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PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in and relating to Door Locks.

I, JACQUES FRANCOIS GABRIEL CHOBERT,,
a French Citizen, of 3, Avenue de la Liberation,
St. Etienne, France, do hereby declare
the nature of this invention and in what man-
5 ner the same is to be performed, to be partic-
ularly described and ascertained in and by the
following statement:—

The present invention relates to a door
lock with more than one bolt.

- 10 According to the present invention there is
provided a lock comprising a spring bolt, re-
mote bolts linked with the spring bolt and
movable in unison therewith, an inside handle
for retracting the spring bolt against its
15 spring, a catch lever for holding the spring
bolt and remote bolts in their retracted posi-
tion, a servo-bolt which, when the door is
slammed, serves to release the catch lever and
thus allow the spring and remote bolts to be
20 shot and a pawl lever serving automatically
and positively to lock the spring and remote
bolts when they have shot into their striking
boxes so that they can be retracted again from
the outside of the door, only by operation of
25 a key.

- Preferred forms of the invention will now
be described with reference to the accompany-
ing diagrammatic drawings, in which Fig. 1
is an elevation of the inside of a door bearing
30 a known form of lock,

Fig. 2 is an elevation of a door bearing a
lock in accordance with this invention.

- Fig. 3 is a view of a portion of the inside
of the lock case shown in Fig. 2, and illus-
35 trating coupling between three bolts.

Fig. 4, is a view of the inside of another
portion of the same lock case, and showing a
pair of deadlock bolts,

- Fig. 5 is another view of the same case and
40 showing a servo-bolt and its associated
mechanism.

Fig. 6 is a transverse section through the
lock of Fig. 5,

- Figs. 7, 8 and 9 are elevations of parts of
45 the mechanism shown in Figs. 5 and 6.

Fig. 10 is a view, on line X-X of Fig. 8

of the lever shown in Fig. 8,

Fig. 11 is a transverse section through the
lock and showing both inner and outer
handles and their associated mechanism. 50

Fig. 12 is a section on the line B-B of Fig.
13,

In Fig. 1 is shown a known form of lock
comprising a movable spring bolt 1, a dead-
lock bolt 2 controlled by a key inserted 55
through a keyhole 3, a sliding bar 4 actuating
an upper bolt 5 and a sliding bar 6 actuating
a lower bolt 7. These sliding bars are oper-
ated in unison, with the spring-bolt 1 from
the inside by a handle 8 (or by a key) and 60
from the outside by a key inserted in a second
keyhole (not shown).

In order to achieve an automatic working
of the multiple bolts 1, 5, and 7, one possible
way (see Fig. 3) is to make the movement of 65
the sliding bars 4 and 6 controlled by that of
the spring-bolt, that is to say, with the bolt
which is actuated by the drawbar 9 and which,
when the door is shut, is first retracted by,
and then falls back into, the strike-box. 70

In the arrangement illustrated in Fig. 3,
the spring bolt 1 is mounted on a plate 10
which is formed with a rack 11. This rack
engages a toothed pinion 12 fixed solidly on
a shaft 13. The shaft carries, in another 75
plane, a second toothed pinion 12 which en-
gages, at one side a rack 14 controlling the
sliding bar 4 and the upper bolt 5 and, at
the other side, a second symmetrical rack 15
controlling the sliding bar 6 and the lower 80
bolt 7.

The spring bolt 1 is withdrawn to its re-
tracted position by the drawbar 9 and it will
be understood that under the action of a
sufficiently resilient and powerful spring 16, 85
the spring bolt 1 can be pushed forward to
engage the strike-box and in this movement
it drives, through the intermediary of pin-
ions 12 and 12 α and racks 14 and 15, the slid-
ing bars 4 and 6 which cause the upper bolt 90
5 to rise and the lower bolt 7 to descend, so
that these two bolts engage in their respective

striking-boxes at the same time as the bolt 1 enters its strike-box.

The synchronisation of the various movements of the bolts may be equally well achieved by means of links, cams, or any other suitable means.

