

Aug. 24, 1926.

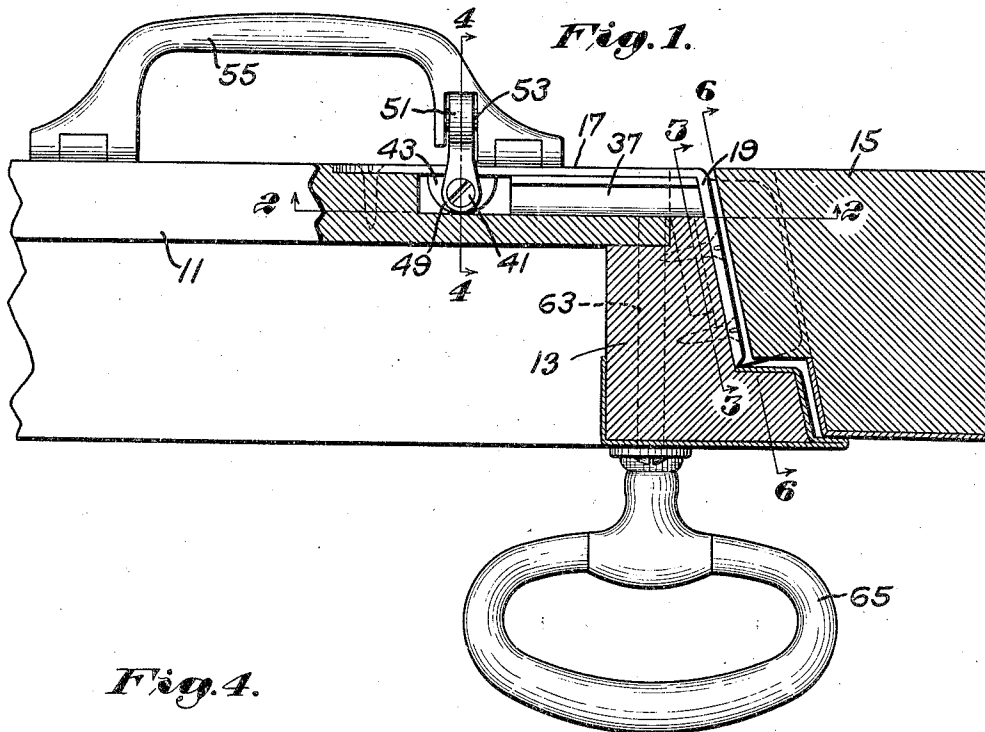
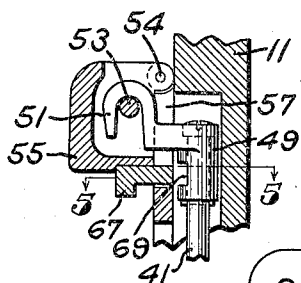
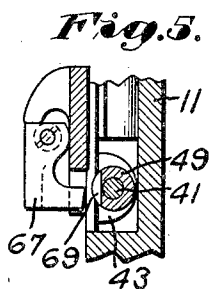
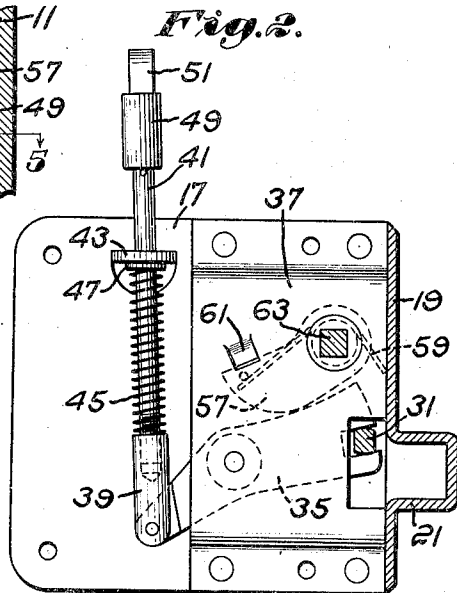
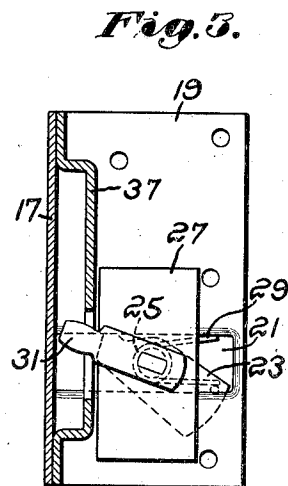
1,597,510

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DOOR LATCH

Filed Dec. 20, 1923

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 6.

