Oct. 27, 1953 E. E. HERRELL 2,657,317

ANTITHEFT DEVICE FOR INTERNAL-COMBUSTION POWERED VEHICLES

Filed Jan. 6, 1953

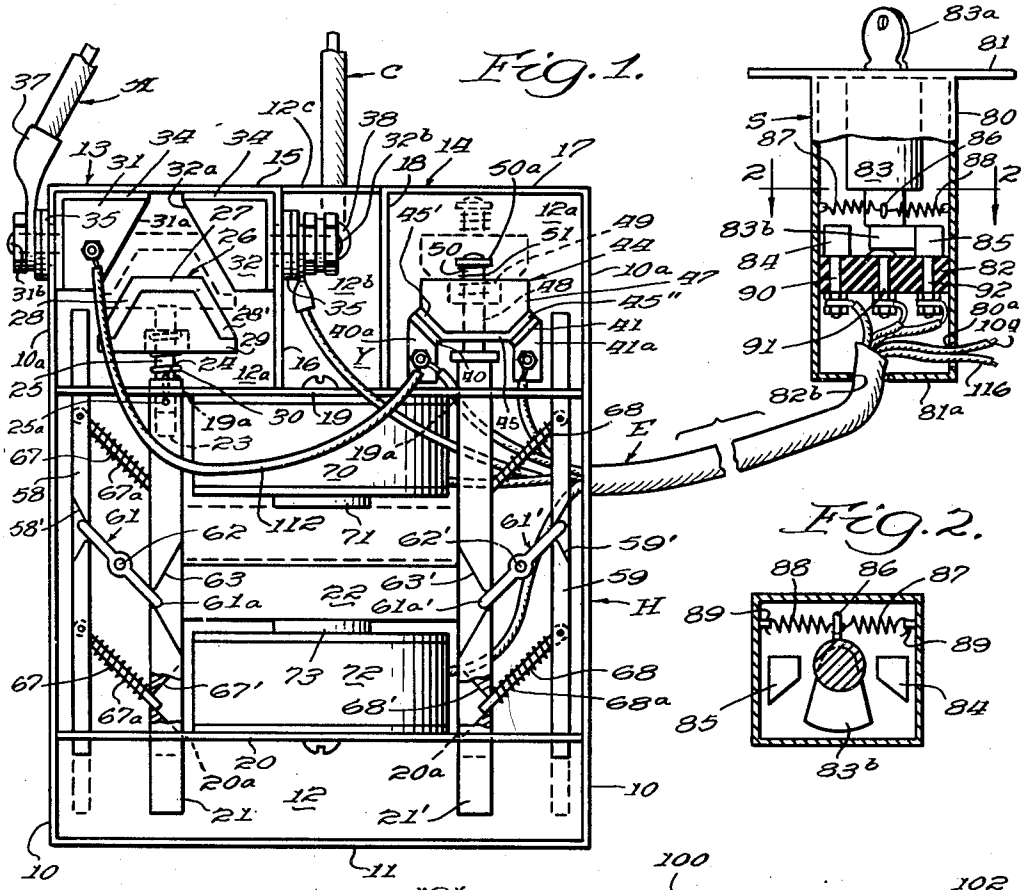


Fig. 1.

Fig. 2.

