

May 7, 1935.

R. E. FARREN

2,000,830

IGNITION TROUBLE ELIMINATOR

Filed Aug. 10, 1931

2 Sheets-Sheet 1

Fig-1.

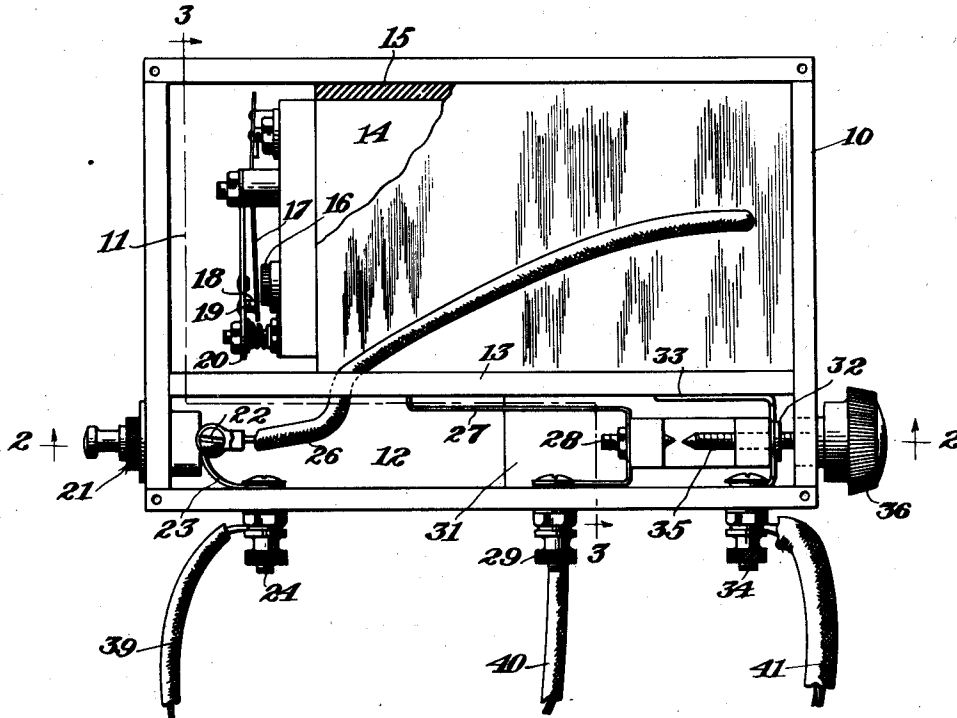
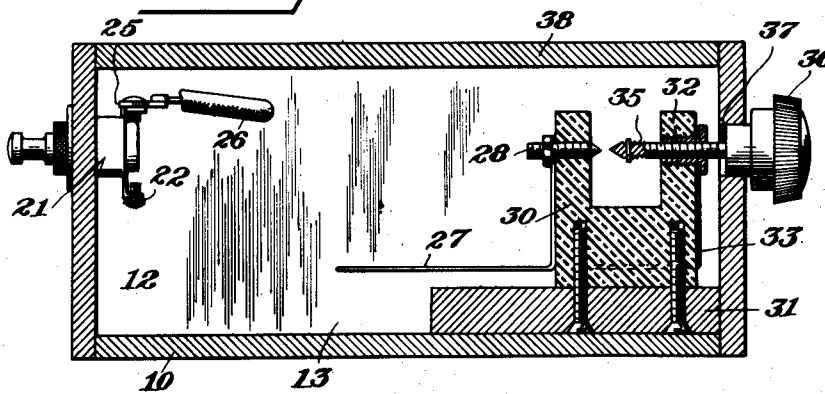


Fig-2.



