W. E. HUBBARD.

CIRCUIT CLOSER.

APPLICATION FILED OCT. 10, 1907.

912,848.

Patented Feb. 16, 1909.

Fig. 1.

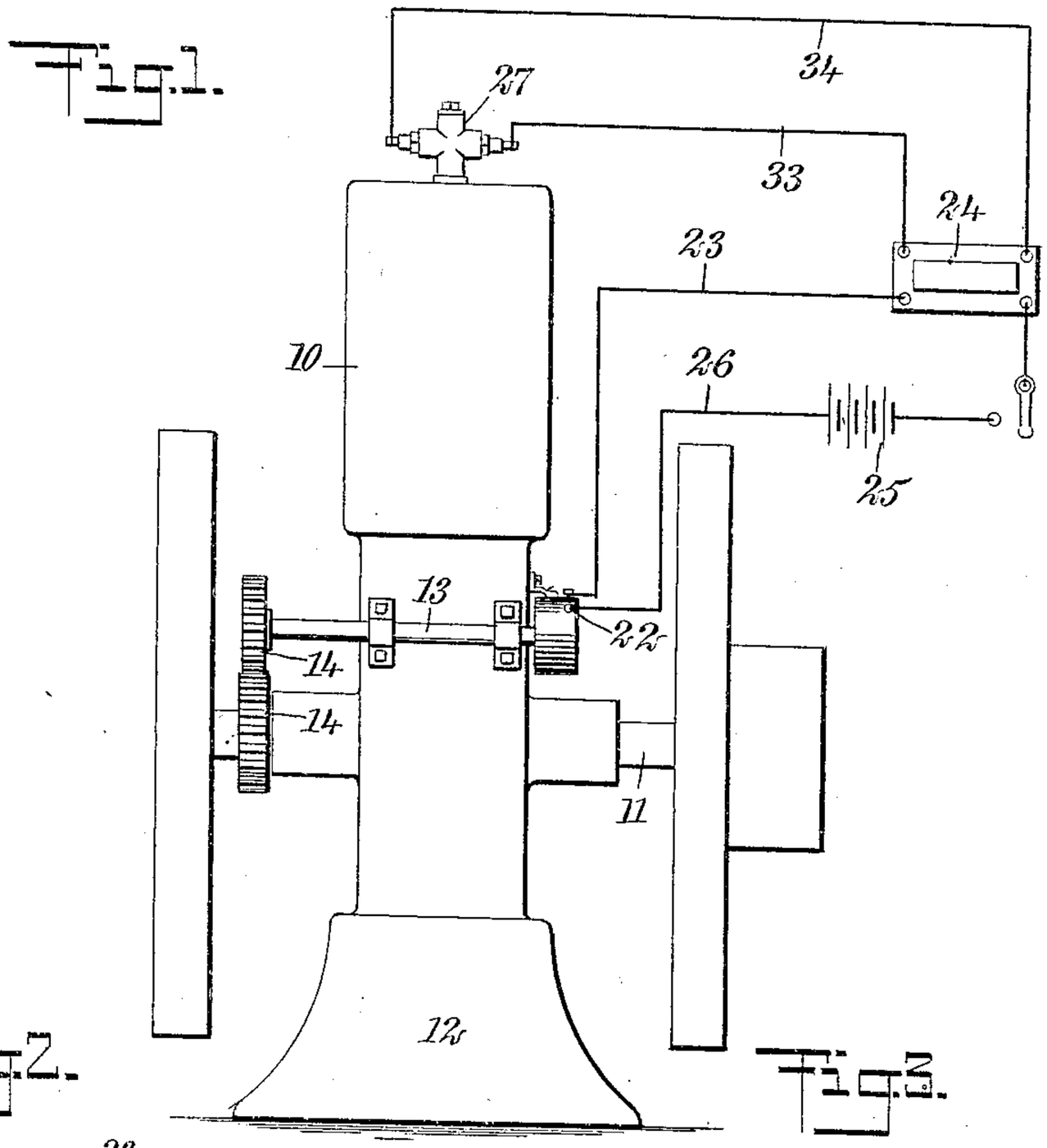


Fig. 2.

