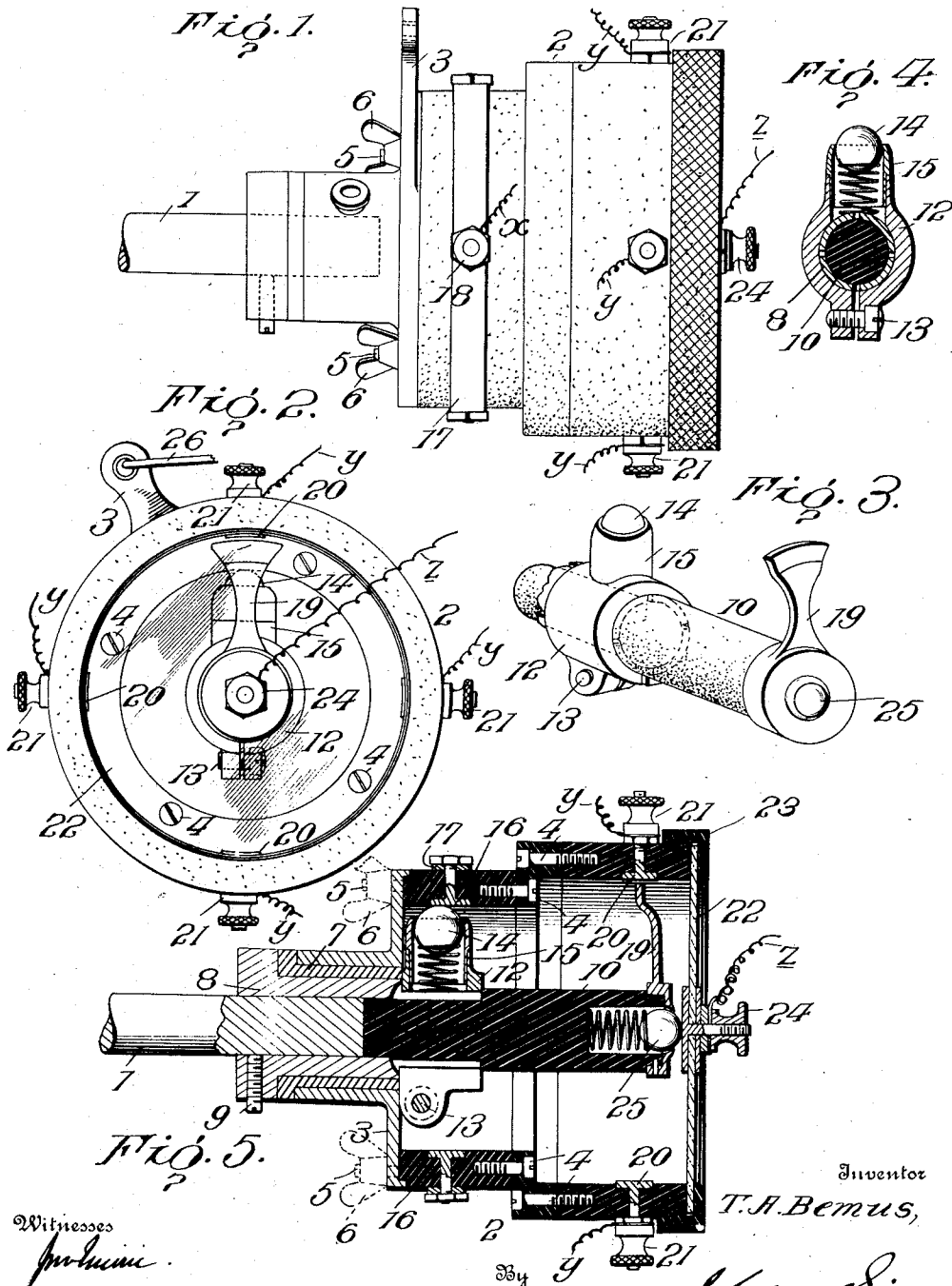


T. A. BEMUS.

CIRCUIT CLOSER FOR EXPLOSIVE ENGINES.

APPLICATION FILED OCT. 2, 1905.



Witnesses

Francis S. Maguire

Inventor

T. A. Bemus,

Attorney

UNITED STATES PATENT OFFICE.

THOMAS ALTON BEMUS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO T. ALTON BEMUS COMPANY, INCORPORATED, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

CIRCUIT-CLOSER FOR EXPLOSIVE-ENGINES.

