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E. W. NORTH

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LOCK

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Fig. 1.

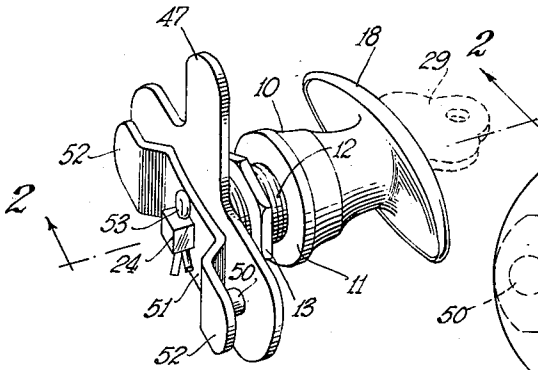


Fig. 3.

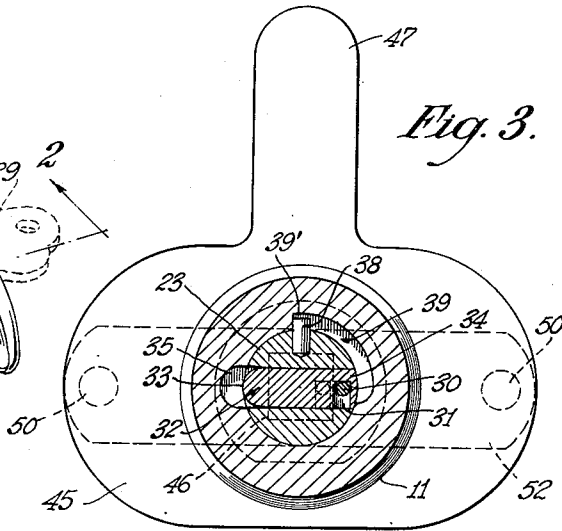


Fig. 4.

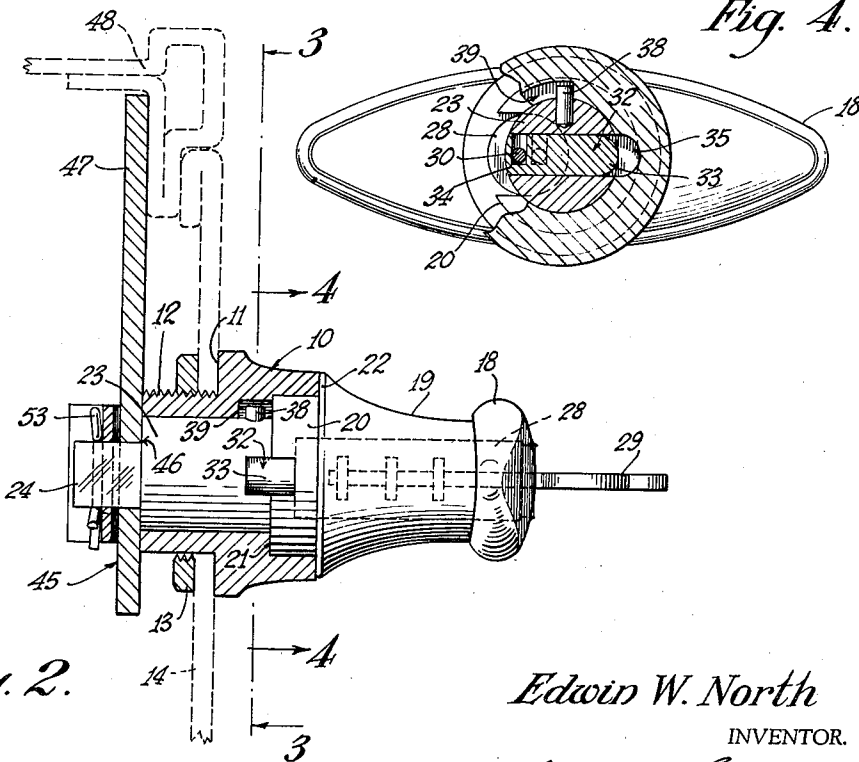


Fig. 2.

