

(No Model.)

J. J. BYRNE.
PERMUTATION LOCK.

No. 585,505.

Patented June 29, 1897.

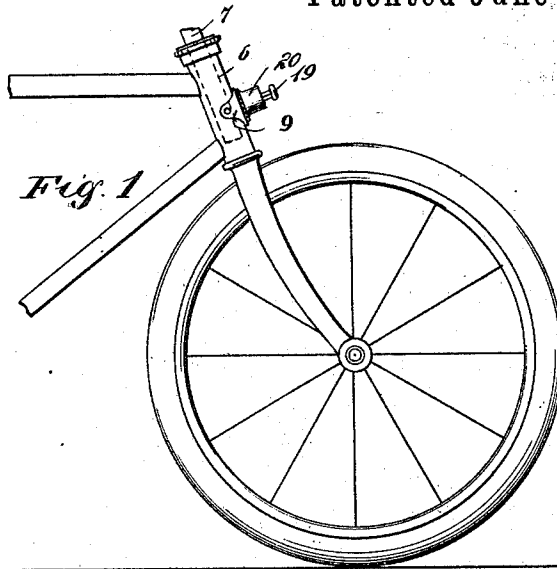


Fig. 1

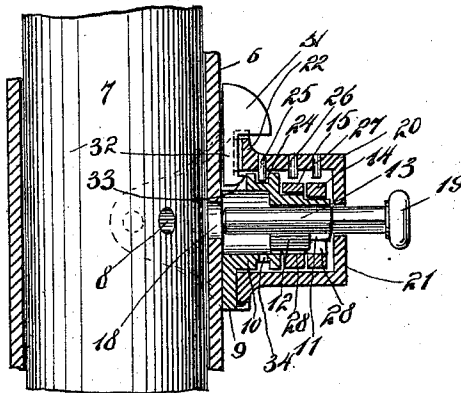


Fig. 2

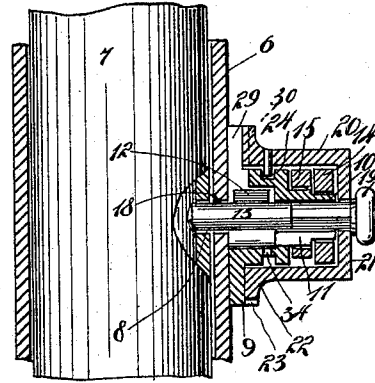


Fig. 3

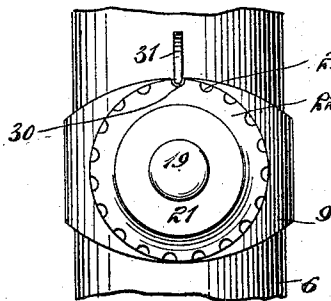


Fig. 4

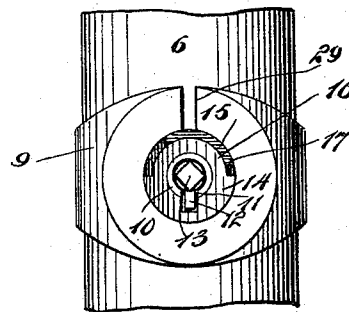


Fig. 5

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UNITED STATES PATENT OFFICE.

JAMES J. BYRNE, OF DETROIT, MICHIGAN.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 585,505, dated June 29, 1897.

Application filed March 18, 1897. Serial No. 628,147. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. BYRNE, of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Permutation-Lock, of which the following is a full, clear, and exact description.

The purpose of this invention is to provide a permutation-lock applicable to the steering-heads of bicycles and capable of engaging and holding the steering-fork so that it will be impossible to steer the machine and consequently to use it.

This specification is a disclosure of one form of my invention, while the claims define the actual scope of my invention.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the invention in use. Fig. 2 is a sectional view taken through the lock and showing it in open or released position. Fig. 3 is a sectional view showing the lock in closed position. Fig. 4 is a front elevation of the lock, and Fig. 5 is a front elevation of the lock with the exterior casing removed.

The steering-head 6 has the lock rigidly attached thereto, and the stem 7 of the steering-form turning within the head 6 has an opening 8, adapted to be engaged with the bolt of the lock, whereby to hold the stem 7 immovably with the head 6 and thus prevent the steering-fork from being operated.

