United States Patent [19]

McLarnon

[11] **3,759,072**

[45] **Sept. 18, 1973**

[54] **LOCK**

[76] Inventor: **Robert Porter McLarnon**, P.O. Box 215, Stittsville, Ontario, Canada

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[21] Appl. No.: **141,285**

[30] **Foreign Application Priority Data**

May 15, 1970 Canada 082942

[52] **U.S. Cl.** **70/59**, 70/33, 70/85, 70/104

[51] **Int. Cl.** **E05b 69/00**, A42b 3/00

[58] **Field of Search** 70/13, 33, 58, 59, 70/93, 196, 199; 211/7, 8; 248/203

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Primary Examiner—Albert G. Craig, Jr.

Attorney—George F. Dvorak, Stephen T. Skrydlak and Marden S. Gordon

[57] **ABSTRACT**

A locking mechanism for a variety of uses is disclosed. The mechanism consists of a lock housing and one or more flat-bottomed slots in the housing to receive a flange or flanges from an article or articles to be secured to the housing and a key-operated locking shaft reciprocally mounted for movement across each of the slots. The locking mechanism may be used in a manner comparable to a padlock or may be secured to a supporting structure such as a motorcycle and be used to secure articles such as a safety helmet to the motorcycle.

2 Claims, 14 Drawing Figures

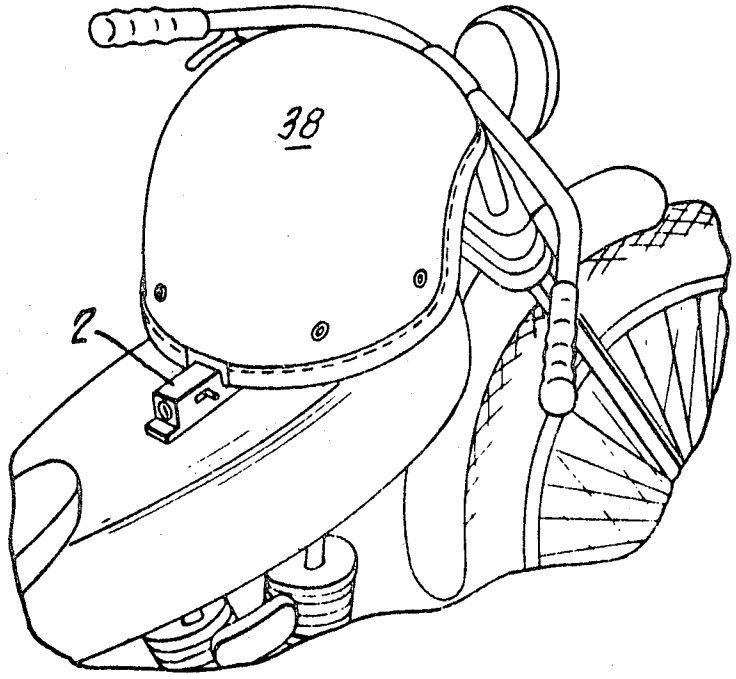


FIG. 1

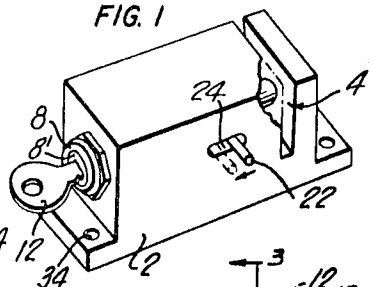


FIG. 3

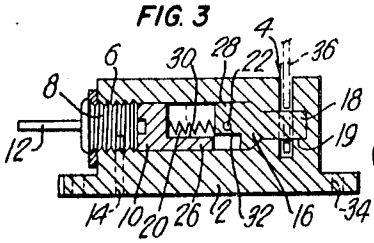
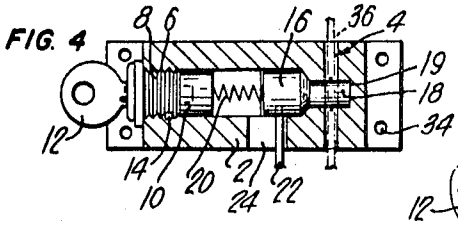