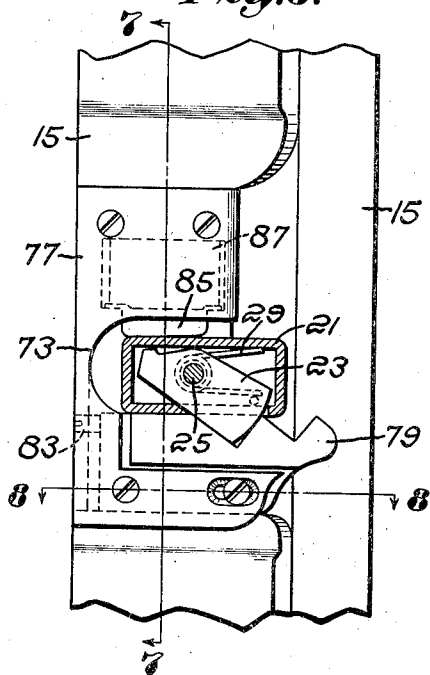


Fig. 7.

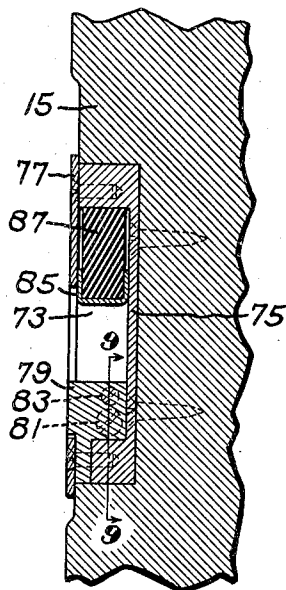


Fig. 8.

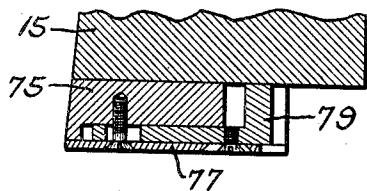
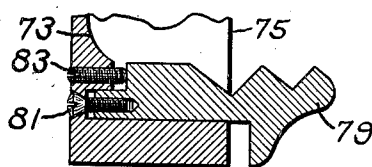


Fig. 9.



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DOOR LATCH.

Application filed December 20, 1923. Serial No. 681,770.

This invention relates to a latching mechanism for closures and finds a particular application to the door latches of automotive vehicles and in particular to vehicles of the closed type. The object of the invention is to provide a simple construction of this character which will be effective and convenient in use and have advantages which will more fully appear as the detailed description proceeds.

In the accompanying drawings I have shown by way of example an illustrative embodiment of my invention as applied to the door of an automobile and in these drawings:—

Fig. 1 is a partial section along a horizontal line through the framing of an automobile door and the jamb against which it closes;

Figs. 2 to 4, inclusive, are sections on the correspondingly numbered lines of Fig. 1;

Fig. 5 is a section on line 5—5 of Fig. 4;

Fig. 6 is a section on line 6—6 of Fig. 1;

Figs. 7 and 8 are sections on the correspondingly numbered lines of Fig. 6; and

Fig. 9 is a section on line 9—9 of Fig. 7.

Referring to Fig. 1 of the drawings, I have there shown a portion of the vehicle door including a lock bar 11 and a rabbetted lock pillar or stile 13, the latter adapted to close inwardly against the jamb 15. An important feature of my invention is the provision of a strong and easily operated latching mechanism which for its installation will require very little cutting away of the lock bar and lock pillar so that these parts will not be weakened and so that the installation of the latch will be simplified. In the preferred embodiment of my invention herein illustrated this purpose is attained in a construction utilizing a bolt pivoted on a horizontal axis at the edge of the door, that is, on the face of the lock pillar which adjoins the jamb when the door is closed.

