J. F. CAVANAGH.

IGNITION DEVICE.

APPLICATION FILED APR. 12, 1911.

1,016,399. Patented Feb. 6, 1912.

Fig. 1.

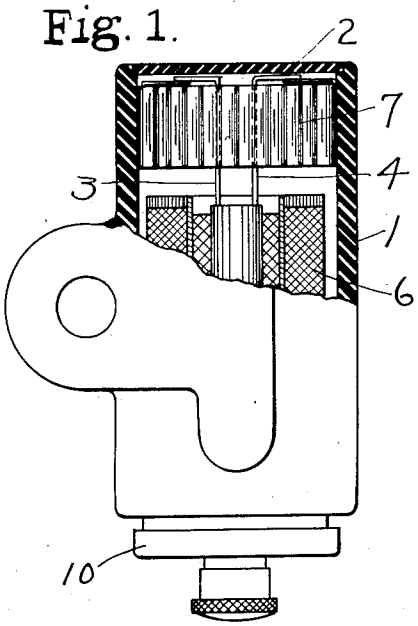


Fig. 2.

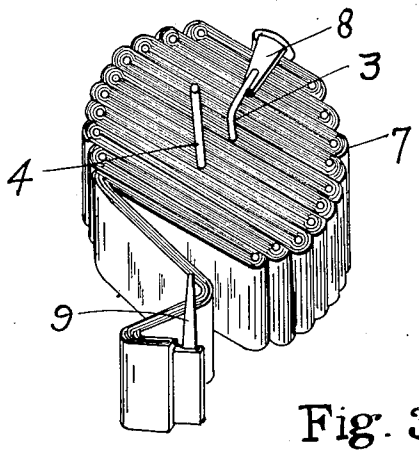
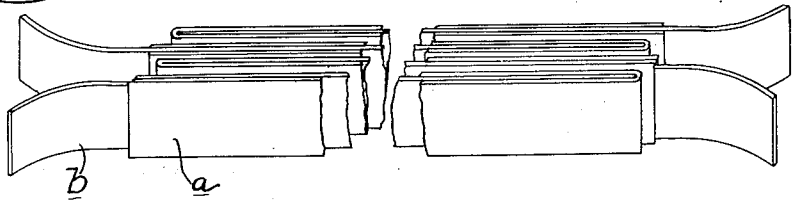


Fig. 3.



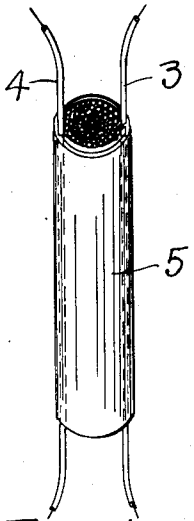


Fig. 4.

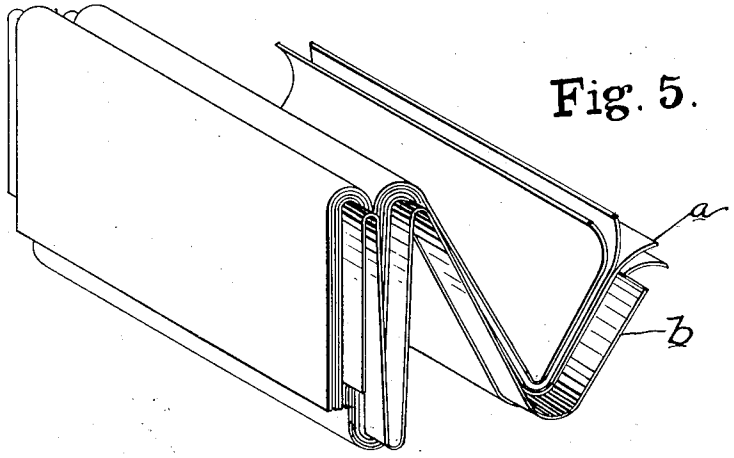


Fig. 5.

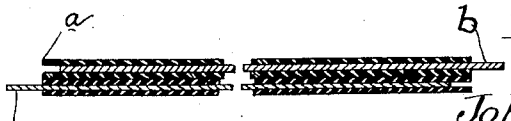


Fig. 6.

Witnesses.

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UNITED STATES PATENT OFFICE.

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IGNITION DEVICE.

1,016,399. Specification of Letters Patent. Patented Feb. 6, 1912.

Application filed April 12, 1911. Serial No. 620,622.

To all whom it may concern:

Be it known that I, JOHN F. CAVANAGH, a citizen of the United States, and resident of the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Ignition Devices, of which the following is a specification.

The invention relates to an ignition device and has for its object to provide a casing in which both the spark coil and condenser are mounted and in which the leads from the condenser extend through the coil within the inner convolutions of the secondary winding.

The invention further consists in constructing the condenser in a circular or disk form whereby it may be readily folded onto a series of flat layers of different lengths into a simple and practical shape and of the required capacity whereby it is adapted to be inserted into a cylindrical casing at one end of the coil.