FIG. 4



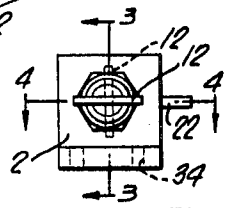
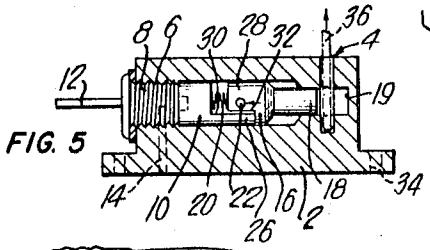


FIG. 2

FIG. 5



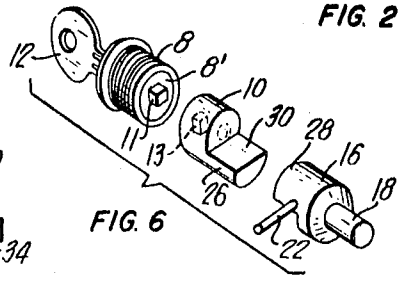


FIG. 6

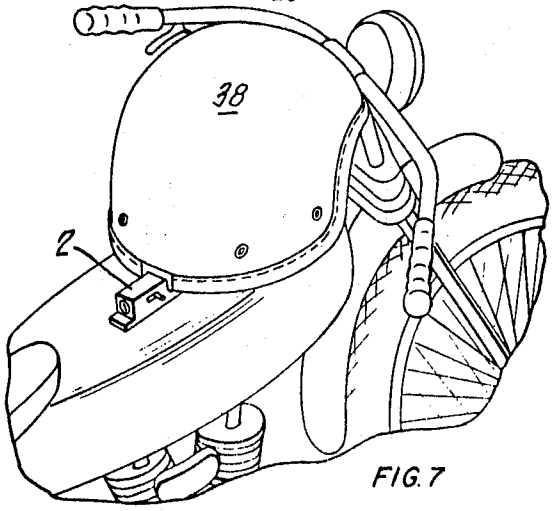


FIG. 7

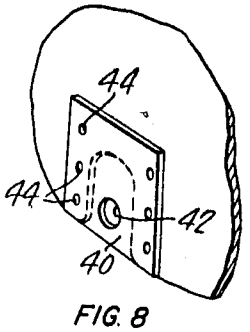


FIG. 8

FIG. 9

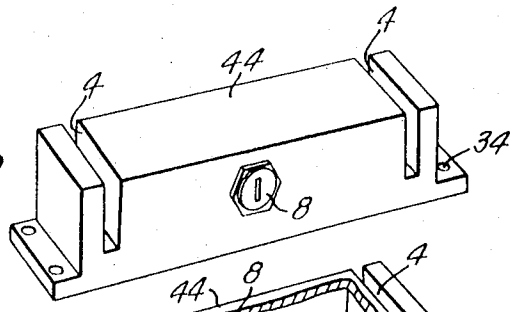


FIG. 10

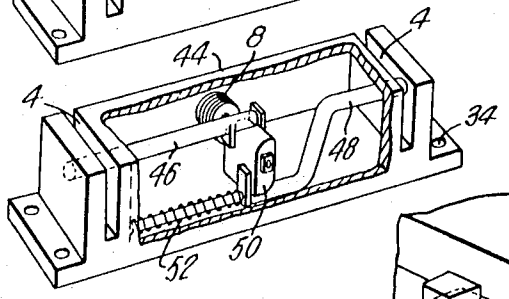


FIG. 13

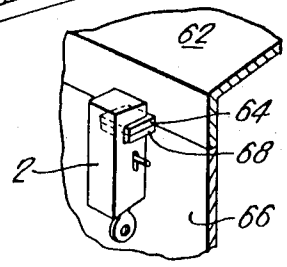


FIG. 11

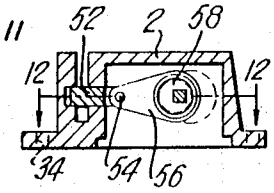
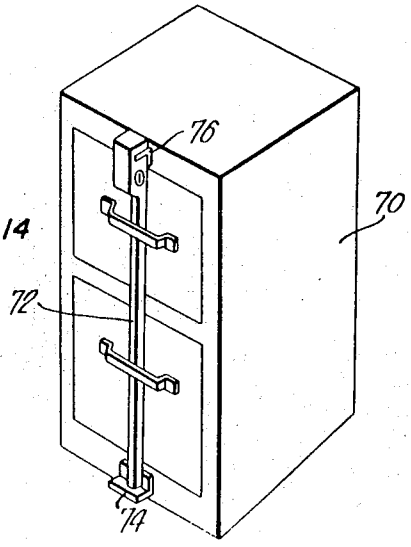


