Sept. 13, 1932. O. D. VON MEHREN 1,876,803

BOLT OPERATING MECHANISM FOR LOCKS

Original Filed Dec. 30, 1929 2 Sheets-Sheet 1

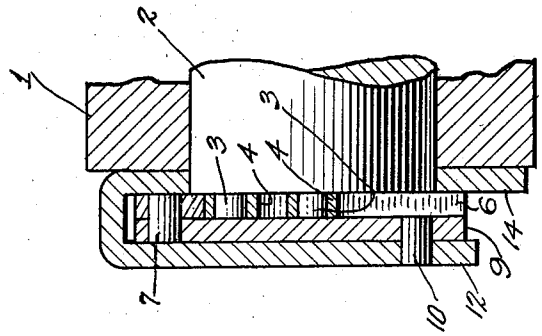


Fig. 2

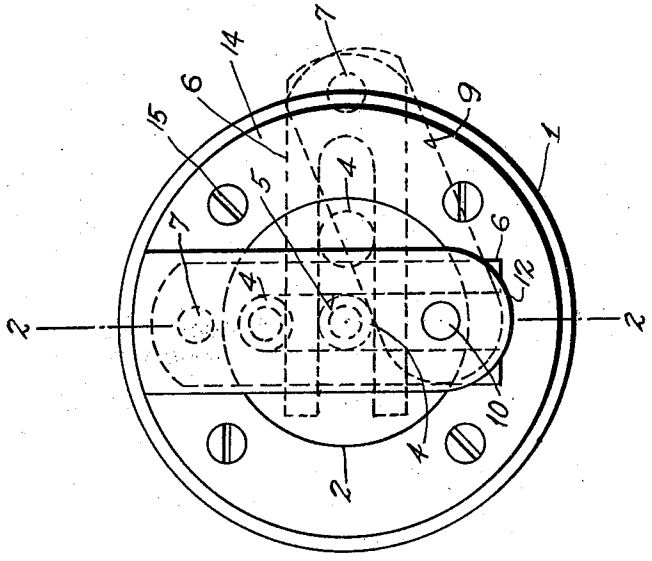


Fig. 1

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BOLT OPERATING MECHANISM FOR LOCKS

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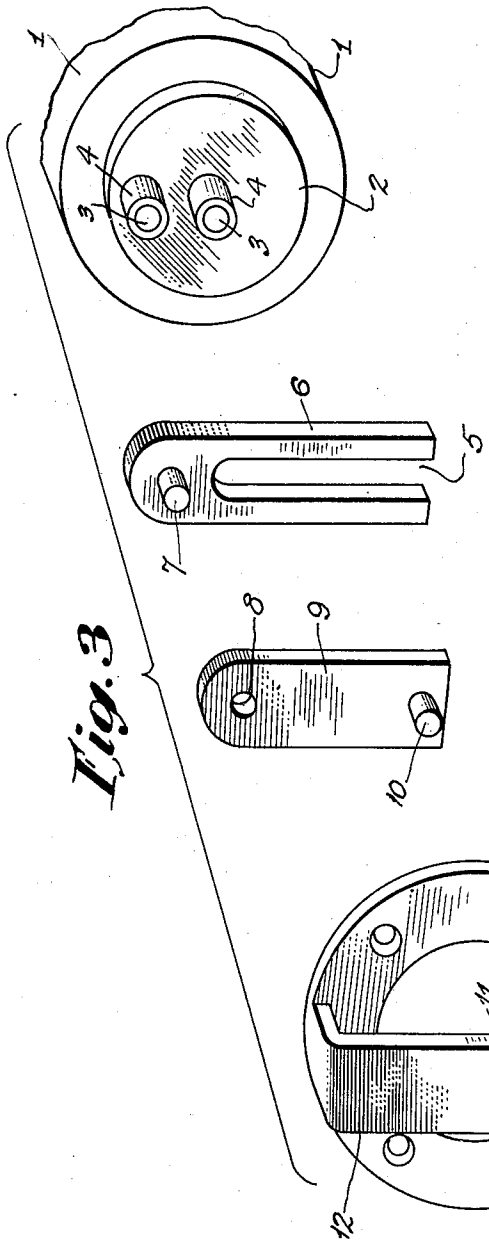


