To all whom it may concern:

Be it known that I, Leo J. Werner, a citizen of Russia, residing at Arlington, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in a Distributor and Means for Mounting the Same, of which the following is a specification.

My invention relates to a distributor and means of mounting it on an internal combustion engine. In such types of engines the vibration is more or less pronounced, particularly on larger sizes used for airplane work and the method of driving the ignition generator, or the distributor, where the distributor is mounted separate from the generator, must be given a great deal of attention.

It is the object of my invention to provide a mounting for the rotating parts or parts of the distributor which will withstand vibration and prevent oil, dirt and other foreign matter from working through into the distributor proper.

Other objects will be apparent to one skilled in this art after a study of the specification and the drawings annexed thereto.

In the drawing, Figure 1 is an end view of my distributor with one half broken away showing part of the means for mounting the distributor base to the engine as well as a part of the rotating finger.

Figure 2 is a sectional view through the distributor and portion of the engine.

Figure 3 is an enlarged sectional view on the line A—B through the shaft driving the rotating part of the distributor.

Referring now to the details, wherein like numbers refer to corresponding parts in the various views, 1 illustrates a part of an engine housing through which passes a shaft carrying a gear 2. The gear 2 is in mesh with a gear 3 fastened on to a shaft 4 herein referred to as the driving shaft. The shaft 4 is hollow and slotted at the outer end for a purpose which will be later referred to. 5 is a distributor base having a hub 6 which projects with the flange 7 which is fastened to the part 1. A distributor block 8 is adapted to be fastened to the base 5 by a suitable number of studs 9, nuts 10 and lockwashers 11. Block 8 carries an annular ring 12 connected to a binding post 13. Mounted for rotation within the housing formed by the base 5 and the block 8 is a

distributing finger 14 having a brush 15 adapted to engage contacts mounted within the inner surface of the distributor block 8. As shown in Figure 1, every alternate contact is longer than the one preceding it. I will refer to the short contacts collectively as 16 and the longer contacts as 17. The intervals 18 between the contacts 16 and 17 are substantially equal. The distributing finger 14 carries a brush 19 which is continually in contact with the annular ring 12 as well as being in continual contact with the brush 15 so that current connected to the terminal 13 is distributed by the brush 15 to the contacts 16 and 17 as the finger 14 is rotated. The finger 14 also carries an auxiliary distributor contact 20 which is known as a trailing or starting contact, a special source of starting current being connected to the terminal 21 which in turn is connected, by means of brush 22, to the terminal 20.

In the type of distributor shown the arrangement is for a 12 cylinder 45 degree engine and the distributing finger 14 is rotated to the right at one half crank shaft speed while the angular distance between the brush 15 and contact 20 is approximately 22½ degrees. The arrangement of the contacts 16 and 17 is such that the distance from the beginning of one of the short contacts 16 to the beginning of one of the long contacts 17 is approximately 22½ and from the last mentioned point to the beginning of one of the short contacts 16 is 37½. With this arrangement and the spacing of the brushes above referred to, I have found that after one of the engine pistons goes "over compression" the trailing contact 20 will be either opposite a contact 16 or a contact 17 whereby when the auxiliary source of ignition current is put into use current will be carried by means of the contact 20 across the small intervening gap to the distributor block contacts 16 or 17 thereby starting the engine "on compression."

It will be understood that the working or service brush 15 delivers current to the contacts 16 and 17 at intervals of 22½ and 37½ degrees of rotation of the distributing finger and the arrangement of the contacts 16 and 17 is such that the brush 15 will be on contact with either one of these contacts at the proper time.

