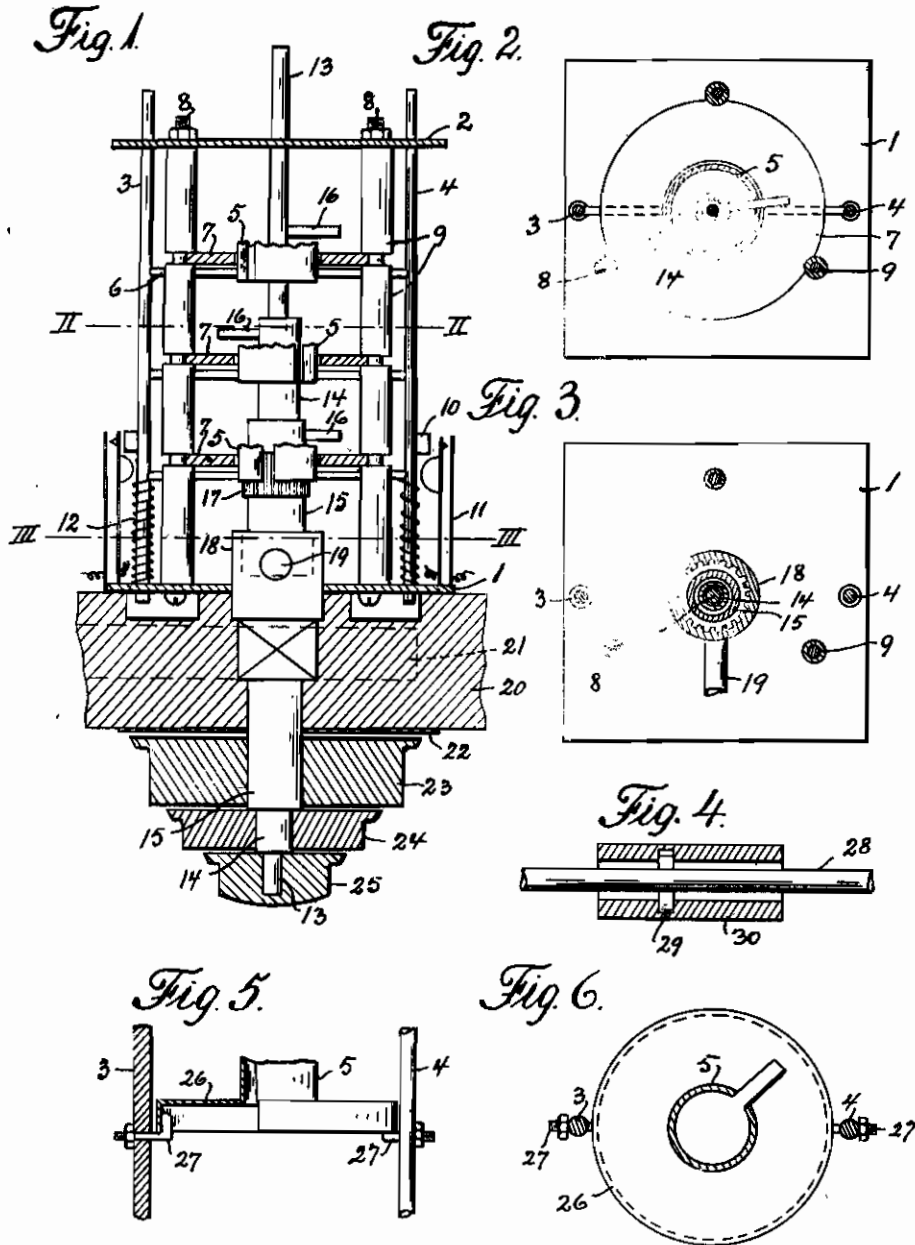


PUBLISHED
MAY 18, 1943.
BY A. P. C.

E. E. A. HINNERFELDT
PERMUTATION AND ALARM LOCKS
Filed Sept. 6, 1939

Serial No.
293,586



Inventor:

Einar Eiloy Anderson Hinnerfeldt.

