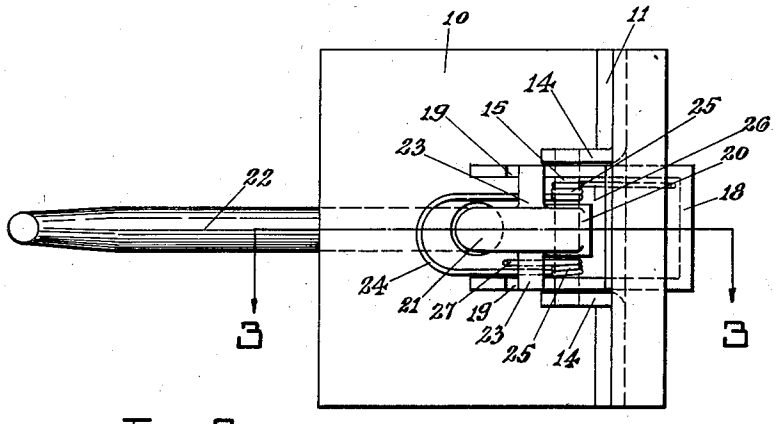


Fig 2

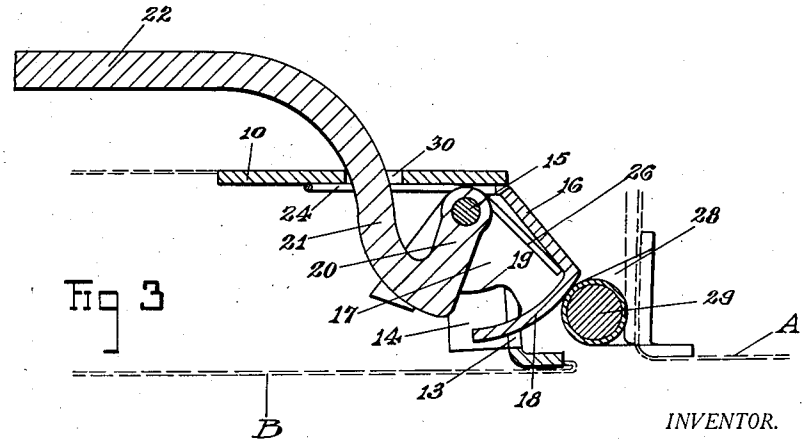


Fig 3

Witness
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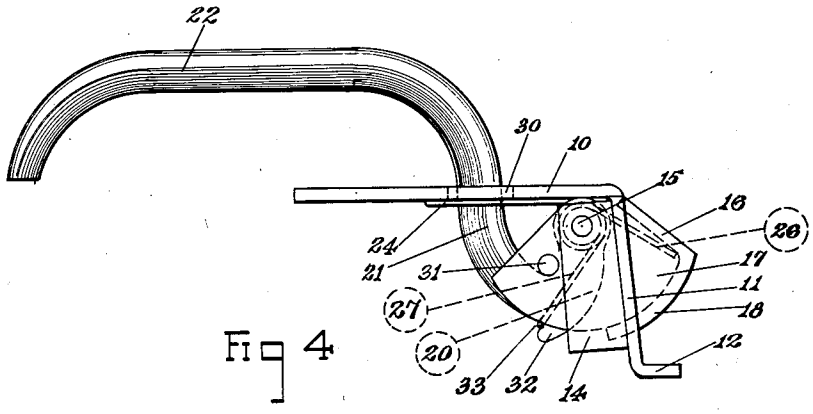


