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 APPARATUS FOR PREVENTING THEFT AND UNAUTHORIZED
 USE OF AUTOMOBILES
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Fig. 1 -

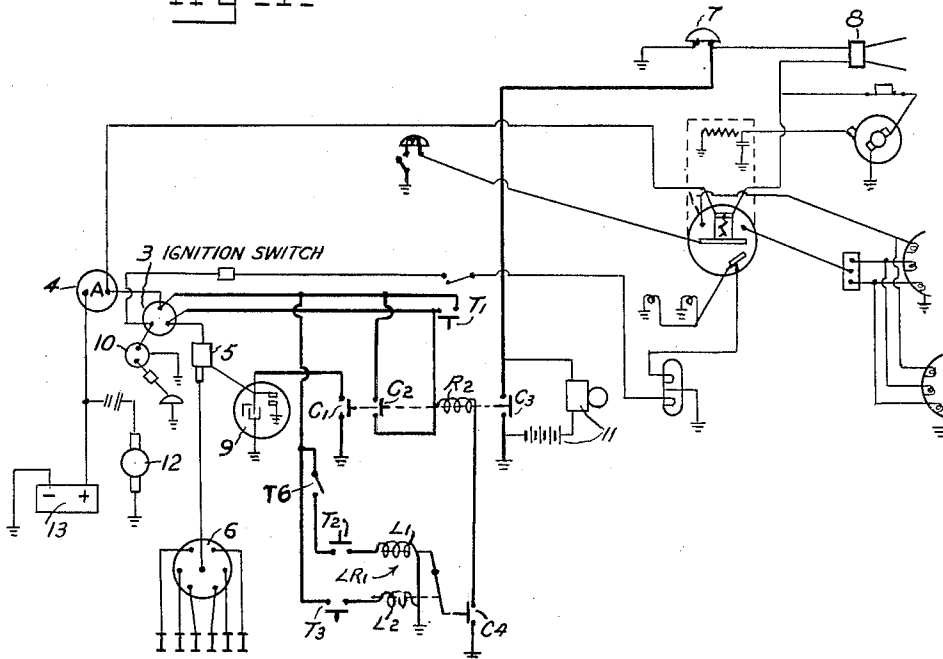
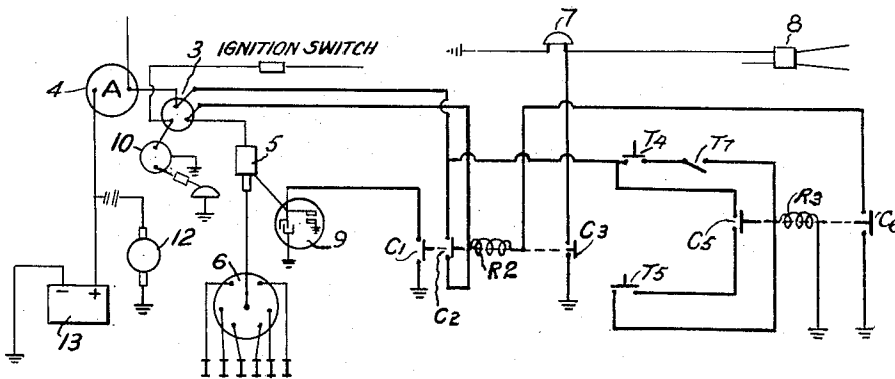


Fig. 2 -



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APPARATUS FOR PREVENTING THEFT AND
UNAUTHORIZED USE OF AUTOMOBILES

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This invention relates to systems or devices for installation in automobiles in order to prevent theft or unauthorized use thereof, and to improvements in such systems.

I propose the use of a relay, with subsidiary contact groups actuated thereby and constituting a relay system, being so arranged that, upon energization of the relay, a sequence of electrical preventive measures will be brought into operation to throw a part of the electric system out of operation so that the vehicle cannot move under its own power, and also, if so desired, to cause an alarm to operate, automatically upon such an attempt at misuse.

