July 9, 1929. W. E. WREAD 1,720,637

COMBINED HANDLE AND LATCH, KNOB AND CYLINDER, LOCK

Filed Sept. 4, 1926 2 Sheets-Sheet 1

Fig. 1

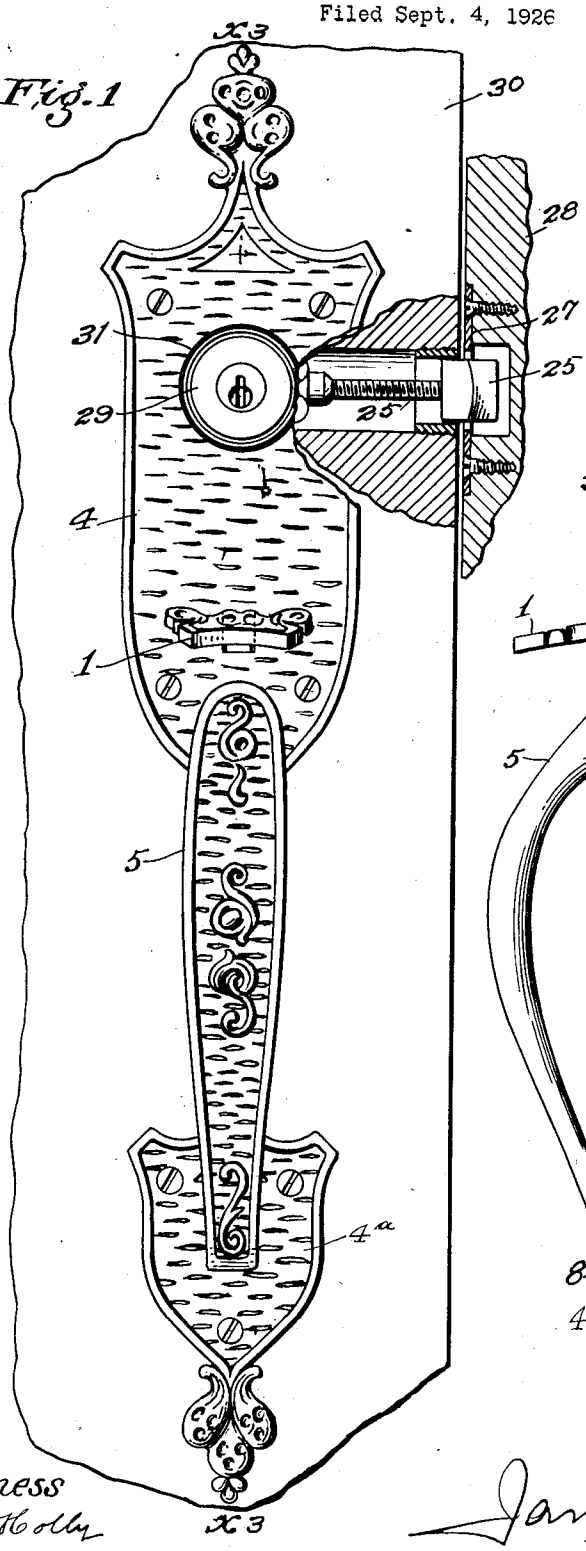
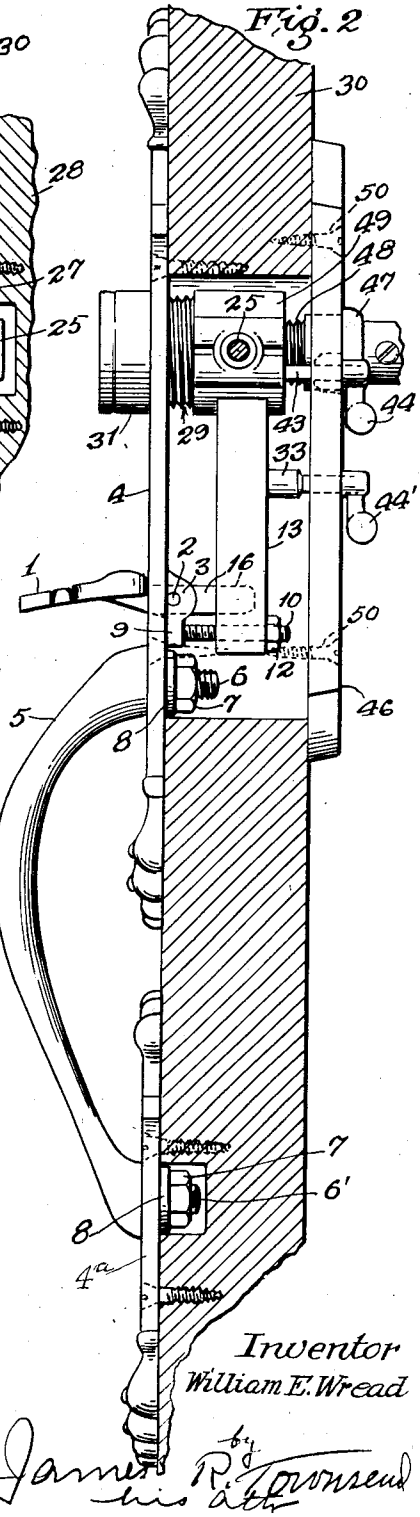


