

Feb. 8, 1938.

H. M. KILPATRICK

2,107,299

LATCH

Original Filed May 20, 1929

2 Sheets-Sheet 1

Fig. 1.

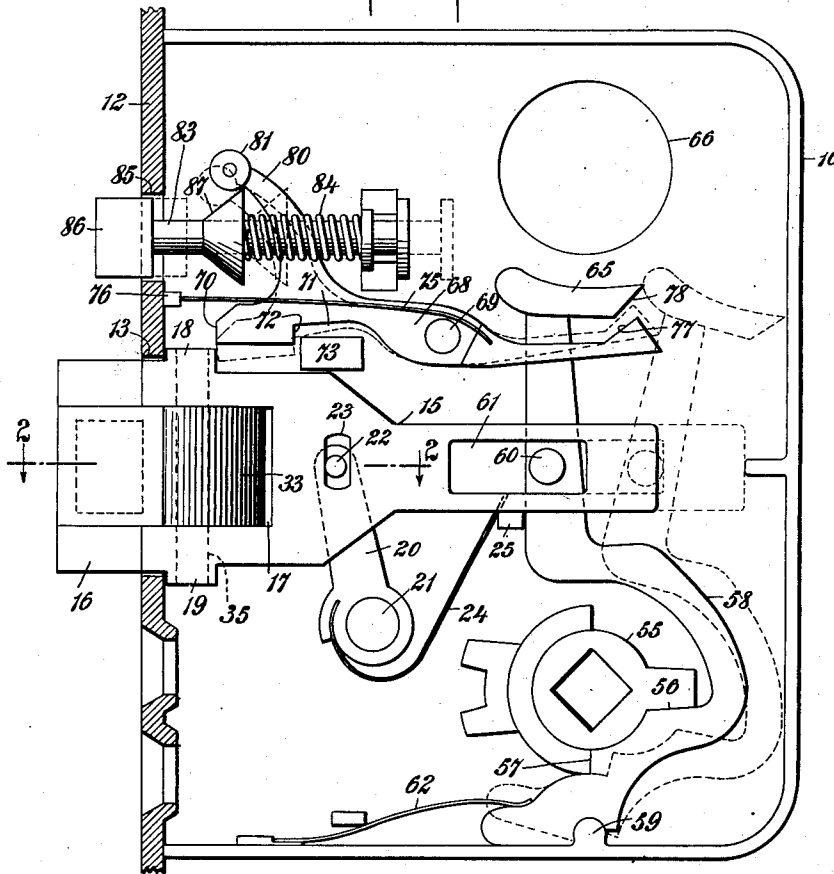


Fig. 5

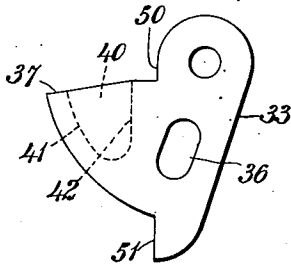
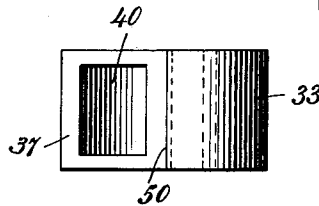


Fig. 6.



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2 Sheets-Sheet 2

Fig. 2.

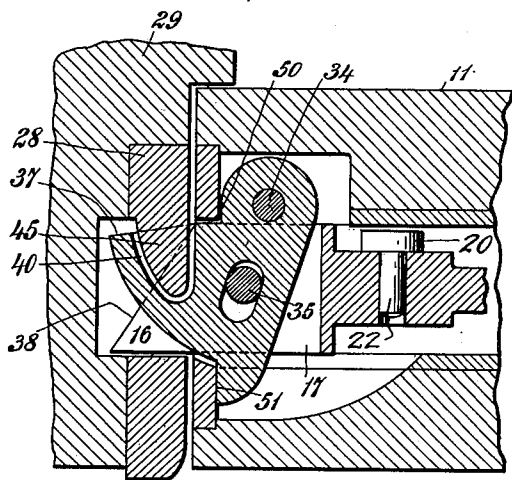


Fig. 4.

