

May 18, 1926.

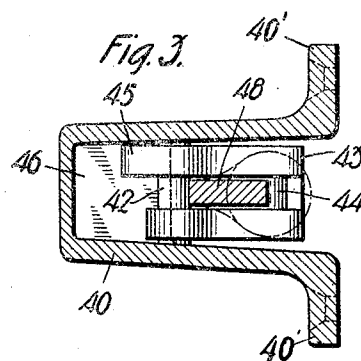
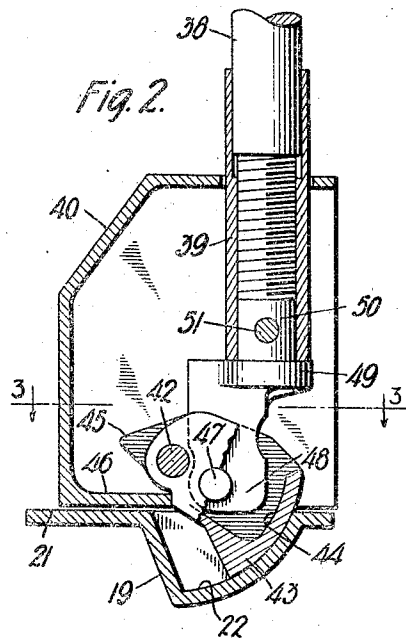
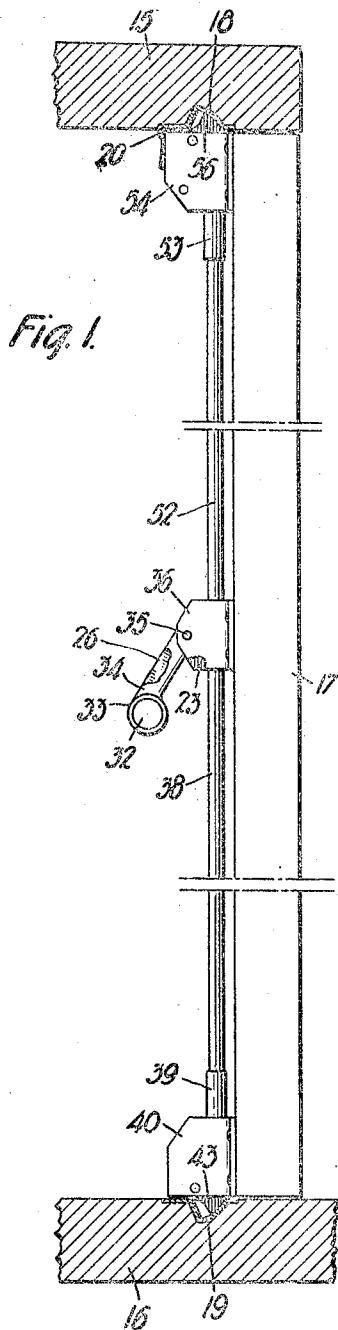
C. G. PALMER

