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A. CLERC

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ELECTRIC CIRCUIT BREAKER WITH COMPRESSED GAS BLOW-OUT

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Fig. 1

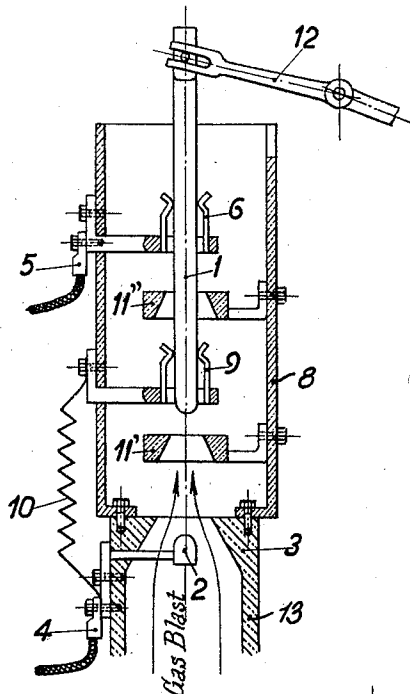


Fig. 2

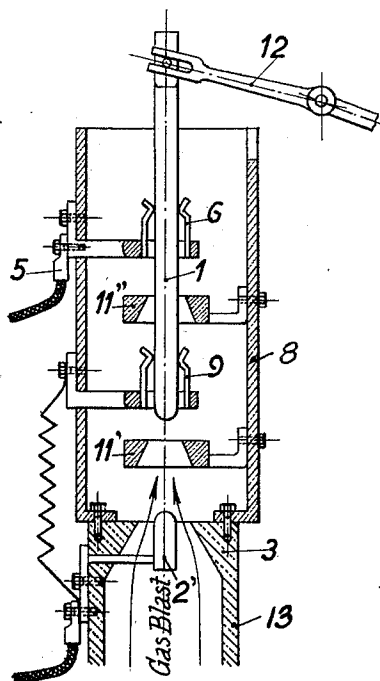
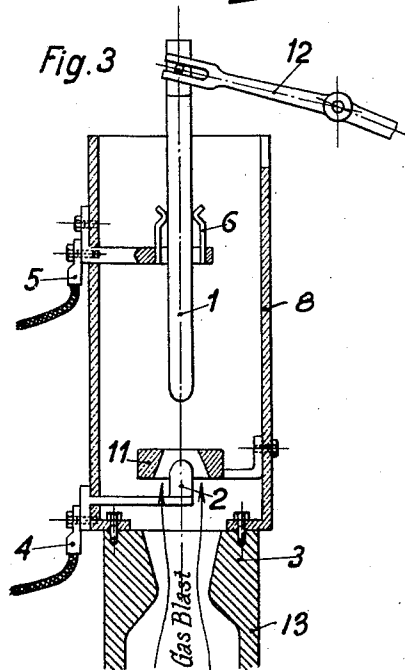


Fig. 3



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ELECTRIC CIRCUIT BREAKER WITH
COMPRESSED GAS BLOW-OUT

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3 Claims. (Cl. 200-148)

The present invention relates to a circuit-breaker with compressed gas blow out in which the arc is developed along the axis of the gas blast and in which the movable contact opens the circuit by being displaced approximately in the direction of the gas blast whilst traversing a zone at atmospheric pressure or a zone in which the pressure is approximately of that order.

An object of the invention consists in means to blow the gas blast uniformly around the arc struck between the contacts and parallel to the movable contact displacement, said means comprising a blowing nozzle electrically insulated from the contacts and directing the gas blast against the arc, a pipe feeding said nozzle with compressed gas, the contacts, nozzle and pipe being disposed in the same straight axis.

Another object of the invention consists in disposing diaphragms concentrically around several portions of the arc.

Figs. 1, 2, and 3 of the annexed drawing show diagrammatically and by way of example three embodiments of circuit-breakers in accordance with the invention.

In all these embodiments 1 represents the movable contact, 2 the stationary contact and 3 the nozzle by means of which the gas blast whose direction of flow is indicated by arrows is directed onto the arc. Said nozzle is fed with compressed gas by means of a pipe 13 in connection with the compressor, not represented in the drawing. The lever operating the movable contact is indicated by 12. The electrical connections are obtained by means of the conductors 4 and 5; the conductor 5 is connected to a sliding contact 6 and the displacement of the movable contact takes place strictly along the axis of the gas blast.

In the embodiments shown, the contacts are situated in the interior of a chamber 8, preferably very spacious and provided with openings sufficiently large to prevent an appreciable increase in pressure at the moment of operation of the circuit-breaker.

In Figs. 1 and 2 an intermediary electrode 9 connected to the contact 2 through a resistance 10 has been provided; this resistance is introduced into the circuit to be opened thus facilitating the extinction of the arc and allowing a reduction in the pressure of the gas blast used. Other similar electrodes not represented in the drawing can be added to the device, these being connected between themselves and with the electrode 9 through resistance.

The length of the arc is restricted to the dis-

tance separating the stationary contact from the movable contact; this distance should be as short as possible, but at least equal to the distance corresponding to the striking voltage.

It will be noted that in all these embodiments the main portion of the arc is developed in a zone under atmospheric pressure. As indicated above, it is advantageous to situate the anterior portion of the arc, considered in the direction of the blast, in a zone in which the blast stream is constricted by guiding walls. This is realized in Fig. 1 by situating the contact 2 in the interior of the nozzle 3 near its orifice.

The stationary contact can however also be situated in the interior of the nozzle, but in such manner that its foremost extremity on which the arc is struck will lie on a level or slightly beyond the level of the orifice of the nozzle as indicated in Fig. 2. In reality, the constricted zone of a gas stream issuing from a nozzle is to a certain extent displaced forward in front of the orifice of this latter.

In the embodiment shown in Fig. 3, in which the nozzle 3 is divergent, the stationary contact is entirely situated outside said nozzle and a convergent stream is obtained about the contact by surrounding same by a convergent diaphragm 11. A diaphragm of this kind or several such diaphragms disposed one behind the other can also be utilized in front of convergent nozzles in view of reinforcing their action. These supplementary diaphragms are indicated by 11' and 11'' in Figs. 1 and 2.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In an electric circuit breaker having a pair of contacts which in their position of rest snugly contact at their end surfaces, means for separating said contacts in a rectilinear direction, and means for blowing a gas current uniformly around an arc between said contacts parallel to the contact movement comprising a nozzle converging in the blowing direction and electrically insulated from said contacts, the nozzle being secured concentrically around one of said contacts, the end surface of said last contact being arranged inside the convergent portion of the nozzle.

2. In an electric circuit breaker, a fixed contact and a movable contact adapted to normally rest snugly against their end surfaces, means to retract the movable contact from the fixed one in a rectilinear movement, a nozzle for blowing

a compressed gas around an arc between the contacts in the retracting direction of the movable contact, said fixed contact being arranged outside the nozzle, and a converging diaphragm secured concentrically around the end surface of the fixed contact and electrically insulated from both contacts.

3. In an electric circuit breaker, a stationary contact and a movable contact, a nozzle for

blowing a stream of compressed gas axially around the arc in the direction of separation of the movable contact and diaphragms disposed concentrically around several portions of the arc and behind said nozzle when seen in the direction of blast, said diaphragms being convergent in said direction of blast.

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