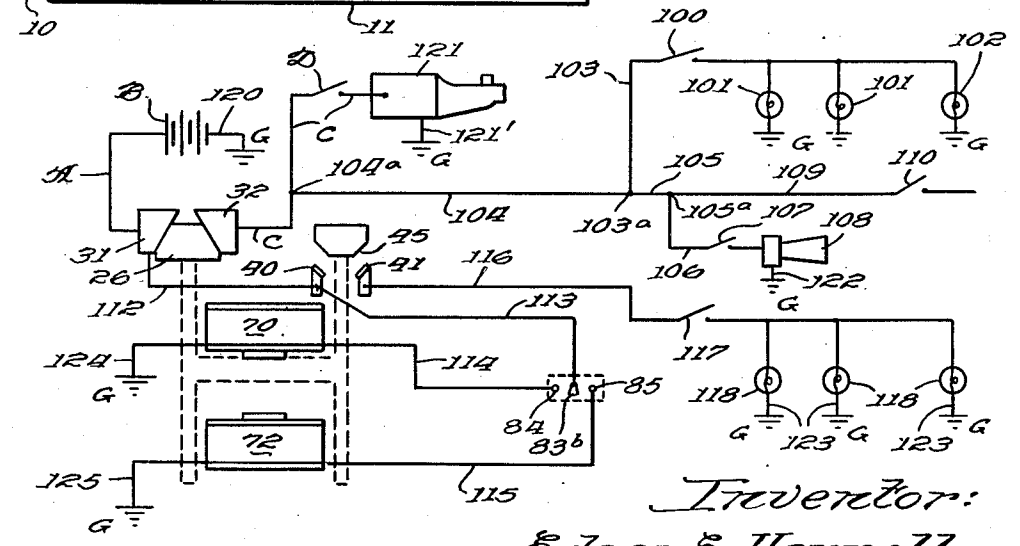


Fig. 3.

Inventor:
Edgar E. Herrell.
By Fulwider, Mattingly & Babcock,
Atty's.

Patented Oct. 27, 1953

2,657,317

UNITED STATES PATENT OFFICE

2,657,317

ANTITHEFT DEVICE FOR INTERNAL-COMBUSTION POWERED VEHICLES

Edgar E. Herrell, San Diego, Calif.

Application January 6, 1953, Serial No. 329,819

7 Claims. (Cl. 307—10)

1

The present invention relates to the field of anti-theft devices, and more particularly to an apparatus that prevents unauthorized actuation of the electrical power circuit of an internal combustion engine powered vehicle.

A major object of my invention is to provide a compact, self-contained unit that may be readily installed on an internal combustion engine powered vehicle, and when so installed, maintains the electrical circuit that supplies electrical energy from the storage battery to the starter, head and tail lights, and the ignition system in an inoperative condition until an authorized person momentarily turns an electrical switch forming a part of my invention to a predetermined position.

Another object of my invention is to supply a device that allows the parking lights of a vehicle to be actuated, although all other portions of the electrical circuit are dead.

A further object of my invention is to furnish a protective device which has a simple mechanical structure, requires little or no maintenance attention, may be fabricated from inexpensive standard commercially available materials, and as a result may be retailed at a sufficiently low price as to encourage its widespread use as a theft preventative device on internal combustion powered vehicles.

These and other objects and advantages of my invention will become apparent from the following description of a preferred form thereof, and the drawing illustrating that form in which:

Figure 1 is a vertical cross-sectional view of my invention, partly in elevation showing the internal structure thereof;

Figure 2 is a vertical cross-sectional view of the actuating switch of my invention taken on the line 2—2 of Figure 1; and

Figure 3 is a schematic view of my invention showing the electrical wiring thereof in detail.

Referring now to Figure 1 of the drawing for the general arrangement of my invention, it will be seen that the major portion of my invention is contained within a housing H from which a first electrical cable E leads to an actuating switch S. The installation of my invention is extremely simple, as the housing H is bolted or otherwise affixed by conventional means (not shown) to a vehicle at a convenient location thereon. After the housing is so affixed, a second electrical cable A is extended therefrom to a storage battery B, and a third electrical cable C extends to a starter switch D, as will be explained in detail hereinafter.

2

The housing H may take a variety of forms, but I have found it convenient to fabricate the housing from sheet material as a substantially rectangular container. Housing H comprises two end pieces 10, connected on their lower edges by a bottom piece 11. The end pieces 10 develop on their longitudinally disposed edges into connecting side walls 12, one of which may be seen in Figure 1. The housing H is formed with two laterally spaced compartments 13 and 14 on the upper portion thereof, with compartment 13 being defined by an end piece 10*a* and two side walls 12*a*. End piece 10*a* and side walls 12*a* are extensions of end piece 10 and side walls 12 respectively. End piece 10*a* is bent downwardly or otherwise formed to provide a top 15 for compartment 13. The downwardly positioned end portion of top 15 is a downwardly bent end piece 16 which serves to completely close compartment 13. Compartment 14 includes a second end piece 10*a* which is an extension of end piece 10. End piece 10*a* is inwardly bent to form a horizontally disposed top 17 which on its free end portion is bent or otherwise formed to provide a downwardly extending end piece 18. The side walls of compartment 14 are formed from extensions 12*a* and are continuations of side wall 12. The lower end of the compartments 13 and 14 are open as above described, but are closed by a rectangular frame member 19 that is rigidly affixed to the interior surfaces of the end pieces 10 and side walls 12 by conventional means (not shown).