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# UNITED STATES PATENT OFFICE

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## LOCK

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6 Claims. (Cl. 70—216)

This invention relates to improvements in locks and the like and has for one of its principal objects the provision of a key-operated lock of general application and particularly suited for use with closures on lockers and various kinds of utility cabinets, the lock being further characterized by simple, rugged construction with relatively few working parts, and adapted to be manufactured at a relatively low cost.

Viewed from another aspect, it is an object of the invention to provide an improved lock having a mounting escutcheon attachable to a closure and a key-operated handle member rotatable in the escutcheon and stop means for limiting the movement of the handle in opposite directions between predetermined limits.

Another object is the provision of a lock including a handle rotatable in a mounting escutcheon and stop means carried by the handle and movable between opposite limits in a slot formed in the escutcheon to limit turning movement of the handle, there being in addition a key-operated latch bolt movable transversely of the handle shank in the escutcheon and constructed and arranged with relation to the stop means so that the handle may be latched in either of two opposite positions notwithstanding the limiting movement of the stop means.

Another object is the provision in a lock of an improved closure-operating or locking member and means for removably mounting the same on the shank of the handle.

Other objects and novel aspects of the invention reside in certain details of construction and operation of the lock structure hereinafter specifically described in view of the accompanying drawing, in which:

Fig. 1 is a perspective view of the complete lock assembly;

Fig. 2 is an enlarged vertical section as seen along line 2—2 of Fig. 1;

Fig. 3 is an enlarged vertical section taken transversely of the handle and escutcheon along line 3—3 of Fig. 2; while

Fig. 4 is a vertical transverse section looking oppositely from Fig. 3 and in the direction of line 4—4 of Fig. 2.

It will be understood that the specific lock structure described hereinafter has been selected as an illustrative embodiment of the invention, and that other forms of construction and modes of operation of the invention may be achieved for accomplishing the various objects and advantages thereof without departing from the spirit and scope of such invention, particularly as the

same will be defined in the claims appended hereto.

A preferred form of the lock includes (Fig. 1) an escutcheon 10 of substantially annular shape and having an annular shoulder portion 11 adapted to fit against a closure, and a threaded tubular shank 12 which projects through an opening prepared in the closure 14 (shown in dotted lines in Fig. 2) and upon which there is threaded a collar nut 13 which secures the escutcheon in place, the closure in this instance being a relatively thin metal locker door. Obviously, the threaded tubular shank 12 may be provided in any length necessary for mounting on any thickness of door.

A handle member 18 having a somewhat conical tapered shank 19 is provided with an annular shoulder 20 which fits into a recess in the escutcheon, there being an edge 21 provided in the latter as a seat for the shoulder 20, the stem portion 19 also having a flange 22 at the juncture of the same with the shoulder 20 and adapted to ride on the outer periphery of the escutcheon when the handle is turned.

A cylindrical shank 23 extends co-axially of the handle from the shoulder 20 and turns in the tubular portion of the escutcheon, there being a square stud 24 projecting from the end of the shank to provide a seat and attaching means for a closure latch or latch-operating member hereinafter to be described.

The lock mechanism itself may be of any suitable form, for example the familiar pin tumbler cylinder lock 28 illustrated in dotted lines in Fig. 2 and adapted to be released for turning movement by a key 29 insertable in a suitable key slot in the head of the handle.

The lock cylinder 28 may be turned by a proper key and is provided adjacent its inner extremity with an eccentric pin 30 which works in a slot 31 provided in a lock bolt 32 arranged for sliding movement transversely of the long axis of the handle in the shank portion thereof (Figs. 2 and 3).

When the key cylinder 28 is properly turned to unlocked position, the bolt 32 is withdrawn into the shank of the handle so that its opposite extremities, including the latching nose 33 thereof and the opposite end 34, are at most flush with the outer periphery of the shank. Stated in other terms when the lock is open, the bolt 32 is shifted transversely into the shank so that it lies in wholly unobstructing relation to the escutcheon or mounting means for the handle, the handle, therefore, being freely movable relative to its mounting.

When the key cylinder is properly turned to locked position, the bolt 32 will be shifted transversely to project its nose 33 into a bolt slot 35 (Figs. 3 and 4) provided on the inner periphery of the escutcheon sleeve, the handle thus being securely latched against rotative movement.

