J. F. ARMATHES.

DISTRIBUTOR.

APPLICATION FILED MAR. 17, 1921.

1,403,827.

Patented Jan. 17, 1922.

3 SHEETS—SHEET 1.

Fig. 2.

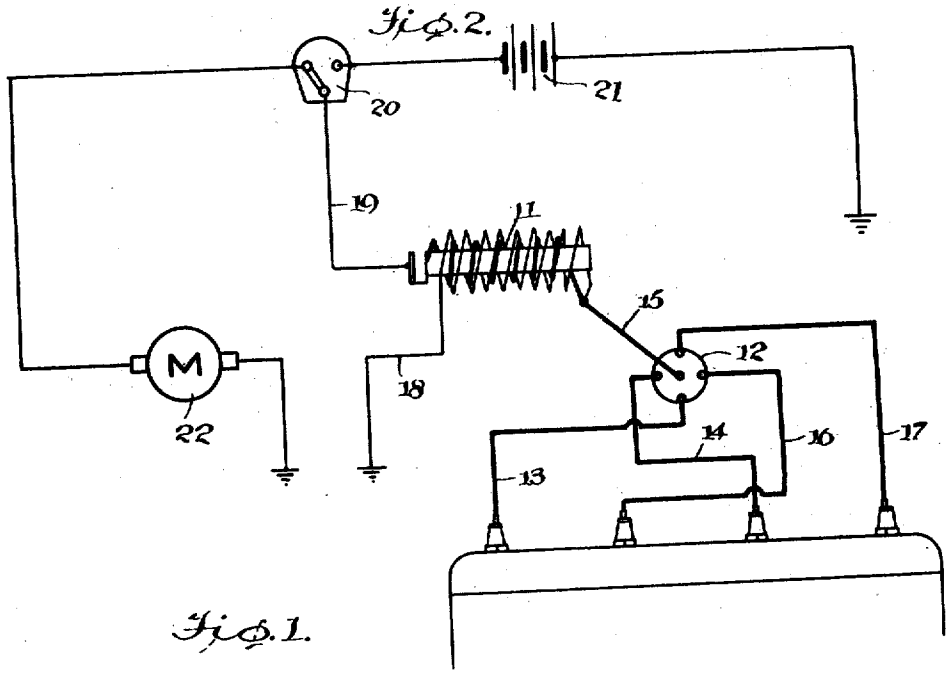


Fig. 1.

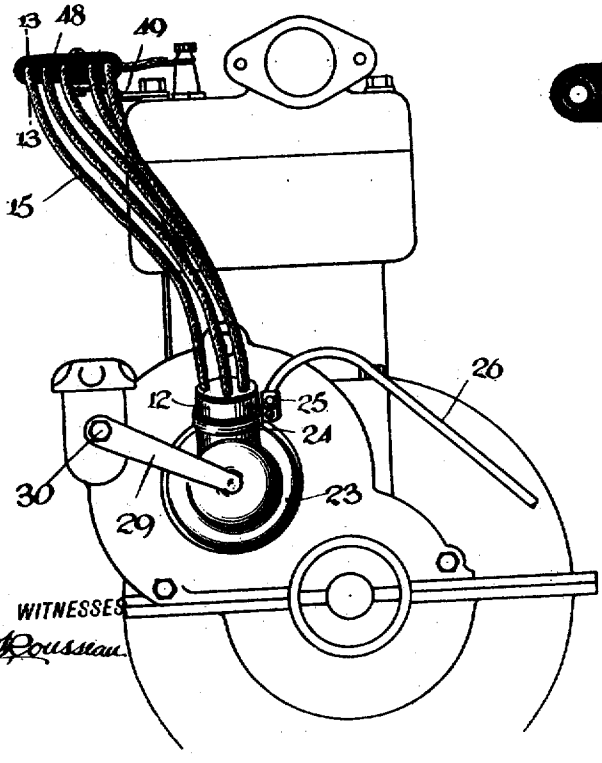


Fig. 12.

