

Nov. 18, 1924.

1,515,764

J. B. ALBERT

IGNITION SWITCH LOCK FOR AUTOMOBILES

Filed Aug. 31, 1923

3 Sheets-Sheet 1

FIG. 1.

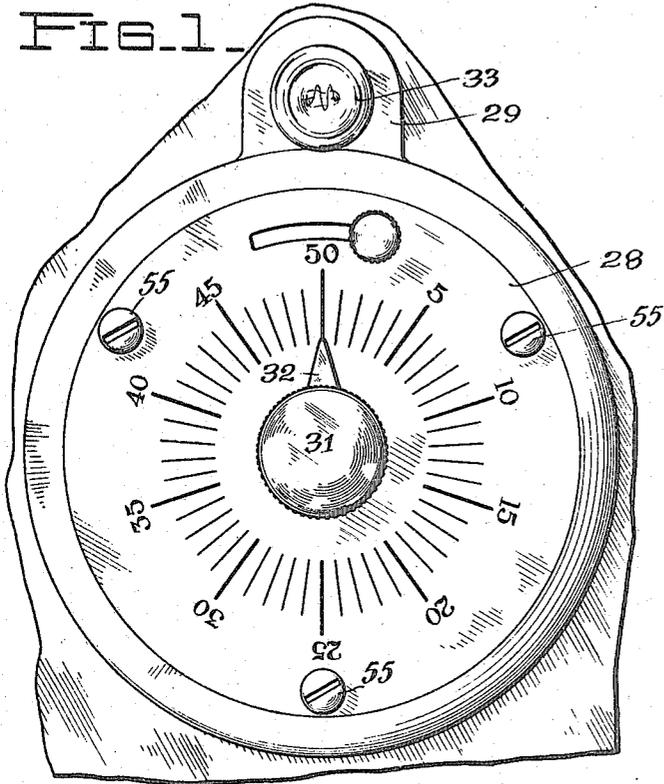


FIG. 2.

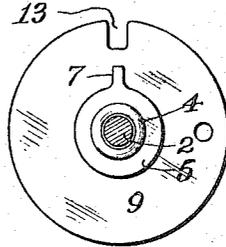


FIG. 3.

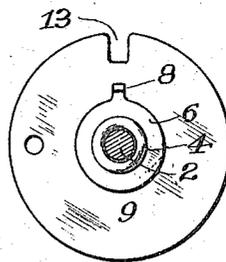


FIG. 4.

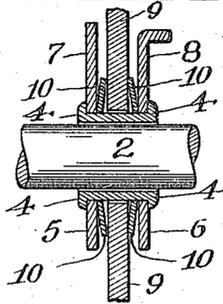


FIG. 5.

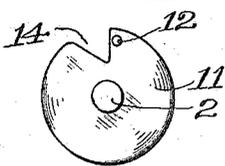
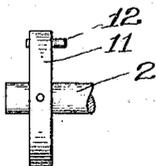


FIG. 6.