For easy access to the interior of housing H, one of the side walls 12 and its extensions 12*a* are preferably made removable by conventional holding means (not shown). A second frame member 20 is positioned within the confines of housing H parallel to frame member 19 but disposed in the lower portion thereof, as may best be seen in Figure 1. The two frame members 19 and 20 have two vertically aligned bores 19*a* and 20*a* formed therein in which an elongate member 21 is slidably supported. Frame members 19 and 20 have a second set of vertically aligned bores 19*a* and 20*a* formed therein in which a second elongate member 21′ is slidably supported. The two members 21 and 21′ are rigidly connected to one another by a cross piece 22 fabricated from a magnetically attractable material such as iron or steel. A bore 23 extends downwardly from the upper end of member 21, and is in communication with two oppositely disposed vertically extending slots 24. A rod 25 is slidably mounted in bore 23, and has a transversely disposed pin 25*a* extending outwardly

therefrom that slidably engages slots 24. The length of slots 24 determines the extent of longitudinal movement of rod 25.

An electrical contact 26 of substantially U-shaped cross section is provided that includes a horizontally disposed web 27 from which two downwardly and outwardly extending legs 28 and 28' extend. A mounting 29 formed from a plastic material such as Bakelite or other electrical insulating material, has the contact 26 disposed on the upper portion thereof, as may best be seen in Figure 1. Mounting 29 is threaded or otherwise rigidly affixed to the upper end of rod 25. A helical spring 30 encircles the rod 25, with one end of the spring in contact with the lower face of the mounting 29 and the other end thereof pressing against the upper surface of frame member 19. In this manner, the contact 26 is at all times urged upwardly from the member 21. In Figure 1 it will be noted that the electrical contact 26 is disposed within the confines of compartment 13.

Second and third electrical contacts 31 and 32 respectively are provided, preferably formed from a metallic material such as brass or copper. These contacts 31 and 32 are identical in shape, and formed with inwardly and upwardly tapering faces 31*a* and 32*a* respectively. Contacts 31 and 32 are provided with outwardly extending bolt-like terminals 31*b* and 32*b* respectively, which project through suitable bores formed in the end pieces 10*a*. Contacts 31 and 32 are electrically insulated from the compartment 13 by strips of insulating material 34, and the bolts by washers 35 are likewise formed of an insulating material.

Terminal 31*b* (Figure 1) is connected to a lug 37 of cable A, and terminal 32*b* is likewise connected to a lug 38 of cable C. It is essential that the lugs 37, 38, and the terminals 31*b*, 32*b* be so disposed that they cannot be cross connected by an unauthorized person in attempting to start the vehicle on which my invention may be installed. Accordingly, to prevent such cross connecting, an upwardly disposed rectangularly shaped segment of the side wall is bent into an L-shape to provide a side wall 12*b* and top 12*c*. The end pieces 16, 18, a portion of frame member 19, side wall 12*b* and top 12*c* cooperate to form an intermediately disposed compartment Y, as may be seen in Figure 1. The cable C extends into compartment Y through an opening (not shown) formed in side wall 12*b*. The terminal 32*b* and lug 38 are completely enclosed in the compartment Y, when the second side piece 12 is mounted on the housing H. With the above construction it is impossible for an unauthorized cross connection to be made between terminals 31*b*, 32*b* or lugs 37, 38. The spring 30 at all times urges the contact 26 into an electrical current carrying engagement with contacts 31 and 32 when the member 21 is in the upwardly disposed position shown in phantom line in Figure 1.

Fourth and fifth electrical contacts 40 and 41 are provided which are disposed within the confines of compartment 14 as shown in Figure 1. Contact 40 occupies an upwardly and outwardly extending position, and is supported within the confines of compartment 14 by an arm 40*a* affixed to side wall 12*a*. The electrical contact 41 is likewise disposed in an upwardly and outwardly position, and is supported by side wall 12*a* in compartment 14 by an arm 41*a* affixed thereto by conventional means.