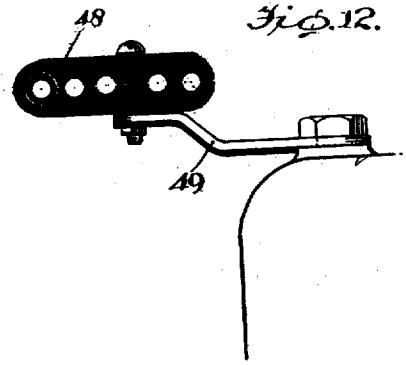
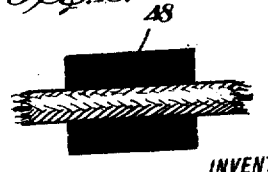


Fig. 13.



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3 SHEETS—SHEET 2.

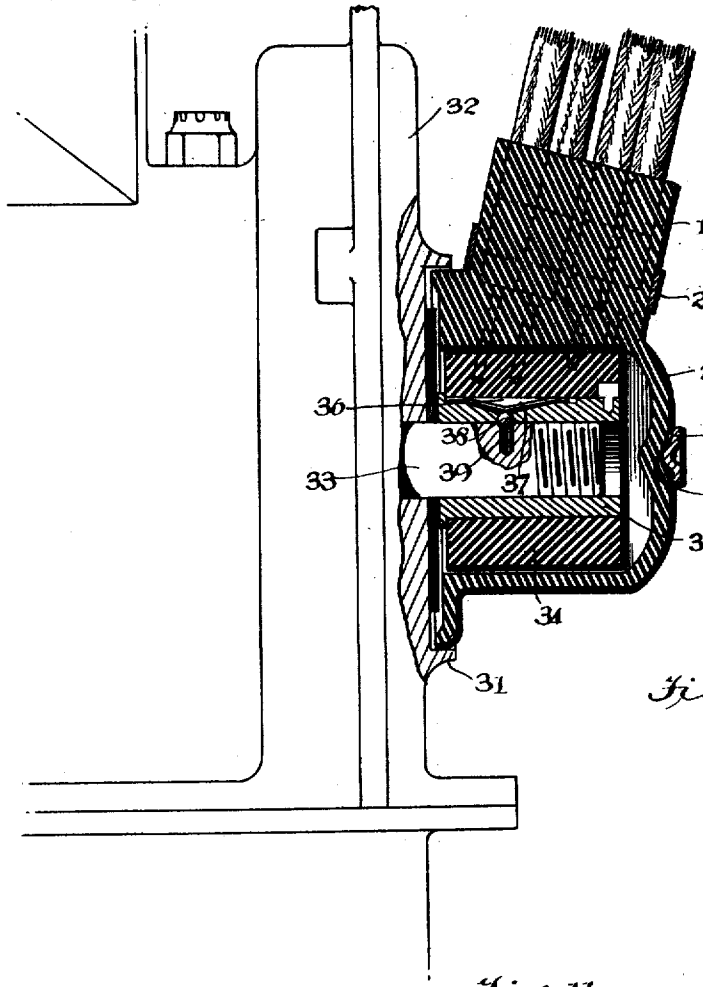


Fig. 3.

