April 16, 1929. H. SUCK 1,709,500

CONCEALED FASTENER FOR DOORS, PANELS, AND THE LIKE

Filed Feb. 23, 1928

Fig.1.

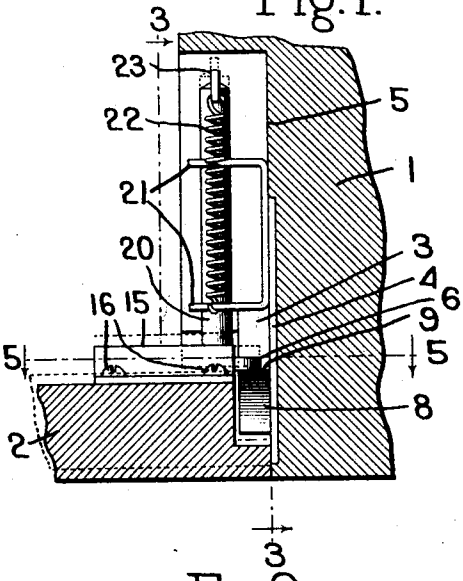


Fig.2.

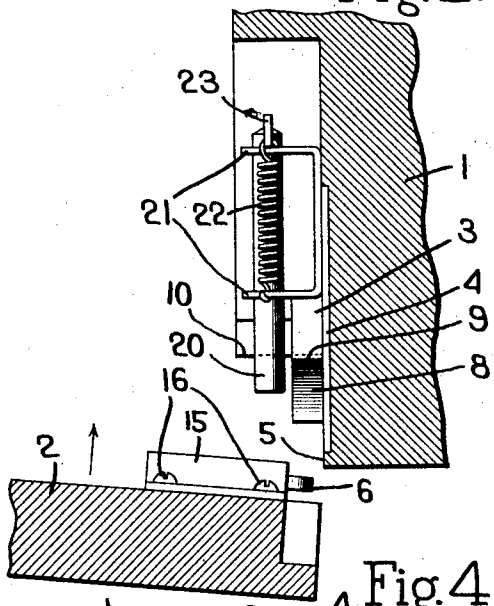


Fig.3.

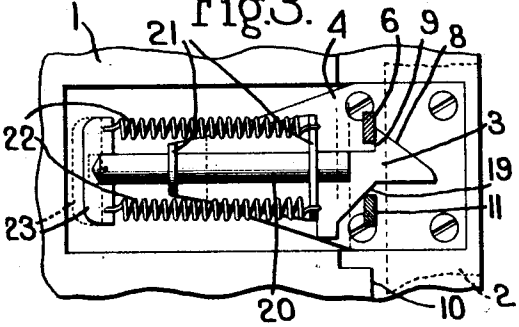


Fig.4.

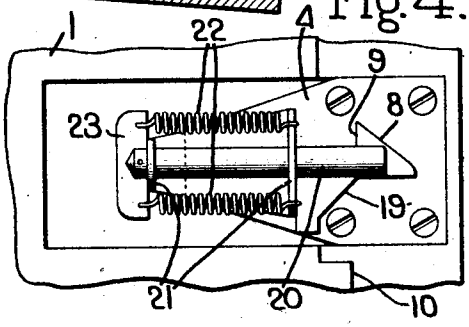


Fig.5.

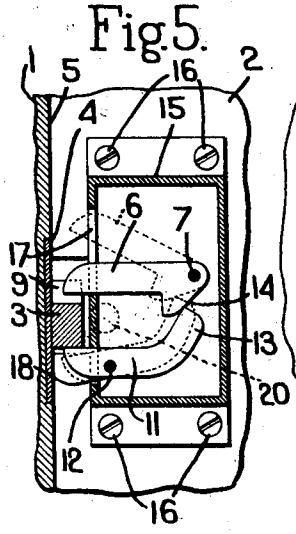


Fig.6.

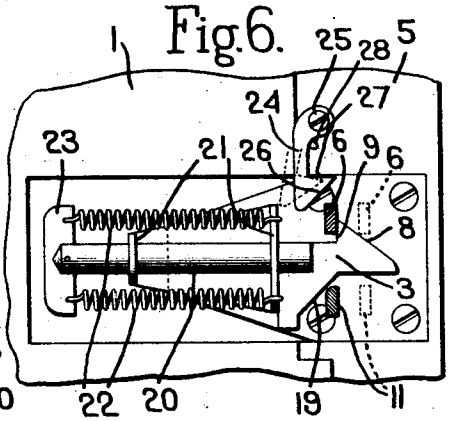
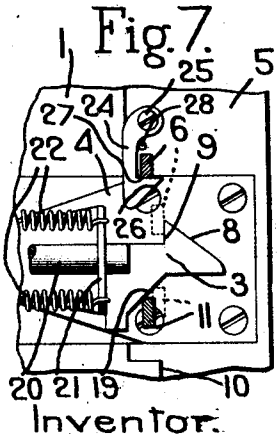


Fig.7.