This locking system is completed (see Fig. 4) by the provision of dead-lock bolts 17a, 17b mounted on a plate 17 and with which they are integral. These dead-lock bolts function only when they are operated, as in an ordinary lock, by a lever 18 which is itself controlled by the rotation of the key. When the cylindrical pin 18a which is riveted to the lever 18 is turned to the left, the pin abuts against the face 19 of the plate 17 to which are riveted the dead-lock bolts, and urges the dead lock towards the left, at the same time raising the gate 21. The gate can now pass the stops 21a and upon being given a second turn the pin abuts against the face 20 and thus causes the dead-lock to move a further distance. The gate 21 is slidably mounted on plate 17 and is forced upwards by the pin 18 against a spring (not shown).

The device described, which is given by way of example only, has the drawback, however, that even though the operation of the lock is automatic nevertheless all the bolts protrude when the door is open. The door could be shut only if each bolt has a ramp surface as in the case of an ordinary double locking bolt and, even with such a device, the bottom bolt 7 would scrape along the floor during the circular movement described by the door for opening or closing.

The present invention overcomes this drawback by modifying the normal movement of the lock. The spring bolts 1 (as shown in Fig. 5) does not automatically advance after it has been retracted by the drawbar 9. This bolt is held in the retracted position by special means which take several forms and the disengagement of which, allowing the bolt to advance, is controlled by another device which can also take several forms.

One embodiment of these devices is shown by way of example in Fig. 5. The plate 10, to which is riveted the bolt 1, carries at its upper surface a tooth 22. When the bolt is pulled back by the drawbar 9 or by the key which controls the bolt externally, the bolt compresses the spring 16 and extends the spring 16 (1), so that the bolt is urged forward; at a certain moment the nose 23 of the small catch lever which rotates about the spindle 24 (this small lever is always urged downwards by a spring) engages the tooth 22. The bolt 1 thus cannot return to the forward position even when the drawbar 9 is released. It is arrested in its movement, when loaded, just as the hammer of a gun is detained when loaded.

The two other auxiliary bolts 5 and 7, the movement of which is controlled by the move-

ment of the bolt 1 (see Fig. 2) are in the same position as the bolt 1. None of the bolts extends beyond the door which latter may therefore rotate freely on its hinges.

The lock carries an auxiliary servo-bolt 25.

This servo-bolt 25 is a narrow spring-loaded bolt having an inclined surface 26 which allows the servo-bolt to recede into the lock when this bolt engages the edge of the strike-box fixed on the stationary frame of the door.

During its retracting movement, a stop 27 secured to the rear part of the servo-bolt 25 slides on the rear surface 28 of the catch lever pivoted at 24, this catch lever being rocked and its nose 23 disengaging the tooth 22 of bolt 1. At this moment bolt 1, influenced by the spring 16, is forced violently forward, at the same time driving along the auxiliary bolts 5 and 7. Simultaneously, the servo-bolt 25 is urged forward by its spring which is secured at one end to the servo-bolt and at the other end to a spindle 30 which serves as a guide for the servo-bolt.

The servo-bolt, when in the strike-box, prevents the door from recoiling to the open position and centres the bolts 1, 5 and 7 in front of their respective striking-boxes which thus allows them to enter automatically.

In a lock assembled as described above, the movement of the bolts is reversible and the three solidly-linked bolts 1, 5 and 7 may be operated synchronously by pushing either of the control rods 4 or 6 manually. The present invention has for an object to effect the automatic locking of the various bolts without the necessity of operating a key or any other auxiliary part of the lock.

Such an arrangement is also shown in Fig. 5.

The rear part of 10 of the spring-bolt 1, which already carries at its upper part a tooth 22, adapted to hold this bolt unlocked when the drawbar 9 is released, carries at its lower end a notch 31 with which engages a small pawl lever 32, rocking on the shaft 33. When the nose of this small pawl lever engages the notch 31 of the spring-bolt 1, the latter cannot be retracted and it is thus impossible to manipulate the solidly-linked bolts by trying to move either of the control rods 4 and 6.

This small pawl lever (which is permanently urged upwards by a spring) bears, at 34, a flange which enables it to make contact with the surface 35 of the large lever 36 which rocks on a shaft 37 fixed on the control plate 17 of the dead-locks (see Fig. 4). This large lever 36 transmits the movement of the key which unlocks the lock from outside to the spring-bolt 1 and to the servo-bolt 25.

