

July 21, 1936.

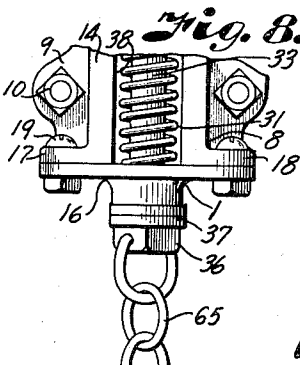
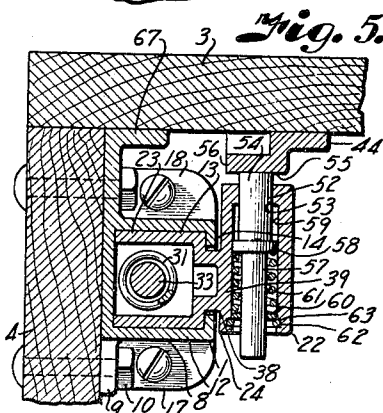
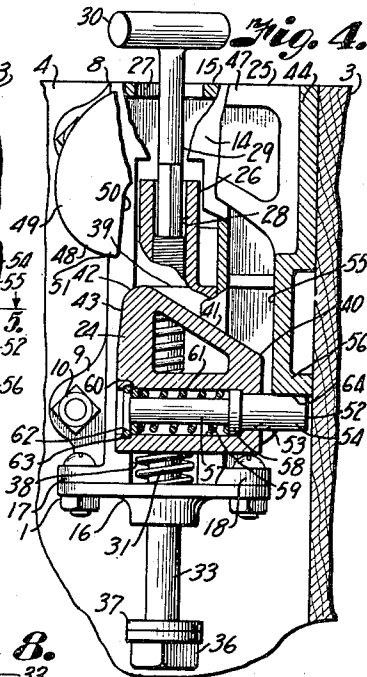
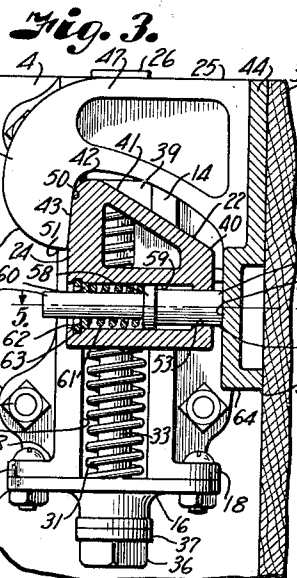
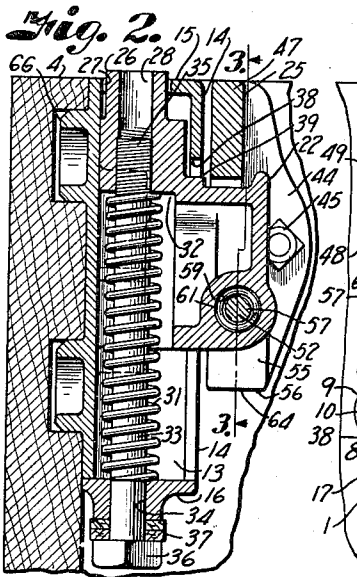
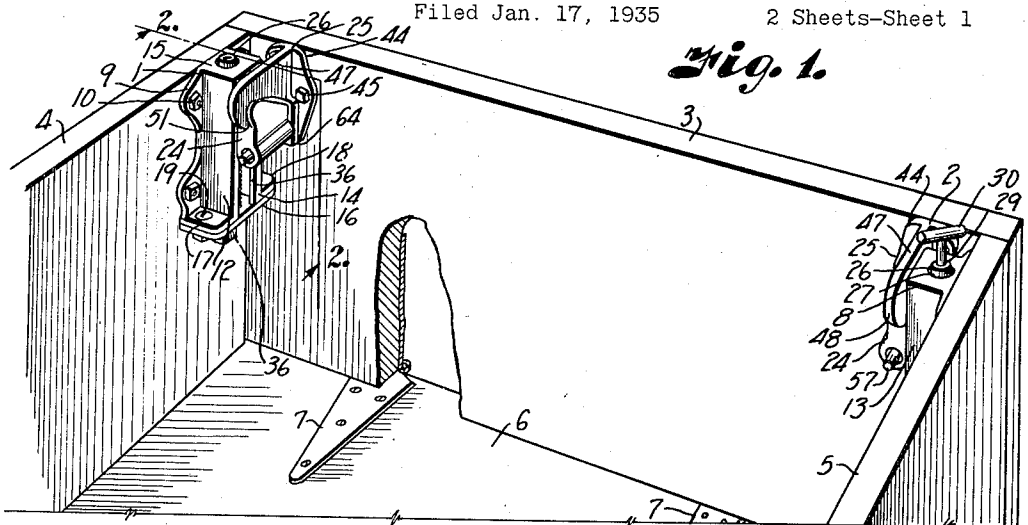
O. N. GREDELL

