

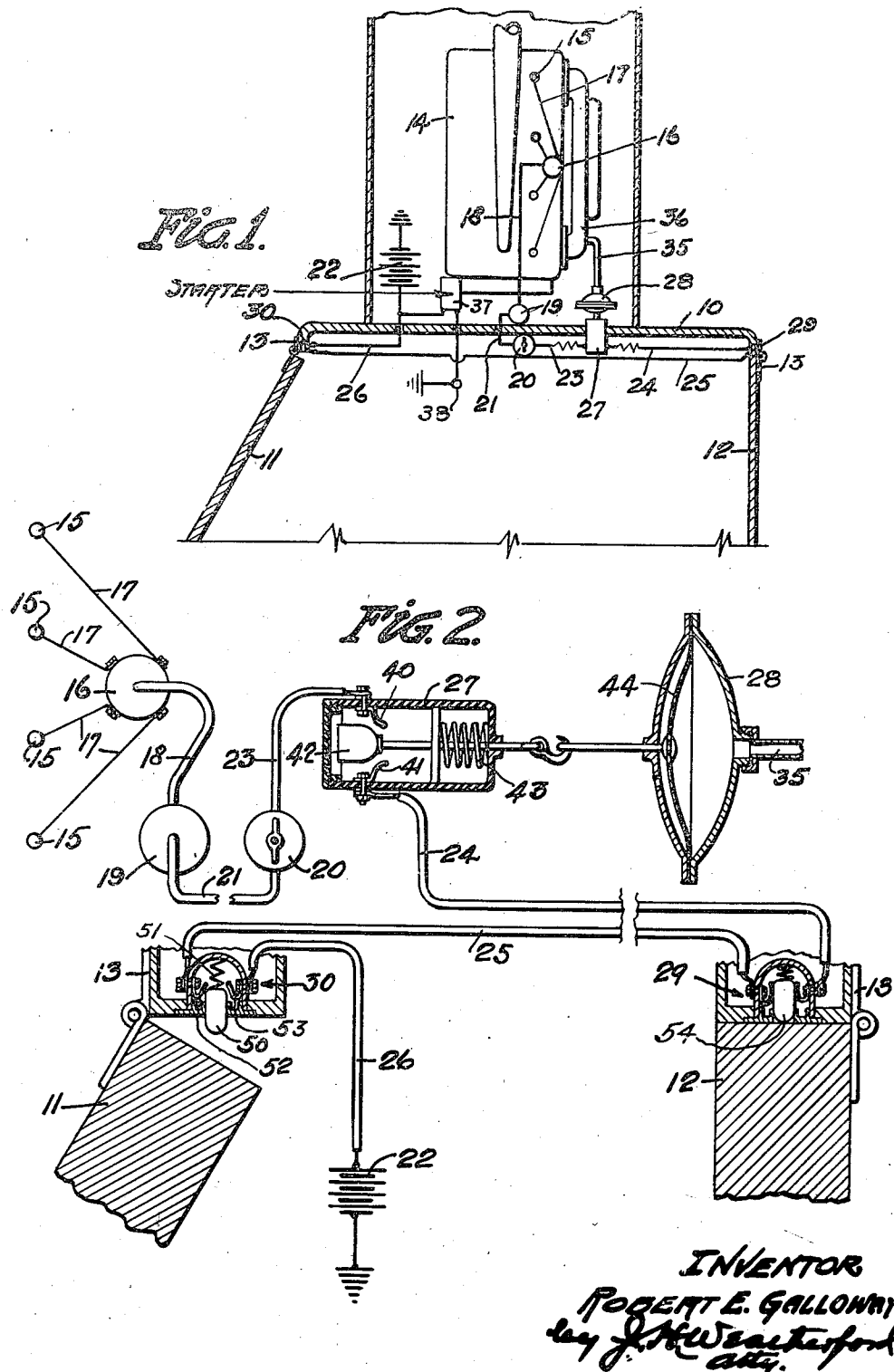
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IGNITION SWITCH CUT-OFF

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IGNITION SWITCH CUT-OFF

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5 Claims. (Cl. 180—82)

This invention relates to an automatic means for cutting off the ignition current of an automobile or other vehicle, powered by an internal combustion engine, whenever the operator of the vehicle leaves the vehicle.

