

June 18, 1929.

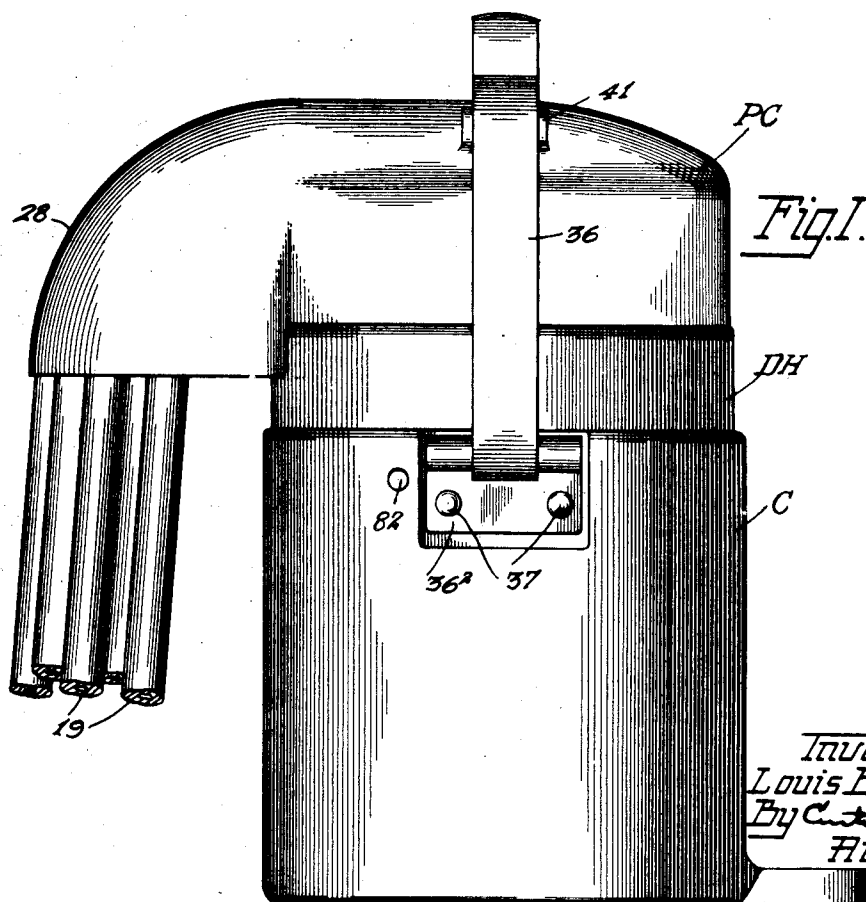
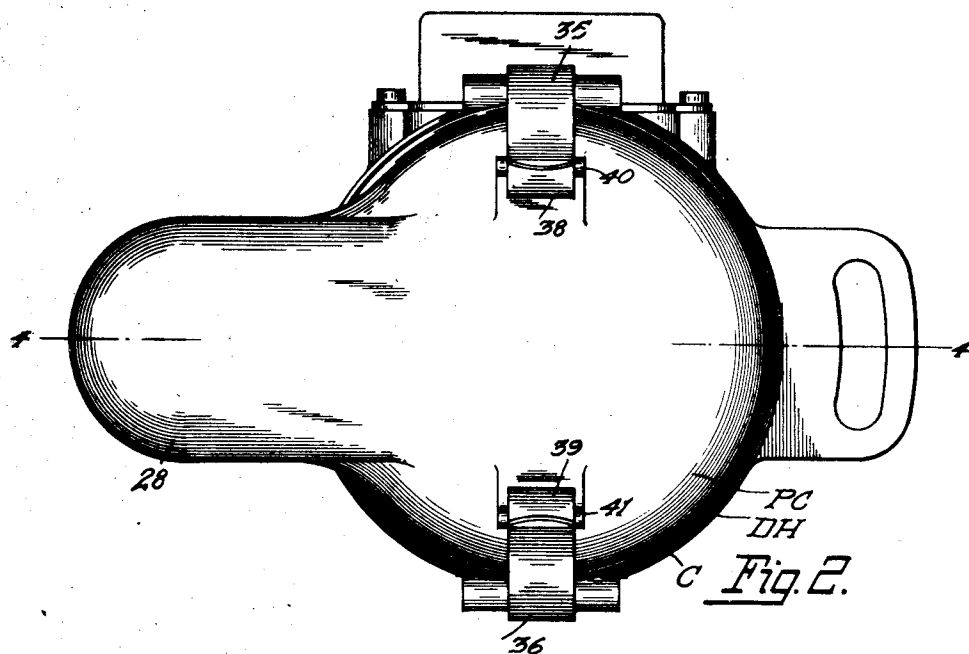
L. B. SAUER

