J. E. ERICKSON.

AUTOMOBILE LOCK AND SWITCH.

APPLICATION FILED DEC. 8, 1920.

1,408,996.

Patented Mar. 7, 1922.

4 SHEETS—SHEET 1.

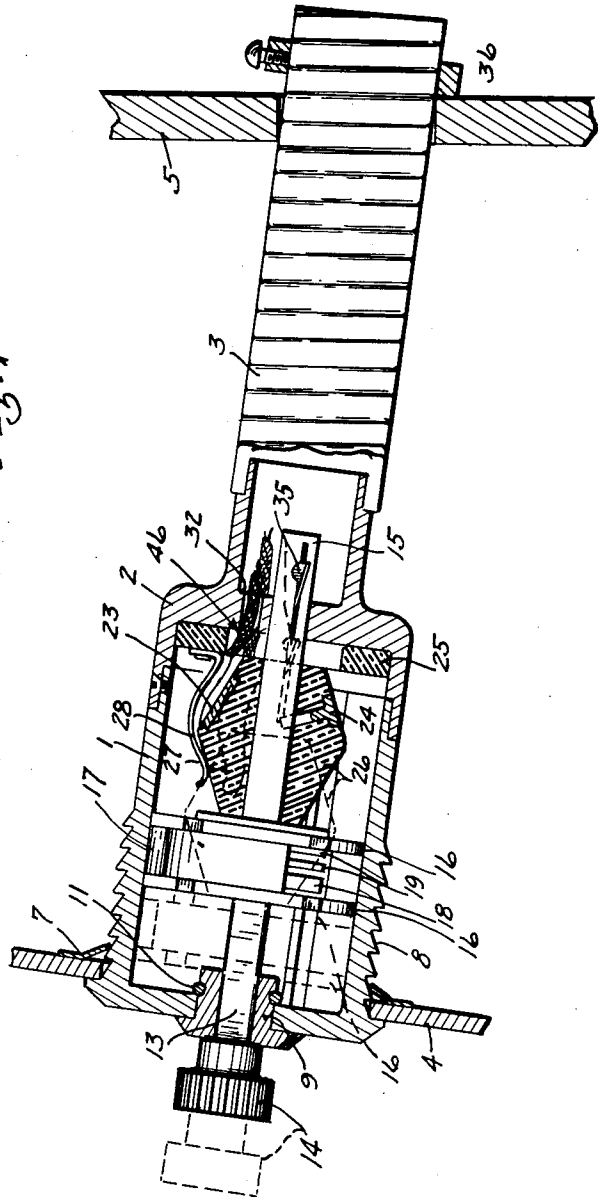


Fig. 1

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Fig. 2

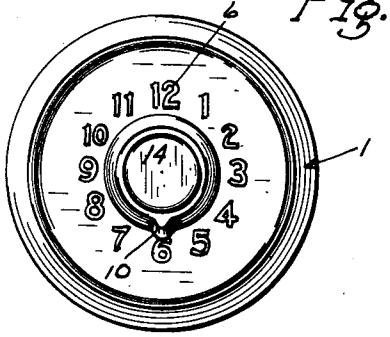


Fig. 3

