Nov. 27, 1923. 1,475,819

A. C. HARTMAN

CONTACT FOR TIMERS

Filed Sept. 7, 1923

Fig. 1.

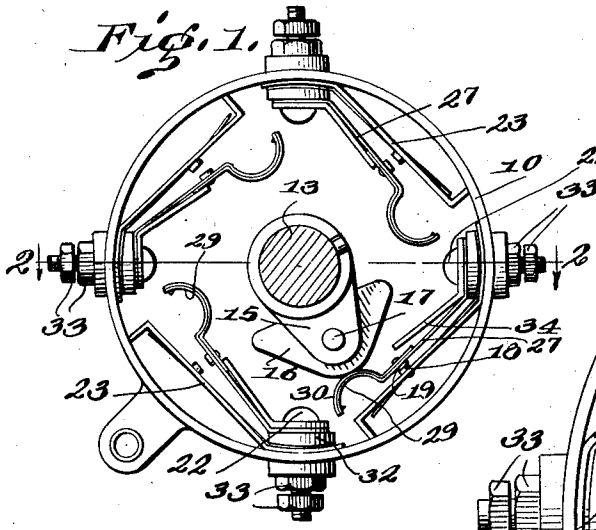


Fig. 3.

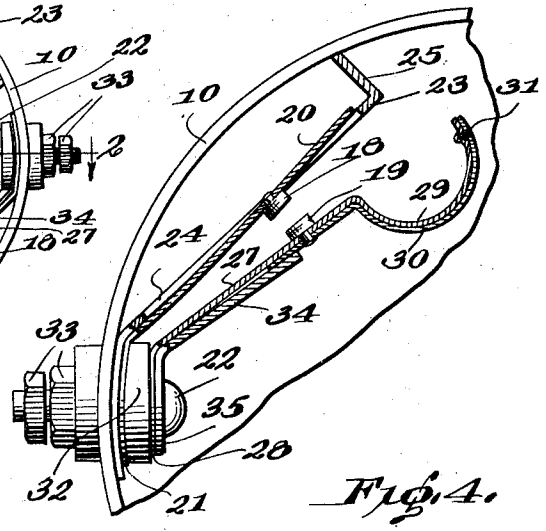


Fig. 2.

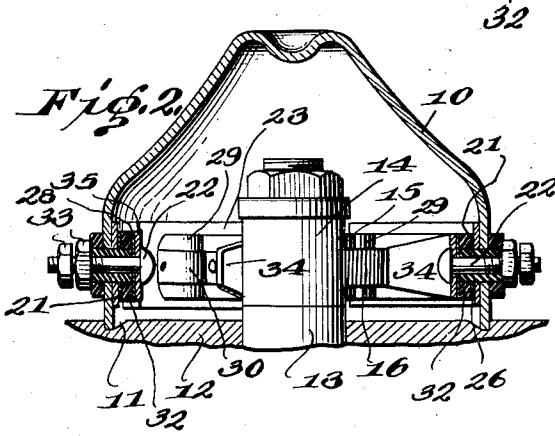


Fig. 4.

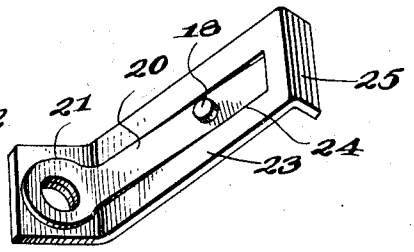
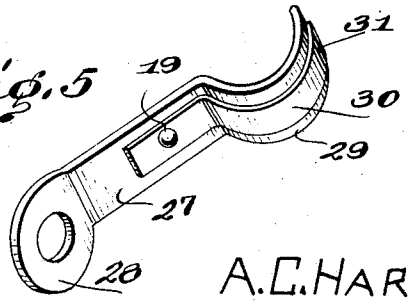


Fig. 5



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Patented Nov. 27, 1923. 1,475,819

UNITED STATES PATENT OFFICE.

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CONTACT FOR TIMERS.

Application filed September 7, 1923. Serial No. 661,402.