It is the primary object of the invention to devise means whereby the owner or driver upon leaving the vehicle will, without manually manipulating any switch or other such control, automatically "set" the relay system, controlling a sequence of electrical preventive measures which may include the sounding of an audible alarm, to be brought into effect upon any attempt at misuse of the vehicle.

Still another object of the invention is to provide means to bring the preventive measures into operation upon any unauthorized attempt to open the vehicle door, windows, or other movable parts.

The above and other objects will be readily appreciated from the following description of typical embodiments of the invention and in order that the present improvements may be more readily appreciated reference will be made to the accompanying sheets of drawings which depict a wiring or circuit diagram applicable to a typical automobile; relatively thick lines thereon denoting parts according to this invention.

Referring to the drawings which form part of this specification:

Figure 1, is a circuit diagram illustrating how a latching-relay means is associated with switch-contact devices actuated by a door or doors of the vehicle, and being adapted to "set" a relay R2, which is provided with subsidiary contacts actuated thereby for purposes later made clear, into a "ready" or active condition.

Figure 2, is a circuit diagram illustrating alternate switch means to be associated with a door or doors of the vehicle and utilizing a continuously-rated relay means in place of a latching-relay.

Throughout the drawings, there is shown a standard automobile ignition circuit wiring in light lines to which the improvements are applied and indicated by heavy lines in which;

Reference R2 indicates the principal-relay

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Reference R3 indicates the ignition switch

Reference R4 indicates the ammeter

Reference R5 indicates the ignition coil

Reference R6 indicates the distributor

Reference R7 indicates the horn button

Reference R8 indicates the horn

Reference R9 indicates the contact breaker box

Reference R10 indicates the starter motor, condenser and button starter switch

Reference R11 indicates the energizing battery bell circuit

Reference R12 indicates the generator

Reference R13 indicates the battery

Referring to Fig. 1, a principal-relay R2, provided with a plurality of normally open subsidiary contact groups, C1, C2 and C3, is so arranged that, upon energization thereof the contacts of the respective groups are caused to close, and when the relay is de-energized the contacts are adapted to be open.

One terminal—hereinafter referred to as the "positive" terminal—of the relay winding is connected to the normally "dead" side of the ignition switch of the vehicle, the other terminal of the relay winding being connected to the frame of the vehicle (or "earthed") by medium of a principal relay controlling switch or contact group C4.

One of the contacts of group C1 has a lead connected to the high tension terminal of the ignition coil, or to the rotor of distributor 6. The other contact of group C1 is earthed.

One of the contacts of group C2 is connected to a "live" integer in the vehicle wiring system, which may be the live side of the ignition switch 3, which in this case is directly connected to the ammeter 4. The other contact of group C2 is connected to the positive terminal of the relay R2.

One of the contacts of group C3 is connected to the "live" side of the horn button 7 or the negative terminal on the horn 8. The other contact of group C3 is "earthed."

It will be apparent from the foregoing that if the principal relay controlling switch or contact group C4 is closed, and the ignition switch is turned "On," the following will happen:

1. The relay R2 will be energized and the groups of contacts C1, C2 and C3 will close.

2. The "high tension" from the ignition coil 5 will become "earthed" through C1 and thus there will be no ignition electric supply to the spark plugs and the engine will not start.

3. A "holding circuit" for the relay will be established through contacts C2, and

4. The horn will be energized continuously through C3, and constitute an audible alarm.

Once the relay R2 is energized, either through normal operation of the ignition switch, or by taking a direct lead from the battery to the ignition coil, or by any other means, it will remain energized until such time as the principal relay controlling switch or contact group C4 is opened, even though the ignition switch, or other primary energizing means, shall be open-circuited.

In accordance with one embodiment of the present invention, a latching relay LR1 is provided with two coils or windings L1 and L2 and a single group of contacts C4, which constitute the principal relay controlling switch. The connection of this relay is such that when coil L1 is energized the contacts C4 close or "make," and are latched or remain closed until coil L2 is energized. One terminal of each relay coil is earthed as shown.