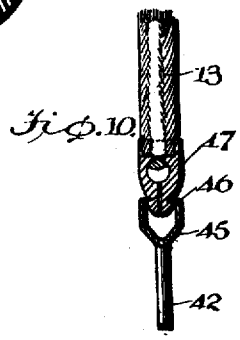
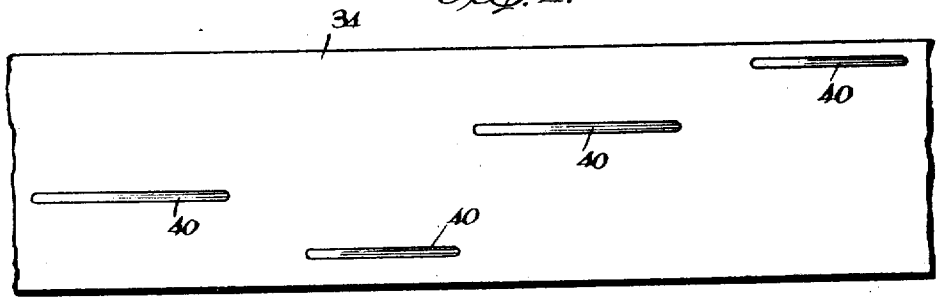


Fig. 10.

Fig. 11.



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3 SHEETS—SHEET 3

Fig. 5.

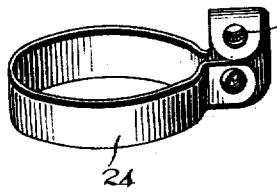


Fig. 6.

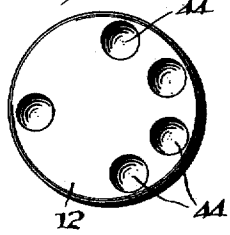


Fig. 4.

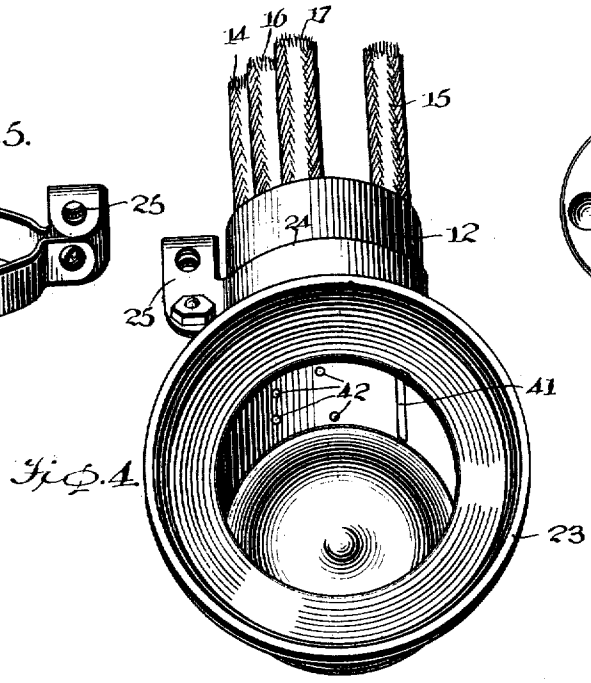


Fig. 7.

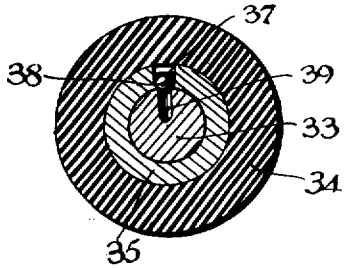


Fig. 8.

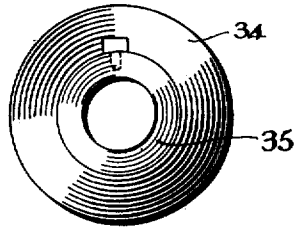
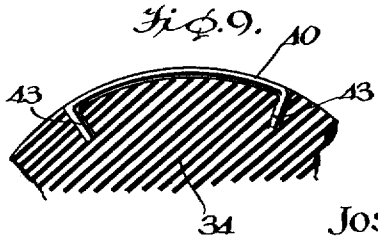


Fig. 9.



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1,403,827. Specification of Letters Patent. Patented Jan. 17, 1922.

Application filed March 17, 1921. Serial No. 452,945.

To all whom it may concern:

Be it known that I, JOSEPH FRANK ARMATHES, a citizen of the United States, and a resident of Plymouth, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Distributors, of which the following is a specification.