A sixth electrical contact 44 having a somewhat U-shaped cross section is provided that includes a central portion 45 from the ends of which two arms 45 and 45' extend upwardly and outwardly. Contact 44 is rigidly affixed to the lower face of a mounting 47 that is formed of an electrical insulating material, and has a bore 48 extending downwardly therethrough. Bore 48 is in communication with a cavity 49 formed in the upper portion of the mounting. Member 21' has an extension 50 mounted on the upper end thereof that slidably engages the bore 58, with the result that mounting 47 is longitudinally movable relative to the member 21'. A helical spring 51 encircles the upper portion of extension 50. A nut 50*a* is threaded to the upper end portion of extension 50 and spring 51 is disposed between nut 50*a* and the bottom face of the cavity 49, as may best be seen in Figure 1. The helical spring 51 is in compression and at all times forces the contact 44 and mounting 47 downwardly. However, the maximum downward movement of mounting is limited by a stop 52 that is rigidly affixed to, or formed as a part of the member 21'. Two uprights 58 and 59 are provided which are slidably supported in bores formed in frame members 19 and 20, parallel to members 21 and 21'.

Two arms 61 and 61' are pivotally supported by pins 62 and 62' from the side walls 12 of the housing H as may best be seen in Figure 1. Members 21 and 21' are formed with recesses 63 and 63' respectively, which are movably engaged by ends 61*a* and 61*a*' of the pivotally supported arms. Uprights 58 and 59 are likewise provided with recesses 58' and 59' respectively, that are likewise movably engaged by the arms 61 and 61'.

It will be understood that with the above construction, uprights 58 and 59 move in a direction opposite to that in which the members 21 and 21' move. Each of the uprights 58 and 59 has two longitudinally spaced rods 67 and 68 respectively pivotally supported therefrom, with the rods 67 and 68 movably engaging slots 67' and 68' respectively in members 21 and 21'. Rods 67 and 68 are provided with springs 67*a* and 68*a* respectively, with the ends thereof being disposed between the adjoining faces of the uprights and the particular members 21 and 21' disposed adjacent the uprights.

In Figure 1 it will be seen that the frame member 19 has a solenoid 70 rigidly affixed thereto by a screw or other conventional fastening means, and depends downwardly therefrom. A solenoid 72 is mounted on the frame member 20 which has a core 73 extending upwardly. Cross piece 22 is disposed between the two cores 71 and 73, and being of a magnetically attractable material, is drawn upwardly or downwardly depending on which of the solenoids 70 or 72 is electrically energized.

Switch S is best illustrated in Figure 2, and includes a tubular shell 80 enclosed on one end by a plate 81 and on the other end by a second plate 81*a*. An annular member 82 formed of an electrical insulating material is disposed within the confines of the shell between the two end pieces. A rotatably mounted core 83 is disposed within the confines of the switch which may be removably engaged by a key 83*a* and rotate it to either a first or second position. A wedge-shaped lug 83*b* of an insulating material extends downwardly from core 83 to serve as an electrical contact, and may be brought into engagement with either a contact 84 when the

core is in a first position, or a contact 85 when the core is in a second position. A pin 86 extends upwardly from the core 83 and is engaged by two oppositely disposed helical springs 87 and 88 that are in equal tension and affixed to eyes or affixing means 89 disposed on the interior surface of the shell 80. The member 82 has three electrical terminals 90, 91 and 92 projecting therethrough. Terminal 90 is connected to contact 84, terminal 91 to the core 83, and terminal 92 to contact 85. The switch S will normally be mounted on the dashboard of the vehicle in much the same manner as the conventional ignition switch of a vehicle.

My invention is connected to and made a part of the vehicle by connection of the control switch 100 for the headlights 101 and tail lights 102 thereof with an electrical conductor 103 to a junction point 103*a* on an electrical cable 104, which cable extends to junction point 104*a* on cable C. An electrical conductor 105 extends from junction point 103*a* to junction point 105*a*, from which an electrical conductor 106 leads to switch 107 used in actuating the horn 108. An electrical conductor 109 extends from junction point 105*a* to an ignition switch 110 that normally forms a part of the vehicle equipment.

As previously mentioned, the second contact 31 is connected by cable A to battery B, and also by an electrical conductor 112 to the fourth electrical contact 40. An electrical conductor 113 extends from contact 40 through cable E to terminal 91. Contact 84 of switch S is connected by an electrical conductor 114 to solenoid 70, and switch terminal 92 is connected by conductor 115 to the solenoid 72. Electrical contact 41 is connected by a conductor 116 to an electrical switch 117 that normally forms a part of the vehicle, and which is so disposed as to control the parking lights 118 thereof. The storage battery B is connected by a connector 120 to a ground G, as is the starter 112 by a conductor 121. Parking lights 118 are connected to ground G by conductors 123, and horn 108 is also connected to ground G by conductor 122. Solenoid 70 has a conductor 124 extending therefrom to ground G, and solenoid 72 is grounded by means of a conductor 125.

