No. 829,180. PATENTED AUG. 21, 1906.

I. N. SWEET.

SLIDING DOOR LOCK.

APPLICATION FILED NOV. 24, 1905.

2 SHEETS—SHEET 1.

Fig. 1

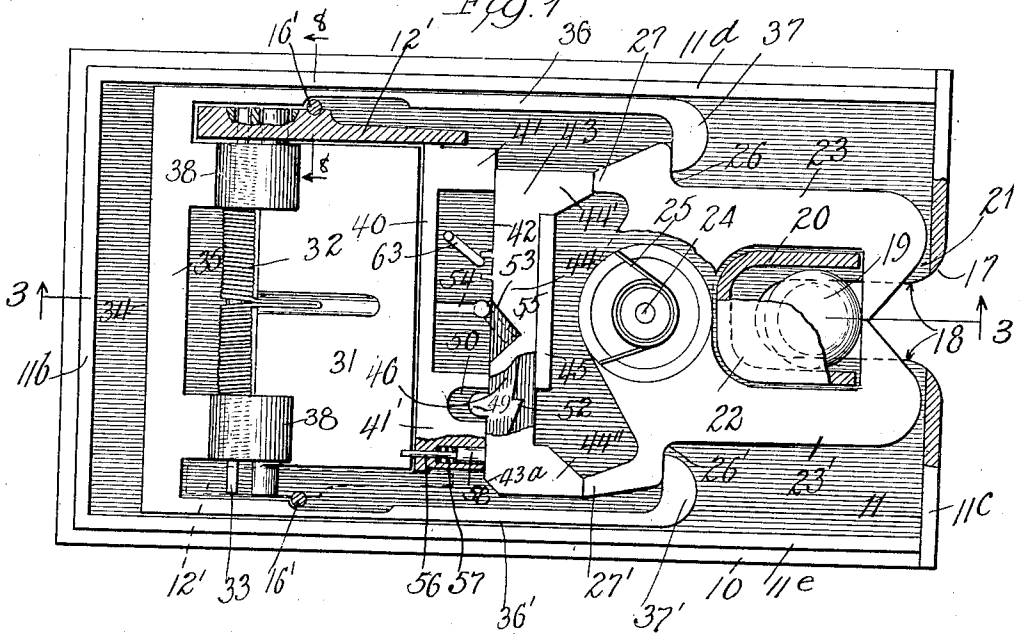
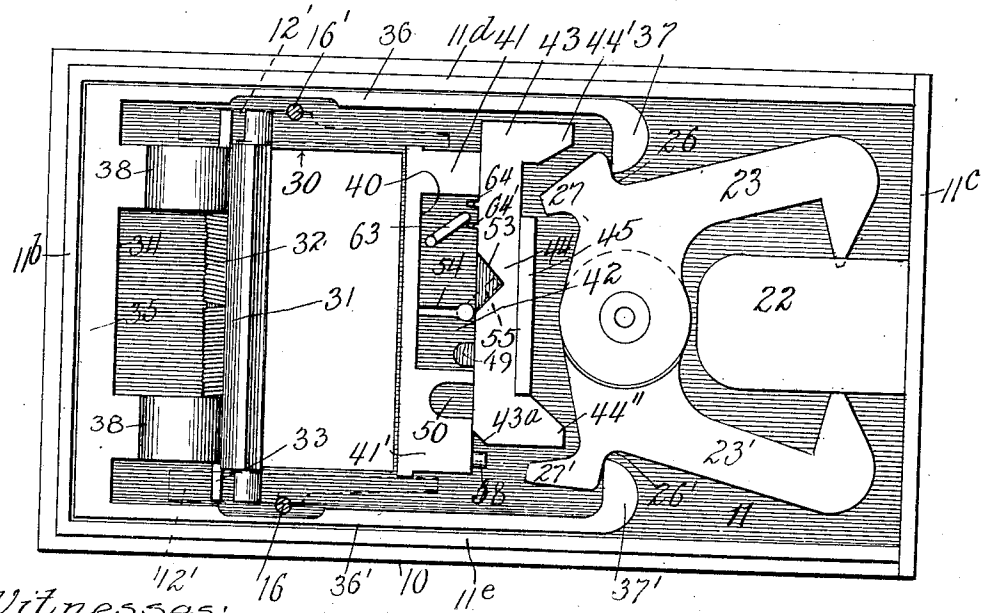


Fig. 2



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Harry R. L. White

Inventor:
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THE NORRIS PETERS CO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

Fig. 3.