In the operation of autos, trucks and the like, particularly autos, such as taxicabs, and commercial trucks, where numerous and sometimes more or less protracted stops are made, in which the operator leaves the machine, there is a tendency on the part of the operator to leave the engine running and where the stops are prolonged incurring an entirely unnecessary expense.

Devices for breaking the ignition circuit are known in which opening of a door of the vehicle breaks a contact and kills the ignition, thus stopping the engine; but such devices are treacherous, in that although the ignition circuit is temporarily cut off and the engine stopped, the circuit is subsequently closed when the door is shut without starting the engine it is true, but restoring the battery circuit and causing subsequent draining of the battery even to the extent that it has been necessary to remove and recharge the battery before it could again be used. This latter occurrence usually arises where a car is parked, as in a garage on Saturday afternoon, or preceding a holiday, and the engine is killed without cutting off the ignition switch, thus permitting the battery to discharge for a period of thirty-six hours or often even longer.

The primary object of the present invention is to provide means for cutting off the ignition when the driver of the vehicle opens the door and leaves the vehicle, and additional means dependent on operation of the engine for cutting off the battery and ignition circuits so that actual operation of the engine by an external means, such as the self-starter, is necessary before the circuit is again restored and the battery reconnected.

The means by which the foregoing and other objects are accomplished and the manner of their accomplishment will be understood from the following specification on reference to the accompanying drawing, in which—

Fig. 1 is a sectional plan view showing diagrammatically an engine, battery and ignition circuit embodying the invention.

Fig. 2 is a diagrammatic view, showing on a larger scale, the circuit and switching mechanisms.

In these views it will be understood that substantially all of the instrumentalities employed are typical only of instrumentalities which may be employed in the circuit, substantially all of

these instrumentalities being purchasable in the open market and their details forming no part of the present invention.

Referring now to the drawing in which the various parts are indicated by numerals, 10 is a part of the vehicle body; 11 and 12 are doors which provide access to the driver's section, the door 11 being shown partially open. These doors are shown with their front edges hinged to the body, as by hinges 13, but it will be understood these hinges may be at the back edges instead.

14 is the engine cylinder block, 15 the spark plugs, and 16 the usual distributor from which current is distributed through the lead wires 17 to the spark plugs. 18 is the lead from the usual coil 19 to the distributor. 20 is the ignition switch and 21 the lead from the ignition switch to the coil. 22 is the storage battery of usual type which may be charged during running in the manner usual to automobiles, but not shown here.

23—24—25—26 are respectively portions which form the lead which connects the ignition switch 20 and the battery 22. This lead is interrupted by a switch 27, which is closed by a vacuum device 28, and is also interrupted by switches 29 and 30, which are mounted on the door frames and are each adapted to be opened by the opening of a door, as the door 11, or closed by the closing of a door, as the door 12.

It will be understood that the circuit shown in Fig. 2 is for the purpose of illustration intended to be identical with the circuit shown in Fig. 1, but it will be distinctly understood that the positioning and sequence of the interrupting switches in the circuit is immaterial so long as they lie between the battery and the spark plugs. Also it will be noted that either of the door switches may be omitted should it be desired.

The vacuum device 28 is connected by a tube 35 with some portion of the engine, such as the intake manifold 36, which is under vacuum during the operation of the engine. 37 indicates the usual well known starter motor and 38 the usual starter button.

The switch 27 may include a pair of contact points 40, 41, connected respectively to the leads 23 and 24, and a contact member 42 for establishing connection between the two points; the contact member 42 being urged away from such contact, as by a compression spring 43, and being adapted to be drawn into and held in contact with the points by the vacuum device 28. This device may include a casing in which is a flexible diaphragm 44, which under action of the engine

vacuum shifts and closes the switch contacts. The door switches, as the switch 30, may include a plunger 50 which, when forced in by closure of the door, against action of a compression spring 51, establishes connection between the contact points 52 and 53, and connects the lead portions 25—26. With the door 11 open, as shown, the plunger has been forced out by the spring 51 and the connection severed. The plunger 54 of the switch 29 is shown forced in by the closed door 12 and the lead portions 24 and 25 connected.