When installed on a vehicle and wired as above described, my invention is ready for use. It will be apparent that when the device occupies the position shown in Figure 1, that the parking lights 118 can be electrically energized by closing the switch 117, as current can flow from battery B through contact 31, conductor 112, contacts 40 and 41, sixth contact 44, and conductor 116 to the switch 117. It will be particularly noted that the actuation of the parking lights 118 is not dependent upon the position of contact 26. However, this is the only portion of the electrical circuit that can be actuated when the vehicle is in a stationary position without using key 83*a*. When it is desired to start the vehicle, key 83*a* may be inserted in switch S and momentarily rotated to bring contact 83*b* into engagement with the contact 84 and cause the electrical energization of solenoid 70.

As the solenoid 70 is energized, a magnetic force is generated in the core or armature 71 of such magnitude that the cross piece 22 is drawn upwardly, together with the members 21 and 21'. Upon upward movement of members 21 and 21', contact 26 is brought into engagement with the two contacts 31 and 32 and firmly held in engagement therewith due to the compression to which the spring 30 is put. During upward movement of members 21 and 21', arms 61 and 61' are rotated to cause downward movement of uprights 58 and 59. At this point rods 67 and 68 have been pivoted to an upwardly and inwardly extending position, and the compressed springs 67*a* and 68*a* exert an upwardly and inwardly extending force to maintain members 21 and 21' in such position that contact 26 is in communication with contacts 31 and 32 after the solenoid 70 is de-energized. De-energization of solenoid 70 occurs as the key 83*a* is permitted to assume the position shown in Figure 2 where it does not maintain contact 83*b* in communication with contact 84. Thus, electrical contact 26 will remain in position with the contacts 31 and 32 as shown in Figure 3, to permit the starter 112, the ignition system controlled by switch 110, the horn 108, the headlights 101 and the tail lights 102 to be energized by the particular switch mechanisms controlling them and forming a part of the vehicle equipment.

When it is desired to place the vehicle in a condition where it cannot be utilized, it is only necessary to turn the ignition switch to the "on" position and momentarily rotate key 83*a*, thus bring contact 83*b* into communication with contact 85. An electrical circuit is immediately established to storage battery B through electrical conductors 115, 113, 112 and A to solenoid 72 upon energization, exerting sufficient magnetic force to draw cross piece 22 and members 21 and 21' downwardly to break communication between contact 26 and contacts 31 and 32. As the downward movement of members 21 and 21' occurs, uprights 60 and 60' are moved upwardly with rotation of the pivotally supported arms 61 and 61' as previously explained. All of the electrical circuits in the vehicle will then be dead with the exception of that portion thereof leading to the parking lights 118.

It will be particularly noted that unauthorized cross connections of the conductors in cable E is prevented, due to the fact that the cable E enters confines of the switch S through an opening 82*b* formed in end piece 82*a*. Conductors 114 and 115 leave the confines of the switch S through an opening 80*a*.

Although the invention herein disclosed is fully capable of achieving the objects and providing the advantages hereinbefore mentioned, it is to be understood that it is merely illustrative of the presently preferred embodiment of my invention, and that I do not mean to limit myself to the details of construction herein shown and described other than as defined in the appended claims.

I claim:

1. An anti-theft device for internal combustion powered vehicles having a storage battery, electrical starter, and electrical ignition system which includes: a frame; a member movably mounted in said frame; spring means adapted to maintain said member in a first position and a second position; a first electrical contact disposed on said member; a second electrical contact; means to electrically connect said second contact to said storage battery; a third electrical contact; means to electrically connect said third contact to said starter and electrical ignition; a first magnetic means which when electrically actuated moves said member to said first position whereby said first contact is in communication

with said second and third contacts; a second magnetic means which when electrically actuated moves said member to said second position whereby said first contact is not in communication with said second and third contacts; an electrical switch capable of being moved to a first position and a second position; and an electrical circuit having a first portion and a second portion, each of which may be selectively completed when said switch is in said first position or said second position, said switch when in said first position completing said first electical circuit to actuate said first magnetic means and move said member to said first position whereby said first contact is in communication with said second and third contacts, and when said switch is in said second position, actuating said second electrical circuit to actuate said second magnetic means to move said member to said second position whereby said first electrical contact is not in communication with said second and third contacts.