Referring particularly to Figs. 1, 2 and 3 of the drawings, the latching mechanism herein shown is organized on a casing of generally angular form including a plate 17 adapted to be placed flush with the inner face of the door, being mortised into the lock rail 11, and a flange 19 adapted to be set flush with the edge of the door. From the flange 19 projects outwardly a hollow housing 21, best shown in Fig. 2, which ac-

commodates, as shown in Fig. 6, a latch bolt 23 which may be pivoted on a substantially horizontal axis formed by a pin 25 journaled in the outer wall of the housing and in an inner wall formed by the plate 27 fixed to the inner surface of the flange 19. The end of the bolt is projected by the spring 29 through a suitable opening in the bottom of the housing to engage a keeper on the door jamb, as shown in Fig. 6 and as hereinafter more fully to be explained, the door swinging to closed position from the right hand side in Fig. 6. The upper portion of the housing 21 may serve as a stop for the bolt, as will be understood from Fig. 6. To swing the bolt against the force of the spring 29 to retract it within the casing and permit the door to be opened, there may be provided on the pivot 25 an arm 31 located inwardly of the flange 19, lying flat against the same and extending towards the angle defined between the plate 17 and the flange 19. This arm 31 is in effect the tail of the latching bolt and the bolt proper 23 and the arm 31 are preferably related one to another as are the parts of a lever of the first class. When installed on the door it will be noted that the housing and the relatively heavy bolt project outwardly from the face of the lock pillar 13 and that a relatively shallow portion of the latter is cut away to accommodate the arm 31.

The arm 31 may be operated to swing the bolt (see Fig. 2) by means of a flat lever 35 lying against the inner face of the plate 17 and having a forked end engaging the end of the arm 31 adjacent the junction of this plate with the flange 19. The arm 31 may be pivoted on the plate 17 and on the auxiliary plate 37 secured thereto and forming a partial housing for this lever and other mechanism to be described. If the lever 35 is swung clockwise viewing Fig. 2, the end of arm 31, viewing Fig. 3, will be depressed and the latch bolt 23 will be retracted within the housing 21 against the force of spring 29.

The lever 35 lies close to the plate 17 and the operating mechanism therefor herein provided permits the latch bolt to be operated either from the inside or outside of the door without cutting away the lock bar 11 except to the shallow depth sufficient to accommodate the casing formed by the plates 110

17 and 37, as shown in Fig. 3, which houses the flat lever 35 and certain other mechanisms herein to be described. In the case of a metallic lock bar the casing would ordinarily be housed in a depression pressed out from the lock bar and in this case too the minimum depth of the casing is an advantage.

The lever 35 may be operated from the interior of the door by means of a pull rod operating on the end thereof and moving substantially in the plane of the plate 17 and of the interior surface of the door without the necessity of any play transversely of the door which would necessitate considerable cutting away of the lock bar. In the present embodiment of the invention this pull rod may comprise a forked nut 39 pinned to the end of lever 35 into which nut taps the screw 41, this threaded engagement of the two parts providing for an adjustment of the length of the pull rod. The screw 41 passes loosely through an ear 43 struck up from the plate 17 and normally is urged downwardly, viewing Fig. 2, by means of the spring 45 interposed between the face of nut 39 and a suitable washer 47 which makes contact with the ear 43. The pull rod operates in a substantially vertical plane adjacent the inner surface of the door in the shallow mortise receiving the lock casing, as is best shown in Figs. 1 and 4. Any suitable means may be utilized for operating the pull rod. Herein I have shown a sleeve 49 swivelled on the upper end of the screw 41 under the head thereof, which sleeve carries a hook 51 projecting to the outside of the interior surface of the door and engaging over a pin 53 eccentrically mounted with respect to one of the pintles 54 of a bail-like handle 55, pivoted at its ends to hinge leaves 57 secured at the inner face of the door. As will be apparent from Fig. 4, a lifting movement of this handle, that is, a clockwise swinging movement thereof, will lift the pull rod 41. The swivelling of the sleeve 49 on the rod 41 facilitates assembly of the parts and promotes their easy action and it leaves exposed the end of the screw 41, which may be provided with the ordinary notch, so that the screw may be rotated with a screw-driver to adjust the length of the rod.

Since the rod 41 acts on the latch bolt through the medium of the lever 35, the proportion of the arms of this lever may be made such that a sufficient range of movement may be given to the latch bolt through a relatively small movement of the rod. Therefore the pin 53 may be located close to the center of motion 54 and any lateral movement of the rod in its lifting movement is negligible. Thus the rod may act substantially in the plane of the plate 17 and in an exceedingly shallow space. The provision of the lever, furthermore, provides for

transmission of motion from the lifting rod through a pair of flat links, the lever 35 and the arm 31 which lie closely adjacent the flanges 17 and 19 of the casing and moves substantially in the plane of those flanges so that the lock pillar is cut away to a minimum extent.