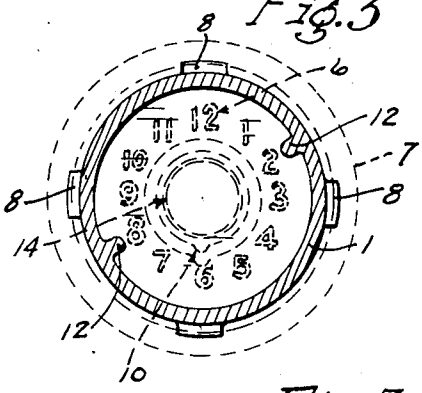


Fig. 4

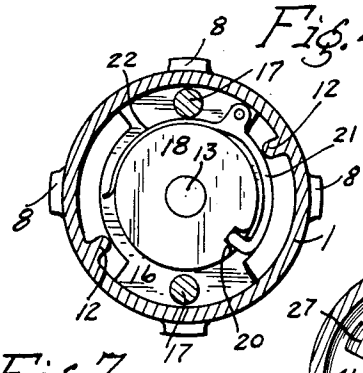


Fig. 5

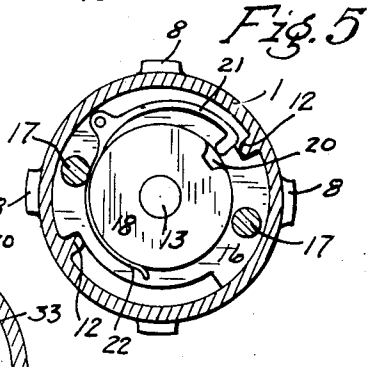


Fig. 6

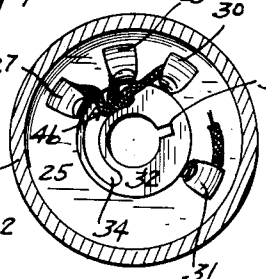


Fig. 7

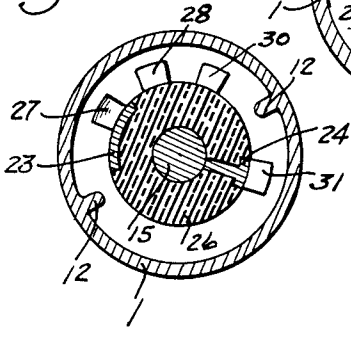


Fig. 8

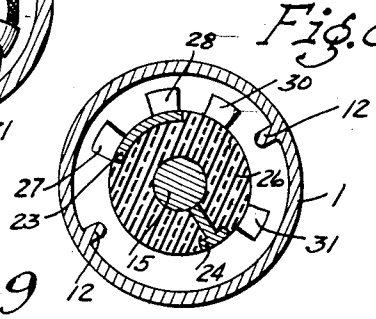
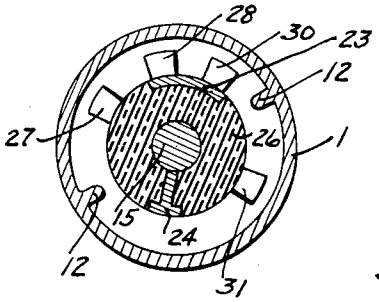