The lock has a base-plate 9, curved to conform to the front face of the steering-head 6 and rigidly secured thereto. The middle portion of the base-plate 9 has an opening therein and has a tube 10 running outward from such opening. The tube 10 has an inner bore equal to the size of the opening in the middle portion of the plate 9, and has an outer bore reduced in reference to the size of the inner bore and provided with a slot 11 in its lower side. The slot 11 runs through the vertical wall of the tube 10, which wall divides the outer and the inner bores, so that the ward 12 on the bolt 13 may pass from the inner to the outer part of the tube. The ward 12 and the bolt 13 are so shaped that the ward 12 may swing freely within the in-

ner bore of the tube 10, and when drawn into the slot 11 the ward may slide longitudinally; but the bolt is held from revolution, owing to the fact that the ward is longer than the radius of the outer portion of the tube.

The outer or reduced portion of the tube 10 has its outer side formed with two circumferences, the outer of which carries a ring-tumbler 14 and the inner of which carries a ring-tumbler 15. The tumbler 14 has a notch 16 in its periphery which extends throughout one-half of the periphery. The tumbler 15 has a notch 17 in its periphery, which notch extends throughout one-third of the circumference of the tumbler. The bolt 13 is axially located with reference to the tube 10, and is capable of passing through an opening 18 in the steering-head 6, so as to enter the opening 8 in the stem 7 of the steering-fork. This will lock the parts 6 and 7 with each other. The outer end of the bolt 13 carries a suitable head 19, by which the bolt may be manipulated.

Inclosing the tube 10 and the tumblers 14 and 15 is a rotative exterior casing 20. The casing 20 is circular and has an outer head 21, with an axially-coincident orifice receiving the bolt 13. The inner end of the casing 20 is open and has an outwardly-projecting flange 22, provided with a series of peripheral notches 23. The enlarged inner portion of the tube 10 has in its outer face an annular groove 24, receiving a pin 25, projecting from the inner face of the casing 20, whereby the casing is held to rotate on the tube 10, but is prevented from being accidentally displaced therefrom. The casing 20 carries two additional inwardly-projecting pins 26 and 27, respectively working in the notches 16 and 17 and serving to adjust the tumblers 14 and 15 on the tube 10 when the casing 20 is turned in the operation of the lock. Each tumbler 14 and 15 is provided on its inner circumference with a notch 28, which is adapted to register with the slot 11 in the tube 10. When the notches 28 register with the slot 11, a clear passage will be provided for the ward 12, permitting the bolt 13 to be drawn longitudinally to engage or disengage the opening 8. The turning of the casing 20 after the manner of a specific "combination" will place the

tumblers 14 and 15 in such position that the notches 28 will register with the slot 11, whereupon the bolt may be withdrawn.

The upper middle portion of the plate 9 is formed with a slot 29, running vertically from the upper edge of the plate downward to the before-described opening in the center thereof. The flange 22 of the casing 20 is provided with a slot 30, running radially in the flange and capable of registering with the slot 29. The slot 30 is coincident to one of the notches 23 in the flange 22.

Fig. 2 shows a key-plate consisting in a head 31 and a shank 32, with an inwardly-running hook 33 at its lower end. The shank 32 of the key-plate is adapted to project downward through the slots 29 and 30 when such slots are in register with each other. The lower edge of the head 31 of the key-plate may now bear upon the notched periphery of the flange 22, whereupon by turning the casing 20 the periphery of the flange 22 will run against the lower edge of the head 31, and a person holding the key-plate may tell by the pulsations of the key-plate against his hand how many notches 23 are passing the key-plate from the turning of the casing 20. In turning the casing 20 to adjust the tumblers the points of the combination which is being followed are counted by the number of notches turning right and left from the slot 29. When there is light, the operator may see the number of notches that are turned, and therefore operate the lock without the key-plate, but when there is no light (at night, for example) the key-plate may be inserted in the slots 29 and 30 and the number of notches turned may be counted by the pulsations of the key-plate against the hand. The inwardly-projecting hook 33 has a beveled lower edge, the purpose of which is to find the slot 30 in the flange 22. The operator can easily find the slot 29 and may insert the lower extremity of the shank 32 therein, permitting the beveled lower edge of the hook 33 to bear against the flange 22. The casing 20 may now be turned until the hook 33 drops into the slot 30 of the flange 22, whereupon the operator will know that he has reached the starting-point for the turning of the combination. He may now proceed to turn the casing right and left, according to the combination, and thus release the lock.

