Jan. 27, 1942. R. E. McNAMARA 2,270,850

IGNITION LOCK AND THE LIKE

Filed June 21, 1940 2 Sheets-Sheet 1

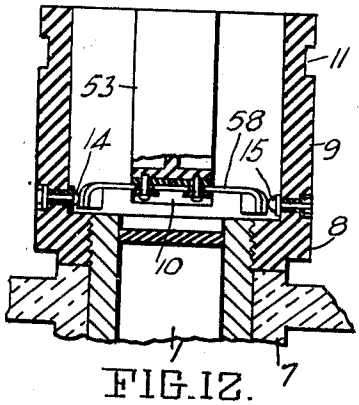


FIG. 12.

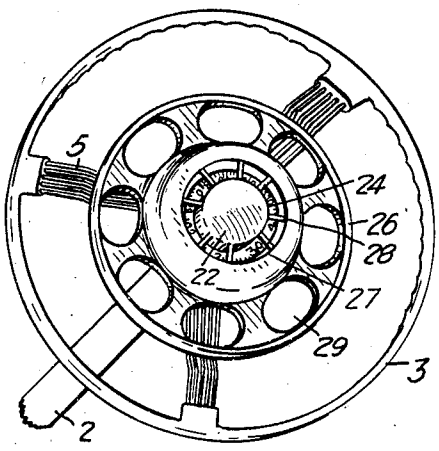


FIG. 1.

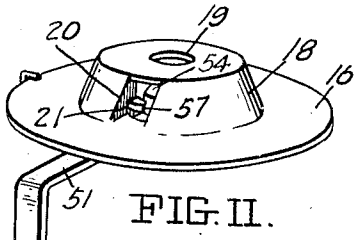


FIG. 11.

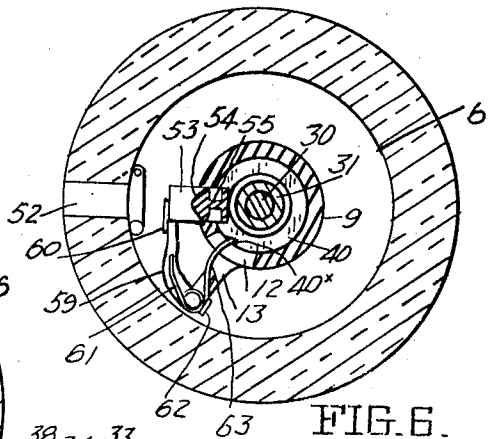


FIG. 6.

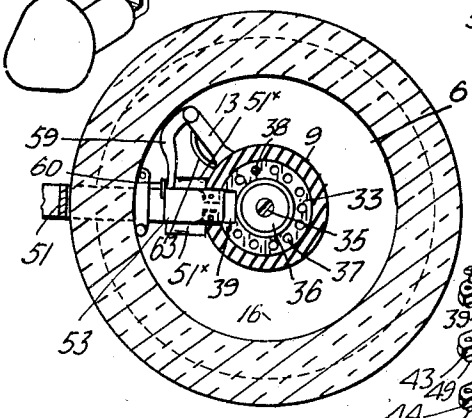


FIG. 7.

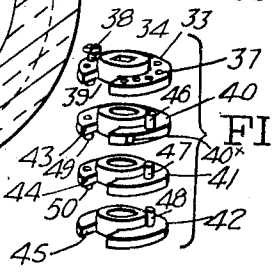


FIG. 9.