A contact switch T2 is wired in circuit between a continuously live or energized part of the circuit, in this case the "live" side of the ignition switch, and the "positive" terminal of relay coil L1. The switch T2 may be fitted in the door adjacent the driving seat, or in any suitable door of the vehicle, in such a manner that the driver closes the switch contacts automatically upon opening the door and leaving the vehicle. The switch T2 may comprise two contacts which are bridged when the door is open and separated when the door is closed.

Switch T3 is likewise connected in circuit with the relay coil L2. The switch T3 may comprise a spring-influenced contact switch, which is normally retained in the open position, and is the switch by which the driver or authorized person may release the latching relay LR1 upon return to the vehicle and it is preferably located in some obscure position in the automobile interior.

The mode of operation is substantially as follows—The driver upon leaving the vehicle will open the door having associated contact-switch T2 thus closing these contacts and energizing the coil L1 of the relay LR1, incidentally closing the contacts C4 and earthing the relay R2.

On account of the nature of the relay LR1 the contact C4 will remain closed, irrespective of the opening of contacts T2 by closing the door, until the switch T3 energizing the coil L2 of LR1 is closed, thus releasing the latching relay LR1 and opening the contacts C4.

If any unauthorized person, not knowing the locality of switch T3 should now enter the vehicle and attempt to use same, the sequence of electrical preventive measures brought into operation will be substantially as hereinbefore described.

A further contact-switch T1 may be associated with the case housing the relay R2, and in the event that any attempt be made to gain access to the relay the contacts may be adapted to close thus energizing relay R2 and immediately bring the electrical preventive measures, into operation, including the sounding of the alarm.

It is to be understood that the relay R2, if so desired, need only be provided with the contacts C2 and C3 for the purposes specified and that contacts C1 indicated as associated with relay R2 may be incorporated with the relay LR1. Indeed these contacts for specified purposes, associated with the respective relays, may be varied, interchanged or substitutions made as may be so desired in any practical embodiment of the invention.

A supplementary audible alarm, independent of

the vehicle horn 8 may be provided and mounted in a relatively inaccessible part of the vehicle if so desired, and may comprise an electric bell or the like with an energizing battery connected in series across contacts C3 as indicated at 11 in Fig. 1.

The contact switch T3, which may be a secreted switch, may be of any convenient form and may be a key operated switch.

Referring now to Figure 2, the relay R2 is provided with contact groups C1, C2 and C3 wired substantially as previously described and for similar functions. A relay R3, having contact groups C5 and C6 is provided and is of the continuously rated type i. e. it may be energized indefinitely without overheating. One side of the relay coil or winding is "earthed" whilst the other or "positive" terminal of the relay coil is connected to one contact of each of contact-switches T4 and T5.

The switch T4 is associated with the door of the vehicle and is in function and purpose similar to switch T2 as described in connection with Figure 1. The other contact of switch T4 is connected to any live or continuously energized point in the wiring system, in this case to the ignition switch.

Switch T5 is a secreted switch of any suitable form which, however, is normally in a closed condition. It may be of suitable key-operated or spring-loaded, single pole construction, and is secreted and normally in a closed condition as stated. The other contact of switch T5 is connected to one of the contacts in the group C5, the other contact in this group being connected to the live contact of switch T4, or any suitable live terminal in the wiring system.

The earth return terminal of relay R2 is connected to one contact of the group C6, the other contact being earthed. The contacts C6 are, in effect, synonymous with and constitute the relay controlling switch or contact group C4 as indicated in Fig. 1.

The mode of operation of this embodiment is as follows. The driver upon opening the door to leave the vehicle will cause contact switch T4, associated with the door, to close thus energizing the coil of the relay R3, and thus in turn closing its associated contacts C5 and C6. Contact C6 will directly earth the relay R2 and thus upon any attempt being made to start the engine by turning the ignition key the sequence of electrical preventive measures as before described will be brought into operation.

It will be noted that once the relay R3 is closed by operation of switch T4 the relay R3 will be maintained closed by current supplied through contacts C5 and switch T5 until such time as the switch T5 is opened by the authorized user.