Fig. 2



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Inventor
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Fig. 3

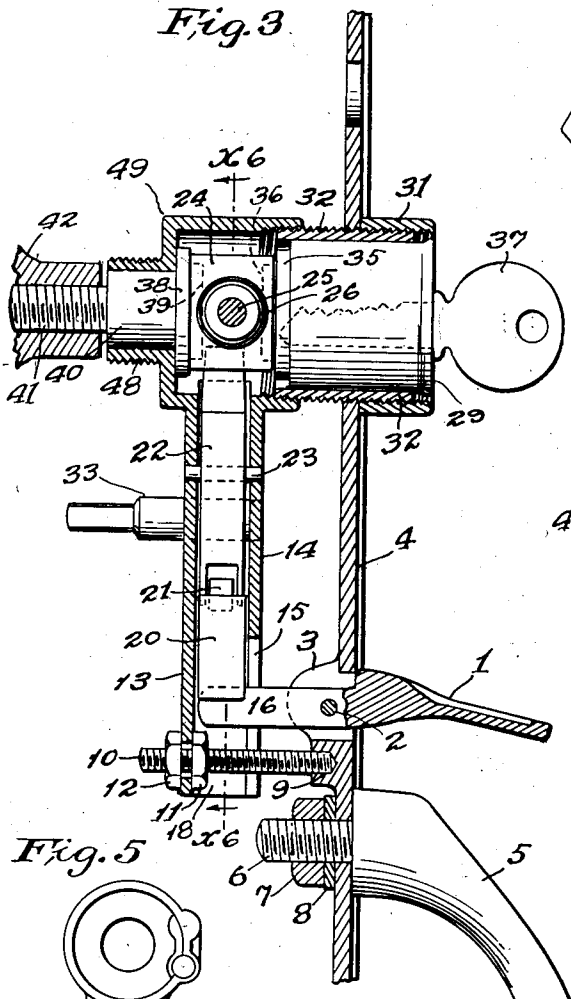


Fig. 4

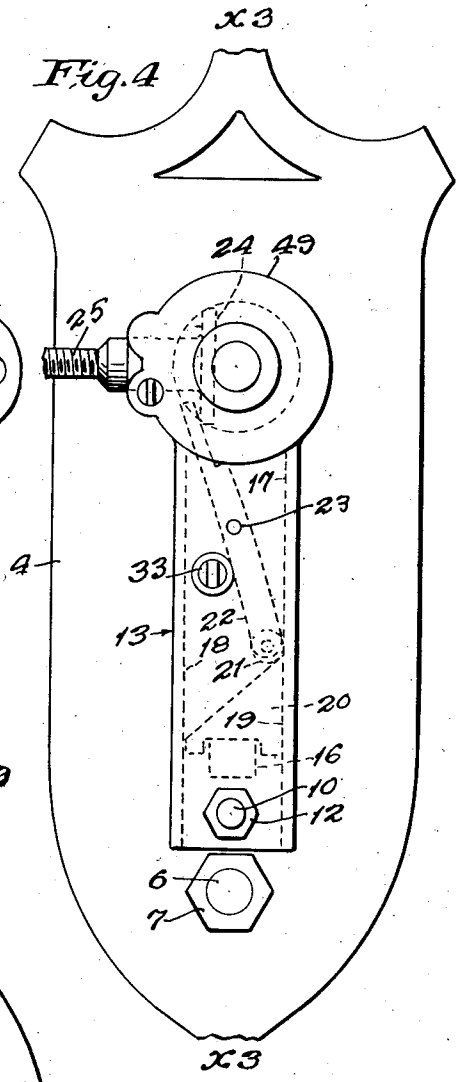


Fig. 5

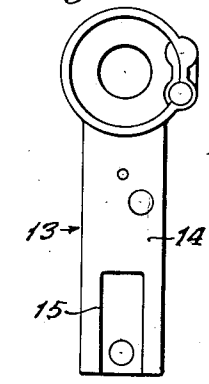
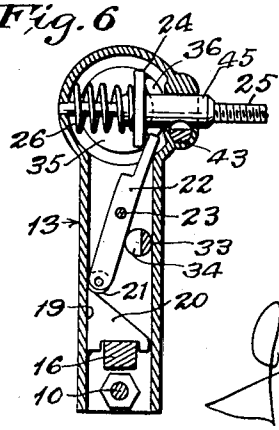


Fig. 6



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Patented July 9, 1929. 1,720,637

UNITED STATES PATENT OFFICE.

WILLIAM E. WREAD, OF LOS ANGELES, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO McKINNEY MANUFACTURING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

COMBINED HANDLE AND LATCH, KNOB AND CYLINDER, LOCK.

Application filed September 4, 1926. Serial No. 133,627.

An object of this invention is to provide an extremely simple, compact and easily installed lock applicable to outside doors.

This invention is broadly new, in that it comprises a lock in which a key controlled bolt moving element, a knob controlled bolt moving element and a lever controlled bolt moving element are all returned to latching position by a single spring; and in which the elements going to make up the latching lock installation are assembled as a single unit and are secured in place by means which cannot be tampered with from outside the closure.

A further object is to provide a latch lock construction in which the housing containing the operating parts of the lock is in fixed rigid relation to the handle and outside finish of the lock, so that the workman who installs the lock in its closure is not required to fit the parts together during the process of installation.

In carrying out this invention I employ elements of construction and features of arrangement that are described and claimed in my Patents Nos. 1,629,764 and 1,617,001; in my applications, Serial No. 53,548, filed August 31, 1925; and certain applications filed on the 4th day of September, 1926, to wit:—Serial No. 133,627; Serial No. 133,628; Serial No. 133,629; and Serial No. 133,630.

A further object of the invention is to provide a construction and arrangement whereby a front door latch lock can be produced at a manufacturing cost many times below that which is necessary for the production of front door locks of the construction now in common use.