Fig 4

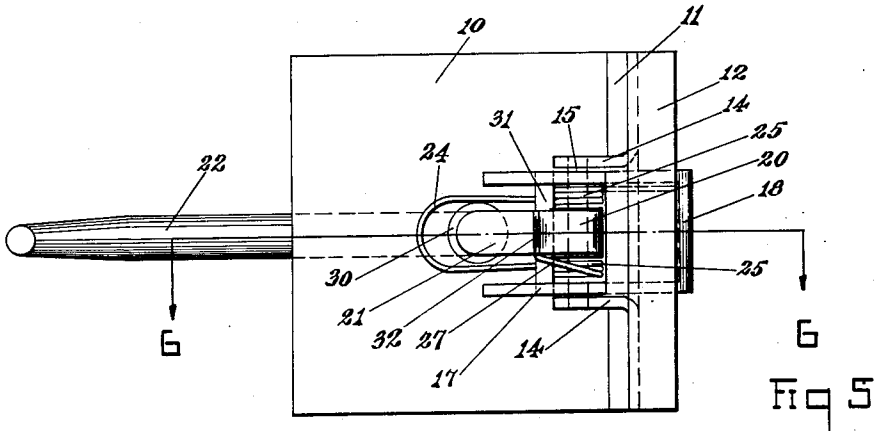


Fig 5

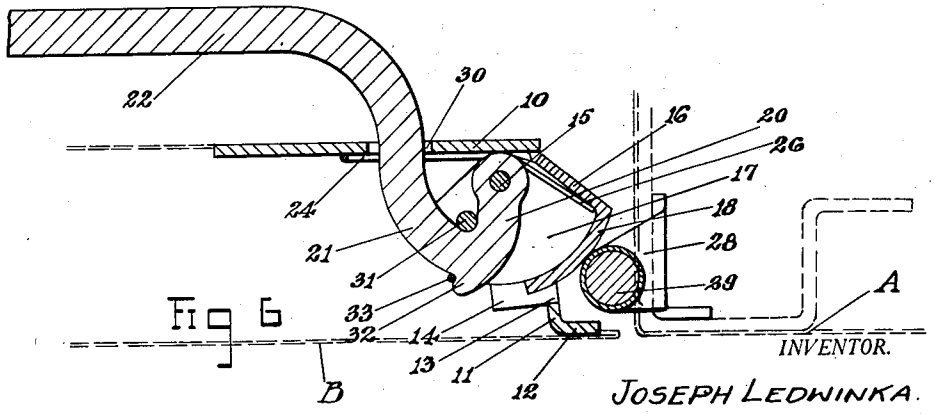


Fig 6

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UNITED STATES PATENT OFFICE.

JOSEPH LEDWINKA, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO EDWARD G. BUDD MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

LATCH MECHANISM.

Application filed October 3, 1921. Serial No. 504,928.

This invention relates to improvements in latch mechanism and, more particularly, to latches of the type provided with a swinging latch bolt.

One of the objects of my invention is to provide an improved latch mechanism, particularly suitable for use in connection with automobile doors, which is exceedingly simple in construction, consists of few parts and may be quickly and conveniently manufactured and assembled, at low cost, so as to provide an efficient latch for automobile doors, which may be produced in quantities for an exceedingly low price.

Another object of my invention is to provide a latch in which the friction due to relatively moving parts is substantially eliminated, so that the latch bolt will be very easily retracted.

Another object of my invention is to provide a latch mechanism including a swinging latch bolt and a lever connected to retract said bolt and so arranged and positioned that it serves as a pull handle for use in closing the door.

Another object of my invention is to provide a latch mechanism including a swinging latch bolt and a keeper having a roller with which the latch bolt cooperates.

Further objects, and objects relating to details and economies of operation and construction, will definitely appear from the detailed description to follow. My invention is clearly defined and pointed out in the appended claims. Constructions constituting preferred embodiments of my invention are illustrated in the accompanying drawings, forming a part of this specification, in which:

Fig. 1 is a view in side elevation of a latch embodying my invention.

Fig. 2 is a plan view of the latch.

Fig. 3 is a sectional view on line 3—3 of Fig. 2, the keeper being shown, in full lines, and portions of an automobile door and body, in dotted lines.

Fig. 4 is a side elevation of a slightly modified form of latch embodying my invention.

Fig. 5 is a plan view thereof, and

Fig. 6 is a sectional view on line 6—6 of Fig. 5, showing the keeper and, in dotted lines, parts of the automobile door and body.

In the drawings, the same reference numerals refer to the same parts throughout the several views, and the sectional views are taken looking in the direction of the arrows at the ends of the section lines.