A further object of the invention is to so form the condenser that in the assembling of the igniting device the leads from the coil may pass through the body of the condenser to facilitate the connecting of these leads to the condenser terminals after both the coil and the condenser are positioned in the casing before said casing has been headed up.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings: Figure 1— is a longitudinal section of the device showing the parts assembled. Fig. 2— is a perspective view of the condenser with one end of the material pulled out to better illustrate the structure. Fig. 3— is a perspective view of end portions of the condenser strip. Fig. 4— is a perspective view of the core of the coil. Fig. 5— is an enlarged view of a portion of the condenser showing the manner of folding the material. Fig. 6— is a longitudinal sectional edge view of the condenser material with the center portion broken away showing the method of insulation and the projecting ends of the conducting material.

Referring to the drawings, 1 indicates a cylindrical casing preferably formed of an insulating compound molded under heavy pressure and as illustrated in Fig. 1, one end of this cylinder is closed by a disk 2 of material similar to that composing the rest of the casing, said disk being sealed in place after the internal mechanism has been placed in the cylinder. The other end of this cylinder 1 has an opening in which is secured a closing cap 10 which with the mechanism contained in said cylinder is illustrated and described in detail in my copending application Serial No. 586,894.

In the construction of condensers it has heretofore usually been customary to run the condenser leads outside of the winding, in which position it was difficult to insulate from the secondary winding, and it also had the disadvantage of making the device more bulky.

As shown by Fig. 4 the wrapping of the bunch of wires comprising the core 5 includes also two leads 3 and 4 which are therefore in such position that they are always protected and are located out of proximity to the secondary winding 6.

I do not wish to be limited to carrying the leads through the core itself as a great advantage may also be obtained by carrying these leads through the coil substantially parallel with the axis of the core thereof anywhere within the convolutions of the secondary winding.

In building up or constructing an induction coil it is well known that the difference of potential is comparatively low within the primary winding and therefore it is very easy to insulate a conductor which passes through it. This difference of potential, however, increases rapidly in radiating from the center. It will therefore be seen that a great advantage is obtained by locating a lead within the inner convolutions of the secondary winding for several reasons, among others being it is more direct, more compact, and owing to the low potential requires less insulation, and on the whole it is a better and cheaper construction. The usual method of running the wires on the outside of the secondary winding requires a heavier insulation, takes up more space, that is makes a more bulky device, and is necessarily of a more expensive construction.

The condenser is formed of two compound layers of material, see Fig. 6, each layer having two sheets of paper *a*, with a sheet of tinfoil *b* between them, and both of these said compound layers are folded together back and forth throughout their length as illustrated in Fig. 5, like the bellows of an accordion, forming a long thin compound tape. Fig. 3 is intended to represent the two ends only of the condenser tape, the four thicknesses being separated from each other in said figure and broken out in the center because the entire tape is very long. In forming the condenser 7 as a whole a single length of this compound tape is folded back and forth in flat layers the length of the layers gradually decreasing in both directions from the diameter of the entire mass as indicated in Fig. 2 so that the condenser is of disk form, whose thickness is the width of the tape. The size of this disk when finished and pressed tightly together is such that it will snugly fit one end of the cylindrical casing. If the layers were made of uniform length the condenser as a whole would be rectangular in form and would then bear against the inner wall of the casing at only its corners or angles, wasting considerable valuable space, which space would permit the layers or folds to separate more or less and loosen up the folds.

In assembling my improved igniting device the coil is first inserted into the casing 1, the leads 3 and 4 extending outward a short distance therefrom. The folds of the condenser are opened slightly permitting these leads to be drawn therein, then said condenser is pressed down into the open end of the casing and the leads are bent outward as illustrated in Fig. 2 and connected to their respective condenser terminals 8 and 9 by solder or otherwise. The whole is then cemented firmly in position and the disk cap 2 is forced into the end of the casing and tightly sealed.

I claim:

1. A combined spark coil and condenser mounting comprising in combination a coil having a primary and secondary winding, and a condenser, the leads from the condenser extending through the coil within the outer convolutions of the coil windings.

2. A combined spark coil and condenser mounting comprising in combination a coil having a core and a condenser, the leads from the condenser extending through the core of the coil.

3. A combined spark coil and condenser mounting comprising in combination a coil having a primary and secondary winding, and a condenser, the leads from the condenser extending through the body thereof and through the coil within the outer convolutions of the coil windings.

4. A combined spark coil and condenser mounting comprising in combination a casing, a coil in said casing, said coil comprising a primary and secondary winding, a condenser snugly fitting the casing at the end of the coil, and the leads from said condenser extending through the coil substantially parallel with its axis and within the outer convolutions of the coil windings.

5. A combined spark coil and condenser mounting comprising in combination a cylindrical casing, a coil in said casing, said coil comprising a primary and secondary winding, a disk-shaped condenser snugly fitting the casing at the end of the coil, and the leads from said condenser extending through the core of the coil.

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

JOHN F. CAVANAGH.

Witnesses:

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