Nov. 17, 1931. L. A. BITTORF 1,832,615

LATCH STRUCTURE

Filed April 2, 1928

Fig. 1.

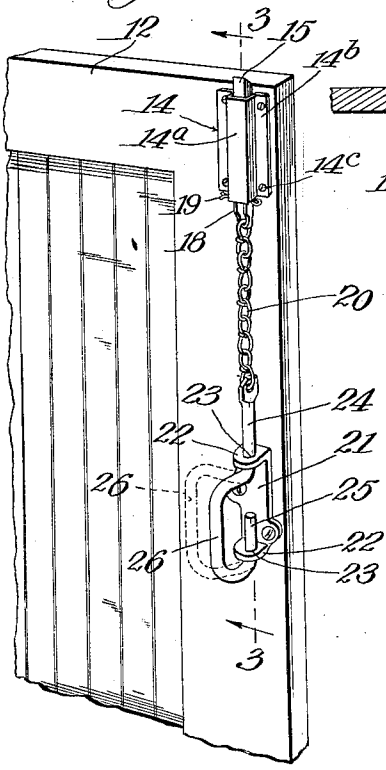
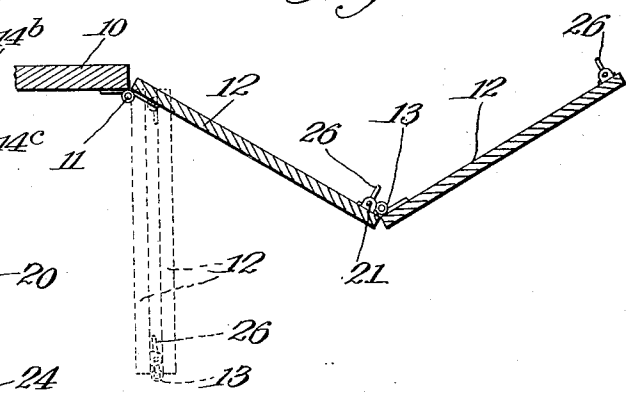
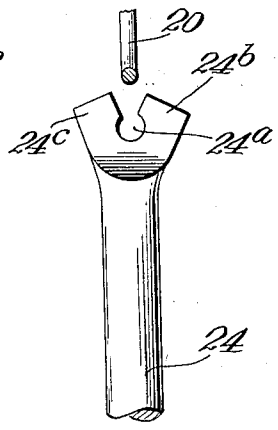


Fig. 2.





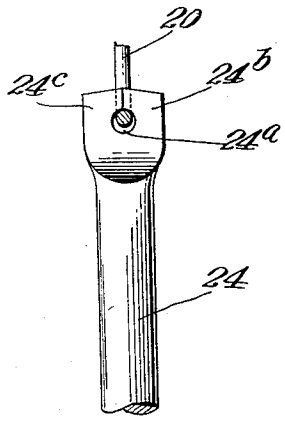


Fig. 3.

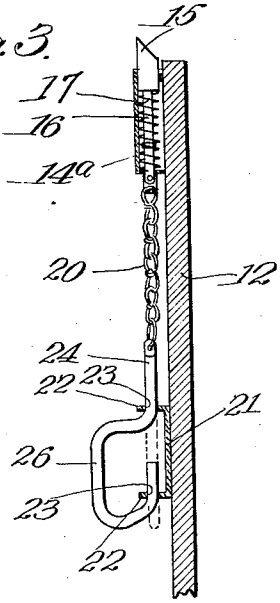


Fig. 4.

Fig. 5.

Inventor:
Louis A. Bittorf.

By
Rector, Hibben, Davis & Macauley Attys.

Patented Nov. 17, 1931

1,832,615

UNITED STATES PATENT OFFICE

LOUIS A. BITTORF, OF STERLING, ILLINOIS, ASSIGNOR TO NATIONAL MANUFACTURING COMPANY, OF STERLING, ILLINOIS, A CORPORATION OF ILLINOIS

LATCH STRUCTURE

Application filed April 2, 1928. Serial No. 266,552.