1,717,854

DISTRIBUTOR

Filed April 25, 1924

3 Sheets-Sheet 1



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DISTRIBUTOR

Filed April 25, 1924

3 Sheets-Sheet 2

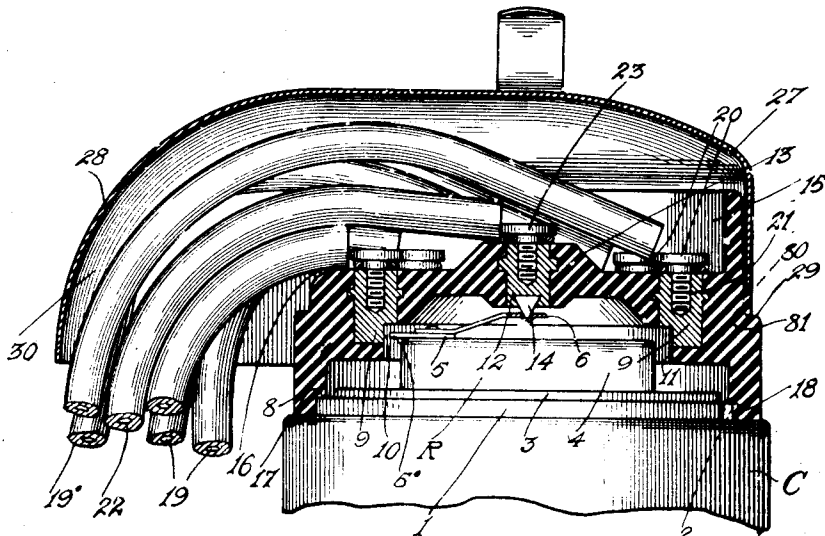


Fig. 4.

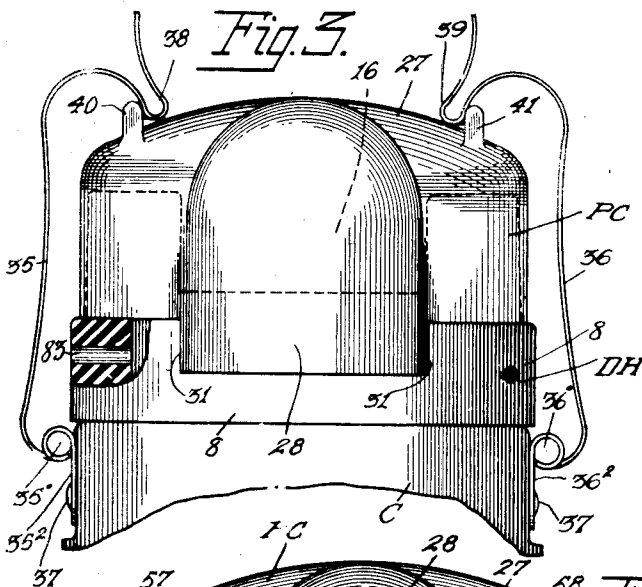


Fig. 5.