My present invention relates generally to automobile ignition systems and more particularly to an ignition device or distributor for Ford automobiles, which will avoid the use of individual vibrators in the high tension connections and will permit of the use of a single vibrating coil so that the disadvantages due to lag in the usual individual vibrators will be avoided.

In carrying out my invention the primary object is the provision of a frictionless distributor which will be lasting, strong and durable, which may be readily and economically constructed, assembled, in which the parts are capable of ready repair and substitution, and in which adjustment is readily provided for in use.

These and other objects as well as the resulting advantages of my invention will be readily understood from the following description, in the light of the accompanying drawings forming a part of this specification and in which,

Figure 1 is a front elevation of a Ford motor illustrating the practical application of my invention,

Figure 2 is a diagram of the electrical connections,

Figure 3 is a side view partly in elevation and partly in vertical section through my improved device in effective position,

Figure 4 is a perspective view of the casing of my improved device looking toward its inner open side,

Figure 5 is a detail perspective view of the clamping ring,

Figure 6 is a top plan view of the upper portion of the casing,

Figure 7 is a transverse section through the rotor and the timer shaft in a plane extending through the detachable clutch member connecting these parts,

Figure 8 is an end view looking at the outer end of the rotor,

Figure 9 is an enlarged detail section through a portion of the rotor in the plane of one of its segmental contact pieces,

Figure 10 is a detail section through the engaging portions of one of the high tension leads and the contact point of the distributor casing with which it detachably engages,

Figure 11 is a diagrammatic plan view of the surface of the rotor,

Figure 12 is a detail front view of the bracket supporting the high tension leads, and

Figure 13 is a detail section through this bracket taken substantially on line 13—13 of Figure 1.

Referring now to these figures and particularly to Figure 2, the secondary or coil lead 15 of the present system extends from the secondary winding of a single vibrating or spark coil 11 to the distributor head indicated at 12, from which high tension current is distributed at proper intervals to the several distributing leads 13, 14, 16 and 17. The primary winding of coil 11 has a ground wire 18 and a connection 19 with a switch 20 by means of which the coil may be placed in circuit with either a grounded battery 21 or a grounded magneto 22.

According to my invention the distributor head 12, which is preferably formed integral with the distributor casing 23, extends above said casing and is externally cylindrical in form adapting it to the reception of a clamping band 24 seen in detail in Figure 5 having one upstanding bent and apertured end 25 to receive the timer control rod a part of which is indicated at 26 in Figure 1, whereby the casing of the distributor may be shifted upon its longitudinal axis.

The casing 23 has an axial depression 27 in its closed outer or forward end to receive the free end 28 of a supporting arm 29 pivotally attached at its opposite end as at 30 to a part of the motor, and the opposite or inner rear side of the casing 23 is open and formed to seat within the annular flange 31 of the front of the timing gear housing 32, which flange is in spaced concentric relation to the forwardly projecting end of the timer shaft 33.

In the ordinary construction the forward end of the timer shaft is threaded as shown in Figure 3 to receive the usual rotor, while the rotor in accordance with my present in-

vention consists of a cylindrical shell 34 of non-conducting material securely fastened upon a cylindrical metal core or bushing 35 having a lengthwise groove 36 in its outer face within the shell 34. This groove supports a spring 37 which engages a clutch ball 38, the latter projecting partially through an inner opening of the core or bushing so as to seat, under the influence of spring 37, in a cavity 39 drilled within the projecting end of the timer shaft 33.

Thus in placing the invention upon the ordinary Ford automobile it is simply necessary to discard the nut usually threaded on the timer shaft and drill a shallow opening in order that the rotor of my present invention may be slipped on to the shaft and into the clutched position best shown in Figure 3 where it is held in readily detachable relation and in such manner as to rotate at all times with the timer shaft particularly in view of the fact that the peripheral surface of the rotor is slightly spaced from the inner cylindrical surface of the distributor casing 23, the distance between these parts being sufficiently slight to permit the spark to readily jump the gap.

