Apr. 17, 1923. 1,452,419

L. A. ECKERMANN

TIMER FOR INTERNAL COMBUSTION ENGINES

Filed July 10, 1920

Fig. 1.

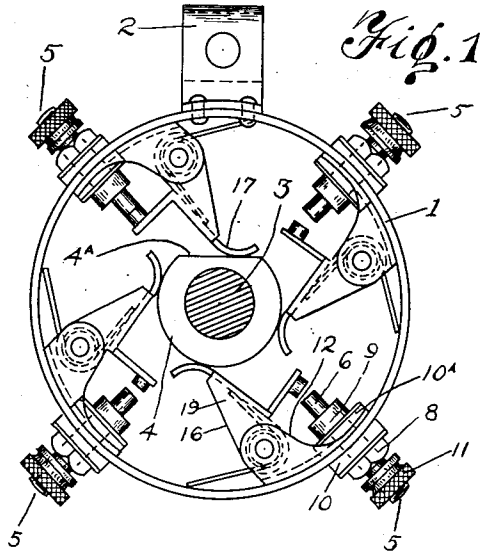


Fig. 2.

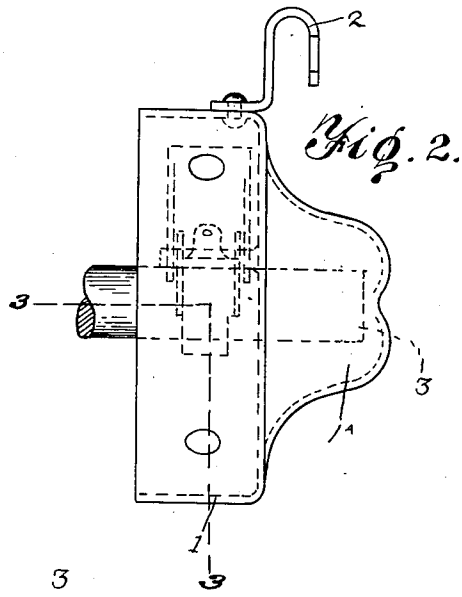


Fig. 4.

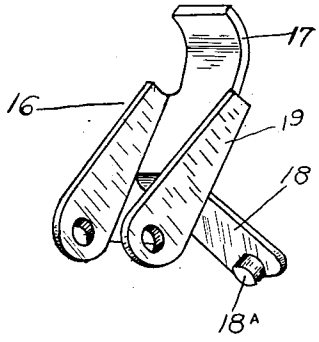


Fig. 3.

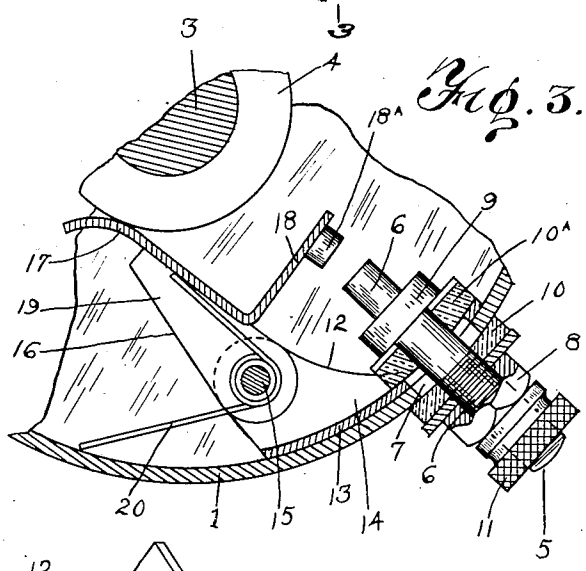
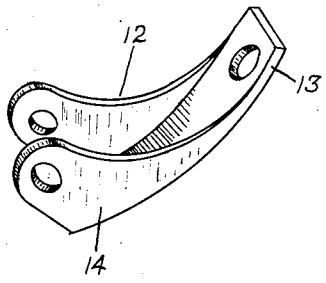


Fig. 5.



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UNITED STATES PATENT OFFICE.

LEO A. ECKERMANN, OF DETROIT, MICHIGAN, ASSIGNOR TO KALES STAMPING COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

TIMER FOR INTERNAL-COMBUSTION ENGINES.

Application filed July 10, 1920. Serial No. 395,292.

To all whom it may concern:

Be it known that I, LEO A. ECKERMANN, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Timers for Internal-Combustion Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to timer for internal combustion engines, and the invention consists in the structural arrangement and combination of parts hereinafter fully described and shown in the accompanying drawing, wherein:

Figure 1 is an end view of the improved timer showing the arrangement of the mechanism in the shell or casing;

Figure 2 is a view of the same in side elevation;

Figure 3 is a sectional view taken on line 3—3 of Figure 2, and showing in detail a mounting of one of the contact posts and of an associated pivotal contact member;

Figure 4 is a detail perspective view of said contact member;

Figure 5 is a detail perspective view of a bracket in which said contact member is journalled.