The lever 35 also provides a means whereby the bolt may be readily operated from the exterior of the door without substantial further weakening of the door frame. For this purpose (see Fig. 2) a wiper or cam 57 lying flat in the space between the plate 17 and the plate 37 and trunnioned in these two plates may be provided. A spring 59 normally presses the wiper away from the lever 35 and against a stop 61 struck up from the plate 37. The trunnion of the wiper may receive a square spindle 63 extending inwardly from the exterior surface of the door where it is provided with a suitable operating handle 65. By means of this spindle the wiper 57 may be rotated counterclockwise, viewing Fig. 2, to rock the lever 35 clockwise and raise the bolt. It will be seen that the operating mechanism for opening the door from the outside comprises the wiper 57 installed with the lever 35 and push rod 41 in a shallow region adjacent the plate 17 and accommodated in the same shallow mortise of the lock bar and that the spindle 63 reaches through a small hole bored through the body of the lock pillar 13 which is easy to make and will not substantially weaken the pillar. The heavy latch bolt 23 is organized exteriorly of the flange 19 and the operating means therefor lies in two shallow mortises adjacent the corner of the door leaving the lock bar and the lock pillar substantially undiminished in strength. These mortises obviously can be cut very expeditiously and conveniently and the assembled latch mechanism, as illustrated in Figs. 2 and 3, simply screwed in position.

It will be noted that the construction utilizes handles installed entirely on the interior and exterior surfaces respectively of the door and is thus adaptable to the door of a closed vehicle. In such a vehicle a bail-like handle 55 as shown is convenient to pull the door shut towards the occupant and it will be noted that the natural motion of pulling on such a handle tends to swing the same, lift the push rod and raise the bolt so that the door shuts easily without the necessity of snapping the bolt over the keeper. In the construction shown provision is made whereby an occupant of the vehicle on the inner side of the door may conveniently prevent the door from being opened by use of the exterior handle 65. For this purpose there is herein provided a dog 67 pivoted to the handle 55 (see Fig. 5) and which may be swung inwardly to engage a notch 69 in the sleeve 49, thus pre-

venting lifting of the rod 41 and consequently movement of the lever 35 so that the latter is locked against operation by the wiper 57 on the spindle of handle 65. At the same time the proportion of parts is such that a swinging movement of the handle 55 will be permitted, the dog 67 withdrawing from the notch 69 and permitting the opening of the door of the vehicle in emergency without the necessity of operating the small dog 67 with the fingers.

Referring to Figs. 6 to 9, I shall next describe the particular construction of strike or keeper herein illustrated. This comprises a jamb fitting adapted to be set in a mortise in the jamb 15 substantially flush with the face thereof which opposes the edge of the door and having a recess 73 opening towards the exterior of the door into which the housing 21 is adapted to close as indicated in Fig. 6. Preferably this fitting is presented flush with the interior of the jamb, the recess which accommodates it being a groove extended across the raised portion of the latter for a purpose hereinafter to be explained. In the form of the invention shown this fitting comprises a back plate 75 secured to the jamb and having flanges at the top, bottom and back defining the recess 73 and providing for the support of the keeper proper and a co-operating mechanism hereinafter to be described, which portions may be maintained in position by a cover plate 77 screwed to the flanges. On one side of the recess 73 is provided a strike or keeper bar 79 consisting of a bar slidably supported on the lower flange of the fitting and having one or more notches upwardly presented to receive the latch bolt 23 in the manner indicated in Fig. 6. Adjustment of this member is provided for as best shown in Fig. 9 by means of a set screw 81 extending from the rear of the jamb fitting and tapped into the member 79 and a cooperating set screw 83 threaded into the fitting of the rear and bearing against the member 79, the screw 81 being adapted to pull the member 79 to the left viewing Fig. 9 against the end of the screw 83, providing an effective means for holding the keeper 79 in desired adjusted position. It will be noted that the heads of these screws, as indicated by the showing in dotted lines of the screw 83 in Fig. 6, are presented at the back of the keeper member and are readily accessible from the inner side of the door jamb.

Opposing the keeper 79 and serving both to cushion the closing movement of the door and to align the door properly with the door casing, there may be provided a resiliently displaceable member adapted to bear on the bolt housing 21 and press it into cooperation with the keeper 79. Herein this buffer takes the form of a flanged metal shoe 85 for contact with the casing 21 resiliently

supported against upward movement by a block of rubber 87, the device being secured in a suitable recess in the keeper member closed on the outside by the plate 77, as will be readily understood from Fig. 6, a portion of the shoe 85 projecting through the restricted lower opening of this recess opposite the keeper 79 and being maintained therein by its flanges which rest on the sides of this opening. The removal of the plate 77 provides ready access to this member for renewal or repair.