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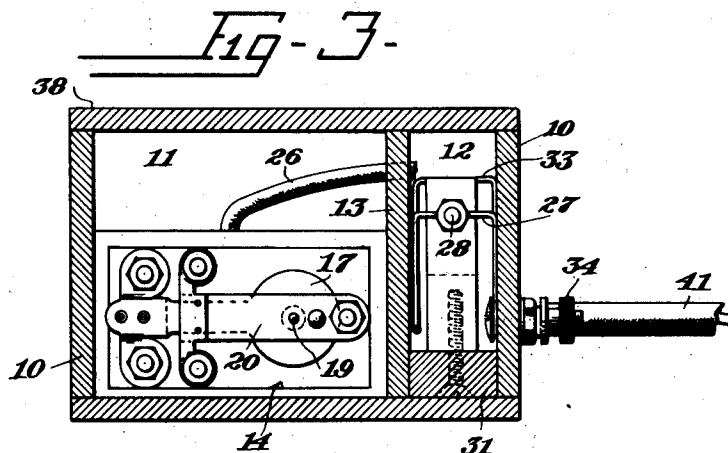
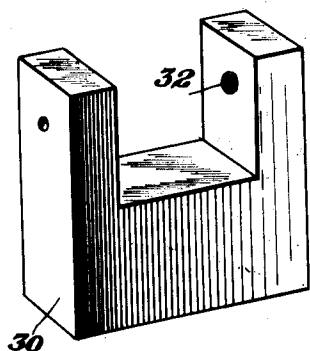
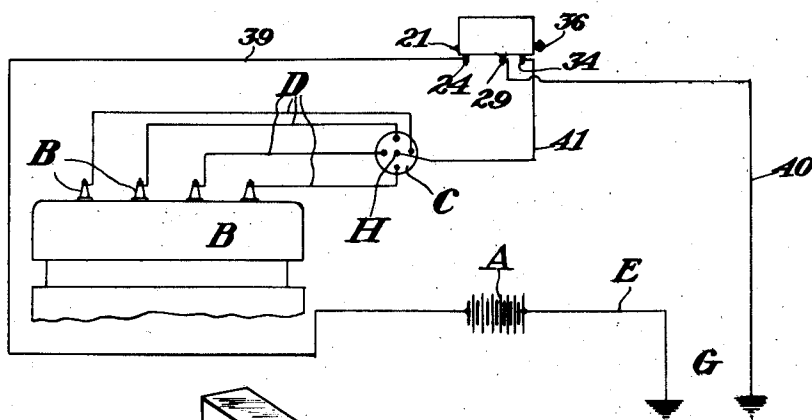


Fig-4-



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## UNITED STATES PATENT OFFICE

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## IGNITION TROUBLE ELIMINATOR

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Application August 10, 1931, Serial No. 556,260

## 1 Claim. (Cl. 123—148)

This invention relates to ignition apparatus for automobiles, motorboats or the like and has for its general object the provision of a novel device for trouble or emergency purposes adapted to be connected with the ground, the battery and the distributor head of the ignition apparatus of an automobile or the like for the purpose of enabling the motor to be run even though the ignition key may be lost or even though there may be a number of defects present rendering the usual apparatus ineffective.

A further object is to provide a device of this character which may be manufactured and sold as a complete and separate designed primarily for emergency purposes but which can naturally, if so desired, be used continually instead of the usual apparatus if such is found advisable for any reason such as for example in the event of an irreparable defect in the distributor of the ordinary ignition system.

An additional object is to provide an apparatus of this character which may be built up of practically standard parts and which will therefore be simple and inexpensive to make, the device being moreover easy to use, positive in action, efficient and durable in service, and a general improvement in the art.

With the above and other objects and advantages in view the invention preferably consists in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which

Figure 1 is a view partly in elevation and partly in section showing my device with the cover plate of the casing removed.

Figure 2 is a section taken on the line 2—2 of Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a diagram of the electrical circuit, and

Figure 5 is a detail perspective view of one of the elements supporting the auxiliary spark gap device.

Referring more particularly to the drawings, I have shown my device as comprising a suitable casing 10 which may be formed of wood or any other suitable material, preferably of an insulating character, this casing being divided interiorly into compartments 11 and 12 by means of a partition 13. Located within the compartment 11 is a conventional type of spark coil indicated as a whole by the numeral 14 and which is preferably surrounded by a jacket 15 of insu-

lating material. Customarily such spark coils comprise a core 16 about which is wound a primary coil located in inductive relation to a secondary coil which provides an induced high tension current appropriate for creating a spark between the electrodes or terminals of the spark plugs of an internal combustion engine. Such a spark coil device 14 also includes a vibratory armature 17 having a contact 18 cooperating with a contact 19 on an adjustable arm 20, the arrangement of these parts being such that when current is passed through the primary coil of the device the armature 18 will be attracted by the core 16 and will break the circuit between the contacts 18 and 19 so that the armature may return to its original position, this action being very rapid and being simply in the nature of a vibration.

Located within the compartment 12 is a conventional type of push and pull switch 21, not shown in detail and which has one terminal 22 connected by a conductor 23 with a binding post 24 on the outside of the casing 10, and which has its other terminal 25 connected by a conductor 26 with one terminal of the primary coil of the spark coil device 14. The other terminal of the primary coil is connected by a conductor 27 with the stationary contact 28 of an adjustable spark gap to be described and with a binding post 29 on the outside of the casing 10. It is customary that one terminal of the primary coil be also connected with one terminal of the secondary coil, and it is apparent that the conductor 27 constitutes this common connection.