Thus during opening, the key makes contact via pin 18 with part 38 of the large lever 36 and causes it to pivot on the shaft 37 in the direction of the arrow.

In the first part of the travel of the large lever, its face 35 comes into contact with the

flange 34 of the small pawl lever 32, causing this lever to pivot around on its shaft 33 and thus disengage the end 32 from the notch 31 which held the spring-bolt 1, in a locked position, this bolt being thereby released.

Then the large lever 36 continues its travel; the edge of the slot 39 drives a shaft 39a integral with the drawbar 9; the shaft 39a makes contact with the face 40 of the rear part 10 of the spring-bolt carrying the control rack and thus withdraws the bolt 1, the upper bolt 5 and the bottom bolt 7, whilst the end 41 of this same large lever contacts the nipple 41a (passing over the stop 27) disengages the catch lever pivoted at 24 and causes the servo-bolt 25 to recede into the lock. In this position the door can be opened.

The drawbar 9 is used to open the door from inside; the shaft 39a which is integral with this drawbar pulls the lever 36 which first releases the small pawl lever from the notch 31 and then causes the spring-bolt 1 to be operated by the shaft 39a and the surface 40, and the servo-bolt through the intermediary of the nipple 41a.

The nose 23 of the small catch lever has engaged the notch 22 of the spring-bolt 1, which remains in the retracted position together with the upper and lower auxiliary bolts of the door.

The servo-bolt advances as an ordinary spring-bolt. When the door is shut the servo-bolt 25 slides on its inclined surface 26 on the strike-box and recedes: the stop 27 contacts the rear surface 28 of the small catch lever 23 which held the spring-bolt in its retracted position. The small catch lever 23 becomes disengaged from the tooth 22 and the spring-bolt 1 is forced forward together with the two auxiliary upper and lower bolts.

An automatic lock according to this invention requires the tension of a strong spring capable of vigorously pushing the spring-bolt controlling the auxiliary bolts 5 and 7. In certain cases the force required to compress this spring may be too great to be done with the aid of a key, as is necessary in order to open the door from outside.

The present invention provides a lock which may be opened from the outside by a special handle. This handle is loose when the door is closed, that is to say it does not control the opening of the door, but is then disengaged.

In order to open the door it is sufficient merely to insert a key into the barrel of the handle. This key allows (1) the opening of the dead-lock bolts if they are locked, and (2) the engagement of the handle which controls the opening of the spring-bolt and of the auxiliary bolts.

One of the possible forms of such a device is illustrated in Figs. 6, 7, 8, 9 and 10. Any form which, by means of a single key placed

in the same barrel, gives control of the two actions mentioned, falls within the scope of this invention.

The handle 42 (Fig. 6) is fixed on the outside of the door and is mounted on a protective cylinder 43 of case-hardened steel around which it may rotate. This protective cylinder 43, and the cylinder 44, are solid with the closure plate 45 of the lock. The tubular part of the handle, which pivots around the protective cylinder 43, bears within the lock a spline 46, which enters an aperture *ad hoc* formed in the lever 47. The latter pivots around the part of the cylinder 44 which is placed inside the lock.

The lever 47 thus moves with the handle 42 through the intermediary of the spline 46. On the other hand, on the inner end of the rotating key barrel 48 is fixed a cam-plate 49 which takes the same movement as is imparted by the key to the key barrel 48.

When the door is locked and the handle is manipulated, the stop 50 on the lever 47 drops into the cavity (see Fig. 7) and the handle moves a distance permitted by the stops, without affecting the lock. In order to operate and open the lock it is necessary to insert the key into the rotating barrel 48 carrying the cam-plate 49 which is fixed at its inner end, the detailed shape of the cam-plate 49 being illustrated in Figs. 8 and 9.

By turning the key to the right the barrel 48, and in consequence the cam-plate 49, are driven in clock-wise direction,

The ramp 51 (see Fig. 7) of the cam-plate 49, which is solid with the key barrel 48, engages by means of stop 57, the flange 52 of an auxiliary lever 53 which is pivoted on the spindle 54 mounted on the lever 36 controlling the spring-bolt 1 until this auxiliary lever takes its extreme position (illustrated in Fig. 8).

