

951,815.

J. O. HEINZE, JR.
DISTRIBUTER.
APPLICATION FILED JULY 29, 1909.

Patented Mar. 15, 1910.
2 SHEETS—SHEET 1.

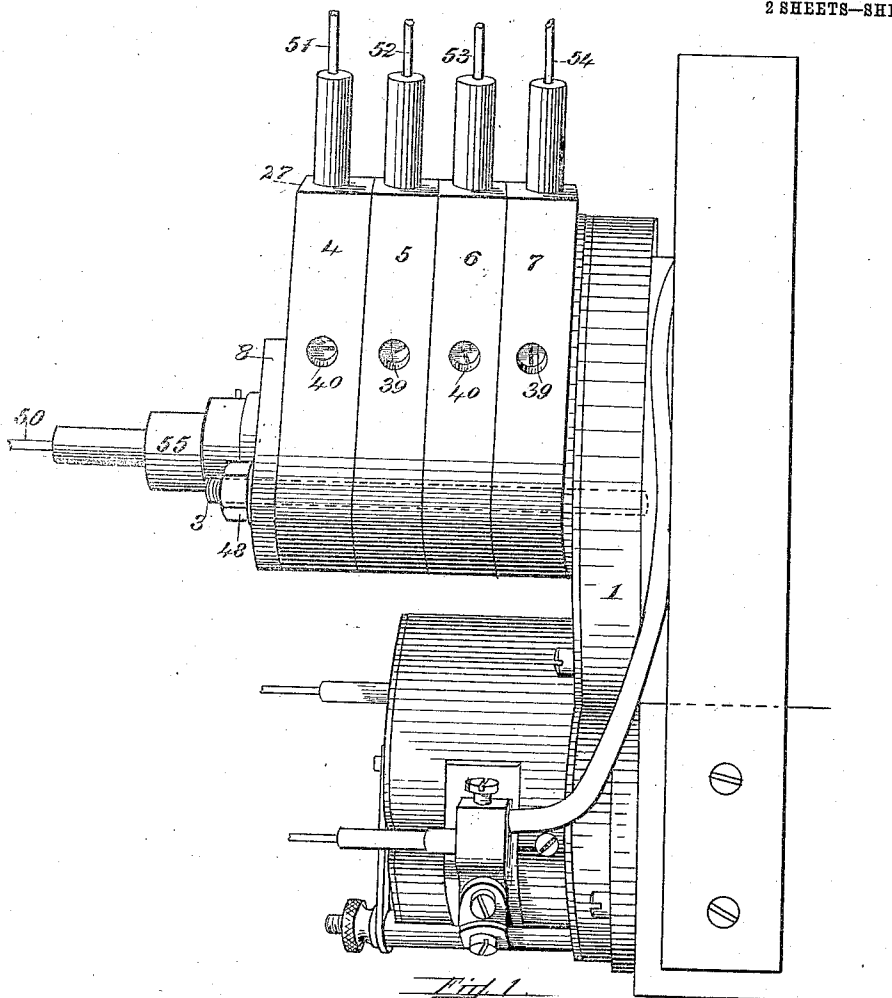


Fig. 1.

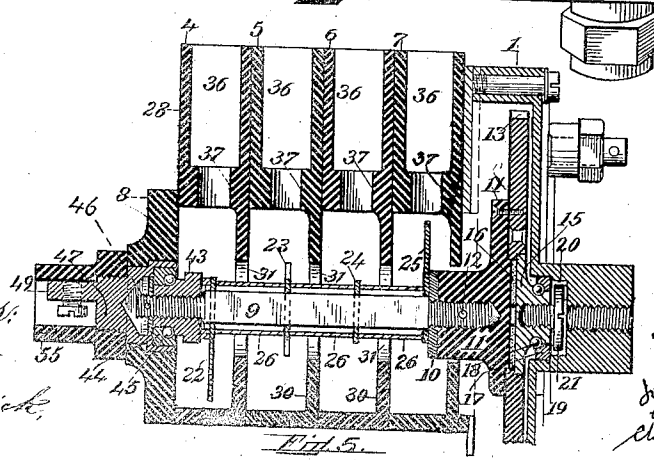


Fig. 5.