FIG. 14



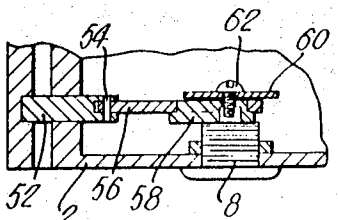


FIG. 12

LOCK

The present invention relates to a lock, and particularly to a key-operated locking mechanism which will find favour for a variety of uses.

The lock structure of the application may be portable and comparable in use to the well-known padlock, but as distinct from the padlock the locking shaft or shafts of the inventive lock is substantially completely enclosed by a solid lock body and is not exposed to tampering (sawing) as are the shafts of a padlock. In an alternative form the lock of the application may have a body housing with means to fixedly secure it to any structure whereby articles may be securely locked to the structure.

One of the preferred uses for the inventive structure is to provide means for lockably securing safety or "crash" helmets to motorcycles, snowmobiles or other vehicles or structures when not in use, and/or as providing means for securing an extra crash helmet to such vehicles when the extra helmet is not required. The inventive locking mechanism is however not restricted to any specific use as will be apparent from the following description.

As indicated, one of the preferred uses of the inventive lock is to provide means on a vehicle to which a safety or crash helmet or helmets may be secured when not in use. The Law provides that all operators and passengers on motorcycles must wear safety helmets when riding the cycles (and this requirement may very well soon extend to encompass snowmobiles and other vehicles) and this results in the problem of what to do with the helmet or helmets when the motorcycles are left. Safety helmets are rather bulky and heavy and it is not convenient to carry them about, nor does it make good sense to leave the helmets unattended, which simply invites theft. The present invention overcomes these problems by providing a locking mechanism which may be securely bolted to a vehicle and to which a helmet may be securely locked to prevent theft. In addition, the structure provides a snug and tight locking of the helmet to the vehicle whereby when the structure is used to carry a spare helmet during operation of the vehicle, the helmet is held secure, thus preventing damage or wear of the helmet and/or the vehicle.

The locking mechanism of the present invention will now be more specifically described with reference to the accompanying drawings wherein;

FIG. 1 illustrates one embodiment of the locking mechanism in perspective view;

FIG. 2 is an end view of the illustration of FIG. 1 with the operating key shown in full lines in its unlock position and in broken lines in its lock position;

FIG. 3 is a side sectional view along line 3 — 3 of FIG. 2 illustrating the inner mechanism in unlocked position;

FIG. 4 is a top sectional view along line 4 — 4 of FIG. 2 illustrating the inner mechanism in unlocked position;

FIG. 5 is a view similar to FIG. 3 but illustrating the locking shaft withdrawn from the receiving slot of the lock housing;

FIG. 6 is an exploded perspective view of the inner locking components illustrated in section in FIGS. 3, 4 and 5;

FIG. 7 illustrates use of the structure of FIG. 1 to secure a safety helmet to a motorcycle;

FIG. 8 is an enlarged portion of the helmet shown in FIG. 7 illustrating a plate secured to the helmet and which is received in the slot in the lock;

FIG. 9 is a second embodiment of the lock of the invention in perspective view;

FIG. 10 is a reverse perspective view of the lock shown in FIG. 9 with a portion of the casing removed to show the inner components in detail;

FIG. 11 is a side sectional view of a third embodiment of the lock and having a key opening in the side of the lock body rather than in one end as shown in FIG. 1;

FIG. 12 is a top sectional view taken along line 12—12 of FIG. 11;

FIG. 13 is a perspective view of the lock in use comparable with that of a padlock; and

FIG. 14 illustrates an embodiment of the invention with locking arm attached in use in the locking of a filing cabinet or the like.