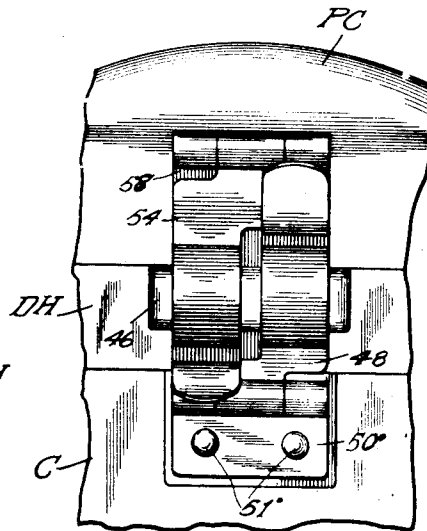


Fig. 6.

Inventor:

Louis B. Sauer.

By Curtis & Co.

Attorney.

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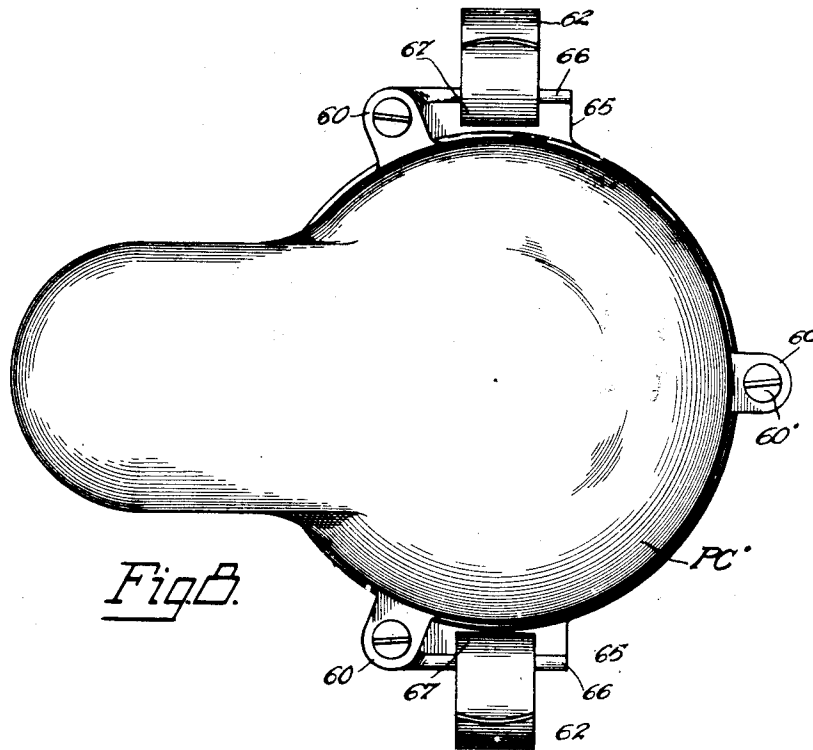


Fig. 6.

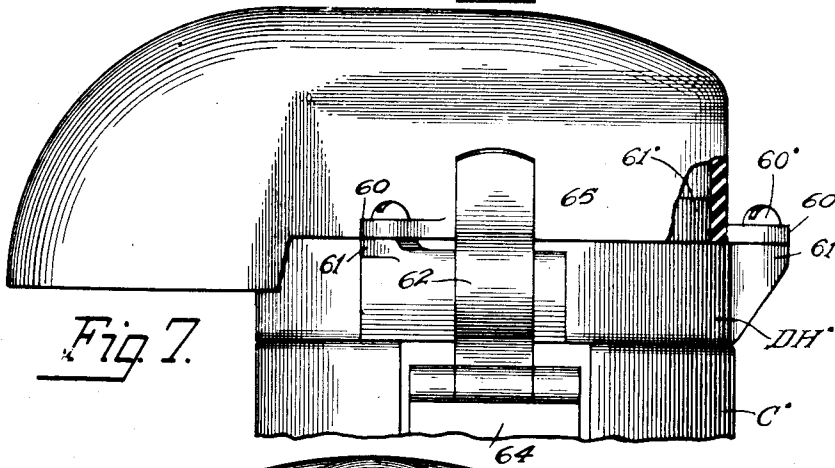


Fig. 7.