1,585,167

GRAVITY LATCH

Filed August 15, 1925

2 Sheets-Sheet 1



Inventor:
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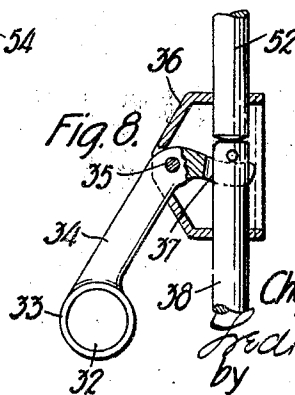
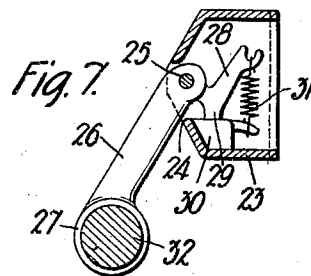
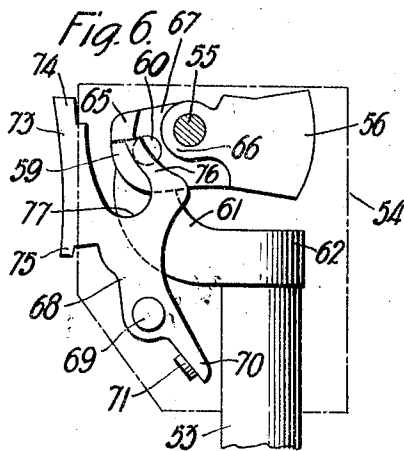
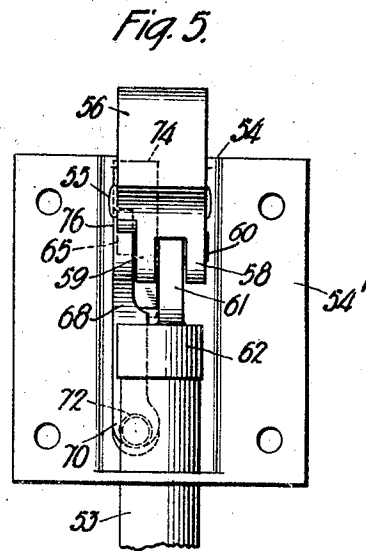
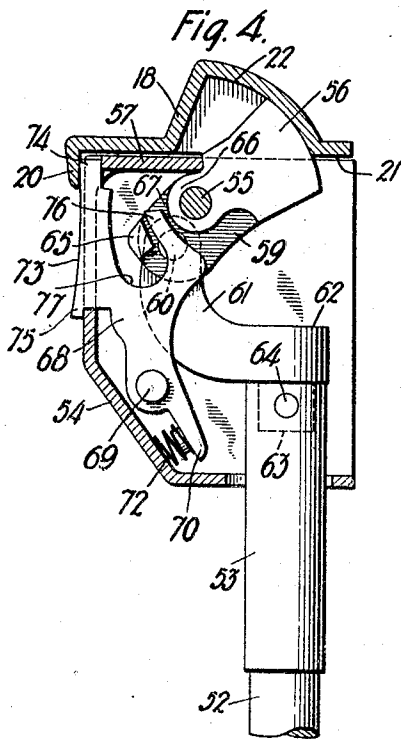
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Inventor:

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UNITED STATES PATENT OFFICE.

CHARLES G. PALMER, OF NEWARK, NEW JERSEY.

GRAVITY LATCH.

Application filed August 15, 1925. Serial No. 50,361.

This invention relates to that class of door latches, known as emergency latches and in which a vertical rod, connected to latching devices carried at the top and bottom of the door, operates to release the same, such doors being usually of fire-proof construction and arranged to automatically latch when closed.

The present invention is an improvement over my earlier Patent, No. 1,469,950, issued October 2, 1923, and has as one of its features the provision of means to prevent the premature operation of the latching elements, no action taking place until the door is fully closed.

A further feature resides in the production of a gravity actuated latch that may be released by moderate pressure applied to a rod extending across the door and at any point therealong.

Another aim is to provide a latch of the type described that is essentially simple in construction and operation, durable and dependable in use and of moderate cost to manufacture.

These and analogous aims and objects of an important nature, that will become apparent as the description proceeds, are accomplished by the novel construction and combination of parts hereafter described and illustrated in the associated drawings, constituting an essential feature of this disclosure, and in which:—

Figure 1 is an edge view of a door shown in closed position and illustrating the application of an embodiment of the invention.

Figure 2 is a fragmentary vertical sectional view of the lower latch casing, keeper and associated elements in a partially latched position.

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 2.

Figure 4 is a vertical sectional view of the upper latch casing, keeper and associated elements in a partially latched position, the view corresponding with Figure 2.

Figure 5 is a rear elevational view of the same, the keeper being omitted.

Figure 6 is a side view of the operative parts shown in Figure 4, but in an unlatched position and prevented from operation.

Figure 7 is a vertical sectional view of one of the actuating cross bar brackets.

Figure 8 is a similar view of the mating bracket and rod section therein.

Referring in greater detail to the draw-

ings, the numerals 15 and 16 designate the upper and lower elements of a frame or wall in the opening of which is a hinged door 17.

Fixedly secured in opposed relation in the elements 15 and 16, adjacent the door, are keepers 18 and 19, level with the surfaces of these members and alike in all respects except that the keeper 18 has formed on its rear end a downwardly extending lug 20, its purpose further on explained.

Each keeper has a plain outer surface 21 and contains a semi-arcuate recess 22, closed at the side and bottom but open at the face 21.

Midway in the height of the door 17, on its inner side, adjacent the edge to which the hinges are attached, is fixed a hollow bracket 23 having an opening 24 in its outer face, and pivoted in the bracket, on a pin 25 is a lever 26 extending at an angle outwardly and downwardly, as shown in Figure 7, the end of the lever terminating in a hollow boss 27.

