Sept. 27, 1955 A. F. MOORE 2,718,776

ELECTRICAL LOCK

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Fig. 1

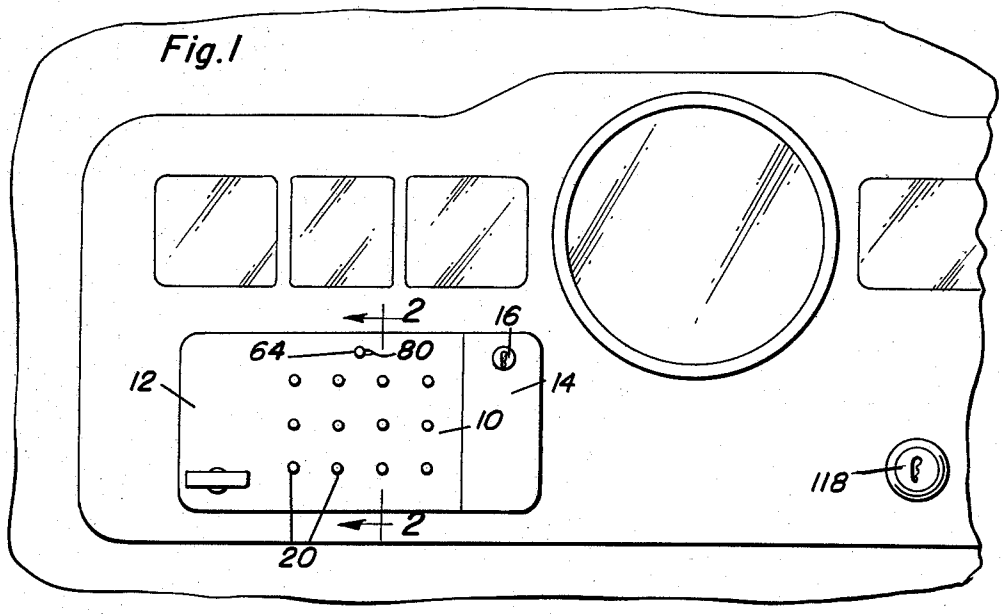
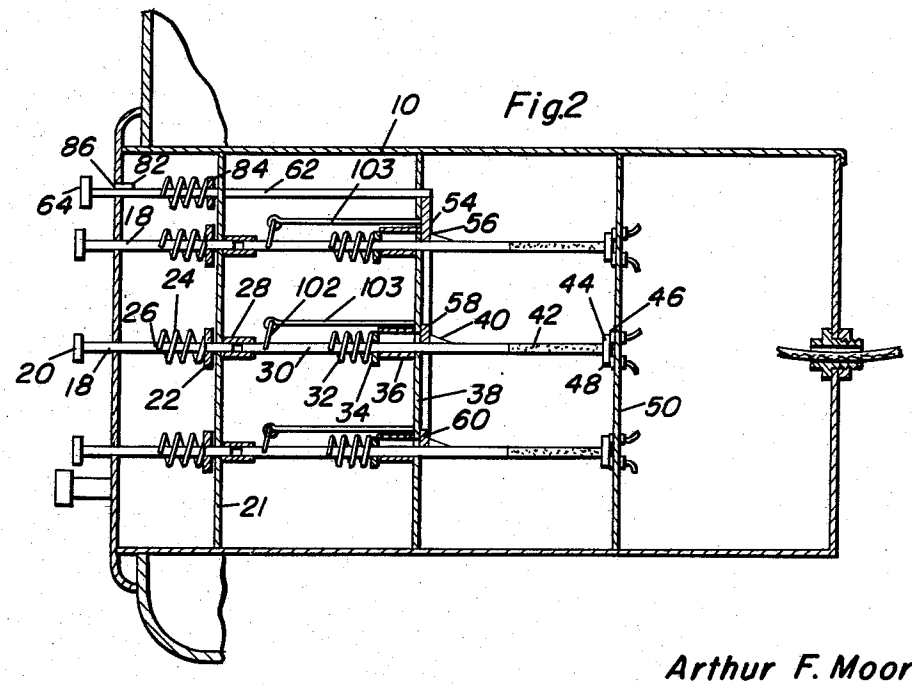