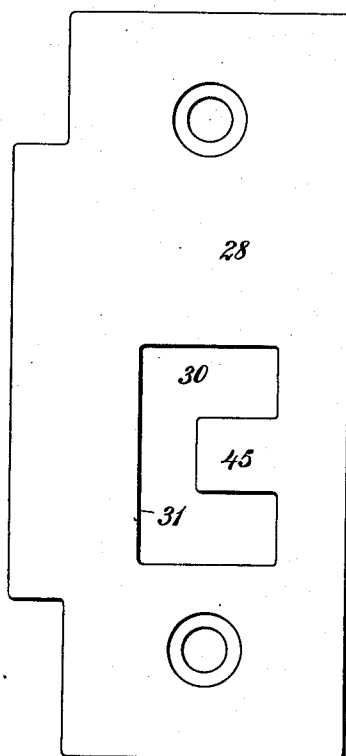
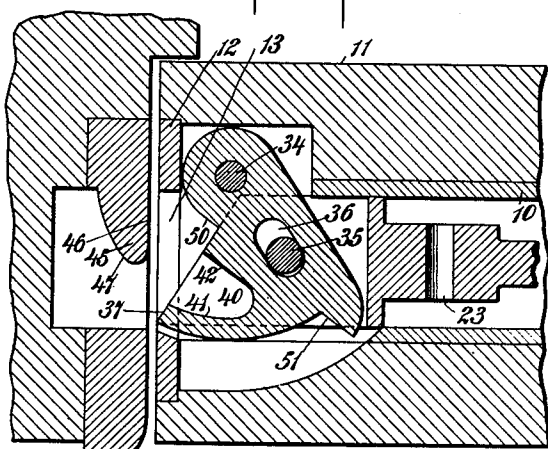


Fig. 3.



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UNITED STATES PATENT OFFICE

2,107,299

LATCH

Howard M. Kilpatrick, New York, N. Y.

Application May 20, 1929, Serial No. 364,650

Renewed January 16, 1933

19 Claims. (Cl. 292—192)

This invention relates to door locks and latches and more particularly to automatic dead locking latches having antifriction devices for retracting the latch when the door is closed, though it is noted that the invention is not limited to antifriction devices nor to latches, dead locking latches or bolts.

One object of the invention is to provide an apparatus or device of this kind having means for automatically locking the latch in the opening of its striking plate, to prevent the door from being forced by forcing the door and door jamb apart, to make the door jimmy proof.

Another object of the invention is to provide an apparatus or device of this kind having latch dogging means, means for strengthening the apparatus and means for rendering the dogging means inaccessible.

Another object of the invention is to provide an arrangement whereby the above means may have a broader application than is associated with latches.

Other objects of the invention are to improve generally the simplicity and efficiency of such apparatus and to provide a device or apparatus of this kind which is economical, durable and reliable in operation, and economical to manufacture.

Still other objects of the invention will appear as the description proceeds; and while herein details of the invention are described and claimed, the invention is not limited to these, since many and various changes may be made without departing from the scope of the invention as claimed in the broader claims.

Matter shown herein is in part claimed in my copending application Serial No. 625,123, filed July 27, 1932, and allowed May 15, 1937.

The inventive features for the accomplishment of these and other objects are shown herein in connection with an improved dead locking latch which, briefly stated, includes a latch slidable in a casing and having an antifriction lever receiving recess in which is received an antifriction lever having its forward end pivoted to the casing and provided intermediately with a radial slot in which is engaged a vertical pin fast in said head.

The active face part of the lever is provided with a large deep recess having its outer face co-axial with the lever.

The striking plate is integrally provided intermediately of the forward edge of its latch receiving opening with a rearwardly disposed locking lug having its inner face co-axial with the outer face of said recess and adapted to be received in said deep recess when the lever is projected.

Automatic dogging means are provided whereby the latch and lever are automatically locked in projected position when the door is latched closed, thus preventing the forceful separation of said lever and recess from said lug and said lever and latch from the striking plate.

In the accompanying drawings, Fig. 1 is a rear elevation of the lock with the cover plate removed.