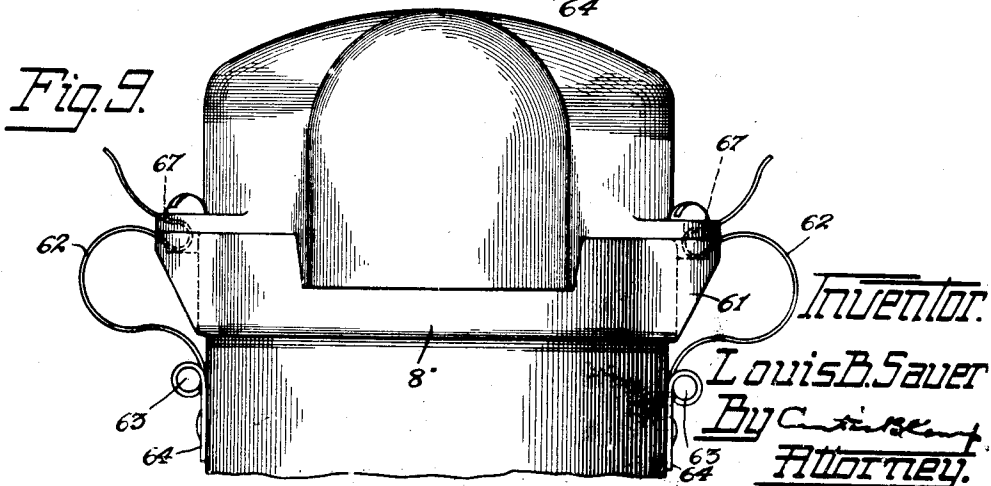


Fig. 8.

Inventor.

Louis B. Sauer

By

Attorney.

UNITED STATES PATENT OFFICE.

LOUIS B. SAUER, OF WESTERN SPRINGS, ILLINOIS, ASSIGNOR TO KELLOGG SWITCH-BOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

DISTRIBUTOR.

Application filed April 25, 1924. Serial No. 708,876.

My invention relates to current controllers commonly called ignition distributors for the electric ignition of internal combustion engines, such for example, as are used in automobiles.

A feature of my invention is the provision of a distributor head for operatively connecting external conductors to the distributor, in combination with the provision of a protector cap for engaging the distributor head to protect the connection of the external conductors with the said distributor head from dust, water and from being interfered with, said protector cap also adapted to protect the top of the distributor head.

In my invention the protector cap may be constructed of metal or of some non-conducting material, such as bakelite or the like, and when my protector cap is constructed of metal, I provide means integrally formed with the distributor head for prevention of conductive or contactual engagement of the ends of the external conductors with the metal protector cap, thereby avoiding the liability of short-circuiting the distributor, the provision of said means forming one of the features of my invention.

Another feature of my invention is the provision of a pair of spring members for securing the distributor head and protector cap of my invention on the casing of the distributor.

Still another feature of my invention is the provision of separate means for securing the distributor head of my invention to the distributor casing, and the provision of separate means for securing the protector cap to the distributor head.

The above features, as well as others, will be pointed out more in detail in the ensuing specification, and for a clearer understanding of the features of my invention, reference may be had to the accompanying drawings in which like reference characters in the several views denote like parts, and in which:

Fig. 1 is a side plan view of the distributor of my invention showing one spring member of the pair of spring members for securing the distributor head and protector cap on the distributor casing;

Fig. 2 is a top plan view of Fig. 1;

Fig. 3 is a left side view of Fig. 1 but showing only the top portion of the distributor casing;

Fig. 4 is a sectional view of my invention along the line 4—4 of Fig. 2;

Fig. 5 is a side plan view of my invention showing the means for securing the distributor head on the distributor casing, and also showing the means for securing the protector cap on the distributor head;

Fig. 6 is a side plan view of Fig. 5 showing the means for securing the distributor head to the distributor casing and showing the means for securing the protector cap on the distributor head, this figure showing, however, only a portion of the distributor head, protector cap and casing.