If the handle is then manipulated, the rectangular stop 50 of the handle lever abuts against the flange 52 of the same auxiliary lever 53. Thus, when the handle is turned the spring-bolt 1 and consequently the auxiliary bolts 5 and 7 are pushed back into the door, by the action of the handle on the lever 47, on the stop 50, the auxiliary lever 53 and the large control lever 36 which moves through its slot 39. The parts of the lock are then in the position shown in Fig. 9.

The auxiliary lever 53 is shaped as illustrated in Fig. 10, that is to say, it has a flange 52, a flange 55 abutting against the lever 36 and a hole 56 which receives the pivot spindle 54.

When the bolts 1, 5 and 7 are engaged in their strike-boxes, that is to say, when the door is closed and the parts are in the position shown in Fig. 7, if the key is then turned towards the left in order to close the dead-lock, the barrel drives through the cylindrical stop 57 on the cam-plate 49 and hence the control-

plate, 17 of the dead-lock which commences to slide towards the left driving towards the left the large control lever 36 secured on this plate, and in consequence, the auxiliary lever 53. The parts of the lock are then in the position shown in dotted lines in Fig. 7 and the cam 49 may describe towards the left two complete revolutions without encountering the flange 52 of the auxiliary lever. The dead-lock is thus double-locked.

In this position of the dead-lock, by turning the key two revolutions towards the right the parts are all brought back into the first position of Fig. 7, that is to say, the dead-lock is retracted and, by turning the key a half-turn more, the handle 42 is engaged, the movement of which thereafter causes the bolts 1, 5, 7 and 25 to re-enter the door. The door is thus disengaged and can be opened.

Of course, it is possible to construct an automatic lock with multiple closures in which the bolt 1 and the auxiliary bolts 5 and 7 are opened from the exterior by the single movement of a key, as in an ordinary lock, although the operation of the key may be a little stiff, owing to the strength of the spring to be compressed.

It is also possible to make an automatic lock with multiple closures by adding to the lock as illustrated in Figs. 11 and 12 a cylinder lock ensuring in known manner the opening and closing of the dead locks and in addition a handle 65 similar to a car-handle carrying a barrel lock 66 the key of which locks the handle or permits it to move ineffectively.

The handle 65 is mounted upon a square rod 67 which drives a part 68 carrying a spur 69. This spur moves in the slot 70 formed in the part 71 which is made of two halves riveted together into U shape. This part 71 is also controlled by the inner handle 72 mounted on a circular portion of the spindle 67. This control is operated through the rod 73.

When the handle 65 is rendered ineffective by its lock the inner handle 72, due to the slots 70, can control the U shaped lever 71, as also can the external handle, once it is re-connected by its lock.

The lever 71 then actuates through the spindle 74 and the levers 75 and 76, the large lever 36 of the normal lock (Fig. 5). This lever 36 controls the unlocking of the bolt 1 and the two auxiliary bolts 5 and 7.

The lock described is used in the following way and with the following advantages.

When the occupier leaves the room and closes the door after him the servo-bolt is brought into operation, by the action of shutting the door, to shoot the spring-bolt and the remote bolts linked with it. From the outside these bolts can be retracted from the inside by normal use of the handle.

If for any reason the occupier needs added

security on leaving the room, he shuts the door to shoot the spring and remote bolts as described above and then uses his key to throw the dead-lock bolts. When this has been done, none of the bolts can be retracted from the inside or outside except with the use of a key. On returning the occupier uses his key first to retract the dead-lock bolts and then the spring and remote bolts both being retracted by the use of the same key in same key-hole.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A lock comprising a spring-bolt, remote bolts linked with the spring-bolt and movable in unison therewith, an inside handle for retracting the spring-bolt against its spring, a catch lever for holding the spring-bolt and remote bolts in their retracted position, a servo-bolt which when the door is slammed serves to release the catch lever and thus allow the spring and remote bolts to be shot and a pawl lever serving automatically and positively to lock the spring and remote bolts when they have shot into their striking boxes so that they can be retracted again from the outside of the door, only by operation of a key.

