C. J. HAGSTROM.

CONCEALED FRENCH CASEMENT LOCK.

APPLICATION FILED JUNE 14, 1919.

1,368,141. **Patented Feb. 8, 1921.**

3 SHEETS—SHEET 1.

Fig: 2.

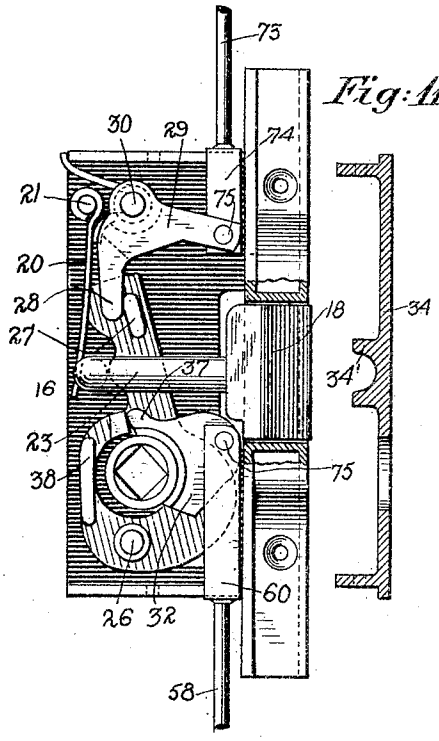


Fig: 11.

Fig: 1.

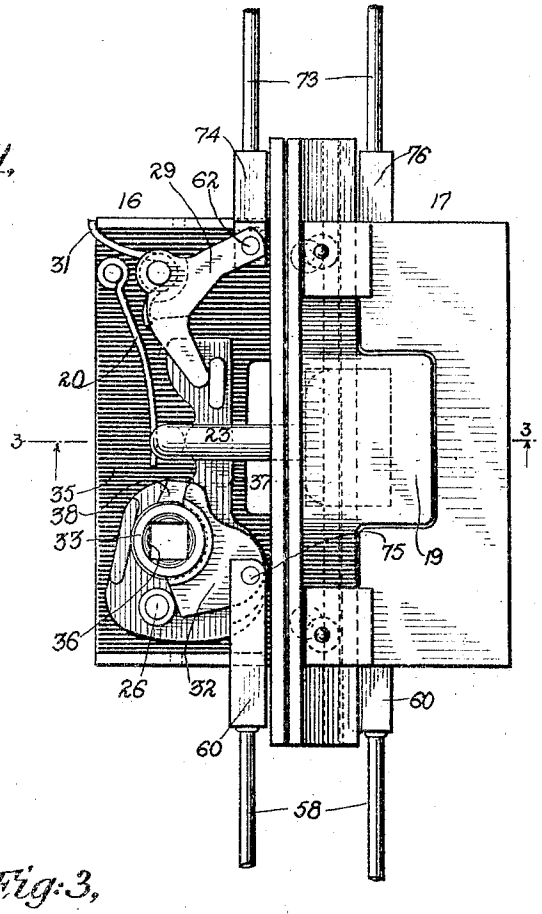
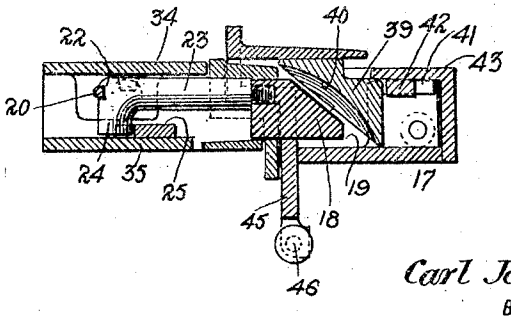


Fig: 3.



WITNESSES

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3 SHEETS—SHEET 2.

Fig: 9.

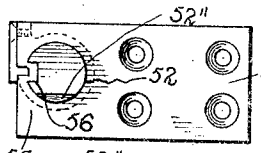


Fig: 7.

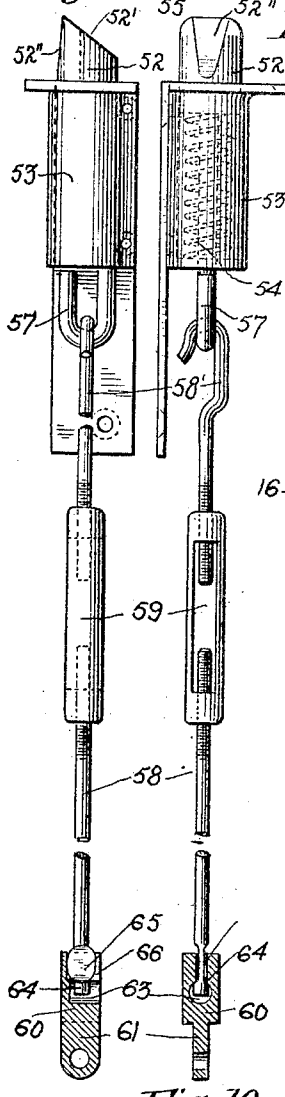


Fig: 8.