Fig. 7 is a side plan view of a modification of my invention showing the protector cap partly in section and secured on the distributor head, and also showing the means for securing the distributor head on the distributor casing;

Fig. 8 is a top plan view of Fig. 7; and

Fig. 9 is a left side view of Fig. 7.

Figs. 1 to 6, inclusive, show a metal protector cap, while Figs. 7, 8 and 9 show a protector cap formed out of non-conducting material, such as bakelite or the like.

Referring now in detail to my invention as illustrated in the drawing, Figs. 1, 2, 3 and 4, C is a cup-shaped enclosing casing for supporting and enclosing various parts of the ignition distributor, while DH is the distributor head and PC is the protector cap of my invention. The casing C is provided with a circumferential flange 1 integrally formed with said casing C, said flange having a cut out portion or slot 2 for purposes to be later pointed out. A non-conducting rotor contact carrying element R, comprising a disk 3 having a block 4 integrally formed therewith to which is suitably secured a conducting member 5 and a contact spring 6, is provided and rotatably supported on a rotatable shaft within the casing C, the said block 4 and a part of the disk 3 extending out of the open end of the casing C and above the flange 1. Since the rotor element R forms no part of my present invention, further description of the same is thought unnecessary for a clear understanding of my present invention.

The distributor head DH of my invention comprises a circular shaped member 8 formed out of suitable insulation material, such as bakelite or the like, and has a plurality of metal terminal inserts 9 uniformly spaced

and suitably secured therein against rotary and longitudinal movement during the process of the formation of said member 8. Each one of the terminal inserts 9 has a portion 5 of its wall cut away at 10 to conform to the contour of the wall 11 of the member 8 for purposes to be pointed out later. A metal terminal insert 12 is also provided and secured against rotary and longitudinal movement in the center of the raised portion 13 of the member 8 during the formation of said member 8. Suitably secured in the end of the terminal insert 12 is a contact member 14. A circumferential flange 15 is provided 15 which is integrally formed with the member 8 and has a cut away portion 16 through which external conductors extend as will be pointed out more clearly in the ensuing specification. The member 8 is of such a size that 20 it is adapted to fit upon and engage the open end of the casing C and has its circumferential shoulder 17 engaging and resting upon the flange 1 of said casing C and to prevent rotary movement of the said member 8 relative 25 to the casing C, a lug 18 is integrally formed with the member 8 which engages the slot 2 formed in the flange 1 of the casing C. When the member 8 is in its mounted position, as shown in Fig. 4, the contact member 14, secured to the terminal insert 12, will engage the free end of the contact spring 6, and the extending end 5' of the conducting member 5 will be opposite the cut away wall 10 of the terminal insert 9, and when the rotor element 35 R is rotated, the contact spring 6 remaining in engagement with the contact member 14 will rotate under said member 14, and the end 5' of the conducting member 5 will be rotated into operative position successively 40 with the terminals 9 to establish a spark circuit as will be clearly understood by those familiar with the art.

Connected to each terminal insert 9 is an insulated conductor 19 which extends from 45 a spark plug on the internal combustion engine and has its end stripped of its insulation 19' and formed to receive a terminal screw 20 which has screw threaded engagement with a suitably tapped orifice 21 in the terminal insert 9. The said stripped end of the 50 conductor 19 resting upon and having contact engagement with the end of the terminal insert 9 and secured thereon by the screw 20 with which it also has contact engagement. An insulated conductor 22 extending from a source of battery current is 55 provided and connected to the terminal insert 12 by a screw 23 in the same manner in which conductors 19 are secured to the terminal inserts 9 as described above. Some of 60 the conductors 19 and the conductor 22 engage and rest in the cut away portion 16 of the circumferential flange 15, while the other of said conductors 19 rest upon these conductors 65 above the said flange 15. The conductors

19 and 22 are insulated from each other by their insulation covering 19', and the terminal inserts 9 and terminal insert 12 are insulated from each other by the insulation member 8.