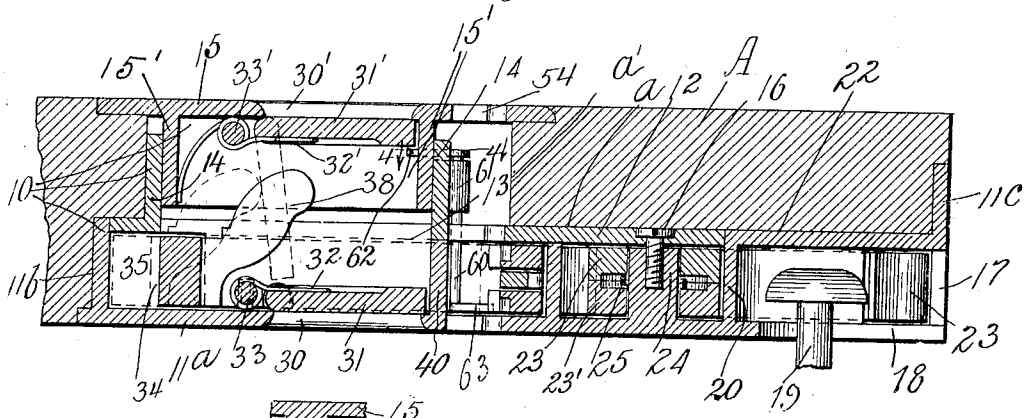


Fig. 8.

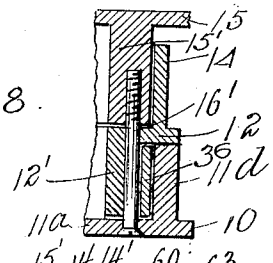


Fig. 9.

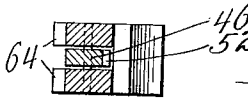


Fig. 4.

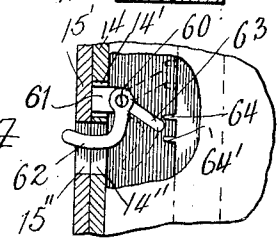


Fig. 6.

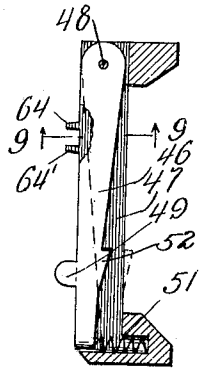


Fig. 5.

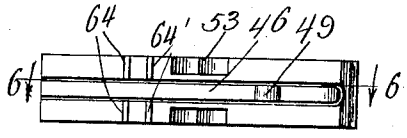
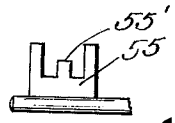


Fig. 7



Witnesses;
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THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

IRA N. SWEET, OF AURORA, ILLINOIS.

SLIDING-DOOR LOCK.

No. 829,180. Specification of Letters Patent. Patented Aug. 21, 1906.

Application filed November 24, 1905. Serial No. 288,956.

To all whom it may concern:

Be it known that I, IRA N. SWEET, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Sliding-Door Locks, of which the following is a specification.

My invention relates to improvements in sliding-door locks, and has in the present embodiment thereof particular reference to sliding-door fasteners of the type described in my Letters Patent No. 777,449, dated December 13, 1904.

It has heretofore been common to provide for the opening of sliding-door locks by hand-grips seated in recesses in the lock-plates; but such operating means have been subject to the disadvantage that when applied to exterior doors, as of barns and warehouses, the hand-grips freeze immovably during snowy weather and otherwise sometimes become clogged and difficult of manipulation.