In general, my invention consists of a latch mechanism including a swinging latch bolt which cooperates with a keeper. This swinging latch bolt may be projected into locking position by means of a suitable spring and it may be retracted from locking position by engagement with the keeper during the closing movement of the door and, also, by a pivoted actuating lever connected to the swinging latch bolt. I find it desirable to connect the latch bolt and the actuating lever in such a manner that the latch bolt may be moved to retracted position, as in the movement caused by the closing of the door, without moving the actuating lever from its normal position, and so that any movement of the actuating lever from normal position will retract the latch bolt. In this application, I have shown two forms of connection between bolt and lever, both of which accomplish the result set forth above. It is obvious that other constructions might effect the same purpose and, therefore, I am not to be restricted to the particular constructions disclosed. In one form, I provide laterally-projecting pins on the actuating lever engaging in elongated slots or notches in the side walls of the latch bolt and, in another form, I provide a fixed pin carried by the swinging latch bolt and engaging a shoulder on the actuating lever. It makes for simplicity of construction and operation to mount the actuating lever and the swinging latch bolt on a common pivot. It is also desirable to provide spring means for restoring the actuating lever to normal position independently of the latch bolt. I have caused the actuating lever to project from the latch mechanism so that it presents, not only a handle for actuating the lever, but also a pull handle for use in closing the door, thus serving a double purpose.

Referring to the form of latch disclosed in Figs. 1, 2 and 3 of the drawings, it will be seen that this embodiment of my invention comprises a base plate, 10, provided

with a laterally-extending flange, 11, which may have a lip or flange, 12, extending parallel to the base plate, 10, for convenience in attaching the latch to a door. An opening, 13, is formed in the flange, 12, through which the latch bolt swings. This opening may be formed by pressing back the ears, 14, which may be utilized to support the latch bolt pivot pin, 15. The swinging latch bolt is pivotally mounted on this pin, 15, and comprises the front wall, 16, which lies in a plane parallel to a radial plane containing the pin, 15, an end wall, 18, which is curved to form a partly cylindrical surface coaxial with the pin, 15, and the side walls, 17. An elongated slot or notch, 19, is formed in each side wall, 17, near the outer edge thereof. It will be seen that this hollow latch bolt may be a stamping which can be produced at a low cost. The pivot pin, 15, carried by the ears, 14, extends through the side walls, 17, near the inner edges thereof.

The actuating lever is also pivotally mounted on the pin, 15, and may comprise a portion, 20, extending substantially radially from the pivot, a portion, 21, which extends inwardly from the outer end of portion, 20, through an opening, 30, formed in the base plate, 10, and a handle portion, 22, which lies on the opposite side of the base plate, 10, from the latch bolt. When the latch is assembled in the door, the handle portion of the lever extends through the base plate and is so formed that it constitutes a pull handle for use in moving the door. The lever and latch bolt are operatively connected together in suitable manner to permit the latch bolt to be retracted independently of the lever and to be positively retracted when the lever is actuated. This result is attained in the arrangement shown in Figs. 1, 2 and 3, by the laterally-projecting pins, 23, on the lever, the ends of which projections or pins work in the slots, 19, in the side walls of the latch bolt. When the latch bolt is in projected position and the lever in normal position, these pins engage shoulders formed at the rear ends of the slots or notches, 19, and any movement of the lever from normal position will retract the latch bolt. The latch bolt may be retracted, however, as by engagement with the keeper in closing the door, without disturbing the lever, since the pin and slot connection allows such a movement of the latch bolt.

I provide spring means acting independently on the lever and latch bolt to yieldingly maintain the former in normal position and the latter in projected position. The spring means, in one form of embodiment of my invention as shown in Figs. 1 to 3, but to which my invention is not to be limited or restricted, may comprise a U-shaped wire spring, 24, which lies against the inner face of the base plate, 10, and straddles the lever, being coiled around the pivot pin, 15, on opposite sides of the lever, at 25. One free end, 26, of the spring, engages the inner surface of the front wall, 16, of the swinging latch bolt, to yieldingly hold it projected. The other free end, 27, of the spring engages behind one of the projections or pins, 23, on the lever, to yieldingly hold it in normal position.

