April 7, 1925. 1,532,573

C. O. BRUNO

TIMER

Filed Feb. 3, 1922

Fig. 1.

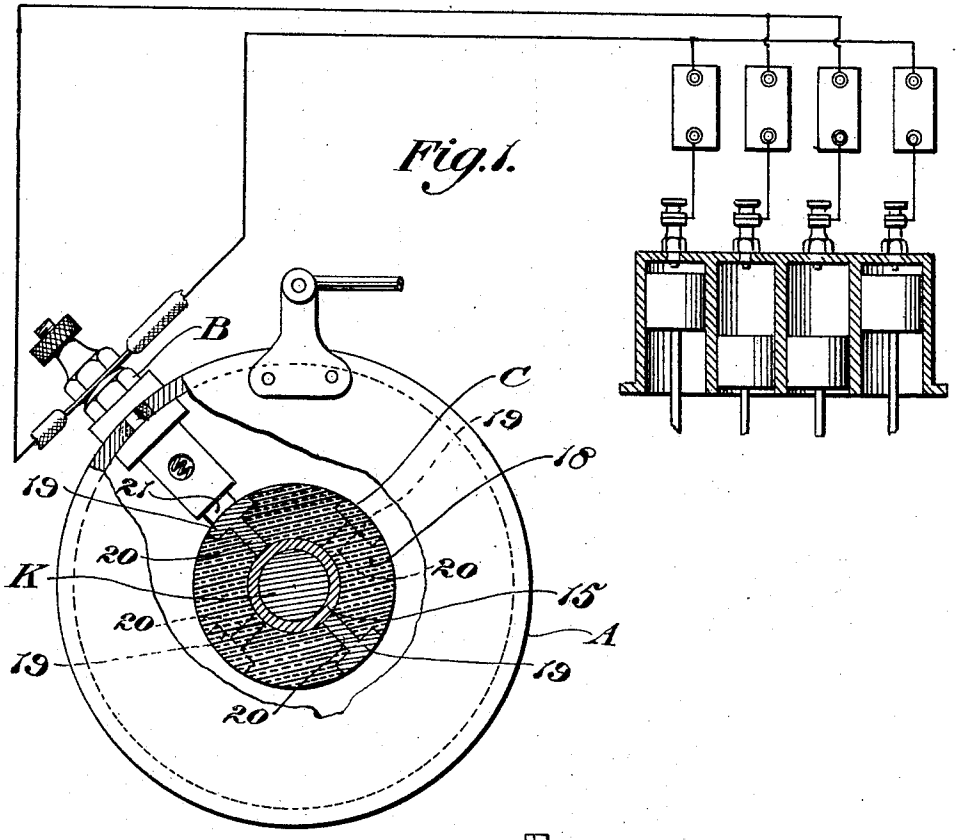
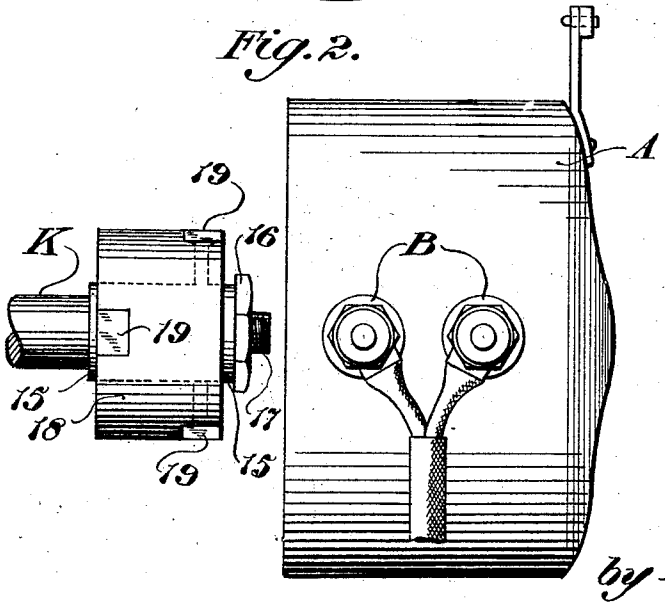


Fig. 2.



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Patented Apr. 7, 1925. 1,532,573

UNITED STATES PATENT OFFICE.

CARL O. BRUNO, OF CHICAGO, ILLINOIS, ASSIGNOR TO BIGELOW-BRUNO MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TIMER.

Application filed February 3, 1922. Serial No. 533,953.

To all whom it may concern:

Be it known that I, CARL O. BRUNO, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Timers, of which the following is a specification.

My invention relates to timers for internal combustion engines, and more particularly to that type embodied in my co-pending application Serial No. 519,636, filed December 3, 1921.