2,048,334

FASTENING DEVICE

Filed Jan. 17, 1935

2 Sheets-Sheet 1



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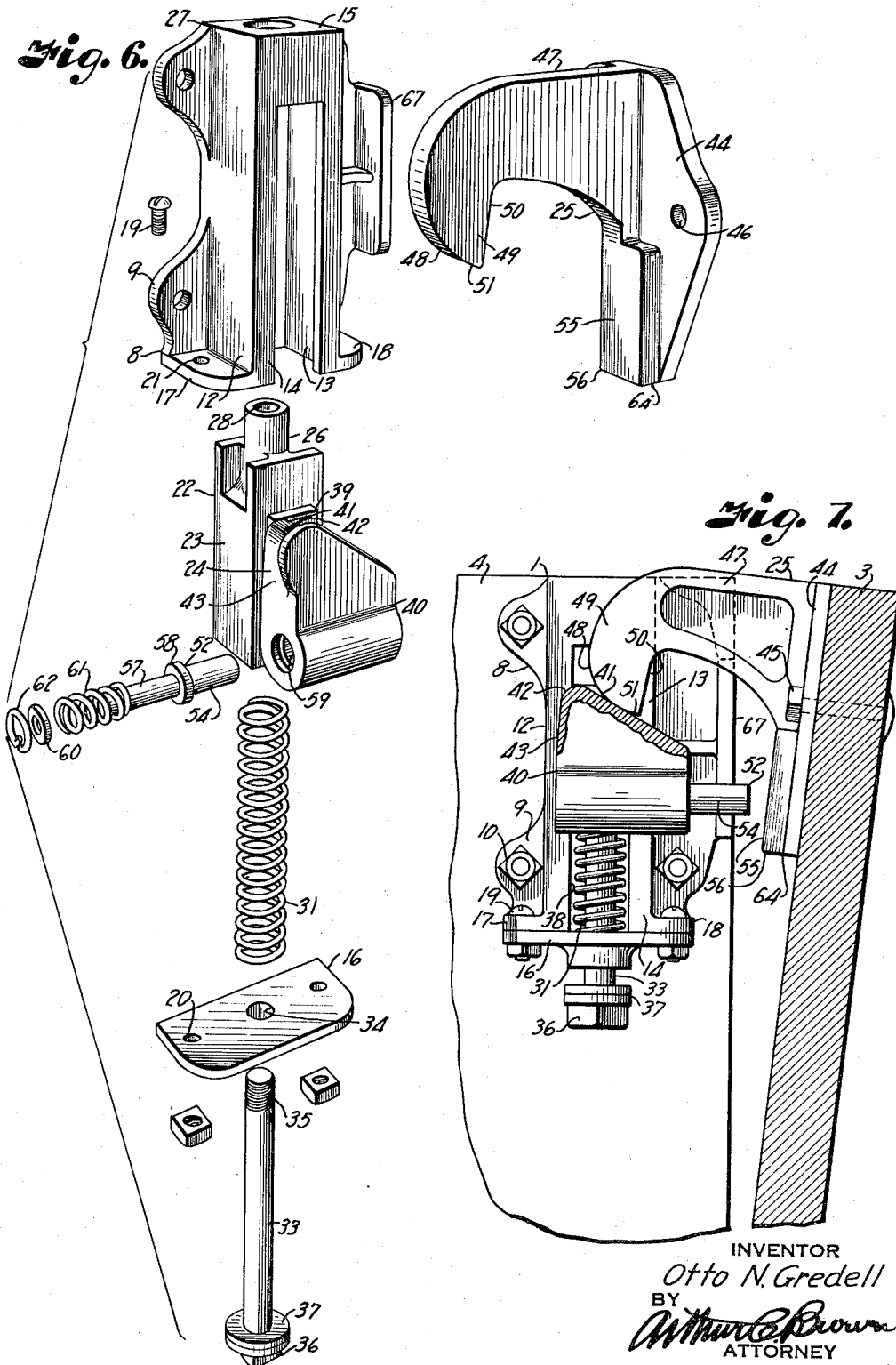
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,048,334

