

F. C. HERSEE.
 TIMER,
 APPLICATION FILED APR. 19, 1917.

1,264,933.

Patented May 7, 1918.

Fig. 1.

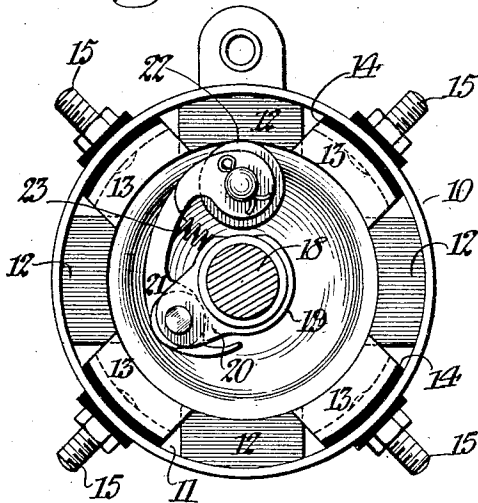


Fig. 2.

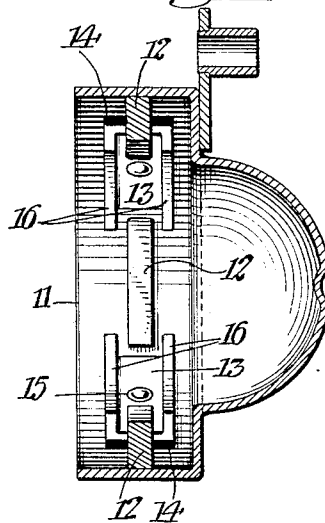


Fig. 4.

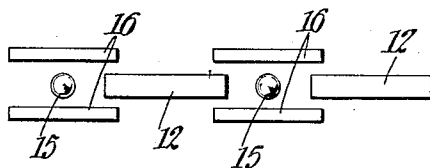


Fig. 5.

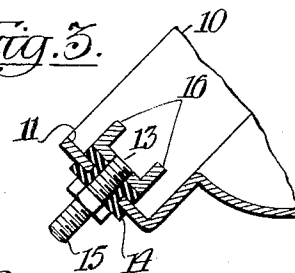


Fig. 6.

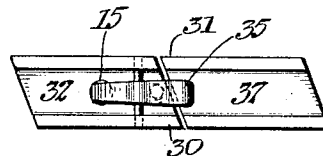


Fig. 7.

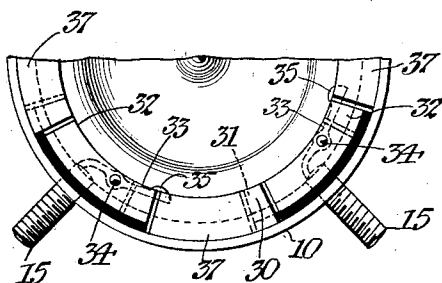
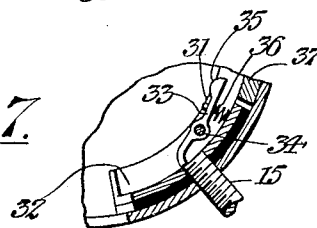


Fig. 8.



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UNITED STATES PATENT OFFICE.

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TIMER.

1,264,933.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK C. HERSEE, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Timers, of which the following is a specification.

My invention is designed primarily as an improvement over that type of circuit closer commonly known as a timer and used for controlling the flow of current to the various igniters of a multiple cylinder internal combustion engine. It is common in such timers to provide a rotatable contact member adapted to engage with a circular raceway including in its construction the several insulated sections constituting contacts for the several circuits.

My invention relates particularly to the construction of this annular raceway and the main object of my invention is to increase the life and render more uniform the operation of the device by making the raceway a complete metal one so that at all times the movable contact member is engaging with some portion of a complete metal ring in spite of the fact that certain sections of the ring or raceway are insulated from other sections. To accomplish this result, I provide as an important feature of my invention a staggered arrangement of sections with over-lapping but laterally spaced ends so that the movable contact does not leave the raceway portion of one section until after it has passed on to the raceway portion of the next section. The sections considered collectively make a continuous and complete peripheral metal raceway and the insulating of one section from another is accomplished by spacing the sections apart laterally or axially, rather than peripherally or circumferentially.

As a further feature of my invention, I provide means whereby the arcing following the breaking of the circuit at the contact will be prevented from acting upon or in any way injuring the portions forming the metal raceway. To accomplish this result I provide each contact section of the raceway with a portion projecting beyond the body of the section so that the arcing will act only upon this projecting portion. The said projecting portion may be held in the path of the rotary contact by spring pressure and may be inexpensive in construction and read-

ily removable so that as soon as it becomes affected in any way by the arcing it may be removed and replaced by a new one without special skill or tools and without material expense.

