Feb. 23, 1926. 1,574,025

F. M. VANDERVOORT

LATCH

Filed Nov. 8, 1923 2 Sheets-Sheet 1

Fig. 1.

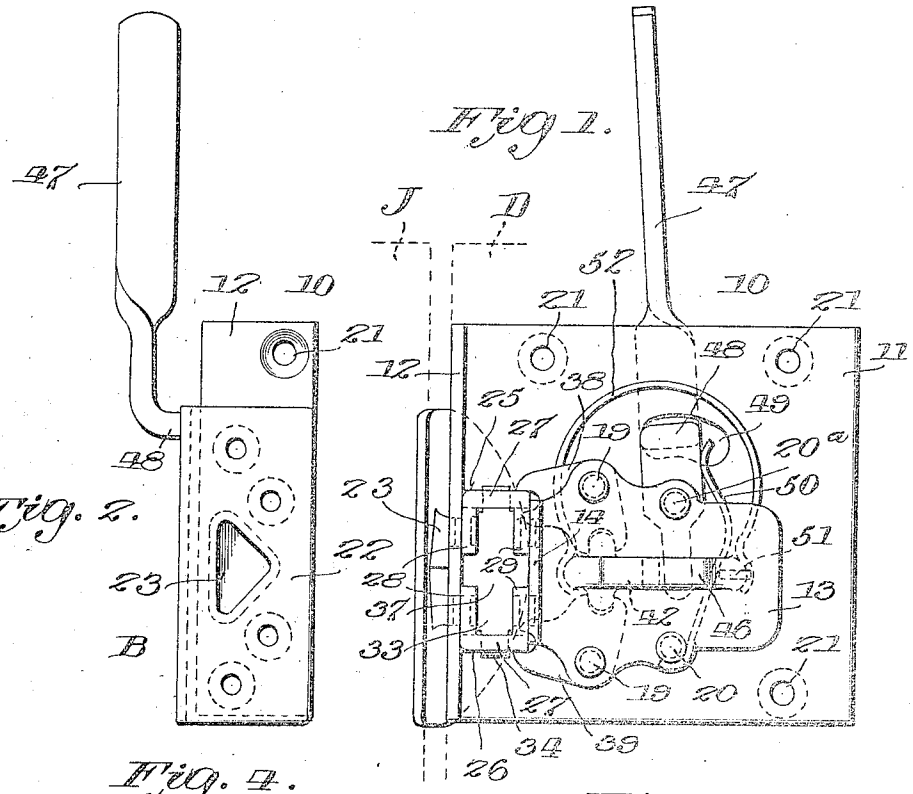


Fig. 2.

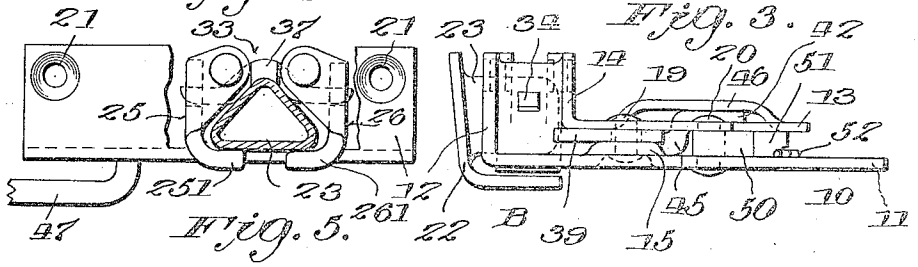


Fig. 4.

Fig. 3.

Fig. 5.

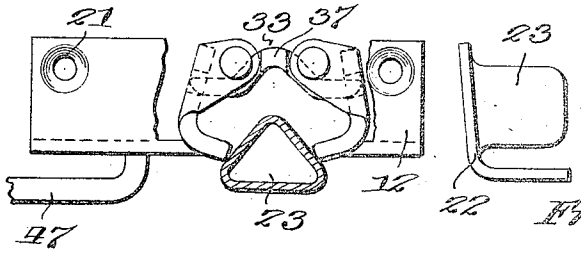


Fig. 22.

Inventor
Francis M. Vandervoort,

By Howard Murray

His Attorneys

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F. M. VANDERVOORT

LATCH

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Fig. 6.

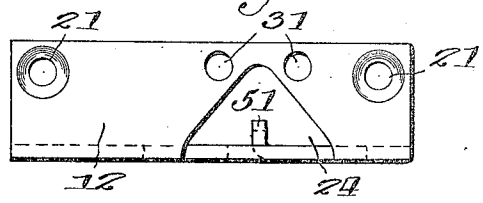


Fig. 7.

