

A. ARENS & E. L. TEICH.
LATCH MECHANISM FOR EMERGENCY DOORS.
APPLICATION FILED DEC. 16, 1909.

958,353.

Patented May 17, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

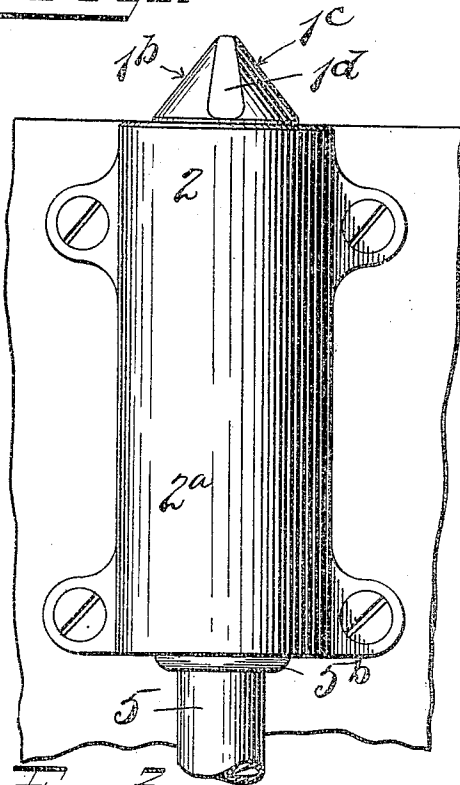


Fig. 2.

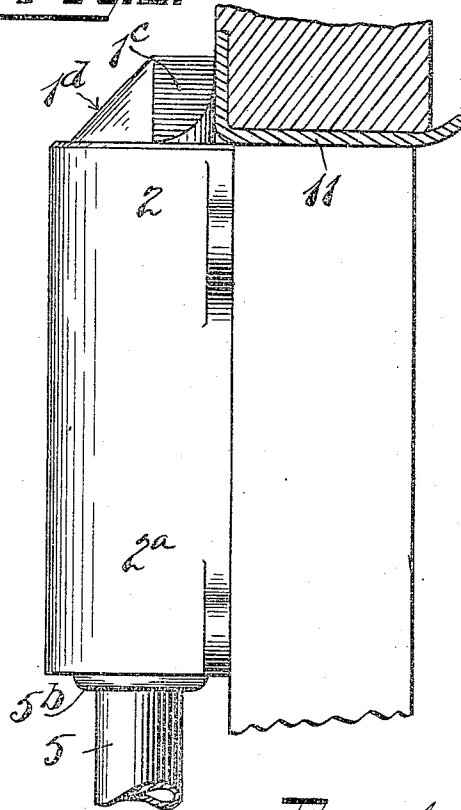


Fig. 3.

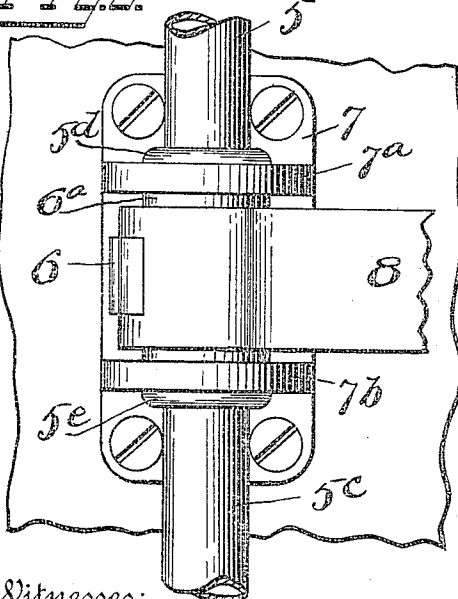
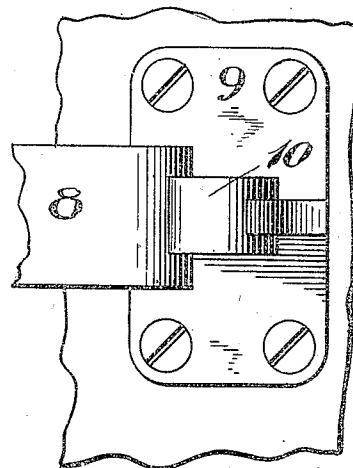


Fig. 4.