ALIEN PROPERTY CUSTODIAN

PERMUTATION AND ALARM LOCKS

Einer Eiby Andersen Hinnerfeldt, Kirkehoerup,
Als, Denmark; vested in the Alien Property Custodian

Application filed September 6, 1939

The present invention relates to the construction of a combined permutation and alarm lock that may be connected to as well new as old locks by removing the handles and the handle spindle that is carried through the bolt nut, and connecting the permutation and alarm lock to this nut.

When employing the invention in connection with ordinary known door locking mechanisms that are provided with a bolt and a bolt nut, there is obtained partly that the lock is altered to a permutation lock which can only be opened after the adjustment of a predetermined code, and partly that the lock is combined with an alarm device that is operated upon any grip of the knobs of the lock without having previously adjusted the lock mechanism in strict accordance with the code. The alarm device may either be an audible or a visible signal, or both simultaneously, and is operated by means of contact members actuated by the lock device, or by mechanical means for transmitting the forces by means of which a person unacquainted with the code endeavours to open the lock.

The alarm device according to the invention comprises mainly an arbitrary number of coaxially arranged shafts that are inserted through a tubular sleeve member that may be connected to the bolt nut of the door lock in connection with which the device is to be used, and after the handles and handle spindle have been removed. The sleeve has a square end for engaging the correspondingly square opening of the nut. The shafts and the sleeve form together a unit that is displaceable longitudinally. Means are provided to allow the individual rotation of the shafts, but prevent their relative displacement. Each shaft has on its one end a permutation knob by means of which the operation of the lock from the outer side of the door may be controlled, and the sleeve is provided with a handle for displacing the sleeve for opening the lock from the inner side of the door independently of the permutation device. The outermost shaft and the sleeve are furthermore provided with means for coupling them together when the proper adjustments of the permutation members have taken place.

According to the invention there are furthermore provided means for locking the shafts in relation to the sleeve, said means comprising laterally extending pins on the end of each shaft, each pin coacting with an annular disc member disposed coaxially to the shaft. These annular discs have each in their inner edge a radial inci-

sion for engaging one of the pins, thus providing means for procuring engagement between the toothed wheel and toothed portion of the sleeve, when each shaft is adjusted to a position in which the pin on the shaft registers with the incision in the disc.

For actuating the alarm device according to the invention the lock is provided with a number of interconnected ring members forming a unit that is displaceable in a direction parallel to the axis of the shafts, for actuating electrical contact devices to close an electric circuit through an alarm device. The said rings are interconnected by means of rods and stays, and they correspond in number to the number of shafts, with which they are arranged coaxially in such a manner that any incorrect adjustment of the permutation members will cause the rings to catch the corresponding pin, thereby causing the alarm device to be displaced for actuating the electric contact device.

By increasing the number of shafts and with them the number of discs it is possible to provide for an arbitrary increase of combination possibilities of the alarm device, so that the device may be made absolutely proof against unauthorized use. As furthermore there is provided a disc for each separate adjustment shaft, a single incorrect adjustment of any of the permutation knobs will immediately cause an alarm to be given if endeavours are made to extract the shafts for operating the lock.

In order to facilitate the engagement of the pins by the rings of the alarm device, these rings are according to the invention irregularly dented in the edge facing the pins.

The code of the alarm device may be altered when desired so that similarly constructed alarm devices may be assembled in a manner to provide differing codes. Means are provided for allowing the rearrangement of the disc members in relation to each other. Likewise means are provided for allowing the rearrangement of the rings.

The following is a description of a device according to the invention, illustrated in the accompanying drawing in which the parts necessary for understanding the invention are shown.

Fig. 1 shows the combined permutation and alarm lock in top elevation and partly in section,

Fig. 2 is a sectional view on line II—II in Fig. 1,

Fig. 3 is a sectional view on line III—III in Fig. 1,

Fig. 4 is a diagrammatic view of a detail in section and

Figs. 5 and 6 a modified manner of construction

of a detail, seen in top and side elevation respectively, in Fig. 5 partly in section.