2. A lock as claimed in Claim 1 comprising a dead-lock bolt linked with the mechanism of the spring-bolt so that it may be locked and unlocked by means of the aforementioned key used in the same key-hole.

3. A door lock as claimed in Claim 1 or 2, including a servo-bolt slidably mounted in the case, a catch-lever pivotally mounted in the case with one end against the servo-bolt and the other formed as a hook, a spring urging the hook against the spring-bolt, and a tooth on the spring-bolt, the arrangement being such that when the spring-bolt is retracted by either the handle or the key, the hook engages the tooth and holds it in the unlocked position, and when the servo-bolt is retracted by impact with the striking-box, the catch-lever is rotated to disengage the hook from the tooth and thus allow the spring-bolt and the remote bolt to move to locked positions.

4. A door lock as claimed in Claim 1 or 2, including a notch formed in the spring-bolt, a pawl lever pivoted in the case so that one end may engage the notch, and having its other end drivably connected with the key and a spring urging the pawl lever into engagement with the notch, the arrangement being such that when the spring-bolt is moved to its locked position the pawl lever is sprung into engagement with the notch so as to lock the spring-bolt in its locked position, and when the key is turned in the unlocking direction the pawl lever is rotated out of engagement with the notch to allow the spring-bolt to be moved to its unlocked position.

5. A door lock as claimed in any preceding

claim including a pawl lever for holding the bolts in the locked position and a handle or key which both releases the pawl lever and retracts the spring-bolt.

- 5 6. A door lock as claimed in any of the preceding claims including a handle on the outside of the door and disconnectable coupling means between the handle and the spring-bolt, the outside handle being con-
10 nected to the spring-bolt by operation of the

key in the key barrel.

7. A door lock substantially as described with reference to the accompanying drawings.

Dated this 16th day of May, 1949.

Agent for the Applicant,

R. G. C. JENKINS,

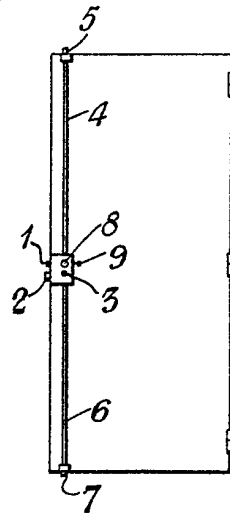
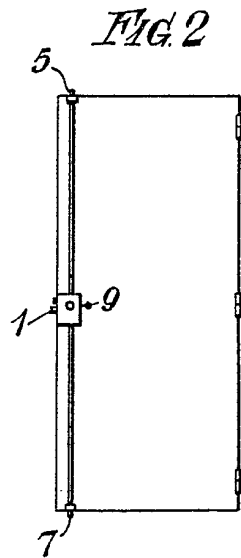
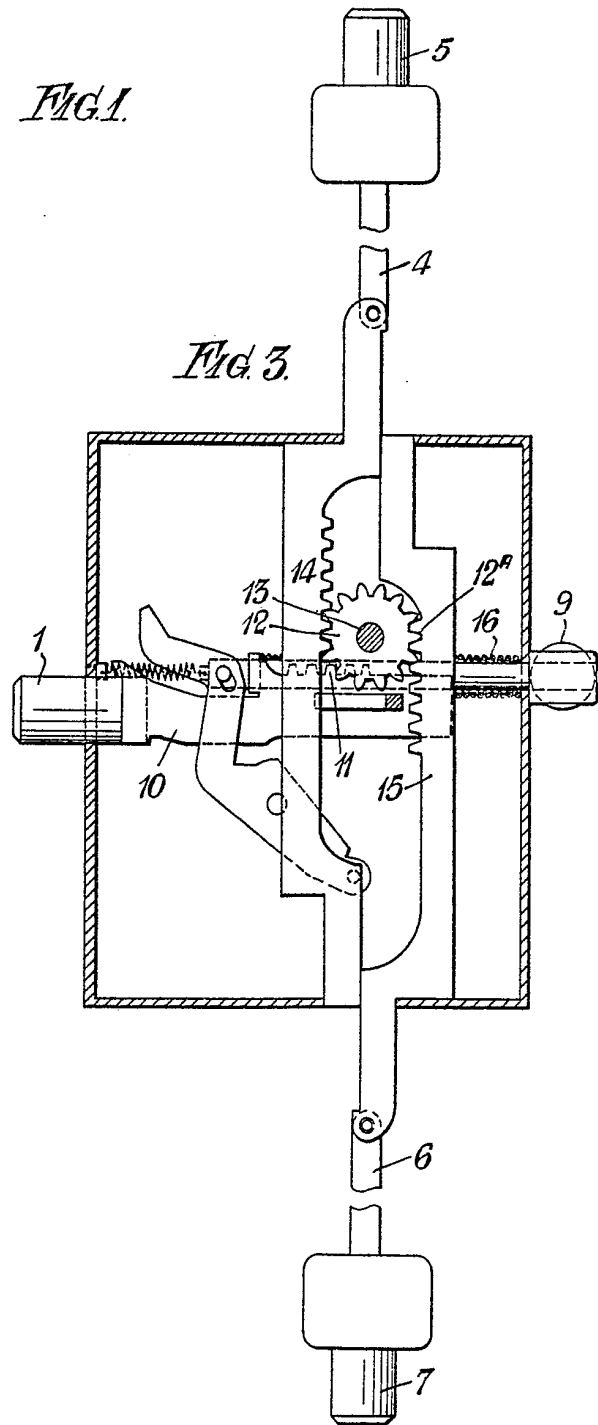
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*FIG. 1.**FIG. 2.**FIG. 3.*