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Fig. 5

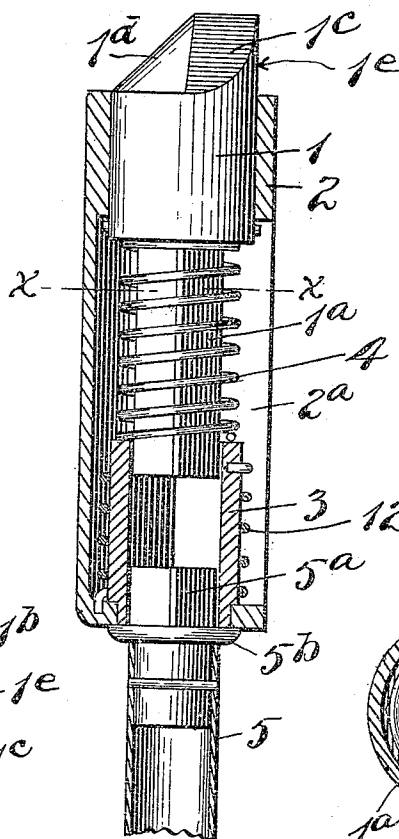


Fig. 6

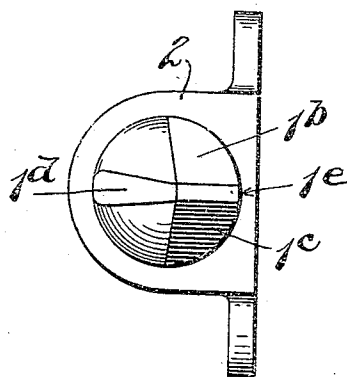
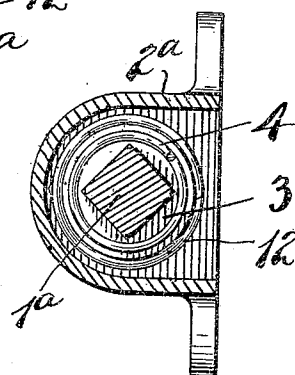