One of the objects of my invention, therefore, is to provide, in conjunction with a door or other lock involving a movable locking or latching member and a part or plate having a hand-grip aperture therein, a movable closure for the aperture so operatively connected with the locking member that when the grip-aperture closure is moved to open position it moves the locking member to inoperative position to condition the door to be opened, the aperture-closure being of such character and arrangement as to render it practically impossible for the latter to freeze or become otherwise incapacitated for ready operation.

A further object of my invention is to provide in such a device a construction which is simple, cheap, efficient, and which effectually prevents the injury of the lock by the admission of dust or water to the moving parts of the lock.

A further object of my invention is to provide a novel locking mechanism of advantageous construction for the fastener which will be most positive in its action, simple in its construction, and which will be practically unoperable by any save the authorized or proper key.

Other and further objects of my invention will best become apparent to those skilled in the art from the following description, taken in conjunction with the accompanying drawings, wherein—

Figure 1 is an elevation of the lock with the cover-plate removed and parts in section, showing the parts in locked position. Fig. 2 is an elevation of the lock with the said cover-plate removed, showing the parts in open position. Fig. 3 is a transverse longitudinal section taken centrally through the lock in place upon a door, the section being taken on line 3 3 of Fig. 1. Fig. 4 is a fragmentary detail in section on line 4 4 of Fig. 3. Fig. 5 is an edge elevation of one of the lock parts. Fig. 6 is a section on line 6 6 of Fig. 5. Fig. 7 is a detail of a key which may be employed to operate with the lock illustrated. Fig. 8 is a section on line 8 8 of Fig. 1. Fig. 9 is a section on line 9 9 of Fig. 6.

Throughout the drawings like characters of reference refer always to like parts.

10 indicates in general a casing comprising a receptacle 11, wherein the lock parts in general are seated and which consists of a side plate 11^a, end walls 11^b and 11^c, and edge walls 11^d 11^e, cover-plate 12 having therein an aperture 13 surrounded by the wall 14 and having depending flanges 12′ 12′, hereinafter referred to, and a cap-plate 15, having flanges 15′ to interfit within the wall 14. This casing may be assembled upon a door A, as shown in Fig. 3, with the body of the casing sunk in a suitable mortise *a* in the door, at the inner side thereof, and with the lateral projection formed by the wall 14 taking through a suitable aperture *a′*, cut through the door, the cap-plate 15 being applied to cover or form part of the exterior face of the door. The plate 12 may be secured on the receptacle 11 of the casing by a screw 16 and cap-plate 15, adjustably connected to receptacle 11 by bolts 16′. It will be understood, however, that for purposes of some of the features of my invention this specific casing arrangement is illustrative only and may be varied at pleasure.

In the end wall 11^c of the casing is provided an opening 17, with which communicates a slot 18 in the side plate 11^a, said slot and aperture being arranged to receive a headed stud 19. This aperture is generally formed in accordance with the teaching of my said prior patent, and it will be understood that it is not here of the essence of the invention and might be departed from in the embodiment of the present invention.

20 indicates a guard-wall extending around the end and partially along the sides of the

slot 18, leaving open only spaces or apertures 21, through which the latch members hereinafter referred to may play.

22 indicates a cover-wall overlying the recess or pocket thus formed in the casing, for the reception of which the cover-plate 12 is suitably cut away. It is obvious, however, that cover for said pocket might be afforded by the cover-plate 12, the part 22 being done away with, the present construction being preferred merely because it affords no joint at the top of the guard-wall 20, through which dust or water might percolate.

