

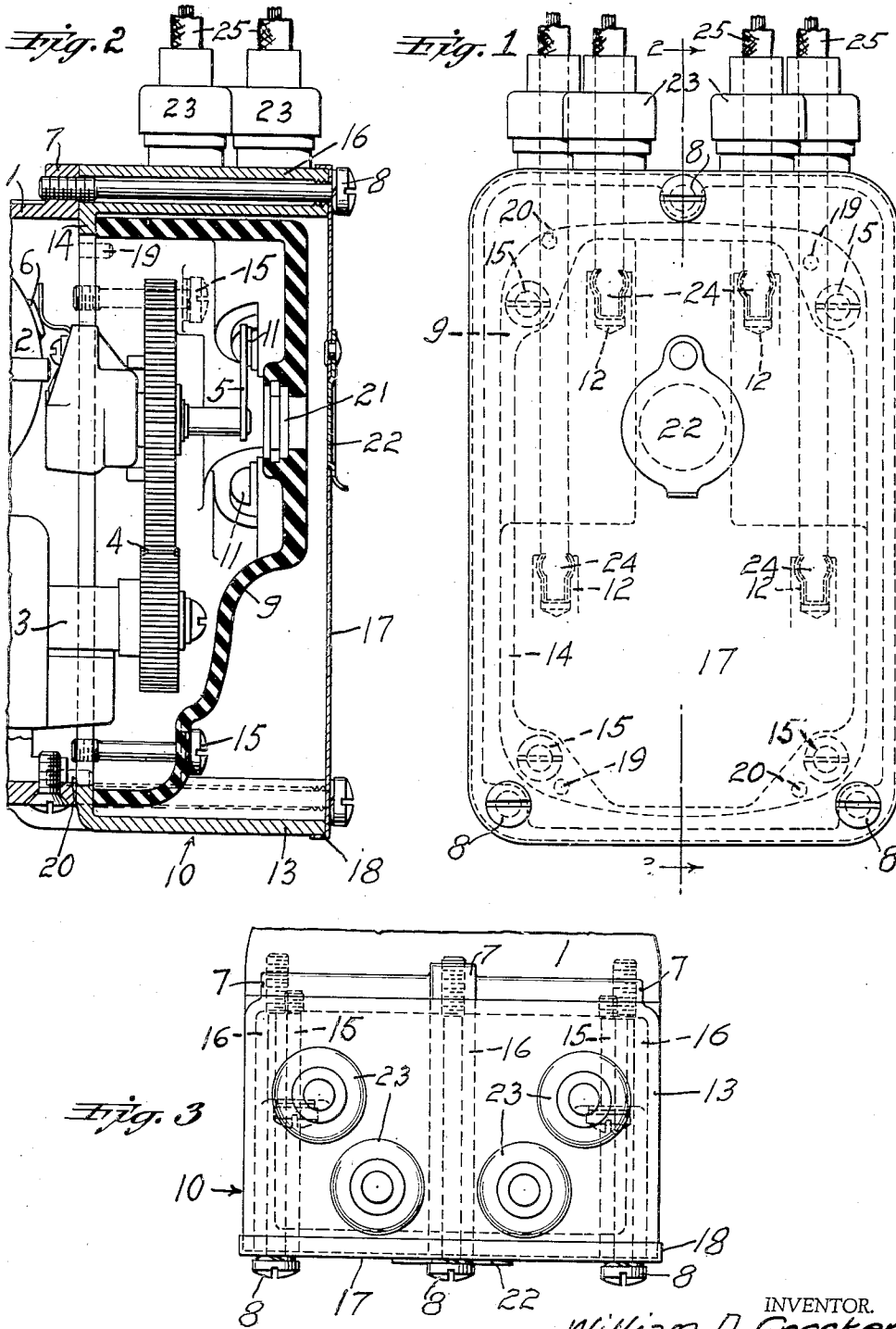
Dec. 23, 1941.

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2,267,396

MULTICYLINDER IGNITION GENERATOR

Filed Dec. 14, 1940



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2,267,396

MULTICYLINDER IGNITION GENERATOR

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Application December 14, 1940, Serial No. 370,103

4 Claims. (Cl. 171—209)

The present invention relates to multicylinder ignition generators for internal combustion engines, such as magnetos and timer distributors associated with battery ignition coils, and it relates particularly to such a generator with a distributor having a housing of metal or insulating or other material acting as a radio shield or a dust or water cover for the distributor plate or cap of the generator.