INVENTOR
R. E. McNAMARA
BY
Fitzsimmons & Co
ATTORNEYS

Jan. 27, 1942. R. E. McNAMARA 2,270,850

IGNITION LOCK AND THE LIKE

Filed June 21, 1940 2 Sheets-Sheet 2

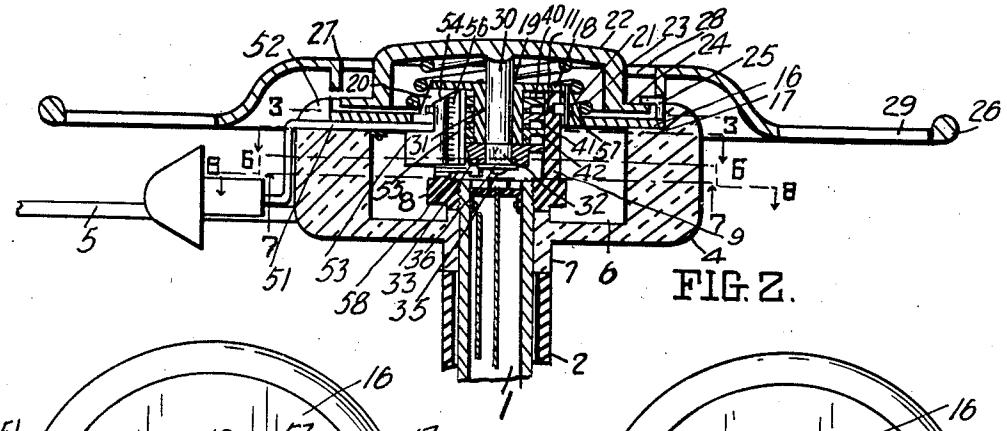


FIG. 2.

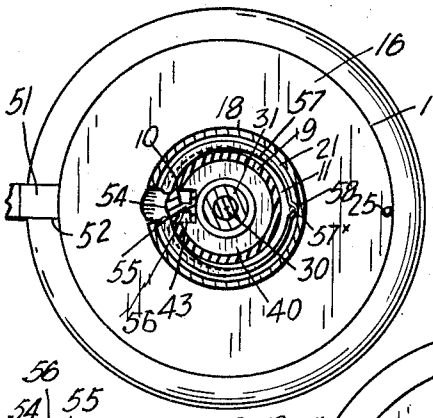


FIG. 3.

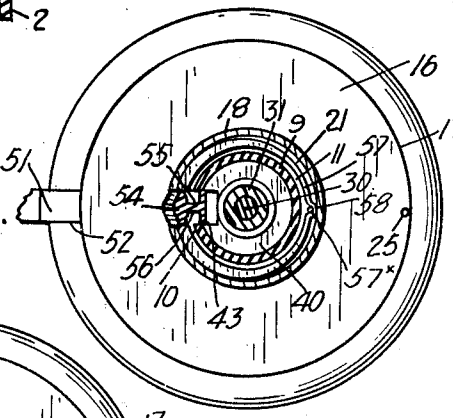


FIG. 4.

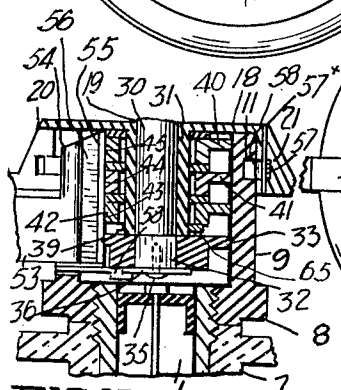


FIG. 13.

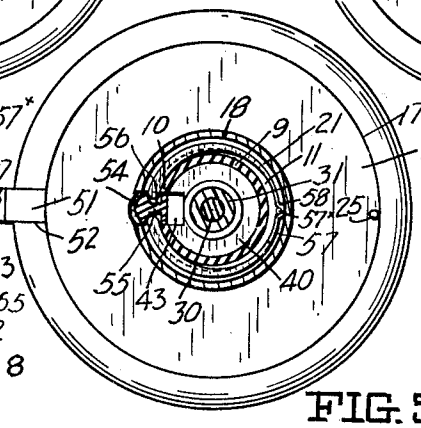


FIG. 5.

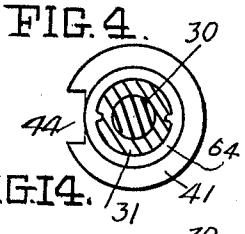


FIG. 14.

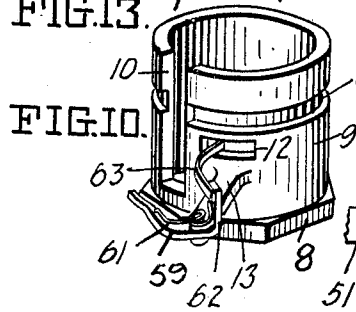


FIG. 10.