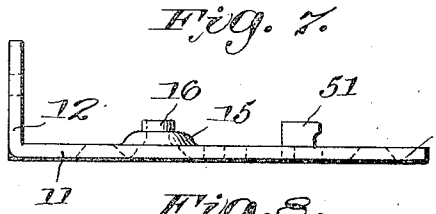


Fig. 9.

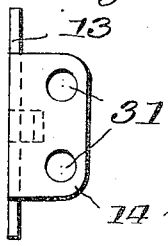


Fig. 10.

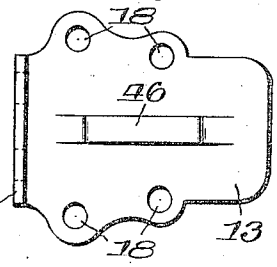


Fig. 8.

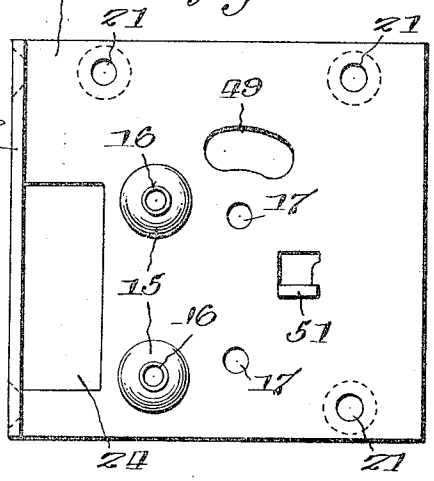


Fig. 12.

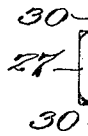


Fig. 11.

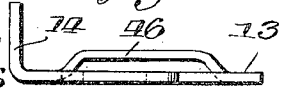


Fig. 13.

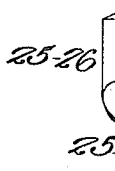


Fig. 14.

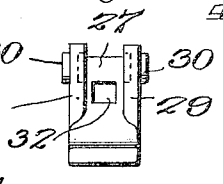


Fig. 18.

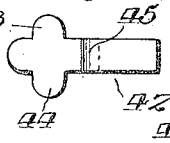


Fig. 19.

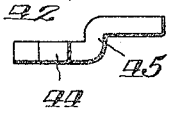


Fig. 20.

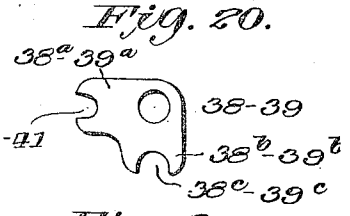


Fig. 21.

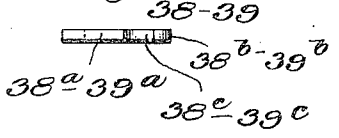


Fig. 15.

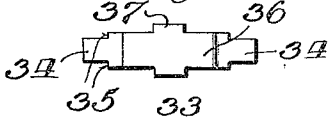


Fig. 16.

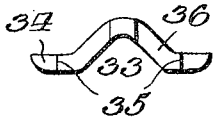
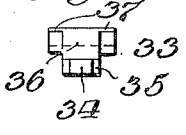


Fig. 17.



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Francis. M Vandervoort

By Steward & McKay

His Attorneys

Patented Feb. 23, 1926. 1,574,025

UNITED STATES PATENT OFFICE.

FRANCIS M. VANDERVOORT, OF PUEBLO, COLORADO, ASSIGNOR TO THE POSITIVE LOCK COMPANY, OF PUEBLO, COLORADO, A CORPORATION OF COLORADO.

LATCH.

Application filed November 8, 1923. Serial No. 673,532.

To all whom it may concern:

Be it known that I, FRANCIS M. VANDERVOORT, a citizen of the United States, residing at Pueblo, county of Pueblo, State of Colorado, have invented certain new and useful Improvements in Latches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to latches, particularly to latches adapted for use in connection with the doors or windows of a vehicle such as an automobile. It is to be understood, however, that the invention is not limited to this particular use and that the term latch is used broadly to include both latch and lock constructions.

One of the principal objects of this invention is to improve and simplify the construction of latches of the type shown in the application of Crompton & Crooks Serial No. 592,497, filed October 5, 1922, especially from the standpoint of reducing the cost of manufacture.