Fig. 9



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Fig. 10

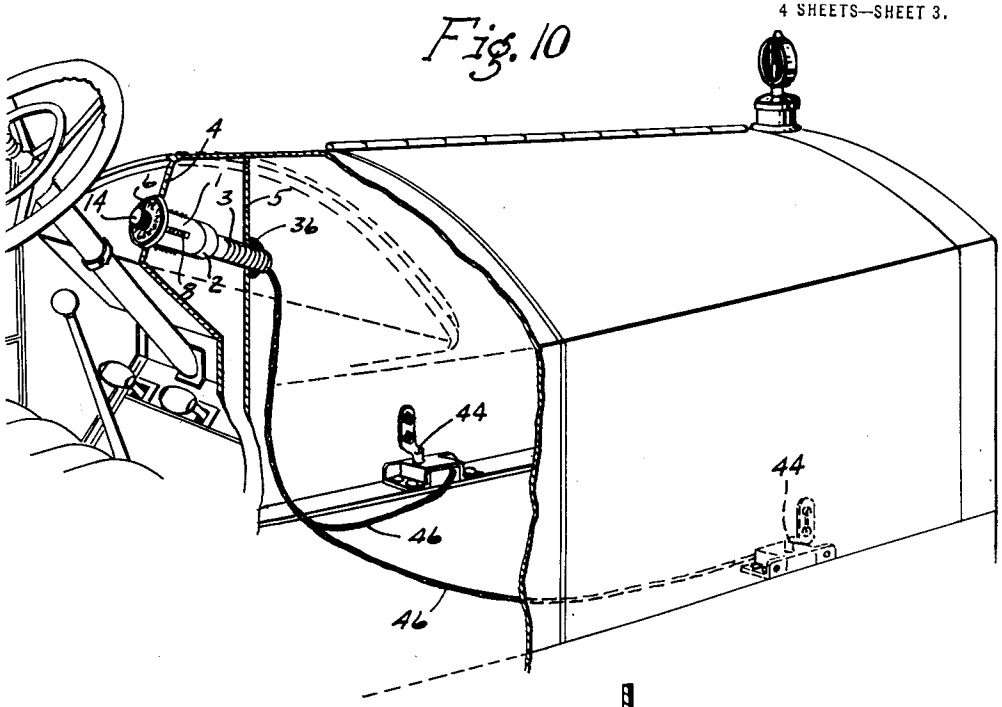


Fig. 11

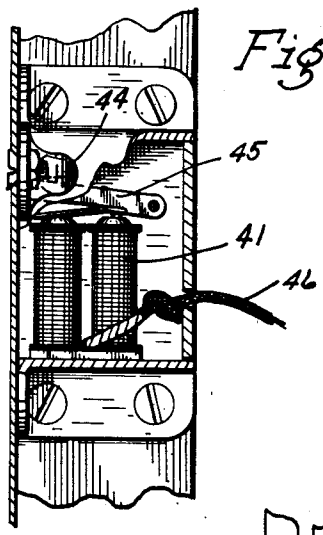


Fig. 12

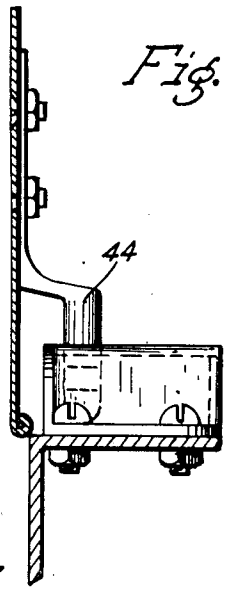
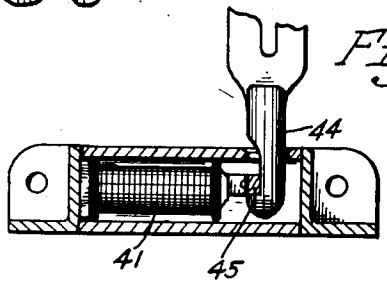


Fig. 13



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4 SHEETS—SHEET 4.