The primary object of the invention is to provide in a generator of this kind a distributor having a housing which is directly and detachably fastened to the generator frame and to which the distributor plate is interiorly and positively fastened detachably and solely, so that the two elements are removable from and attachable to the generator frame as a unit only and only when so removed from the generator may be attached to and detached from each other. Preferably, the distributor plate housing carries outlet terminals or other means for the sparkplug cables passing individually there-through from electrical connection with the distributor plate, and has a detachable end wall or other portion which may be removed whenever the ignition generator is at rest, whether or not installed on the engine, in order that the distributor plate may be detached from the housing, and/or in order that sparkplug cables may be more readily disconnected from the distributor plate. In such preferred construction, that wall or portion, in the form of a flanged plate, is so arranged as to be detached from or attached to the remainder of the housing, as a rim surrounding the distributor plate, by means of the same screws as fasten the housing to the generator frame. In this way, a simple, inexpensive, positively connected and compact arrangement is provided in a construction which meets the requirements for quick and ready assembly and disassembly, for inspection, adjustment or repair of the generator while on or off the engine, and furthermore comprising parts which are positively fastened together so as to remain securely and dependably fastened under severe conditions of vibration as on an airplane.

Another object of the invention is to provide a distributor plate housing which may or may not have the detachable arrangement above noted but which is provided with a timing window, and a movable door for sealing it, in registry with a timing window in the distributor plate.

Other objects and advantages of the invention will appear from the following description taken in connection with the accompanying drawing

showing, as an example, a metal housing acting with the metal frame of a magneto to constitute therewith a complete radio shield for the generator, and having individual outlets for the respective shielded sparkplug cables. In the drawing,

Fig. 1 is an elevation of the rear end of the magneto showing the preferred form of the housing, with some interior parts of the associated distributor plate and sparkplug cables shown in broken lines; Fig. 2 is a fragmentary section, partly in elevation, on line 2—2 of Fig. 1; and Fig. 3 is a top plan view of the housing in place on the magneto, with certain interior parts shown in broken lines.

In the drawing, the reference numeral 1 generally indicates a magneto frame of die cast metal enclosing an ignition coil 2, magnetic rotor 3, distributor gearing 4 and distributor rotor 5 electrically connected to the high tension terminal 6 of the coil, all of the general form shown in Patent No. 2,243,418. The frame 1 has three outwardly-extending threaded lugs like 7 into which extend the three screws 8 to fasten thereto as a unit over the open rear end of the frame, as will hereinafter appear, the Bakelite distributor plate 9 and the metal housing therefor generally indicated by 10. The distributor plate has on its interior face the circularly arranged electrodes 11, which are cooperative sequentially with the distributor rotor 5 to form a jump spark distributor, and which are electrically connected by metal inserts to the sockets of the sparkplug cable outlets 12 accessible at the exterior face of the distributor plate, all as well known. The housing 10 comprises a die cast metal rim 13 of generally rectangular form open at opposite ends and fitting against the open end of the frame 1 around the distributor plate 9. This rim has an inturned flange 14 to which the distributor plate 9 is positively and detachably fastened by screws 15 interiorly of the housing 10, and three sockets 16 aligned with the threaded openings in lugs 7. Fitted over the rear opening of the rim is a sheet metal cover plate 17 with a peripheral lip 18, which plate is detachably fastened to the rim by the same screws 8 as detachably fasten the housing 10 to the magneto frame 1 exteriorly of the housing. This fastening arrangement, as in the case of the arrangement for fastening the distributor plate 9 to the housing, is of the well known kind in which the screw has a threaded end portion and a shank of reduced diameter whereas both ends of the engaging members are threaded, so that the screw

can be detached completely if desired but is normally retained loosely to prevent loss when the members are detached. To assure ready and accurate alignment of the members when assembled, the inturned flange 14 carries two diagonally opposite dowel pins 19 arranged to extend loosely into registering holes in the inner face of the peripheral rim of the distributor plate 9, and the magneto frame 1 carries two alternate dowel pins 20 arranged to extend loosely into registering holes in the flange 14. The distributor plate has the usual timing window 21 and the cover plate 17 has a registering window normally sealed by a tightly fitting pivoted metal door 22, whereby the distributor gearing 4 may be timed in known manner and whereby the radio shielding is not reduced in effectiveness during operation of the magneto. Individual metal outlets 23 of known kind are fastened to the rim 13 directly over the distributor plate sockets 12. Each outlet is so constructed that when tightly screwed together, after the end connector terminal 24 of the cable is pushed into its socket 12, it grips its shielded sparkplug cable 25, and when loosened it allows the cable to be pulled or pushed therethrough in attaching or detaching the connector terminal to or from the socket.

The disassembly and assembly as a unit of the distributor plate 9 and its housing 10 to and from the magneto frame 1, and with respect to each other, will now be described. With the assembly as shown in the drawing, whether on or off the engine, assume that the magneto is to be serviced. The three screws 8 are backed out of threaded engagement with the lugs 7, whereupon the housing 10, with the distributor plate 9 fastened thereto and the sparkplug cables 25 fastened in the outlets 23 in electrical connection with the sockets 12 of the distributor plate, is detached as a unit from the magneto frame 1. The internal parts of the magneto and the inner face of the distributor plate 9 are then exposed. If now the screws 8 are backed completely out of sockets 16, the cover plate 17 may be taken off the rim 13 to give access to the outer face of the distributor plate. The sparkplug cables 25 may then be detached from the distributor plate after loosening the outlets 23, and the distributor plate 9 may then be detached from the rim 13 after the screws 15 are disengaged from the inturned flange 14. The assembly of the distributor plate 9 and housing 10 to the magneto will now be understood. However, it is noted that the sparkplug cables 25 are more readily connected either when the distributor plate is out of the housing or when it is fastened to the rim 13 but the cover plate 17 is off. Also it is noted that the magneto timing can be observed with the housing 10 attached to the frame, merely by swinging the door 22 to expose the timing windows.