2. An anti-theft device for internal combustion powered vehicles having a storage battery, electrical starter and electrical ignition system which includes: a frame; a member movably mounted in said frame; spring means adapted to maintain said member in a first position and a second position; a first electrical contact disposed on said member; a second electrical contact; means to electrically connect said second contact to said storage battery; a third electrical contact; means to electrically connect said third contact to said starter and electrical ignition; a magnetically attractable bar mounted on said member; a first solenoid which when electrically energized attracts said bar causing said member to move to said first position whereby said first contact is in communication with said second and third contacts; a second solenoid which when electrically energized attracts said bar causing said member to move to said second position whereby said first contact is not in communication with said second and third contacts; an electrical switch adapted to be moved to a first position and a second position; and an electrical circuit having a first portion and a second portion, each of which may be selectively completed when said switch is in said first position or said second position, said switch when in said first position completing said first electrical circuit to actuate said first solenoid and attract said bar to move said member to said first position whereby said first contact is in communication with said second and third contacts, and said switch when in said second position breaking said first circuit and completing said second circuit to actuate said second solenoid and attract said bar to move said member to said second position whereby said first electrical contact is not in communication with said second and third contacts.

3. An anti-theft device for internal combustion powered vehicles having a storage battery, electrical starter and electrical ignition system which includes: a frame; a substantially H-shaped member formed with a cross bar of magnetically attractable material; spring means adapted to maintain said member in a first position and a second position; a first electrical contact disposed on said member; a second electrical contact; means to electrically connect said second contact to said storage battery; a third electrical contact; means to electrically connect said third contact to said starter and electrical ignition; a first magnetic means which when electrically actuated moves said member to said first position where said first contact is in communication with said second and third contacts; a second magnetic means which when electrically actuated moves said member to said second position where said first contact is not in communication with said second and third contacts; an electrical switch capable of being moved to a first position and a second position; and an electrical circuit having a first portion and a second portion, each of which may be selectively completed when said switch is in said first position or said second position, said switch when in said first position completing said first electrical circuit portion to actuate said first magnetic means and move said member to said first position where said first contact is in communication with said second and third contacts, and said switch when in said second position actuating said second electrical circuit portion to actuate said second magnetic means and move said member to said second position where said first electrical contact is not in communication with said second and third contacts.

4. An anti-theft preventing device for an internal combustion powered vehicle having a storage battery, electrical starter, head and tail lights, electrical ignition and parking lights, comprising: a frame; a substantially H-shaped member, a portion of which is formed from a magnetically attractable material which includes a first leg and a second leg; spring means adapted to maintain said member in a first position and a second position; a first electrical contact disposed on said first leg; a second electrical contact; means to electrically connect said second contact to said storage battery; a third electrical contact; means to electrically connect said third contact to said starter, head and tail lights and electrical ignition; a fourth electrical contact; a fifth electrical contact; a sixth electrical contact disposed on said second leg; a first magnetic means which when electrically actuated moves said member to said first position where said first contact is in communication with said second and third contacts, and said sixth electrical contact is not in communication with said fourth and fifth electrical contacts; a second magnetic means which when electrically actuated moves said member to said second position where said first contact is not in communication with said second and third contacts, and said sixth electrical contact is in communication with said fourth and fifth electrical contacts; an electrical switch capable of being moved to a first position and a second position; a first electrical conductor extending from said second contact to said fourth contact; a second electrical conductor extending from said fourth contact to said switch; a third electrical conductor extending from said switch to said first magnetic means; a fourth electrical conductor extending from said switch to said second magnetic means; a fifth conductor extending from said fifth contact to said parking lights; and means grounding said storage battery, starter, head and tail lights, parking lights and said first and second magnetic means, with said switch when in said first position completing a circuit from said storage battery to said first magnetic means to move said member to said first position and permit said battery to energize said starter, ignition and head and tail lights, and said switch when in said second position

completing a circuit from said battery to said second magnetic means whereby said member is moved to said second position where only said parking lights may be energized from said battery.