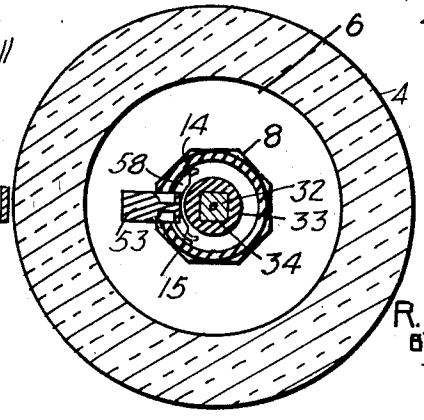


FIG. 8.

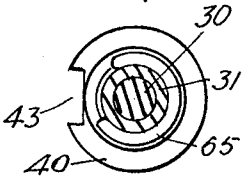


FIG. 15.

INVENTOR
R. E. McNAMARA
BY Fetherstonhaugh & Co.
ATTORNEYS

Patented Jan. 27, 1942 2,270,850

UNITED STATES PATENT OFFICE

2,270,850

IGNITION LOCK AND THE LIKE

Russell Edward McNamara, London, Ontario, Canada

Application June 21, 1940, Serial No. 341,784

2 Claims. (Cl. 200—59)

My invention relates to improvements in ignition or other locks and the object of the invention is to devise a very convenient means for opening and closing the ignition circuit of an automobile which may be operated at a point adjacent to the steering wheel and by the hand of the operator while resting on the wheel, which will dispense with the use of a key for opening and closing the circuit, which when the ignition circuit is opened thereby will automatically lock the circuit closure in the open position preventing the closing of such circuit by an unauthorized person or by a drunken driver and it consists essentially of the arrangement and construction of parts hereafter described.

Fig. 1 is a perspective view of a steering wheel and my lock applied thereto.

Fig. 2 is an enlarged transverse sectional view through Fig. 1.

Fig. 3 is a sectional plan view on line 3—3 Fig. 2, showing the hub of the steering wheel in full and the parts in the locked position.

Figs. 4 and 5 are similar views to Fig. 3 showing the parts respectively in the intermediate and unlocked positions.

Fig. 6 is a sectional view on line 6—6 Fig. 2, looking downward.

Fig. 7 is a sectional view on line 7—7 Fig. 2 looking upward.

Fig. 8 is a sectional view on line 8—8 Fig. 2.

Fig. 9 is a perspective view of the discs of the combination lock separated apart.

Fig. 10 is a perspective detail of the contact box containing the terminal ends of the ignition circuit.

Fig. 11 is a perspective detail of the stationary or lower disc carried in the wheel hub.

Fig. 12 is a sectional detail taken through the contact box and passing through at one side of its centre.

Fig. 13 is an enlarged sectional detail through the combination lock and adjacent parts.

Fig. 14 is a plan section showing a combination disc and its spacer ring.

Fig. 15 is a plan section showing a combination disc and locking ring.

In the drawings like characters of reference indicate corresponding parts in each figure.

1 indicates the tubular steering column and 2 the tubular casing thereof. 3 is a steering wheel connected to a circular hub 4 by spokes 5. The hub 4 is provided with a concentric recess 6 having a central tubular boss 7 fitting around the column 1 so as to rest on the end of the casing 2 to allow the upper exteriorly threaded end of the column to project upward above the boss 7.

8 is a nut which is screwed onto the upper threaded end of the column 1 to clamp the boss 7 between such nut and the upper end of the casing 2 thereby securing the hub 4 in place.

The nut 8 is provided with a tubular portion 9 having a vertical slot 10, an annular groove 11, a segmental slot 12 and a radial arm 13. The nut 8 and tubular portion 9 together form a contact box containing the contacts 14 and 15 of the ignition circuit suitably insulated from the box.

A stationary annular disc 16 fits at its edge an annular groove 17 formed in the hub 4 around the upper edge of the recess 6. A housing 18 extends upwardly from the inner periphery of the disc 16 and is provided with a central orifice 19 and a peripheral orifice 20. The housing 18 is also provided with an internal groove 21 opposite the groove 11.

A hollow horn button 22 extends over the housing 18 and is supported in spaced relation therewith by a conical spring 23 resting on the plate 16 and normally supporting an annular plate or flange 24 in spaced relation with the stationary plate 16.