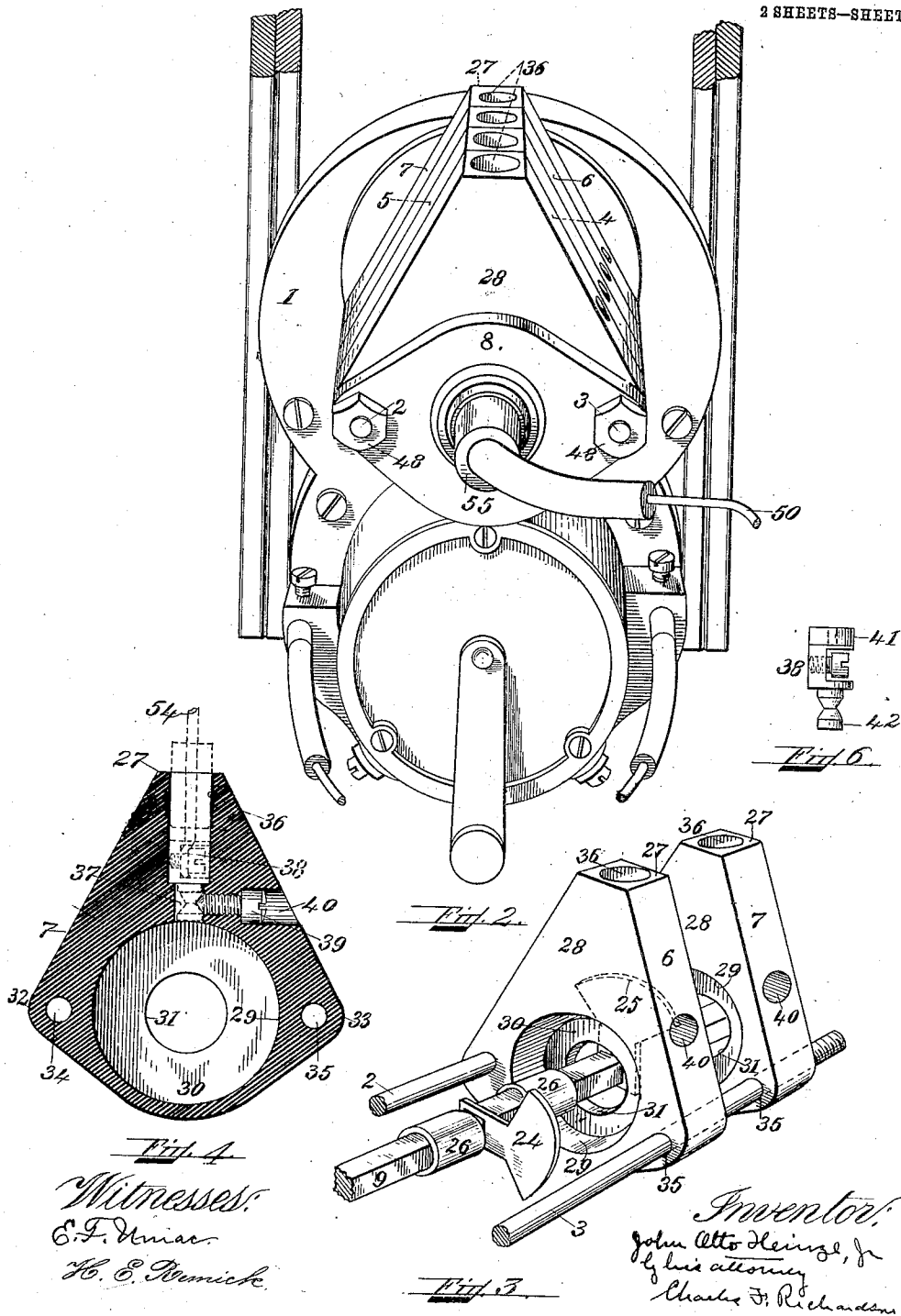
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Inventor:
John Otto Heinz, Jr.
by his attorney
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN OTTO HEINZE, JR., OF LOWELL, MASSACHUSETTS.

DISTRIBUTER.

951,815.

Specification of Letters Patent. Patented Mar. 15, 1910.

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To all whom it may concern:

Be it known that I, JOHN OTTO HEINZE, Jr., a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Distributers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to apparatus known as high voltage distributors employed in connection with magnetos for distributing secondary currents to spark plugs in the explosion chambers of internal combustion engines.

In distributors heretofore used, there has been a single distributing arm or blade brought into contact, successively, with a series of terminals connected with sparking devices in the cylinders of an internal combustion engine. Such construction is objectionable for many reasons. For example, should the blade become inoperative, the whole distributor becomes useless; should the distributor be designed for a four cylinder engine, it could not be used for an engine having a greater or a less number of cylinders; and further, as the terminals, leading to the cylinders, are in the same chamber and lie in the same plane as is the revolving distributing blade, there is danger of two or more of the adjacent terminals becoming short circuited.