My invention relates generally to door latch structure, and has to do especially with latch operating means primarily adapted for use with multiple-section folding doors which may be used for garages and other buildings having large exit-entrance openings.

In the use of multiple-section folding doors, it is desirable that the sections be folded closely together into a small space when the doors are open. The various forms of latch structure heretofore employed have not been of such character as to permit of ready access to and ease in manipulation of the same, at the same time permitting the door sections to be folded as above stated.

The main object of my invention is to provide a simple and inexpensive, but highly efficient, latch and latch operating mechanism which may be mounted at any desired position on any section of the door, and which is adjustable so as to not interfere with the folding of the door sections closely together, while, at the same time, providing an arrangement which may be easily and quickly manipulated to latch and unlatch the door.

Another object is to provide an adjustable handle for operating the latch member, such handle being adapted to be swung to a position where it may be readily and securely grasped for operation of the latch member and which may be folded closely against the door surface when not in use so that it does not interfere with the folding of the doors closely together. This feature also guards against accidental and unauthorized manipulation of the latch member.

A further object is to provide a novel form of handle attachment which enables the handle to be readily, quickly and securely connected to the latch member, and which makes the structure as a whole stronger and cheaper to construct and install. The attachment is such that the handle may also be readily detached from the latch member.

Other objects and advantages will become apparent as this description progresses and by reference to the drawings wherein,—

Figure 1 is a perspective view of the upper corner portion of a door or door section having my invention applied thereto;

Fig. 2 is a plan section of a multiple-section folding door structure having my invention applied thereto, the door sections being shown in a closed position in full lines and in a folded or open position in dotted lines;

Fig. 3 is an enlarged vertical section taken substantially on line 3—3 of Fig. 1;

Fig. 4 is an enlarged view of the attachment end of the latch operating handle, showing the form which the attachment-jaws take prior to interlocking the same with the remainder of the latch structure; and

Fig. 5 is a view similar to Fig. 3, except showing the attachment-jaws of the handle closed and interlocked with the remainder of the latch structure.

With particular reference to the drawings, the latch structure may be associated with a door supported in proper position upon the building wall 10 by a plurality of hinges 11. This door (Fig. 2) may take the form of a plurality of sections 12 which are connected together by suitable hinges 13 to permit them to be folded together, as indicated in dotted lines in Fig. 2, or to be extended toward a door-closing position as indicated in full lines in Fig. 2.

In order to provide means for latching or fastening the door sections, and door, in their door-closing position, I provide a latch structure adapted to be mounted upon one or more of the sections and which is of such a character as to be readily grasped and operated, at the same time, permitting the door sections to be folded closely together in a compact space. This structure embodies a latch keeper 14 having a rectangular body part 14^a with horizontally extending wings 14^b adapted to be secured to the surface of the door sections 12 as by screws 14^c, preferably, at a point adjacent the upper corner of the door section as indicated in Fig. 1. This keeper is adapted to freely and slidingly receive a latch member which is comprised of a reduced stem portion 16 having one end extending through the innermost end of the latch keeper and having a rectangular-shaped latch head 15 at the other end. A spring 17 is mounted around the latch stem 16 between the enlarged head 15 and the innermost end

of the keeper so that the latch is always thrust outwardly toward the latching position. The end of the latch stem projects through the inner end of the keeper and pivotally receives a yoke member 18, the pivot being provided by a cross pin 19 which is of sufficient length to act as a stop for limiting the outward or latching movement of the latch member 15.

A chain connector comprised of jointless links 20 is secured at one end to the yoke 18. The other end of the chain connector is connected to an adjustable operating handle supported by a bracket 21. More specifically, the bracket 21 is provided with horizontally extending legs 22, each having a centrally aligned opening 23 to rotatably and reciprocably receive the vertically aligned arms 24 and 25 of the handle. These two handle arms are integrally joined by a bulging or U-shaped handle-grip 26 which readily receives the hand of the operator to permit rotation and reciprocation of the handle as a whole.