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UNITED STATES PATENT OFFICE.

HENRY SUCK, OF ROSLINDALE, MASSACHUSETTS.

CONCEALED FASTENER FOR DOORS, PANELS, AND THE LIKE.

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This invention relates to a concealed fastener for doors, panels and the like and it has for its general object to provide a novel concealed fastener which is simple in construction and yet is easily manipulated.

My improved fastener is of that type which will automatically secure the door when the latter is closed but which may be released by giving the door a slight inward movement beyond its normal closed position, and another object of the invention is to provide a novel fastener of this type which will function as a trick fastener in that the inward movement of the door must have some special characteristics in order to release the fastener.

Other objects of the invention are to improve generally concealed fasteners all as will be more fully hereinafter set forth.

In order to give an understanding of the invention I have illustrated in the drawings a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

In the drawings, Fig. 1 is a sectional view through a portion of a door frame and one edge of a door illustrating my improved fastener and showing the door in fastened condition;

Fig. 2 is a similar sectional view showing the door being closed and just before it is fastened;

Fig. 3 is a section on the line 3—3, Fig. 1 showing the fastener in fastening position;

Fig. 4 is a view of the keeper which is attached to the door jamb looking toward the right, Fig. 2;

Fig. 5 is a section on the line 5—5, Fig. 1;

Figs. 6 and 7 are views similar to Fig. 3 but illustrating a different embodiment of the invention.

My improved fastener is capable of use with doors of almost any description and also for fastening swinging panels and the like.

In the drawings 1 indicates a portion of the door jamb and 2 is a swinging door which is closed by a movement in the direction of the arrow Fig. 2. My improved door fastener comprises a keeper 3 which may be secured either to the door jamb or to the door and a pivoted latch of novel construction which may be mounted either on the door or on the door jamb. In the illustrated embodiment of my invention the keeper is mounted on the door jamb and the latch on the door but the position of the parts may be reversed without departing from the invention. The keeper is indicated at 3 and is shown as being rigid with a striker plate 4 that is secured to the door jamb 1 and is illustrated as being located in a recess 5 formed in the jamb.

The latch which is carried by the door is indicated at 6. Said latch is pivotally mounted at 7 and is arranged to swing in a vertical plane. When the door closes the end of the latch rides up on the inclined face 8 of the keeper and drops behind the shoulder 9 thus securing the door as will be readily understood.

The door is constructed so that after it is latched by the engagement of the latch member 6 with the shoulder 9 of the keeper 3 said door may be given an additional inward movement into an advanced position. A stop 10 co-operates with the door to limit the extent of such additional movement. My invention contemplates novel means whereby such additional inward movement will operate to raise the latch 6 and release it from the keeper thus unlatching the door and will also hold the latch raised while the door maintains its advanced position. The device also includes suitable springs which act on the door when the latter is closed tending to open it so that as soon as the latch is raised the springs will function to swing the door open.

For raising the latch by this further additional inward movement of the door I have provided a latch-raising member 11 which is pivotally mounted on the door at 12 and is provided with a tail portion 13 adapted to engage the cam face 14 of the latch. The construction of this latch-releasing member is such that when the outer end is depressed the tail 13 thereof will be raised thereby swinging the latch upwardly about its pivot. Both the latch 6 and the latch-releasing member 11 are illustrated as pivotally mounted in a suitable housing or casing 15 which is attached to the inside of the door by suitable screws 16, said casing having slots 17, 18 in one edge through one of which the end of the latch projects and through the other of which the end of the latch releasing member projects.