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by  
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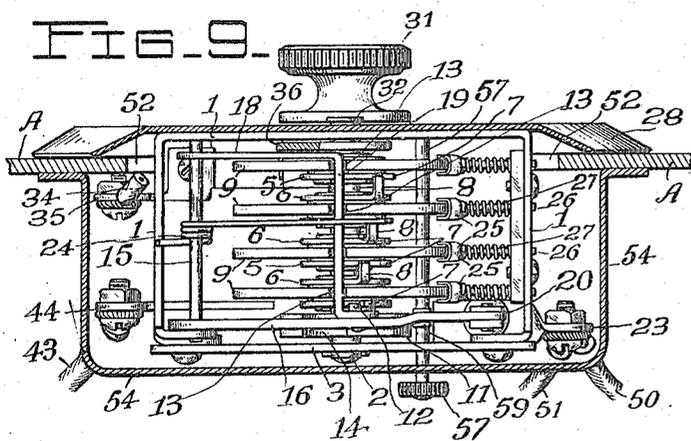
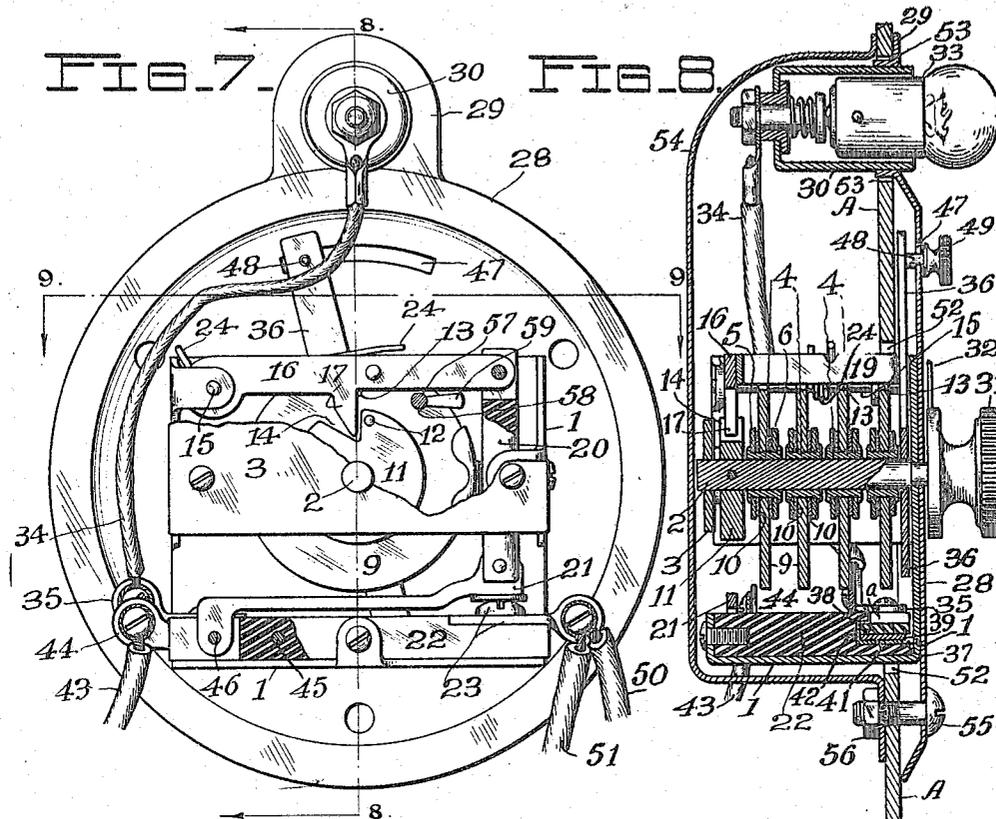
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IGNITION SWITCH LOCK FOR AUTOMOBILES

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3 Sheets-Sheet 2



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# UNITED STATES PATENT OFFICE.

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IGNITION-SWITCH LOCK FOR AUTOMOBILES.

Application filed August 31, 1923. Serial No. 660,285.

*To all whom it may concern:*

Be it known that I, JOHN B. ALBERT, a citizen of the United States, residing at the city of Bridgeport, county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Ignition-Switch Locks for Automobiles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an ignition lock for automobiles, but more particularly has reference to the peculiar structure and operation of a permutation locking mechanism whereby the ignition circuit may be opened or closed at the will of the operator.

Another object of the invention is to prevent theft of an automobile by driving it while operating by its own power and ignition system.

Furthermore, the invention aims to provide a simple but efficient mechanism for bringing about the desired results.

In the accompanying drawing—

Figure 1 is a front elevation of the improvement as it appears when in position for use.

Figures 2 and 3 are detail elevations of opposite sides of one of the combined bushing and auxiliary disk structures.

Figure 4 is a detail sectional elevation, on an enlarged scale, of one of the combined bushing and auxiliary disk structures.

Figure 5 is a detail elevation of the face of the master disk.

Figure 6 is a detail side elevation of the same.

