Jan. 4, 1927. 1,613,550

M. WILDRICK

KEYLESS LOCK

Filed Nov. 14, 1924

Fig. 1.

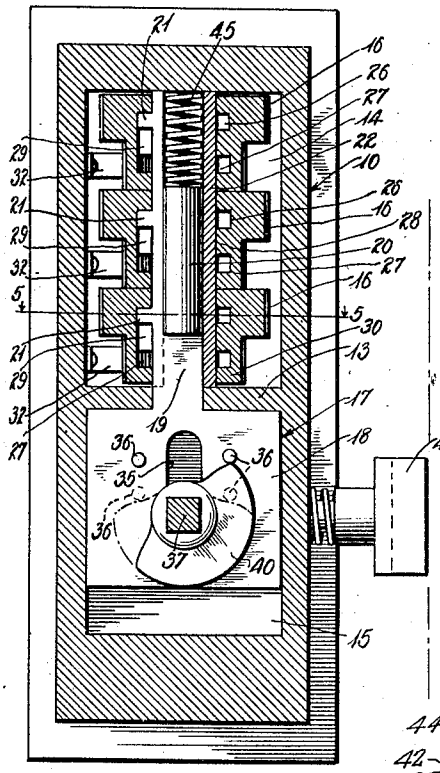


Fig. 2.

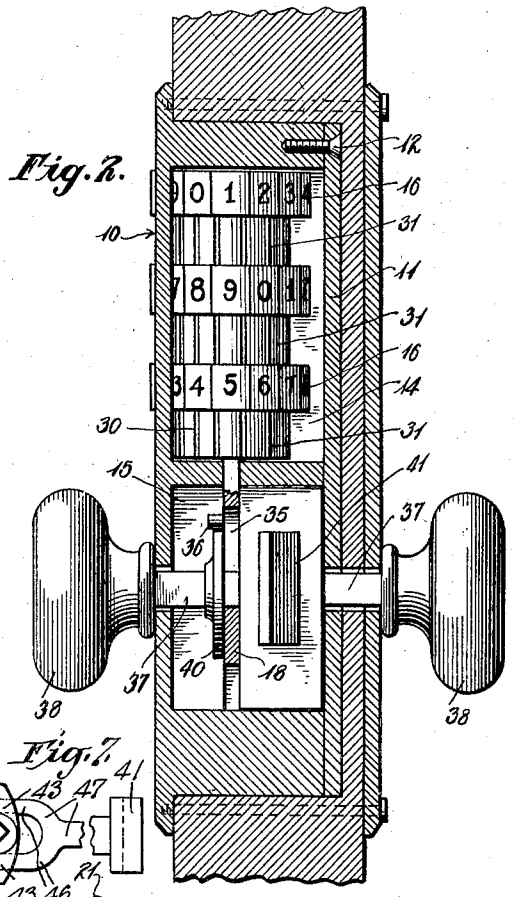


Fig. 7.

Fig. 3.

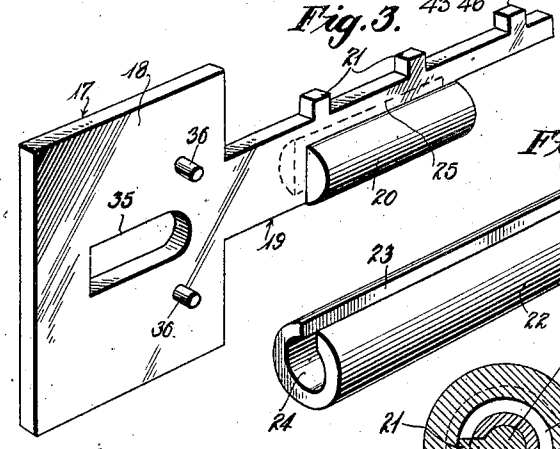


Fig. 4.

Fig. 6.

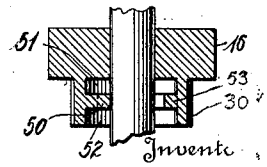
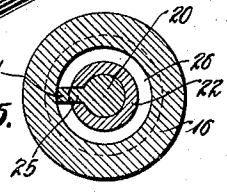


Fig. 5.



Inventc

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Patented Jan. 4, 1927. 1,613,550

UNITED STATES PATENT OFFICE.

MEADE WILDRICK, OF SAVANNAH, GEORGIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SESAMEE COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

KEYLESS LOCK.

Application filed November 14, 1924. Serial No. 749,924.