5. An anti-theft preventing device for an internal combustion powered vehicle having a storage battery, electrical starter, head and tail lights, electrical ignition and parking lights, comprising: a frame; a substantially H-shaped member, a portion of which is formed from a magnetically attractable material which includes a first leg and a second leg; a plurality of uprights movably supported in said frame; pivotal connecting means that cause said uprights to move in a direction opposite that in which said member moves; spring means operatively associated with said frame and uprights that maintain said frame in either a first position or a second position; a first electrical contact disposed on said first leg; a second electrical contact; means to electrically connect said second contact to said storage battery; a third electrical contact; means to electrically connect said third contact to said starter, head and tail lights and electrical ignition; a fourth electrical contact; a fifth electrical contact; a sixth electrical contact disposed on said second leg; a first solenoid which when electrically energized attracts said member to move it to said first position where said first contact is in communication with said second and third contacts, and said sixth electrical contact is not in communication with said fourth and fifth contacts; a second solenoid which when electrically energized attracts said member to move it to said second position where said first contact is not in communication with said second and third contacts, and said sixth electrical contact is in communication with said fourth and fifth electrical contacts; an electrical switch capable of being moved to a first position and a second position; a first electrical conductor extending from said second contact to said fourth contact; a second electrical conductor extending from said fourth contact to said switch; a third electrical conductor extending from said switch to said first magnetic means; a fourth electrical conductor extending from said switch to said second magnetic means; a fifth conductor extending from said fifth contact to said parking lights; and means grounding said storage battery, starter, head and tail lights, parking lights and said first and second magnetic means, with said switch in said first position completing a circuit from said storage battery to said first magnetic means causing said member to move to said first position and permitting said battery to energize said starter, ignition and head and tail lights, said switch when in said second position completing a circuit from said battery to said second magnetic means whereby said member is moved to said second position and only said parking lights may be energized from said battery.

6. A theft preventative device for internal combustion powered vehicles having a storage battery, electrical starter and electrical ignition system which includes: a frame; a member movably mounted in said frame; spring means capable of maintaining said member in a first position and a second position; a first electrical contact disposed on said member; a second electrical contact; means to electrically connect said second contact to said storage battery; a third electrical contact; means to electrically connect said second contact to said storage battery; a third electrical contact; means to electrically connect said third contact to said starter and electrical ignition; an electrical switch capable of being moved to a first and a second position; electrically operated magnetic means capable of moving said member to either said first or second positions; and an electrical circuit having a first portion and a second portion, each of which may be selectively completed when said switch is in said first position or said second position, said switch when in said first position completing said first electrical circuit portion to actuate said first magnetic means and move said member to said first posiiton whereby said first contact is in communication with said second and third contacts, and said switch when in said second position actuating said second electrical circuit portion to actuate said second magnetic means and move said member to said second position whereby said first electrical contact is not in communication with said second and third contacts.

7. A theft preventative device for internal combustion powered vehicles having a storage battery, electrical starter and electrical ignition system which includes: a frame; a member movably mounted in said frame; spring means capable of maintaining said member in a first position and a second position; a first electrical contact formed with two opposite, upwardly and inwardly disposed sides; a rod affixed to said contact and slidably mounted for longitudinal movement on said member; a stop affixed to said rod that restricts longitudinal movement of said contact relative to said member; resilient means that at all times urge said contact outwardly from said member; a second electrical contact formed with an upwardly and inwardly disposed face adapted to be placed in communication with one face of said first contact; means to electrically connect said second contact to said storage battery; a third electrical contact formed with an upwardly and inwardly disposed face adapted to be placed in communication with one face of said first contact; means to electrically connect said third contact to said starter and electrical ignition; an electrical switch capable of being moved to a first and a second position; electrically operated magnetic means capable of moving said member to either said first or second position; and an electrical circuit having a first portion and a second portion, each of which may be selectively completed when said switch is in either said first position or said second position, said switch when in said first position completing said first electrical circuit portion to actuate said first magnetic means and move said member to said first position where said first contact is in communication with said second and third contacts, and said switch when in said second position actuating said second electrical circuit portion to actuate said second magnetic means and move said member to said second position where said first electrical contact is not in communication with said second and third contacts.

EDGAR E. HERRELL.

No references cited.