On the inner end of the lever is an arm 28 having a stop 29 held normally against a projection 30 in the bracket by reason of a spring 31 arranged in the bracket for that purpose.

Fixed in the boss 27 is one end of a cross bar 32, its opposite end engaging in a similar boss 33 on the end of a lever 34, pivoted on a pin 35 in a similar bracket 36 secured on the opposite side of the door.

The inner end of the lever 34 is turned at an angle and formed to present a fork 37 in which is connected the upper end of a rod or tube 38, the same extending downward through an opening in the bracket, its lower end being adjustably screw-threaded into a socket 39 slidable through an opening in the upper wall of a hollow casing 40 having lateral base flanges 40' firmly attached to the door close to its lower edge adjacent the keeper 19 over which it passes as the door is swung upon its hinges.

Pivoted on a pin 42 fixed transversely in the lower part of the casing 40 is a latch bolt 43, generally segmental in contour and having a recess 44 in its upper surface. This bolt is provided with a projecting stop 45, making contact with the lower wall 46 of the casing when the bolt is fully retracted from the keeper recess 22.

A pin 47, passing through the bolt recess 44 in the bolt, pivotally engages a leaf 48

formed on a connection 49 having a stem 50 fixed in the lower end of the socket 39 by a pin 51.

Thus it will be seen that raising the rod 5 38 removes the bolt 43 from engagement with the keeper at the bottom of the door.

The upper end of the rod 38 reaches through the fork 37 and engages a similar rod 52 extending upward through the 10 bracket 36 and having its upper end adjustably engaged in a socket 53, passing through the wall of another hollow casing 54 fixed on the door near its upper edge in register with the lower casing 40 but in reversed 15 position relative thereto, being held by its flanges 54. The employment of separate rods, in place of a single rod, enables the latch to be readily assembled upon different sized doors, since the length of the upper 20 rod may be changed by cutting off the lower end thereof. The cut end can then be easily inserted through the opening of the bracket 36.

A single rod, however, can only be altered 25 at one end or the other, after which such end must be rethreaded to attach the same to the latch.

A further function of the two rod arrangement is to allow the lower latch to engage its keeper irrespective of the position 30 of the upper latch. This function would be valuable should the door warp or sag and the trip mechanism of the upper latch fail to operate.

The use of separate rods also conserves 35 space in the packing of the latch for shipment.

Pivoted on a pin 55 set in the side walls of the casing is a latch bolt 56, having a 40 segmental profile co-incident with the recess 22 in the keeper with which it is engageable, the bolt swinging upwardly through an opening in the upper base wall 57 of the casing.

On the end of the bolt 56, opposite the 45 pivot, are offset extensions 58 and 59, carrying a pin 60, on which, between the extensions which constitute a fork, is pivoted a leaf 61, the same being rearward curved and part of a connection 62, having a stem 50 63 held in the upper end of the socket 53 by a pin 64.

From the foregoing it will be apparent 55 that raising the rod 52 will, through its connections, release the bolt 56 from the upper keeper, simultaneously with the release of the lower bolt.

In order to prevent the bolts from being 60 moved into a latching position prior to the door being fully closed an automatic stop is provided, the same consisting of a lateral lug 65 on the fork 59, the lug reaching nearly to the inner surface of the adjacent wall of the casing 54 and between the lug and hub 66 of the bolt 56 is a recess 67.

A lever 68 is pivoted on a pin 69 set in the casing 54, near its lower front corner, see Figures 4 and 6, a lower arm 70 of the lever having a projection 71 to receive a compression spring 72 abutting the casing 70 front wall to rock the upper portion of the lever outwardly.

On the upper part of the lever is a pad 73 extending through an opening in the front wall of the casing and having overhanging 75 ends 74 and 75, the latter lower element acting as a stop making contact with the casing wall and the upper element 74 being brought into forcible contact with the lug 20 of the upper keeper when the door is 80 fully closed.

Another arm 76, spaced from the pad 73 by a recess 77 extends upwardly at an angle from the lever 68 to enter the recess 67 in the swing bolt 56 when the door is closed and 85 the lever 68 rocked inwardly by contact of the pad against the keeper lug 20, as seen in Figure 4.