This invention relates to "keyless locks" of the general type shown in my prior Patent No. 1,373,283, granted March 29, 1921 and has for one of its objects to provide a lock of this character which will be simple in construction, comparatively inexpensive to manufacture and very efficient in use.

A further object of the invention is to provide a somewhat different form of permutation wheel and bolt controlled thereby which will readily lend itself to use in various types of locks such for example, as automobile locks of all kinds, baggage locks, safe locks, builders' hardware locks, locks for office equipment and in fact any sort of lock where permutation wheels may be employed.

With the above and other objects in view, which will appear as the description proceeds, the invention consists in the novel details of construction and combinations of parts more fully hereinafter described and particularly pointed out in the appended claims.

Referring to the accompanying drawings forming a part of this specification in which like reference characters designate like parts in all the views:—

Figure 1 is a vertical sectional view through a door lock embodying the present invention.

Figure 2 is a similar view at right angles thereto.

Figure 3 is an enlarged perspective view of the bolt constituting an important feature of this invention.

Figure 4 is a similar view of the bolt sleeve.

Figure 5 is a detail cross sectional view taken approximately on the plane indicated by 5—5 of Figure 1 and

Figure 6 is a fragmentary sectional view of a slightly modified form of permutation wheel.

Figure 7 is a conventional representation of an operating connection between the latch 41 and the spindle 37.

In the said drawings, the numeral 10 indicates generally a casing or housing which may take the form of a hollow casting open at its rear side, which open side may be closed by the plate 11, secured to the casing 10 as by the screws 12. The casing 10 is provided with a horizontal partition wall 13 which divides the interior space into two compartments 14 and 15, in the former of which is located the permutation wheels 16. The said wheels are rotatably mounted upon the bolt 17, the head 18 of which is positioned within the lower compartment 15, while the shaft 19 of the said bolt projects upwardly through the partition wall 13 and into the compartment 14 as will be clear from Figure 1.

As is best shown in Figures 1 and 3, the said bolt comprises the head 18 which is in the form of a substantially rectangular plate, while the major portion of the shaft 19 is also flat and is provided with a substantially cylindrical portion 20, which extends only a portion of the length of the shaft. The flat portion of the shaft 19 is provided with a plurality of lugs or projections 21 which coact with the permutation wheels 16 to control the bolt action, which will appear more fully below.

The shaft portion 19 of the bolt is enclosed in a split sleeve 22 having the slot 23 extending longitudinally thereof and the said permutation wheels 16 are mounted upon this sleeve and rotate thereon, thereby relieving the bolt shaft proper from the wear incidental to the manipulation of the wheels. The bore 24 of the sleeve is of such diameter as to receive the cylindrical portion 20 of the bolt and to permit the same to slide therein, it being understood that the fin portion 25 of the bolt shaft slides in the slot 23.

The permutation wheels 16, as above stated, are rotatably mounted on the sleeve 22 and their inner circumferences are provided with the circumferential grooves 26 and 27 spaced apart to form a rib 28 between them. These ribs are in turn provided with axially extending slots or key-ways 29 affording communication through the ribs between the circumferential grooves 26 and 27 whereby the projections or lugs 21 of the bolt may be moved from the grooves 26 into the grooves 27 and vice versa.

The wheels 16 are also provided with the reduced hub portions 30, the exterior circumferences of which bear the longitudinally extending notches 31 which coact with suitable detent springs 32 to maintain the wheels in any desired set positions.

The head 18 of the bolt is provided with an elongated slot 35 and with a pair of pins or projections 36 as will be clear from Fig-

ures 1, 2 and 3. An operating shaft or spindle 37 passes through the slot 35 and carries at either end, the door knobs 38 shown in Figure 2. Said shaft or spindle 37 may be made in one piece if desired, although it preferably comprises the well known split, or two piece construction whereby it is possible to manipulate the lock at all times from the inside, while permitting of such manipulation from the outside of the door, only when the bolt 17 is unlocked through the proper setting of the permutation wheels.

The spindle or shaft 37 which is preferably square in cross section has rigidly secured to it, immediately adjacent the bolt head 18, the cam member 40 which is adapted to coact with the pins 36 carried by the said bolt when the spindle is oscillated to raise the bolt, when the permutation wheels are set to the proper combination.

The catch member 41 may be of the usual well known construction and may be connected to the spindle 37 through the usual well known mechanism in such manner as to form a spring latch which, of itself, forms no part of the present invention. One conventional form of such mechanism is illustrated in Figure 7. It comprises a sleeve 42, on the spindle 37, having oppositely-disposed fingers 43, in engaging relation with lugs 44 extending laterally from the forked ends 46 of a bolt 47, one end of which carries the catch member 41. On rotating one of the knobs 38 in either direction the bolt and connected latch member are withdrawn as a result of the cam action between one of the fingers 43 and the co-operating lug 44.