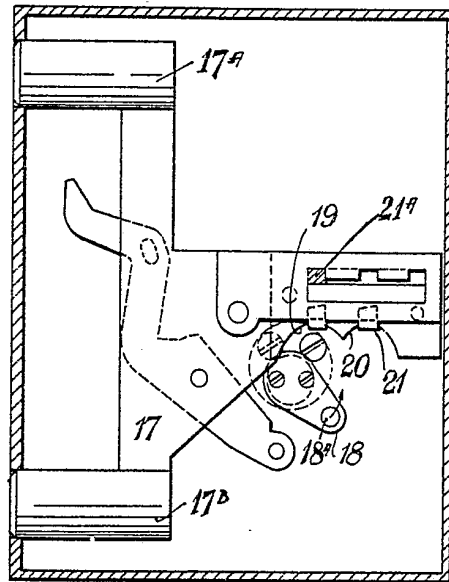
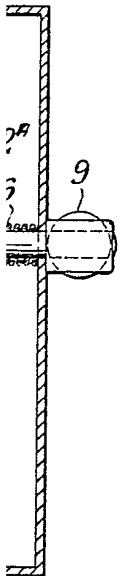


Fig. 4.

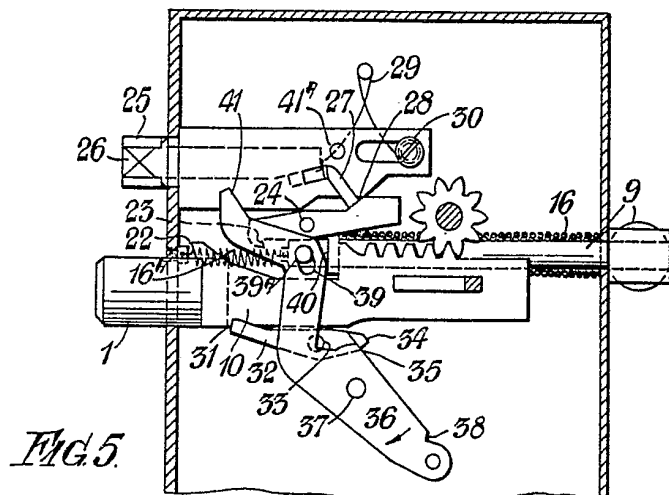


Fig. 5.

