H. E. WHITE.

MAGNETIC BLOW-OUT.

APPLICATION FILED FEB. 4, 1910.

967,281. Patented Aug. 16, 1910.

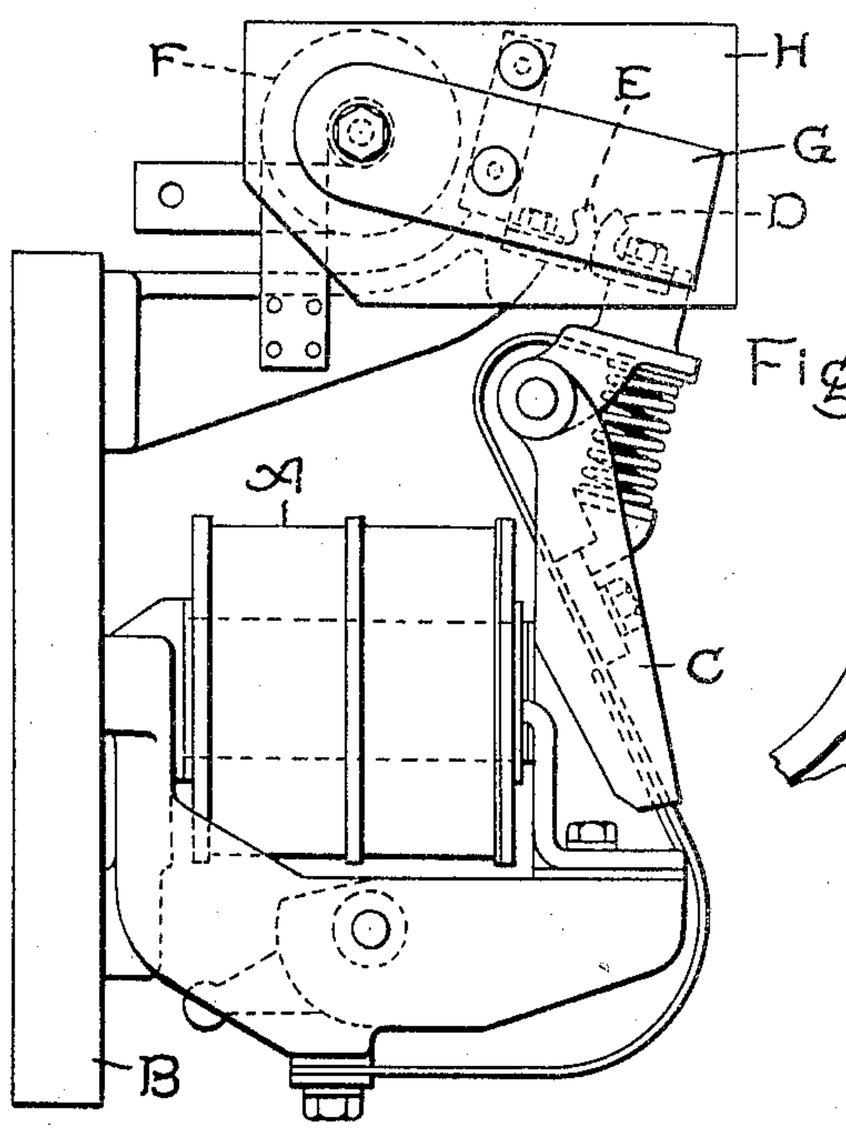
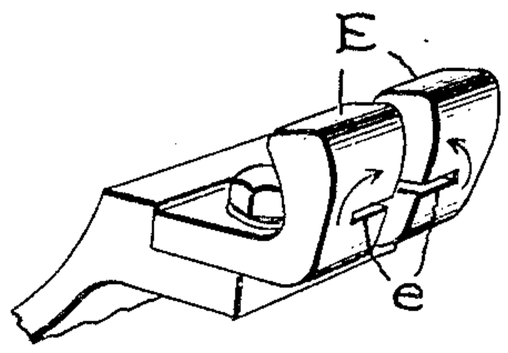


Fig. 1.

Fig. 2.



