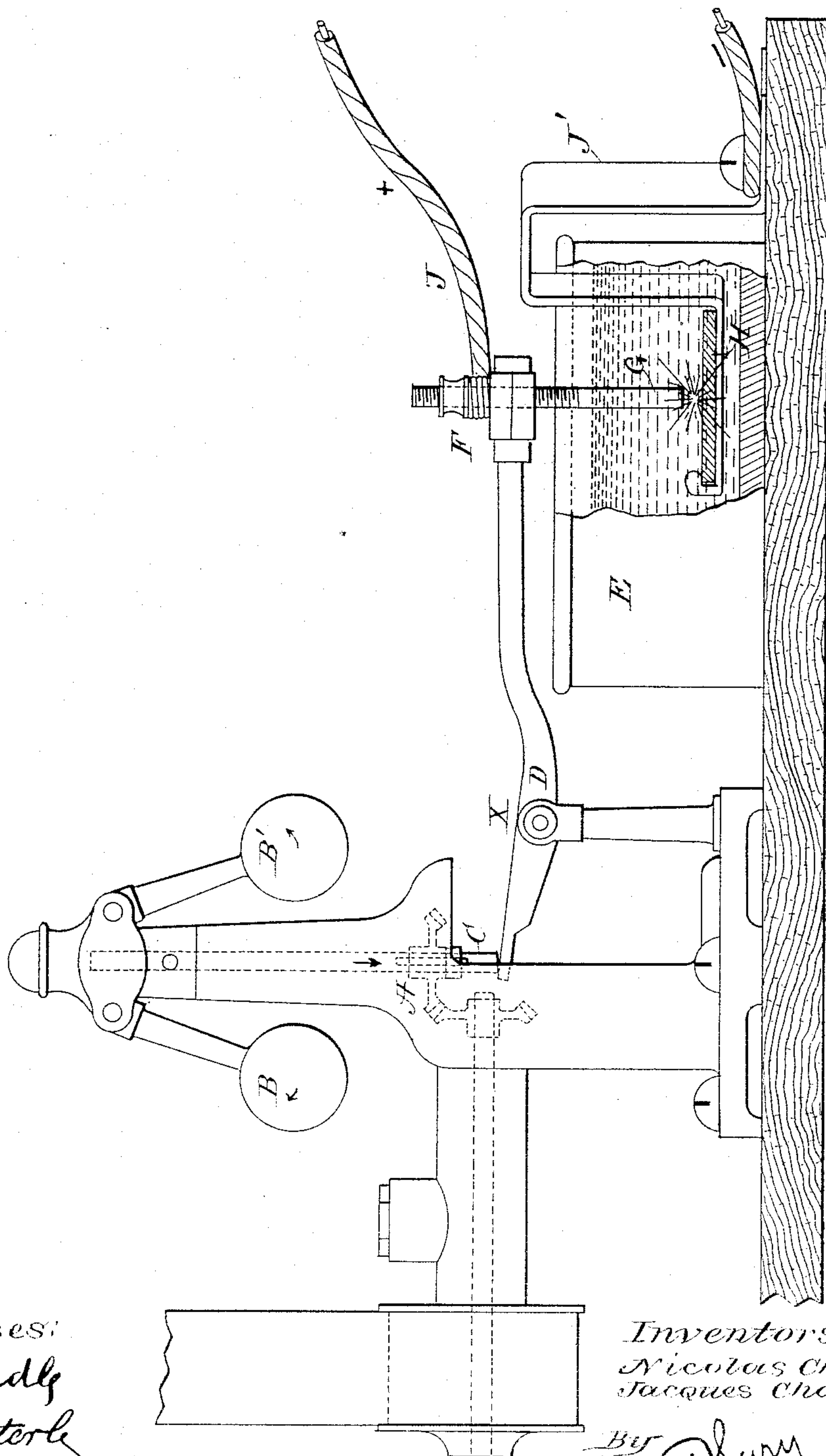


(No Model.)