In these views the reference character 1 designates a cylindrical shell, one end face of which is closed as indicated at 1^a, said shell being preferably stamped from sheet steel. A bracket 2, which also has the nature of a sheet steel stamping, rigidly surmounts the shell 1 and serves to secure the same to some stationary member, as for example the engine casing, (not shown). As is customary, the cam shaft 3 of the engine passes axially into the shell 1, and mounted fast thereupon within said shell is a cam 4 having a flattened face 4^a. 5 designates a plurality of contact posts mounted upon the rim portion of the shell 1, one of said posts corresponding as is usual, to each cylinder of the engine with which the timer is associated. Each post 5 comprises a threaded steel pin 6 passing radially through an opening 7 in the rim of the shell 1, and having sufficient clearance from the edge of said opening to insure against any direct electrical connection between said post and rim. A pair of clamping members, to maintain said pin in the described position, are formed by collar 9 on the pin within the shell, and a lock nut 8 threaded upon the pin exteriorly of the shell, insulated washers 10 and 10^a being arranged between said clamping members and the shell. The usual binding nut 11 is engaged with the threaded outer end portion of each pin. Each of the described contact posts serves to secure interiorly to the shell 1 a bracket 12, comprising an arcuate portion 13, one end portion of which is apertured for engagement by the pin 6, and a pair of parallel wing members 14 projecting from the other end portion of the member 13 toward the center of the shell. The arcuate member 13 engages the pin 6 between the rim member of the shell and the insulated washer 10^a, and thus the clamping pair 8—9, by which the contact post is held in position also serves to position the bracket 12 and establish the latter in firm contact with the shell. The wing members 14 carry a pintle 15 parallel to the axis of the shell and said pintle forms a pivotal support for the switch member 16, which has the nature of a sheet steel stamping and comprises bell crank arms 17 and 18, the former having a curved free end portion bearing against the cam 4, and the latter carrying adjacent its free end the contact point 18^a, normally slightly spaced from the inner end of the pin 6. The arm 17 is formed with a pair of parallel wings 19 serving to pivotally mount the switch member upon the pin 15. Preferably the wing members 19 are spaced apart a distance only slightly less than that between the bracket wings 14, so that the latter prevent any transverse movement of the switch member upon the pivot pin 15. The described construction is such that the contact member 18 normally is maintained spaced from the pin 6, while the arms 17 engage the cylindrical portion of the cam 4, while upon registration of the flat face 4^a of said cam member with any of the arms 17, said arms are permitted such movement toward the axis of the shell, as to engage the corresponding contact 18^a with the corresponding pin 6. A spring 20 coiled upon each pintle 15 has its end portions respectively bearing upon the corresponding arm 17 and the inner face of the shell 1 so as to effect an immediate rocking of the switch member to circuit closing position upon registration of said arm with the flattened por-

tion 4ª of the cam 4. The pin 6 is electrically connected to the shell 1, when the switch member is rocked to engage the contact 18ª with said pin, since said switch member is in electrical contact with the bracket member 14 and the latter is in electrical contact with the shell. It is to be noted that the pin 6, in passing through the portion 13 of the bracket 12, has a sufficient clearance from said bracket to avoid any electrical contact or arcing.

The described construction advances the arc by securing an increased simplicity and by effecting a reduction of the manufacturing costs, reduced expense resulting largely from the considerable use of steel stampings in the improved construction. Also the assembly is simplified and the expense thereof reduced by arranging the switch member and its mounting in the form of a unit, which when assembled is adapted to be attached to the shell of the timer by the same clamping pair which mounts the corresponding contact post upon said shell.

What I claim as my invention is:

1. In a timer, the combination with the shell thereof, of a contact post mounted upon said shell, a cam centrally rotatable within the shell, and a switch member pivotally mounted in the shell and secured thereto by said contact post, of bell crank form, having an actuating arm engaging said cam member and a contact arm engageable with said post in one position of the cam member.

2. In a timer, the combination with the shell thereof, of a contact post mounted upon said shell, a cam member centrally rotatable within the shell, a switch member mounted upon and electrically connected to the shell by said contact post, having bell crank form, one arm thereof being arranged to bear upon said cam and the other being adapted to engage said post in a predetermined position of the cam, and a spring engaged between said shell and the arm of the switch member bearing upon the cam, maintaining the desired engagement of the latter with the cam.

3. In a timer, the combination with the shell thereof, of a contact post mounted upon said shell, a cam member rotatable centrally within the shell, and a unit secured to said shell by said post and comprising a switch member of bell crank form, having a cam engaging arm, and an arm engageable with the contact post, a bracket providing a pivotal support to said switch member, and a spring urging said switch member to its circuit closing position.

4. In a timer, the combination with the shell thereof, of a contact post including a clamping pair attaching said post to the shell, a bracket member clamped interiorly to the shell by said clamping pair, a switch member pivoted upon said bracket, and a cam directly engaging and controlling said switch member rotatable in said shell.

5. In a timer, the combination with the shell thereof, of a contact post including a clamping means attaching said post to the shell, a cam, a bracket member clamped to said shell by said clamping means and insulated from said post, a switch member pivoted upon said bracket and provided with a pair of arms angularly disposed in relation to each other one of which engages and is rocked by said cam and the other of which forms a contact with said contact post when said first-mentioned arm is rocked.

In testimony whereof I affix my signature.

LEO A. ECKERMANN.