FASTENING DEVICE

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Application January 17, 1935, Serial No. 2,216

8 Claims. (Cl. 292—174)

This invention relates to fastening devices and more particularly to latches for securing a hinged door, panel, or the like, and has for its principal objects to provide a latch with means for facilitating operation thereof, to provide for remote control of the latch, to provide a latch which cannot be accidentally released, and to provide an improved mounting for the latch to relieve the shearing stresses on the latch attaching means.

In accomplishing these and other objects of the invention, as hereinafter pointed out, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a hinged panel that is retained in closed position by a pair of latches embodying the features of the present invention, the bolt and keeper members of the latches being shown in interengaged position.

Fig. 2 is a sectional view through one of the latches on the line 2—2, Fig. 1.

Fig. 3 is a section on the line 3—3, Fig. 2.

Fig. 4 is a section similar to Fig. 3 showing the bolt in disengaged relation with the keeper and retained by the latch detent, a part of the keeper and bolt housing being broken away to show the key for effecting release of the bolt.

Fig. 5 is a cross section through the detent portion of the latch on the line 5—5, Fig. 3.

Fig. 6 is a perspective view of the latch parts shown in disassembled spaced relation.

Fig. 7 is a sectional view showing the hinged panel being moved to closed position to cause engagement of the keeper with the bolt.

Fig. 8 is a detail view of a modified form of latch wherein the latch bolt guide pin is provided with a flexible cable for effecting remote operation of the latch.

Referring more in detail to the drawings:

1 and 2 designate a pair of latches embodying the features of the present invention and which, in the illustrated instance, are employed in retaining a hinged panel 3 in latched engagement relatively to a pair of end boards 4—5 and a bottom 6. The lower edge of the panel 3 is hingedly connected with the bottom 6 by means of suitable hinges 7 whereby the panel is swingingly movable to and from closed position.

In panels of this character and particularly those of longer length than the reach of an operator, it is difficult to simultaneously release the latches holding the respective ends of the panel; therefore, as above pointed out, it is a principal object of the present invention to provide means for facilitating operation of the latches so that

either one or the other may be latched in disengaged position while the operator moves the other latch to disengaged position to free the panel as now to be described.

The latches 1 and 2 are of identically the same construction and a specific description of one will suffice for the other. Each latch is shown as including a bracket 8 having laterally extending ear portions 9 through which suitable fastening devices 10 are extended to secure the bracket to the inner side face of the ends 4—5. Projecting outwardly from the face of the bracket is a substantially rectangular shaped housing 11 including spaced side walls 12 and 13, a front wall 14 and a closed end 15. The opposite end of the housing 15 is closed by a plate 16 having its ends removably secured to laterally extending ears 17 and 18 on the lower edges of the side walls 12 and 13 as best illustrated in Figs. 3 and 4, the plate being secured to the ears by fastening devices 19 extending through suitable openings 20 in the plate and aligning openings 21 in the ears as shown in Fig. 6.