The upper face of the plate 24 is divided around its outer edge by graduation marks and numerals similar to any combination lock dial with which the stationary pointer 25 carried by the stationary plate 16 coacts.

A dial wheel 26 is provided with a central orifice 27 concentric to the horn button 22 and spaced therefrom and connected thereto by the spoke bars 28. The orifice 27 forms a viewing orifice through which the dial markings on the flange 24 may be observed. The wheel 26 is provided with an annunlar series of orifices 29 by which the dial wheel may be easily turned by the finger of the operator when dialing.

The horn button 22 is provided with a central depending stem 30 extending through a stationary sleeve 31 depending from the centre of the housing 18. The external periphery of the stem 30 and the internal periphery of the sleeve 31 are cylindrical so that the stem is free to turn. The stem 30 extends to the bottom of the sleeve 31 and is provided with a squared projecting portion 32.

What I term a master disc 33 is provided with a squared central orifice 34 (see Fig. 8) into which the squared portion 32 fits being secured thereon by a screw and washer 35 and 36 respectively. The master disc is provided with an annular se-

ries of internally threaded orifices 37 into any one of which may be secured a screw 38, such screw projecting beneath the disc.

The disc 33 is also provided with a peripheral notch 39 with which the locking plunger hereinafter described engages. Mounted to turn freely on the sleeve 31 are a plurality of discs 40, 41 and 42 provided respectively with locking notches 43, 44, and 45 with which the locking plunger engages when they are brought into vertical alignment. The discs 40, 41 and 42 are provided with upwardly extending pins 46, 47 and 48 and the discs 40 and 41 with downwardly projecting pins 49 and 50.

The disc 40 is also provided with a peripheral notch 40^x for a purpose which will hereinafter appear. The locking plunger is in the form of a flat bar 51 slidable between the guides 51^x forming part of the disc 16 and in the guiding groove 52 extending radially of the hub 4. The locking head comprises a body 53 secured to the inner end of the bar 51 from which extends an upwardly extending portion 54.

55 is a T portion, the transverse arms of the T corresponding in width to the width of the notches 39, 43, 44 and 45 and the stem of the T form vertical grooves 56 on each side of the head between such transverse arms and the body of the head. As will be seen clearly in Figs. 3–5, the front and rear vertical edges of that portion of the extension outside of the grooves 56 are rounded for a purpose which will hereafter appear.

In the groove 21 a spring 57 is secured by means of a vertical pin 57^x extending through the groove and through a recess 58 formed in the thin portion of the spring. At each side of the above point the spring gradually widens out towards each end to the full width of the groove 21, such ends being normally apart a distance less than the width of the locking head.

When the locking head is in the locking position fitting into the vertically aligned locking notches of the discs 33, 40, 41 and 42, the ends of the spring 57 contract together at the outside of the locking head extension allowing the major portion of the spring to fit into both the grooves 11 and 21 preventing the withdrawal of the housing 18 from the contact box 8, 9. When the locking head is in the intermediate position as in Fig. 4, the ends of the spring 57 are spread apart so that the spring is contained entirely within the groove 21 allowing the withdrawal of the housing 18 from the contact box 8, 9.

When the locking head is in the unlocking position the ends of the spring 57 again contract together to enter the grooves 56 as in Fig. 5 so that the spring again assumes a position in both of the grooves 11 and 21 to again lock the housing 18 from the withdrawal from the contact box 8, 9.

In order to change the combination the locking head is moved to the intermediate position shown in Fig. 4 and the housing 18 withdrawn from the contact box 8, 9 so that the screw 38 may be readily gotten at and moved into another orifice 37 thus changing the relative position of the discs and the combination of numbers which will bring the notches 39, 43, 44 and 45 to a vertically aligned position. When the position of the screw 38 has been changed the dial wheel 26 is rotated to bring the notches 39, 43, 44 and 45 into a vertically aligned position, noting the position of the pointer 25 and the numbers on the dial 24 which it indicates. The housing is then replaced and the locking head withdrawn to the unlocking position. Immediately this takes place the disc 40 is turned automatically carrying the notch 43 out of line with the remaining notches, thus locking the locking head 53 and the locking plunger 51 in the open position.