In installing the device, the ignition circuit from the usual battery on the car is brought to the switch 30 on one of the doors; thence carried across to the switch 29 of the other door, if there be two such doors, through which ingress and egress of the vehicle operator is had; thence carried to a vacuum operated switch 27, and thence to the usual ignition switch, the wiring from the ignition switch to the motor not necessarily being disturbed. Stated in another way, the ignition circuit from the battery to the ignition switch is interrupted by these three switches. It will be obvious and is understood that if there be only one door through which ingress and egress is had only one such switch could be used. It will be noted that preferably each of the three switches is biased open; that two of them are closed each by closing the related vehicle door and that the third is closed whenever the engine is running or is being turned by the starter at sufficient speed to create a vacuum.

In operation; with the vehicle doors shut and the ignition switch on, the engine is started in usual manner by use of the self-starter, the self-starter turning the engine creates a vacuum in the intake manifold and, through the tube 35, creates a vacuum in the vacuum device 28, closing the switch 27 and establishing an uninterrupted ignition circuit, permitting normal operation of the vehicle.

When the vehicle is stopped, the operator may cut off the ignition switch, in which case the present apparatus would be unnecessary; however, should the operator fail to cut off the ignition switch, leaving the engine running, opening of a door to leave the vehicle would permit the related door switch to open and kill the ignition circuit, cutting off the engine ignition and stopping the engine. When the engine stopped the vacuum created by operation of the engine would cease and the switch 27 also open. Thereafter closing of the door and closing the related door switch would still leave a circuit broken by the vacuum switch and obviously would keep the battery disconnected and prevent drainage of the battery current. On return of the operator to the vehicle starting would be effected as above described.

I claim:

1. In a vehicle having doors for entrance and exit of an operator; said vehicle being powered

by an internal combustion engine having a chamber under vacuum during operation and having a starter adapted to turn said engine and create a vacuum; an ignition circuit including in series, switches operatively connected each to a said door and an additional switch biased open; a vacuum device for closing said latter switch, and means connecting said engine vacuum chamber and said vacuum device; said door switches each including means operable by opening and closing its respective said door for opening and closing said switch, and said vacuum being adapted to close said additional switch under vacuum.

2. In a vehicle having doors for entrance and exit of an operator, said vehicle being powered by an internal combustion engine having a starter adapted to turn said engine; an ignition circuit including in series, switches biased open and connected each to a said door and an additional switch biased open; and means actuated by turning of said engine for closing said latter switch, said door switches each including means operable by closing its respective said door for closing said switch.

3. In a vehicle having a door for entrance and exit of the operator, said vehicle being powered by an internal combustion engine which during operation creates a vacuum within a chamber thereof, and which has a starter adapted to crank said engine for starting; an ignition circuit which includes in series, a first switch biased open, mounted adjacent said door and closed by closing said door and a second switch biased open; a vacuum device for closing said second switch, operatively connected thereto; and means establishing connection between said vacuum device and said engine chamber.

4. In a vehicle having a door for entrance and exit of the operator, said vehicle being powered by an internal combustion engine, and which has a starter adapted to turn said engine for starting; an ignition circuit which includes in series, a first switch biased open, and mounted adjacent said door, said switch being closed by closing said door and a second switch, biased open; and means operated by turning said engine operatively connected to said second switch for closing said switch during turning of said engine.

5. In a vehicle having a door for entrance and exit of the operator, said vehicle being powered by an internal combustion engine, and which has a starter adapted to crank said engine for starting; an ignition circuit, which includes in series, circuit breaking means opened and closed respectively by opening and closing said door and a second circuit breaking means biased open; and means connected to said second circuit breaking means and rendered effective by operation of said engine for closing said second circuit breaking means.

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