



# UNITED STATES PATENT OFFICE.

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## LOCK-CASING.

943,899.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed February 24, 1909. Serial No. 479,797.

*To all whom it may concern:*

Be it known that I, HENRY W. SIMPSON, a citizen of the United States, residing at Ithaca, in the county of Tompkins and State of New York, have invented certain new and useful Improvements in Lock-Casings, of which the following is a specification.

My invention relates to improvements in lock casings and means for securing such casings to doors, etc; and has particular reference to that type of casings which are adapted to be insertible within or extended through the door.

One object of my invention is to provide a casing structure formed of separable sections, each section having portions tubular in cross-section, the diameter of one section being greater than the main portions of the remaining sections, said sections combinedly forming a casing of predetermined size.

A further object is to provide a casing formed of separable sections with inter-engaging means for preventing endwise movement of the sections relative to each other.

A further object is the provision of means for locking the separable sections against a relative rotary movement when properly positioned relative to each other.

A further object is to provide means for securing a casing of this type to the door, said means also serving as a positioning device for the knob shank or spindle.

To these and other ends the nature of which will be readily understood as the invention is hereinafter disclosed, my invention consists in the improved construction and operation of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, in which similar reference characters indicate similar parts in each of the views,—Figure 1 is a view in elevation of the casing as applied to a door, the latter being shown in section, the knobs being shown in position. Fig. 2 is a view, partly in elevation and partly in section of the casing, and also showing one of the knobs. Fig. 3 is a perspective view of a preferred form of one of the sections of the casing. Fig. 4 is a fragmentary view of portions of a lock structure which may be used in connection with the section shown in Fig. 3. Fig. 5 is a cross-sectional view taken

through the casing on line 5—5 of Fig. 2. Fig. 6 is a similar view of a modified form of casing. Fig. 7 is a detail view of one of the sections adapted to cooperate with the section shown in Fig. 3. Fig. 8 is a detail view of a locking member.

In lock mechanism where the locking mechanism is located entirely within the confines of the door, there is required the use of a casing therefor to protect the mechanism; and as such mechanism is generally of a diameter greater than that of the diameter of the knob shank or spindle, the ends of the casing must be reduced in diameter to form a closure surrounding the knob-spindle. In such structures, however, several difficulties are present. For instance, the lock mechanism must be inserted within the casing prior to the closure of the ends, so that there is a requirement of the use of separate end pieces which are placed in position after the locking mechanism is in place. This structure is generally provided by forming the exterior of the central or main portion of the casing with external screw threads upon which are screwed the end sections. The disadvantages of this construction lie in the fact that the opening for the central casing must be sufficiently larger than the casing itself to permit of the passage of the end caps thereover, so that the only support against a rotary movement of the casing would be that afforded by the frictional engagement of the cap with the periphery of the opening, and as the screw threaded engagement would not prevent relative movement of the two parts in a rotary direction, such frictional engagement would not prevent such rotary movement. A further disadvantage of connecting the sections in this manner is the fact that although the lock-mechanism be placed in the central section of the casing, the latter placed within the opening, and the latch or lock bolt be placed in position, the screwing on of the end caps is liable to disarrange the position of the central section, and as the parts are entirely hidden by such end-sections, adjustment could only be had by manipulating the exposed end of the latch or lock-bolt, and this is difficult unless the edge of the door be cut away to such an extent as to provide access to practically the entire shank of the bolt and necessarily weakening the door at this point. The pres-

ent invention is designed to overcome these disadvantages and provide a minimum cutting of the door.

The casing is formed of three sections, viz: the central section 6 and the end sections 13. The central section is in the form of a tube of equal diameter from end to end and of desired length, and is provided with the necessary radially-extending openings 8 and 9 for the passage therethrough of the shanks of the latch or lock bolts or both, the openings shown in Fig. 3 and designated 8 and 9, being those required for use in connection with the lock mechanism illustrated in my application for Letters Patent filed September 24th, 1907, Serial No. 394,267. The sections 13 are substantially similar to each other and are in the form of a tube having one of its ends expanded radially as shown in Fig. 7. The particular shape of the expanded end is immaterial, it being essential only that there be provided a tube portion of sufficient length and that the diameter of the end shall be such as to provide for the connection herein described.

For the purpose of forming the connection between the sections, the section 6 is provided on its interior with a peripheral groove 15 adjacent each end of the tube, which groove is enlarged longitudinally of the tube at predetermined points, the enlarging thereof carrying the groove to the end of the tube, thereby providing each end with openings or gates leading to the groove, the portion of the end between the gates being of the normal thickness of the casing and forming abutments 16 against a free endwise movement of the section 13 when placed within the groove as will be described. The gates and abutments may be of any desired number and may be of equal or unequal peripheral length as may be desired.