I have described in considerable detail the particular mechanical construction shown in the accompanying drawings as an example of the invention in order that the details thereof might be clearly understood. It is clear, however, that all these details are not essential and that the mechanical construction may be widely varied without departing from the essential inventive ideas which will be defined in the annexed claims.

In referring to the various parts in these claims I will use such words as "inner" and "outer", "upper" and "lower" and the like, with reference to a lock as applied to an ordinary automobile door which opens outwardly and on which the lock would be installed with the handle 55 at the inner side of the door and the handle 65 at the outer side, the door lying in a vertical plane. It will be obvious, however, that these words are merely relative and used in an exemplary sense.

I claim:—

1. Door latch mechanism comprising a latch casing including a plate and flange to fit one side and the edge of the door, a pivot carried by said flange and supporting a swinging bolt exteriorly of the flange and means for operating the bolt comprising shallow links organized adjacent said plate and flange and interconnected adjacent the angle between the latter whereby a minimum portion of lock pillar and lock rail need be cut away to receive said casing.

2. Door latch mechanism comprising a latch casing having a flange adapted to lie at the edge of the door, a bolt pivoted externally of said edge on a horizontal pivot, an arm interior to said flange for turning said pivot and extending toward one side of the door, and means for moving said arm comprising a lever swinging substantially in the plane of said side of the door.

3. Door latch mechanism comprising a latch casing having a plate to lie at one side of the door and a flange to lie at the edge of the door, a housing projecting from said flange, a bolt received in said housing and adapted to swing on a horizontal pivot extending in the plane of the door, an arm inwardly of the flange for turning the bolt,

the bolt and arm being related one to another as the parts of a lever of the first class, and means for operating the bolt comprising a lever pivoted to said plate and engaging the end of the arm.

4. Door latch mechanism comprising a plate fitting a side of the door having a flange fitting the edge thereof, a bolt pivoted to said flange to swing in a plane perpendicular to the door, a lever pivoted to the plate for operating the bolt and a pull rod guided in said plate for movement substantially in a vertical plane for swinging said lever.

5. Door latch mechanism comprising a plate fitting a side of the door having a flange fitting the edge thereof, a bolt pivoted to said flange to swing in a plane perpendicular to the door, a lever pivoted to the plate for operating the bolt and a wiper pivoted on said plate for rocking the lever and having an opening to receive an operating spindle from the other side of the door.

6. Door latch mechanism comprising a plate fitting a side of the door having a flange fitting the edge thereof, a bolt pivoted to said flange to swing in a plane perpendicular to the door, a lever pivoted to the plate for operating the bolt, a pull rod guided in said plate for movement substantially in a vertical plane for swinging said lever and a wiper pivoted on said plate for rocking the lever and having an opening to receive an operating spindle from the other side of the door.

7. Door latch mechanism comprising a bolt pivoted between its ends at the edge of the door, a lever at the inner face of the door for operating on the tail of the bolt, link-work at the inner face of the door for working said lever from that side, a wiper cooperating with the lever and a handle spindle extending through the door to engage the wiper.

8. Door latch mechanism comprising a bolt pivoted between its ends at the edge of the door, a lever at the inner face of the door operating on the tail of the bolt, a link for rocking the lever and means for operating the link without substantial movement thereof from a single plane, whereby operating mechanism for the bolt is provided within a restricted space.

9. Door latch mechanism comprising a bolt pivoted at the edge of the door on an axis extending substantially in the plane of the door and having a keeper engaging end pointing toward the outside of the door, mechanism organized in a shallow space at the interior of the door for operating on the tail of the bolt to swing the same and a spindle extending from the exterior of the door to engage said mechanism for operating the same from the exterior.

10. Door latching mechanism comprising a plate applicable to the edge of the door, a bolt located between the planes of the sides of the door and pivoted exteriorly of the plate to swing in a plane transverse to the door about a horizontal axis, the end of said bolt pointing outwardly and a co-operating keeper having an upwardly and inwardly opening notch.

11. The mechanism as defined in claim 10 wherein the bolt is received in a housing projecting from said plate having an opening at the bottom thereof through which the engaging portion of the bolt is projected.

12. The mechanism as defined in claim 10 wherein the bolt is received in a housing projecting from said plate having an opening at the bottom thereof through which the engaging portion of the bolt is projected and a wall forming a stop engaging the bolt on the opposite side of its pivot.