Fig. 7



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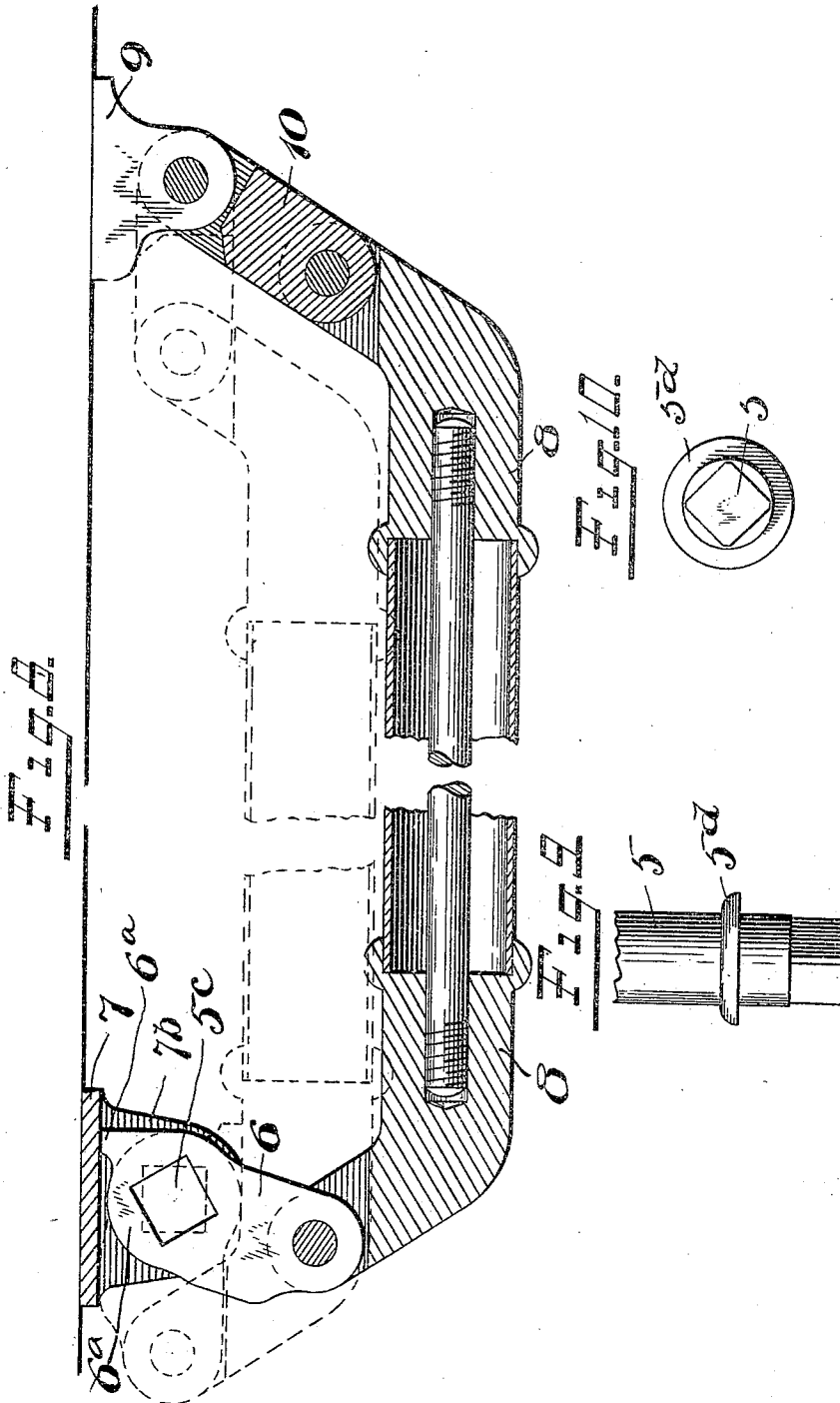
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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LATCH MECHANISM FOR EMERGENCY-DOORS.

958,353.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, AUGUST ARENS and ERNEST L. TEICH, citizens of the United States, residing at New Britain, county of
5 Hartford, State of Connecticut, have invented certain new and useful Improvements in Latch Mechanism for Emergency-Doors, of which the following is a full, clear, and exact description.

10 This invention relates to latch mechanism and particularly to bolts adapted to emergency door exits, such bolts being commonly termed "panic door" bolts.

The object of the invention is to simplify
15 and improve the construction whereby in the event of a panic, and occasion for hasty exit, pressure toward the door from the inside will operate to release the latch mechanism so that the door may freely swing open.

20 Our invention comprehends a number of improvements which will later be more fully explained.

In the drawings Figure 1 is a front elevation of the latch bolt end of the apparatus. Fig. 2 is a side elevation thereof, showing
25 a part of a door and door casing. Fig. 3 is a front elevation of the latch bolt operating apparatus. Fig. 4 is a front elevation of a mounting for part of the operating mechanism. Fig. 5 is in the main a longitudinal sectional view showing the latch bolt and certain related parts in elevation. Fig. 6 is
30 a plan view of the latch bolt. Fig. 7 is a section on the line $x-x$ of Fig. 5. Fig. 8 is in the main a horizontal sectional view of the operating mechanism, certain parts, however, being shown in elevation. Fig. 9 is a side elevation of the lower end of one of the operating rods. Fig. 10 is a view of the
40 lower end of said rod.