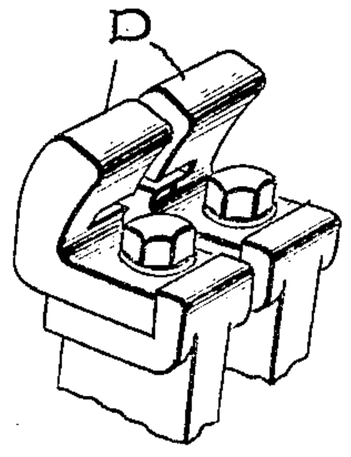


Fig. 3.

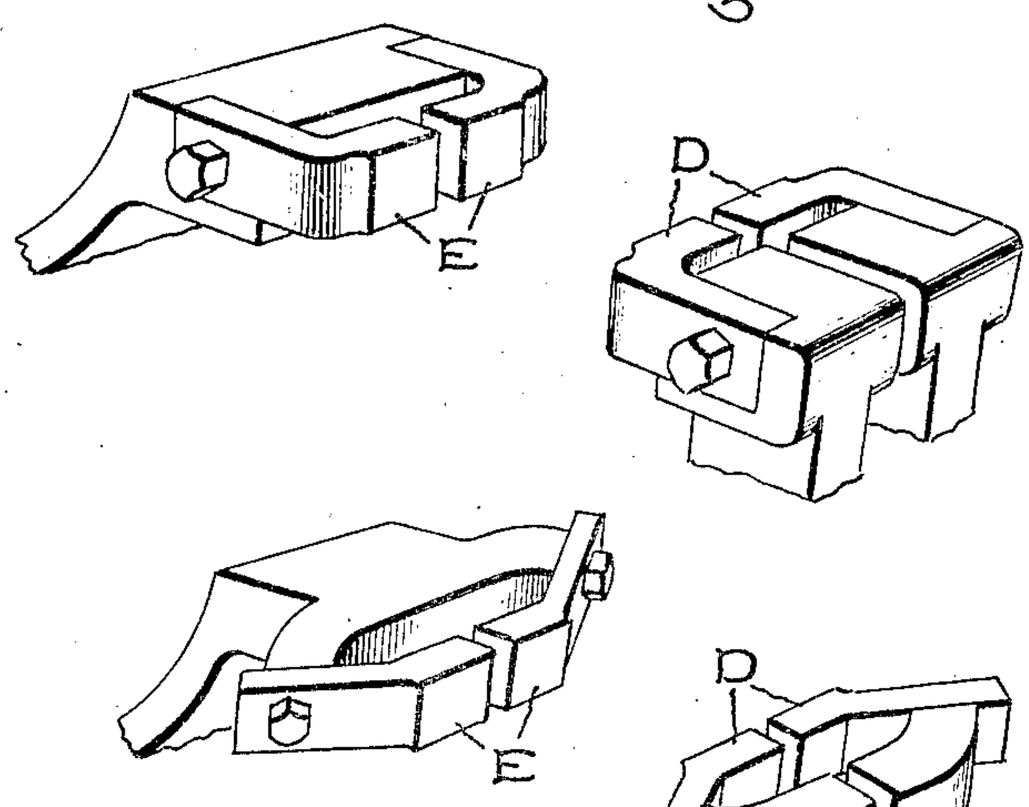


Fig. 4.

WITNESSES:

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UNITED STATES PATENT OFFICE.

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MAGNETIC BLOW-OUT.

967,281. Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed February 4, 1910. Serial No. 542,045.

To all whom it may concern:

Be it known that I, HAROLD E. WHITE, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Magnetic Blow-Outs, of which the following is a specification.

My invention relates to magnetic blow-outs, such as are frequently employed for rupturing the arc formed at the contacts of switches or contactors carrying a large current. Such devices ordinarily comprise an arc chute, surrounding the contacts, and a blow-out magnet arranged to produce a magnetic field transverse to the chute, the effect being to blow the arc along the plane of the chute so as to elongate and break it. In breaking heavy currents the sides of the chute become more or less burned in time, because the arc is sometimes driven against the sides of the chute. I have found that with the ordinary contact construction the direction in which the arc is blown depends upon the point on the contact where it is formed. If the arc is formed near the center of the contact, the arc ordinarily is blown practically along the central plane of the chute, but if the arc forms on one side or the other of the chute it is blown off that side of the contact against the adjacent wall of the chute.