The latching mechanism herein shown comprises in general companion latch members 23 23′, each having at its end a beveled head adapted and arranged to take through the corresponding aperture 21 on its side of the slot 18, the latch members being pivoted in common upon a stud 24, projecting from the base-plate 11^a, and which stud may conveniently receive screw 16, before referred to. A spring 25, coiled about the stud 24 and bearing at opposite ends against suitable abutments in the latch members 23 23′, acts to normally maintain the latching parts in closed position, as shown in Fig. 1. Shoulders 26 26′ are provided upon opposite sides of the latch members 23 23′ about on the line of their pivotal center, and rearwardly-projecting shoulders 27 27′ are likewise provided thereon for purposes which will be described. It will be understood that while I regard this particular construction of latch as advantageous for use in sliding doors, yet so far as certain features of my invention are concerned the particular latching member is shown as merely illustrative of one of the numerous possible embodiments of a movable locking or latching member and that I appreciate that features hereinafter disclosed are readily applicable to other forms of latching mechanism.

Adjacent the rear end of the casing, in opposite sides thereof, specifically in the side plate 11^a and the cap-plate 15, I provide hand-grip apertures 30 30′, respectively, and I associate with said apertures hinged closures arranged to be moved when the fingers are inserted in the hand-grip, and I operatively connect said closures for the hand-grip apertures with the movable latching members, so that motion of the hand-grip closures in opening is transmitted to the latching members to move the latter to inoperative or open position.

31 indicates a closure for aperture 30, finding pivotal support in flanges 12′ 12′, depending from the cover-plate 12 and extending to the side plate 11^a, said flanges 12′ being arranged generally in parallelism to the edge walls 11^d 11^e of the casing at a sufficient distance therefrom to permit of the interposition of the arms of the yoke member to be described. 32 indicates a spring coiled upon a shaft 33, mounted in said flanges 12′ 12′, said spring bearing against the door or closure 31 and tending to maintain it constantly closed. A similar closure or door member 31′ is provided for the aperture 30′, the closure 31′ being pivoted in the flange 15′ of the cap-plate, where is likewise supported the spring-shaft 33′, upon which is coiled the closing-spring 32′ of the closure 31′. Operative connection between both of said hand-grip closures and the movable latch members is afforded in common by a yoke 34, comprising a cross-bar 35, extending across the casing adjacent its rear end, and parallel arms 36 36′ extend along the side walls 11^d 11^e of the casing outside the flanges 12′ 12′ of the cover-plate and bearing at their forward ends heads 37 37′, respectively arranged for engagement with the shoulders 26 26′ of the companion latch members. The parts are so proportioned and arranged that the yoke 34 may be moved forward and back a distance sufficient to retract the latch members to position shown in Fig. 2 or permit their restoration by the spring 25 to position shown in Fig. 1. Bearing-lugs 38 38 extend from the cross-bar 35 in such position as to be in the path of movement of each of the closures 31 31′, so that, as shown in Fig. 3, when one of the closures is opened by the insertion of the fingers of the user the yoke 34 is automatically pushed rearwardly by the movement of the closure to transmit motion to the companion latch members 23 23′ to move the latter to open position, as shown in Fig. 2.

While I regard the specific construction above described as new and advantageous, particularly in the provision of a closure for a hand-grip aperture pivoted for movement about an axis substantially parallel with the wall wherein the aperture is formed, whereby the free edge of the closure may be swung inward to position its aperture-closing face to constitute a rear wall of the recess uncovered by its movement and to constitute of said face a convenient hand-bearing, I desire it to be understood that I believe myself to be the inventor of the broad idea of closing a hand-grip aperture with a closure movable inwardly away from the apertured wall and outwardly toward said apertured wall to open by its inward movement a recess deeper than the thickness of the wall wherein the aperture is made and also of connecting the said closure with a latch member to move the latch when the closure is opened.

I provide in conjunction with the parts described means for locking the latch members against movement and simultaneously locking the grip-aperture closures against motion, and such parts I will now describe.

40 indicates a partition-wall carried by the casing member 11^a, extending transversely of the casing between the depending flanges 12′ 12′ to divide the casing generally into the hand-grip chamber, wherein the closures 31

31′ operate, and the lock-chamber in front thereof, wherein the locking parts operate. From the partition 40 project forwardly at the ends thereof the abutments 41 41′, whereon may laterally slide or reciprocate the bolt member 43, between which and the central portion of the partition 40 is left a space or chamber 42. The bolt member 43 comprises in general a tumbler-carrying body 44 and rigid end abutments 44′ 44″, so arranged that when the bolt is in one position, as shown in Fig. 1, said abutments 44′ 44″ bear closely against the shoulders 27 27′ of the latch members heretofore described to prevent rearward movement of said shoulders and to consequently hold the latch members in locked position. When the bolt member is at the other extremity of its movement, as shown in Fig. 2, its abutments 44′ 44″ are removed from the paths of movement of shoulders 27 27′ of the latch members, so that the latter may be moved at will.