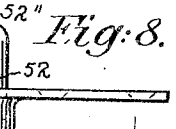


Fig: 4

Fig: 5,

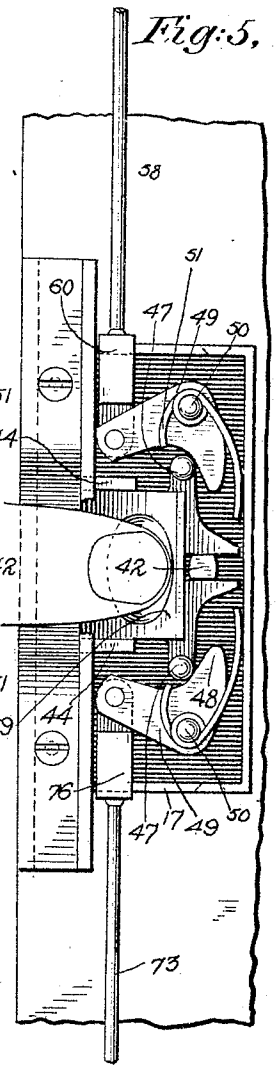


Fig: 10,

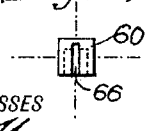
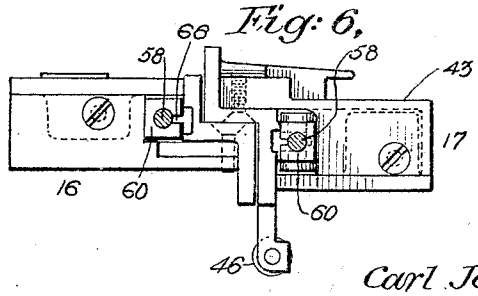


Fig: 6,



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3 SHEETS—SHEET 3.