Fig. 3

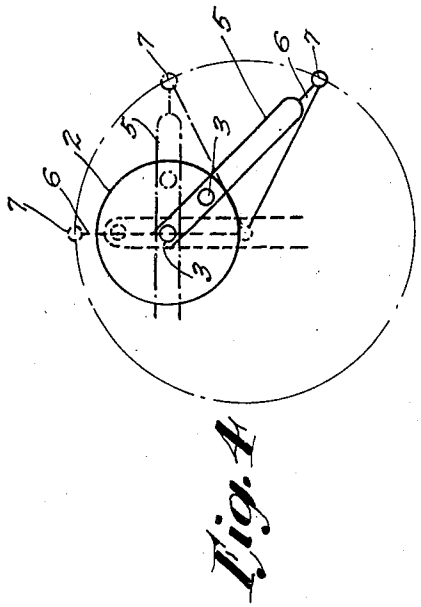


Fig. 4

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Patented Sept. 13, 1932 1,876,803

UNITED STATES PATENT OFFICE

OSWALD D. VON MEHREN, OF NEW YORK, N. Y., ASSIGNOR TO MEHREN LOCK CO., INC., OF CLIFTON, NEW JERSEY, A CORPORATION OF NEW JERSEY

BOLT OPERATING MECHANISM FOR LOCKS

Application filed December 30, 1929, Serial No. 417,270. Renewed April 13, 1932.

This invention is a bolt operating mechanism for locks and while adapted for general use in this art is particularly intended to be employed in connection with cylinder locks which embody a rotary key operated barrel which is utilized through appropriate connections to operate the bolt. The present invention has to do primarily with the said appropriate connections.

In the operation of bolt mechanism from rotary lock barrels as conventionally employed, it is the practice to mount the rotary barrel eccentrically of the lock casing, so that mere rotation of the barrel with an operating member secured thereto will result in eccentric movement of the operating member with respect to the lock casing and this eccentric movement is availed of to produce a cam action upon the bolt mechanism of the lock. However, when the rotary barrel is positioned coaxially of the lock casing, serious problems are involved in the operation of the bolt mechanism from the rotary barrel, because any bolt operating device rigidly secured to the barrel will partake of a coaxial movement in contradistinction to that eccentric movement necessary to operate the bolt mechanism. This problem has long been recognized and various expedients have been resorted to for the solution thereof, but none of these expedients have proven satisfactory.

The most practical suggestion thus far advanced is to provide a bolt operating member having a geared connection with the barrel, but in such devices the gears must necessarily be so small and involve so much friction that these devices have never proven successful, from a practical standpoint.

In view of the foregoing considerations, the object of the present invention is to provide a mechanism whereby rotary movement of the barrel will be translated into eccentric movement of a bolt operating member for the purpose of operating said bolt without undue friction, without appreciable loss of power and in a thoroughly efficient and practical way.

Speaking generally, the invention in one of its preferred practical forms embodies a bolt operating member pivoted eccentrically to and independently of the rotary barrel of the lock and in such relation to the bolt operating mechanism that the rotation of said member about its fixed pivot will cause it to coact with the bolt mechanism to appropriately actuate the same. To the rotary barrel is secured a plate adapted to rotate with the barrel, but free for longitudinal movement in a direction cross axially of the barrel and one end of said plate is connected to the free end of the bolt operating member, so that when the barrel is rotated, the plate is turned therewith and acts to rotate the bolt operating member on its fixed axis whereby said member is caused to partake of eccentric movement and during such movement to engage with and actuate the bolt mechanism.

The structure is unusually simple, economical to manufacture, powerful in its operation and fully efficient in the performance of its intended functions.

Features of the invention, other than those specified, will be apparent from the hereinafter detailed description and claims, when read in conjunction with the accompanying drawings.

The accompanying drawings illustrate one practical embodiment of the invention, but the construction therein shown is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a rear elevation of a cylinder lock casing and barrel showing mechanism embodying the present invention associated therewith.

Figure 2 is a section on the line 2—2 of Figure 1 showing the rotary barrel of the lock in elevation and all pivot pins also in elevation.

Figure 3 shows in perspective the structural elements illustrated in Figure 1 dismantled and separated from one another so as to show the elements independently.

Figure 4 is a diagrammatic view graphically illustrating the operation of the parts.

In the drawings, 1 indicates a lock casing in which casing the barrel 2 which is operated by the key in a conventional lock is mounted

to rotate. In the particular form of the invention shown, the barrel 2 is shown as extending a short distance beyond the rear end of the casing 1, although this is not essential to the operativeness of the present invention. On the rear end of the rotary barrel 2 are mounted two fixed pins 3 which may be provided with anti friction rollers 4. These pins are positioned in one diameter of the barrel and are adapted to extend through a slot 5 of an arm or plate 6. The arm 6 carries near one end a pin 7 and this pin is adapted to extend into a hole 8 in one end of a link 9. The other end of the link carries a pin 10 which finds a bearing in the hole 11 formed in a bracket 12. This bracket forms part of a supporting member which includes a ring 14 perforated at 15. The ring is made of a size, so that it will embrace the barrel 2 and abut the rear end of the casing 1 to which it is secured by means of screws 16 as shown best in Figures 1 and 2.

