May 4, 1926. 1,583,686

A. G. HATCH

PERMUTATION WHEEL FOR KEYLESS LOCKS

Filed April 22, 1924

Fig. 1.

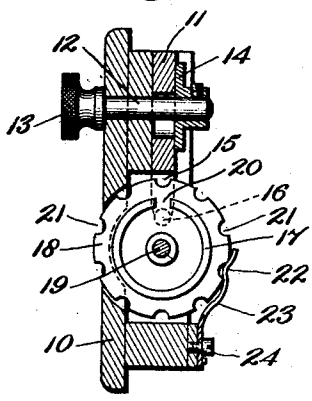


Fig. 2.

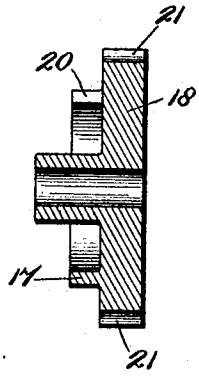


Fig. 3.

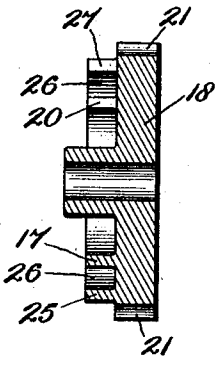


Fig. 4.

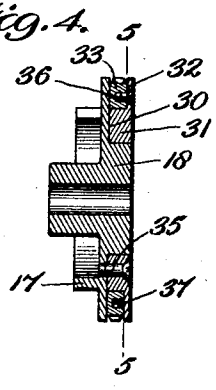


Fig. 5.

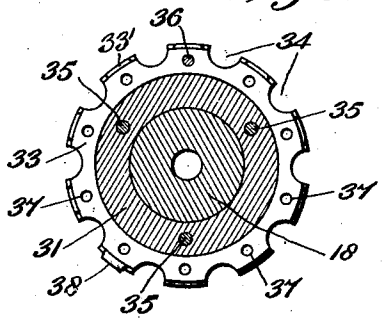


Fig. 6.

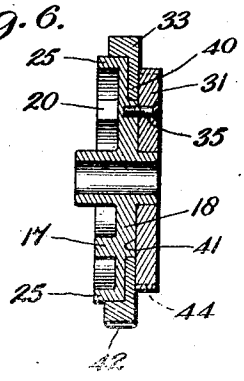
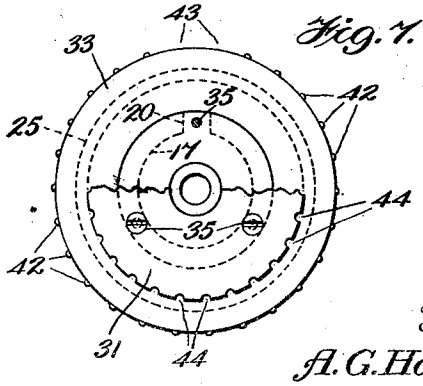


Fig. 7.



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Patented May 4, 1926.

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1,583,686

UNITED STATES PATENT OFFICE.

ALEXANDER GILCHRIST HATCH, OF HONOLULU, TERRITORY OF HAWAII, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO W-H KEYLESS LOCK COMPANY, LIMITED.

PERMUTATION WHEEL FOR KEYLESS LOCKS.

Application filed April 22, 1924. Serial No. 708,253.

To all whom it may concern:

Be it known that I, ALEXANDER G. HATCH, a citizen of the United States, residing at Honolulu, Territory of Hawaii, have invented certain new and useful Improvements in Permutation Wheels for Keyless Locks, of which the following is a specification.

This invention relates to permutation wheels for keyless locks, such for example as the various types of locks shown and claimed in my prior Patent No. 1,555,969, granted October 6, 1925, and entitled Keyless lock, of which this application is a continuation in part, and has for its principal object to provide a permutation wheel of this character which will be simple in construction, comparatively inexpensive to manufacture and more efficient in use than those which have been heretofore proposed.

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 and arrangements 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 central vertical sectional view, partly in elevation, of one of the forms of lock shown in my said co-pending application, and showing one form of permutation wheel in place therein;

Fig. 2 is an enlarged central sectional view of the form of wheel shown in Fig. 1;

Fig. 3 is a similar view of a slightly modified form of wheel;

Fig. 4 is a central vertical sectional view of a still further modified form of wheel wherein the indicia are mounted upon a shiftable ring, so that the combination of the lock may be readily changed at will;

Fig. 5 is a sectional view of the form of wheel shown in Fig. 4, taken approximately on the plane indicated by the line 5—5 of the said figure;

Fig. 6 is a central vertical sectional view on a still further modified form of wheel, somewhat similar to that shown in Figs. 4 and 5, but in which the indicia bearing ring is frictionally mounted; and.

Fig. 7 is a side elevational view, partly broken away, of the parts shown in Fig. 6.

Referring more particularly to the said drawings, the numeral 10 indicates a lock casing in which is slidably mounted a locking bolt 11, which is operable by means of the bolt shaft 12, which is provided at one end with a knurled head or finger piece 13, and at the other end with a disc 14, which has a pin and slot connection with the said bolt 11, all as is fully disclosed in my prior Patent No. 1,555,969.

The bolt 11 is provided with one or more depending legs 15, which are provided at their lower extremities with the angularly projecting toes 16, which are adapted to project under or over the annular projecting rib or flange 17, which is rigidly formed upon one face of the permutation disc or wheel 18. The said disc or wheel is rotatably mounted upon a shaft 19 and the said flange or rib 17 is cut away as indicated at 20, to permit the passage from the inside of the said flange to the outside thereof of the angularly projecting toe 16, whereby the locking bolt may be reciprocated to lock and unlock the mechanism to which the lock is applied.