The purpose of my invention is to overcome these objections, and I attain this purpose by means of what I term "unit" distributors, so arranged that each is complete in itself; is perfectly insulated from all others; and, in case of breakage of any of its parts, or in case the unit becomes inoperative, such parts, or any entirely new unit may be quickly and easily substituted; and further, the construction of most of the parts of my distributor is such that instead of having to make particular parts for a particular distributor for, say, one, or a two, or a four, or a six cylinder engine, the parts are adapted to be assembled in the formation of a distributor for any multiple cylinder engine. It will be obvious that such a distributor greatly simplifies and reduces the cost of manufacture, and its form is a great convenience in case it is injured or destroyed.

In the drawings illustrating the principles of my invention and the best mode now

known to me of embodying the same, Figure 1 is a perspective side view showing a series of four unit distributors mounted upon a magneto, only a portion of which is shown; Fig. 2 is a perspective end view of the unit distributors; Fig. 3 is a perspective view showing how the unit distributor cases are assembled and sustained in relation to a common distributing shaft, and distributing blades thereon; Fig. 4 is a vertical section of a unit distributor case, with a high tension wire and a binding post, indicated in dotted lines, and held by a binding screw; Fig. 5 is a vertical longitudinal section of so much of the apparatus shown in Fig. 1, as embraces the unit distributor construction. Fig. 6 is a view of a high tension binding post for each unit distributor case.

A brass frame 1 is secured, say, to the base of a magneto, and two rods 2, 3, fixed to this frame, extend forward horizontally, and receive and sustain one or more unit distributor cases 4, 5, 6, 7, and an end plate 8, which, in turn, sustains one end of a common distributor shaft 9, Fig. 5; the other end of said shaft having a bearing in said frame. The distributor shaft 9, Figs. 3 and 5, here shown, is rectangular in cross section, and has each end portion turned down and provided with screw threads. On the threaded inner end portion is placed a washer 10, and against it is screwed a fiber head 11 secured in position on the shaft by a pin 12 through the head and the shaft. Upon the fiber head centrally mounted in relation to the shaft, is a distributor gear wheel 13 which receives its power, as, from a driving gear fixed to an armature shaft, and not shown. A ball bearing cone 15 is centrally fixed to the distributing gear, and is separated from the head of insulation 11 by a mica washer 16, while a retaining ring 17 with balls 18 therein, is held in proper position against a shoulder 19 formed in a recess 20 in a portion of the frame 1. A headed screw 21, which may be screwed into the cone 15, retains the ring and balls upon the ball cone, so that the ball bearing becomes removably secured to the distributor shaft and gear wheel. This distributor shaft 9, being designed for a distributor to be used with a four cylinder engine, requires four blades 22, 23, 24, 25, one for each cylinder, and hence each blade has a square hole to permit it to be fixed in the proper relation to, and turn with, the square distributing shaft.

To separate the blades from each other, spacers 26 of steel tubing of proper length are slid over the square distributing shaft.

Each unit distributor has its distributor case, as 4, struck up in suitable form, out of fiber. The form I have adopted may be roughly described as kite shaped, and, when in position, the tail portion 27 is uppermost. In the front face 28 of the case, is a recess 29 in which, as will be made plain hereinafter, its respective distributing blade, as 22, may be rotated freely; while through the bottom 30 of the recess is a hole 31 in which the distributor shaft may turn. In the two opposite shoulder portions 32, 33, Fig. 4, of the case are two holes 34, 35, having their longitudinal axes parallel with that of the distributing shaft opening 31. Extending downward from the tail portion 27 of the case and into the blade recess 29 are two connected cavities 36, 37, Figs. 4 and 5, in which a metallic binding post 38, may be removably secured by a binding screw mounted in a cavity 40 provided for said screw at right angles to said binding screw cavity 37. This binding post is also shown in Fig. 6, the larger portion 41 to occupy the larger cavity 36, while the lower grooved portion 42 is to lie in the lower cavity 37, and have its groove engaged by the binding screw 39.