As above stated, the cylindrical portion 20 of the bolt shaft extends only a portion of the length of the said shaft thereby leaving the other end of the sleeve 22 unoccupied, and into this portion of the sleeve there may be introduced a coil spring 45 which normally urges the bolt downwardly as viewed in Figure 1, to the locked position.

The operation of the present lock will be clear from the foregoing, but it may be briefly summarized as follows:—Assuming the parts to be in a locked position, that is, with the lugs or projections 21 in alinement with the circumferential grooves 27 of the permutation wheels, if the said wheels are set to the proper combination to bring the longitudinal keyways into vertical alinement with the said lugs, then any turning movement of the door knobs 38 will be transmitted through the spindle 37 and the cam member 40 to one or the other of the pins 36 carried by the bolt head 18 to move the bolt upwardly to the position shown in Figure 1. During this movement, the lugs 21 will pass through the axially extending keyways 29 from the circumferential grooves 27 to the grooves 26 and should it be desired to lock the parts in this position, one or more of the permutation discs may be rotated to move the vertical keyways 29 out of alinement with the said lugs. When the wheels 16 have been again set to the proper combination, the spring 45 will force the bolt in the opposite direction, providing of course, the turning force has been removed from the door knob 38 and will return the lugs 21 through the keyways 29 to the grooves 27. The parts may then be locked in this position by simply moving one or more of the permutation wheels.

In Figure 6 there is shown a slightly modified form of wheel in which the hub 30 is made of a slightly increased diameter and is provided upon its inner circumference with an annular rib 50, which provides the necessary circumferential grooves 51 and 52 on either side thereof. The communication between the grooves 51 and 52 may be accomplished through the longitudinal keyway 53 cut through this rib.

While the permutation wheels have been illustrated as being provided with ribs 28 having plain surfaces, it will of course be obvious that if desired, these wheels may be provided with the shiftable indicia bearing rings shown in my Patent No. 1,579,046, granted March 30, 1926, entitled "Keyless locks and permutation wheels for the same," and with arcuately spaced false recesses or slots such as are disclosed in my co-pending application, Serial No. 746,178, filed October 27, 1924 and entitled "Wheel for keyless locks"; also that it would be perfectly feasible to employ the bolt structure similar to that shown in the patent of Meade Wildrick and Alexander G. Hatch, No. 1,565,132, granted December 8, 1925, and entitled "Keyless locks". It is further obvious that those skilled in the art may vary the precise details of construction as well as the arrangement of parts, without departing from the spirit of the invention and it is therefore not wished to be limited to the above disclosure, except as may be required by the appended claims.

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

1. A lock comprising a mounting member, a latch mechanism including a manipulator and a latch movable thereby from an effective to an ineffective position, and a lock mechanism comprising a locking member movable into and out of a direct movement-obstructing relation with a movable part of said latch mechanism, whereby said latch mechanism may be converted into a lock, and a permutation mechanism to control the effective movement of said locking member, said mechanism comprising pairs of movement-obstructing elements each pair comprising an element carried by said locking

member and an element mounted in said mounting member, one of the elements of each pair having parts so disposed as to lie in the path of movement of a part of the other, except when one of said elements is set in a predetermined position with respect to the other, the settable elements being freely movable out of their "set" positions when said locking member is either in or out of its movement-obstructing relation with respect to said latch mechanism.

2. A lock comprising a mounting member, a spring latch mechanism comprising a manipulator and a latch adapted to be snapped into engaging relation with a keeper and removed therefrom by said manipulator, and a lock mechanism comprising a locking member movable into and out of a direct movement-obstructing relation with a movable part of said latch mechanism, whereby said latch mechanism may be converted into a lock and a permutation mechanism to control the effective movement of said locking member, said mechanism comprising pairs of movement-obstructing elements, each pair comprising an element carried by said locking member and an element mounted in said mounting member, one of the elements of each pair having parts so disposed as to lie in the path of movement of a part of the other, except when one of said elements is set in a predetermined position with respect to the other, the settable elements being freely movable out of their "set" positions when said locking member is either in or out of its movement-obstructing relation with respect to said latch mechanism.