Referring now specifically to the drawings and particularly to FIGS. 1 to 5, a solid lock body is indicated by numeral 2 and is provided with a flat bottomed receiving slot 4, and is hollowed to receive the locking mechanism and is threaded as at 6 to receive a key-operated lock barrel 8. A lock release plug 10 is secured to inner rotatable lock barrel 8' by suitable means whereby rotation of inner lock barrel 8' results in a corresponding rotation to the lock release plug 10. The key 12 and lock barrel 8 may be of known construction and provided with an anti-rotation lock pin 14 which prevents rotation of the outer portion 8 of the lock barrel when the inner portion 8' of the lock barrel (to which plug 10 is secured) is rotated by key 12. While the drawings do not specifically show the plug 10 actually secured to the inner rotatable lock barrel 8' this may be accomplished by any suitable means such as threading. In the drawings the plug 10 is held snugly, against the lock barrel 8' by the action of spring 20 (discussed below) and both plug 10 and barrel 8' are rotatable together by square knob 11 which is integral with barrel 8' fitting within a correspondingly shaped recess 13 formed in plug 10 (see FIG. 6).

A locking shaft plug 16 including integral locking shaft 18 is provided within the housing and in axial alignment with plug 10 and is normally urged into the position shown in FIGS. 3 and 4 with the locking shaft 18 extending across the receiving slot 4 and into recess 19 and in locking position by means of spring 20 extending between the plug 10 and plug 16.

The locking shaft plug 16 is provided with a pin 22 which projects outwardly through a slot 24 provided in the housing 2 and by which the locking shaft 18 can manually be withdrawn from receiving slot 4 when plugs 10 and 16 are in suitable alignment by moving pin 22 in the direction of arrow 23 in FIG. 1. The plug 10 is provided with a step 26, and plug 16 is provided with a complementary step 28, and plug 16 can be moved toward plug 10 (to withdraw locking shaft 18 from slot 4) only when the two surfaces 30 and 32 of the two steps 26 and 28 respectively are aligned in parallel to permit relative movement as in the position shown in FIGS. 3, 4, 5 and 6. When however locking plug 16 is in the position shown in FIG. 3 and the inner lock cylinder is rotated by the key to rotate step 26 from alignment with step 28 movement of the locking shaft from the receiving slot 4 is not possible, and when the key is removed with bolt 10 in this position movement of locking shaft 18 is not possible.

In the embodiment shown in FIGS. 1 to 5, the structure is shown with holes or apertures 34 through which bolts, screws, rivets or self-locking or non-removable screws or the like (not shown in the drawings) may be passed to secure the lock housing 4 to a structure such as a vehicle. Also in FIGS. 3, 4 and 5, a flange which forms part of a unit to be secured to the lock body is shown by numeral 36. This flange is provided with a hole (not numbered in the drawings) through which lock shaft 18 protrudes to securely lock the unit to the lock body.

While specific inner mechanisms such as plugs 10 and 16 and withdrawing pin 22 are disclosed, the use of other inner lock mechanisms whereby locking shaft 18 is withdrawn from slot 4 during rotation of the key 12 are within the scope of the present invention.

FIG. 7 illustrates the lock of the invention secured to a motorcycle and locking and holding a safety helmet 38 snugly thereon. The helmet is modified (see FIG. 8) to receive a plate 40 having a hole 42 provided therein to receive the locking shaft 18 of the lock. The plate 40 is secured to the helmet by means such as rivets 44, and this modification does not weaken the helmet (and may in fact strengthen it) nor does the plate result in any protrusion from the helmet which if present during an accident could cause injury to the rider, passenger or other individual. The plate 40 being flat-bottomed, fits snugly down on the flat bottom of the receiving slot 4 of the lock, and the shaft 18 passing through hole 42 holds the helmet snugly in the lock thereby making it possible for a rider to carry an extra helmet without the helmet knocking against the machine causing damage or superficial scratches or markings to either the helmet or vehicle.