A further object is to make provision whereby the latch handle and the rigid parts of the lock are rigidly secured to each other and to the face plate and to the closure when the installation is made, and to effect this result I provide a unitary housing for the latch lock operating mechanism and connect said housing to the finish plate by a stud bolt connection, and screw the cylinder lock into such housing and against a collar that engages the finish plate.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

The accompanying drawings illustrate the invention.

Figure 1 is an outside view of a front-door latch lock constructed in accordance with this invention and installed in a door closure and jamb, fragments of which are shown partly in vertical section.

Fig. 2 is an edge view looking from the right of Fig. 1, the door closure being shown in vertical section and the door jamb and strike are omitted.

Fig. 3 is an enlarged fragmental view showing in vertical section on line x^3, Figs. 1 and 4, the bolt operating parts of the latch lock and fragments of the handle installed in a closure.

Fig. 4 is a view of the latching lock installation looking toward the finish plate.

Fig. 5 is a front view of the lock housing detached.

Fig. 6 is a front elevation of the housing viewed from line x^6, Fig. 3, with the operative parts in place.

The latch lever 1 is a lever of the first class fulcrumed at 2 to the bearing 3 which is an integral part of the face plate 4.

The parts 1, 2, 3, and 4 may be of any standard construction and the external portion 5 of the handle may also be of any standard construction excepting that it is provided with studs 6, 6′ which may be integral with the handle, and which extend through the face plates 4 and 4^a, respectively and are fastened by any suitable means, as by screw threading the studs and screwing nuts 7 thereonto and against a lock washer 8 of any suitable construction to prevent accidental working loose of the nut 7.

The face plate is also provided on the inner side with a projecting rod or tie bolt, which may be positioned and held in different ways. One convenient way is to provide a threaded socket 9 into which a tie bolt 10 is screwed to receive spacing nuts 11 and 12 for fixing the lower end of the elongate housing 13 relative to the face plate 4.

Said nuts 11 and 12 engage the back wall of the housing 13 on sides thereof so that when the tie bolt 10 is screwed home in the socket 9 and the nut 11 is screwed to the proper position to hold the wall of the housing 13 at the proper distance from the fac-

ing 4, then by screwing the nut 12 in place. the lower end of said housing is positively fixed with relation to the front face plate 4.

