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A. P. McCULLOCH

TIMER

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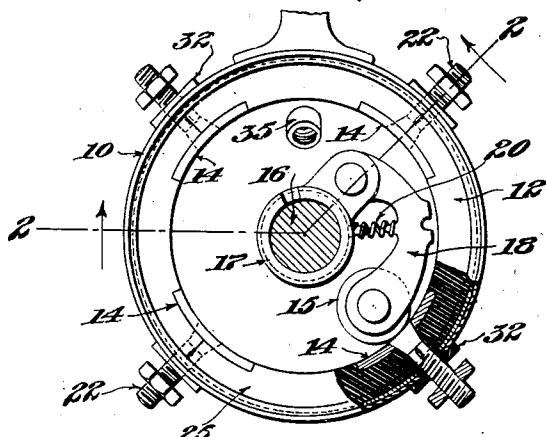


Fig. 1

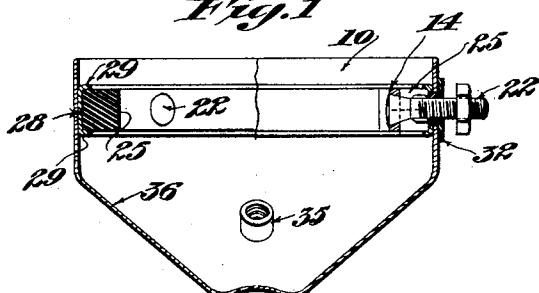


Fig. 2

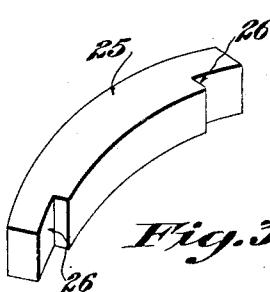


Fig. 5

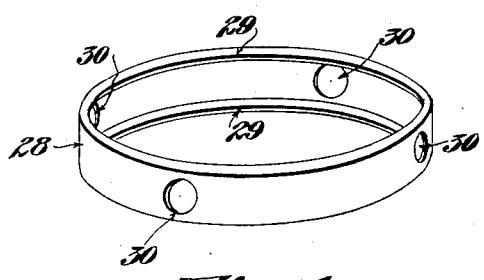


Fig. 4

Witness

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UNITED STATES PATENT OFFICE.

ALBERT P. McCULLOCH, OF DORCHESTER, MASSACHUSETTS.

TIMER.

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To all whom it may concern:

Be it known that I, ALBERT P. McCULLOCH, a citizen of the United States, residing at Dorchester, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Timers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in timers, and more particularly to the small rotary timers employed in connection with automobile ignition systems.

A construction of timers generally employed consists of a metal housing within which is located a fibre ring having a plurality of metal contact plates received in the inner face to be engaged by a contact roller which travels about the inner periphery of the ring. This fibre ring as normally constructed is provided with a series of recesses to receive the contact plates. The ring is furthermore provided with a series of openings extending through it to receive the attaching members for securing the ring to the housing, and which act as conductors, connecting the contact plates with the usual terminal leads. It is a matter of some considerable difficulty to satisfactorily form these rings, as it is necessary to employ several operations for completing them, and there is always a liability, especially when forming the recesses, of chipping off the ring and rendering it unfit for use.

One feature of the present invention is to improve the construction of timers of this character by providing a sectional ring, which may be made accurately and at a comparatively small expense, and which in its completed form has certain advantages over the solid ring.

Another feature of the invention is to provide in a timer of this sort, having provision for the injection of a lubricating medium at the upper portion of the housing, a clamping band within which the fibre ring is rigidly mounted, the clamping band extending about the outer periphery of the ring and being interposed between the ring and the wall of the housing when the timer is assembled. This metal clamping band serves to prevent the lubricating medium from working down and lodging between the fibre ring and the wall of the housing

and causing deterioration of the ring, and is of extreme importance in conserving the life of the timer.

Still further features of the invention consist in certain novel features of construction and combinations and arrangements of parts hereinafter described and claimed, the advantages of which will be obvious to those skilled in the art from the following description.

In the accompanying drawings illustrating the preferred form of the invention, Figure 1 represents a front elevation, partly in section of the improved timer; Fig. 2 is a section of the timer housing on the line 2-2 of Fig. 1 looking in the direction of the arrows and having the shaft and rotating parts removed therefrom; Fig. 3 is a perspective view of one of the sections of the ring before its assembly; and Fig. 4 is a perspective view of the band for clamping the various sections of the ring together.

The timer shown in the illustrated embodiment of the invention is a type used generally on Ford automobiles, and comprises essentially a metal housing 10 within which is supported an insulating ring 12. A series of contact plates 14 (4 in number) are received in the inner face of the ring 12, and serve to complete an electric circuit through the usual contact roller 15. The roller 15 travels about the inner face of the ring 12, and to this end is mounted upon a shaft 16 having a sleeve 17 secured thereto which carries a swinging arm 18 on the outer end of which the roller is journaled. The roller is yieldingly maintained in contact with the surface of the ring by a spring 20 interposed between the arm 18 and the sleeve 17, as shown in Fig. 1. Each of the contact plates 14 is provided with a terminal screw 22 which serves the dual function of binding the plate 14 and the ring 12 to the housing, and also as a conductor for the passage of current.