Fig. 2



Arthur F. Moore
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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Fig.3

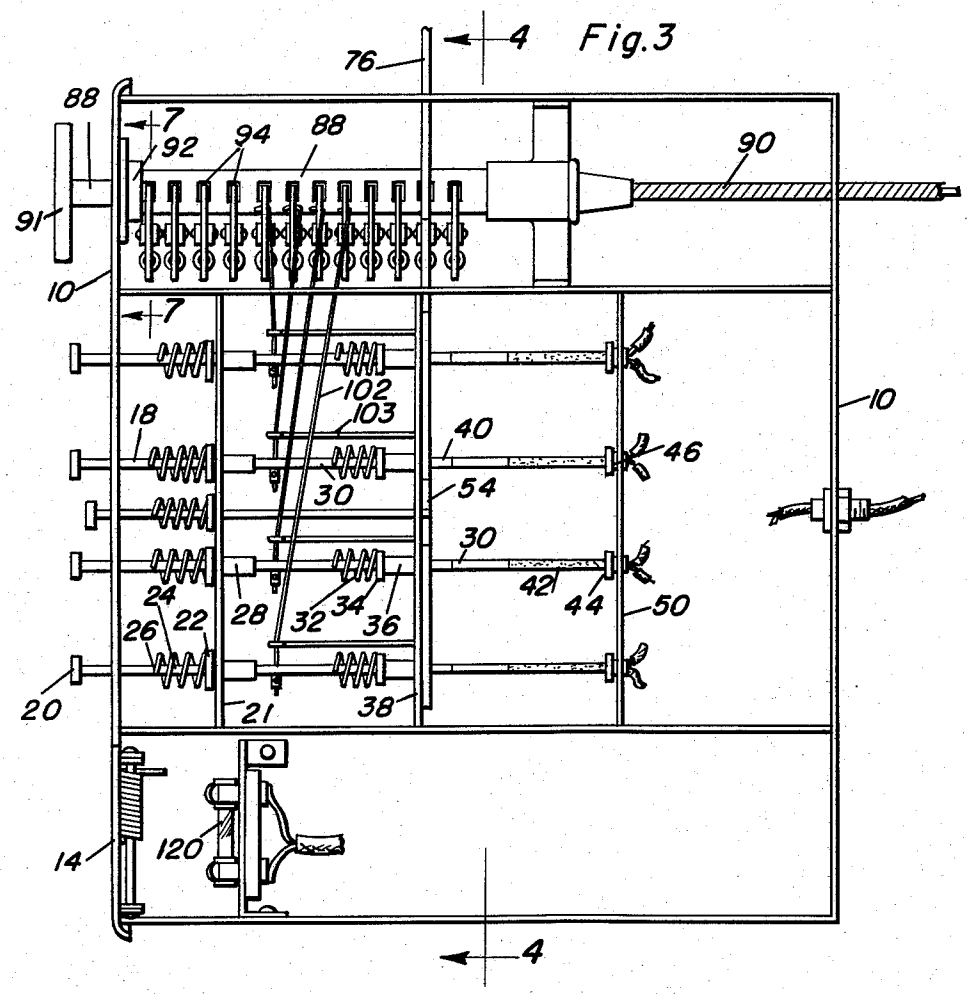
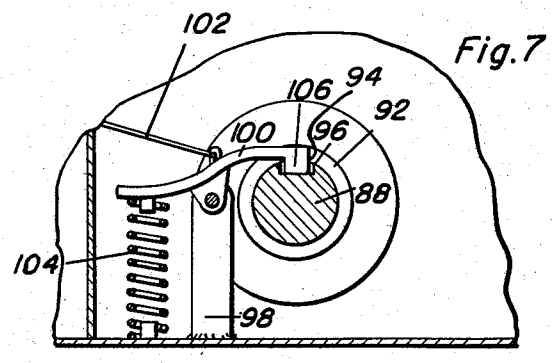


Fig.7



Arthur F. Moore
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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ELECTRICAL LOCK

