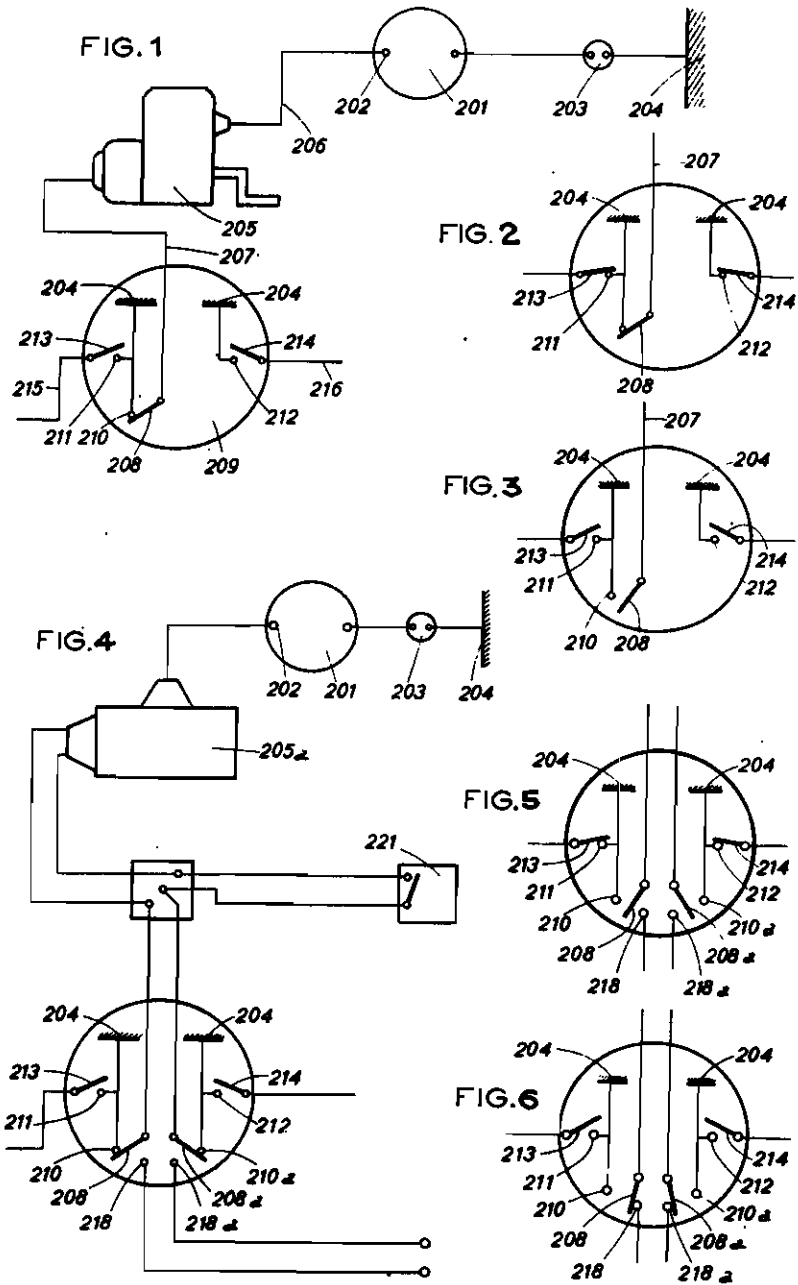


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DEVICES FOR STARTING AIRCRAFT ENGINES
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ALIEN PROPERTY CUSTODIAN

DEVICES FOR STARTING AIRCRAFT ENGINES

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Property Custodian

Application filed July 14, 1942

The present invention is a division of my co-pending application Serial No. 343,303 filed on 29th June 1940.

My invention relates to the devices used for starting internal combustion engines for aircrafts and the like and more particularly to electric devices for producing the ignition during starting, and has for its objects a number of improvements in this type of devices.

A first improvement consists in a switch provided with two contacts which are connected to the frame and respectively co-operate with two movable contacts, one connected to one of the magnetos of the engine to be started and the other to the second magneto, and at least a third fixed contact which is likewise connected to the frame and co-operates with a third movable contact connected to the auxiliary starting generator.