The protector cap PC of my invention comprises a substantially cup-shaped member 27 which has an integrally formed outwardly extending portion 28, which protector cap PC is adapted to encircle the circumferential 75 flange 15 of the member 8 of the distributor head DH and rest upon the circumferential shoulder 29 of said member 8. The protector cap PC is positioned on the distributor head DH so that the opening 30 in the extending 80 portion 28 coincides with the cut away portion 16 of the flange 15, the extending portion 28 adapted to fit over the conductors 19 and conductor 22 and has its shoulders 31 engaging the side of the member 8. The protector 85 cap when in the position as shown in Fig. 4 for instance will serve as guiding means for conductors 19 and conductor 22 to the distributor head DH and will protect the ends of said conductors connected to the terminal 90 inserts 9 and terminal insert 12, and also the top of the distributor head against injury and from water, dust, grease and the like. The flange 15 of the member 8 extends up into the protector cap PC to protect the terminal 95 ends of the conductors and the terminal inserts and screws from the metal protector cap PC so that no conductive engagement of the said terminal inserts, screws and conductors may be effected to ground the distributor. The conductors 19 and conductor 100 22 engaging the cut away portion 16 of the flange 15 and extending through the opening 30 in the extending portion 28 of the protector cap PC will prevent rotary movement 105 of the protector cap PC upon the distributor head DH. Furthermore, the cap PC has a tight fit with the member 8 of the distributor head which also tends to prevent rotary movement of the cap PC on the head DH. The circumferential edge of the cup shaped protector 27 is provided with a notch 80 and the distributor head DH is provided with an integrally formed lug 81 which rests in the notch 80 in the circumferential edge of the 115 cup shaped protector 27 and prevents rotary movement of the cover PC relative to the distributor head DH.

To secure the protector cap PC upon the distributor head DH, I will first describe 120 the means employed as shown in Figs. 1, 2, 3 and 4. A pair of spring members 35 and 36 are provided and are hinged diametrically opposite each other on the members 35' and 36' secured in the members 35² and 36² respectively, said members 35² and 36² being 125 secured to the casing C by suitable rivets 37. The spring members 35 and 36 have loop portions 38 and 39 formed near their free ends respectively, which loop portions 38 and 130

39 are adapted when pulled upward to fit over and engage the lugs 40 and 41, respectively, and to also bear down against the top of the protector cap PC, the lugs 40 and 41 being integrally formed with the protector cap PC. The spring members 35 and 36 are of such a length that they exert spring pressure upon the protector cap PC when said springs are in the position shown in Fig. 3 whereby the protector cap PC and the distributor head DH are held on the distributor casing C against displacement. The protector cap PC and the distributor head DH may be removed by lifting the loop portions 38 and 39 of the spring members 35 and 36 respectively from the protector cap PC whereupon the cap PC and head DH may be removed from the casing C.

Referring now to the means for holding the distributor head DH and the protector cap PC on the casing C as shown in Figs. 5 and 6, a pair of outwardly extending diametrically opposed lugs 45 and 46 are provided which are integrally formed with the member 8 of the distributor head DH, said lug 45 having flanges 45¹ and 45² integrally formed therewith, and lug 46 having flanges 46¹ and 46² integrally formed therewith. To secure the distributor head DH upon the casing C, a pair of spring members 47 and 48 are provided and hinged diametrically opposite each other and in operative relation with the lugs 45 and 46, respectively, on the members 49 and 50 secured in the members 49' and 50', respectively, said members 49' and 50' being secured to the casing C by rivets 51. The spring members 47 and 48 are shaped and adapted to have their loop portions 47' and 48' pulled upward and hooked over the flanges 45¹ and 46¹ respectively, and brought into engagement with the lugs 45 and 46, respectively. The spring members 47 and 48 exert spring pressure upon lugs 45 and 46, whereby the distributor head is held upon the casing C, and the flanges 45¹ and 46¹ prevent the disengagement of the spring members 47 and 48 from the lugs 45 and 46, respectively.