The keeper member carried by the door post may comprise ears, 28, in which a roller, 29, is journaled. This roller engages the front wall, 16, of the latch bolt, during the closing movement of the door, and retracts the latch bolt against the pressure of the free end, 26, of the spring until the extreme end of the front wall, 16, passes beyond the roller and the arc surface, 18, of the latch bolt, engages the roller surface. The roller, 29, eliminates any sliding friction as the front wall of the latch bolt moves over it. After the door is latched any movement tending to open the door is resisted by the roller and this resistance is transmitted in a line radial of the axis of the latch bolt so that it is ineffective to swing the bolt on its axis. Portions of the door post are indicated, at A, in dotted lines, and parts of the door are shown in dotted lines, at B.

The embodiment of my invention, shown in Figs. 4, 5 and 6, does not differ essentially in principle from that just described, but, structurally, the notches, 19, in the side walls, 17, of the latch bolt and the pins, 23, on the lever, as described in connection with Figs. 4, 5 and 6, are eliminated and a different connection between bolt and lever is used in the arrangement shown in Figs. 4, 5 and 6. A transverse pin, 31, is mounted on the side walls, 17, and, when the lever is in normal position and the bolt in projected position, as shown in Fig. 6, the pin engages the lever. In the illustrative arrangement shown, this pin engages in the bottom of the notch formed by the junction of parts, 20 and 21, of the lever. It will be seen that a movement of the lever from normal position will retract the latch bolt, while the latch bolt may be retracted by engagement with the keeper without moving the lever. The elimination of the pins, 23, makes it necessary to provide a different connection between the free end, 27, of the spring and the lever, and I accomplish this by providing a projection, 32, on the lever and bending the end of the portion, 27, of the spring laterally, at 33, so that it engages behind the projection, 32. It is apparent that the spring acts as before to yieldingly maintain the lever in normal position.

The operation of this latch mechanism is

apparent from the foregoing description. One end of the spring yieldingly holds the actuating lever in its normal position, with the extreme end of the handle, 22, near the inner face of the door. When one desires to unfasten the door, he grasps the handle, 22, and swings the actuating lever on its pivot, 15, against the pressure of the spring. The engagement of the lever and bolt, as, for example, the engagement of the projections or pins, 23, with the shoulders formed at the rear ends of the notches, 19, in the form shown in Figs. 1 to 3, swings the latch bolt on its pivot against the pressure of the portion, 26, of the spring, thus retracting the bolt. In the embodiment of Figs. 4 to 6, this is acomplished by the engagement of the lever with the transverse pin, 31, caried by the bolt. In both forms, the engagement of the roller, 29, with the front wall, 16, of the latch bolt retracts the bolt independently of the lever. There are only two moving parts in this latch, the lever and the bolt, and both of these parts are under independent spring tension, so that all rattling is eliminated. The only forces resisting the withdrawal of the latch bolt, in closing the door, are the pressure of spring, 26, the friction of the latch bolt on its pivot pin and the friction of the roller, 29, as it rolls over the front wall of the bolt. These frictional forces are very small so that I have a very sensitive latch and one in which a forcible slamming of the door will not be necessary in order to latch it. Furthermore, I have produced a very simple, cheap and efficient latch for automobile doors, in which the handle of the latch lever serves as a door pull.

I am aware that the latch construction which I have disclosed may be altered considerably without departing from the spirit of my invention and, hence, I wish to claim my invention broadly, as indicated by the appended claims.

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

1. A device of the class described comprising a base plate, a swinging latch bolt, and a pivoted actuating lever, said bolt and lever being mounted on a common pivot extending substantially parallel to the base plate.

2. A device of the class described comprising a base plate, a latch bolt pivoted thereon to swing transversely thereof, and an actuating lever also pivoted on said base plate, one of said pivoted parts having a lateral projection adapted to inter-engage with a laterally disposed shoulder on the other part whereby to retract the bolt when the lever is swung from its normal position.

3. A device of the class described comprising a base plate, a latch bolt pivoted thereon to swing transversely thereof, an actuating lever pivoted on the base plate and engaging the latch bolt, and spring means acting independently on said bolt and lever to project the former and yieldingly hold the latter in normal position.