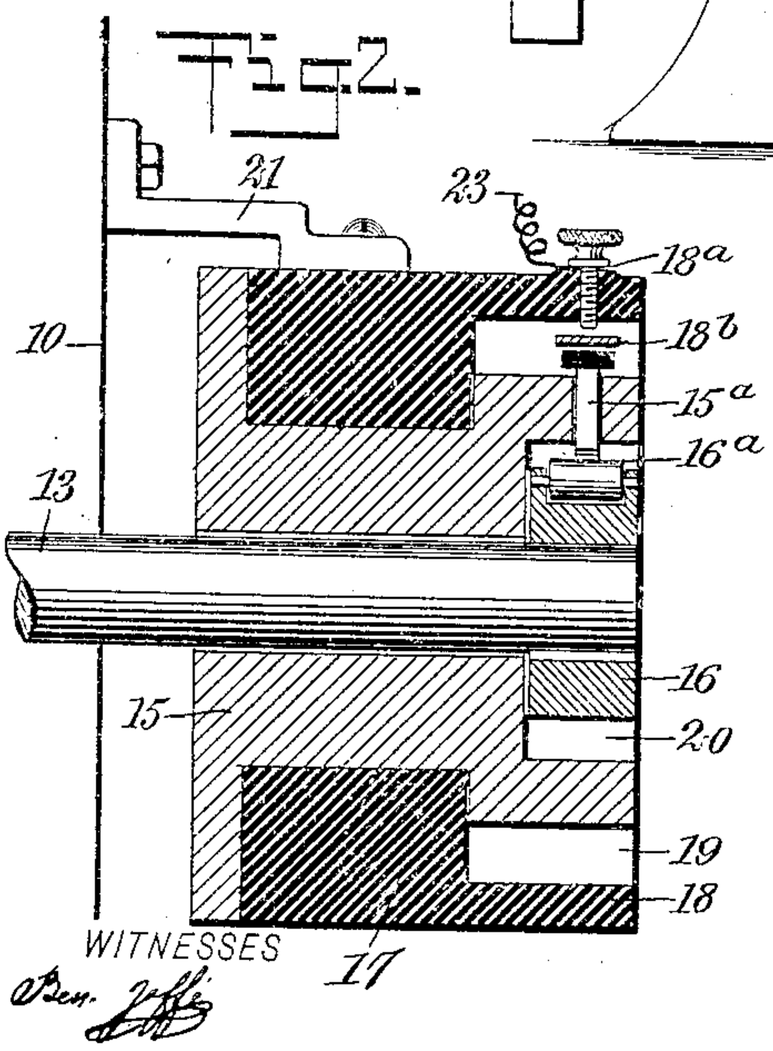
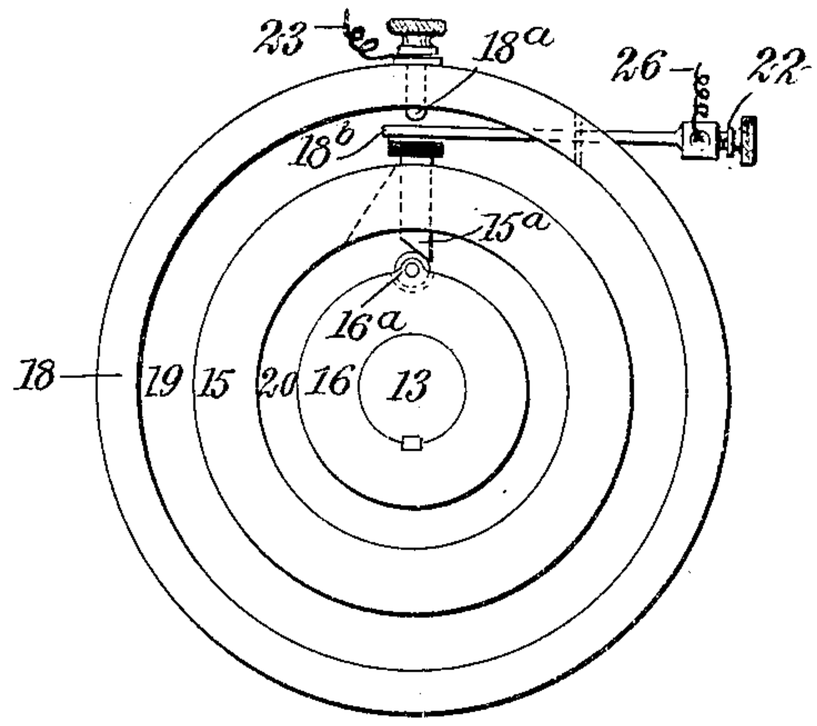


Fig. 3.