The above and other objects and features of the invention will be apparent from the following description taken in connection with the accompanying drawings which show one specific embodiment of the invention, but it is to be understood that the specific embodiment of the invention shown and described is merely one form typical of the broad invention chosen to explain the principles of the broad invention and is to be taken as illustrative and not restrictive.

In the drawings,

Fig. 1 is a plan view of a latch and cooperating keeper embodying this invention shown in the position which the parts occupy when mounted on the door and door jamb, respectively, of an automobile, parts of said door and door jamb being shown in dotted lines;

Fig. 2 is an end view of the latch and keeper looking from the left of Fig. 1;

Fig. 3 is a side view of the latch and keeper looking from the bottom of Fig. 1;

Fig. 4 is an end view of the latch only with part of the end plate broken away showing the bolt, illustrated in section, in latched position within the latch;

Fig. 5 is an end view similar to Fig. 4 showing the bolt, shown in section, just entering between the latch members;

Figs. 6, 7 and 8 are end, side, and plan views, respectively, of the main or base plate of the latch casing;

Figs. 9, 10 and 11 are end, plan and side views, respectively, of the housing plate of the latch casing;

Figs. 12, 13 and 14 are end, side and plan views, respectively, of one of the latching members;

Figs. 15, 16 and 17 are plan, side and end views, respectively, of the abutment member;

Figs. 18 and 19 are plan and side views, respectively, of the sliding operating member;

Figs. 20 and 21 are plan and side views, respectively, of one of the pivoted operating members, and

Fig. 22 is a side view of the bolt.

Broadly stated, the invention comprises latching means movable to engage and hold a bolt or catch in latched position, abutment means supported by said latching means adapted to engage and press the bolt or catch against said latching means, and means for operating the latching means to release the bolt or catch.

Stated more specifically, the invention comprises opposed pivoted latching members separable one from the other by the insertion of a bolt or catch therebetween, an abutment member supported by said latching members adapted to engage and press the bolt or catch against said latching members, means for operating the latching members to release the bolt or catch, and means acting through such operating means normally retaining said latching members in latched position.

Referring to the drawings, 10 indicates generally the latch casing or mounting to support the latch elements. In the example illustrated, the mounting or casing comprises a base or back plate 11 having an integral substantially right-angular extension forming an end portion 12, and a housing plate 13 also having an integral substantially right-angular extension forming an end portion 14. Plates 11 and 13, with their bent ends or extensions, are both substantially L-shaped and these plates are secured together in spaced relation to form between

them a substantially L-shaped space. Although any suitable means of securing plates 11 and 13 together may be used, the means shown is preferred. Plate 11 is provided with two hollow extruded portions 15 forming countersunk apertures, each terminating in a hollow boss 16, to be explained more in detail later. Base plate 11 is also provided with two apertures 17. Housing plate 13 is provided with four apertures 18, two of said apertures adapted to register with hollow extruded portions 15 and the other two apertures registering with apertures 17, respectively. Rivets 19 passing through extruded portions 15 and holes 18, and shoulder rivets 20 and 20a, each passing through holes 17 and 18, rigidly hold plates 11 and 13 in spaced relation. Ordinarily, the latch casing 10 is mounted on a door, indicated in dotted lines at D, with the end portion 12 substantially flush with one edge of the door, the casing being secured to the door by means of screws or similar fastening means passing through apertures 21 provided for this purpose in plate 11. The latch is used with a cooperating bolt or strike, indicated generally by B, mounted on the door jamb J so that when the door is swung shut, the projecting bolt is engaged and held in latched position by means within the latch casing or mounting 10.

The construction of the bolt or catch B may vary within the broad scope of the invention, but the form illustrated is desirable because it can be made of one piece of stamped metal. Bolt or strike B comprises a bent plate 22 provided with holes to receive screws or other fastening means for securing the plate to the door jamb and the bolt proper 23 punched or pressed out from plate 22. The bolt proper 23 is shown substantially triangular in cross-section, but this shape may vary. In order to permit bolt B to enter casing 10, adjoining portions of base or back plate 11 and end 12 are cut away to form the slot or opening 24.