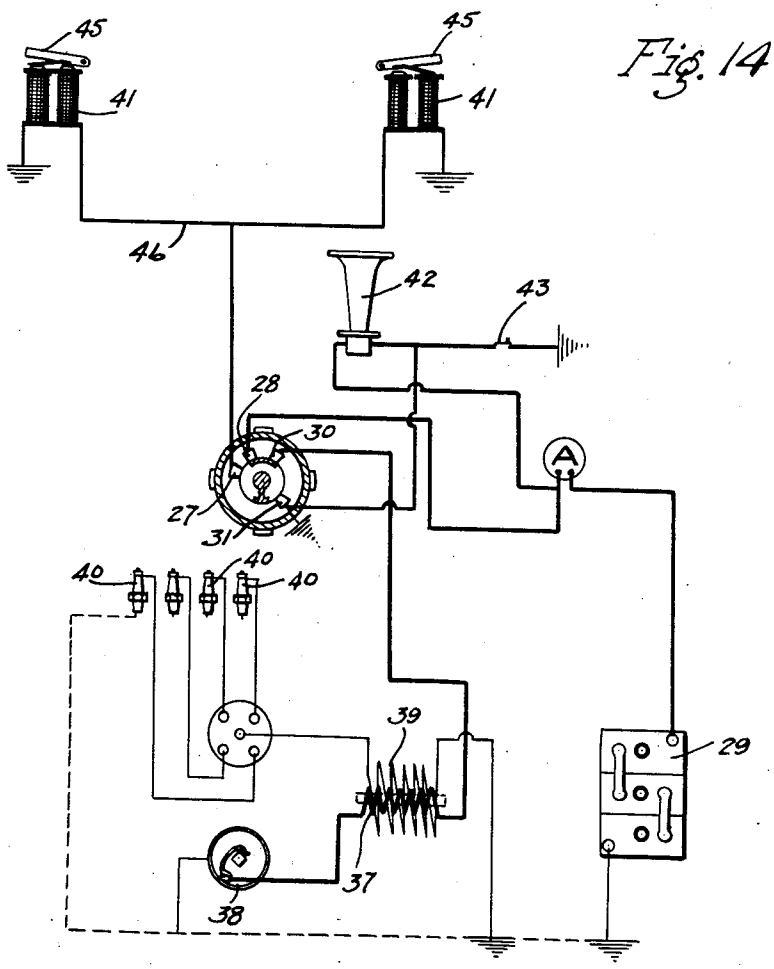


Fig. 14

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UNITED STATES PATENT OFFICE.

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AUTOMOBILE LOCK AND SWITCH.

1,408,996. Specification of Letters Patent. Patented Mar. 7, 1922.

Application filed December 8, 1920. Serial No. 429,273.

To all whom it may concern:

Be it known that I, JOHN E. ERICKSON, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Automobile Locks and Switches; and I do hereby 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 a combination lock and switch, and particularly to such a switch used in the ignition and other circuits of an automobile. It is now the common practice to provide locking mechanism for switches of this character so that the same cannot be operated when the owner or driver of the car is absent therefrom.

It is an object of this invention to provide a combination lock and switch which may be quickly and easily placed in locking position and which will be returned to normal position by means of a combination designed to be known only by the owner or driver of the car.

It is a further object of the invention to so construct the switch that if an attempt is made to operate the same when it is in locked position, an alarm circuit will be completed which will result in the sounding of an alarm which is shown in the particular embodiment disclosed, as the usual horn of the automobile.

It is another object of the invention to provide an electrically operated locking means for the sections of the hood of the automobile which are controlled by the switch.

These and other objects of the invention will become apparent from the following description made in connection with the accompanying drawings in which like reference characters refer to the same parts throughout the different views, and in which

Fig. 1 is a view of the switch mostly in longitudinal section showing somewhat diagrammatically the main portions thereof;

Fig. 2 is a view looking at the front of the combination switch and lock;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Figs. 4 and 5 are transverse sections taken on the line 4—4 of Fig. 1, showing the lock mechanism in different circumferential positions;

Fig. 6 is a transverse section taken on the line 6—6 of Fig. 1;

Figs. 7, 8 and 9 are transverse sections taken on the line 7—7 of Fig. 1, showing the contact mechanism in different circumferential positions;

Fig. 10 is a perspective view of the dash and hood of an automobile showing the hood locks and the cables connecting the same to the switch;

Fig. 11 is a section taken approximately on the line 11—11 of Fig. 10;

Fig. 12 is a section taken on the line 12—12 of Fig. 10;

Fig. 13 is a section taken on the line 13—13 of Fig. 12; and

Fig. 14 is a diagram of the wiring connections for the various parts controlled by the switch.

The switch herein shown and described forms an improvement of the combination lock and switch disclosed and claimed in my co-pending application S. N. 344,402 filed December 12, 1919. Referring to the drawings, particularly to Fig. 1, it is seen that the switch comprises a casing having longitudinal sections 1 and 2, to the latter of which is connected a corrugated conduit 3. The switch extends through an opening in the instrument board 4 of the automobile and is arranged to extend therefrom to and through an opening in the dash board 5. The front part of the section 1 is formed as a face plate or dial and has thereon a series of numerals 6. This face plate has a shoulder formed thereon which contacts the front of the dash and prevents the section 1 from passing therethrough. A lock collar 7 is secured in any suitable manner to the inside of the dash 4 and is arranged to co-operate with a series of teeth 8 formed on the section 1 to prevent said section from being drawn through the opening in the dash. The teeth 8 are shown as extending some distance along the outside of section 1 and can thus be used with a collar 7 to accommodate various thicknesses of the dash 4. The front dial portion of casing 1 is bored to receive therein a hub member 9 which has an enlarged plate portion contacting with the front of the dial and this portion carries a pointer 10 arranged to co-operate with the numerals 6 in operating the combination lock. The hub 9 is held from withdrawal through the dial by means of a split collar 11 seated in a circumferential groove in said