Slidable in the housing is a latch bolt 22 including a substantially rectangular shaped body portion 23 having free sliding fit within the vertical walls of the housing so that it may be reciprocated therein to effect engagement of the bolt head and keeper elements 24 and 25 of the latch as later described. Formed on the upper end of the body portion of the bolt 22 is a cylindrical boss 26 that normally projects through an opening 27 in the closed end of the housing. The boss 26 is provided with an axial bore 28 for receiving the shank 29 of a suitable key 30 or other instrument by which the latch bolt is moved against action of a spring 31 that is mounted in the housing and has its lower end engaging the plate 16 and its upper end engaging in a socket 32 in the body portion of the latch bolt.

In order to further guide the latch bolt in its housing, the latch bolt is provided with a guide pin 33 slidably mounted in a bearing 34 on the plate 16 and which has its upper end threaded as at 35 to engage in the lower threaded end of the bore 28 and provide an abutment for the shank 29 of the key 30 above described. The lower end of the guide pin carries a head 36 seating one or more compressible washers 37 to absorb shock and prevent the metallic click which would be caused by the head 36 engaging the plate when the latch bolt is driven to the top of the housing under propelling influence of the spring 31.

The front wall of the housing has a rectangular

slot 38 extending from its lower edge to a point adjacent its upper end and in which operates a projecting boss 39 that carries the bolt head 24. The head 24 is preferably formed integrally with the body portion of the latch bolt and includes a keeper engaging portion 40 having an upwardly inclined cam face 41 terminating in a rounded edge 42 over which the keeper 25 slides into engagement with a preferably inclined face 43 which provides wedge-like engagement of the keeper to take up play and securely retain the panel in closed position under action of the spring 31.

The keeper 25 includes a plate portion 44 that is fixed to the inner face of the panel 3 by fastening devices 45 extending through openings 46 therein and through aligning openings in the panel. Projecting outwardly from the upper end of the plate is an arm 47 having a rounded forward edge 48 terminating in a hook 49 having an inclined face 50 to engage the inclined face 43 of the bolt head previously described.

With the construction thus far described, it is apparent that when the panel is moved to closed position the rounded nose 48 of the keeper will engage the inclined face 41 of the head 24 to cause the latch bolt to be moved downwardly in its housing against tension of the spring 31. When the latch bolt has been depressed to the point where the tip 51 of the keeper rides over the rounded end 42 of the bolt head, the spring 31 will be automatically released to move the bolt into latching engagement with the keeper as shown in Fig. 3 to retain the panel in closed position.

To release the panel, the key 30 may be inserted in the bore of the boss 26 to depress the latch bolt against tension of the spring 31 until the rounded portion 42 clears the lower edge 51 of the keeper, after which the keeper is free to be moved outwardly to release one end of the panel as shown in Fig. 7.

Where a latch is mounted on each end of the panel, as shown, it is difficult to release both bolts at the same time. I, therefore, provide each bolt with a detent 52 that is slidably mounted in a bore 53 extending transversely across the lower portion of the bolt head as best illustrated in Fig. 6. The detent includes a head portion 54 that is adapted to slidably engage the face 55 of a lug 56 on the plate portion of the keeper so that when the panel is closed, the detent is retained in retractive position within the bore of the bolt head.

The detent also includes a shank 57 having a collar 58 slidable in an enlarged portion 59 of the bore 53. Sleeved over the shank 57 with one end engaging against the collar 58 and its opposite end engaging a washer 60 is a spring 61 to normally urge the detent in contact with the face of the lug. The washer 60 is retained in the open end of the bore by means of a split ring 62 having its outer periphery seated in an annular groove 63 as shown in Fig. 3.