Within casing 10 is provided means for securely latching bolt B and at the same time firmly clamping and holding the same against rattling irrespective of wear or looseness of the latch parts. Pivotally mounted between spaced ends 12 and 14 of plates 11 and 13 respectively are two opposed hook-shaped latch members 25 and 26. These latch members, preferably made of stamped sheet metal, are generally of channel shape, each having a web 27 and depending sides or flanges 28 and 29. The flanges 28 and 29 are each provided with an oppositely extending extruded portion or boss 30, these extruded portions or bosses 30 extending into holes 31 provided in end portions 12 and 14 of plates 11 and 13 respectively to thereby pivotally support the hook members. It is to be noted that the flanges or sides 28 and 29 of the hook members 25 and 26 do not extend as far as the hook ends 251 and 261 respectively, of said hook members, only the web portions forming the hook ends. Each hook member is provided intermediate the hook and pivoted ends with an aperture 32 to be explained later. The hook members 25 and 26 are mounted with the hook ends 251 and 261, respectively, facing each other, the hook ends being disposed adjacent each other and extending into the slot or recess 24 in the front end of the casing. The hook members 25 and 26 are pressed or urged toward each other by suitable means to be described hereafter. Mounted between the hook members 25 and 26 and supported thereby is an abutment member 33. As best shown in Figs. 15, 16 and 17, the abutment member 33 in the present instance is made of sheet metal, the ends 34 of the abutment being reduced to form shoulders 35. Intermediate ends 34, the abutment is bent to provide a hump or substantially V-shaped bent portion 36, the vertex of the bend or hump being located approximately at the center of the abutment bar 33. The abutment is further provided with a central projection or enlargement 37, providing lateral extensions on each side of the abutment. In mounting the abutment bar 33, the reduced ends 34 extend into apertures 32 provided in the webs of the hook members, the central enlargement or projection 37 of the abutment engaging between the pivoted ends of the hook members to prevent longitudinal shifting of the abutment bar. The hook members tend to come together and are prevented from actually coming together by shoulders 35 on abutment bar engaging the webs of the hook members. When the door is swung shut, one corner of the bolt enters between the hook members, forcing them apart. As the hook members swing away from each other, they move the abutment away from the entering bolt until the bolt has passed the hook ends. The hook ends then close behind the bolt to hold it in latched position and as the hook members swing toward each other, they move or slide the abutment toward the bolt. The abutment engages and presses the bolt against the hook ends whereby the bolt is held against rattling. It will be observed that the pivoted ends of the hook members form a guideway to slidingly support the central enlargement 37 of the abutment therebetween. It is to be noted that the concavity or bend 36 of the abutment member 33 corresponds substantially in contour to the shape of one corner of the bolt and that when the bolt is held in latched position, one corner of the bolt engages in the bend or concavity 36 of the abutment member whereby the bolt is firmly clamped against substantially all lateral movement.

Means have been provided for operating the latch members to release the bolt or catch. Pivotally mounted on the hollow bosses 16 of plate 11 are two opposed members 38 and 39 respectively. In the present instance, as shown in Figs. 20 and 21, members 38 and 39 are bell crank levers and are mounted adjacent hook members 25 and 26 to swing transversely thereof. Arm 38[a] of lever 38 is provided with a notch or recess 40 engaging hook member 25 near the hook end 251 and arm 39[a] of lever 39 is provided with a notch or recess 41 engaging hook member 26 near the hook end 261. Arms 38[b] and 39[b] of levers 38 and 39, respectively, extend toward each other, the ends of the arms being spaced from each other to receive therebetween an operating slide 42. Slide 42 is provided adjacent one end with integral laterally-extending lugs or tongues 43 and 44, lug 43 adapted to engage in a notch or recess 38[c] in arm 38[b] of lever 38 and lug 44 adapted to engage in a cooperating notch or recess 39[c] in arm 39[b] of lever 39. Intermediate its ends, slide 42 is provided with an offset bend 45 so that one end of the slide engages plate 11 and the other end of the slide engages housing plate 13. Housing plate 13 is formed to provide a slideway 46 or guide for the slide 42. In the present instance, this slideway or guide is formed by cutting or punching two substantially-parallel slits in housing member 13 and pushing out or expanding the metal between the slits to form an integral slide-way or guide to receive and support one end of the operating slide 42. The offset bend 45 of the operating slide 42 forms an abutment to be engaged by one end of an operating or retracting lever 47 pivoted at 20[a] to the latch casing. This lever is provided with an offset bend 48 intermediate its ends. Lever 47 projects from one side of the casing, a curved slot 49 cut in plate 11 permitting swinging movement of the lever. The end of the lever which projects from the casing is adapted to lie parallel to the inner side of the door when the latch is mounted on the door and may extend to or slightly above the top edge of the door in order that it may be conveniently operated by the end of the user. In order to prevent rattling of the operating lever 47, a leaf spring 50 is provided. One end of spring 50 engages rivet 20 and the other end engages operating lever 47, forcing the lever against one end of the curved slot 49 in plate 11, the spring being held under tension by engagement with lug 51 bent up or struck out from plate 11.