hub. As shown in Fig. 3, the interior of casing 1 is provided with two diametrically opposite lugs 12 extending longitudinally thereof. The movable parts of the switch comprise two shaft portions, the front portion 13 of which is square in cross section, passes through a similar shaft aperture in the hub 9 and has secured to its outer end an operating knob or handle 14. The inner shaft section is shown as 15 and is circular in cross section. Both shafts project into a tubular casing formed by two spaced disk members 16 arranged for rotation in the casing 1, one of which is provided with diametrically opposite lugs 17 which are threaded to receive fastening screws not shown, which pass through the other member 16 and thus secure the two members together. A tumbler 18 is disposed in the front part of the tumbler casing and is rigidly secured to the end of shaft 13. Two of the tumbler members 19 are mounted in the tumbler casing to rotate upon the end of the shaft 15 and all of these tumblers are provided with notches in the periphery thereof, one of which is shown as 20 in Figs. 4 and 5. A pawl member 21 pivoted to the member 16 has an inturned end which, when the combination is suitably turned to work the notches of all of the tumblers into alignment, will seat in said notches. This pawl is normally urged inward to seat in the notches by a leaf spring 22 formed thereon beyond the pivot thereof. When the lock is arranged to permit the pawl 21 to engage the notches 20, the shaft 13 will be coupled to the shaft 15. When the tumblers are scattered to throw the pawl out of engagement with the notches, the two shafts will be disconnected for rotative movement but can still be moved longitudinally by longitudinal movements of the knob 14. The details of this locking mechanism have been fully described and illustrated in the copending application above referred to, and as the specific structure thereof forms no part of the present invention, need not be further described herein.

The shaft 15 has secured thereto a switch member comprising a body of biconical formation 26 of insulating material and which has set in the sides thereof, as shown in Figs. 1, 7 and 9, contact members 23 and 24. These contacts are arranged to co-operate with stationary contacts arranged on the member 25 disposed in section 2. These stationary contacts are in the form of spring members pressing upon the front end of the member 26, as shown in Fig. 1. One of these contacts 27 is connected by suitable contacts with the circuit controlling the hood locks. Another contact 28 is connected to the battery 29, while contact 30 is connected to the ignition circuit. A fourth contact 31 is connected to the alarm circuit. The member 25 is apertured at its central portion, as shown in Fig. 1, to provide for the passage of shaft 15 and the conductors connected to the stationary contacts. The casing 2 has a partition 32 extending thereacross which has a central aperture to receive the shaft 15, which aperture is provided with a lateral notch 33, as shown in Fig. 6. One or more arcuate slots 34 are also formed through the partition 32 to provide a passage for the conductors. The shaft 15 has disposed in the longitudinal slot thereof a spring-pressed dog 35 which is normally held in position outside of the periphery of the shaft. It will be here noted that section 3 of the switch is provided with a collar 36 to prevent withdrawal of the same through the engine board 5.

In Fig. 14, is shown a diagram of the various circuits controlled by the switch, the usual primary circuit including the battery 29, the customary ammeter, the contacts 28 and 30, the primary coil 37, the interrupter 38, is shown in heavy black lines. The secondary circuit of the ignition comprising the secondary coil 39, and spark plugs 40, is shown in light black lines. The ground circuit is shown in broken lines and by a series of adjacent graded short lines. The circuit extending from contact 27 and electromagnets 41, which are disposed to control the hood locks, is also shown in heavy full lines, as are also the normal and alarm horn circuits which include the horn 42 and a normally open push button 43 for operating the same.