Fig: 15,

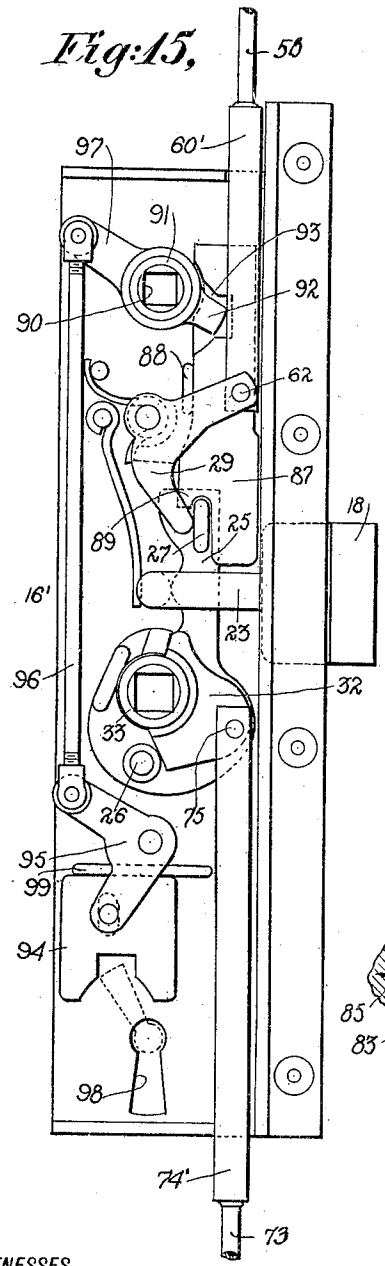


Fig: 12,

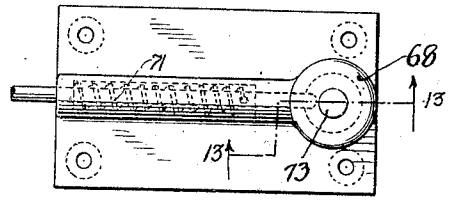


Fig: 13,

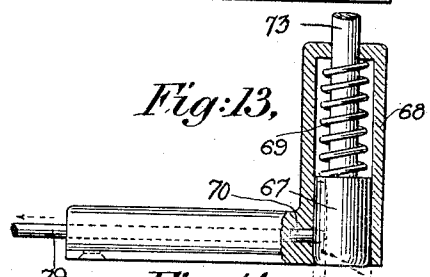
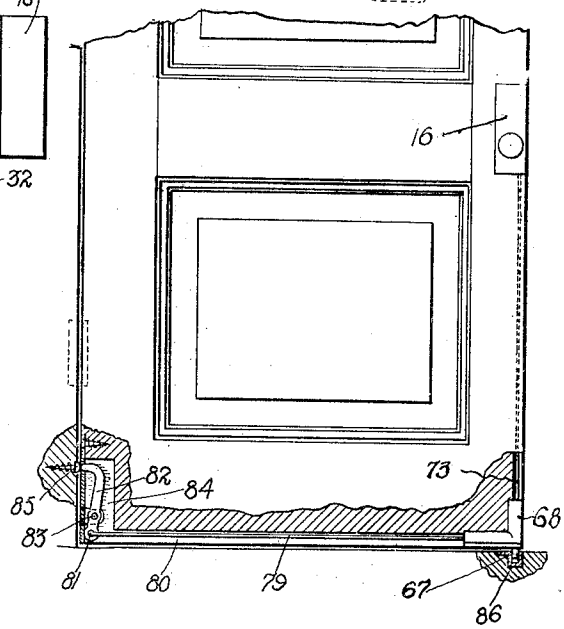


Fig: 14,



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CONCEALED FRENCH-CASEMENT LOCK.

1,368,141. Specification of Letters Patent. Patented Feb. 8, 1921.

Application filed June 14, 1919. Serial No. 304,120.

To all whom it may concern:

Be it known that I, CARL JOHN HAGSTROM, a citizen of the United States, and a resident of Glen Cove, in the county of Nassau and State of New York, have invented a new and Improved Concealed French-Casement Lock, of which the following is a full, clear, and exact description.

This invention relates to builders' hardware and has particular reference to French casement locks.

Among the objects of the invention is to provide a lock for French casement doors or windows, all parts of which are practically concealed even though devices are provided for locking a door or window at both the top and the bottom as well as intermediate thereof at the usual level for hand operation.

More specifically stated the improvement relates to devices, parts of which are carried by the meeting doors or windows, and while I shall refer for convenience hereinafter to a door I wish to be understood as covering generically any analogous device on or with which my improvement is adapted to be used, the part carried by one door being adapted to be operated either by a key or a knob, and the parts carried by the other door being adapted to be operated by the insertion of a thumb or finger through the striking edge of the latter after the first door is opened.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings, in which like reference characters designate the same parts in the several views, and in which—

Figure 1 is an outside elevation of the two main coöperating parts of the improved lock, one portion of one of the casings being removed and the upward and downward rod connections being broken away.

Fig. 2 is a view similar to the left side of Fig. 1 but showing a changed position of the bolt and parts associated therewith.

Fig. 3 is a transverse section on the line 3—3 of Fig. 1.

Fig. 4 is an elevation of the same parts as in Fig. 2 but indicating the opposite side of the lock and also indicating the face of the opposite casing removed.

Fig. 5 is a view similar to the right side of Fig. 4 and indicating the opening operation by the thumb.

Fig. 6 is a plan view of the lock shown in Fig. 4 with parts in section on the line 6—6.

Fig. 7 is a fragmentary view of one of the catches at the top of either door.

Fig. 8 is a view of the same at right angles to Fig. 7.

Fig. 9 is a plan view of the same.

Fig. 10 is an end view of the rod connecting knuckles.

Fig. 11 is a vertical sectional view of the casing plate presumed to be removed from Fig. 2.

Fig. 12 is a plan view of the catch for the lower end of the door.

Fig. 13 is a vertical sectional view of the same on the line 13—13.

Fig. 14 is a diagram indicating the bottom of a door and the automatic releasing means for the catch bolt indicated in Figs. 12 and 13; and

Fig. 15 is a view corresponding essentially to Fig. 2 but indicating a modification with means for preventing the opening of the lock from the outside of the door except by the use of a key.

Referring now more specifically to the drawings, the main views show two casings 16 and 17 adapted to be mortised in or otherwise secured to the meeting or striking edges of two coöperating doors. In the casing 16 is fitted a bolt 18 slidable transversely of the casing and adapted to project beyond the same for coöperation with a socket 19 of the other casing, under the force of a spring 20 anchored at 21 and bearing in a notch or groove 22 at the inner end of the shank 23 of said hole. The shank 23 may be made advantageously of round metal having one end tapped into the inner face of the bolt 18, while its other end is turned at right angles to the main portion of the shank where it has easy rolling bearing at 24 with the arm 25 pivoted at 26 adjacent to one end of the casing. Said arm is provided adjacent to its free end with a lug 27 projecting laterally therefrom and adapted to strike against the arm 28 of a bell crank 29 pivoted at 30 and urged normally in a direction to

occupy the position shown in Fig. 1 by virtue of a strong spring 31.