The locking head 53 carries a bridging contact 58 insulated therefrom so that when the locking head is withdrawn or in the locked position the bridging contact is withdrawn from between the contacts 14 and 15, leaving the circuit open and when the locking head is moved inward to fit in the aligned notches 39, 43, 44 and 45 the contact 58 bridges the contacts 14 and 15 to close the circuit.

In order that when a driver opens the ignition circuit prior to leaving his car he will automatically lock the ignition circuit open I provide the mechanism which I will now describe.

On the arm 13 extending from the tubular portion 9 of the contact box a lever 59 is pivotally mounted which is spring held at its free hand against a projection 60 by the spring 61. The inner end of the lever 59 is provided with an upwardly projecting portion 62 carrying a curved spring finger 63 which enters at its free end into the notch 40^x.

When the locking head 53 is forced inward into the notches 39, 43, 44 and 45 the projection 60 forces the end of the lever 61 with which it engages inward carrying the end of the spring 63 into compression into a more greatly flexed position against the base of the notch 40^x.

As soon as the circuit is opened by the withdrawal of the locking head 53 the spring 63 acts to turn the disc 40 as soon as the locking head clears the locking notches 39, 43, 44 and 45 so that the notch 43 is out of line with the remaining notches 39, 44 and 45 preventing the inward movement of the locking head and the closing of the circuit by the bridging contact 58.

When more notches than the notch 43 have been displaced it requires nine turning movements of the dial wheel 26 to bring the notches 39, 43, 44 and 45 into line that is a right hand turning movement to the number corresponding to the disc 42 then two complete rotations in the same direction to that number, then by a left hand turning movement to the number corresponding to the disc 41 and two complete left hand rotations to that number, then by a right hand turning movement to the number corresponding to the disc 40 and then one right hand complete rotation to that number and finally a left hand turning movement to the number corresponding to the disc 37.

When the device is automatically locked by the displacement of the disc 40 two turning movements, one to the left and then one to the right, are only required to bring the notches in line. In order that the discs 33, 40, 41 and 42 turn freely with a minimum amount of friction I provide each disc with a centre hub against each of which a spacing ring 64 (see Fig. 4) bears. I do not describe this in further detail as it is common practice.

Also the lower end of the sleeve 31 is provided with an annular groove 65 in to which a split spring ring is held to secure the discs 40, 41 and 42 on the sleeve. A horn contact 66 is mounted centrally within the column so that when the horn button 22 is depressed the screw head 35 engages the contact 66 to close the horn circuit in the usual manner.

From this description it will be seen that when the ignition circuit has been opened and automatically locked by the device it will be practically impossible for him to operate the car should he become intoxicated and the more he fumbles with the mechanism when in this condition the more securely locked it is likely to become and also any other person not knowing the combination would be prevented from stealing the car.

What I claim as my invention is:

1. In a device of the class described, a tubular contact box having a vertical slot in its wall and an annular external groove, a housing member into which the box extends, an internal annular groove in the housing opposing the groove of the box, a split spring ring secured in one of the grooves, a radially movable member passing through the slot of the box and so formed as to permit the split ring to contract to enter both annular grooves when the movable member is in both its outer and inner positions and to be expanded to be entirely contained in the groove of the housing when the member is in an intermediate position to permit the housing to be withdrawn from the contact box.

2. In a device of the class described, a tubular contact box having a vertical slot in its wall and an annular external groove, terminal contacts contained in the box, a housing member into which the upper end of the box extends and having an internal groove opposite the external groove of the box, a split spring ring the intermediate portion of which is contained in the housing groove and the end portions in both the external and internal grooves, a combination lock contained in the contact box and including notched discs mounted on a common axis, a movable member passing through the slot of the contact box into the notches of the discs when in vertically aligned position, the sides of which are so formed as to allow the spring ring to contract when in the outer or the inner position to engage both the external and internal grooves and to expand the ring when in an intermediate position to release the housing from the contact box to expose the discs of the combination lock and a contact carried by the movable member to bridge the terminal contacts when the member is moved to its inner position.

RUSSELL EDWARD McNAMARA.