Figs. 2 and 3 are fragmental horizontal sectional views, partly in plan, showing the latch and antifriction lever in different positions, the section being taken substantially on the line 2—2 of Fig. 1, looking in the direction of the arrows of said line.

Fig. 4 is an outer face view of the striking plate; and

Figs. 5 and 6 are front elevation and plan of the antifriction lever.

My invention is shown in combination with a lock having a casing adapted to be secured in a door (Figs. 2 and 3) and having at its outer edge a face plate 12 having a latch opening 13 receiving a latch 15 slidable in said casing and having a forwardly beveled split bolt head 16 providing a centre antifriction lever receiving recess 17 and provided with limiting and dogging lugs 18, 19 (Fig. 1) on its top and bottom faces.

Spring means are provided for projecting the latch and are shown as comprising a lever 20 pivoted at 21 and provided with a pin 22 engaging in the slot 23 of the latch. A spring 24 carried by the lever and engaging a lug 25 causes the lever to project the latch.

A striking plate 28 (Fig. 2) adapted to be secured to a door jamb 29 is provided with a single latch-receiving locking-opening 30 (Fig. 5) having a rear locking edge 31 against which the latch head 15 engages to hold the door closed.

An antifriction lever 33 is disposed in said recess 17 and has its forward end pivoted on the pin 34 carried by the casing.

A vertical pin 35 fast in said head passes through a radial slot 36, whereby when the forward active face 37 of the lever projecting forward of the beveled face 38 of the latch strikes the striking plate as the door closes, a wall of said slot 36 presses said pin to retract the latch approximately to the position of Fig. 3.

The active face part 37 of the antifriction lever is provided with a large deep recess 40 having its outer face 41 co-axial with the lever and its inner face 42 normally substantially coincident with the outer face of the face plate 12, as in Fig. 2.

The striking plate 28 is integrally provided intermediately of the forward edge of the open-

ing 30 with a rearwardly disposed locking lug 45 adapted to be received in said recess 40 (Fig. 2) when the door is latched, and has its outer face 46 (Fig. 3) substantially flush with the outer face of the striking plate, and its inner face 47 co-axial with the outer face of said recess 40 when the door is latched. Thus the provision of the recess 40 forms, on the lever 33, an undercut part substantially engageable at the face 41 with the face 47.

Suitable dogging means later to be described automatically locks the latch in projected position when the door is latched closed, whereby the bolt-head 16 and the antifriction lever 33 are locked in their projected position and held against removal from the locking opening and the locking lug, the latch head holding the lever 33 with its recess 40 received on the lug 45. The front and rear parts of the lever are shouldered as at 50, 51 to engage the inner face of the face plate to positively hold the lever in the casings.

Any suitable latch operating and dogging means may be used, the one illustrated being merely by way of example.

A knob-shaft-receiving split hub 55 (Fig. 1) below the latch is provided with active shoulders 56, 57 engaging a latch-retracting-lever 58 pivoted at 59 and having a pin and slot lost-motion connection 60, 61 with the latch, whereby the latch may be pushed back independently of the retracting lever 58 or by a lost-motion movement of the retracting lever, the spring 62 restoring the lever.

The upper end of the retracting lever has an off-set head 65 engageable by the roll back of a cylinder lock carried in the circular opening 66, for retracting the lever and latch to the position of the dotted lines of Fig. 1.

A dogging lever 68, intermediately pivoted as at 69 to the casing above the latch, is provided with a front abutment end 70 adapted when lowered to press upon the dogging lug 18, if the latch is retracted, and to engage behind the lug, as shown by the dotted lines, to deadlock the latch, if the latch is projected. The lower face of the abutment end has a long notch 71 providing a rearwardly faced shoulder 72 at its front end; with an abutment member 73 mounted fast in the casing, engageable when the abutment is lowered.

A spring 75 carried by said lever 68 and engaging in a seat 76 yieldably presses said abutment end 70 downward. The rear end of the dogging lever is provided with an upturned end 77 engageable with the rear cam face 78 of the head 65 when in dogging position, whereby retracting movement of the retracting lever 58 raises said abutment end 70 before the lost-motion connection retracts 60, 61 the latch.