It will be observed that when the housing 10 is assembled to the frame 1 and the door 22 is closed, the magneto is completely shielded against the emanation of radio waves from within and against the entry of dust and water from without. By having the housing 10 and distributor plate 9, together with the sparkplug cables 25 when connected, detachable as a unit from the frame 1 by fastening the plate and the cable outlets to the housing solely, the internal parts of the magneto may be exposed quickly after merely backing out the three screws 8 from engagement with the lugs 7; and by providing the detachable cover plate 17, the outer face

of the distributor plate 9 may be exposed by removing those screws to thereby facilitate the connection of the sparkplug cables 23, whether the rim 13 is off or loosely on the frame 1, and also to detach the distributor plate from the rim 13 by backing out the four screws 15. Furthermore by providing the lugs 7 exteriorly of the frame and extending the flange 14 inwardly, the same distributor plate 9 may be used with the same frame 1, with the lugs 7 removed if desired, but without a housing 10, merely by using longer screws 15 extending into threaded lugs inside the frame. In this connection, it will be understood that the dowel pins 19 and 20 assist in locating the distributor plate electrodes 11 in accurate gap relationship with the distributor rotor 5 notwithstanding the interposition therebetween of the rim 13, and that the same dowel pin openings in the distributor plate may be used for dowel pins, but longer than 19, extending from the frame 1 when the housing 10 is not used.

Although but one embodiment is described specifically herein, it will be understood that many changes may be made, and many variations may be incorporated, without departing from the invention as broadly expressed in the appended claims. For instance, the magneto may be designed for any other suitable number of sparkplugs and may be of any type incorporating any form of distributor with a plate having any form of sparkplug cable connection thereon in any suitable arrangement. If the housing is not to act as a radio shield as well as a dust and water protector for the distributor plate, it might be made of any suitable material other than metal, and in some arrangements it may be integral instead of having a detachable cover plate, or if the cover is used it may be fastened to the rim of the housing by other than the means which fasten the rim to the magneto frame.

Having thus described my invention, what I claim is:

1. In a multicylinder ignition generator, a generator frame having an opening, a distributor rotor arranged near said opening, a distributor plate having electrodes sequentially cooperative with the distributor rotor, sparkplug cables electrically connected to the respective electrodes, a housing covering the distributor plate and having an inturned flange, detachable fastening means fastening the distributor plate to said inturned flange interiorly of the housing, and other detachable fastening means fastening the housing to the generator frame exteriorly of the housing, whereby the distributor plate and its housing are removable from and attachable to the generator frame as a unit only and are attachable to and detachable from each other only when so removed.

2. In a multicylinder ignition generator, a generator frame having an opening and at least one exterior lug, a distributor rotor arranged near said opening, a distributor plate having electrodes sequentially cooperative with the distributor rotor and covering said opening, sparkplug cables electrically connected to the respective electrodes, a housing covering the distributor plate and having an inturned flange, detachable fastening means fastening the distributor plate to the inturned flange of the housing interiorly of the housing, and other detachable fastening means fastening the housing to the exterior lug of the generator frame exteriorly of the housing, whereby the distributor plate and its housing are removable from and attachable to the generator

frame as a unit only and when so attached the opening in the generator frame is covered by the distributor plate, and are attachable to and detachable from each other only when so removed.

3. In a multicylinder ignition generator, a generator frame having an opening, a distributor rotor arranged near said opening, a distributor plate having electrodes sequentially cooperative with the distributor rotor, sparkplug cables electrically connected to the respective electrodes, a housing covering the distributor plate and having a detachable cover, detachable fastening means fastening the distributor plate to the housing interiorly of the housing, and other detachable fastening means each of which fastens the cover on the housing and also fastens the housing to the generator frame exteriorly of the housing, whereby the distributor plate and housing with its cover are removable from and attachable to the generator frame as a unit only and are attachable to and detachable from each other only when so removed.

4. In a multicylinder ignition generator, a

generator frame of metal having an opening, a distributor rotor arranged near said opening, a distributor plate having electrodes sequentially cooperative with the distributor rotor and having a timing window, sparkplug cables electrically connected to the respective electrodes, a metal housing covering the distributor plate and forming with the generator frame a radio shield for the generator, said housing having an opening in registry with the timing window and also having a movable metal door arranged to seal the opening in the housing, detachable fastening means fastening the distributor plate to the housing interiorly of the housing, and other detachable fastening means fastening the housing to the generator frame exteriorly of the housing with the timing windows in registry, whereby the distributor plate and its metal housing completing the radio shield of the generator are removable from and attachable to the generator frame as a unit only and are attachable to and detachable from each other only when so removed.

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