In the embodiment of the invention selected for illustration the latch bolt is shown to be of the so-called Cremorne type in which a bolt is provided at the upper and
45 lower edge of the door, each bolt being suitably connected with an operating member readily accessible by the one who is to operate the door, said bolts co-acting with the upper and lower parts of the door casing to
50 hold the door closed. In the drawings we have shown only one latch bolt, viz., the one for the upper edge of the door, it being sufficient to explain that the bolt for the lower edge of the door may be understood to be of
55 corresponding construction.

1 represents the main body of the latch bolt, the same being of circular outline in horizontal cross section. This bolt both slides and oscillates in a guide 2.

2^a is a housing for certain other parts 60 which we will presently describe.

1^a is the tail of the latch bolt, which is preferably angular in horizontal cross sectional outline, and somewhat smaller in diameter than the main body 1.

The operative end of the latch bolt is of
65 peculiar formation. As shown in the drawings, the opposite sides of the upper end of said latch bolt taper toward each other to form the two side inclines 1^b 1^c or repressing walls. The inner side of the latch bolt
70 (toward the door) is rounded to provide a curved and tapered surface 1^d, corresponding in general outline to one-half of a cone, the same being provided to also act as a re-
75 pressing wall.

1^e is an abrupt holding wall.

3 is a sleeve having an angular longitudinal passage arranged to slidably receive the angular tail 1^a of the latch bolt. The
80 sleeve 3 is mounted within the housing 2^a and preferably has a bearing therein whereby said sleeve may be rotated. Between the sleeve 3 and the rear end of the main body 1 of the latch bolt is located an expansion
85 spring 4 for projecting the latch bolt outwardly.

5 is a rod having an angular upper end 5^a arranged to enter the lower end of the housing and take into the angular passage
90 in the sleeve 3.

5^b is a bearing flange on the rod 5 arranged to rest against the end of the housing 2^a.

6 is an operating lever mounted in a 95 bracket 7 and arranged to swing upon an axis concentric with the rod 5. It matters not how the operating lever 6 is mounted or supported in the bracket 7 so far as involves the broad idea of this invention but,
100 in the preferred form, this operating lever 6 has a hub 6^a which has a bearing in two offsets 7^a—7^b of the bracket 7. Each of these offsets has a passage through which the rods 5—5^c pass (the rod 5^c being de-
105 signed to connect with the second bolt, not shown). The hub 6^a of the lever 6 preferably has an angular passage. Each rod 5—5^c has its end which engages said hub shaped to enter the squared passage 110

of the hub. The rods 5—5^c are also preferably provided with bearing flanges 5^a—5^e respectively, which rest upon said offsets.

The guide 2 and bracket 7 may be secured 5 to the door by any suitable means, such as the usual wood screws.

8 is a bar arranged to extend across the inner side of a door in a substantially horizontal plane, one end of the bar being pivotally connected to the operating lever 6, 10 as shown, the opposite end being connected to a bracket 9 by a link 10. This cross bar 8 is preferably employed and is preferably mounted in the manner shown so that if 15 any pressure is brought against the outer side of the door, said rod is bound to be influenced by said pressure as later described.

The normal position of the operating lever 20 6 is shown in the drawings, the angle at which said lever stands being such as to avoid a dead center whereby pressure applied directly toward the door against the rod 8 will cause said lever to rotate in a direction to turn the hub 6^a and with it the 25 rod 5 and bolt head 1.

11 represents the strike plate and keeper which is designed to be carried by the door casing and to be engaged by the projecting 30 outer end of the bolt. Assuming the door stands ajar with the bolt projected and standing in the position shown in Fig. 5, if the door is moved in a direction to close the same, some part of the semi-conical incline 1^a will engage the outside end of the 35 strike plate whereby said bolt will be forced back into guide 2 sufficiently to permit the door to be fully closed, whereupon said bolt will be projected so as to stand behind the inner end of the strike plate so as to hold 40 the door closed, the abrupt square wall of said bolt (opposite the semi-conical portion) at such time standing against said strike plate so that the door cannot be under such circumstances pulled or forced open 45 (see Fig. 2).