Means are provided for urging the hook members toward one another and in this instance this means acts through the operating mechanism. A circular, substantially horseshoe shaped contractile spring 52 is provided in the present instance, one end of said spring engaging lug 51 and the other end of the spring engaging the forward end of slide 42. This tends to force the operating slide 42 to the rear or to the right of the casing, as viewed in Fig. 1, and this in turn operates through the opposed levers 38 and 39 to urge the hook members 25 and 26 toward each other.

Briefly stated, the operation is as follows: When the door is swung shut, the bolt enters the casing, forcing hook members 25 and 26 apart, hook members 25 and 26 moving abutment member 33 away from the entering bolt. After the bolt has passed hook ends 251 and 261, the hook members come toward each other, hook ends 251 and 261 overhanging the bolt to hold it in latched position. As the hook members 25 and 26 move toward each other, they move abutment member toward the bolt so that when the bolt is in latched position between the hook members, abutment member 33 presses the bolt against the hook members, the bent portion of the abutment embracing the bolt to clamp the same against substantially all lateral movement.

To open the door, handle member or lever 47 is operated or swung on its pivot, lever 47 engaging and operating slide 42. Slide 42 operates or swings opposed levers 38 and 39, these levers in turn operating the hook members to swing them away from each other, and as the hook members swing away from each other, they cause abutment member 33 to move away from the bolt. The bolt is thus released and the door is free to swing.

It will be observed that a latch of simple, compact construction has been provided. One of the important features of the invention resides in the fact that practically every part can be made of stamped sheet metal, thus greatly reducing the cost of manufacture. It is to be understood that various changes in construction and arrangement of the parts can be made without departing from the scope of the invention as defined in the appended claims.

What is claimed is:

1. Latch means comprising latch members separable one from the other and adapted to receive a bolt therebetween, opposed members pivoted to swing transversely of said latch members for operating said latch members, and slidable means engaging and operating said opposed members.

2. Latch means comprising latch members separable one from the other and adapted to receive a bolt therebetween, means for operating said latch members, and means acting through such operating means urging said latch members toward one another.

3. Latch means comprising latch members separable one from the other and adapted to receive a bolt therebetween, opposed mem-

bers pivoted to swing transversely of said latch members for operating said latch members, and means movable between said opposed members for operating the same.

4. Latch means comprising latch members separable one from the other and adapted to receive a bolt therebetween, opposed pivoted members for operating said latch members, and slidable means engaging and operating said opposed pivoted members.

5. Latch means comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, opposed members pivoted to swing transversely of said hook members for operating said hook members, and slidable means engaging and operating said opposed operating members.

6. Latch means comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, opposed operating members engaging said hook members and pivoted to swing transversely thereof, slidable means engaging said operating members, and means for operating said slidable means.

7. Latch means comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, means for operating said hook members, and means acting through said operating means urging said hook members one toward the other.

8. Latch means comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, a slidable operating member, means connecting said operating member and said opposed hook members, and spring means acting through said slidable operating member tending to force said hook members one toward the other.

9. Latch means comprising latch members separable one from the other and adapted to receive a bolt therebetween, opposed members positively connected to said latch members to positively move said latch members to latching and unlatching position, and means for operating said opposed members.

10. Latch means comprising latch members separable one from the other and adapted to receive a bolt therebetween operating means connected to said latch members to move the same to unlatched position, and means acting through said operating means normally retaining said latch members in latched position.

11. In a latch, a mounting or casing comprising a base plate having an angular end portion, and a housing plate having an angular end portion, said plates secured together in spaced relation with the end portions substantially parallel, said end portions provided with opposed apertures, latching members provided with extruded portions engaging in said apertures whereby said latching members are pivotally supported between said end portions, and means supported between said plates for operating said latching members.

12. In a latch, a mounting or casing comprising a base plate having an angular end portion and a housing plate having an angular end portion, said plates secured together in spaced relation with the end portions substantially parallel, said end portions provided with opposed apertures, hook-shaped latching members each made of one piece of stamped metal and provided with extruded portions, the extruded portions of said latching members engaging in said apertures whereby said latching members are pivotally supported between said end portions, and means supported between said plates for operating said latching members.