The object of my invention is to confine the arc approximately to the central plane of the chute and thereby to prevent the burning that has heretofore occurred.

By my invention I utilize the field produced by the current in the contact itself to confine the arc to the central plane.

My invention consists in so shaping the contacts that the flow of current in the contacts has a directional component transverse to the chute and in opposite directions on opposite sides of the central plane of the chute. The effect of this is that an arc formed on either side of the central plane will travel toward the central plane and be held there.

My invention will best be understood by reference to the accompanying drawing, in which—

Figure 1 shows a side elevation of a magnetic blow-out of the type to which my invention is applicable; Fig. 2 shows in perspective one suitable construction of the contacts, in accordance with my invention, and Figs. 3 and 4 show modified contact constructions.

I have shown my invention as applied to a contactor of standard construction, comprising a magnet coil A mounted on a suitable base B and actuating an armature C, at the end of which is carried a movable contact D which, when the armature is drawn up by the magnet, as shown in Fig. 1, engages a stationary contact E.

F represents a blow-out coil in series with the contacts provided with pole pieces G extending on each side of the contacts.

H represents the walls of the arc chute consisting of pieces of insulation placed between the pole pieces G and the contacts.

The contacts E and D are shown in perspective separated in Fig. 2. The construction of the two contacts is similar and is best shown for the contact E. This contact comprises two portions which are provided with saw cuts or slots *e*, so that the contact tips form portions projecting toward each other and toward the central plane of the chute. Consequently, if current is flowing from contact E to contact D, the direction of current in contact E is approximately as shown by the arrows. Of course, if current is flowing from D to E the direction is reversed but the current distribution in the contact remains the same. In either case the direction is such as to give to the current in the contact a directional component transverse to the chute and in opposite directions on opposite sides of the central plane. The result is, that, when the contacts D and E are separated, an arc springing from either portion of contact E is driven by the field produced by the current in the contact itself in the direction indicated by the arrows, that is, toward the central plane of the chute. If the arc leaps across the gap from one portion of contact E to the other, it is immediately driven back toward the central plane by the new field which is established by the new direction of current flow. I have found by test that this contact arrangement is very effective in confining the arc to the central plane of the chute, consequently, preventing the walls of the chute from being burned.

Obviously, the shape of the contacts may be very greatly varied, the only essential thing being to form them so that the current

shall flow in a direction transverse to the chute and in opposite directions on opposite sides of the central plane. For instance, the contacts may be shaped as shown in Fig. 3 or in Fig. 4, the current flow in both of these constructions being more directly transverse to the chute than in the construction of Fig. 2. Other contact arrangements may be employed and, consequently, I do not desire to limit myself to the particular construction and arrangement of parts shown and described, but aim in the appended claims to cover all modifications which are within the scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. In a magnetic blow-out device, a blow-out magnet, an arc chute, and separable contacts within the chute, said contacts being shaped to cause the current in the contacts themselves to have a directional component transverse to the chute.

2. In a magnetic blow-out device, a blow-out magnet, an arc chute, and separable contacts within the chute, said contacts being shaped to cause the current in the contacts themselves to have a directional component transverse to the chute and in opposite directions on opposite sides of the central plane of the chute.

3. In a magnetic blow-out device, a blow-out magnet, an arc chute, and separable contacts within the chute, each of said contacts comprising two portions extending toward each other and the central plane of the chute, whereby current flowing through the contact flows from both sides of the chute toward the center, or from the center toward both sides, according as the current is passing from said contact to the other, or from the other to it.

4. In a magnetic blow-out device, a blow-out magnet, an arc chute, a contact within the chute comprising two portions extending toward each other and the central plane of the chute, whereby the current in the contact has a directional component transverse to the chute and in opposite directions on opposite sides of the central plane of the chute, a second contact within the chute, and means for producing a relative movement of said contacts to bring them into and out of engagement.

In witness whereof, I have hereunto set my hand this 3rd day of February, 1910.

HAROLD E. WHITE.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.