Figure 7 is a rear interior view of the assembled structure, partly broken and sectioned.

Figure 8 is a section at the line 8—8 of Figure 7.

Figure 9 is a section at the line 9—9 of Figure 7.

Figure 10 is a view similar to Figure 7 but showing the position which the various parts assume when the ignition circuit is broken.

Figure 11 is a section at the line 11—11 of Figure 10.

Figure 12 shows diagrammatically the ignition circuit, and

Figure 13 is a section at the line 13—13 of Figure 11.

Similar numerals of reference denote like parts in the several figures of the drawing.

1 is a frame within which the various parts are assembled. 2 is a shaft journaled in the front of the frame and in the back plate 3 of the frame, and 4 are bushings loosely supported around the shaft and capable of free rotation.

Each of these bushings has rigid therewith and at opposite ends hubs 5, 6, from which extend respectively straight and hook fingers 7, 8. Loosely supported around each bushing is an auxiliary disk 9, and between the side faces of this disk and the hubs 5, 6, are concavo-convex spring washers 10, and the ends of the bushings are crimped inwardly so as to clamp these washers with considerable friction against the disks 9, so that it will be clear that the bushings may be revolved independently of the disks, provided the latter are held stationary, while the entire structure may be revolved if the disks are released.

There are as many of these combined bushings and auxiliary disks as desired, but four of them are shown in the drawings this number being quite sufficient.

Secured to the rear portion of this shaft so as to always move therewith is a master disk 11 which has extending from its outer face a stud 12.

The hook fingers above specified are at the front ends of all the bushings with the exception of the outermost bushing, while the straight fingers specified are at the rear ends of all the bushings. In other words, each auxiliary disk is flanked by straight fingers at the rear and hook fingers at the front with the exception of the outermost auxiliary disk in the instance of which latter there is no finger whatsoever in front of the disk because it is not necessary as will be obvious.

From the foregoing description it will be clear that when the shaft is revolved, the stud 12 of the master disk will strike the straight finger of the innermost disk and

revolve the latter which will cause the hook finger of this disk to contact the straight finger of the next disk and revolve that disk also, and so on, so that each disk will be successively picked up and revolved.

It will likewise be clear that if the auxiliary disks are all held stationary during this revolution of the shaft then the bushings themselves will be successively revolved.

Each auxiliary disk has in its periphery a gate 13, and in the periphery of the master disk 11 is a gate 14 one wall of which is beveled for the purpose hereinafter explained.

Pivoted around a cross pin 15 extending through the frame is a lever 16 from which depends a dog 17 one face of which is beveled and the other straight, said dog adapted to enter the gate 14 in the manner and for the purpose hereinafter to be explained, and likewise pivoted around the cross pin 15 is a lever 18 which is bent at right angles to form a cross bar 19 that extends immediately above the disks 9, the free end of this cross bar being secured to the lever 16, so that it will be clear that the levers 16, 18, and the cross bar 19 constitute a skeleton frame which is pivoted around the cross pin 15.

Pivoted to the free end of the lever 16 is a vertically disposed bar 20 of insulating material, and pivoted to the lower extremity of this bar is the front end of a switch 21 the rear extremity of this switch being pivoted within a block 22 of insulating material.

23 is a terminal of the ignition circuit which terminal is secured upon the insulation block 22, and this terminal is likewise included in the circuit for the self starter, these circuit connections being quite ordinary but being more specifically referred to hereafter.

The rear or pivoted end of the switch 21 is electrically connected in circuit with the battery as will hereafter be more particularly referred to, so that it will be clear that when the switch structure, which includes the switch proper and the levers 16, 18, cross bar 19, and insulated bar 20, is elevated, the ignition circuit will be broken, and when said switch comes in contact with the terminal 23 said circuit will be closed.

24 is a coil spring which surrounds the cross pin 15, one terminal of which spring is elongated and bears on top of the cross bar 19 while the other terminal bears upon the frame 1, the function of this spring being to always urge the switch structure toward the auxiliary disks 9, so that the cross bar will, when the gates of the disks are alined, enter these gates and cause the switch to contact the terminal 23.