The adjustable spark gap device is also located within the compartment 12 and comprises a U-shaped support 30 of insulating material here represented as mounted upon a block 31 secured within the casing, the stationary contact 28 above referred to passing through one arm or leg of this U-shaped member as clearly indicated in Figure 2. The gap device further includes a metallic bushing or sleeve 32 extending through the other arm or leg of the U-shaped support 30 and having connected therewith a conductor 33 which connects with the other terminal of the secondary coil of the spark coil device 14 and also with a binding post 34 on the outside of the casing 10. Threaded through the metallic sleeve or bushing 32 is a screw 35 having its free end intended to cooperate with the free end of the stationary contact 28 for the purpose of defining a spark gap. The adjacent ends of the contact 28 and screw 35 are preferably tapered or of conical shape as shown. At its other end the screw 35 is

equipped with an adjusting knob 36 located exteriorly of the casing and journaled in an opening 38 in one wall thereof, the idea being that by turning the knob 36 in one direction or the other the screw 35 may be advanced or retracted for varying the spark gap distance between the adjacent ends of the contact 28 and screw 35.

It is intended that the entire device when completed be assembled within the casing 10 which may be filled with a sealing compound if such is desired but which is at least closed by means of a cover 38 so that access may not be had to the interior for the purpose of tampering. However in the event of necessity the cover 38 might be removed so that there could be an adjustment made to the vibrator structure of the spark coil device 14.

In the use of the device, it is intended that it be used in association with the storage battery A, the spark plugs B and the distributor head C all forming part of the ignition system of the automobile or the like. It is well known that the stationary contacts of the distributor head C are connected by conductors D with the respective spark plugs of the engine. It is also known that the storage battery customarily has one terminal grounded by a conductor E. In using my device, it is necessary to connect a conductor 39 with the binding post 24 and with the other terminal of the storage battery A, to connect the binding post 29 with the ground G by means of a conductor 40, and to connect the binding post 34 by means of a conductor 41 with the central terminal H of the distributor head.

In the operation, it will be seen that current will flow from the battery A through the conductor 39, through the switch 21, primary coil of the spark coil device, binding post 29, and conductor 40 back through the ground to the battery. The secondary or high tension current induced in the secondary coil of the spark coil device or vibrator will flow from the conductor 41 to the central contact H of the distributor head C and as the rotary arm of this distributor turns this current will be supplied to the successive contacts connected by the conductors D with the spark plugs B of the engine, thereby causing the necessary ignition to effect running of the engine.

The spark gap is connected across the secondary and is adjusted to effect such spacing of its points that the secondary current will be shunted to the ground, except when the movable

member of the distributor is directly opposite any of the contacts thereof. By making the spark gap adjustable, the proper spacing of its points may be effected to accomplish this purpose. Thus, except in the proper positions of the distributor, the ignition current will be shunted to the ground through the spark gap.

By reason of this arrangement, the ordinary vibrator coil can be used for ignition purposes and no circuit breaker is necessary as on the conventional ignition. Therefore, should the circuit breaker get out of order, or the ignition coil, or the condenser thereof in the usual vehicle equipment, the present invention may be substituted by connecting the binding post 29 to the ground, the binding post 34 to the rotary member of the distributor and the binding post 24 to the ungrounded terminal of the battery, when ignition current will be immediately available to the vehicle engine. Thus the invention provides an emergency equipment susceptible of use with the conventional motor vehicle equipment, in the event of damage or disarrangement of numerous parts of the ignition apparatus, as above explained.

Having thus described the invention I claim:

An emergency or auxiliary appliance for operating the ignition system of an internal combustion engine independently of the usual ignition switch, the same comprising a casing, a spark coil of the vibrator type located within the casing and having primary and secondary windings of which one terminal of each is grounded, the other terminal of the primary winding being for connection with the ungrounded terminal of the motor vehicle battery and the other terminal of the secondary winding being for connection with the rotary member of the vehicle distributor, and a spark gap connected across the secondary winding and comprising a U-shaped member of insulating material mounted within the casing, a stationary contact extending through one arm of said U-shaped member, and a screw contact threaded through the other arm of the U-shaped member and having an operating knob located exteriorly of the casing for adjustment of the screw to effect such spacing of the gap as will shunt the secondary current to ground except when the movable member of the distributor head is directly opposite any of the stationary contacts of said head.

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