The members of a permutation and alarm lock according to the present invention are assembled between two end plates 1 and 2, that serve partly as guide plates for a movable part of the device comprising two rods 3 and 4 that are rigidly interconnected and spaced parallel to each other by means of split rings 5 and stays 6, and partly as assembly plates for circular discs 7 that are clamped between spacing tubes 8 arranged on clamping rods 9. The rods 3 and 4 are displaceable longitudinally in relation to the end plates, and each rod carries a lug 10 that coacts with a contact device 11.

In Fig. 1 the device is shown in its inactive position, in which it is held by means of coil springs 12 inserted between the end plate 1 and the nearest stay 6 on the rods 3 and 4. In this position the lugs 10 are out of engagement with the contact devices 11. The end plates 1 and 2 have bearings for a system of shafts comprising a spindle 13 partly surrounded by a tubular shaft 14, which again is partly surrounded by another tubular shaft 15. These shafts and the spindle are displaceable longitudinally, and means are provided for preventing their relative displacement longitudinally, but which allow them to rotate independently of each other. Such means are shown diagrammatically in Fig. 4, in which is shown a shaft 20 corresponding to either the shaft 14 or 13, and which is provided with a lug 29 engaging an annular groove formed in the inner wall of a tubular shaft corresponding to either the shaft 14 or 15.

Each shaft 13, 14 and 15 carries a radially extending pin 16 that has a length and a thickness corresponding to the width and length of the split in the rings 5 and the slots in the discs 7. The exterior tubular shaft 15 carries furthermore a fixed toothed wheel 17, which upon the displacement of the shafts engages the teeth of an interiorly toothed tubular sleeve member 18, provided with a handle 19, that projects into and is attached to the bolt of a lock 21 of conventional construction and applied in known manner to a door 20, and from which lock the handles and handle spindle have been removed. By means of the pin 16 it is possible to manipulate the door lock 21 from the inner side of the door independently of the other members of the lock device according to the inven-

tion. The shafts 13, 14 and 15 extend to the outer side of the door 20, where each is provided with a knob 23, 24 and 25 respectively, by means of which they may be rotated independently of each other, and by means of which the shafts may be displaced longitudinally as a unit. A numeral plate 22 on the outer side of the door in combination with marks on the separate knobs allows for an adjustment from the outside of the door of the shafts 13, 14 and 15 in relation to each other without actuating the rings 5, and to allow the displacement of the shafts for coupling the device to the sleeve 18 and thus to the bolt of the lock 21.

The combined permutation and alarm lock operates in the following manner. Upon turning the knobs 23, 24 and 25 in accordance with the predetermined code for opening the lock, each pin 16 is moved to register with the split in a ring 5 and with the slit in a disc 7. When hereafter the shafts are displaced for instance by extracting the knob 23, for procuring engagement between the toothed wheel 17 and the teeth in the sleeve 18, the door lock 21 can be opened by turning the knob 23. As it is necessary for opening the door lock from the outer side of the door that the shafts are coupled to the sleeve 18, it will be understood that the pins 16 must prior hereto be adjusted to their proper positions in relation to the other locking and alarm members. If endeavours are made to extract the shafts before this adjustment is made, the pins 16 will be caught by the rings 5, thereby actuating the device for operating the contact device for closing an electric current through the alarm means.

In Figs. 5 and 6 there is shown a modified manner of constructing the rings 5. In this instance the ring is formed as a projecting flange on a circular disc 26, the flange as well as the disc having a slot through which the pin 16 can pass. The disc 26 is by means of a folded edge attached to the rods 3 and 4 and clamped thereto by means of hook members 27 that are threaded for a nut, so that they are adjustable.

The details of construction of the above described device may be altered without deviating from the scope of the invention, the essential being that the rings are attached in such a manner that their position may be altered when desired.

NINER EIBY ANDERSEN HINNERFELDT.