The section 13 has the diameter of its expanded end equal to the inner diameter of the section 6, and has its periphery provided with a series of spaced peripheral lugs 14, said lugs having a width and radial length equal to the width and radial depth of the groove 15, and are preferably of a peripheral length equal to the similar length of the gates of the sections 6, and are obviously of equal number with said gates and positioned in such manner as will permit of their simultaneous insertion through the gates into the groove.

It will be obvious that when a section 13 has had its lugs 14 introduced through the gates of section 6 into the groove 15, that a rotatory movement of the section 13 will place the lugs in such position as to prevent an endwise movement of the section to disengage the sections by reason of the presence of the abutments 16, thereby securing the sections together. While the sections are

thus secured together, the diameter of the casing is not increased, so that if the opening for the casing be of a size to snugly receive the casing, the frictional engagement will be had whether the sections 13 are in position or not. And as the grooves 15 limit the inward movement of the sections 13 the interior of the casing is of predetermined length.

While the connection just described prevents endwise movement of the sections 13, it will be obvious that a rotatory movement of these sections of a length sufficient to place the lugs 14 opposite the gates of the section 6 will again permit of such endwise movement. To prevent this rotatory movement locking means of suitable character are employed, the drawings illustrating different forms. For instance, a groove or grooves, 7 (which may be, if desired, short and inclined from end to end) may be formed in the section 6, and extending longitudinally from the end thereof, (preferably from end to end), said groove intersecting the groove 15 and being of equal depth with the groove at the point of intersection, one or all of the lugs 14 of the section 13 being provided with a recess 17. If the groove and recess be brought into alinement, a pin, such as indicated at 7', may be driven into the groove and through the recess 17, thereby effectively but removably locking the sections 6 and 13 together. Another form of connection would be to provide the casing 6 with openings 12' and 18' (Fig. 3), of equal or unequal surface area, as desired, said openings being adapted to receive the lugs 22 and 28 of a spring member 11 shown in Fig. 8, the lug 22 of greater length than the lug 28, said lug 22 being adapted to enter a radial recess in the periphery of the section 13, while the lug 28 serves simply as a retaining element to prevent the spring from being swung laterally. If desired, however, lugs 22 and 28 may be of equal size, in which case the spring 11 will be connected to section 6 at its center. If desired, the recesses 17 may be used for receiving the lugs 22, said recesses being preferably increased in depth radially for this purpose. And it will be understood that, if desired, both forms of securing means may be employed. As the spring 11 is relatively thin, there is no requirement of an excessive cutting out of the door to permit of its being employed.

While the lugs 14 are shown with their ends extending in radial directions in Figs. 5 and 7, it will be understood, that, if desired, they may be formed inclined, as shown in Fig. 6, in which case such inclined ends will permit of the spring structure shown in Fig. 8 being used when the sections 13 are being inserted after the section 6 has been placed in position, the said

ends causing the lugs 22 (or 28, if the latter be of equal length with lug 22) to be moved outward and ride on the periphery of the lugs 14 until the recess therein is encountered, whereupon said lugs will pass into the recesses and automatically lock the section.

By the constructions above indicated, it will be readily understood that the central section 6 (which is of a less length than the length of the door opening) may be placed in position within the door opening formed to receive it, one end of the section projecting a suitable distance, and the lock mechanism placed therein. The sections 13 are then placed on the knob spindles, if used, and positioned within the casing 6 in the manner hereinbefore indicated, the end edges of the section 6 being constantly exposed while the connection is being made, and permitting of a ready positioning of the sections 13 to permit of the placing of the locking means after which the casing 6 is moved endwise to position it intermediate the ends of the door opening, the latch bolt being then placed in position to prevent endwise movement of the casing as an entirety. I also provide the tube portions of the sections 13 with external screw threads adapted to receive the cap 4 which has its outer end provided with an inwardly extending peripheral flange having an opening of the approximate diameter of the knob spindle. I also provide a rose 5 which may or may not be screw threaded, said rose being brought into contact with the face of the door by the screw movement of the cap 4. If desired, the cap 4 and rose 5 may be formed integral. The length of the screw threaded portion of the section 13 is sufficient to permit of the use of the same length of section 6 for doors of different thickness, it being understood, of course, that the thickness of the door is, in all cases, greater than the length of section 6. By this particular construction of parts, and arranging the casing 6 to be permanently positioned intermediate the ends of the door opening, I prevent a rotative movement of the casing not only by the presence of the latch-bolt but also by reason of the frictional engagement of the casing 6 and the walls of the door opening, additional means for this purpose being provided by pins 7' when the latter are used; furthermore, by the use of the casing 6 of less length than the length of the door-opening, I produce a structure which can only be manipulated to expose the interior of the lock by a removal of the latch-bolt and the unscrewing of the rose on the opposite side of the door from that on which it is proposed to remove the casing 13, since there is a requirement of the exposure of the casing 6 to a point where the lug 22 can be withdrawn, obviously rendering it impossi-

ble for a person to gain access to the lock mechanism when the door is closed or locked.