No. 874,289.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed October 2, 1905. Serial No. 281,054.

To all whom it may concern:

Be it known that I, THOMAS ALTON BEMUS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Circuit-Closers for Explosive-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The primary object of this invention is to provide a high tension distributor or circuit closer which will be so simple in construction as to permit of the ready assemblage and removal of its parts, even by those not skilled in the art, and furthermore one which will be composed of but so few parts that danger of derangement is greatly reduced. And further objects are to have the gaps for the sparks in the secondary circuit as short as possible; to enable the parts to be readily inspected without having to remove any portion of the inclosure; and to provide a distributor which will be inexpensive, durable, self adjustable, and positive in operation.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is an end view. Fig. 3 shows in perspective the primary and secondary brushes. Fig. 4 is a sectional view through the primary brush. Fig. 5 is a longitudinal sectional view.

Referring to the drawings, 1 designates the rotary shaft upon which the circuit closer is located, such shaft being preferably that by which the valves of an explosive engine are operated, or it may be separate and geared to such shaft.

2 designates an inclosing casing preferably constructed throughout of insulating material, with the exception of the inner end cover plate 3 which is preferably made of metal. The casing 2 is shown as being made up of three separate parts united by screws 4, although it is manifest that it may be made in one piece. At its inner end it is equipped with threaded rods 5 which project through openings in cover plate 3, the parts being locked together by thumb nuts 6. The cover plate at its axis carries a bushing 7 wherein fits a sleeve 8 which is held by

screw 9 to shaft 1, the flange of such latter sleeve being held up against that of the bushing. That portion of sleeve 8, projecting beyond the plane of the inner face of plate 3 is reduced and split, and into this split portion fits the reduced end of a plug 10 of insulating material. This plug is held by a split ring 12 encircling the reduced portion of sleeve 8, said ring serving also to lock the end plate on said sleeve, all being so retained by a single screw 13 passed through the flanged ends of the split ring.

14 designates the brush of the primary or low tension circuit, and is shown in the form of a spring-pressed ball mounted in an open-ended sleeve 15 projecting at right angles from ring 12. This brush is designed to engage with contacts shown in the form of plates 16 flush with the inner surface of the circumferential wall of the inner reduced portion of casing 2. I have shown four such contacts, all of which are electrically connected on the outside of the casing by a metallic band 17, equipped with a binding post 18 to which the wire *x* of the primary or low tension circuit is connected, such wire leading from a vibrator (not shown). One pole of a battery (not shown) is also connected to such vibrator, the other pole wire being grounded on the machine.

19 designates the secondary or high tension brush which is shown in the form of an arm projecting radially from the end of plug 10, its inner cap-like end being fitted on said plug. The outer end of this brush is designed to travel in close proximity to, but not to contact with, secondary terminals 20, four of which are shown as being set in the circumferential wall of the outer, larger portion of the casing. From the binding posts 21 of these terminals lead the high tension wires *y* to the several spark plugs of the cylinders of an explosive engine.

The outer end of the casing is covered with a transparent disk 22, of insulating material, preferably glass, held in place by a ring 23, and at the center of this disk and passing therethrough is a binding post 24 to which the other wire *z* of the secondary or high tension circuit is secured, such wire leading from a single coil of the vibrator. This binding post at its inner end has a contact plate at the axial center of the disk in line with the end of plug 10 so as to be en-

gaged by a spring-pressed ball contact 25 in the end of such shaft, the ball projecting through an opening in the metallic cap-like end of the secondary brush 19. By this means I am enabled to carry the high tension current through the end of the inclosing casing without creating a spark, the ball 25 remaining always in engagement with the contact plate of post 24, thus avoiding using up additional energy which necessarily follows where spark gaps occur. On the other hand, the brush 19 is intended to travel in close proximity to the terminals 20, without engaging therewith, so that the spark gap will be as short as possible. With high tension currents, of course the jump may be almost any distance, but the smaller the gap the less energy required. The ball 25 is always changing its position and hence the contact is not liable to be impaired by the presence of grease, dirt, or other foreign particles. This is also true of the ball contact 14 the engagement of which latter with the contacts 16 is insured by the centrifugal action independently of the tension of its spring.