To all whom it may concern:

Be it known that I, ARTHUR C. HARTMAN, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Contacts for Timers, of which the following is a specification.

The present invention relates to an improved contact supporting and operating device for use particularly in the timers of automobiles.

An object of the present invention is to provide a pair of spring members insulated one from the other and each of which is provided with a contact, and spring members which have spaced supporting points whereby initial flexing of one of the members first brings the contacts together and subsequent flexing of said spring member causes the contacts to wipe across each other for maintaining the contacts clean and free of corrosion and other accumulations.

A further object of the invention is to provide an improved construction of make and break contacts which are independent of the rotary arm or closing member directly connected to the timer shaft and which are free of wear and are associated for a self-cleaning contact.

Another object of the invention is to provide a pair of spring members of this character which may be constructed of a non-crystallizing or relatively durable material and which are provided with means for protecting the same against excess wear incident to the rubbing action of a wiper, a roller or other suitable contact closing device which may be carried by the operating arm of the timer shaft.

A further object of the invention is to provide a timer of this character which may be substituted upon the Ford engine by the removal of but relatively few parts thereof and without any change in the construction or arrangement of the principal parts of the motor.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views.

Figure 1 is an inner side elevation of a timer constructed according to the present invention, showing the timer shaft in section.

Figure 2 is a longitudinal section taken through the same substantially on the line 2—2 of Figure 1.

Figure 3 is an enlarged fragmentary view partly in section of a pair of the contacts and their supporting spring members in position upon the casing or shell of the timer.

Figure 4 is a detail perspective view of the inner bracket and adjacent spring member with its contact, and

Figure 5 is a similar view of the outer spring member with its contact and wear plate.

Referring to the drawing 10 designates the casing or shell of the timer which is of the usual construction at present used on Ford engines and which, as shown in Figure 2, is adapted to be seated at its open inner side in a groove 11 formed in the front wall 12 of the motor. The shell 10 is placed concentrically about the timer shaft 13 and the latter extends into the shell for a substantial distance.

The timer shaft 13 carries a rotary arm in the form of a sleeve 14 having at one side ears 15 between which are secured a wiper block 16 by means of a pin 17 which engages through the ears 15 and the block 16. The block 16 presents opposite inwardly flaring contact edges for closing the contacts as will be later set forth.

Arranged within the shell 10 is a series of pairs of contacts 18 and 19 arranged to consecutively close the various spark circuits during the rotation of the timer shaft arm. The contacts 18 are the ground contacts and are mounted upon spring tongues 20 which, as shown particularly in Figure 4, are provided with apertured attaching lugs 21 through which a binding post 22 engages for clamping the tongue 20 at its inner end to the shell or casing 10. Fitted beneath and about the tongue 20 is a bracket plate 23 which has one end interposed between the shell 10 and the lug 21 and is bound therebetween for supporting the spring tongue 20 and also to provide an electrical connection between the shell and the tongue. The bracket plate 23 has a longitudinal slot 24 therein through which the free end portion of the tongue 20 may vibrate, the plate 23

extending, as shown in Figure 3 particularly, beyond the lug 21 and serving to support the spring tongue against undue outward flexing. The outer end of the bracket plate 23 has an inturned flange 25 serving as a spacer between the shell 10 and the outer end of the bracket plate 23.

The binding post 22 is provided with an insulating bushing 26 which surrounds the same and which passes through the lug 21 and the base of the bracket plate 23, and which also passes through the shell 10. Mounted upon the inner end of the binding post 22 is a spring arm 27, shown in detail in Figure 5, provided with an apertured lug 28 arranged to fit about the binding post 22 beneath the head thereof, and which extends from the binding post in spaced relation from the spring tongue 20 and which carries the other contact 19.

The spring member 27 at its outer end is arched or bowed inwardly away from the adjacent wall of the shell 10 as shown at 29 to provide an abutment against which the wiper 16 of the rotary arm is adapted to engage. The spring tongue 20 and the spring arm 27 are preferably made of bronze or other suitable non-crystallizing or durable metal possessing the characteristics of a spring, and in order to prevent undue wear by the wiper 16 against the abutment 29, the spring arm 27 is provided upon its outer end and on its outer side with a wear plate or strip 30 which is secured beneath the inner riveted end of the contact 19 and which is held by a detent or punched portion 31 to the outer end of the abutment 29. The wear plate 30 is of sufficient width only to engage the wiper 16 and is made of steel or other suitable relatively hard substance which may withstand wear and which will protect the relatively soft bronze arm 27.