It is thus apparent that the spring 61 retains the head of the detent in yielding engagement with the face of the lug 56 but when the bolt is depressed to release the keeper, the detent will ride off the bottom edge of the lug, whereupon the spring 61 will project the detent under the shoulder 64 that is formed by the lower edge of the lug. Then when pressure on the bolt is released, it will be retained in retracted position by means of the detent until the time that the panel is swung outwardly to remove the lug from the

path of the detent. When this occurs, the bolt is released for return by its spring to its normal position.

Upon closing of the panel, the rounded nose portion of the keeper riding on the inclined face 41 will depress the bolt until the hook shaped edge of the keeper overrides the rounded portion of the bolt head, whereupon the spring 61 will return the bolt into latched engagement with the keeper. Due to the fact that the extent of depression of the bolt caused by the camming action of the keeper is less than required to cause the detent to ride off the lug, the detent is retained in retractive position as shown in Fig. 3.

To relieve shearing stresses on the fastening devices 10, the rear face of the bracket 8 is provided with spaced bosses 66 that are mounted in sockets formed in the inner faces of the end boards 4.

In order to assist in spacing the brackets so that the hook portion of the keeper is in proper relation with the bolt head, the side of the bracket adjacent the panel is provided with a laterally extending stop flange 67 adapted to abut against the face of the panel at the time the edge 51 overrides the rounded end of the bolt head.

In the form of the invention shown in Fig. 8, the heads of the guide pins are provided with flexible cables 65 whereby the latch bolts may be selectively operated at a remote point, thereby eliminating the necessity of using the key 30.

In applying the latches constructed as described, recesses are made on the inner faces of the end boards to accommodate the bosses 66, the recesses being so located that the flange 67 abuts squarely against the inner face of the panel 3. Holes are then drilled for the fastening devices 10 which are extended therethrough and through the ears 9 of the bracket. The keepers 25 are then applied to the inner face of the panel in line with the cam face 41 of the bolt by drilling holes through the panel in line with the openings 46, after which the fastening devices 45 are projected therethrough to complete attachment of the keepers.

In this position, the faces 50 of the keepers cooperate with the wedge face 43 of the bolt heads to draw the panel tightly against the flange 67 to prevent rattling or looseness of the parts. Should wear occur between the faces 43 and 50, the spring 31 will maintain wedging engagement of the bolt heads with the hooked ends of the keepers. Variation in relative position between the latch bolts and keepers may be compensated for by varying the thickness of the washers 37 that are applied to the guide pins 33.

To release the latches in the installation above described, the bolt for the latch 1 is depressed by inserting the shank 29 of the key 30 into the bore 28 until the end thereof engages the end face of the guide pin 33.

Pressure is then applied on the handle of the key to cause depression of the bolt 22 in the guide housing. This carries the latch bolt downwardly away from the hook shaped end of the keeper; however, downward movement of the latch bolt is continued until the detent 52 latches under the lower end of the lug 55. Then when the key is removed, the detent will hold the latch bolt in disengaged relation with the keeper. The key may then be applied in the bore 28 of the latch 2 to cause depression of the bolt for that latch.

The panel is then free to swing away from the stop flanges 67 carrying the keepers therewith.

As soon as the shoulders 64 clear the detents, the springs 31 will raise the bolts carrying them to their original position. The spring 61 will have effected projection of the detents into the position shown in Fig. 7.

When the panel is moved to closed position, the rounded ends of the keepers will, upon engaging the inclined surfaces 41 of the bolt heads, cause downward movement thereof. Simultaneously, the lugs 55 will have engaged the end of the detents 54 to cause their retraction within the bores 53; however, the keepers when finally latched with the bolts will not have moved the bolts far enough to cause the ends of the detents to ride off the lower ends of the lugs.