The lock according to the invention is key-operated, and the same key could be used both for the lock and as the ignition key for the vehicle. In vehicles without ignition keys, the key of the helmet lock could be wired into the ignition circuitry of the vehicle and employed as the key ignition switch. Alternatively when an ignition key is present on the vehicle, both the ignition key and the lock key could be wired in series to provide double safety against theft.

While the above discussion is concerned primarily with the securing of a helmet to a vehicle, other articles such as motorcycle saddle bags or other containers could easily be modified for use with the lock of the invention.

A second embodiment of the invention is illustrated in FIGS. 9 and 10. In this embodiment the lock housing 44 is provided with double parallel flat-bottomed slots 4. The key locking barrel 8 is provided in the side of the housing, and rotation of the barrel by the key moves locking shafts 46 and 48 reciprocally into and out of the double slots 4. With this arrangement it will be possible to lock one or two articles (such as helmets to a vehicle.

Rotation of the lock barrel by means of a key (not shown) will result in rotation of the cam plug 50 to move the locking shafts 46 and 48 into and out of slots 4 to provide locking and unlocking positions.

With reference to FIG. 10, rotation of cam plug 50 in a clockwise direction will result in withdrawing the locking shafts from the slots 4 and against the action of return spring 52 which normally urges the cam plug 50 to rotate in a counter-clockwise direction to move the shafts into the slots.

In the embodiment shown in FIGS. 11 and 12, the lock housing 2 is similar to that shown in FIG. 1 with the exception that the lock barrel 8 is shown positioned in the side of the housing rather than in the end. In this embodiment a locking shaft 52 is pivotally secured by pin or rivet 54 to cam follower 56 which has an aperture (not numbered) which fits over an eccentric cam 58 which is rotatable by rotation of the inner lock cylinder. The assembly is held together by retaining plate 60 and bolt 62. It will be appreciated that rotation of the eccentric cam 58 will result in movement of the locking shaft into and out of locking position in slot 4.

FIGS. 13 and 14 illustrate two differing uses of a locking mechanism according to the present invention.

In FIG. 13, the lock of FIG. 1 is employed to lock a chest or cabinet. The lid 62 of the chest is provided with a lug 64 and the body 66 of the chest is provided with a lug 68, secured thereto by any suitable means such as screws or bolts (not shown). Each of the lugs is provided with a hole (not shown) which are in alignment when the lid is closed and the locking shaft of the lock passes through the holes to securely lock the chest.

The advantages of the lock of the invention over the common padlock are clearly shown in FIG. 13, as the locking shaft is not exposed to tampering (sawing) as is the case with padlocks.

A further use of the inventive mechanism is also clearly shown in FIG. 14 which illustrates the locking of the drawers of a filing cabinet 70. The lock body is provided with a tail shaft 72 which fits through an aperture (not numbered) in lower lug 74, while the locking shaft of the lock passes through an aperture (not shown) provided in upper lug 76. Both lugs 74 and 76 are of course securely attached to the cabinet.

The locking mechanisms of the invention may be constructed from any suitable materials such as metal and metal alloys.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A lock assembly for securing a safety helmet to an open vehicle, such as a motorcycle, motorbike, and the like to prevent theft or dislodgement of the helmet, the helmet being provided with a plate secured thereto and an aperture in the plate, the plate having a substantially flat bottom edge, the plate being secured to the surface of the helmet and substantially flush therewith, the lock consisting of a lock housing having means to secure the housing to the vehicle, and a slot in the housing, the slot having a width to snugly receive the plate therein and a substantially flat bottom to receive the substantially flat bottom edge of the plate thereagainst, and a locking shaft carried in the housing and mounted for reciprocal movement across the slot to engage in the aperture in the plate, and a spring in the housing urging the locking shaft across the slot and a pin secured to the shaft and projecting outwardly through the housing permitting manual retraction of the locking shaft from across the slot to enable positioning or removal of the plate with respect to the slot, and a rotatable key cylinder carried by the housing and selectively rotatable by means of a key to a locking position to prevent retraction of the locking shaft from across the slot.

2. The lock assembly for securing a safety helmet to an open vehicle according to claim 1, further characterized by key cylinder being mounted in the lock housing with the axis of the key cylinder being normal to the plane of the slot.

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