An upturned branch arm 80 on said dogging lever carries an off-set roller 81 on the upper end of the arm disposed a considerable distance above said abutment end 70 and above a guard latch 83 guided, and yieldably forwardly pressed by a spring 84, through an opening 85 in the face plate and provided with a forwardly beveled projecting end 86 engageable with the striking plate remote from the opening therein. Said guard latch has on its upper part an upwardly and rearwardly inclined cam 87 adapted to raise said roller 81 and the dogging lever when the door is open and the guard latch projected to the position of Fig. 1, and to move out of contact with said roller when the door is closed and the guard latch pushed back, thereby to permit

said abutment end 70 to drop to the dogging position shown by the dotted lines.

The operation of the lock is very simple, as is obvious from the foregoing, and now need be only briefly summarized.

When the door is in normal open position, the parts are as shown in the full lines of Fig. 1.

When the door is slammed closed, the active face 37 (Figs. 2 and 4) of the antifriction lever 33 strikes the striking plate and forces the lever 33 and latch back.

Before the guard latch 83 has struck the striking plate, the lug 18 has moved back under the abutment end 70, and when the latch 83 is retracted by the striking plate and the cam 87 moves from under the roller 81, the abutment end 70 rests on the lug 18.

Further closing movement of the door then pushes the latch and antifriction lever back almost to the position of Fig. 3, and when the door is completely closed these snap to the position of Fig. 2, and the abutment end snaps to the position of Fig. 1.

Thus the latch is positively held projected by the dogging lever 68; and the pin 35, being rigid on the latch, positively holds the antifriction lever in projected position. In this locked position the pin 35 prevents the antifriction lever from pivotally moving from around the lug 45; the lug 45 prevents the antifriction lever from being pulled perpendicularly from the opening 30, and the locked latch head 16 and the pivot 34 prevent the antifriction lever from moving toward the edge 31.

Thus the head 16 and antifriction lever cannot be removed from the opening 30, without breaking the lock, unless the abutment end 71 of the dogging lever be raised to the position of the full lines. The lug 18 prevents the insertion of a tool through the opening 12 to the abutment end 70; and the large abutment 73 takes breaking strain from the pivot 69.

If an attempt be made to force the face plate 12 and the striking plate apart, the shoulders 50 and 51 hold the antifriction lever in the lock, and the lug 45 is made thick and strong to prevent breakage.

When it is desired to open the door by the key or knob, initial movement of the retracting lever, before the pin 60 reaches the rear of the slot 61, causes the cam face 78 to depress the end 77 and raise the end 70, thus undogging the latch, whereupon further movement of the pin 60 retracts the latch to the position of the dotted lines and of the full lines of Fig. 3.

The recess 40 and the lug 45 may be applied to any latch of the guarded-bolt, antifriction-lever type herein shown without substantial change; but the increased safety resulting from the arrangement makes it worth while to make the parts of the lock stronger than heretofore.

It is noted that the antifriction lever is not controlled by the projecting part of the latch, and that the invention is, therefore, not limited to the presence or absence claimed in some of the claims of a latch. The use of the expressions "front", "rear", "above" and the like, are for designations only, and it is understood that the claims are to be construed broadly and not limited to any position of the apparatus as a whole.

It is noted that all of the herein mentioned objects and advantages are accomplished by an assembly which departs only slightly from standard practice in latches.

The lateral edges of the lever 33 are substan-

tially continuous and straight so that this lever will not hook over any portion of the striker plate except the lug 45.

I claim as my invention:

5 1. A fastener for cooperation with a striking plate having an opening provided with an inner rear locking shoulder, said fastener comprising a casing having a face plate having an opening; a lever in said second opening having one end of the lever pivotally connected with said casing, the opposite end being free, said lever having an overhanging part adapted to engage behind said inner rear locking shoulder; the free end of the lever having a projecting shoulder engaging the inner face of said face plate when the lever is projected, to prevent the lever from being withdrawn from the face plate when separating stress is applied between the striking plate and the casing.