To secure the protector cap PC upon the distributor head DH, a pair of spring members 53 and 54 are provided which are similar to spring members 47 and 48 and are hinged on members 55 and 56 which are secured to the members 57 and 58, respectively, said members 57 and 58 being secured to the flat faces 59 and 60 formed in the protector cap PC by suitable rivets 61. The loop portions 53' and 54' of spring members 53 and 54, respectively, are pulled downwardly and hooked over the flanges 45² and 46², respectively, and engage the lugs 45 and 46, respectively, said flanges 45² and 46² engaging the loop portions 53 and 54' respectively, retain said loop portions in engagement with the lugs 45 and 46, and due to spring pres-

sure exerted by the spring members 53 and 54, the protector cap PC is held on the distributor head DH. The protector cap PC may be removed from the distributor head by pulling upwardly on the free ends of the spring members 53 and 54, which will cause said spring members to disengage the lugs 45 and 46. The distributor head DH and protector cap PC may be removed from the casing C as a single unit by pulling downwardly on the free ends of the spring members 47 and 48, which will cause said spring members to disengage the lugs 45 and 46, respectively.

Referring now to Figs. 7, 8 and 9, the protector cap PC' is formed out of non-conducting material, such as bakelite or the like, and is the same in shape as the protector cap described above and shown in the other figures of the drawings, except that it is provided with integrally formed ears 60. The protector cap PC' is adapted to fit over and engage the outer face of the circumferential flange 61' integrally formed with the distributor head DH' and is secured upon the said distributor head DH' by means of suitable screws 60' which extend through suitable openings in the said ears 60 and have screw-threaded engagement with suitably tapped inserts secured in the members 61 integrally formed with the non-conducting member 8' of the distributor head DH' during its formation. Thus it will be seen that the distributor head DH' and protector cap PC' are secured together to form a single unit. To secure this unit in operative position upon the casing C' spring members 62 are provided and are hinged on the members 63 secured in the members 64, which members 64 are suitably secured to the side of said casing C' so that said spring members 62 are diametrically opposite each other. A pair of wing members 65 are provided and integrally formed with a pair of members 61 and also with the member 8' of the distributor head DH', said wing members 65 being provided with a flange 66. The loop portions 67 of the spring members 62 are adapted to be hooked over the flange 66 and engage the wing member 65 whereby the flange 66 retains the spring member 62 in engagement with the wing member 65, and due to spring pressure exerted by the spring members 62 upon the wing members 65, the protector cap PC' and distributor head DH' are secured on the distributor casing C' as a unit. The protector cap PC' may be removed by removing the screws 60', and the protector cap PC' and distributor head DH' may be removed as a unit from the casing C' by lifting the loop portion 67 of the spring member 62 from the wing members 65.

Except as pointed out above, the protector cap PC' and the distributor head DH' are the same in construction as that pointed out in the description given to Figs. 1, 2, 3 and 4.

An air hole 82 in the casing C and an air hole 83 in the distributor head DH will permit the circulation of air within the distributor.

5 Having described a preferred embodiment of my invention I do not wish to be limited to the exact structure as shown and described, as changes and modifications may readily suggest themselves, therefore it is to be understood that I intend to cover all that which
10 may come within the spirit and scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters
15 Patent is:

1. A device of the class described including a cup shaped casing, a distributor head resting upon and engaging the open end of said casing, means for preventing rotary
20 movement of said distributor head upon said casing, a plurality of terminals secured in said distributor head, external conductors secured to said terminals, a protector cap having an integrally formed downwardly extending portion through which said external
25 conductors extend, said cap adapted to fit upon and engage said distributor head, a member integrally formed with said distributor head for protecting the connection of said external conductors and said terminals from said
30 protector cap, lugs on said distributor head, spring members fastened to said cap adapted to engage said lugs to secure said cap to said distributor head to form a unit structure, other spring members fastened to said casing
35 adapted to engage said lugs to secure said unit structure to said casing, said first spring members adapted to maintain said unit structure when the same is removed from said casing.