In the case in which said generator is a coil, the switch is provided with a fourth fixed contact which is identical to the third and which co-operates with a fourth movable contact, these two movable contacts being adapted to occupy three positions and to contact respectively with two other fixed contacts connected to the two poles of the source of current.

Other objects and features of my invention will furthermore become apparent from the ensuing description of an exemplary embodiment of an apparatus for the ignition during starting and be more fully pointed out in the appended claims.

In the annexed drawings:

Fig. 1 shows diagrammatically an apparatus for the ignition during starting including a starting magneto.

Figs. 2 and 3 show the controlling switch in two other operative positions.

Figs. 4, 5 and 6 are respectively similar to Figs. 1, 2 and 3 in the case of apparatus provided with a starting coil.

In Fig. 1, which shows diagrammatically the electric apparatus for the ignition during starting, 201 designates the magneto for normal operation and 202 the starting contact with which said magneto is provided, 203 designates one of the spark plugs and 204 the metal mass of the engine; 205 is the starting magneto, the secondary of which is connected by a wire 206 to the starting contact 202 of the normal operation magneto 201, whereas its primary is connected by a wire 207 to a movable contact 208 of a switch 209. Said contact 208 cooperates with a contact 210 and the switch is provided with two other contacts 211 and 212 which are con-

nected to the frame 204 and co-operate respectively with movable contacts 213 and 214 respectively connected by the wires 215 and 216 to the normal operation magnetos of the engine.

The operation of this apparatus is as follows:

In the inoperative position (Fig. 2), the three movable contacts 208, 213 and 214 are respectively connected to the corresponding contacts 209, 211 and 212 and the respective primaries of the three magnetos are connected to the frame. The ignition is cut off and there is absolute safety.

In order to start the engine (Fig. 3), the movable contacts 208, 213 and 214 are separated from the contacts 209, 211 and 212 and the primaries of the three magnetos are insulated from the frame. The three magnetos can therefore all supply current at once.

In normal operation (Fig. 1), the movable contacts 213 and 214 are separated from the contacts 211 and 212 but the movable contact 208 is on the contact 209. The normal operation magnetos therefore continue to supply current whereas the starting magneto 205 no longer supplies current, its primary being connected to the frame and the high frequency oscillations being short-circuited to the frame.

The apparatus shown in Fig. 4 differs from the previous one by the fact that the high tension starting generator is formed by a coil 205a. One of the ends of the primary of said coil is connected to the movable contact 208 as was the above starting magneto 205 but the switch is provided with a contact 210 which co-operates with said movable contact 208 and which is connected by a conductor 219 to one of the poles of a source of current 220. The other end of said primary is connected to a shielded switch 221 which is itself connected to a movable contact 208a of the switch, which contact is similar to the contact 208, and which co-operates with two contacts 210a and 218 respectively connected to the contact 212 and, through a conductor 222, to the second pole of said source of current.

The operation is the same as in the previous case and it is obvious (Fig. 4) that, in normal operation, the coil 205a is completely insulated from the source of current 220 while the normal operation magnetos are connected to the frame through the coil 205 owing to the fact that the movable contacts 208 and 208a are connected to the contacts 210 and 210a.

When inoperative (Fig. 5), the normal operation magnetos are directly connected to the frame, the movable contacts 213 and 214 being

respectively connected to the contacts 211 and 212 and the coil is again completely insulated from the source of current 220, the contacts 208 and 208a being open.

In the position for starting ignition (Fig. 5), the contacts 108 and 108a are connected to the contacts 118 and 118a and the coil 105a is thus connected to the source of current 120, whereas the contacts 113 and 114 are open and the corresponding magnetos are insulated from the frame.

Whether the starting high tension generator is a magneto or a coil, the movable contacts of

the switch are preferably conjugated with each other in such a manner as to be operable by means of a common hand or foot operated member.

5 While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification, without departing from the spirit of the invention, I therefore do not wish
10 to be limited to the precise details of construction set forth.

CHARLES RAYMOND WASEIGE.