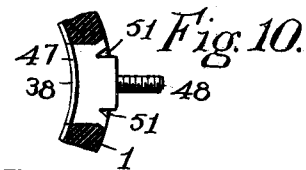
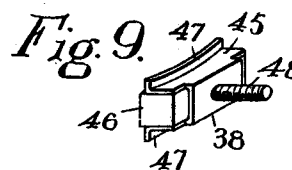
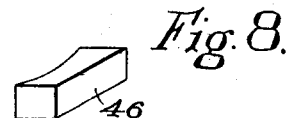
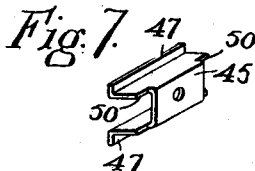
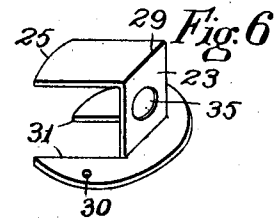
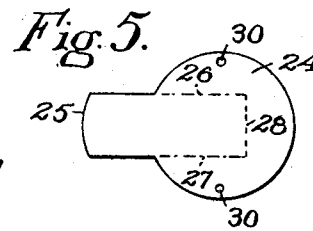
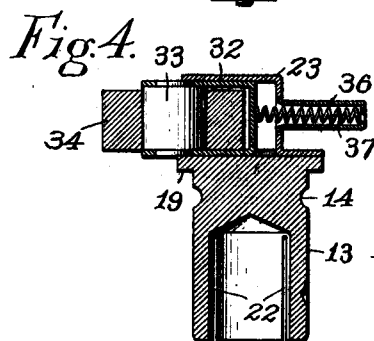
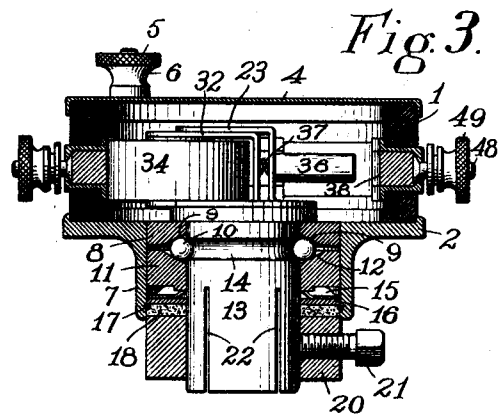
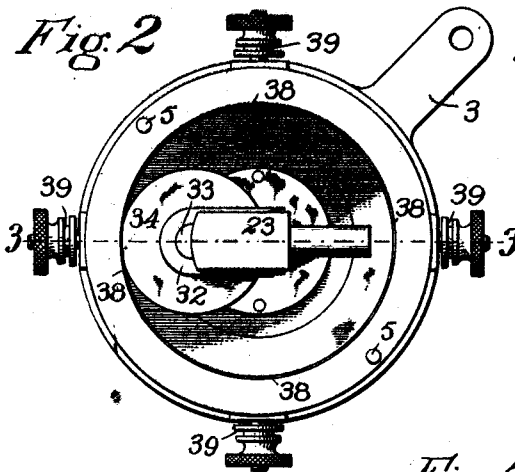
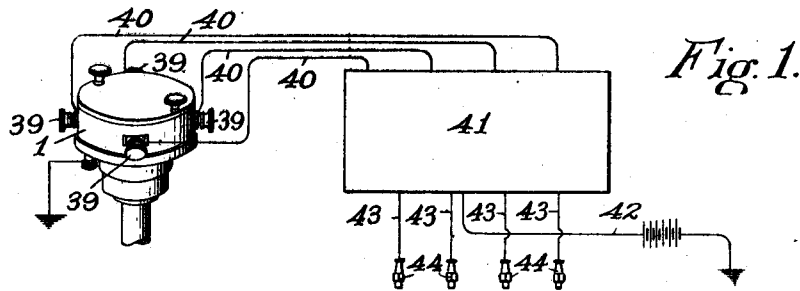


W. M. STEELE.
ELECTRIC TIMER FOR EXPLOSIVE ENGINES.
APPLICATION FILED APR. 15, 1910.

1,064,104.