4. A device of the class described comprising a base plate, a latch bolt pivoted thereon and an actuating lever pivoted on said base plate independently of said latch bolt and in engagement therewith, said lever itself projecting through the base plate and having a handle portion on the opposite side of the base plate from the latch bolt.

5. A device of the class described comprising a base plate, a latch bolt pivoted thereon to swing transversely thereof, and an actuating lever pivoted on the base plate, said bolt and lever having a common pivot and interengaging portions.

6. A device of the class described comprising a base plate, a pivot pin carried thereby and extending substantially parallel thereto, a latch bolt pivoted on said pin and spring-pressed into projected position, and an actuating lever pivoted on said pin, said bolt and lever having portions in engagement when the bolt is projected and the lever in normal position.

7. A device of the class described comprising a base plate, a pivot pin carried thereby and extending substantially parallel thereto, a latch bolt pivoted on said pin, and an actuating lever also pivoted on said pin and engaging the bolt, said lever projecting through the base plate and having a handle portion on the opposite side of the base plate from the latch bolt.

8. A device of the class described comprising a base plate, a pivot pin carried thereby, a latch bolt pivoted on said pin, and an actuating lever also pivoted on said pin and having an inner portion extending radially from said pin away from the base plate and an outer portion extending from the outer end of said radial portion through the base plate and terminating in a handle lying on the opposite side of the base plate from said latch bolt, said latch bolt having a projection adapted to engage the lever at the junction of the inner and outer portions thereof.

9. A device of the class described comprising a base plate, a hollow latch bolt pivoted thereon, and an actuating lever pivoted on the base plate with its inner end working within the hollow latch bolt, said bolt and lever being in operative engagement with each other.

10. A device of the class described comprising a base plate, a hollow latch bolt pivoted thereon, and a pivoted actuating lever engaging said bolt and working within the hollow thereof, said bolt and lever swinging on a common axis.

11. A device of the class described com-

prising a base plate, a hollow latch-bolt pivoted thereon, and a pivoted actuating lever having a common pivot with said bolt and working within the hollow thereof, said bolt and lever having projecting portions adapted to engage each other.

12. A device of the class described comprising a base plate, a hollow latch-bolt pivoted thereon, a pivoted actuating lever having a common pivot with said bolt and working within the hollow thereof, said bolt and lever having projecting portions adapted to engage each other, and spring means acting independently on said bolt and lever to restore them to normal and projected positions, respectively.

13. A device of the class described comprising a base plate, a hollow latch-bolt pivoted thereon, and an actuating lever working in the hollow of said bolt and pivoted on a common axis therewith, said bolt and lever having projecting portions adapted to engage each other, said lever extending through the base plate and being provided with a handle lying on the opposite side of the base plate from the latch bolt.

14. A device of the class described comprising a base plate, a pivot pin carried thereby, a latch bolt pivoted thereon and including spaced side walls, a front wall and a curved end wall, and an actuating lever pivoted on said pin between said side walls and operatively connected to said bolt.

15. A device of the class described comprising a base plate, a pivot pin carried thereby, a latch bolt pivoted on said pin and including spaced side walls, a front wall and a curved end wall, and an actuating lever pivoted on said pin between said side walls, said bolt and lever having portions adapted to engage each other.

16. A device of the class described comprising a base plate, a pivot pin carried thereby, a latch bolt including spaced side walls, a front wall and a curved end wall, said bolt being pivoted on said pin, and an actuating lever pivoted on said pin between said side walls and engaging said bolt, said lever extending through said base plate and being provided with a handle lying on the opposite side of the base plate from said latch bolt.

17. A device of the class described comprising a base plate, a pivot pin carried thereby, a latch bolt pivoted on said pin and including spaced side walls, a front wall and a curved end wall, an actuating lever pivoted on said pin between said side walls and engaging said bolt, said lever extending through said base plate and being provided with a handle lying on the opposite side of the base plate from said latch bolt, and a spring engaging the base plate, coiled around said pivot pin on opposite sides of the lever, and having one free end engaging the latch bolt to project the same and the other free end engaging the lever to yieldingly hold it in normal position.