The elongate housing 13 is provided on the side toward the face plate with a front wall 14 having at its lower end a slot 15 to accommodate the inner end 16 of the latch lever 1. The housing 13 also has side walls 17 and 18, and a vertical slideway 19 is thus provided for a member of the latch-bolt operating train of devices, here shown as the lever operated wedge 20 that is adapted to act upon an antifriction roller 21 journalled to a bolt operating lever 22 that is fulcrumed at 23 to the housing 13, and is arranged at its upper end to act against the tappet 24 to withdraw the latch bolt 25 from latching position, 9. (Fig. 1.)

It is thus seen that by pressing the outer end of the thumb lever 1, the wedge 20 will be shoved up to move the latch operating lever 22 on its fulcrum 23 and cause the upper end of lever 22 to operate the bolt retracting means to withdraw the bolt from the position to engage the strike 27, that may be of any ordinary construction and attached to the door jamb 28.

The cylinder lock 29 which may be of any well known construction is secured to the door closure 30 by an internally threaded retaining sleeve 31 which is screwed onto the barrel 32 of the cylinder lock 29.

The thumb latch locking device comprises a locking pin 33 having a notch 34 and journalled in the housing 13 on that side of the latch operated lever 22 toward which a portion of the lever adjacent the pin must be moved in order to cause said lever to retract its tappet 24. The notch 34 of said pin is of such depth that when it is turned into the position shown in Fig. 6 it will accommodate the lever 22, when the same is operated by the wedge 20, so that so long as the pin is turned in that position the latch 1 may be operated and will thus function through its inner end 16, the wedge 20 and the lever 22 to retract the tappet 24 and latch 25 connected thereto.

When the pin 33 is turned to bring its web into lever intercepting position, the thumb lever 1 cannot be operated; but the locking thus effected does not interfere with the operation of the tappet 24 by the cylinder lock 29 which operates said tappet through the disk 35 provided with the cam 36 that acts upon the tappet to withdraw the bolt when the lock cylinder 29 is turned by the key 37.

An inner disk 38 provided with a cam 39 arranged to engage the tappet 24 to retract it against the spring 26 is connected through a journal 40 with knob shank 41 on which is fixed the inside knob 42. 43 is the dead bolt locking pin having a handle 44 on the inside of the door, and said locking pin is described in my companion application for patent on pin lock, Serial No. 133,631, filed on the 4th day of September, 1926, and also in application Serial No. 133,632, filed on the 4th day of September, 1926, for night latch.

Said dead bolt locking pin is notched in a manner corresponding to the latch pin 33 shown in Fig. 6 of this application, and the bolt connection 45 is notched to engage the web of the dead bolt locking pin 43 when said pin is turned to bring its web into the notch of the bolt connection.

The locking pins 33 and 43 are operable by handles 44 and 44′ on the inside face of the door.

It is thus seen that the latch bolt can be locked from the inside of the door against operation either by the thumb latch lever, the key, or the knob.

It is also seen that a knob of any approved diameter may be applied to the knob spindle 41 on the inside of the door.

The inside plate 46 carries the levers 44 and 44′ which are journalled therein in any suitable manner and a knob nut 47 is screwed onto the hub 48 that projects from the upper cylindrical portion 49 of the housing 13; and said inside face plate is secured to the closure by screws 50.

It will be seen that by reason of the disposition of the knob and key bolt-moving elements in line with the bolt on opposite sides of the housing and the disposition of the latch element for moving the bolt in the housing below the bolt, a very compact arrangement is provided with a minimum number of operating parts. The different actuating elements are quite independent of one another, so that no one is affected by any movements of or derangements of another. The projecting spring for the bolt serves, through the independent connections, to restore always the parts to normal position, so that the necessity of independent restoring means for any of the parts is done away with.

I claim:—

1. The combination with a housing containing the operating parts of the lock; a face plate; and a stud bolt screwed into the inner side of the face plate and secured to the housing by a nut.

2. The combination with a face plate, of a cylinder lock; means to secure the cylinder lock to the face plate; a bolt; a housing for the bolt; bolt operating mechanism in the housing; a stud bolt screwed into the inner side of the face plate; and means securing the housing to the stud bolt.