40 2. A device of the class described including a cup shaped casing, a non-conducting member adapted to engage the open end of said casing, terminals secured in said member, rotatable means in said casing operatively associated with said terminals, external
45 conductors having their one end secured in contactual engagement with said terminals, a flange integrally formed with said member and having a portion thereof cut away to receive said external conductors, a cover cap having a downwardly extending portion integrally formed therewith through which
50 said conductors extend to said terminals via said cut away portion, said cap adapted to encircle said flange and rest upon a shoulder formed in said member, said flange protecting
55 said conductors and said terminals from a conductive engagement with said protector cap, lugs on said non-conducting member, spring members fastened to said cap adapted to engage said lugs to secure said cap to said
60 non-conducting member to form a unit structure, other spring members fastened to said casing adapted to engage said lugs to secure said unit structure to said casing, said first
65

spring members adapted to maintain said cap and said non-conducting member as a unit structure when the same is removed from said casing.

3. A device of the class described including a cup shaped casing, a non-conducting
70 member supported on said casing, terminals secured in said member, external conductors, means for connecting said conductors to said terminals, a metal cover cap adapted to
75 engage said member and enclose the ends of said conductors, said connecting means and said terminals, an opening through which said conductors extend, and a flange integrally formed with said member for preventing
80 conductive connection of said metal cover cap with said conductor ends and said connecting means, lugs on said non-conducting members, spring members fastened to said cap adapted to engage said lugs to secure
85 said cap to said non-conducting member to form a unit structure, other spring members fastened to said casing adapted to engage said lugs to secure said unit structure to said casing, said first spring
90 members adapted to maintain said cap and said non-conducting member as a unit structure when the same is removed from said casing.

4. A device of the class described including an enclosing casing provided with a
95 flange, a distributor head adapted to fit on top of said casing and provided with a circumferential shoulder for engaging said flange, terminals secured in said distributor head, external conductors extending to said
100 terminals, means for securing said conductors to said terminals, a protector cap for fitting over and engaging said distributor head for protecting the terminal ends of said external conductors, said securing means
105 and said terminals, a flange integrally formed with said distributor head for protecting the terminal ends of said conductors and said securing means from conductive engagement with said protector cap, lugs on
110 said distributor head, spring members fastened to said cap adapted to engage said lugs to secure said cap to said distributor head to form a unit structure, other spring members fastened to said casing adapted to engage
115 said lugs to secure said unit structure to said casing, said first spring members adapted to maintain said unit structure when the same is removed from said casing.

5. A device of the character described including a casing member, a terminal head
120 adapted to fit onto said casing member, a protective cap adapted to fit onto said terminal head and to form a unit structure therewith, spring means adapted to secure said cap and head together to form said unit
125 and to maintain said unit when said head is removed from said casing, and yielding clamping means for clamping the casing member, terminal head and caps together. 130

6. A distributor comprising a casing member, a terminal head adapted to fit thereon, a cover cap adapted to fit onto said terminal head and having an extended portion with its under side open for the reception of conductors connected to said terminal head, means for securing said casing member, said terminal head and said cover cap together to form a unitary structure, means including spring members secured to said cap and adapted to engage lugs on said terminal head for maintaining said cap and head as a unit structure when removed from said casing, means for preventing said terminal head from rotating relative to said casing member, and means for preventing

said cover cap from rotating relative to said terminal head.

7. A distributor comprising a casing member, a terminal head, a cover cap, means for preventing said members from rotating relative to each other, spring means for yieldingly securing said members together to form a unit structure when removed from said casing by spring members secured to said cap and engaging lugs on said terminal head, and orifices through which air passes into and out of said casing member.

Signed by me at Chicago, in the county of Cook and State of Illinois, this 23d day of April, 1924.

LOUIS B. SAUER.