An insulating sleeve 32 is mounted on the binding post about the bushing 26 and between the lug 21 of the spring tongue and the lug 28 of the spring arm so as to electrically insulate these members one from the other The spring arm 27 has electrical contact with a binding post 22, and the outer end of the binding post is provided with a pair of nuts 33 for securing the parts together and for receiving and clamping the wire of an electric circuit.

The forward flexing of the spring arm 27 is limited by a stop finger 34 which has an attaching lug 35 at its inner end adapted to engage about the binding post 22 beneath the head thereof and which may be bent to the desired angle from the lug 35 to receive the spring arm 27 thereagainst and hold the spring arm from further inward flexing. This maintains the abutment 29 in the proper position for engagement with the wiper 16 and prevents it from vibrating inwardly to a harmful extent.

It is apparent that when the rotary arm on the timer shaft 13 is turned in the shell or casing 10 it is brought consecutively against the row of abutments 29 and consecutively depresses the abutments for closing the pairs of contacts 18 and 19. When an abutment 29 is depressed the outer contact 19 is first brought into engagement with the inner contact 18 and the two contacts are further depressed under the additional tension of the spring tongue 20. As the lugs 21 and 28 of the spring members are spaced apart by the insulating sleeve 32, the flexing of the members 20 and 27 causes a differential movement between them so that the contacts 18 and 19 are slid one upon the other. This sliding or wiping action of the contacts maintains the same clean and free from corrosion and accumulation and thus insures a complete and perfect closing of the circuit. The wear plates 30 prevent the breaking of the abutments 29 and also prevent the wearing away thereof, particularly since the spring arm 27 is made of bronze or similar material.

I do not wish to be restricted to the size form, and proportions of the various parts, and obviously changes could be made in the construction herein described without departing from the spirit of the invention, it being only necessary that such changes fall within the scope of the appended claims.

What is claimed is:—

1. In a timer, a casing, a rotary arm mounted in the casing, a circular row of pairs of spring members mounted in the casing with the inner spring members having their ends in the path of said rotary arm for depression by the same during turning of the rotary arm, pairs of contacts on said spring arms adapted to be brought together when the inner arms are depressed, and stops mounted in the casing for engaging the inner sides of the inner arms to maintain the inner arms from swinging inwardly too far when the rotary arm moves past the same and to hold the inner arms in proper position for reengagement by said rotary arm.

2. In a timer, a shell, a plurality of pairs of spring members mounted in a circular row in the shell, the inner spring members having abutments upon their free ends, a rotary arm mounted in the shell and having a wiper on its outer end adapted to consecutively engage said abutments, pairs of contacts on said pairs of spring members adapted to be brought together when the inner members are depressed by said rotary arm, supporting brackets mounted in the casing against the outer side of the outer spring members to support the same against undue flexing, and adjustable stops arranged at the inner sides of the inner members for limiting the flexing thereof and for

maintaining said abutments in proper position for contact with said wiper.

3. In a timer, a shell, a rotary arm mounted in the shell, pairs of spring members arranged in the circular row in the shell, and constructed of a relatively durable material, the inner spring members having abutments upon their free ends arranged in the path of said rotary arm, pairs of contacts on said spring members adapted to be brought together when said abutments are depressed, wear plates mounted on the inner sides of said abutments for direct engagement with said rotary arm to take up wear of said inner spring members, relatively rigid bracket plates carried by the shell and engaging the outer spring members for regulating the flexing thereof, and adjustable stops engaging the inner sides of the inner spring members for regulating the flexing thereof and for determining the positions of the rest of said abutments.

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

ARTHUR C. HARTMAN.

Witnesses:
ARTHUR H. STURGES,
CLARA M. JAYCOX