45 indicates a guide for the front edge or face of the bolt. The bolt member 43 is provided with one or more tumblers 46, consisting of levers arranged in slots 47, made through the bolt-body, each lever being pivoted, as at 48, at one end and at its opposite end provided with a nose 49, adapted for engagement in a recess 50, provided therefor in the abutment 41′. A spring 51 is provided in conjunction with each tumbler to normally maintain the tumbler in operative position with its nose projecting beyond the rear face of the bolt. Upon the upper surface of each tumbler-lever is provided a projection 52, so located that when the parts are in the position shown in Fig. 1 the shoulder is adapted to be forced out beyond the front face of the body of the bolt for engagement with the extremity of the guide 45. The bolt is also cut away at some suitable point, as illustrated at 53, to provide shoulders for engagement of a suitable key 55, which it will be understood may be inserted through the keyhole 54 (one of which is provided at each face-plate of the casing) and turns in the space 42. Said key is of course provided with suitable projections 55′ for coöperation with the tumbler or tumblers 46, and it will be apparent from an inspection of the drawings that when such key of suitable construction is inserted through the hole 54 and rotated it will lift the tumbler 46, so that its nose 49 is concealed within the slot 47, and then by engagement with the sides of recesses 53 of the bolt shift the bolt member from position shown in Fig. 1 to that shown in Fig. 2, or vice versa.

It will be apparent that the construction described makes the lock one very difficult to pick or open by any unauthorized key, for the reason that the clearance of the tumbler may be made very small, so that the tumbler must be positioned within a very small fraction of an inch of a predetermined position in order that it may rise over the abutment 41′, and at the same time very slight movement beyond such predetermined position caused by a too-long projection 55′ of the key will throw the tooth 52 of the tumbler out into position to engage the guide 45, so that the bolt may not be moved from locking to unlocking position, even though the wards be accurately cut in the key.

I prefer to provide in conjunction with the latch-locking means, as described, means for locking the closures 31 31′ against movement when the latch members are locked, and as it is desirable to have the lock-casing adjustable for variation of the distance between the cap-plate 15 and the face-plate 11^a to compensate for different thicknesses of doors I deem it advantageous to supply independent locking means for the said grip-aperture closures. The lock for the closure of the grip-aperture 31 is shown as comprising a bolt 56, sliding in a guide formed therefor in the abutment 41′ and normally maintained by a spring 57 with its head 58 interposed in the path of movement of the bolt 43 and its closure-locking stem retracted to inoperative position. The end of the bolt 43 is beveled, as shown at 43^a, so that as the bolt is moved to position from that shown in Fig. 2 to that shown in Fig. 1 it strikes and moves the bolt 56, projecting its stem into the path of movement of the closure 31, as shown in Fig. 1. The latch of the outer grip-closure 31′ involves a rocking rod 60, having bearing in a boss 61, which projects from and may be formed integrally with the flange 15′ of the cap-plate 15. When the cap-plate is in position upon the cover-plate, said boss 61 projects through a slot 14′ in the wall 14 of the cover-plate 12, so that the rod 60 lies without the wall 14. At its upper end the rod 60 carries a bolt member 62, adapted to be moved into and out of position to lock the closure member 31′ through slots 14″ and 15″ in the parts 14 and 15′, respectively, according as the rod 60 is rocked. The lower extremity of the shaft 60 is provided with a lever-arm 63, lying in the space 42 and adapted to be partially embraced by projections extending clear across the uninterrupted portions of the face of the bolt. It will therefore be apparent that the cap-plate 15 may be moved up and down relative to the body of the casing without disengaging the arm 63 from the projections of the bolt. Consequently it will be clear that as the bolt is moved from position shown in Fig. 1 to that shown in Fig. 2 the projection 64′, striking the lever-arm 63, rotates the rod 60 to retract the bolt 62 from locking position relative to aperture-closure 31′ to position shown in dotted lines in Fig. 4, while reverse movement of the bolt causes projection 64 to engage the lever 63 to move bolt 62 to locking position.