Patented June 10, 1913.



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ELECTRIC TIMER FOR EXPLOSIVE-ENGINES.

1,064,104.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed April 15, 1910. Serial No. 555,761.

To all whom it may concern:

Be it known that I, WILLIAM M. STEELE, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Electric Timers for Explosive-Engines, of which the following is a specification, accompanied by drawings, forming a part of the same.

My present invention relates to a rotating timer for controlling the electric connection between a battery or other source of an electric current and a series of separate spark plugs connected with the cylinders of an explosive engine.

The object of my invention is to simplify the construction, reduce the expense, and increase the efficiency and durability of the device, and I accomplish these results by the construction and arrangement of parts as hereinafter described and set forth in the annexed claims.

Referring to the accompanying drawings, Figure 1 is a diagrammatic view of a box containing spark coils, an electric timer embodying my present invention, and illustrating the system of wiring in connection with the spark plugs of an automobile engine. Fig. 2 is a plan view of a timer, shown full size, embodying my invention and having the cover removed to disclose the interior mechanism. Fig. 3 is a vertical central sectional view on the plane of the broken line 3-3, Fig. 2. Fig. 4 is a detached central sectional view of the rotating spindle and contact wheel. Fig. 5 represents a sheet metal blank from which the bracket supporting contact wheel is formed. Fig. 6 is a detached perspective view of the bracket for supporting the contact timer. Figs. 7 and 8 represent detached pieces forming one of the contact terminals. Fig. 9 is a detached view of one of the contact terminals. Fig. 10 is a sectional view of the insulating ring and representing one of the contact terminals held therein.

Similar reference characters refer to similar parts in the different figures.

My improved timer comprises a ring 1 of insulating material mounted upon an annular disk 2, suitably supported and provided on one side with a radial arm 3 by which a rotative adjustment of the disk is effected. Upon the ring 1 is placed a cover 4 held in place by bolts 5, each provided

with a thumb nut, one of which is shown at 6, Fig. 3. The bolts 5 are attached to the annular disk 2 and pass up through the insulating ring 1, whereby the disk, ring and cover are securely clamped together by means of the nuts 6. The disk 2 is provided with a hollow hub 7, in the upper end of which is tightly driven a ring 8 having a beveled surface 9 which forms one side of a ball track for a row of friction balls 10. A second ring 11 is placed loosely in the hub 7 having a similar beveled surface 12 bearing against the friction balls 10. Journaled within the rings 8 and 11 is a spindle 13 provided with a semicircular ball race 14. An elastic washer 15 is placed against the ring 11 and beneath the elastic washer 15 is a flat washer 16 which is held in place by an elastic split ring 17 which is sprung into a semicircular recess in the interior wall of the hub 7. Beneath the washer 16 is an annular piece of felt 18 filling the end of the hollow hub and preventing the admission of dust. The spindle 13 is provided with a shoulder 19 which bears upon the upper surface of the ring 8, and the spindle is held in place by means of a collar 20 and set screw 21. The hollow spindle 13 is provided with a series of longitudinal slits 22 which permit the hollow spindle to be compressed by the set screw 21 and clamped upon the end of a revolving shaft driven by the motive power of the automobile.