With this embodiment it is to be understood that the relay R2, if so desired, need only be provided with the contacts C2 and C3 for the purpose specified and that contacts C1 indicated as associated with relay R2 may be incorporated with the relay R3, then the ignition circuits of the car will be automatically rendered inoperative immediately the authorized person leaves the car. Indeed these contacts for specified purposes, associated with the respective relays, may be varied, interchanged or substitutions made as may be so desired in any practical embodiment of the invention.

In Figures 1 and 2 contact group C1 is utilized to "short" the contact breaker mechanism, as indicated on the drawings as 9. As an alternative,

these contacts C1 may be so arranged to be in a normally closed condition, and connected in series with, for example, the ignition coil primary energizing circuit, so that upon energization of the relay R2 the contacts open and render the particular part of the apparatus inoperative. It is to be understood, however, that modifications such as this do not affect the essence of the present invention and that various alterations modifications and/or additions may be incorporated in the foregoing without departing from the true scope thereof.

In certain circumstances, such as, for example, when the vehicle is garaged for service purposes, it may be desirable for the authorized driver or person to be able to render inoperative a preventive system according to this invention, and without the necessity for divulging the location of the secreted switch to another party who may have to use the vehicle in course of duty.

Accordingly, a further switch, which may be of conventional single pole tumbler type, may be incorporated in each of the embodiments schematically represented in Figs. 1 and 2 of the accompanying drawings.

Referring to Fig. 1, such a switch T6 may be placed in series with the circuit to the door contact switch T2 or in any other position whereby it will serve to open the energizing circuit to relay coil L1 associated with the latching relay LR1.

Referring to Fig. 2, such a switch T7 may be placed in series with the circuit to the door contacts T4 or in any other position whereby it will serve to open the energizing circuit to relay R3.

The mode of operation is as follows: The authorized person or driver, after entering the vehicle, actuates the switch T6, Fig. 1 (or T7, Fig. 2 as the respective case may be) to the "Off" position, then actuates the secreted switch T3, Fig. 1 (or T5, Fig. 2) to thereby render the system inoperative. The system will remain inoperative until such time as the switch T6, Fig. 1 (or T7, Fig. 2 as the case may be) is restored to the "On" position.

The switch T6 or T7, may be located in any convenient position in the automobile, not necessarily in a secreted position.

Throughout this specification I have referred to wiring connected to the "live" side of the ignition switch; it will be readily appreciated, however, that any other suitable continuously energized part of the electrical system may be utilized if it be more convenient to do so. Similarly, wiring connected to the normally "dead" side of the ignition switch may be connected to any other point which becomes energized upon any attempt at unauthorized opening or use of the vehicle.

The foregoing description has also been based on the assumption that the negative of the battery is connected to the frame of the vehicle, or grounded or earthed, and the description is worded accordingly. However, if, as is the case with some automobile wiring systems, the positive of the battery is connected to the frame of the vehicle, the wiring would be substantially the same but phraseology in the specification may be slightly affected.

The wiring as shown is purely schematic. In actual practice all wiring may be "double banked" and be passed through "spaghetti" so as to make it substantially impossible for the unauthorized person to trace any wire. The wiring may be so arranged that if the thief cuts any band of wiring it will make the motor inoperative.

Fuses have not necessarily been indicated in the circuit diagram but they may have to be inserted in cases where their use is warranted.

The systems described are to be construed as capable of variations in application and they need not necessarily be installed specifically as described. For example, if an owner so desires he may have the system without the alarm, or on the other hand he can have the alarm system without the engine being made inoperative.

Also he may have variations of, or additions to the embodiments described, i. e. he may require the alarm to function when a door is opened, as well as when an attempt is made to start the motor. To any person versed in the art, such variations may be readily effected, whilst still remaining within the scope of the invention.