The striker plate 4 is provided with a cam face 19 situated just beyond the shoulder 9

of the keeper member, said cam face 19 being so disposed that when the door is locked the projecting end of the latch-releasing member will be situated closely adjacent said cam face as seen in Fig. 6 so that when the door is moved inwardly beyond the point indicated in Fig. 6 or from the full to the advanced dotted line position Fig. 1 the end of the latch-releasing member will engage said cam face 19 thus depressing said member. The downward movement of the outer end of the latch-releasing member resulting from its engagement with the cam face 19 causes the tail of the latch-releasing member to swing upwardly thereby raising the latch 6. It will thus be seen that when the door is closed it will automatically lock itself by reason of the latch dropping over the shoulder 9 of the keeper, and that when the door is pushed inwardly beyond its latching position the latch-releasing member will engage the cam face 19 and thereby raise the latch out of engagement with the keeper. The latch will be held raised so long as the door is maintained in its advanced position because while the door is in such position it acts on the latch-releasing member 11 and holds the latter in the dotted line position Fig. 5.

The relation between the latch-releasing member and the latch are such that a slight downward movement of the projecting end of the latch-releasing member will give a considerable upward movement to the projecting end of the latch. This is because the pivot 12 of the latch-releasing member is nearer to the projecting end thereof than to the tail and because said tail acts on the latch relatively near its pivot.

As stated above the complete fastener also includes a spring device which acts on the door when the latter is closed and which tends to open the door, said spring device functioning to swing the door open as soon as the inward pressure on the door necessary to release the latch has ceased.

This spring device may have any desired construction without departing from the invention so long as it is arranged so that it will exert an outward pushing force on the door when the latter is closed. In the construction herein illustrated this spring device comprises a spring-pressed pusher 20 which is slidably mounted in ears 21 formed on the striker plate 4 and which is adapted to act against the inside of the door when the latter is closed, said plunger being acted upon by one or more springs 22. These springs are shown as connected at one end to one of the ears 21 and at the other end to a head 23 on the end of the pusher 20. Said springs normally hold the pusher in such position that it will engage either the door 2 or the housing 15 before the door is entirely closed so that when the door is finally closed the springs are under considerable tension. When the door is latched this spring device thus holds the latch firmly against the shoulder 9 of the keeper but when the latch has been released from the keeper by the further inward movement of the door the spring then functions to give the door an opening impulse which will swing it free of the jamb 1.

My improved fastener can be constructed so that it will be released simply by an inward pressure upon the closed door or it may be constructed in the nature of a trick lock which cannot be released unless the inward pressure has certain characteristics. If the fastener is constructed so that it will be opened simply by an inward pressure on the door and without regard to the character of such pressure, I propose to provide said fastener with means operating to engage the latch when it has been raised by the inward movement of the door and to hold said latch in such raised position until the door has opened sufficiently to carry the latch outwardly beyond the keeper.

Any suitable means may be employed for thus holding the latch raised when once it has been lifted into unlatched position by the inward movement of the door. In Figs. 6 and 7 I have illustrated for this purpose a catch 24 which is pivotally mounted on the door jamb and is situated above the normal or lowered position of the latch 6. Said catch is constructed, however, so that when the latch is raised the catch will automatically engage the raised latch and hold it elevated. Said catch is shown as being pivoted to the door jamb at 25 and is provided with a cam face 26 and a shoulder 27. When the door is closed, as shown in Fig. 6, the latch 6 will be situated directly underneath the cam face 26 of the catch and as the latch is raised by the inward movement of the door the rising latch will engage the cam face 26 and throw the catch backwardly into the dotted line position Fig. 6, such catch swinging forward by gravity underneath the latch after the latch has been carried above the shoulder 27. Said shoulder 27, therefore, will engage the latch and hold it elevated as shown in Fig. 7 thus unlocking the door. This operation will transpire regardless of the character of the inward movement of the door from the full to the dotted line position Fig. 2, that is, regardless as to whether such inward movement is a slow firm pressure or a quick movement more in the nature of one which would be produced by a blow.

After the latch has been thus locked in its elevated position then if the pressure on the door is released the springs 22 will force the door open and as the door opens the latch will be withdrawn from the shoulder 27 of the catch and will gravitate to its normal

or lowered position. By the time the door is opened sufficiently to withdraw the latch from the shoulder 27 said latch has been carried outwardly beyond the shoulder 9 of the keeper so that when the latch does thus gravitate to its normal position it will not drop behind the keeper.