The pins 26 and 27, being once inserted, need never be removed; but it may be desirable at some times to remove the pin 25, so as to permit the casing 20 to be taken off the tube 10, for example, when it is preferred to change the combination of the lock. To do this, I form a hole 34 at a known point in the extent of the groove 24. The outer end of the pin 25 should be filed flush with the outer surface of the casing 20. When it is desired to remove the pin 25, the casing 20 is turned until the pin is in radial line with the opening 34, after which the pin should be

driven into the hole 34, which will cause the casing 20 to be disconnected from the tube 10 and permit the casing to be removed. The combination—i. e., the certain relative relation of the tumblers, the bolt, and the casing 20—may then be changed in the usual manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a base-plate having a slot therein, a tube carried by the base-plate, a bolt with a ward, the bolt and ward being revoluble in the tube, tumblers turning on the tube and controlling the movement of the bolt, and a casing turning on the tube and adjusting the tumblers, the casing having a flange with peripheral notches and having a slot run through the inner face of the flange, the slot in the flange being capable of registering with the slot in the base-plate so as to receive a key, a portion of which may bear against the notched periphery of the flange on the casing.

2. The combination of a base member having a slot, a bolt, tumblers controlling the bolt, and a casing mounted to turn on the base member and having a flange with a notched periphery, whereby a key may be fitted within the slot of the base member and bear on the notched periphery of the flange.

3. A permutation-lock having an exterior casing revolubly mounted to turn and adjust the position of the tumblers, the casing having a flange with a broken periphery capable of being engaged by an object to determine the number of notches turned by the casing.

4. The combination of a base member, a tube carried by the base member, a bolt movable within the tube, tumblers turning on the tube, and a casing inclosing the tube and tumblers, the casing having a notched portion.

5. The combination of a base member, a tube carried by the base member, tumblers turning on the tube, a bolt movable within the tube, and a casing inclosing the tube and tumblers and turning around the same, the casing having a broken exterior surface capable of being engaged by an object whereby to determine the number of degrees turned by the casing.

6. A permutation-lock having a base-plate with an opening therein, a tube with an enlarged inner portion and a reduced outer portion, the reduced outer portion having a slot running through the wall between the two portions of the tube, a casing turning on the inner portion of the tube, two tumblers turning on the outer portion of the tube, and a bolt movable within the tube and controlled by the tumblers, the casing being capable of adjusting the tumblers by turning on the tube.

7. A permutation-lock having a base member with an opening, a tube carried on the base member and surrounding the opening, the tube having an enlarged inner portion

and a reduced outer portion, the outer portion of the tube having a slot running through the wall between the inner and outer portions of the tube, a tumbler turning on the outer portion of the tube, a bolt movable within the tube, and having a ward capable of turning freely within the inner portion of the tube and moving through the slot in the outer portion of the tube, and a casing enclosing the tube and tumblers and capable of movement to adjust the tumblers whereby to engage or disengage the ward of the bolt.

8. A permutation-lock having a tube with an enlarged inner portion and a contracted outer portion, the outer portion having a slot running through the outer portion and through the wall between the inner and outer portions of the tube, the tumblers turning on the outer portion of the tube and having a notch in their inner walls, the notch being capable of registering with the slot, means for adjusting the tumblers, and a bolt movable within the tube and having a ward capable of turning within the inner portion of the tube and of moving through the slot in the outer portion of the tube and through the notch in the tumblers.

9. A permutation-lock having a tube with an annular groove in its exterior face and an opening running through the thickness of the tube, a pin removably held in the casing and running in the groove of the tube, the pin being capable of being driven through the opening in the tube to release the casing,

and a bolt and tumblers coacting with the tube and casing.

10. A permutation-lock having a tube with an enlarged inner portion and a contracted outer portion, the inner portion having an annular groove in its exterior face and the outer portion having a slot running through it and through the wall between the inner and outer portions of the tube, a bolt movable within the tube and having a ward movable through the slot in the outer portion of the tube, a tumbler turning on the outer portion of the tube and controlling the bolt by engagement with the ward thereof, and a casing having a projection running in the groove of the inner portion of the tube and being held on the tube by means of said projection, the casing being capable of engaging the tumbler to actuate the same.

11. A permutation-lock having a base member with a groove running along the face thereof, and a rotating member turning on an axis to which said groove is radial, the rotating member having a portion of its periphery provided with notches that successively pass the groove in a circular line so that a key carried in the groove may press against the notched periphery of said rotating member.

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Witnesses:

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