A principal feature of the invention is the provision of means for limiting the rotative movement of the handle 18 in opposite directions when the same is unlocked, this means including a stop pin or means 38 (Figs. 2, 3, 4) which projects radially from the shank 23 for movement in an arcuate stop pin slot 39 which extends through an arc which is preferably about 90 degrees in extent on the inner periphery of the escutcheon sleeve and which is offset or spaced away in a circumferential sense from the latch bolt slot 35.

It will be apparent that the stop pin 38 working in the slot 39 in the illustrative embodiment of Fig. 3 will limit the rotative movement of the handle 18 to a displacement of approximately 90 degrees or a quarter turn. Other degrees of displacement may be provided.

Another novel aspect of the invention is the arrangement whereby the latch bolt is so positioned and designed with respect to the stop means 38—39 that the handle may be locked in either one of two extreme positions approximately a quarter-turn apart. This is made possible by the relative dimensioning and placement of the parts concerned, particularly the circumferential displacement of the latch slot 35 with respect to the stop pin slot 39.

An examination of Fig. 3, for example, will disclose that if the shank 23 is turned to the right until the stop pin 38 abuts the lower extremity of the slot 39, the nose portion 33 of the latch bolt 32 will be moved a corresponding distance away from the slot 35 until it is substantially opposite the upper and left-hand extremity 39' of the slot 39, and if the lock tumbler then is turned to locked position, the nose 33 will project into the portion 39' of the stopping pin slot 39 and the handle will then be latched against movement toward the left (Fig. 3) by the bolt 32, and toward the right by the stop pin 38.

On the other hand, if it is desired to lock the handle in a position a quarter turn away from the position previously described, the bolt nose 33 will project into the slot 35 and serve to latch the handle against turning movement in either direction. It will be observed that the stop pin 38 will also function under the latter conditions to prevent movement of the handle toward the left, in addition to the limiting operation of the bolt.

Another feature of novelty in the improved lock structure resides in the provision of a closure latch in the form of an arm 45 having a centrally located square opening 46 adapted to fit over the squared stud 24 so as to turn with the handle, there being an outwardly projecting latch arm 47 integral with the main arm and of any form suitable for latching engagement with a stationary latch keeper such as indicated in dotted lines by the locker margins 48 adjoining the door 14. The locking arm 47 may also be utilized to actuate a bolt lever system frequently used on locker closures and the like.

The main arm portion 45 extends transversely of the latch handle at its inner end and is provided with a pair of lateral studs 50 near its outer extremities.

An elongated bridle strap 51 is provided with a centrally disposed squared opening which fits

onto the squared stud 24 against the latching member 45, the strap having its opposite end portions 52 offset to provide feet which abut the extremities of the pins 50 and constitute a rigidifying means for the locking member 45. The median portion of the bridle strap 51 in the region of the stud 24 is bowed outwardly somewhat to provide a bearing against a cotter pin 53 or other securing means extended transversely through the stud portion 24 to hold the assembly in place.

It will be apparent that the improved lock may be readily mounted and dismounted from a closure, it being merely necessary to provide an opening through which the threaded sleeve portion 12 may be inserted, and thereafter to apply the collar nut 13, the closure latching member 45 being slipped over the stud 24 and the bridle strap being applied on the stud following the closure of the latch, and the pin means 53 being slipped into place.

The form of the handle and escutcheon may be varied, since the invention in its broader aspects relates to the provision, broadly speaking, of a handle, means mounting the handle for rotative movement on a closure or the like, a latch bolt arranged for movement transversely into and out of that portion of the handle in the mounting means and radially projecting stop means working in a slot in the escutcheon or mounting means in such manner as to limit the rotative movement of the handle in opposite directions, preferably, though not necessarily, about a quarter of a turn, and the latch bolt and stop means being so arranged with respect to each other and the mounting means that the handle may be latched in either one of its extreme positions as limited by the stop means.