To assemble the blades 22, 23, 24, 25 and unit distributor cases 4, 5, 6, 7, in proper relation to the common distributor shaft 2, see Fig. 5, the washer 10 is mounted onto the shaft and abuts the shoulder formed by the end of the fiber head 11; a distributor case, as 7, see also Fig. 3, with its rear plane surface toward the gear wheel 13, is next slid over the shaft; next a blade 25; next a spacer 26; next another case, as 6, and blade 24, and spacer 26; and so on, until the desired number of cases and blades are provided; here, for example, four unit distributors are called for. On to the front threaded portion of the distributor shaft, see Fig. 5, is screwed a front ball bearing cone 43; while a retaining ring 44 with balls 45 therein, is held upon the cone by a washer and pin 46 passing through the free end portion of the shaft. From the above description, it will be plain that the distributing shaft, ball bearings, gear, and blades may all be bound together; while the unit cases, to be sure, may dangle free about the shaft, but are prevented from dropping off of it by the blades, which, by the way, are here 90 degrees apart. To removably mount these parts on the magneto, in operative position, the distributing cases 4, 5, 6, 7, are, by means of the holes 34, 35, slid onto the two horizontal supporting rods 2, 3, fixed to the frame. A further reference to Fig. 3 will make this very plain.

To bind the distributing cases together, and to form a support for the outer and ball

bearing 43, 44, 45, Fig. 5, of the distributor shaft, the end plate of hard fiber 8 is mounted upon and at right angles to the two supporting rods 2, 3, and has centrally disposed in and extending through it a metal piece 47, recessed to receive the retaining ring 44 for the outer ball bearing of the shaft. When the end piece 47 is in position, nuts 48, Figs. 1 and 3, may be screwed upon the end portions of the rods 2, 3, and, by turning up the nuts, the end plate, pushing against the retaining ring 44 of the outer ball bearing of the shaft, and also against the outer distributing case as 4, causes the distributing cases and the inner ball bearing all to assume, and to be held in, operative position. To the outer end portion of the metal recessed piece 47 in the end plate 8, is a device or binding post 49 to which a high tension wire, as 50, may be attached for supplying the desired current through the outer ball bearing to the rotating distributing shaft, and thence to the distributing blades, and successively to the high tension wires 51, 52, 53, 54, leading to sparking devices of the engine. A sleeve 55 of insulating material is threaded and screwed onto the piece 47, for the electrical protection of the connection between the wire 50 and the binding post 49.

It is to be noted that the shaft is insulated from the gear wheel by the hard fiber head; that the free end portion of each distributing blade is just out of contact with the high tension or secondary binding post terminal, mounted in the top of the distributing case and flush with the inside surface of the blade recess in the distributing case. Further, it is also to be observed that the bottom of the blade recess in each case forms a deep partition of insulation not only between the adjacent blades, but also between the adjacent secondary terminals; and the danger of short circuiting these terminals is absolutely prevented. Now if any of the parts become broken, say a blade, or a case, or if it is desirable to interchange any of the parts or substitute new for old, clearly the construction of the parts is such, that they may be quickly taken out, and examined and the distributor assembled.

Should it become necessary to adapt the above described distributor of four units to a three cylinder engine, all that would be necessary so to do, would be to dispense with one distributing case, substitute for the square shaft, a shorter one having a suitable cross section, and three blades. If there are six cylinders, then provide six distributing cases, substitute a longer shaft having a hexagonal cross section, and six blades having hexagonal shaft holes.

All the parts, except the shaft and blades with holes to fit a particular shaft, being adapted to be assembled in a distributor for

any number of cylinders, obviously, by providing proper shafts, and blades for engines with different numbers of cylinders, a suitable distributor for an engine with a particular number of cylinders may be very quickly made ready by assembling all the parts, suitable for and required by any distributor, with a shaft and blades for a particular distributor. In fine, all the parts except the shaft and blades, of a distributor, are adapted to be assembled for a distributor designed to operate any number of cylinders.

Having described my invention and desiring to protect the same in the broadest manner legally possible, what I claim is:—

1. In a distributor, a distributing shaft, polygonal in cross section; distributing blades mounted on said shaft in parallel planes and having therethrough holes so as to enable the blades to be properly placed on the polygonal shaft.

2. A distributing shaft with distributing blades thereon in parallel planes; a distributing case of insulating material for, and to contain, each distributing blade; and means to support and retain each case in

proper position in relation to its respective blade and distributing shaft.

3. A distributing shaft with distributing blades thereon in parallel planes; distributing cases of insulating material for, and to contain, the respective distributing blades, said cases being arranged in series and in parallelism; and terminals mounted in said cases to electrically coöperate with said blades.

4. A distributing shaft with distributing blades thereon in parallel planes; distributing cases of insulating material for, and to contain, the respective distributing blades, said cases being arranged in series and the adjacent cases abutting each other; terminals mounted in said cases to electrically coöperate with said blades; and insulating partitions in said cases to electrically separate said terminals.

In testimony whereof I affix my signature in presence of two witnesses:

JOHN OTTO HEINZE, JR.

Witnesses:

E. F. UNIAC,

F. J. V. DAKIN.