My invention may be embodied in various different forms although in the accompanying drawings I have illustrated only two such embodiments. Various other forms will readily occur to those skilled in the art. In these drawings, to which reference is to be had and in which similar reference characters indicate corresponding parts in the several views,

Figure 1 is an end view of a timer constructed in accordance with my invention, the cover plate being removed and the drive shaft being shown in section;

Fig. 2 is a central longitudinal section through the casing of the timer, said section being taken on a vertical line through Fig. 1;

Fig. 3 is a section through a part of the casing showing a terminal connection;

Fig. 4 is a development of the face of the raceway on a somewhat smaller scale;

Fig. 5 is a view similar to a portion of Fig. 1 but showing a modified form;

Fig. 6 is a face view of a portion of the raceway shown in Fig. 5; and

Fig. 7 is a section on the line 7-7 of Fig. 6.

In the specific construction illustrated in Figs. 1 to 4 inclusive, the timer includes a casing 10 of stamped or cast metal or any other suitable material and includes a cylindrical portion 11 for supporting the raceway. The raceway as shown is made up of a series of eight sections, the four alternate sections 12 being in the form of inwardly directed flanges rigid with the cylindrical wall 11 of the casing. These flanges 12 may be secured in position in any suitable manner as for instance by soldering, welding or riveting and they all lie in the same plane at right angles to the axis of the casing.

The other four alternate sections 13 are each substantially channel-shaped in cross section as shown particularly in Fig. 3 and each has the web portion thereof insulated from the casing in any suitable manner as for instance by a layer 14 of insulating material. Each of these sections 13 is rigidly secured in position, preferably by a screw extending through the peripheral wall and insulated from the latter and serving as

means whereby an electric wire may be connected to the section.

The inner edges of all of the sections form portions of the same cylindrical surface and all are at equal distances from the axis of the device. The space between the two side flanges 16, 16, of each section 13 is slightly wider than the width of the end portions of the adjacent sections 12, 13, and the end portion of each section 12 extends in between the two side flanges of the section 13 so that the inner surface of each section overlaps the inner surface of the sections at each end thereof. Thus a continuous metal cylindrical surface is formed although it is made up of separate sections spaced and insulated from each other. By the term "continuous", it is not meant that the sections 12 and 13 engage or unite, but it is meant that the member, in moving along the inner surface of the series of sections, will find a continuous metal path all portions of which lie in the same cylindrical surface.

Any suitable form of rotary contact member may be used within my improved casing above described. Merely as an example of such construction, I have shown a shaft 18 projecting into the end of the casing and having a collar 19 secured thereto. Pivoted on this collar is an arm 20, one end of which, 21, may engage with the collar to limit the movement of the arm in one direction, and the other end of which carries a contact roller 22 for engagement with the sections above described. A suitable spring 23 may engage with the collar and the arm to hold the contact roller in operative position. The length of the roller is at least equal to the width of the wider section 13 of the raceway so that as the shaft is rotated, the roller will first engage with the two flanges 16 of the section 13 and before leaving them, it will pass on to the next section 12. For a brief interval it will engage with both sections and at all times overlap a portion of a cylindrical metal surface with which it may engage. At the instant it leaves the section 13, the circuit through the latter will be broken as will be readily understood by those familiar with the art. The extent to which the ends of the sections overlap may be varied but so far as the providing of a continuous metal pathway is concerned, the overlap may be comparatively slight. As the ends of the sections 13 may in time be pitted by the arcing action, the overlap should be sufficient to provide a material distance on the section 13 in which pitting may occur without destruction of the desired perfect cylindrical raceway.

In the specific form above described, the sections which are connected to the electric terminals are of channel-shape while the other sections extend between the flanges of the channel. It is evident that the reverse

arrangement might be equally satisfactory, that is, that the sections 12 insulated from the casing and connected to the electric terminals and the sections 13 grounded if desired. Although it is preferable that the sections which have one flange engage intermediate of the ends of the roller and the sections which have two flanges engage with the roller at equal distances from the ends of the latter to avoid any tilting action or thrust on the axis of the roller, yet this is not imperative and one of the flanges 16 of each section 13 might be omitted if desired.