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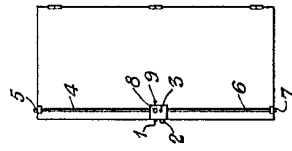
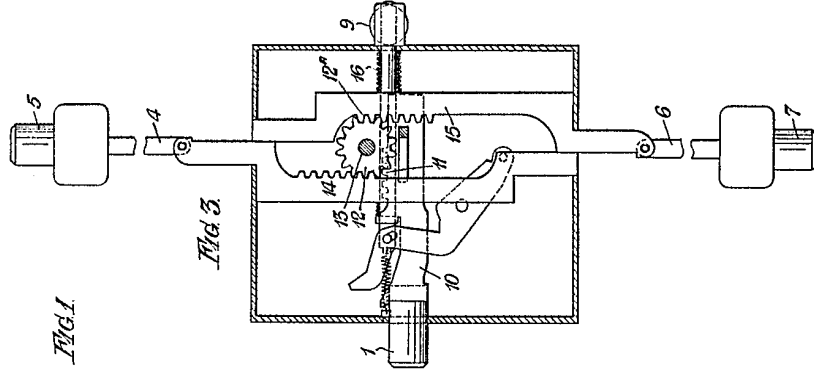
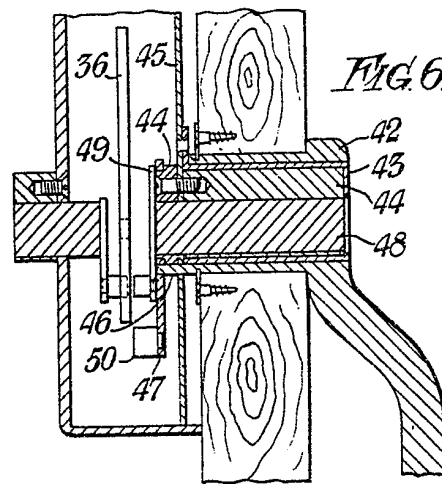
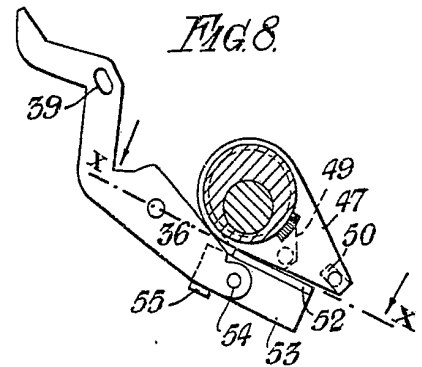
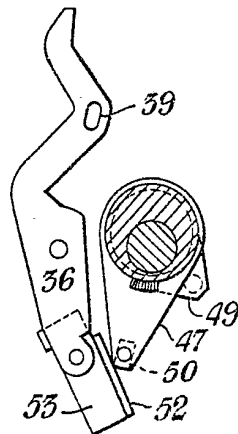
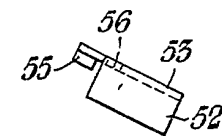
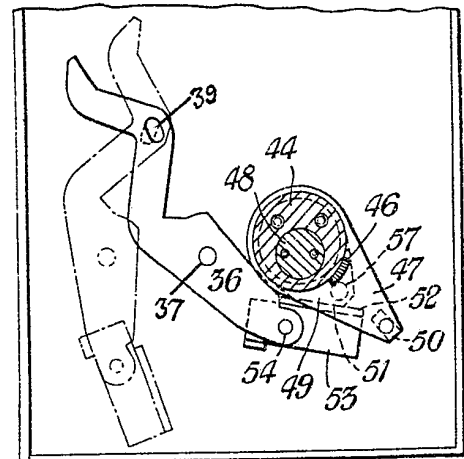


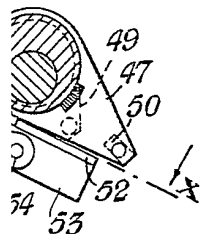
Fig. 1



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*Fig. 6.**Fig. 8.**Fig. 9.**Fig. 10.**Fig. 7.*

G.8.