25 are brake shoes having extending therefrom pins 26 which latter pass loosely through the frame, and 27 are coil springs

around the pins and between the frame and shoes the function of these springs being to always urge the shoes into contact with the peripheries of the auxiliary disks with sufficient pressure to prevent the rotation of these disks except when the latter are driven positively.

28 is a dial having an upward extension 29 within which is secured, as by soldering or otherwise, a socket 30 for the electric light.

The shaft 2 extends concentrically through the dial and has affixed to its outer end a manipulating knob 31 which carries an index 32.

33 is a small electric light secured within the socket 30 and electrically connected by a conductor 34 to a terminal 35 which latter is secured to the insulation block 22.

36 is a switch lever pivoted around the shaft 2 and having its lower extremity extending within a recess *a* in a block 38, which latter has on its lower face a shoe 39 made of some good conductor of electricity which shoe has a toe portion 40 that forms the front face of the block. 41 is a plate likewise made of a good conductor of electricity and fixed upon the floor of a cut out portion 37 of the block 22 immediately beneath and always in contact with the shoe 39, and this plate has a flanged portion 42 which extends against the inside wall of said recess.

43 is any suitable conductor extending from a battery and connected to a terminal 44 that extends within the insulation block 22 and is in contact with a conducting pin 45 which is also in contact with the flange 42, so that it will be clear that the plate 41 and consequently the shoe 39 are always in the battery circuit.

46 is the pivot pin of the switch 21 and this pin is made of a metal of good electrical conductivity and extends through the insulation block 22 into contact with the terminal 44 so that it will be evident that the switch is likewise in circuit with the battery.

Extending from the upper extremity of the switch lever 36 through an arcuate slot 47 in the dial plate is a stud 48 to the outer extremity of which is affixed a thumb piece 49, whereby the switch may be swung to and fro on its pivotal point so as to throw the block 38 with its toe 40 in contact with the terminal 35, or to slide the block so as to separate said toe and terminal, as the case may be.

Extending from the terminal 23 is an electrical conductor 50 which goes to the ignition and from the latter to one pole of the battery, the conductor 43 leading to the other pole, and 51 is an electrical conductor extending from the terminal 23 to the self starter and thence to the ignition.

Of course, it will be readily understood that the exact circuit as shown is immaterial since it may be varied as to details. The

diagrammatic view at Figure 12 will clearly show the various circuits.

The provision of the electric light is merely for the purpose of enabling the operator to see the dial in the night time and this latter has nothing whatever to do with the construction and operation of the parts necessary in practicing the invention.

In securing the parts to the dash A of an automobile, an opening 52 is cut in the dash and the frame inserted therethrough from the front, the socket 30 being simultaneously inserted through a suitable opening 53 likewise cut in the dash. A cover 54 is then placed over the parts from the inside and secured by means of screw bolts 55 driven through the dial plate and cover and engaged with nuts 56 at their free ends.

But it is really immaterial how the device is secured to the dash since it is quite understandable that the mere securement of the device is a matter that may be varied according to the desires of the user.

In changing the combination, the gates are first brought into alinement by the manipulation of an old combination, which latter causes the switch structure to enter the gates in the manner hereinbefore described. A key 57 is then inserted through perforations 58 that are in each auxiliary disk and which have been alined simultaneously with the alining of the gates.

Referring to Figure 7, the key is shown inserted within the perforations in the auxiliary disks, only one of these perforations, of course, appearing, and the key is provided with an elongated bit 59, which, in this Figure of the drawings, is positioned immediately preparatory to the turning of the key so that this bit will strike against the lever 16 and thereby elevate the switch structure free of the gates in all of the disks.

The key is inserted through a suitably shaped key hole 60 which is cut both in the back plate 3 and in the cover 54, and the major portion of the length of the key consists of a circular rod as shown more particularly at Figure 9, while the bit of the key projects from the rod, so that when the rod portion of the key has been inserted through the perforations in the auxiliary disks, the bit will be immediately beneath the lever 16, so that when the key is given a quarter turn the bit will operate to raise the switch structure in the manner before explained.