According to the usual construction, this fibre ring is made in one piece, having the recesses formed in the face to receive the contact plates 14, and it is a matter of considerable expense to form these recesses accurately and without chipping the ring, so that they may tightly hold the contact plates. As a matter of fact, the formation of the finished ring in a single piece requires several operations with properly formed cutting dies. According to the pres-

ent invention, the expense of manufacturing the ring is materially lessened and the ring improved by making the latter in a plurality of separately formed sections which are later assembled to produce the finished ring. Each of these sections 25, as illustrated in Fig. 3, is provided with a shoulder 26 formed at each of the opposite ends, and serving to form a complete recess for the reception of a contact plate when the sections are assembled end to end. These sections, owing to their configuration, may be molded accurately and cheaply in a single operation, without liability of weakening the ring, due to the cutting out of certain portions after it has been molded. These sections (4 in number) are assembled within a metal clamping band 28 having inturned flanges 29 which are employed to grip opposite faces of the sections to retain the sections firmly and rigidly in assembled position. The clamping band is provided with a series of openings 30 with relation to which the sections are properly assembled, and after the fibre ring has been mounted within the band, openings are bored through the ring in alignment with the openings 30 to receive the usual terminal screws 22. After the contact plates 14 have been seated within the corresponding recesses in the fibre ring, and the ring connected with the timer housing through the terminal screw, the inner face of the ring about which the roller 15 travels is turned down sufficiently to eliminate any shoulders at the junction of the contact plates 14 and the face of the ring and provide a continuous, smooth, circular track. As will be evident from an inspection of Figs. 1 and 2 of the drawings, each of the terminal screws 22 is provided with an insulating bushing 32 at the point where it passes through the clamping band 28 and the housing 10, in order to completely insulate the terminal screw from the housing.

The timer is normally positioned with the housing located as shown in Fig. 1, and in this position an oil duct 35 is located in the upper portion of the housing to lubricate the moving parts of the timer. It is found that this oil runs down the inclined wall 36 of the housing and enters between the fibre ring and the housing proper. This oil soaking into the ring may distort it and cause it to swell, making it impossible to keep the ring tightly secured within the housing. This distortion and loosening of the ring within the housing obviously interferes with the efficiency of the timer, as the roller 15 is thereby prevented from maintaining accurate contact with the inner surface of the ring at all times. According to the present invention the clamping band 28 is accurately fitted to the inside of the housing, and this band, through the medium of

the flanges 29, rigidly grips the ring and ensures a close union between the ring and the housing. The band furthermore prevents oil or other lubricating medium from penetrating between the outer surface of the ring and the wall of the housing, and in this respect also contributes materially to the efficiency of the timer.

While it is preferred to employ the specific construction and arrangement of parts shown and described, it will be understood that this construction and arrangement is not essential except so far as specified in the claims, and may be changed or modified without departing from the broader features of the invention.

The invention having been described, what is claimed is:

1. A timer comprising a housing, a series of relatively thin contact plates, a fiber insulating ring of substantially greater depth than the thickness of the contact plates and consisting of a plurality of sections corresponding in number to the plates and each having shouldered portions formed in the inner face at opposite ends to receive the contact plates when the sections of the ring are assembled therewith and provide a continuous, smooth, circular track, and terminal screws connected with the contact plates for securing the plates and insulating ring within the housing.

2. A timer comprising a housing, a fibre ring supported within the housing, a metal band gripping the outer peripheral surface of the fibre ring and accurately fitting the interior of the housing, and means for securing the ring to the housing.

3. A timer comprising a housing, a fibre ring, a metal band having inturned flanges to grip opposite faces of the ring and adapted to fit closely within the housing, a plurality of contact plates received in the inner surface of the ring, and means passing through the contact plates for securing the ring to the housing.

4. A timer comprising a normally stationary housing, a metal band fitting within the housing a plurality of fibre ring sections clamped within the band, a contact plate bridging each pair of sections, and means for securing the ring within the housing.

5. The combination with a circular casing having an open end, and a plurality of arc-shaped contacts provided with stems disposed in said casing and spaced therefrom, of an insulating ring interposed between said contacts and said casing, said ring comprising a plurality of similar sectors, the meeting ends of said sectors correspondingly grooved to receive the stems carried by said contacts, and each sector having a plurality of circumferential recesses for the embedding of said contacts.

6. An insulating ring for ignition system

comprising a plurality of arc-shaped sectors of insulating material and having circumferential recesses formed in the inner peripheral surfaces adjacent the ends, and
5 an annular metallic band within which the sectors are clamped.

7. A timer comprising a housing, a plurality of arc-shaped sectors of insulating ma-

terial having circumferential recesses adjacent the ends, contact plates received in the 10 recesses and bridging the sectors, and an annular metallic band fitting within the housing and connected to the sectors.

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Witness:

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