WITNESSES

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WILSON E. HUBBARD, OF DENNIS, TEXAS.

CIRCUIT-CLOSER.

No. 912,848. Specification of Letters Patent. Patented Feb. 16, 1909.

Application filed October 10, 1907. Serial No. 396,766.

To all whom it may concern:

Be it known that I, WILSON E. HUBBARD, a citizen of the United States, and a resident of Dennis, in the county of Parker and State of Texas, have invented a new and Improved Circuit-Closer, of which the following is a full, clear, and exact description.

The special object of the invention is to provide a timer or circuit closer for the ignition system, in which both of the terminals are not only insulated from each other, but are also insulated from the engine frame.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which—

Figure 1 is a side elevation of an engine provided with an ignition circuit including my improved circuit closer. Fig. 2 is a section through the circuit closer; and Fig. 3 is an end view of the latter.

In the drawings I have illustrated my circuit closer as applied to an internal combustion engine having a main cylinder 10, a crank shaft 11, and a suitable supporting base 12. The engine supports an auxiliary shaft 13 connected by suitable intermeshing gears 14 with the main shaft 11 of the engine. At the end of the auxiliary shaft is disposed my improved circuit closer, the latter being so constructed that neither the shaft nor any portion of the engine proper forms a part of the circuit. As shown, the circuit closer involves two sections, one of which comprises a collar 15 surrounding the outer end of the shaft 13 and normally held against rotation in respect thereto, and the other of which comprising a collar 16 keyed or otherwise rigidly secured to the shaft. These two collars may be made of any suitable material, but are illustrated as being formed of metal. The stationary collar 15 carries an outer insulating collar 17 rigid therewith and provided with an outwardly-extending flange 18 spaced from the outer end of the collar 15 to leave an annular space 19 therebetween. The rotatable collar 16 fits within a recess in the outer end of the collar 15 and is normally spaced therefrom to form an annular recess 20. The inner collar carries a small roller 16^a adapted to engage with the inner beveled end of a radially-movable plunger 15^a carried by the collar 15 at its outer end. The outer flange 18 of the insulating collar 17 carries two contacts adjacent the outer end of the plunger 15^a. One of these contacts is in the form of a pin 18^a extending radially through the plunger and having a binding post at its outer end, while the other contact involves a piece of spring metal 18^b normally lying adjacent the inner end of the pin but spaced a short distance therefrom and intermediate the pin and the plunger. As the collar 16 rotates, the roller intermittently engages with the inner end of the plunger and forces it outward to bring the two contacts together and close the circuit. The collar 15 is held from rotation in any suitable manner, as, for instance, by a bracket arm 21, and the two contacts are connected in a circuit involving a battery and a vibrator. The binding post at the outer end of the pin 18^a is connected to a wire 23 leading to a vibrator coil 24 and from said vibrator through a battery 25 and a wire 26 to the binding post 22 at the outer end of the contact 18^b. Both of the contacts are carried by the flange 18 of the insulating collar 17 and are not connected to the body of the engine or any portion of the frame thereof. The plunger 15^a normally operates to bring the contacts together, but as it is insulated at its outer end does not contact with any of the circuit.

The vibrator coil 24 is arranged in circuit with the spark plug 27, the circuit being completed by two wires 33 and 34 independent of the engine frame and connected to separate terminals on the spark plug. It will thus be noted that the contacts at the circuit closer are insulated from the engine frame and that the complete igniter circuit is insulated and separate from the engine, so that stray currents cannot deplete the battery and the minimum amount of electricity may be employed.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

A circuit closer having a shaft, a substantially stationary collar encircling the same, and a collar of insulating material secured to said first-mentioned collar, said collars having concentric annular flanges spaced apart to leave an annular space therebetween, a contact pin carried by the outer flange of the second-mentioned collar and extending into said annular space, a spring contact plate also carried by the flange of the second-mentioned collar and extending substantially tangentially into

said annular space, adjacent the end of said contact pin but normally out of engagement therewith, a plunger carried by the flange of the first-mentioned collar and movable longitudinally into engagement with said contact plate but insulated therefrom, and means carried by said shaft for engagement with said plunger for intermittently moving the same longitudinally, to force said contact plate into engagement with said contact pin.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILSON E. HUBBARD.

Witnesses:

W. A. KERR,

G. W. WOOLSEY.