While I have herein described in some de-

tail an embodiment of my invention which I have found to be practical and advantageous, it will be apparent that my invention is not limited to the specific construction shown and described and that certain of its features are widely applicable to fastener constructions of varying forms or types, and I therefore do not desire to be understood as limiting my invention to the specific construction shown and described further than as specified in the claims.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In combination with the movable latch member of a fastening appliance, a casing having a hand-grip aperture therein, a closure for said aperture mounted for movement inwardly from and outwardly toward said apertured casing, and means whereby said inward movement of said closure is transmitted to the latch member to move it to unlatching position.

2. The combination with a casing, having a hand-grip aperture therein, of a closure, normally overlying the aperture to close the same, and pivoted on an axis substantially parallel to said apertured casing, and adjacent the rear edge of said aperture, whereby the free edge of said closure may be swung inward, to position the aperture-closing face of said closure to constitute a wall of the recess uncovered by its movement, and to constitute of said face a convenient hand-bearing.

3. The combination with a casing having a hand-grip aperture therein, of a closure, normally overlying the aperture to close the same, and pivoted adjacent its rear edge on an axis substantially parallel to the apertured casing, whereby the closure may be swung inward to constitute a wall of the recess uncovered by its movement and afford a convenient hand-bearing, a fastening device comprising a movable latch member, and an operative connection between said aperture-closure and the latch member, whereby movement of the closure as aforesaid is communicated to the latch member to move it to inoperative position.

4. In combination with a movable latch member of a fastening appliance of the character described, a part having a hand-grip aperture therein, a closure for said aperture pivoted at one edge to swing inwardly, and operative connection between said pivoted closure and the latch member, whereby motion may be communicated from said closure to the latch member to move the latter to inoperative position.

5. In combination with a movable latch member of a fastening appliance of the character described, a casing having a hand-grip aperture therein, a closure for said aperture pivoted on an axis parallel to the apertured casing and movable to such angle to said apertured casing as to constitute of its aperture-closing face a bearing-surface for the fingers of the user, operative connections between the closure and the latch member whereby motion may be communicated from said closure to the latch member, and means for locking one of said interconnected elements against movement.

6. In combination with a movable latch member of a fastening appliance of the character described, a casing having a hand-grip aperture therein, a closure for said aperture pivoted on an axis parallel to said apertured casing, operative connections between said closure and the latch member whereby motion may be communicated from said closure to the latch member to open the latter as the former is opened, means for normally maintaining the closure member and latch member in closed position, and means for locking the closure member against movement to open position.

7. In combination with a movable latch member of a fastening appliance of the character described, a casing having oppositely-opening hand-grip apertures therein, a closure for each aperture pivoted on an axis parallel to the apertured casing, and a common means, movable independently of each closure, for communicating motion from either of said closures to the latch member to move the latter to open position as the aperture-closure is opened.

8. In combination, a casing having a hand-grip aperture, a closure for said aperture pivoted on an axis parallel to the apertured casing, a movable latch member, and a sliding yoke operatively related to the closure and the latch member to move the latter to inoperative position as the closure is opened.

9. In a sliding-door lock, a casing comprising flat apertured plates, spaced apart, closures for said apertures, each pivoted on an axis parallel to its associated plate, and each adapted and arranged to swing inwardly to form a finger-bearing extending at an angle to its associated plate in the space within the casing, and a latching device comprising a movable latch member associated with the hinged closures for movement to unlatching position by the inward movement of either closure as described.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

IRA N. SWEET.

In presence of—
MARY F. ALLEN,
GEO. T. MAY, Jr.