Also, the term "relay" is used in its broad sense. It refers to any suitable device which closes or opens sets of contacts, automatically or otherwise, when required to do so, and no limitation or restriction is to be placed upon the type or style of the relay employed.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An improved system for installation in automobiles and other road vehicles as a safeguard against theft or any unauthorized use thereof, comprising an electrical principal relay device, means electrically connecting said device with the ungrounded terminal of the ignition coil of the ignition circuit of the road vehicle, a switch controlling said principal relay device, automatic switching mechanism actuated by the opening of a door of the vehicle to close said controlling switch of the principal relay device, said automatic switching mechanism including a subsidiary relay, and an energizing circuit for the latter relay, including a normally open switch so located with respect to a door of the vehicle as to be closed when said door is opened, the energizing circuit for the subsidiary relay device including a terminal for connection to the ungrounded terminal of the ignition coil of the ignition circuit, whereby energization of the coil circuit when the normally open switch has been closed will energize the subsidiary relay to close said controlling switch and thereby energize the principal relay device, and a manually operable switch which is electrically connected with said automatic switching mechanism, and means for maintaining the controlling switch of the principal relay device closed until intentionally opened by said manually operable switch.

2. An improved system as claimed in claim 1 wherein said principal relay device includes a relay and a plurality of normally open contact switches simultaneously closed or opened, and closed upon energization of said principal relay, one switch being connected to the high tension terminal of the ignition coil and to ground, another switch connected to a live integer of the ignition switch and wiring system, and positive terminal of the relay, and another switch connected to the live side of a signal and to ground, and said subsidiary relay is provided with a subsidiary contact group which is connected in the electrical circuit of and constitutes the controlling switch of the principal relay device and whereby energization of the subsidiary relay causes the contacts of the subsidiary contact group to close, said subsidiary contact group embodying a plurality of normally open contact switches simultaneously closed or opened, and

closed upon energization of said subsidiary relay; one switch being connected to a continuously live side of the ignition switch and the positive side of a grounded coil of the subsidiary relay, adapted upon energization to close said principal relay control switch, another switch connected to a movable part of the vehicle to be actuated thereby, and another switch connected to a live integer of the ignition switch and to a grounded coil of the subsidiary relay and adapted upon being closed to energize a subsidiary relay coil to open said principal relay control switch, at least one of said latter plurality of switches adapted to remain closed and the subsidiary relay to remain energized irrespective of the opening of another switch in circuit therewith, including the door-operated switch.

3. An improved system according to claim 1 wherein the principal relay device is provided with a contact group adapted to be closed by energization of the winding of the principal relay device, one contact being electrically connected with an electrically alive integer in the vehicle wiring system and the other contact being connected to the positive terminal of the winding of the principal relay device whereby, upon energization of the principal relay winding, said contact group establishes a holding circuit for the relay energizing winding which will remain energized until the principal relay controlling switch is opened.

4. An improved system as claimed in claim 1 wherein said subsidiary relay is provided with a subsidiary contact group which is connected in the electrical circuit of and constitutes the controlling switch of the principal relay device and whereby energization of the subsidiary relay causes the contacts of the subsidiary contact group to close and wherein the subsidiary relay comprises a latching relay comprising two windings, one of said windings electrically connecting an energizing terminal of the contact switch normally open when the door is closed to the return of the electrical circuit, and the other winding electrically connecting an energizing terminal of the manually operable switch and the return of the electrical circuit, the former winding being

adapted to be energized by closing of the contact switch which is normally open when the door is closed and which winding upon energization is adapted to close the subsidiary contact group, which constitutes the controlling switch of the principal relay, and which contacts remain closed until energization of the other winding by means of the manually operable switch.

5. An improved system as claimed in claim 1 wherein said subsidiary relay is provided with a subsidiary contact group which is connected in the electrical circuit of and constitutes the controlling switch of the principal relay device and whereby energization of the subsidiary relay causes the contacts of the subsidiary contact group to close, and wherein the subsidiary relay comprises a relay having an energizing winding of the continuously rated type, said subsidiary relay being provided with an additional contact group, the contacts of which are upon energization adapted to be closed, a normally manually operable switch, said additional contact group being electrically connected between an electrically "alive" component in the vehicle wiring system and one terminal of the latter switch, the other terminal of which is connected with the energizing winding of the subsidiary relay, in such a manner that when the winding of the subsidiary relay is energized by closing of the contact switch, the said subsidiary relay will remain energized by current supplied through said additional contact group until de-energized by opening said manually operable switch.

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