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Fig.4

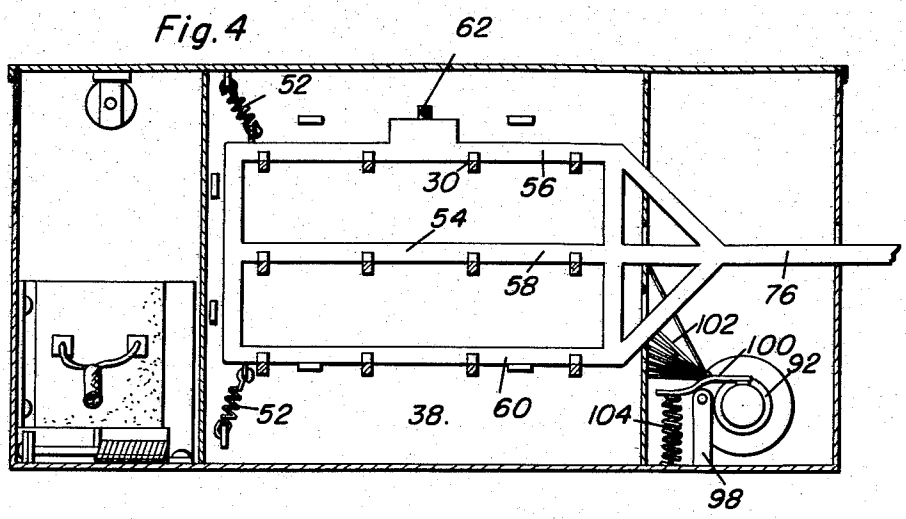


Fig.5

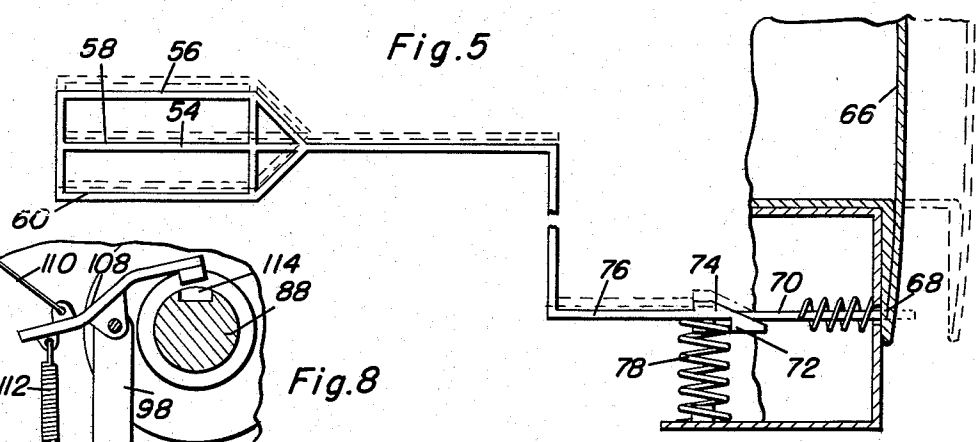


Fig.8

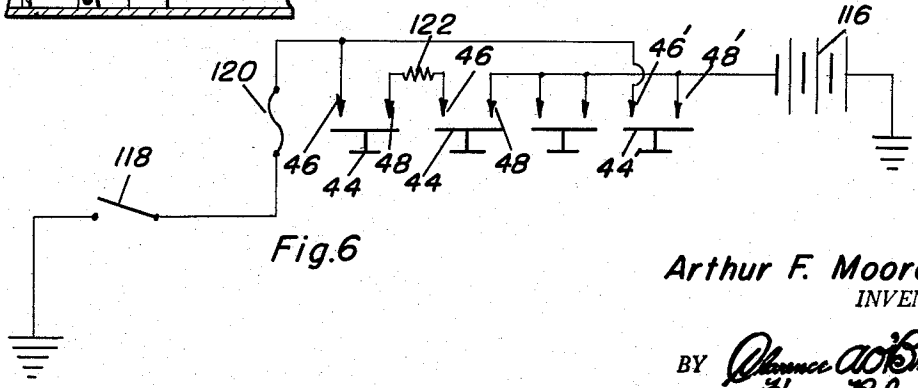


Fig.6

Arthur F. Moore
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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2,718,776

ELECTRICAL LOCK

Arthur F. Moore, South Fork, Pa.