If the latches are to be operated from a remote point, the heads of the guide pins 33 will be provided with flexible connections 65 through which unlatching movement of the bolts may be effected in substantially the same manner as with the key 30.

From the foregoing, it is apparent that I have provided a latch construction which may be readily operated and selectively retained in released condition so that a similar latch at the other end of a movable door or panel may be conveniently operated to release the panel.

It is also apparent that a single latch might be used on a door and operated remotely by a cable as indicated in Fig. 8.

What I claim and desire to secure by Letters Patent is:

1. A device of the character described including a bracket, a bolt, means movably mounting the bolt on the bracket, a keeper normally engaged with the bolt and having a detent engaging portion terminating in a stop shoulder, and a detent yieldingly carried by the bolt and engageable with said engaging portion during movement of the bolt into engagement with the keeper and engageable under said stop shoulder when the bolt is moved to release the keeper.

2. A device of the character described including a bracket, a bolt supporting housing on the bracket, a bolt reciprocable in the bolt housing and having a keeper engaging head, a keeper, a spring in the housing having one end engaging the bolt to retain said head in engagement with the keeper, and a spring pressed detent slidably mounted on said head and engageable with the keeper to selectively retain the head in disengagement with the keeper against action of said spring.

3. A device of the character described including a bracket, a bolt housing on the bracket, a bolt reciprocably mounted in the housing and having a keeper engaging head, a keeper normally engaging said head and swingingly movable therefrom, means in the housing engaging the bolt and normally retaining said head in engagement with the keeper, means for shifting the bolt to release the head from engagement with the keeper, and a spring pressed detent movable with the bolt and engaging the keeper to retain the head in

disengaged position during swinging movement of the keeper away from the bolt.

4. A device of the character described including a bracket, a bolt housing on the bracket, a bolt reciprocable in the housing and having a key engaging boss projecting from the housing in one position of the bolt, a keeper engaging head on the bolt, a guide pin fixed to the bolt and guidingly supported in the housing, a keeper, a spring sleeved on the guide pin and having one end engaging the bolt to retain the head in engagement with the keeper, and a spring pressed detent slidably mounted on the bolt and engageable with the keeper to selectively retain the head of the bolt in disengagement with the keeper against action of said spring.

5. A device of the character described including a bracket, a bolt housing on the bracket, a bolt reciprocable in the housing having a keeper engaging head projecting from the housing, a guide pin slidably mounted in the housing and connected with the bolt, a keeper, a spring in the housing normally urging the bolt to retain said head in engagement with the keeper, a spring pressed detent slidably mounted on the head and engageable with the keeper to selectively retain the head in disengagement with the keeper against action of said spring, and a flexible connection connected with the guide pin for actuating the bolt against action of said spring.

6. A device of the character described including interengaging bolt and keeper members movable one from the other, a detent engaging shoulder on one of the members, and a detent slidably mounted on the other member and movable under said shoulder when one of the members is moved from engagement with the other.

7. A device of the character described including a bracket, a keeper having a detent engaging shoulder, a bolt having a keeper engaging head, means movably supporting the bolt on the bracket whereby said head is moved to and from engagement with the keeper, a spring normally urging the bolt in one direction to normally retain the head in engagement with the keeper, and a spring pressed detent movable with the head and engageable under said shoulder to selectively retain the head in disengagement with the keeper against action of said spring.

8. A device of the character described including a bracket, a bolt having a keeper engaging head, a keeper, means movably supporting the bolt on the bracket for carrying said head into and out of engagement with the keeper, a guide pin connected with the bolt and slidably supported on the bracket, a spring in the bracket normally urging the bolt to retain said head in engagement with the keeper, a spring pressed detent slidably mounted on the head and engageable with the keeper to selectively retain the head in engagement with the keeper against action of said spring, and a flexible connection connected with the guide pin for actuating the bolt against action of said spring.

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