The advantages of my invention are apparent. All of the brushes can be observed through the glass disk, which serves as an insulation for the high tension binding post. In this way it may be readily ascertained whether or not anything is visibly wrong. Access may be had through the outer end of the casing by removing the ring and glass, or the casing itself may with ease be moved by taking off the thumb nuts 6. When this is done there is no danger of inexperienced persons getting the wires out of their proper positions, since they always remain secured to the casing. To the end plate 3 is secured a rod or wire 26 for shifting the position of the casing so as to advance or retard the closing of the circuits.

By means of my invention I am enabled to distribute high tension current from one coil to the sparkers of any number of cylinders. The low current circuit is closed through the machine at the same time the high tension current is being conducted from the vibrator coil to the distributor and through the sparkers to the engine and back to the battery through the grounding connection of the low tension current.

I claim as my invention:—

1. The herein described circuit closer comprising a sleeve, a plug of insulating material carried by said sleeve, a casing mounted on and movable relative to said sleeve, a primary brush, a carrier therefor also mounted on said sleeve, a secondary brush carried by said plug, a secondary contact in engagement with said secondary brush, primary contacts mounted in said casing and with which said primary brush is designed to engage, secondary terminals also mounted in said casing in proximity to the plane of

movement of said secondary brush, and a secondary binding post in engagement with said secondary contact.

2. The combination with a rotary shaft, of a primary brush mounted thereon, a plug of insulating material extended from said shaft, a secondary brush and secondary contact mounted on said plug, said contact being in the end of the latter, a casing detachably mounted on said shaft and inclosing said plug and brushes and having a series of contacts with which said primary brush is designed to engage, and also having a series of secondary terminals in proximity to the plane of travel of said secondary brush, and a binding post mounted in the end of said casing with which said secondary contact is designed to be in constant engagement.

3. The combination with a rotary shaft, of a primary brush mounted thereon, a plug of insulating material extended from said shaft, a secondary brush and secondary contact mounted on said plug, said contact being in the end of the latter, a casing detachably mounted on said shaft and inclosing said plug and brushes and having a series of contacts with which said primary brush is designed to engage, and also having a series of secondary terminals in proximity to the plane of travel of said secondary brush, a binding post with which said secondary contact is designed to be in constant engagement, and a glass disk removably secured over the end of said casing wherein said binding post is mounted.

4. The herein described circuit closer comprising a sleeve, a primary brush mounted thereon, a secondary brush and a secondary contact carried by, but insulated from, said sleeve, a casing of insulated material detachably mounted on said shaft, a series of contacts in said casing with which the primary brush is designed to engage, means electrically connecting all of said contacts, a binding post projecting from one of said contacts to which the wire of the primary or low tension circuit is designed to be secured, a series of secondary terminals also mounted in said casing to which are secured distributing wires, said secondary brush traveling in close proximity to said terminals, a disk over the end of said casing, and a binding post mounted in said disk to which a high tension wire is designed to be secured, said secondary contact engaging said latter binding post.

5. The herein described circuit closer comprising a sleeve, a plug of insulating material fitted in and projecting from said sleeve, a casing, an end plate therefor axially mounted on said sleeve to which said casing is detachably secured, a brush carrier mounted on said sleeve, said brush carrier serving to retain the end plate on the sleeve, a primary brush, a secondary brush and secondary contact carried by said plug, primary contacts

mounted in said casing with which said primary brush is designed to engage, secondary terminals also mounted in said casing in proximity to the plane of movement of said secondary brush, and a secondary binding post with which said secondary contact is designed to engage.

6. The herein described circuit closer comprising a sleeve, a plug of insulating material fitted in and projecting from said sleeve, a casing, an end plate therefor axially mounted on said sleeve to which said casing is detachably secured, a split ring mounted on said sleeve for holding said plug therein and retaining the end plate on the sleeve, a primary brush carried by said ring, a secondary brush and secondary contact carried by said plug, primary contacts mounted in said casing with which said primary brush is designed to engage, secondary contacts also mounted in said casing in proximity to the plane of movement of said secondary brush,

and a secondary binding post in the end of said casing with which said secondary contact is designed to engage.

7. The combination with a casing having primary and secondary contacts, and a binding post in line with its axis, of a sleeve having a split-end, a plug of insulating material fitted in said end, a secondary brush and secondary contact carried by said plug, an end plate axially mounted on said sleeve, a ring fitted on said split end for retaining said plug and holding said end plate and casing on said sleeve, and a primary brush carried by said ring.

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

THOMAS ALTON BEMUS.

Witnesses:

ROBERT B. WALSH,
WILFRID J. GAFFNEY.