20 2. A fastener for cooperation with a striking plate having an opening provided with a rear locking shoulder, said fastener comprising a casing having a face plate having an opening; a lever in said second opening having one end of the lever pivotally connected with said casing, the opposite end being free; said lever having an overhanging part adapted to engage behind said rear locking shoulder; the pivot end and the free end of the lever having projecting shoulders engaging the inner face of said face plate when the lever is projected.

3. A latch for cooperation with a striking plate having an opening provided with a rear locking shoulder, said latch comprising a casing having a face plate having an opening; a yieldably projected lever in said second opening having one end of the lever pivotally connected with said casing, the opposite end being free; said lever having an overhanging part adapted to engage behind said rear locking shoulder; the pivot end and the free end of the lever having projecting shoulders engaging the inner face of said face plate when the lever is projected, to prevent the lever from being withdrawn from the face plate and to prevent strain on the pivot connection, when separating stress is applied to said plates.

4. A latch for cooperation with a striking plate having an opening provided with a rear locking shoulder, said latch comprising a casing having a face plate having an opening; a bolt slidable in said openings; a lever in said second opening having one end of the lever pivotally connected with said casing, the opposite end being free; said lever having an overhanging part adapted to engage behind said rear locking shoulder; the pivot end and the free end of the lever having projecting shoulders engaging the inner face of said face plate when the lever is projected, to prevent the lever from being withdrawn from the face plate and to prevent strain on the pivot connection when separating stress is applied to said plates.

5. In a lock, a casing having an abutment therein; a latching member movable in said casing and having a dogging shoulder; a movable dogging member; guide means for the dogging member separate from said abutment; said dogging member being provided with a front abutment end and a rear shoulder respectively adapted when the bolt is dogged to engage behind the shoulder and in front of the abutment.

6. In a lock, a casing having an abutment therein; a latching member movable in said casing and having a dogging shoulder; a dogging member; pivot means for the dogging member

separate from said abutment end and a rear shoulder respectively adapted when the bolt is dogged to engage behind the shoulder and in front of the abutment.

7. A door locking means for a door having a jamb having a striking plate, a projecting engagement edge portion facing in door opening direction, and a locking shoulder facing in door closing direction and adapted to be engaged by a bolt to hold the bolt against movement in door opening direction, said striking plate having a shoulder forming portion facing in door opening direction and having an inner shoulder facing away from said door; the major portion of the face of said plate and said shoulder forming portion facing toward the door being all in a single plane substantially perpendicular to the plane of the door; the major portion of the inner face of the plate and said edge portion being in a single plane substantially perpendicular to the plane of the door; said locking means comprising a casing constructed for attachment to the door; a yieldably projected bolt slidable in the casing; and a member movably carried by said casing and having an overhanging part pointing in door closing direction when in locked position and formed to engage behind said inner shoulder when the bolt is in projected locking position when the door is closed; said member having a part constructed and positioned to prevent said overhanging part from hooking behind said projecting edge and to retract said member on door closing; and automatic dogging means for the bolt and member.

8. In a locking means for a door, a lock casing secured to the door; a striking plate attached to the door jamb substantially perpendicular to the plane of the door when in locking position and having an outer projecting engagement edge facing in door opening direction and provided with an opening, the inner edge of said opening most remote from said engagement edge facing in door opening direction and forming an inner shoulder faced away from the lock casing; and a lever pivoted to the casing and formed with an active engagement face engageable with said engagement edge during door closing movement to automatically retract the lever, and adapted to snap into said opening when locking position is reached, said lever having a recess in said active face forming an overhanging part engaging said inner shoulder when locked position is reached; a portion of said face being continuous in the plane of the face from the pivot end to the free end to prevent said overhanging part from hooking behind said engagement edge.

9. In a locking means for a door, a lock casing secured to the door; a striking plate attached to the door jamb and having an outer engagement edge facing in door opening direction and provided with an opening receiving the bolt, the inner edge of said opening most remote from said engagement edge facing in door opening direction and forming an inner shoulder faced away from the lock casing; and a lever pivoted to the casing and formed with an active engagement face having a part continuous in the plane of the face from pivot end to free end for engagement with said engagement edge during door closing movement to automatically retract the lever and bolt, and adapted to snap into said opening when locking position is reached, said lever having a recess forming an overhanging part engaging said inner shoulder when locked position is reached; and means for automatically dogging said lever

for locking said overhanging part behind said engagement edge.