18. A device of the class described comprising a base plate, a latch bolt pivoted on said base plate and including spaced side walls, a front wall and a curved end wall, and an actuating lever pivoted on a common axis with said latch bolt, one of said side walls being provided with a slot and said lever having a projection working in said slot.

19. A device of the class described comprising a base plate provided with a lateral flange, which flange has an opening therein, a latch-bolt pivoted on said base plate and swinging transversely of the base plate through said opening, and an actuating lever pivoted on said base plate and engaging said latch bolt.

20. A device of the class described comprising a base plate provided with a lateral flange having an opening therein, a hollow latch bolt pivoted on said base plate and swinging through said opening, and an actuating lever pivoted on the same axis with said bolt and working within the hollow thereof.

21. A device of the class described comprising a base plate provided with a lateral flange having an opening therein, a latch bolt pivoted on said base plate and swinging transversely thereof through said opening, and an actuating lever pivoted on the same axis with said bolt and engaging the same, said lever extending through said base plate and being provided with a handle lying on the opposite side of the base plate from said latch bolt.

22. A device of the class described comprising a base plate provided with a lateral flange, a pair of ears struck rearwardly from said flange forming an opening therein, a latch bolt pivoted on said ears and swinging through said opening, and a pivoted actuating lever engaging said bolt.

23. A device of the class described comprising a base plate provided with a lateral flange, a pair of ears struck rearwardly from said flange forming an opening therein, a pivot pin carried by said ears, a latch bolt pivotally mounted on said pin and swinging through said opening, and an actuating lever pivoted on said pin and engaging the bolt.

24. A device of the class described comprising a base plate provided with a lateral flange, a pair of ears struck rearwardly from said flange forming an opening therein, a pivot pin carried by said ears, a latch bolt pivoted on said pin and including spaced side walls, a front wall and a curved end wall, and an actuating lever pivoted on said pin between said side walls and engaging said bolt.

25. A device of the class described com-

prising a base plate provided with a lateral flange, a pair of ears struck rearwardly from said flange forming an opening therein, a pivot pin carried by said ears, a latch bolt pivoted on said pin and including spaced side walls, a front wall and a curved end wall, and an actuating lever pivoted on said pin between said side walls and engaging said bolt, said lever extending through the base plate and being provided with a handle lying on the opposite side of the base plate from said latch bolt.

26. A device of the class described comprising a base plate provided with a lateral flange, a pair of ears struck rearwardly from said flange forming an opening therein, a latch bolt pivoted on said ears and swinging through said opening, and actuating means for said bolt.

27. A device of the class described, a base plate, a latch bolt on one side of said base plate, and an S-shaped operating lever therefor, one branch of which is operatively connected with said latch bolt on one side of said base plate and the other branch of which lies on the opposite side of the latch bolt and constitutes an operating handle, said lever being wholly disposed for movement in a horizontal plane.

28. A device of the class described comprising a base plate, a swinging latch bolt pivoted thereon and projecting radially over the face thereof, and an operating lever therefor also pivoted on the base plate and extending first in the direction of the latch bolt and then reversely through and to the opposite side of said base plate, said lever being wholly disposed for movement in a horizontal plane.

29. A device of the class described comprising a base plate, a latch bolt, and actuating means for said latch bolt, together with a common spring means acting independently on said bolt and actuating means to project the former and yieldingly hold the latter in a normal position.

30. A latch mechanism having a swingable latch bolt including an actuating lever mounted on the pivot of the latch bolt and rotatable with respect to the latter, and inter-engaging portions on said lever and bolt whereby the lever engages the latch bolt in its swinging movement for withdrawing the latch bolt.

31. A latch mechanism having a swingable latch bolt including an actuating lever mounted on the pivot of the latch bolt and rotatable with respect to the latter and inter-engaging portions on said lever and bolt whereby the lever engages the latch bolt in its swinging movement for withdrawing the latch bolt, said inter-engaging portions being so arranged as to permit retraction of the latch bolt independently of the actuating lever.

In testimony whereof, I affix my signature.

JOSEPH LEDWINKA.