After this operation of the key the master disk will be free and can be revolved while the auxiliary disks will all be held stationary by the key itself.

Bearing in mind that the auxiliary disks are friction tight on the bushings, the knob 31 is then manipulated, thereby causing the stud 12 of the master disk to strike the straight finger of the rearmost bushing so as to revolve the latter, and during the rev-

olution of this bushing its hook finger will come in contact with the straight finger of the next bushing and revolve the latter also which will cause the hook finger of the same to strike the straight finger of the next bushing and likewise revolve it and cause the hook finger of this last named bushing to strike the straight finger of the outermost bushing and revolve the latter.

The operator manipulates the knob 31 any desired number of times toward the left and stops with the index 32 opposite the desired number on the dial. This determines the relative positions of all the fingers when the index is registered in this manner.

The operator then turns a desired number of times to the right, which will cause a similar revolution of the bushings, and stops with the index registering with any suitable number on the dial, and this operation is continued according to the number of permutations desired.

In this setting of the combination above described the gates in the auxiliary disks will be held in alinement by the key, and the cross bar 19 will be immediately above these alined gates, while the dog 17 will be supported on top of the periphery of the master disk.

After a combination has been obtained in this manner the operator withdraws the key, but the switch structure will not enter the gates so as to effect contact with the terminal 23 because such structure is held in elevation owing to the fact that the dog 17 is resting upon the periphery of the master disk 11, but when this disk is turned either to the right or to the left, as the occasion may demand, until the gate 14 comes beneath the dog, the switch structure will drop and contact of the switch with the terminal 23 will then be effected.

When the owner of the car wishes to render the latter safe as against theft he manipulates the knob 31 to the right, thereby throwing the dog 17 out of the notch 14 and thus elevating the switch structure and causing the gates in the auxiliary disks to be thrown out of alinement.

When the car owner again desires to use his car he manipulates the same combination, heretofore determined by the rotation of the bushings, which will again bring the gates in the auxiliary disks all in alinement below the cross bar 19, and he then turns the master disk to the right or left until the dog 17 enters the gate 14.

Should the car owner desire to manipulate the combination at night he merely operates the switch lever 36 to close the circuit for his light 33 in the manner above described.

In the manipulation to arrive at a combination the permutations of which have already been obtained, the auxiliary disks

will be revolved with the bushings owing to the frictional union between them, but none of the auxiliary disks can be revolved except when such revolution is brought  
 5 about by the contact of the stud of the master disk or the contact of hook fingers with straight fingers, because the bearing of the brake shoes 25 will prevent any revolution of the auxiliary disks except by positive  
 10 means.

What is claimed is:—

1. In a device of the character described, the combination of a casing, a rotary shaft journaled in said casing, a series of spaced  
 15 and gated disks the innermost of which is a master disk and is rigid with said shaft while the remaining disks are auxiliary and have axial friction tight bushings that are loosely supported on said shaft, interengaging members carried by said bushings  
 20 and master disk, a terminal in the ignition circuit, a switch in said circuit for making and breaking contact with said terminal, a spring depressed member which carries said  
 25 switch and has a cross-bar which normally rests upon the peripheries of said auxiliary disks when the gates of the latter are out of alinement but which enters the alined gates  
 30 of the disks and thereby causes the switch to make contact with said terminal to close the circuit, a manipulating knob and index carried by the outer portion of said shaft, and a dial with which said index registers.