The appended claims, therefore, are not to be restricted to any precise details of structure recited herein but are to include all equivalent forms, means, and modes of operation.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a lock, a mounting, a spindle arranged to turn in the mounting, a lock bolt arranged for radial movement in the spindle, mechanism arranged relative to said spindle for radially moving said bolt, a stopping member projecting radially of said spindle in predetermined circumferentially spaced relation to said bolt, stopping formations arranged in said mounting adjacent the periphery of said spindle along the path of movement of said stopping member and bolt, said stopping formations being circumferentially spaced the aforesaid predetermined amount and engaged by said stopping member when the spindle is turned in opposite directions said amount to limit movement of the spindle, said bolt and stopping member being respectively positioned opposite one of said stopping formations when the spindle is in a predetermined position to lock the same against movement.

2. A lock including a handle, an escutcheon mounting said handle for rotative movement on a closure or the like, a latch bolt arranged for movement radially into and out of said handle in said escutcheon, said escutcheon having a latch bolt receiving formation interiorly thereof and a stop pin slot spaced therefrom in a direction of rotation of the handle, a stop pin projected radially of said handle into said stop pin slot, said stop pin being spaced in the direction of rotation of said handle a predetermined distance away

from said latch bolt, lock means in said handle for actuating said latch bolt, said stop pin limiting turning movement of said handle, and said latch bolt being operable to lock said handle either by engagement in the aforesaid latch bolt receiving formation when said handle is in one of its extreme positions, or by movement into said stop pin slot when said handle is in the other extreme position.

3. A lock including a handle having a substantially cylindrical shank, a mounting sleeve for said handle and having said shank portion rotatively disposed therein, a latch bolt arranged for movement radially into and out of said handle in said mounting sleeve for engagement in a bolt receiving slot in the latter, said mounting sleeve having a stop pin slot extending in the direction of rotative movement of the handle and shank, said slot being spaced a fraction of a complete turn away from said bolt receiving slot and being of a length substantially equivalent to the same fraction of a turn, a stop pin projecting from said shank on the handle into said stop pin slot and effective to engage the opposite extremities of the latter slot to limit the turning movement of said handle a distance equivalent to said fraction of a turn, said latch bolt being engageable in said bolt receiving slot when said stop pin is at one extremity of said stop pin slot, said bolt being latchingly engaged in said stop pin slot when said stop pin is at the opposite extremity thereof.

4. In a lock, a handle member arranged to turn in a mounting, a lock bolt arranged for movement radially in the handle member into and out of locking engagement in a bolt-receiving formation in said mounting, a stopping member displaced circumferentially away from said bolt on said handle member, means providing circumferentially spaced stopping formations in said mounting for engagement by said stopping member when the handle is turned in opposite directions and spaced from said bolt-receiving formation in a direction of turning movement of the handle member whereby the bolt may be locked in said receiving formation when the handle is turned into a particular position or the bolt and stopping member upon projection of the bolt may be lock-

ingly engaged with said stopping formations when the handle is turned into a different position, and mechanism carried by said handle member for actuating said bolt.

5. In a lock of the type having a handle member mounted for rotative movement in a mounting and a radially projecting locking bolt engageable with a locking formation on said mounting, the combination of means for limiting movement of said handle member and comprising a stopping member projecting radially of the handle member and spaced away from the bolt in the direction of turning motion of the handle member, said stopping member engaging oppositely spaced stopping members disposed on said mounting and spaced relative to said locking formation in one direction of rotation of the handle member whereby the latter may be locked either by engagement of the bolt with the locking formation when the handle member is in a certain position or by joint stopping engagement of said stopping member and bolt with said stopping members on the mounting upon projection of the bolt when the handle member is in a different position, and lock mechanism carried by said handle member for actuating said bolt.

6. In a lock, a mounting and a handle arranged for rotative movement therein, a lock bolt carried by said handle and arranged for radial movement into and out of locking engagement with a bolt-receiving formation in said mounting, a stop pin projecting radially of said handle and displaced 90 degrees away from the bolt, an elongated pin-receiving slot being provided in said mounting with one of its ends displaced 90 degrees from said bolt-receiving formation and an opposite end displaced 180 degrees from said bolt-receiving formation and in which said stopping pin moves responsive to turning movement of the handle, said bolt being arranged to project into said pin-receiving slot for locking abutment with one end of the same when said stopping pin is disposed at the opposite end thereof, whereby to lock said handle in a certain position, said bolt being lockingly engageable with said bolt-receiving formation to lock the handle in a different position.

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