13. Door latching mechanism including a plate applicable to the edge of the door, a bolt exterior of the plate having a horizontal pivot about which it may swing in a plane transverse to the door projecting through the plate and means for operating the bolt comprising an arm on the pivot at the interior of the plate and lying substantially parallel to the plate closely adjacent thereto.

14. Door latching mechanism comprising an angle plate having flanges to fit one face and the edge of the door respectively, a bolt located between the two sides of the door exterior to the second flange and having a horizontal pivot about which it may swing in a plane transverse to the door, which pivot projects through said flange, and means for turning the pivot to operate the bolt comprising linkwork organized in shallow regions adjacent the flanges of the angle plate.

15. In door latch mechanism a latch bolt, an operating lever therefor, means for operating the lever from one side of the door comprising a link, means for operating it from the other side of the door comprising a spindle-operated wiper, and a shiftable dog to engage the link and thereby lock the lever against operation by the wiper.

16. In door latch mechanism in combination a recessed jamb fitting having a keeper at one side thereof and a latch casing having a hollow housing projecting at the door edge to enter said fitting, and a bolt pivoted to swing in a plane perpendicular to the door having a portion projected through the housing to engage the keeper.

17. In door latch mechanism, in combination, a jamb fitting having a recess open toward one side of the door and having a keeper along the bottom thereof and a latch casing comprising a housing projecting at

the edge of the door and entering said recess through the open side thereof, said housing having an opening in the bottom thereof and a bolt pivoted in the housing on a horizontal pivot to swing in a plane transverse to the door and projecting through said opening to engage the keeper.

18. In door latch mechanism in combination a recessed jamb fitting having at one side thereof a notched keeper and opposite a member resiliently pressed toward the keeper, a latch casing having a housing to enter between said keeper and member, and a bolt pivoted to swing in a plane perpendicular to the door projected through the housing to engage a notch of the keeper.

19. A jamb fitting adapted to be secured to the door jamb and having a recess opening to the outer side of the door, a keeper slidably received at one side of the recess and an adjusting screw therefor accessible at the inner side of the fitting.

20. Door latch mechanism comprising a jamb fitting adapted to be secured to the door jamb and having a recess opening to the outer side of the door, a keeper slidably received at one side of the recess and an adjusting screw therefor accessible at the inner side of the fitting and in combination therewith a door fitting having a housing to enter and fit said recess and a bolt pivoted on a horizontal axis and projected from said housing to engage the keeper.

21. A structure as defined in claim 20 and including a member at the side of the recess opposing the keeper resiliently to bear on said housing.

22. A jamb fitting having a recess opening toward the side from which the door closes, one horizontal side of said recess being defined by a notched keeper, and a vertically yieldable bumper on the opposite horizontal side.

23. A jamb fitting having a recess opening toward the side from which the door closes, one horizontal side of said recess being defined by a notched keeper slidably mounted for horizontal adjustment, and a

vertically yieldable bumper on the opposite horizontal side.

24. A jamb fitting having a recess opening toward the side from which the door closes, a notched keeper slidably supported at one horizontal side of the recess and means for adjusting the keeper comprising a screw having an operating portion exposed at the rear of said fitting.

25. Door latching mechanism comprising a jamb fitting having a recess opening toward the outer face of the door, door-aligning means projecting into said recess, a door fitting comprising a bolt housing projecting from the edge of the door adapted to enter the recess and cooperate with the fitting and a bolt pivoted in said housing to swing about a horizontal pivot in a plane transverse to the door, which bolt is spring projected through a side of the housing to latch with said jamb fitting.

26. Door latching mechanism comprising means for operating the bolt including a pull rod, said rod comprising two parts threaded together and providing for adjustment and a spring against which said rod operates embracing the rod and tending longitudinally to separate the parts thereby holding the threads engaged and the parts in adjusted position.

27. Door latch mechanism comprising a latch bolt, an inner handle, mechanism operated thereby to retract the bolt, an outer handle also operating on said mechanism to retract the bolt, a dog carried by the inner handle and separately manually protractable to engage and lock a part of said mechanism whereby the retraction of the bolt by the outer handle is blocked, said dog in its protracted position moving freely with said inner handle in its normal stroke both into and out from engagement with said mechanism whereby retraction of the bolt by the inner handle is freely possible independently of the position of said dog.

In testimony whereof, I have signed my name to this specification.

HERMENEGILDE CARRIER.