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12 Claims. (Cl. 70—241)

This invention relates to a device adapted to protect a motor vehicle against theft and more particularly to an electrically actuated ignition lock for control of the ignition system of the vehicle.

The primary object of this invention resides in the provision of effective means for preventing car theft that employs an electrical combination lock having means for completing an operative electrical circuit between the battery comprising the source of electrical power for the vehicle and the ignition system thereof when a selected combination of plungers are actuated. Other means are provided for effectively preventing the discovery of the selected combination as by trial and error, thus guarding against attempted use of the vehicle by a person to whom the selected combination is unknown.

The construction of this invention features means associated with the plungers forming the elements of the electrical combination lock whereby the hood release lever adapted to release the hood covering the engine compartment of the vehicle is prevented from operation unless the selected combination of plungers are actuated. Means are further associated with the plungers not of the selected combination for maintaining the hood release lever against operation if they are actuated due to some error.

Another object of this invention resides in the provision of means for preventing the lifting of the hood of the automobile which would enable a comparatively skilled mechanic to install a "jumper" across the ignition lock thereby permitting the starting of the motor vehicle.

Another feature of the invention resides in the provision of the door actuated mechanism for releasing and resetting the plungers to an initial position when the door is open. Manual means are provided for selectively preventing operation of the door operated mechanism when this is desired by the operator of the vehicle.

Still further objects and features of the invention reside in the provision of an electrical lock adapted to prevent theft of automobiles and like vehicles that is simple in construction and manufacture and capable of being readily and easily installed on various makes and models of currently produced automobiles, trucks, and the like, and which is comparatively inexpensive to produce while capable of having the combination of selective plungers varied in accordance with the wishes of the owner of the vehicle.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this electrical lock, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is an elevational view showing the electrical lock installed on the dashboard of a conventional automobile;

Figure 2 is a vertical sectional view as taken along the plane of line 2—2 of Figure 1;

Figure 3 is a horizontal sectional view illustrating the construction of the means associated with the plunger for controlling the operation of the hood release lever in greatest detail;

Figure 4 is a vertical sectional view as taken along the plane of line 4—4 of Figure 3;

Figure 5 is a schematical illustration indicating the operation of the door control mechanism for resetting this electrical lock;

Figure 6 is a schematical wiring diagram of the support electrical components of the invention;

Figure 7 is a sectional detail view illustrating the construction of the rocker arm and tie wires connected to the plungers which prevent operation of the hood release lever unless the selected combination of plungers is actuated; and

Figure 8 is another sectional detail view similar to Figure 7 but showing the construction of the rocker arms and the tie wires which interconnect the hood release mechanism with the other plungers forming elements of this invention.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 generally designates a casing having a front panel 12 and a compartment door 14 capable of being lockingly closed by means of a conventional lock 16. The door 14 provides access to the interior of the container for the replacement of fuses as will be covered later in detail.

Extending through the panel 12, are a plurality of plungers 18 having knobs or keys 20. The plungers may be of a number chosen by the manufacturer of the device as most convenient for production, yet sufficient to afford little chance of a correct guess of the selected combination. The plungers 18 extend through a partition 21. Slidably mounted on the plungers 18 are collars 22. Coil springs 24 abut against the collars 22 at one end thereof and are fastened to the plungers as at 26 at the other end. The plungers 18 extend into guides 28 affixed to the inner wall of the partition 21. The plungers 18 are formed in two pieces and also seated within the guides 28 is the outermost end of the inner plunger sections 30. Each inner plunger section has a spring 32 which abuts against a sliding collar 34 mounted on the inner plunger section 30. The collars 34 are adapted to abut against guides 36 mounted on a second inner partition 38. The plungers extend through the inner partitions 38 and have triangular locking keys 40 mounted thereon. The innermost ends of the inner plunger sections 30 have insulated extensions 42 attached thereto to which electrically conductive contact plates 44 are attached. The contact plates 44 are adapted to complete electrical circuits between the pairs of contact points 46 and 48 respectively mounted on a third partition 50.