32 indicates a tumbler having a hub 33 journaled in the face plates 34 and 35 of the casing 16 and adapted to be rotated by means of a knob, not shown, fitted in the socket 36 formed in the center of the hub. When the tumbler 32 is rotated from the position of Fig. 1 to that of Fig. 2 or toward the left the extension 37 thereof bearing against a lug 38 projecting laterally from the arm 25 causes the movement of the arm 35 in the same direction though around its own center 26. The movement of the arm causes the sliding movement of the bolt 18 inward and the rotation of the bell crank 29 toward the right.

The opposite casing 17 is likewise mortised or otherwise secured in or upon the striking edge of the other door and is provided centrally with a plunger 39 corresponding in some respect to the bolt 18 in its movements. The plunger is located in the socket 19 of the casing 17 and has its active face beveled and concaved at 40 providing an easy thumb hold for manipulation thereof inward. The inner end or portion of the plunger is slotted at 41 for direct cooperation with a lug 42 fixed to the inner surface of the wall 43 while the main portion of the plunger is guided between lugs 44 and so confined to movements in right lines transverse of the casing. The beveling of the outer surface of the plunger provides ample clearance for the engagement of the outer end of the bolt 18 in the socket 19 when the lock is in normal holding position. The beveled face of the bolt 18 strikes against a projection 45 and more particularly against an anti-friction roller 46 journaled therein so that the action of the lock is unusually easy. The upper and lower ends of the plunger consist of horns 47 which when the plunger is forced inward bear against the arms 48 of bell cranks 49 pivoted at 50 in the casing, such movement being against the force of the springs 51 which tend to hold the parts in the position shown in Fig. 4. The face plate 34 of the casing 16 in addition to the upper and lower flanges is provided with a pair of spaced lugs 34′ adapted to straddle the shank 23 and so coöperate with the front portion of the casing to guide the bolt and its shank in its horizontal reciprocations.

Referring now to Figs. 7, 8 and 9 I show the type of catch bolt that I prefer to use at the top of each door for direct coöperation with the frame above the door. Each of these devices comprises a bolt 52 slidable upward through the casing 53 under the force of a spring 54 within the casing tending to cause the beveled end of the bolt to engage in a keeper in the door frame. The bolt is held from rotation by means of a rib 55 projecting into a groove 56 formed on one side of the bolt. The bolt in addition to the main bevel 52′ which provides for the automatic snapping of the bolt into place when the door is being closed, is provided with a slight bevel 52″ on the opposite side to facilitate the opening of the door. To a hook 57 formed on the lower end of the bolt shank I connect a jointed rod 58 the several portions of which being connected adjustably as to length by a turn buckle 59, or its equivalent, while the extreme lower end of the rod is connected to one of the knuckles 60. Each of these knuckles comprises a tongue 61 for connection with a bell crank 29 or 49 with a pivot 62 while the body portion of the knuckle is recessed at 63 for the head 64 formed on the end of the rod by a simple flattening of the rod at 65. This flattened portion of the rod 65 is adapted to slip directly into a narrow neck extension 66 from the socket 63. As shown clearly in Fig. 6 the headed end of the rod is held from lateral displacement or movement in any direction with respect to the knuckle by means of the adjacent portion of the casing. The connection is easily effected between the rod and the knuckle. When the door is being closed the bolts 52 move inward against the springs 54, the loose connection between the hook 57 and the hook 58′ of the upper end of the rod permitting free movement of the bolt whether the rod as a whole moves downward or not. The bolts 52 are held normally projected upward whether the door is opened or closed by virtue of the springs 54.

At the bottom of each door is a catch such as shown in Figs. 12, 13 and 14, the same comprising a bolt 67 slidable upward in a casing 68 against the force of a spring 69 tending to project it downward. The casing 68 includes two sockets at right angles to each other, one for the bolt and spring 69, while the other is for a detent 70 urged normally frictionally against the side of the bolt 67 by means of a spring 71. The end of the detent bears preferably in a groove 72 formed in the side of the bolt. The force of the spring 71 serves to cause the point of the detent to grip the bolt frictionally with a force superior to the spring 69 so that when the bolt is lifted by connection therewith of the rod 73 projecting downward from the knuckle 74 pivoted at 75 to the tumbler 32 or a similar knuckle 76 connected to the lower bell crank 49 against the force of the spring 71 the bolt will be held in its elevated position when the door is open or being opened. Consequently when the door is open there can be no contact between the bolt 67 and the floor. The rods 73 are connected preferably to the bolts 67 through lost motion hooks such as shown at 57 and 58′ so that the action of the bolts 67 will