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52

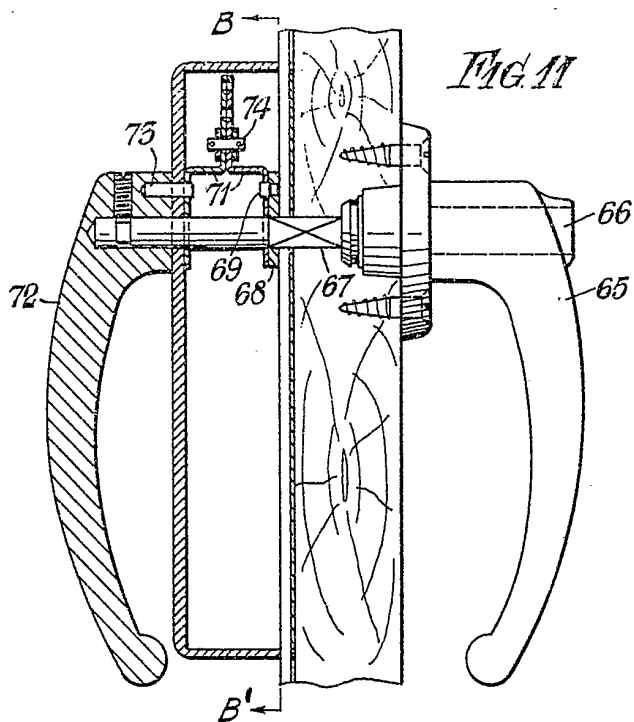
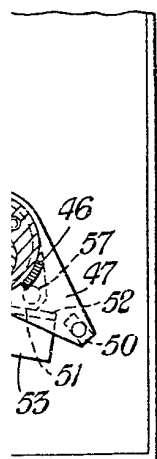
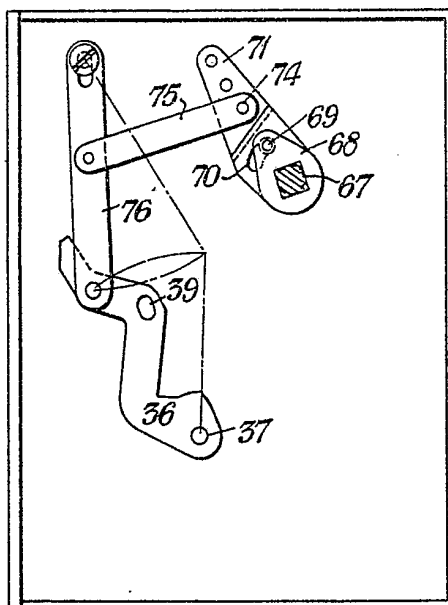


FIG. 12.



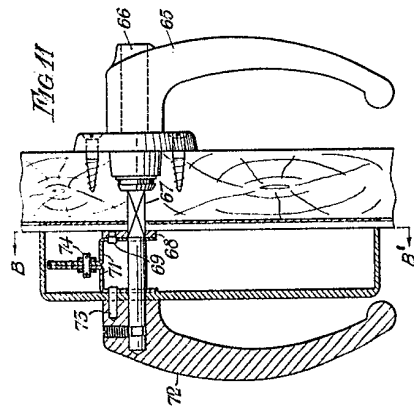


Fig. 12.

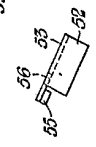
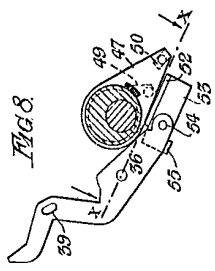
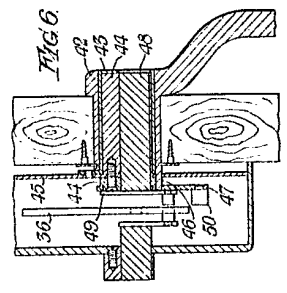
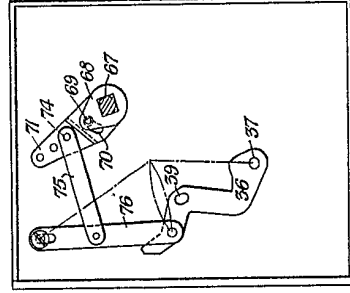


Fig. 10.

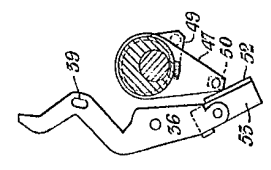


Fig. 9.

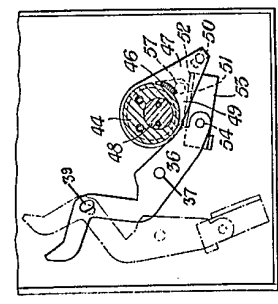


Fig. 7.

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