A purpose of my present invention is the provision of a timer which, in addition to having the brushes contact with the commutator segments at points spaced from the inner periphery of the casing, has the brushes arranged side by side and on one side of a diameter of the casing, with each brush successively engaged by two contacts to effect the successive sparking of the four spark plugs of the four-cylinder engine. As in the form of invention hereinbefore referred to, the brushes are arranged at the outer side of the timer casing to provide for the necessary clearance for the fan belt and to prevent contamination of the contact wires by oil and other foreign matter.

I will describe one form of timer embodying my invention and will then point out the novel features thereof in claims.

In the accompanying drawings,

Figure 1 is a view showing the timer in side elevation, with the casing partly broken away and the parts thus revealed in section, the timer being shown as electrically connected to an internal combustion engine.

Fig. 2 is a view showing the timer in edge elevation with the casing removed from the commutator.

Referring specifically to the drawings, in which similar reference characters refer to similar parts, my invention, in its present embodiment, comprises a commutator designated generally at C and including a metal sleeve bushing 15 adapted to be secured in any suitable manner to the cam shaft K of an internal combustion engine so as to rotate with the shaft. The commutator in its entirety is locked against accidental displacement from the shaft by means of a nut 16 fitting on an extension 17 of the shaft K and engaging the bushing, all as clearly shown in Fig. 2.

The commutator C also includes a ring 18 formed of suitable insulating material and snugly embracing the bushing 15. This ring contains in its periphery four contact segments 19 arranged in pairs, with the segments of each pair disposed at the same end and at points diametrically opposed with respect to each other. Circumferentially, the segments of one pair occur at intervals of 90° with respect to the segments of the other pair. As shown in Fig. 1, each segment is provided with a shank 20 which extends inwardly to and through the bushing 15 thereby serving to rigidly connect the ring with the bushing and to provide a good contact between the cam shaft K and the segments as will be understood.

The timer includes a casing A which in its applied position with respect to the commutator occupies a concentric position. At one side of a diameter of the casing, which is the outer side when the casing is in applied position, a pair of brushes B are mounted so as to extend inwardly and radially for engagement with the commutator. These brushes are arranged side by side as clearly shown in Fig. 2, so that the brush ends or contact blocks 21 thereof are adapted to continuously engage the periphery of the ring 18. The arrangement of brushes is such that one contact block of one brush is successively engaged by the segments of one pair, with the contact block of the other brush successively engaged by the segments of the other pair. It will therefore be seen that with the commutator continuously rotating, the circuits controlled by the brushes will be successively closed, with each brush serving to complete two circuits. By consideration of the diagrammatic circuit showing in Fig. 1, it will be clear that each contact segment co-operates with its respective brush in controlling the supply of current to one spark plug, and that the arrangement of segments and brushes is such that they serve to successively close the spark plug circuits in the sequence desired.

Although I have herein shown and described only one form of timer embodying my invention, it is to be understood that various changes and modifications may be made herein without departing from the spirit of the invention and the spirit and scope of the appended claims.

What I claim is:

1. A timer comprising a commutator

adapted for connection to and rotation with a cam shaft, segments arranged about the periphery of the commutator and in pairs with the segments of each pair disposed at one end of the commutator at diametrically opposed points, a casing, and brushes mounted in the casing and so arranged that each brush is adapted to be successively engaged by the segments of the corresponding pair for the purpose described.

2. A timer comprising a commutator, a casing surrounding the commutator, brushes arranged side by side in the casing for engagement with the periphery of the commutator at different points along the length of the latter, and segments in the periphery of the commutator arranged in sets with the segments of one set arranged to be engaged by one brush and the segments of the other set arranged to be engaged by the other brush.

3. In a timer for internal combustion engines, a commutator adapted for connection to and rotation with a cam shaft, segments arranged about the periphery of the commutator, in pairs, with the segments of each pair disposed at one end of the commutator at diametrically opposed points, a casing and brushes mounted in the casing at one side of a diameter thereof.

4. A timer comprising a commutator adapted for connection to and rotation with a cam shaft, a casing arranged concentrically of the commutator, a pair of brushes mounted in the casing at one side of a diameter thereof, and segments in the commutator so arranged that when the latter is rotated each brush will successively engage two segments, and alternately with respect to the other brush.

5. A timer comprising a commutator adapted for connection to and rotation with a cam shaft, segments arranged about the periphery of the commutator and in pairs with the segments of each pair disposed at one end of the commutator at diametrically opposed points, a casing, and brushes mounted in the casing at one side of a diameter thereof and so arranged that each brush is adapted to be successively engaged by the segments of the corresponding pair for the purpose described.

In testimony whereof I have signed my name to this specification.

CARL O. BRUNO.