In the present instance, the lock being applied to emergency exit doors only, it is unnecessary to describe means for operating 50 the bolt excepting from the inner side of the door, the mechanism heretofore outlined being appropriate for that purpose. If occasion arises demanding the use of the door for exit purposes the person or persons desiring to pass out through said door simply 55 swing the operating lever 6 for example, by pressing against the cross rod 8. This swinging of the lever rotates the bolt 1 substantially a quarter of a turn. This partial rotation will present to the inner end of the 60 strike plate one or the other of the side inclines 1^b 1^c. In the particular arrangement shown in the drawings, this movement will present the incline 1^b. When this incline is 65 presented to the strike plate, pressure

against the door will cause the bolt 1 to be forced back into the guide 2 against the influence of spring 4 and the door will thereupon freely open. Any suitable means may be provided to restore the parts to their normal position. In the particular form 70 shown, 12 is a spring for that purpose, the same being located within the housing, 2^a and being coiled around the sleeve 3, one end being anchored to said housing, the other being connected to said sleeve. 75

6^a is a stop on the operating lever to check the lever on its return movement and hold it in the desired position.

From the foregoing it will be seen that 80 practically all tendency to bind or "hang" is eliminated and that the withdrawing of the bolt is in a sense automatic, the parts being so constructed that, when shifted to a certain position, mere pressure against the 85 door from the inside will cause the bolt to be repressed by the strike plate. By this arrangement, even though very heavy pressure is brought to bear against the inner side of the door, still the bolt may be turned 90 with the greatest ease from its holding position to its free position in which position the door will be instantly released to be swung outwardly by the aforesaid pressure. Since 95 the bolt is turned with but very little effort under all conditions, it follows that wear and danger of breakage is minimized.

What we claim is:

1. In a latch mechanism for doors, a latch bolt, a guide therefor, said bolt being arranged to both oscillate and slide in said 100 guide, a yielding projecting means for said bolt, said bolt having its outer end formed on its side, and at substantially right angles, with an inclined repressing wall and a 105 straight holding wall, and manually operable means for imparting an oscillating movement to said bolt without shifting the same longitudinally, whereby one or the other of said walls may be brought into position for engagement with part of a door casing by approximately a quarter turn of 110 said bolt.

2. In a latch mechanism for doors, a bolt, a support therefor, said bolt being arranged 115 to both oscillate and slide in said support, yielding means for normally holding said bolt projected, the outer end of said bolt having two oppositely arranged side inclines, a semi-conical surface connecting 120 both inclines at one side of the bolt and a straight holding wall opposite said semi-conical incline, said bolt being free to be pushed in at all times, and manually operable means for oscillating said bolt whereby 125 one of the inclined walls may be brought into position for engagement with part of a door casing by approximately a quarter of a turn of said bolt.

3. In a latch mechanism for doors, a latch 130

bolt having at its outer end an inclined repressing wall and also an abrupt holding wall, a support and guide for said bolt in which said bolt is arranged to both slide and oscillate, means for yieldingly holding said bolt normally extended relatively to said bolt support, and manually operable means for presenting at will relatively to one surface of the door either the inclined repressing wall of the bolt or the abrupt holding wall of the bolt without exerting thereon longitudinal pressure, said means being operatively connected with said bolt by a rotatable sleeve.

4. In a latch mechanism for doors, a round bodied bolt, the outer end of said bolt having an inclined repressing wall and an

abrupt holding wall, a guide or support for the bolt including a fixed part and a rotatable sleeve, in which said bolt may slide said sleeve being mounted in said fixed part to oscillate, means for yieldingly holding said bolt projected, an oscillating operating device for manual operation, a connection between said oscillating operating device and said latch bolt, whereby said parts are connected for oscillation only by the movement of said operating device.

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