3. A lock comprising a mounting member, a latch mechanism including a manipulator and a latch movable thereby from an effective to an ineffective position, a lock mechanism comprising a locking member movable into and out of a direct movement-obstructing relation with a movable part of said latch mechanism, whereby said latch mechanism may be converted into a lock, and a permutation mechanism to control the effective movement of said locking member, said mechanism comprising pairs of movement-obstructing elements, each pair comprising an element carried by said locking member and an element mounted in said mounting member, one of the elements of each pair having parts so disposed as to lie in the path of movement of a part of the other, except when one of said elements is set in a predetermined position with respect to the other, the settable elements being freely movable out of their "set" positions when said locking member is either in or out of its movement-obstructing relation with respect to said latch mechanism, thereby preventing movement of said locking member from either position to the other without first resetting said settable elements, motive means capable of moving said locking member, when not restrained by said permutation mechanism, into its movement-obstructing relation with said latch mechanism and normally tending to maintain it there, and an operating connection between said manipulator and said locking member whereby the latter may be moved by the former out of its movement-obstructing position against the opposing effort of said motive means except when held fast by said permutation mechanism.

4. In a keyless lock, a rotatable bolt-operating spindle, a spindle-locking element movable into and out of an effective locking position, motive means tending to maintain said locking element in its effective position and to return it thereto when removed therefrom, and permutation tumblers having lock-controlling elements movable into the paths of spindle-releasing movement of parts of said locking element, said lock-controlling elements having clearanceways so disposed as to receive the opposed portions of said locking element and permit a spindle-releasing movement to be imparted thereto only after said tumblers have been set in accordance with a predetermined combination.

5. In a keyless lock, a rotatable bolt-operating spindle, a spindle-locking element movable into and out of an effective locking position, said spindle and its locking element having opposed parts each movable into the path of movement of the other and of such relative forms and proportions as to constitute a driving connection whereby said locking element, if free, may be moved out of its effective position by a rotation of said spindle in either direction, but, if held fast, will prevent such rotation, motive means tending to maintain said locking element in its effective position and to return it thereto when removed therefrom, and permutation tumblers having lock-controlling elements movable into the paths of spindle-releasing movement of parts of said locking element, said lock-controlling elements having clearanceways so disposed as to receive the opposed portions of said locking element and permit a spindle-releasing movement to be imparted thereto only after said tumblers have been set in accordance with a predetermined combination.

6. In a keyless lock, a rotatable bolt-operating spindle, a spindle-locking element moveable into and out of an effective locking position, said spindle and its locking element having opposed parts of appropriate relative size and form to prevent rotation of said spindle in either direction when said locking element is held fast in its effective position, but permitting a spindle rotation of not less than 30 degrees in either direction when said locking element is free, mo-

tive means tending to maintain said locking element in its effective position and to return it thereto when removed therefrom, and permutation tumblers having lock-controlling elements movable into the paths of spindle-releasing movement of parts of of said locking element, said lock-controlling elements having clearanceways so disposed as to receive the opposed portions of said locking element and permit a spindle-releasing movement to be imparted thereto only after said tumblers have been set in accordance with a predetermined combination.

7. In a keyless lock, a rotatable bolt-operating spindle, a spindle-locking element movable into and out of an effective locking position, said spindle and its locking element having opposed parts of appropriate relative size and form to prevent rotation of said spindle in either direction when said locking element is held fast in its effective position, but permitting a spindle rotation of approximately 45 degrees in either direction when said locking element is free, motive means tending to maintian said locking element in its effective position and to return it thereto when removed therefrom, and permutation tumblers having lock-controlling elements movable into the paths of spindle-releasing movement of parts of said locking element, said lock-controlling elements having clearanceways so disposed as to receive the opposed portions of said locking element and permit a spindle-releasing movement to be imparted thereto only after said tumblers have been set in accordance with a predetermined combination.

8. A lock comprising a mounting member, a latch mechanism including a bolt and a manipulator therefor upon the movement of which the latch-releasing movement of said bolt is dependent, and a lock mechanism comprising a locking member movable into and out of direct movement-obstructing relation with a movable part of said latch mechanism whereby said latch mechanism may be converted into a lock, and a permutation mechanism to control the effective movement of said locking member, said mechanism comprising pairs of movement-obstructing elements, each pair comprising an element carried by said locking member and an element mounted in said mounting member, one of the elements of each pair having parts so disposed as to lie in the path of movement of a part of the other, except when one of said elements is set in a predetermined position with respect to the other, the settable elements being freely movable out of their "set" positions when said locking member is either in or out of its movement-obstructing relation with respect to said latch mechanism.

MEADE WILDRICK.