Resiliently held, as by springs 52, behind the partition 38, is a three pronged locking bar 54. The prongs, 56, 58, and 60 being adapted to engage the keys 40 mounted on the plunger after the plungers are depressed thus holding the contact plates 44 in engagement with the contacts 46 and 48 were the plunger 18 to be depressed. It is to be noted that the cam shaped triangular locking keys 40 will ride underneath the locking bar 54 when the plungers 18 are depressed and will engage the locking bar 54, thus preventing the spring 32 from withdrawing the contact plates 44 from engagement with the contact points 46 and 48. The plungers 18 are formed into sections so as to permit the keys 20 to return to an initial position even though the contact plates 44 are engaging the contacts 46 and 48. The spring 24 is adapted to urge the plungers 18 back to their initial position when released by the operator. A manual plunger 62 having a key 64 is provided for preventing the locking bar 54 from rising when the door 66 of the vehicle is open. It is to be noted that

the door 66 of the vehicle is adapted to engage the push button end of a plunger 70 having a cam surface 72 adapted to engage a cam surface 74 on an extension 76 of the locking bar 54. Hence, when the door is open, the locking bar 54 will be urged upwardly due to the biasing action of the spring 78. The plunger 64 is adapted to prevent motion of the locking bar 54 upwardly and may itself be locked in an inner position by sideways movement into the intercommunicating slot 80, provided in the front wall of the casing which is adapted to be engaged by the detent 82 mounted on the rod 62. A spring 84 is provided for continuously urging the plunger 62 to a position where the locking bar 54 is free to move. It is to be noted that the detent 82 is free to move through the aperture 86 in the front wall 12 of the casing but cannot move through the small slot 80.

The hood release lever 88 has a cable 90 attached thereto connected to the hood latch used in securing the hood to the engine compartment of the vehicle at the front engine compartment of the vehicle. The cable 90 is actuated by a hood release handle 91. The hood release lever 88 extends through a sleeve 92 mounted in the casing 10. The sleeve is provided with a plurality of apertures 94 therethrough. The lever 88 is provided with a series of recesses 96 adapted to align with the apertures 94. Mounted on stands 98 adjacent the sleeve 92 are a series of rocker arms 100 which are interconnected by wires 102 extending through guides 103 to certain of the plunger sections 30. Compression springs 104 continuously urge the rocker arms 100 to a position where the detents 106, carried by the rocker arms 100, extend through the apertures 94 and into the recesses 96. As is shown in Figure 8, other rocker arms 108 are interconnected by wires 110 to the other of the plunger sections 30 so that the tension springs 112 continuously withdrawing the detents 114 from the apertures 94 and the recesses 96, can be overcome upon actuation of the plungers. This will then cause the locking of the hood release lever to be effected.

This device operates on the principle that the closing of the plungers 18 of certain selected plungers of the set of plungers will when all of the contact plates 44 complete an operatively electrical circuit through the contact points 46 and 48 interconnect the battery 116 with the ignition circuit controlled by the conventional ignition switch 118. A fuse 120 is provided in series with the switch 118 and the battery 116 whereby upon closure of one of the non-selected contact plates 44' with contacts 46' and 48', will short circuit the resistance 122 in series connection with the selected contact plates 44 and contacts 46 and 48, thus causing the fuse 120 to blow. The failure of the fuse 120 will prevent the completion of an operatively electrical circuit between the ignition system and the battery 116 until the fuse is replaced upon opening of the lock 16 controlling the door 14. It is to be understood that a "jumper" cannot be connected across the battery to the ignition system since the hood will be held closed by the operation of the rocker arms 100 and 108. Unless the rocker arms 100, connected to the selected plunger elements 30, are actuated, the detents 106 will lock the hood release lever 88 against movement. Further, if the plungers 18 of the non-selected group of plungers are actuated, the locking detents 114 will then engage the hood release lever 88 preventing release of the hood.

Since from the foregoing, the construction and advantages of this electrical apparatus will be readily apparent, further description is believed to be unnecessary. However, since numerous modifications will readily occur to those skilled in the art, after a consideration of the foregoing specification and accompanying drawings, it is not intended to limit the invention to the exact construction shown and described, and all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected plungers preventing operation of said hood release lever unless said selected plungers are actuated, and members interconnecting the other of said plungers with said hood release lever preventing operation of said lever when said other of said plungers are actuated.

2. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected plungers preventing operation of said hood release lever unless said selected plungers are actuated, said means including locking detents adapted to seat in recess in said hood, release lever, and tie wires interconnecting said detents with said selected plungers.

3. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected plungers preventing operation of said hood release lever unless said selected plungers are actuated, said means including locking detents adapted to seat in recess in said hood, release lever, and tie wires interconnecting said detents with said selected plungers, and members interconnecting the other of said plungers with said hood release lever preventing operation of said lever when said other of said plungers are actuated.

4. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected plungers preventing operation of said hood release lever unless said selected plungers are actuated, said means including locking detents adapted to seat in recess in said hood, release lever, and tie wires interconnecting said detents with said selected plungers, said detents being mounted on rocker arms, said rocker arms being spring pressed to continuously urge said rocker arms to position said detents in said recess.

5. An electrical lock for use in motor vehicles com-

prising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, a bar for holding said selected plungers in engagement with said selected pairs of contact points, and door actuated means interconnecting said bar with a door of said vehicle to automatically release said selected plungers upon opening of said door.

6. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, a bar for holding said selected plungers in engagement with said selected pairs of contact points, and door actuated means interconnecting said bar with a door of said vehicle to automatically release said selected plungers upon opening of said door, and manual means for selectively preventing said door actuated means from releasing said selected plungers.

7. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected plungers preventing operation of said hood release lever unless said selected plungers are actuated, said means including locking detents adapted to seat in recess in said hood, release lever, and tie wires interconnecting said detents with said selected plungers, a bar for holding said selected plungers in engagement with said selected pairs of contact points, and door actuated means interconnecting said bar with a door of said vehicle to automatically release said selected plungers upon opening of said door.

8. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected plungers preventing operation of said hood release lever unless said selected plungers are actuated, said means including locking detents adapted to seat in recess in said hood, release lever, and tie wires interconnecting said detents with said selected plungers, a bar for holding said selected plungers in engagement with said selected pairs of contact points, and door actuated means interconnecting said bar with a door of said vehicle to automatically release said selected plungers upon opening of said door.

9. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected plungers preventing operation of said hood release lever unless said selected plungers are actuated, said means including locking detents adapted to seat in recess in said hood, release lever, and tie wires interconnecting said detents with said selected plungers, a bar for holding said selected plungers in engagement with said selected pairs of contact points, and door actuated means interconnecting said bar with a door of said vehicle to automatically release said selected plungers upon opening of said door, and means interconnected between said source of power and the ignition system of said motor vehicle to effectively break the electrical circuit between said source of power and said ignition system when the other of said plungers are actuated.

10. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected plungers preventing operation of said hood release lever unless said selected plungers are actuated, a bar for holding said selected plungers in engagement with said selected pairs of contact points, and door actuated means interconnecting said bar with a door of said vehicle to automatically release said selected plungers upon opening of said door.

11. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected plungers preventing operation of said hood release lever unless said selected plungers are actuated, a bar for holding said selected plungers in engagegment with said selected pairs of contact points, and door actuated means interconnecting said bar with a door of said vehicle to automatically release said selected plungers upon opening of said door, and manual means for selectively preventing said door actuated means from releasing said selected plungers.

12. An electrical lock for use in motor vehicles comprising a plurality of contact plungers adapted to engage pairs of spaced contact points, selected pairs of said contact points engaged by selected plungers being connected in series connection with the source of electrical power and the ignition circuit of a motor vehicle to complete an operative electrical circuit between said ignition circuit and said source of electrical power, said motor vehicle having an engine compartment provided with a hood, said hood being adapted to be held in a locked position and released only by a hood release lever, and means interconnecting said hood release lever with said selected

plungers preventing operation of said hood release lever unless said selected plungers are actuated, a bar for holding said selected plungers in engagement with said selected pairs of contact points, and door actuated means interconnecting said bar with a door of said vehicle to automatically release said selected plungers upon opening of said door, and manual means for selectively preventing said door actuated means from releasing said selected plungers, and means interconnected between said source of power and the ignition system of said motor vehicle to effectively break the electrical circuit between said

source of power and said ignition system when the other of said plungers are actuated.

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