To readily, quickly and securely attach the handle arm 24 to the inner end link of the chain connector, the free end of such arm is flattened and cut to provide a diametrical tongue split into a central opening 24^a to form a pair of integral and flat-sided jaws 24^b and 24^c which, before the attachment is complete, assume the separated or flaring relation shown clearly in Fig. 4. To fasten the handle and chain together, the jointless end link 20 is passed inwardly between the jaws 24^b and 24^c into the central opening 24^a therebetween. The jaws are then forced together by any suitable tool around the link 20 to the position shown in Fig. 5 with the result that a rigid, strong and durable connection is quickly formed between the chain and such connection is capable of withstanding the maximum loads which may be imposed upon the handle or chain. This arrangement also permits of ready and quick detachment of the handle and chain by spreading the jaws 24^b and 24^c apart to an extent to permit the link to pass therebetween. This arrangement permits the use of a jointless-link type of chain, such as that shown and described, which may be very cheaply made. It will be noted that this diametrical tongue is slightly wider than the diameter of the handle arm 24 and it is also wider than the bracket openings 23. This prevents the parts from becoming separated during shipment and when being handled as stock items. It is very beneficial in preventing separation of the parts when not in use.

In the use of my invention, assuming that the door is closed, the door may be unlatched by rotating the handle about its support from the dotted line position of Fig. 1 to a position at right angles (full line position of Fig. 1) to the door surface so that the handle grip 26 may be readily grasped by the hand. The handle is then moved downwardly to disengage the latch head 15 from the latch socket (not shown) as will be well understood. The handle may then be moved to the dotted line position of Fig. 1 and the door sections 12 moved about their hinges 13 to a folded position indicated in dotted lines in Fig. 2; or the adjacent section door may engage the handle and move it to its latter-mentioned position as the door is opened. The doors may, eventually, be folded back against the wall surface 10. By folding the handle to the dotted line position of Fig. 1, the doors may be folded closer together and to an extent permitted by the latch keeper 14. Thusly, my invention provides for the use of a relatively large handle which may be readily and firmly grasped without limiting the extent to which the door sections may be moved together in their opening movement, Furthermore, by moving the handle grip to a position parallel with the door surface when the door is closed and the sections unfolded, the possibility of accidental or unauthorized manipulation of the latch is practically eliminated. It will be understood that while my invention is primarily adapted to multiple-section door structures, it may also have utility in connection with any form of door. The latch structure may be applied to the bottom edge of the door as well as to the top as shown in the drawing. Also, while I have shown and described only one form of my invention, it is to be understood that various changes in details and arrangement of parts thereof may be varied without departing from the spirit and scope of my invention as defined by the claims which follow.

I claim:

1. A handle for operating a door latch comprising a pair of vertically aligned guide arms carried in spaced relation by a U-shaped hand grip which is integrally connected to the corresponding ends of said arms, the free end of one of said arms being shaped to form normally a pair of flat diametrical and gaping jaws with a circular receiving-space therebetween, said jaws being adapted to be forced together to encompass and confine a connector element within said circular receiving-space.

2. A handle adapted to be attached to a connector element for operating a door latch comprising a hand grip portion and an integral circular attachment-shank, the end of said shank being shaped to form a diametrical tongue rectangular in cross-section and having a central opening extending through its side walls, said tongue being split into said opening to provide oppositely adjustable jaw sections which may be spread apart and closed to receive and retain the connector element.

3. Handle structure for operating a door latch comprising a handle, said handle hav-

ing a pair of spaced guide arms extending endwise in the same general direction and a hand-grip between said arms, a bracket adapted to be attached to the door and having horizontally extending legs with openings therein to rotatably and reciprocably receive said arms, the inner of said arms having its end portion flattened to provide a diametrical tongue greater in width than the remainder of said arm and said bracket-leg opening through which said latter arm operates, said tongue being adapted for detachable connection to the latch.

In testimony whereof, I have subscribed my name.

LOUIS A. BITTORF.