If it is desired that the fastener should function as a trick lock to be opened only when the inward movement has a certain characteristic, then the catch 24 is omitted. Said catch can be easily taken off by simply removing the sustaining screw 25. With the catch 24 omitted or removed there is nothing to hold the latch 6 elevated when it has been raised by the additional inward swinging movement of the door and in order to open the door it is necessary to give the latter a quick inward movement and then to instantly release the door. Such quick inward movement will throw the latch into its raised position and if the door is instantly released the spring device 22 will give the door a quick outward impulse sufficient to carry the latch outwardly beyond the shoulder 9 of the keeper before the latch has an opportunity to fall into its fastening position. If, however, the door is simply pushed in moderately and then released in ordinary fashion the latch 6 will have time to gravitate into its fastening position behind the shoulder 9 before the springs 22 carry the door into a position where the latch 6 is in front of the shoulder 9. With the catch 24 omitted, therefore, the door can only be opened by pushing it in to raise the latch and then instantly withdrawing the pressure on the door so that the springs 22 will be unhampered in their action of giving the door a quick outward movement by which the latch is carried outwardly beyond the shoulder 9 before it has time to gravitate into its lowered position.

It will be noted that the fastener is entirely located within the door and on the inside of the jamb and that no part of the lock is visible on the outside of the door when the latter is closed. The fastener, therefore, is entirely concealed from view and if it is used for locking a panel there will be nothing to indicate from the outside that the panel is in any way different from an ordinary panel. With this invention, therefore, it is possible to provide secret panels or doors which are not only secret in that they give no exterior appearance of being hinged panels but are also secret in the sense that they can only be opened by those who know how to manipulate the fastener.

While I have illustrated a construction in which the latch is mounted on the door and the keeper is on the door frame yet it will be obvious that the position of the parts might be reversed without departing from the invention. In other words, it would be possible to place the keeper on the door and the latch on the door frame and yet to have the invention operate as described.

I claim:

1. In a concealed door fastener, the combination with a door and its frame, of a keeper secured to one of the parts, a pivoted latch carried by the other part and adapted to latch behind the keeper when the door is closed, said latch swinging in a vertical plane, said door being capable of having a slight additional inward movement into an advanced position after the latch has engaged the keeper, and means operated by such additional movement of the door to raise the latch and disengage it from the keeper and to hold said latch raised.

2. In a concealed door fastener, the combination with a door and its frame, of a keeper secured to one of the parts, a pivoted latch carried by the other part and adapted to latch behind the keeper when the door is closed, said latch swinging in a vertical plane, said door being capable of having a slight additional inward movement into an advanced position after the latch has engaged the keeper, means operated by such additional movement of the door to raise the latch and disengage it from the keeper and to hold the latch raised while the door occupies its advanced position, and automatically-operative means acting against the closed door and tending to open it.

3. In a concealed door fastener, the combination with a door and its frame, of a keeper secured to one of the parts, a pivoted latch carried by the other part and adapted to latch behind the keeper when the door is closed, said latch swinging in a vertical plane, said door being capable of having a slight additional inward movement into an advanced position after the latch has engaged the keeper, means operated by such additional movement of the door to raise the latch and disengage it from the keeper and to hold the latch raised while the door maintains its advanced position, and a spring acting on the closed door and tending to open it.

4. In a door fastener, the combination with a door and its frame, of a keeper secured to one of the parts, a pivoted latch secured to the other part and adapted to latch behind the keeper when the door is closed, said door being capable of a slight additional inward movement after the latch engages the keeper, and latch-releasing means actuated by said additional movement of the door to raise the latch out of engagement with the keeper and hold the latch raised while the door maintains the position it occupies at the end of said additional movement.

5. In a door fastener, the combination with a door and its frame, of a keeper se-

cured to one of the parts, a pivoted latch secured to the other part and adapted to latch behind the keeper when the door is closed, said door being capable of a slight additional inward movement after the latch engages the keeper, a latch-releasing member, and a cam to actuate said member when the door is given such additional inward movement thereby releasing the latch from the keeper.

6. In a door fastener, the combination with a door and its frame, of a keeper secured to one of the parts, a pivoted latch secured to the other part and adapted to latch behind the keeper when the door is closed, said door being capable of a slight additional inward movement after the latch engages the keeper, latch-releasing means operated by such additional movement of the door to raise the latch and release it from the keeper, and means to engage the raised latch and hold it raised.

7. In a door fastener, the combination with a door and its frame, of a keeper secured to one of the parts, a pivoted latch secured to the other part and adapted to latch behind the keeper when the door is closed, said door being capable of a slight additional inward movement after the latch engages the keeper, latch-releasing means operated by such additional movement of the door to raise the latch and release it from the keeper, and means operative to hold the latch raised until the door has opened slightly, said latch then being released.

In testimony whereof, I have signed my name to this specification.

HENRY SUCK.