10. A locking means for a door adapted for co-
operation with a striking plate, said plate having
an outer engagement edge facing in door opening
direction and an opening provided with an edge
facing toward said outer edge and provided with
a lug pointing toward said outer edge and forming
an inner shoulder behind the striking plate,
said locking means comprising: a casing; a fixed
pivot pin in the casing; and an antifriction lever
pivoted on said pin and having an active face
adapted during door closing movement to engage
with said outer edge of the striking plate to cause
the lever to retract the lever, said lever being
adapted to snap into said opening when locking
position is reached; said active face having an
intra-marginal recess therein adapted to receive
said lug and forming an overhanging part adapted
to engage behind said inner shoulder when in
locked position; said lever with said overhang-
ing part serving the multiple function of auto-
matically retracting the lever by engagement with
the striking plate and positively hold the striking
plate and casing together when separating stress
is applied and transmitting said stress directly
from the striking plate to the pivot pin and cas-
ing; a portion of said active face at opposite mar-
gins of said recess being continuous in the plane
of said face from the pivot end to the free end
of the lever; thereby furnishing a continuous en-
gagement face.

11. A locking means for a door adapted for
cooperation with a striking plate substantially
perpendicular to the plane of the door said plate
having an outer engagement edge facing in door
opening direction, and a bolt receiving opening
provided with an edge facing toward said outer
edge and provided with a lug pointing toward said
outer edge and forming a shoulder behind the
striking plate, said locking means comprising: a
casing; a yieldably projected latch bolt in the
casing and adapted when in locking position to
engage in said opening; a fixed pivot pin in the
casing; and an antifriction lever pivoted on said
pin and connected to the latch bolt, and having an
active face adapted during door closing move-
ment to engage with said outer edge of the strik-
ing plate to retract the lever and latch bolt, said
lever and bolt being adapted to snap into said
opening when locking position is reached; said
active face having a recess therein forming an
overhanging part adapted to engage behind said
shoulder when in locked position; said lever with
said overhanging part serving the multiple func-
tion of automatically retracting the lever and
latch by engagement with the striking plate and
positively holding the striking plate and casing
together when separating stress is applied and
transmitting said stress directly from the strik-
ing plate to the casing; a portion of said active
face at a margin of said recess being continuous
in the plane of said face from the pivot end to
the free end of the lever for continuous engage-
ment with said projecting outer edge during lever
retraction.

12. A locking means for a door suitable for co-
operation with a thin single plane striking plate
substantially perpendicular to the plane of the
door, and having a projecting outer edge facing
in door opening direction and an opening pro-
vided with an edge facing toward said outer edge
and provided with a lug pointing toward said
outer edge and forming an inner shoulder behind
the striking plate, said locking means compris-

ing: a casing; a fixed pivot pin in the casing; a
yieldably projected antifriction lever pivoted to
said pin and having an active face adapted dur-
ing door closing movement to engage with said
outer edge of the striking plate to retract the
lever, said lever adapted to snap into said open-
ing when locking position is reached; said active
face having a recess therein forming an over-
hanging part adapted to engage behind said inner
shoulder when in locked position; said lever with
said overhanging part serving the multiple func-
tion of automatically retracting the lever and
holding the striking plate and casing together
when separating stress is applied and transmit-
ting said stress directly from the striking plate
to the casing; a portion of said active face at a
margin of said recess being continuous in the
plane of said face from the pivot end to the free
end of the lever; thereby preventing said over-
hanging part from hooking on said projecting
outer edge.

13. A striking plate for use substantially per-
pendicular to the plane of the door, said plate
having an outer engagement edge facing in door
opening direction and a bolt receiving opening
provided with an edge facing toward said outer
edge and provided with a lug pointing toward
said outer edge and forming a shoulder behind the
striking plate, said lug being thinner than the
plate at said engagement edge.

14. A striking plate having an outer engage-
ment edge and a bolt-receiving opening having
an edge facing toward said engagement edge and
forming a shoulder behind the plate, said plate
at said shoulder being thinner than the major
portion of the plate and the portion at said en-
gagement edge.