If desired, the sections 6 may be formed integral with one of the sections 13, thereby leaving one side only of the casing with an opening equal to the area of the interior of the tube 6 in cross-section. In this case the knob shank must be arranged to be connected to the spindle after the latter has been passed through the permanently relatively closed end. Where both ends are removably secured to the casing 6, a structure permits of the use of locking mechanism where no spindle is employed, the knob shank carrying means to provide an actuating device for the lock mechanism of the type shown in my application heretofore referred to.

While I have herein shown and described preferred forms of construction, it will be obvious that the various changes in details may be made therein to accord with the several constructions arising in lock structures, and I desire it to be understood that I reserve the right to use any and all such modifications thereof as may fall within the spirit and scope of my invention as expressed in the accompanying claims.

Having thus described my invention, what I claim as new is:—

1. A lock casing comprising separable tube sections, removably secured together, complementary means on said sections for permitting the sections to have relative endwise and rotary movements, the rotary movements being solely in a single peripheral plane, and means movable with respect to the casing for securing said sections against relative rotary movement at predetermined points.

2. A lock casing comprising separable tube sections, removably secured together, complementary means on said sections for permitting the sections to have relative endwise and rotary movements, the rotary movements being solely in a single peripheral plane, and means for automatically securing said sections against relative rotary movement at predetermined points.

3. A lock casing comprising separable tube sections, removably secured together, complementary means on said sections for permitting the sections to have relative endwise and rotary movements, the rotary movements being solely in a single peripheral plane, and means movable with respect to the casing for securing said sections against relative rotary movement at predetermined points, said means providing a locking stop in contact with the sections having the relative movement.

4. A lock casing comprising separable tube sections removably secured together, complementary means on said sections for permitting the sections to have relative end-

wise and rotary movements, the rotary movements being solely in a single peripheral plane, and means movable with respect to the casing for securing said sections 5 against relative rotary movement at predetermined points, said means providing a removable locking stop in contact with the sections having the relative movement.

5. A lock casing comprising separable 10 tube sections removably secured together, complementary means on said sections for permitting the sections to have relative end-wise and rotary movements, the rotary movements being solely in a single peripheral 15 plane, means movable with respect to the casing for securing said sections against relative rotary movement at predetermined points, said means including an element extending through the wall of one casing into 20 the casing to be connected thereto, said element being yieldable.

6. A lock casing comprising a plurality of tubular sections of different diameters, the section of greater diameter providing 25 the central casing member, the section of less diameter having an expanded end adapted to fit within the central casing, complementary means on said sections for permitting the sections to have relative end-wise and rotary movements, the rotary 30 movements being solely in a single peripheral plane, and means movable with respect to the casing for securing said sections against rotary movement at predetermined 35 points.

7. A lock casing comprising a plurality of tubular sections of different diameters, the section of greater diameter having open 40 ends, said section providing the central cas-

ing member, a section at each end of said 40 casing member, said end sections being of less diameter than the central section and each having an expanded end adapted to fit within the central casing, complementary 45 means on said sections for permitting the sections to have relative end-wise and rotary movements, the rotary movements being solely in a single peripheral plane, and means movable with respect to the casing 50 for securing said sections against rotary movement at predetermined points.

8. A lock casing comprising a plurality of tubular sections of different diameters, the section of greater diameter providing the 55 central casing member, a section of less diameter having an expanded end adapted to fit within the central casing, said casing member having an annular groove on its inner periphery adjacent its end, and said 60 groove being open to the end of the member at pre-determined points to provide entrances to the groove, the expanded end of the section of less diameter having peripheral 65 projections adapted to pass through said entrances into the groove, whereby said sections are permitted to have relative end-wise and rotary movements, the rotary move- 70 ments being solely in a single peripheral plane, and means movable with respect to the casing for securing said sections against rotary movement at predetermined points.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY W. SIMPSON.

Witnesses:

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T. K. BRYANT.