The outer circumference of the disc or wheel 18 is provided with a plurality of depressions 21, equally spaced around its circumference, which depressions are adapted to not only afford means whereby the disc may be readily turned, but which are also adapted to receive a bent portion 22 of a detent spring 23, which is suitably secured to the lock casing 10, as by the screw 24. The portions of the circumference of the wheel between the said depressions 21 bear suitable indicia engraved therein or otherwise applied thereto, such for example as the numerals from zero to nine.

The form of wheel shown in Figs 1 and 2 is the simplest form, and probably the most inexpensive to manufacture, and the form shown in Fig. 3 is substantially the same except that a second concentric annular rib 25 is provided outside the rib 17 and spaced therefrom, so as to provide an annular groove 26 into which the projecting toe 16 may ride while the locking bolt is in its locked position. The said rib 25 may also be cut away as indicated at 27 to permit the

said toe 16 to be withdrawn therethrough when it is desired to dissemble the lock.

In the form of the invention shown in Figs. 4 and 5, the disc or wheel 18, in addition of being provided with the annular flange 17, has its opposite face cut away, as indicated at 30, to receive a clamping ring 31, the outer circumference of which is in turn, cut away as indicated at 32, to provide an annular groove in which is seated an indicia bearing ring 33 carrying suitable raised indicating characters 33'. The said ring 33 is provided with the arcuately spaced notches or depressions 34 similar to the depressions 21, above described, and the outer circumferences of the wheel 18 and the ring 31 are correspondingly cut away so that the said notches extend completely through the thickness of the assembled wheel.

The clamping ring 31 is secured to the body of the disc 18 by suitable screws 35, while the ring 33 is secured to the ring 31 by a screw 36. The said ring 33 is provided with a threaded hole 37 for each of the indicia, which are provided on its circumference so that by merely removing the screw 36 and shifting the ring 33 arcuately, it is possible to change the relative positions of the members and thereby afford a ready means for changing the combination necessary to open the lock.

In order to facilitate the operation of the lock, by the sense of touch, one of the characters provided upon the circumference of the ring 33 may be raised above the normal circumference, as indicated at 38, so that by turning the wheel until this raised character is felt, it is possible to then move the same the required number of notches by the sense of touch or by the sense of sound, since a slight click will be given by the spring, such as 23, as it engages the notches 34.

In the form of the invention shown in Figs. 6 and 7, the indicia bearing ring 33, instead of being positively secured to the clamping ring 31 is merely frictionally held in place upon the body of the disc 18 by the said ring 31. The inner portion 40 of the said ring 33 may be made of a thickness sufficient to cause the same to be frictionally engaged by the surface 41 of the ring 31 when the latter is tightened by means of the screws 35, so that the said indicia bearing ring may be securely held against arcuate movement by frictional engagement. However, should it be desired to change the combination, this can be readily done by either backing off slightly on the said screws 35 to reduce the friction, and then shifting the ring, after which the screws may be again tightened, or the friction between the disc 31 and the ring 33 may be so adjusted that the said ring may be shifted by the application of sufficient force, without loosening the screws, while at the same time the said friction will be sufficient to prevent the unintentional shifting of the ring 33 during the normal operation of the lock.

In this form of the invention, the body portion 18 of the disc is shown as provided with the second annular flange or rib 25 which, in this instance, is not provided with a cut away portion, such as 27, shown in Fig. 3, whereby the said flange will act as a protection against the insertion of a thin blade or member between the indicia ring 33 and the casing of the lock in an endeavor to feel the position of the cut away portion 20 whereby it might be possible for unauthorized persons to open the lock by turning the wheel to the proper position to permit the passage of the toe 16 through the cut away portion 20, after they had located its position relative to the ring 33.

In this form, the outer circumference of the ring 33 is shown as provided with equidistantly spaced raised projections 42, between which the indicia such as letters of the alphabet are placed. Furthermore, in order to facilitate the working of the combination by the sense of touch or sound, two of these projections are omitted as indicated at 43 so that by turning the wheel until this smooth place on its circumference is felt, it will be possible for the operator to locate a certain indicating character after which the required number of movements may be made to bring up the desired character.

The detent spring, such at 23, may, of course, bear directly upon the outer surface of the ring 33, but it is preferred to provide notches 44 on the circumference of the clamping ring 31, which may be engaged by the detent springs, as in the preceding forms.

It is obvious that those skilled in the art may vary the details of construction as well as the arrangement of parts without departing from the spirit of the invention, and therefore it is not wished to be limited to the above disclosure except as may be required by the accompanying claims.

What is claimed is:

1. A permutation wheel for a keyless lock comprising a disc having a laterally extending annual rib separating two unobstructed, concentric, annular spaces adapted to form endless passageways adjacent each of its opposite surfaces, a slot in said rib forming a passageway from one of said spaces to the other, and a second annular rib concentric with, spaced from and surrounding the first.

2. A permutation wheel for a keyless lock comprising a lock-controlling element having, as a part thereof, a circular slotted abutment adapted to serve as a movement-

obstructing element of a lock mechanism, a concentric wheel setting element journaled on said lock-controlling element, and of a relative diameter such as to adapt it to be extended through a slotted casing so as to be accessible for manipulation, a friction clutch, and variable clamping means for said clutch whereby its effectiveness may be adjusted at will, said clutch affording a coupling whereby said lock-controlling element may be rotated by said setting element to a set position but may be held fast in set position during relative rotation of said element to change the combination of the lock in which the wheel is used.

ALEXANDER GILCHRIST HATCH.