2. In a device of the character described,  
 35 the combination of a casing, a shaft journaled in said casing, a plurality of bushings loose on said shaft, a master disk rigid with the shaft, auxiliary disks frictionally secured to said bushings, gates in the periph-  
 40 eries of all the disks, interengaging members carried by the master disk and by said bushings whereby the revolving of said disk will effect the successive revolutions of said bushings, a spring depressed member having a  
 45 cross-bar which normally rests upon the peripheries of said disks when the gates are out of alinement, a switch in the ignition circuit and carried by said member, a terminal in said circuit with which said switch  
 50 cooperates to close and open the circuit, a dog depending from said member, said cross bar and dog adapted to respectively enter the gates of the auxiliary disks and the gate in the master disk when said gates are all  
 55 alined whereby the circuit is closed, a manipulating knob and index rigid on the outer part of the shaft, and a dial with which said index registers.

3. In a device of the character described,  
 60 the combination of a casing, a rotary shaft journaled therein, a plurality of bushings loose on said shaft, an inner master disk rigid on said shaft and having a beveled gate, auxiliary disks that are friction tight  
 65 on said bushings and have gates in their

peripheries, straight fingers rigid with the rear ends of the bushings, hook fingers that are rigid with the front ends of all of the bushings except the outermost one, a stud  
 70 extending from the front face of said master disk, the straight fingers being in the paths of revolution of the hook fingers and stud, whereby the rotation of the master disk will effect the successive rotations of  
 75 all the other disks, a dial, a manipulating knob and index registering with said dial whereby the bushings are revolved to establish the desired combination with the gates of all the disks except the master disk held in alinement, a terminal in circuit with  
 80 the ignition, a switch also in the ignition circuit and adapted to make and break contact with said terminal whereby the circuit is closed and opened, and a spring depressed member carrying the switch and also carry-  
 85 ing a cross-bar and a dog that are respectively adapted to enter the gates of the auxiliary disks and the gate of the master disk when said gates are all alined to thereby establish contact with said terminal and  
 90 close the circuit.

4. In a device of the character described, the combination of a casing, a rotary shaft journaled therein, a series of elements each  
 95 composed of a bushing loose on said shaft and a disk having a friction tight connection with the bushing and each disk having a gate in its periphery, a dial, a manipulating knob and index registering with  
 100 said dial and rigid on the outer end of the shaft, a terminal in the ignition circuit, a spring depressed switch in said circuit and adapted to make and break contact with said terminal, means operable by the rota-  
 105 tion of said knob for successively rotating said bushings with the gates of the disks all held in alinement and for determining by said index and dial a desired combination, and means for causing the switch to be depressed with the gates in alinement,  
 110 whereby contact will be established with said terminal and the ignition circuit closed.

5. An ignition combination lock for automobiles, comprising a terminal and a  
 115 spring depressed switch in the ignition circuit, a dial, a rotary shaft carrying an index for the dial, a series of auxiliary disks having peripheral gates and friction tight bushings through which latter said shaft  
 120 revolves freely, a master disk carried by the shaft and having a peripheral beveled gate, and cooperating elements carried by said master disk and bushings whereby the rotation of the shaft will effect the successive  
 125 rotation of said bushings when the auxiliary disks are held stationary with their gates in alinement to thereby determine the desired combination of the lock and thereafter, when said disks are released and the  
 130 same combination manipulated, to bring

said gates in alinement and permit the switch to contact said terminal and close the circuit.

6. In a device of the character set forth, 5 the combination of a spaced series of bushings, each having an axially disposed and friction tight auxiliary disk each disk having a peripheral gate, a manipulating shaft loosely supporting said bushings, a master 10 disk carried by said shaft and having a beveled peripheral gate, a spring depressed switch structure in the ignition circuit including a dog and a cross-bar the latter resting upon the peripheries of the aux- 15 iliary disks when the gates of the latter are out of alinement, a terminal in the igni-

tion circuit, interengaging elements carried by said bushings and master disk whereby the revolution of the latter will effect the successive revolutions of the auxiliary disks, 20 a dial and an index carried by said shaft for determining the proper rotations of the auxiliary disks to bring the gates of the latter in alinement immediately beneath said cross bar, whereby, when the master disk 25 is turned to bring its gate beneath said dog, the switch structure will be depressed and will contact said terminal to close the ignition circuit.

In testimony whereof I affix my signa- 30 ture hereto.

JOHN B. ALBERT.