In the periphery of the rotor are a series of segmental contact pieces 40, disposed in lengthwise and circumferentially spaced relation, and each of a length sufficient to bridge the inner lengthwise contact bar 41 of the distributor casing 23 with the inner end of the respective contact pin 42, of which there are a series in the distributor casing spaced lengthwise to accord with the spacing of the several segmental contact pieces 40 of the rotor.

In Figure 9 it will be noted that each of the segmental contact pieces 40 of the rotor is in the nature of a wire with bent ends 43, the wire and its said ends being embedded in the surface of the shell 34 of the rotor.

The distributor head 12 has a plurality of upwardly opening bores 44 as seen in Figure 6 to receive the several distributing leads 13, 14, 16 and 17 and the lead 15 from the coil 11, and in the lower end of each of these bores 44, the upper end of each of the contact pins 42 as well as a pin leading from the contact bar 41, has a socket 45, one of which is shown in Figure 10, with inturned edges 46 to engage the annularly grooved head 47 of the respective wire or lead, so that these several wires or leads will thus be effectively though detachably held in the distributor head, the current flowing into the distributor through the coil lead 15 to the contact bar 41. As each of the segmental contact pieces 40 passes the contact bar 41 in the rotation of the rotor, and moves adjacent to its respective contact pin 42, current passes from the bar to the segmental contact and from the latter to the contact pin from which it flows through the respective distributing leads 13, 14, 16 and 17 to the respective cylinder spark plug.

As seen in Figures 1, 12 and 13 the coil lead 15 as well as the several distributing leads 13, 14, 16 and 17 may be extended through a clamp 48 preferably formed of non-conducting material and supported by a bracket 49 in turn connected to the motor, so as to avoid abrasive contact of the several leads with one another and avoid possible short circuiting.

In view of the fact that the rotor moves in spaced relation to the inner surface of the distributor casing 23, it is quite obvious that the supporting means shown and described for holding the rotor in readily detachable relation upon the timer shaft 33 will suffice for all purposes of support and will at the same time permit of ready quick installation in lieu of the usual distributor as well as ready removal in case repair or substitution should be required on account of accidental breakage. It is furthermore obvious that in view of this spaced rotation there is practically no wear and except for breakage the parts will last indefinitely.

The distributor proposed by my invention will thus be effective in operation, durable and lasting in use, is of simple inexpensive construction, and provides for ready advancing and retarding of the spark as may be desired.

I claim:

1. A distributor including a casing open at one side and having supports at its opposite sides with respect to which it is rotatable, a timer shaft projecting axially into the open side of the casing, a rotor detachably mounted on the shaft and having an external non-conducting surface rotating in spaced relation to the inner surface of the casing and provided with a plurality of segmental contact pieces, a contact bar within the casing extending along the rotor, a plurality of contact pins in the casing alined with the contact pieces of the rotor and spaced from the contact bar, said contact pieces of the rotor being greater in length than the spaces between the contact bar and contact pins of the casing as described.

2. In a distributor, the combination with a timer shaft, of a detachable rotor having spring controlled means arranged to disengageably clutch the shaft and normally support the rotor in connection therewith.

3. In a distributor, the combination with a timer shaft, of a casing rotatably mounted around the timer shaft and having contact members, and a rotor having contact members movable within the casing in non-contacting relation thereto, said timer shaft having a recess, and said rotor having spring controlled means shiftable into and out of

the recess of the shaft and normally acting to support the same on the shaft as described.

4. A distributor including a casing having an internal lengthwise contact bar and a lengthwise series of contact pins each spaced from the said bar, and a rotor within and spaced from the casing having a series of lengthwise and circumferentially spaced contact segments alined with the several contact points of the casing and each of a length greater than the space between its respective contact pin and the said contact bar.

JOSEPH F. ARMATHES.