N. & J. CHAIZE.  
CIRCUIT INTERRUPTER.

No. 438,344.

Patented Oct. 14, 1890.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

NICOLAS CHAIZE AND JACQUES CHAIZE, OF ST. ETIENNE, FRANCE.

## CIRCUIT-INTERRUPTER.

SPECIFICATION forming part of Letters Patent No. 438,344, dated October 14, 1890.

Application filed September 23, 1889. Serial No. 324,742. (No model.) Patented in France January 23, 1888, No. 188,238, and in England July 31, 1889, No. 12,135.

*To all whom it may concern:*

Be it known that we, NICOLAS CHAIZE and JACQUES CHAIZE, citizens of the French Republic, residing at St. Etienne, in the Department of Loire, France, have invented certain new and useful Improvements in Devices for Interrupting Electric Currents, (for which we have obtained a patent in Great Britain, No. 12,135, dated July 31, 1889, and a patent in France, No. 188,238, dated January 23, 1888;) and we 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to apparatus and devices in and by means of which an electric circuit may be opened or interrupted; and it has for its object to prevent the heating effect and burning of the conductors which arise in the use of the apparatus as ordinarily constructed.

These improvements consist in constructing and arranging the apparatus in such a manner that the circuit shall be opened below the surface of pure water or of a similar fluid or solution. The presence of this liquid while it may not prevent the formation of an arc or sparks effectually prevents the localization of any injurious heating effect, and consequently also prevents injury by burning or otherwise to the conductors or to the contact pieces or points at which the circuit is opened and closed. By this means, the condition of the contact-points being always in perfect order, it is possible to utilize interruptions of an electric current in a large number of applications, and particularly in the regulation of the working of electromotors by the use of any form of governor which operates to open the circuit automatically and to momentarily interrupt the circuit, as may be desired.

The accompanying drawing illustrates a

practical application of this invention to the regulation of an electromotor by means of a pendulum-governor.

A is the governor, which is driven by the motor. When the current attains a pressure which drives the motor at a speed greater than is desired, the balls B B' of the governor rise by centrifugal force and depress the spindle C in the same manner as when the governor is used in the ordinary manner with a steam-engine. The lower end of the spindle C rests upon the end of a lever D, fulcrumed at X, which lever carries at its upper end the vertical rod or circuit-interrupter G, which is adjustably secured by the nut F. In a vessel E filled with water or other suitable fluid there is immersed the contact mass H, which forms the terminal of the conductor J', while the rod G forms the terminal of the conductor J, so that when G is in contact with the mass H the circuit J J' is closed, but when G is lifted out of contact with H the circuit is opened. When the speed of the motor exceeds that at which it is desired to run, the spindle C is forced downward upon the contiguous end of the lever D, the other end of which consequently lifts the rod G out of contact with the mass H and the circuit in which the motor is included is instantaneously opened and the speed of the motor is reduced, whereupon the governor-spindle rises and the circuit is re-established. This cycle of operations is automatically repeated as often as may be necessary to obtain uniformity of speed in the motor.

The water or other suitable fluid in the vessel E may be renewed, as desired, and may be used either warm or cold.

Having now described our invention, we declare that what we claim is—

In a device for opening or interrupting an electric circuit, the combination consisting of a pendulum-governor, the bevel-gear A, connected to its vertical spindle C, said bevel-gear A engaging with a second bevel-gear mounted upon the driving-shaft, and the fulcrumed lever D, having one end thereof bear-



ing up against the base of the aforesaid spindle C, the other end of said lever D carrying the vertical adjustable circuit-interrupter G, the latter designed to come in contact with  
5 the terminal H, the whole adapted to open and close an electrical circuit within a suitable fluid contained within a suitable vessel, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

NICOLAS CHAIZE.  
JACQUES CHAIZE.

Witnesses:

J. GIRAUD,  
CR. ROBERTS.