The distributor finger 14 is carried in a finger holder 23 which is cup shaped at one
end, as shown in Figure 2, a lockwasher 24 and snap ring 25 being used to secure the finger 14 in place within the holder 23. In the assembly of my device a piece of packing 26 is secured in the flange 27 of the base 5 and the outer balance race 30 pushed in place. The base 5 is then ready to receive the holder 23 on which the inner balance race 28 and ball retainer and inner spacer 29 have been mounted. The packing 31, preferably of felt, is then put in place followed by the outer spacer 32. The outer balance race 33 is then put in place within the hub 6 followed by the ball retainer and the inner race 34. The washer 35 and snap ring 36 may then be put in place and also the washer 37 against which are placed a number of strips 38 which fit within a slot in the end of the holder 28, being riveted thereto by rivet 39. As will be seen from Figure 3, the strips 38 are long enough to pass through the wall 40 of the hollow shaft 4. The strips 38 are preferably of thin resilient material, such as spring steel so that a flexible driving connection is afforded between the driving shaft 4 and the finger holder 23 after the finger and base have been put in place as shown in Figure 2, following the assembly of the various parts to the base 5, as hereinbefore described. The base 5 is held to the engine member 7 by any suitable number of bolts 41, four being shown in Figure 1, a tie wire 42 being fastened through a pair of such bolt heads to prevent their turning. The base 5 also carries a gasket or packing 43 to prevent dust and water from working in around the edge of the base and distributor block which is then attached to the base in a manner previously described thus completing the assembly or mounting of the entire structure to the engine. A drain passage 44 is provided, as shown in Figure 2, to carry away any oil or other material which passes through the bearing or bearings to a point adjacent the packing ring 26.

While I have shown a preferred arrangement of parts, it will be apparent that various changes may be made and I therefore, not wish to be limited to the exact details shown and described, except as limited by the appended claims.

Having thus described my invention what I claim is:—

1. In combination, an engine casing having a hole therein, a distributor base fastened to said casing and having a hub projecting through said casing, a distributing finger support rotatably mounted within said base hub, a distributing finger carried by said finger support, an engine driving shaft flexible connecting means between said shaft and said finger support and a distributor block carried by said base enclosing said finger and connecting therewith to distribute current to said engine cylinders, as described.

2. In combination, an engine casing having a hole therein, a distributor base fastened to said casing and having a hub projecting through said casing, a distributing finger support rotatably mounted within said base hub, a distributing finger carried by said finger support, an engine driving shaft having a hollow end with slots in the side wall thereof, flexible material fastened to the end of said finger support and loosely resting in the slots in said driving shaft, and a distributor block carried by said base enclosing said finger and connecting therewith to distribute current to said engine cylinders.

3. In combination, an engine casing having a hole therein, a distributor base fastened to said casing and having a hub projecting through said casing, a flange on the outer surface of said base having a ring of packing material carried thereby, a distributing finger support having a cupped shape portion adapted to be engaged by said packing and an end projecting within said base hub, bearings within said hub carrying the end of said finger support, means for spacing said bearings within said hub and for holding them securely in position, an engine driving shaft and flexible connecting means between said shaft and said finger support consisting of slots in the side wall of said shaft, a series of resilient strips fastened to the end of said finger support and having the ends thereof resting within said slot, a distributing finger set within and fastened to the cupped end of said finger support, and a distributor block carried by said base and adapted to cooperate with said finger to distribute current to said engine cylinders.

4. In combination, an engine casing having a hole therein, a distributor base fastened to said casing and having a hub projecting through said casing, a distributing finger support rotatably mounted within said base hub, a distributing finger carried by said finger support, an engine driving shaft having a hollow end with diametrically opposite slots in the side wall thereof, driving means between said driving shaft and the finger support consisting of a series of resilient members having the ends thereof resting in the said shaft slots but fastened centrally to the end of the finger support, an exterior flange on said distributor base, packing material carried by said flange and within said hub coating with the finger support to prevent oil, dirt and other foreign matter from working in on to the distributing finger, and an outlet through the distributor base adjacent the packing carried by said flange for carrying away any oil or material which may accumulate near said outlet, a ring of packing carried around the
outer circumference of said distributor base, and a distributor block adapted to be held by said base against said packing ring for cooperation with said distributing finger for the purpose described.

5. A distributor for a multicylinder 45 degree engine having a casing, consisting of a base fastened to said engine casing, a finger holder rotatably supported by said base, a driving shaft having slots in the end thereof and flexible means loosely carried within said slots but securely fastened to the end of said distributor finger support, a distributing finger carried by said finger support having two independent brushes angularly spaced at approximately 22½ degrees one from the other, and a distributor block adapted to be fastened to said base, said block having an annular ring to which service ignition current is adapted to be connected with means carried by said finger for electrically connecting said ring to the advance brush in said finger and a second contact adapted to have starting ignition current connected thereto with means carried by said finger for conveying said starting current to the trailing brush, contacts carried by said block adapted to cooperate with the brush carried by said distributing finger, said contacts being equally spaced apart, of different arcuate lengths whereby said trailing brush will be adjacent one of said contacts when the engine is at rest.

In witness whereof, I affix my signature.

LEO J. WERNER.