I might form all of the sections substantially channel-shape and might cut the ends of each section on a diagonal. I have shown such an arrangement in Fig. 6 where it will be noted that each member has two side flanges 30 and 31, and that each flange 30 at one end projects circumferentially beyond the flange 31 of the next section. Thus, the roller, in moving along from one section to the other, will engage the flange 30 of one section before it leaves the flange 31 of the last preceding section.

In Figs. 5, 6 and 7, I have also shown a further feature of my invention whereby injury to the raceway from arcing is prevented. In the specific form illustrated, each terminal or insulated section 32 has an extension 33 somewhat in the form of a pawl and mounted on a pivot 34 extending across from one flange to the other of the section. The end 35 of the extension projects inwardly to a very slight extent beyond the cylindrical surface of the raceway and is held out by a small spring 36. This end also projects circumferentially beyond the end of the body of the section and between the two flanges of the grounded section 37. The roller, or other movable contact member, in passing along the raceway will close the circuit when it reaches the section 32 and the circuit will remain closed until after the contact has entirely left the body of the section and until it leaves the tip end 35 of the member 33. The instant it leaves this end, the circuit will be broken and any arcing action will be between the roller or other movable contact and this end 35. In case the said end becomes pitted, eroded or otherwise injuriously affected by the arcing action, the entire member may be very readily removed and replaced by a new one. Thus none of the arcing action takes place between the movable contact member and the parts presenting the cylindrical surface of the raceway and this cylindrical surface will not be affected by any action other than ordinary wear.

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

1. A timer including a movable contact and an annular raceway, said raceway being

formed of a series of sections presenting a complete cylindrical metal pathway, successive sections having their ends overlapped peripherally and spaced apart axially.

5 2. A timer including a casing presenting a series of inwardly projecting flanges, said flanges being arranged in series to form a raceway and each section having its opposite ends extending peripherally beyond the adjacent ends of the next successive sections but insulated therefrom.

10 3. A timer including a casing presenting a series of inwardly projecting flanges, said flanges being arranged in series to form a raceway and each section having its opposite ends extending peripherally beyond the adjacent ends of the next successive sections but insulated therefrom, and means for connecting electric circuits to each alternate section.

20 4. A timer including a casing presenting a series of inwardly directed flanges, the inner surfaces of all of said flanges forming parts of the same cylindrical surface and each of said sections having a portion projecting peripherally beyond the adjacent end of the next successive section, means for insulating certain of said sections from said casing and a contact member movable along said cylindrical surface.

30 5. A timer including a series of metal contact members, a series of interposed metal members, the said interposed members having their end portions projecting beyond the ends of the contact members to provide a continuous metal path, means for insulating said contact members from said interposed members, and a contact member movable along said path and at all times in engagement with at least one of the members forming said path.

40 6. A timer including a casing, a series of flanges projecting inwardly from the peripheral wall thereof, a series of contact members secured to said peripheral wall and arranged alternately with said flanges, each of said contact members being insulated from said casing and being of substantially channel shape with the side flanges of the channels projecting peripherally beyond said first mentioned flanges and spaced from the latter, and a movable contact member

including a roller at all times in engagement with either said first mentioned flanges or the side flanges of said first mentioned contact members. 55

7. A timer including an annular raceway formed of a series of metal sections all having their inner surfaces forming parts of the same cylindrical surface and having their ends overlap to make a continuous metal pathway, certain of said sections being insulated from the remaining sections to form contacts, and each contact having a movable terminal portion projecting beyond the next adjacent section, and a movable contact member for successive engagement with said sections and acting to break electric circuits as it leaves each of said projecting portions. 60 65 70

8. A timer including a series of sections presenting a continuous metal pathway, the adjacent ends of said sections being overlapped and spaced from each other, each alternate section being insulated from the remaining sections to form a contact, a movable contact member in continuous engagement with the cylindrical surface presented by said sections, and a movable portion projecting from each contact section peripherally beyond the cylindrical surface portion of said contact and in the path of said movable contact member. 75 80

9. A timer including a series of sections presenting a continuous metal pathway, the adjacent ends of said sections being overlapped and spaced from each other, each alternate section being insulated from the remaining sections to form a contact, a movable contact member in continuous engagement with the cylindrical surface presented by said sections, and a spring pressed, pivoted and removable portion projecting from each contact section peripherally beyond the cylindrical surface portion of said contact and in the path of said movable contact member. 85 90 95

Signed at Boston, in the county of Suffolk and State of Massachusetts, this 17th day of April, A. D. 1917.

FREDERICK C. HERSEE.

Witnesses:

ALEXANDER FRASER,
EDMUND M. CREEDON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."