Mounted upon the upper end of the spindle 13 is a bracket 23 which is formed from a blank 24 of sheet metal, the form of which is represented in Fig. 5, consisting of a circular disk having on one side a projecting tongue 25. The disk is cut on the dash and dot lines 26 and 27, and the tongue 25 thus separated from the disk is bent on the dotted line 28 at right angles to the disk and is again bent at right angles at 29. The disk 24 is provided with holes 30 by which it is riveted upon the end of the spindle 13. The sides 31 formed by the removal of the tongue 25 form guide ways for a sliding U-shaped frame 32 in which is held a cylindrical spindle 33 which forms a bearing for a rotatable annular roller 34. The upright portion of the bracket 23 is provided with an opening 35 to receive a tubular spring case 36 inclosing a spiral spring 37, having one end bearing against the bottom of the spring case and the opposite end bearing against the U-shaped frame 32, so that the tension

of the spring 37 will be applied to push the periphery of the rotatable roller 34 against the inner wall of the insulating ring 1. Inserted at suitable intervals in the insulating ring 1 are a series of contact terminals 38. The ring in the present instance contains four equally spaced, and each provided with binding posts 39 for the attachment of the wires 40, Fig. 1, connecting said binding posts with the coils of a coil box 41 suitably connected by a wire 42 with a battery, and also by wires 43 with a series of spark plugs 44.

Each of the contact terminals consists of a sheet metal holder 45, Fig. 7, between the opposing sides of which is inserted a block of copper 46, Fig. 8. The contact terminals are inserted through mortises formed in the insulating ring 1 and the flanges 47, 47', of the terminals bear against the inner wall of the insulating ring. A screw 48 is held in the holder to receive a nut 49 constituting the binding post of the terminal. The sheet metal holder 45 is cut away at each end, as at 50, to expose the outer surface of the copper block 46. When the terminals have been inserted in the insulating ring 1 an arbor is placed within the ring to serve as an anvil and each of the copper blocks are spread by a chisel pointed instrument, as shown at 51, 51', Fig. 10, in order to expand the outer side of the block and draw the flanges 47 firmly against the inner wall of the insulating ring. A rotary motion having been imparted to the spindle 13 corresponding to the speed of the engine, the rotatable roller 34 will be carried around in contact with the inner wall of the insulating ring completing the electric circuit each time it passes over one of the contact terminals 38.

I claim,

1. In a timer for explosive engines, the combination with a ring of insulating material provided with a series of spaced mortises, of a series of contact terminals held in the mortises of said ring, each of said terminals comprising a flanged sheet metal holder having its flange bearing against the inner wall of said ring, a metal contact block held in said holder, and means for crowding the flange of said holder against said ring.

2. In a timer for explosive engines, an insulating ring having a series of spaced

mortises, a series of contact terminals held in said mortises, each consisting of a flanged sheet metal holder, with its flange bearing against the inner wall of said ring, means for pressing said flange against the ring, a contact block held in said holder, a screw held in said holder, and a nut carried by said screw.

3. In a timer for explosive engines, a ring of insulating material having a series of mortises at stated intervals, a series of contact terminals inserted through said mortises, each contact terminal consisting of a sheet metal holder inclosing a block of electric conducting material and provided with a flange bearing against the inner surface of said ring, with the outer side of said block arranged to be expanded in order to draw said flange firmly against said inner surface.

4. In a timer for explosive engines, a ring of insulating material, a series of contact terminals held at stated distances in said ring, each of said terminals comprising a sheet metal clamp inclosing a block of electric conducting material, and provided with a flange bearing against the inner surface of said ring, a binding post held outside said ring, and means for bringing said terminals successively into an electric circuit.

5. In a timer for explosive engines, a rotating spindle, a series of spaced contact terminals concentric with said spindle, a disk attached to the upper end of said spindle having an integral tongue cut from the disk and bent upwardly and then parallel with said disk to form a guideway, a U-shaped frame slidable in said guideway, a contact roll carried by said frame, and means for rotating said spindle.

6. In a timer for explosive engines, a rotating spindle, a contact member carried by said spindle, consisting of a disk attached to the end of the spindle, a guideway formed by cutting a tongue piece in said disk, bending said tongue at right angles to and then parallel with said disk, a U-shaped frame slidable in said guideway, a spring to force said frame radially outward, and a contact roller carried by said frame.

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