Referring to Figs. 10 and 13, the hood sections are shown as provided with locking members 44, in the form of bolts or latches which are secured to the inside of the hood sections by countersunk nutted bolts. Disposed on the frame members of the car on each side of the hood are electromagnet locking means 41 comprising electromagnets illustrated as of a double coil type having armatures 45 normally spring pressed to open position. These armatures 45 are arranged to normally engage the notch in the end of the locking bolts 44, as shown in Fig. 13. When the circuit is closed through magnets and the same are operated, the armatures 42 will be drawn down against the pole pieces of the coils shown and members 44 will be free to be swung outwardly with the hinged hood sections. The electromagnets with the armature are shown as housed in suitable boxes which are provided with end flanges by which they are secured by threaded bolts to the frame members of the automobile. The lock bolts 44 extend through openings formed in one side of these boxes. Suitable cables 46 are shown as connecting the electromagnets to the proper switch contacts. Normally, the switch will occupy the position shown in Fig. 9, the

knob 14 being pulled out to the dotted line position shown in Fig. 1. At this time the ignition contact 30 will be connected to the battery and the automobile will be in running condition. The shafts 13 and 15 will be connected by the pawl 21 seating into the notches 20. The dog 35 will also be in alignment with the notch 33, so that the knob 14 and shaft 15 can be readily moved longitudinally.

When it is desired to operate the hood circuit to unlock the hood sections, the knob 14 will be turned to the left and the contact 33 will be moved to connect contacts 27 and 28. In this rotary movement of the knob, the tumbler casing moves in casing 1. This movement is limited by shoulders on the member 16 engaging with the lugs 12. The switch can again be turned to the ignition position without disturbing the combination setting or disconnecting shafts 13 and 15.

When it is desired to lock the switch, the knob 14 can be pushed inwardly to the position shown in full lines in Fig. 1. Movement of the knob 14 to the left will then rotate the tumbler casing until the same is stopped by contact with the lugs 12. This will bring the contacts 23 and 24 into the position shown in Fig. 7. A further movement of the knob 14 will now scatter the tumblers 18 and 19 so that the shaft 15 is disconnected from the shaft 13 and movement of the knob will not change the position of the switch contacts. By this movement, the dog 35 will also be moved somewhat out of alignment with the slot 33. If anyone should tamper with the switch while in this position and pull the knob 14 outwardly again, the contact 24 will come into engagement with the contact 31 and the contact 23 will come into engagement with the contact 27. This will complete the circuit through the horn and the horn will now sound an alarm. If the person tampering with the switch now attempts to push the knob inwardly again, this will be prevented by engagement of the dog 35 against the partition 32. The switch will now have to be brought to proper position by manipulation of the combination which will again connect the shafts 13 and 15.

From the above description it is seen that applicant has produced a combination lock switch by means of which the ignition circuit, hood unlocking circuits and the alarm circuits can be quickly and easily operated. As above described, when the switch is left in locked position, any attempt to operate the same will result in the sounding of the alarm. It will, of course, be understood that various changes may be made in the arrangement and details of the apparatus without departing from the scope of the invention, which, generally stated, consists in the matter shown and described and set forth in the appended claims.

What is claimed is:

1. In combination with the hood sections and the ignition switch of an automobile, locking means for holding the hood sections in closed position, electrically operated means in said hood for unlocking said means, and auxiliary contacts on said switch electrically connected to said interlocking means.

2. The combination with the hood sections and controlling switch of an automobile, the latter of which is located on the dash, of locking bolts secured to said hood sections, spring pressed members engaging said locking bolts to normally hold the hood sections locked in closed position, electromagnets having said members constituting the armatures thereof, conductors forming a circuit for opening said electromagnets to withdraw said members from engagement with said locking bolts, and contacts in said switch movable to operate the circuit to actuate the electromagnet.

3. The combination with the hood sections of an automobile and a rotary switch located on the dash thereof, locking means for said hood sections and electrically operated means for releasing said locking means controlled by rotation of said switch, comprising cooperating contacts on said switch, electrically operated means for actuating said locking means, and electrical contacts extending from said contacts to said last mentioned means.

In testimony whereof I affix my signature.

JOHN E. ERICKSON.