be independent of the bell crank 29 and the lower bell crank 49. The detent constitutes or has connected to it a rod or wire 79 which leads along a groove or channel 80 in the bottom of the door and is attached at 81 to the short arm of a lever 82 pivoted at 83 in a recess 84 at the corner of the door. The upper end of the lever 82 is bent outward and is adapted to strike against an adjustable stop such as a screw 85 fitted in the door jamb. By the adjustment of the screw in or out the control of the detent may be easily and accurately determined irrespective of the tightness or looseness of the door on its hinges. It will be understood that while the bolt 67 is normally held in the position shown in Fig. 13 when the door is open, when the door is closed the free end of the lever 82 striking against the stop 85 will cause the rod or wire 79 to hold the detent out of frictional contact with the bolt 67 allowing said bolt to snap downward under the force of the spring 69 and into a metallic socket piece 86 fitted in the door sill or the like.

The construction in Fig. 15 includes practically all of the features of Figs. 1 and 2, but the casing 16′ has a greater extent upward and downward than the casing 16 for the accommodation of additional parts. The tumbler 32, hub 33, bolt 18, shank 23, arm 25, bell crank 29 and other associated parts being practically identical with the corresponding parts in the first figures. The knuckles 60′ and 74′, however, are longer than the corresponding members aforesaid though their function is the same. 87 indicates a bolt, or its equivalent, slidable vertically within the casing 16′ and confined by a lug 88 or the like from lateral movement. This bolt has a lip or lug 89 which is adapted to engage over a lug 27 carried by the arm 25 whereby said arm is held from movement around its pivot 26 and as a consequence the locking bolts cannot be moved or opened by the means above described until the bolt 87 is released from the lug 27.

The release of the bolt 87 may be effected in either of two ways as illustrated: First, by the turning of a knob fitted in the square hole 90 of a tumbler 91 in the upper end of the casing, said tumbler having a lug 92 coöperating with the bolt in a notch 93 so when the tumbler is turned to the left as shown in the figure the bolt 87 will be lifted. Adjacent to the lower end of the casing is a slide 94 to which is pivoted a bell crank 95 from one arm of which a rod 96 extends to the tumbler extension 97. The slide 94 is close to a keyhole 98 to which a key may be introduced from the outside of the door, which when turned will cause the slide to move horizontally beneath a rib 99 fixed to the casing. This movement of the slide will cause the turning of the bell crank and the drawing downward of the rod 96 and opening of the bolt 87.

I claim:

1. The herein described French casement lock comprising two coöperating casings, one for each of two casement doors, actuating means movable along the central portion of each casing away from the other casing, one being movable by hand from the edge of the door only when the other door is open, a pair of bolts for the top and bottom of each door, operating means in the upper and lower portions of each casing connected to said bolts for moving them toward and from each other simultaneously, and connections between each actuator and the bolt operating means.

2. In a French casement lock, the combination of a lock casing, a bolt movable horizontally therein and adapted to project beyond the striking edge of the door, a pivoted tumbler within the casing, an acuator between the tumbler and the bolt and serving to retract the bolt when the tumbler is moved, said actuator being in the form of an arm pivoted adjacent but eccentric to the tumbler, a bolt carried in the lower portion of the door for coöperation with the door sill, and connections between the bottom bolt and said tumbler whereby when the tumbler is moved to retract the first mentioned bolt the bottom bolt will be moved simultaneously.

3. In a lock of the class set forth, a bolt for one end of the door, means to withdraw the bolt into the door from engagement with the door frame, means to automatically hold the bolt within the door, the bolt having a longitudinal groove formed along one side thereof, said automatic holding means comprising a spring-pressed detent acting frictionally against said bolt at right angles thereto and projecting into said groove whereby the bolt is held from rotation, and means to automatically release said detent when the door is closed.

4. In a door lock, the combination of a casing, a member rotatable therein, means to rotate the member, a bolt at one end of the door and connections between the bolt and said rotatable member serving to cause movement of the bolt in one direction when the rotatable member is moved, said connections including a knuckle pivoted to said rotatable member and having in its opposite end a recess with a restricted opening leading therefrom, said connections including also a rod having a head at its end and a flat portion adjacent thereto, the flat portion being adapted to slip into the narrow opening of the knuckle while the end of the rod constitutes a head fitted in the main opening of the member.

CARL JOHN HAGSTROM.