13. Latch means comprising a mounting or casing, latch members separable one from the other and adapted to receive a bolt therebetween, and means including a sliding member for operating said latch members, said mounting or casing provided with a guideway for supporting said sliding member.

14. Latch means comprising opposed members separable one from the other by the insertion of bolt therebetween, said opposed members each provided with an aperture, and abutment means engaging in said apertures engageable by a bolt entering between said members, said abutment means pressing the bolt against said opposed members.

15. Latch means comprising opposed pivoted members resiliently pressed one toward the other and separable one from the other by the insertion of a bolt therebetween, said opposed members each provided with an aperture, and an abutment provided with reduced end portions, said end portions engaging in said apertures whereby said abutment is supported between said pivoted members, said abutment provided with shoulders normally abutting said pivoted members to limit movement of one opposed member toward the other.

16. Latch means comprising opposed pivoted members separable one from the other by the insertion of a bolt therebetween, said opposed members each provided with an aperture, and an abutment engaging in said apertures whereby the abutment is supported between said pivoted members, said abutment provided with a projection extending between the pivoted ends of said opposed members to prevent disengagement of said abutment from said apertures.

17. Latch means comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, said hook members each provided with an aperture, spring means urging said

members toward one another, and an abutment engaging in said apertures said abutment engageable by a bolt entering between said members, said abutment pressing the bolt against said hook members.

18. The combination, with a bolt, of latching means movable by said bolt and adapted to hold the latter in latched position, abutment means movable to engage and press said bolt against said latching means, and means including a slidable member for operating said latching means to release the bolt.

19. Latch means comprising opposed members separable one from the other by the insertion of a bolt therebetween, abutment means supported by said opposed members engageable by the bolt entering between said opposed members, said abutment means pressing the bolt against said opposed members, and means for operating said opposed members to release the bolt.

20. A latch comprising latching means movable to engage and hold a bolt in latched position, abutment means supported by said latching means adapted to engage and press the bolts against said latching means, and means for operating the latching means to release the bolt.

21. A latch comprising latching means movable to engage and hold a bolt in latched position, abutment means supported by said latching means adapted to engage and press the bolt against said latching means, means for operating the latching means to release the bolt, and means acting through such operating means normally retaining said latching means in latched position.

22. A latch comprising opposed pivoted latching members movable to engage and hold a bolt in latched position, an abutment member supported by said latching members and adapted to engage and press the bolt against said latching members, and means for operating the latching members to release the bolt.

23. A latch comprising opposed pivoted hook members movable to engage and hold a bolt in latched position, an abutment member supported by said hook members adapted to engage and press the bolt against said hook members, and means for operating said hook members to release the bolt.

24. A latch comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, said hook members each provided with an aperture, an abutment member engaging in said apertures adapted to engage and press said bolt against said hook members, and means for operating said hook members to release the bolt.

25. A latch comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, said hook members each provided with an aperture, an abutment member engaging in said apertures adapted to engage and press said bolt against said hook members, means for operating said hook members to release the bolt, and means acting through such operating means normally retaining said hook members in latched position.

26. A latch comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, said hook members each provided with an aperture, an abutment member engaging in said apertures adapted to engage and press said bolt against said hook members, opposed pivoted members engaging said hook members for operating said hook members to release the bolt, a slidable member engaging and operating such pivoted operating members, and handle means for operating said slidable member.

27. A latch comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, said hook members each provided with an aperture, an abutment member engaging in said apertures adapted to engage and press said bolt against said hook members, opposed pivoted members engaging said hook members for operating said hook members to release the bolt, a slidable member engaging and operating said slidable member, and spring means acting through said slidable member and such pivoted operating members to normally retain the hook members in latched position.

28. A latch comprising opposed pivoted hook members separable one from the other by the insertion of a bolt therebetween, an abutment member supported by said hook members adapted to engage and press the bolt against said hook members, opposed pivoted levers for operating said hook members, a slide mounted between said levers for operating the latter, said slide provided with an offset bend intermediate its ends and laterally projecting lugs adjacent one end, each of said levers provided with two notches, one of said hook members engaging in one of said notches of one of said levers and one of said lugs on said slide engaging in the other notch of the same lever, spring means engaging and holding said slide in a certain position, and a pivoted hand lever engaging the offset bend of said slide to operate said slide against the tension of said spring.

In testimony whereof I hereunto affix my signature.

FRANCIS M. VANDERVOORT.