When the door is unlatched and moved 90 away from the keeper, the spring 72 presses the lever outwardly, causing the arm 76 to take a position directly below the lug 65 acting as a detent positively preventing the bolt 56 to swing upon its pivot and extend the pad 73, as shown in Figure 6, thus auto- 95 matically latching the bolt until the door is again closed.

From the foregoing it will be clear that the door will become automatically and securely latched, both at the top and bottom, 100 when it is closed and that it may be instantly released by merely pressing the cross bar 32 at any point in its length, inwardly towards the door.

Although I have described my improve- 105 ments with considerable detail and with respect to certain particular forms of my invention, I do not desire to be limited to such details since many changes and modifications may well be made without departing from the spirit and scope of my invention in its 110 broadest aspect.

Having thus described my invention, what I claim as new and desire to secure by Let- 115 ters Patent, is:—

1. A gravity latch comprising, the combination with a door and its frame, of keepers fixed in said frame at the top and bottom of the door, casings on said door having their bases disposed at the upper and lower edges 120 of the door to register with the keepers, latch bolts pivoted in said casings to swing into and out of said keepers, rods connecting said bolts whereby said bolts are moved in unison in opposite directions, a bracket 125 on said door into which the adjacent ends of said rods extend, and a forked lever pivoted in said bracket engaging one of said rods, said lever extending outwardly 130 for manual operation.

2. A gravity latch comprising, the combination with a door and its frame, of keepers fixed in said frame at the top and bottom of the door, casings on said door having their bases disposed at the upper and lower edges of the door to register with the keepers, latch bolts pivoted in said casings to swing into and out of said keepers, a bracket on said door, a forked lever pivoted in the bracket to extend outwardly for manual operation, rods connecting said bolts whereby they are both moved in unison in opposite directions, one of said rods being connected to the upper bolt at a point at the rear of the pivot, the other rod being connected to the lower bolt at a point in the front of its pivot, and stops for said bolts limiting the movement that can be imparted to them.

3. A gravity latch comprising, the combination with a door and its frame, of keepers fixed in said frame at the top and bottom of the door, casings on said door having their bases disposed at the upper and lower edges of the door to register with the keepers, latch bolts pivoted in said casings to swing into and out of said keepers, rods connecting said bolts whereby they are both moved in unison in opposite directions, means carried on said door, levers pivoted in said means, a horizontal bar connection between the outer ends of said levers, a spring in said means to raise the levers and rods, a fork on one of said levers, one of said rods engaged in said fork, and operative connections on the ends of said rod to actuate said bolts simultaneously with respect to their keepers.

4. A gravity latch comprising, the combination with a door and its frame, of keepers fixed in said frame at the top and bottom of the door, casings on said door, latch bolts pivoted in said casings, rods connecting said bolts whereby they are both moved in opposite directions simultaneously to engage or disengage said keepers, said rods being gravity operated, means for manually raising said rods, and means in the up-

per casing to prevent latching of the bolts until the door has been closed.

5. A gravity latch comprising, the combination with a door and its frame, of keepers in said frame, latch casings on the door, latch bolts pivoted in said casings engageable in said keepers, manual means for normally actuating said bolts in unison, a spring actuated lever pivoted in one of said casings, said lever having an arm adapted to prevent movement of said bolts, and means on one of said keepers to tilt said lever into position to permit engagement of the bolts upon closing of the door.

6. A gravity latch comprising, the combination with a door and its frame, of keepers in said frame, latch casings on the door, latch bolts pivoted in said casings engageable in said keepers, manual means for normally actuating said bolts in unison, a lug on one of said bolts, a lever pivoted in the casing, an arm on said lever movable into and out of the path of said lug, resilient means to normally maintain said arm in position to obstruct movement of said bolt, a pad on said lever extending outwardly of the casing, and a lug on the corresponding keeper to press the pad inwardly when the door is fully closed whereby said arm is released from the bolt.

7. A gravity latch comprising, the combination with a door and its frame, of keepers in said frame, latch casings on the door, latch bolts pivoted in said casings engageable in said keepers, rods connecting said bolts whereby they are both moved in unison in opposite directions, manual means for normally actuating said bolts in unison, a spring pressed lever pivoted in the casing, means on said lever normally intercepting movement of the bolt, and other means on the lever to contact with a fixed stop whereby the bolts are free to engage their keepers when the door is fully closed.

This specification signed this 11th day of August, 1925.

CHARLES G. PALMER.