3. In a lock, a housing provided with a chamber to house a bolt operating tappet and provided at one side with a threaded socket to receive a lock cylinder and on the opposite side with a journal bearing for a knob spindle and also provided with an opening at one edge for a bolt operating

shank and provided at the bottom with an extension to receive a tappet operating lever; a cylinder lock screwed into said socket; a tappet in said chamber, a knob spindle journalled in said bearing, a spring to yieldingly hold the tappet in one direction, cams on said lock and said spindle to operate the tappet to withdraw the bolt, a lever in the extension and extending into position to operate the tappet; a wedge to operate the lever; and a thumb latch to operate the wedge.

4. In a lock of the character set forth in claim 3 having a housing provided with a slot in which the thumb latch operates, a pin fulcruming the thumb latch to the face plate; a stud bolt screwed into the face plate and extending through the housing; and spacing nuts screwed on the stud bolt and engaging opposite faces of the housing to hold the housing in true position relative to the face plate.

5. A latch lock comprising a housing provided with a threaded seat in which a lock cylinder may be screwed and provided with an elongated extension; a lever in such extension to operate the latch mechanism; a wedge to operate the lever; means to operate the wedge; a pin having a notch to accommodate the lever; and a web to intercept the lever to prevent it from being operated by the wedge.

6. The combination with a housing containing latch-operating parts, of a face plate, a screw stud for adjustably positioning the housing transversely of the face plate and for holding them in assembled relation, a threaded extension at the opposite side of said housing, and means for adjustably connecting a second face plate to said extension.

7. The combination with a housing containing latch-operating parts, of a face plate disposed in spaced relation to the housing, means for attaching the housing to the face plate in a laterally adjustable relation, a threaded portion on the opposite side of the housing, and a second face plate adjustably connected to the housing through the medium of said threads.

8. In a fixture of the class described, the combination of a bolt, a lever actuated bolt-moving element, an independent key actuated bolt-moving element, an independent knob actuated bolt-moving element, each of said elements being operable to actuate the bolt independently of the other bolt-moving element, and means to maintain said bolt and said bolt actuating elements in and to return them to latching positions when released.

9. In a fixture of the class described, the combination of a bolt, a lever actuated bolt-moving element, an independent key actuated bolt-moving element, each of said elements being operable to actuate the bolt independently of the other bolt-moving elements, and a spring to maintain said bolt and said bolt actuating elements in and to return them to latching positions when released.

10. In a fixture of the class described, the combination of a bolt, a lever actuated bolt-moving element, an independent key actuated bolt-moving element, an independent knob actuated bolt-moving element, each of said elements being operable to actuate the bolt independently of the other bolt-moving elements, and a spring carried by said bolt to maintain said bolt and said bolt actuating elements in and to return them to latching positions when released.

11. In a fixture of the class described, the combination of a bolt, a lever actuated bolt-moving element, an independent key actuated bolt-moving element, an independent knob actuated bolt-moving element disposed oppositely to said key actuated bolt moving element, each of said elements being operable to actuate the bolt independently of the other bolt moving elements, and a spring to maintain said bolt and said bolt actuating elements in and to return them to latching positions when released.

12. In a fixture of the class described, the combination of a housing, a bolt carried by said housing, a lever actuated bolt-moving element mounted in said housing below the bolt, an independent key actuated bolt-moving element mounted at one side of said housing substantially in line with the bolt, an independent knob actuated bolt-moving element mounted on the other side of the housing substantially opposite said key actuated element, and a spring to maintain said bolt and said bolt actuating elements in and return them to latching positions when released.

13. In a fixture of the class described, a housing, a bolt mounted in said housing, a lever acutated bolt-moving element in the lower part of said housing below said bolt, an independent key actuated bolt-moving element mounted in a wall of said housing adjacent said bolt, an independent knob actuated bolt-moving element mounted in the other side of said housing opposite said key actuated element, each of said elements being operable to actuate the bolt independently of the other bolt-moving elements, and means to maintain said bolt and said bolt actuating elements in and return them to latching positions when released.

14. In a fixture of the class described, the combination of a housing having a substantially cylindrical upper portion and a straight chambered portion depending therefrom, a spring projected bolt mounted in the cylindrical part of said housing, a key actuated bolt-moving element mounted on one side of said cylindrical body portion, an independent knob actuated bolt-moving element mount-

ed on the opposite side of said cylindrical body portion, and an independent lever actuated bolt-moving element mounted in the depending portion of said housing below said bolt, each of said elements being operable to actuate the bolt independently of the other bolt moving elements, said bolt projecting spring serving to maintain said bolt and said bolt actuating elements in and to return them to latching position when released.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 20th day of August, 1926.

WILLIAM E. WREAD.