It will be noted from these latter figures that the supporting member functions as a fixed support for the pivot pin 10 and imparts to said pin a rigid, permanent axis of rotation about which the link 9 is adapted to rotate when impelled by the pin 7. It will be noted, moreover, that the axis of the pin 10 is eccentric to the axis of the barrel 2, and this eccentricity is such that the end of the link 9 on which it is positioned the pin 8 will swing through the arc of the circle appropriate to actuate the bolt mechanism.

The parts may be readily assembled as follows: Pass the pin 10 through the hole 11, then swing the link 9 so that the hole 8 is without the circumference of the ring 14. Then pass the pin 7 through the hole 8. Then pass the ring 14 against the back of the casing 1, as shown in Fig. 1, and secure it in place by the screws 16. This completes the assembly of the parts. In practice, they can be metal stampings and may be economically and expeditiously made.

The operation of the structure will be clearly apparent from Figs. 1 and 4. The position in which the parts are shown in full lines in Figure 1 is indicated by the dotted line position of the arm 6 in Fig. 4. This position corresponds to the normal position of the rotary barrel with the key removed. If a key is now introduced into the barrel and the barrel rotated in a clockwise direction to 90 degrees, the parts will appear as shown in the dot and dash lines of Fig. 4. If the rotation of the barrel is continued, the parts will assume the full line positions of Figure 4 and at about this time the outer end of the link 9 will engage with and commence to operate the bolt actuating mechanism and will continue to so operate it until the bolt has been moved to unlocking position whereupon the link 9 will move away from the lock actuating means and through continued rotation will return to the dotted line position of Figure 4.

I have referred to the outer end of the link 9 as acting directly upon the bolt actuating mechanism, but it will of course be understood that the outer end of the plate 6 may serve the same purpose or the outer ends of both the link 9 and plate 6 may coact to operate the lock actuating means. I do not limit the invention in this connection. In any event, it will be noted that power is applied to the bolt actuating means without appreciable diminution and through effective leverage to impart the greatest power during such operation, said power being materially in excess of any that could possibly be obtained through the actuation of such parts by a gear train as heretofore suggested.

Emphasis is placed upon the extreme simplicity of the structure and its marked economy of manufacture and ease of assembly.

The foregoing detailed description sets forth the invention in its preferred practical form, but the invention is to be understood as fully commensurate with its appended claims.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination of a key operated rotary part, a bolt operating member mounted to rotate about an axis eccentric of the barrel and through such rotation to engage with and operate suitable bolt mechanism, and an element having a pivotal connection with said member, and also connected to the barrel for rotation with the latter, said element being slotted to permit the pivotal connection between the said member and element to assume variable radial distances from the axis of rotation of the barrel during rotation of the barrel about its axis and the concurrent rotation of the member about its axis.

2. The combination of a key operated rotary part, a bolt operating member mounted to rotate about an axis eccentric of the barrel and through such rotation to engage with and operate suitable bolt mechanism, and a plate mounted on said rotary part for rotary movement therewith, and for sliding movement radially thereof, said plate having a pivotal connection with said element near the outer end of the latter.

3. A key operated rotary part having at the rear end thereof a radially extending arm mounted for longitudinal adjustment with respect to the barrel and for bodily rotation therewith, a bolt operating member, one end of which is pivotally connected to the outer end portion of said arm, and means for supporting the opposite end portion of the bolt operating member for rotation about a fixed axis eccentric to the axis of the rotary part.

4. The combination of a key operated rotary barrel provided at its rear end with a pair of pins positioned along a diametrical line of the barrel, a slotted plate through the slot of which said pins are adapted to extend to cause the plate to rotate about the axis of the barrel when the barrel is rotated but to permit of radial adjustment of the plate with respect to the axis of the barrel, a key operating member, one end of which is pivoted to said plate, and the other end of which is mounted to rotate about a fixed axis eccentric to the axis of the barrel.

5. The combination of a key operated rotary barrel provided at its rear end with a pair of pins positioned along a diametrical line of the barrel, a lock casing in which said barrel is mounted to rotate, a slotted plate through the slot of which said pins are adapted to extend to cause the plate to rotate about the axis of the barrel when the barrel is rotated, but to permit of radial adjustment of the plate with respect to the axis of the barrel, a key operating member, one end of which is pivoted to said plate, and a bracket supported on the lock casing, and a pivotal connection between said bracket and the other end of said member, said last mentioned pivotal connection being positioned eccentric to the axis of rotation of the barrel.

In testimony whereof I have signed the foregoing specification.

OSWALD D. VON MEHREN.