15. In a lock, a lever of substantially sector
shape having a pivot opening at the apex, a slot
and a face spaced therefrom both approximately
radial to the axis of said opening, said face form-
ing a side of the sector and having a deep notch
therein entirely intramarginal of said face.

16. In a lock, a lever of substantially sector
shape having a pivot opening at the apex, a slot
and a face spaced therefrom both approximately
radial to the axis of said opening, said face form-
ing a side of the sector and having a deep notch
therein, said lever having projecting shoulders
respectively at its pivot end and the opposite end
remote from said face.

17. A locking means for a door adapted for co-
operation with a striking plate having an outer
engagement edge facing in door opening direc-
tion and an opening having an edge facing to-
ward said outer engagement edge and provided
with a lug pointing toward said outer edge and
forming an inner curved shoulder behind the
striking plate, said lug being thickest at its base
and curved toward its point and being, at the
point, thinner than said plate; said locking means
comprising: a casing; a fixed pivot pin in the
casing; and an antifriction lever pivoted on said
pin and having an active advance face adapted
during door closing movement to engage with
said outer edge of the striking plate to retract
the lever, said lever being adapted to snap into
said opening when locking position is reached;
said active face having an intra-marginal recess
therein adapted to receive said lug and forming
an overhanging part having an inner curved face
adapted to conform with and engage said curved
inner shoulder when in locked position; said lever
with said overhanging part serving the multiple
functions of automatically retracting the lever

by engagement with the striking plate and positively holding the striking plate and casing together when in locked position and separating stress is applied and transmitting said stress directly from the striking plate to the pivot pin and casing; a portion of said active face at opposite margins of said recess being continuous in the plane of said face from the pivot end to the free end of the lever, thereby furnishing a continuous engagement face during door closing.

18. In a locking means for a door, a striking plate having an outer engagement edge facing in door opening direction and an opening having an edge facing toward said outer engagement edge and provided with a lug pointing toward said outer edge and forming an inner curved shoulder behind the striking plate, said lug being thickest at its base and curved toward its point and being, at the point, thinner than said plate; said striking plate being adapted for cooperation with a lock comprising: a casing; a fixed pivot pin in the casing; and an antifriction lever pivoted on said pin and having an active advance face adapted during door closing movement to engage with said outer edge of the striking plate to retract the lever, said lever being adapted to snap into said opening when locking position is reached; said active face having an intra-marginal recess therein adapted to receive said lug and forming an overhanging part having an inner curved face adapted to conform with and engage said curved inner shoulder when in locked position; said lever with said overhanging part serving the multiple functions of automatically retracting the lever by engagement with the striking plate and positively holding the striking plate and casing together when in locked position and separating stress is applied and transmitting said stress directly from the striking plate to the pivot pin and

casing; a portion of said active face at opposite margins of said recess being continuous in the plane of said face from the pivot end to the free end of the lever, thereby furnishing a continuous engagement face during door closing.

19. In a locking means for a door, the combination of a striking plate having an outer engagement edge facing in door opening direction and an opening having an edge facing toward said outer engagement edge and provided with a lug pointing toward said outer edge and forming an inner curved shoulder behind the striking plate, said lug being thickest at its base and curved toward its point and being, at the point, thinner than said plate; a casing; a fixed pivot pin in the casing; and an antifriction lever pivoted on said pin and having an active advance face adapted during door closing movement to engage with said outer edge of the striking plate to retract the lever, said lever being adapted to snap into said opening when locking position is reached; said active face having an intra-marginal recess therein adapted to receive said lug and forming an overhanging part having an inner curved face adapted to conform with and engage said curved inner shoulder when in locked position; said lever with said overhanging part serving the multiple functions of automatically retracting the lever by engagement with the striking plate and positively holding the striking plate and casing together when in locked position and separating stress is applied and transmitting said stress directly from the striking plate to the pivot pin and casing; a portion of said active face at opposite margins of said recess being continuous in the plane of said face from the pivot end to the free end of the lever, thereby furnishing a continuous engagement face during door closing.

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