

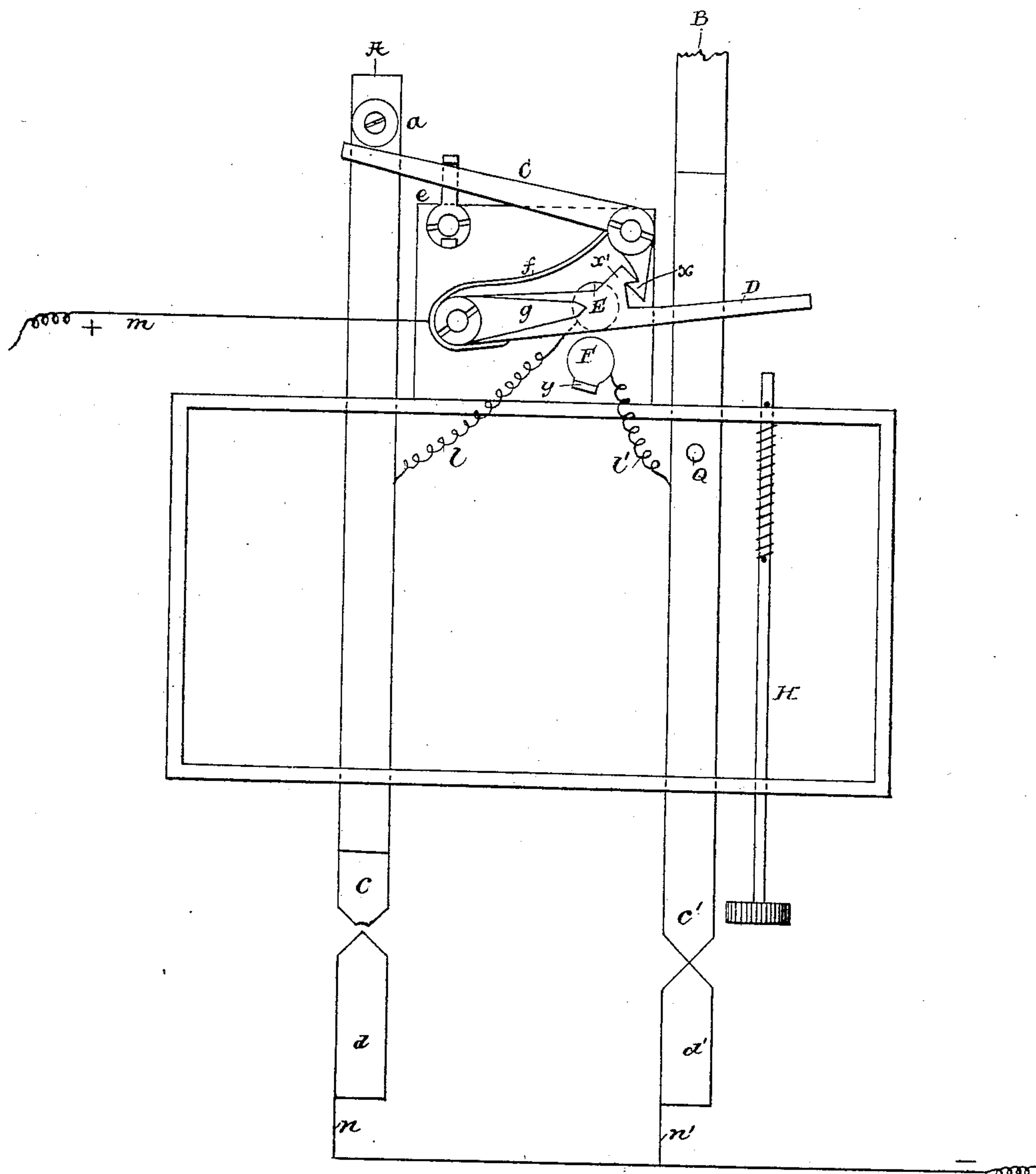
(No Model.)

E. R. KNOWLES.

AUTOMATIC SWITCH FOR ELECTRIC ARC LAMPS.

No. 397,729.

Patented Feb. 12, 1889.



WITNESSES,
Arthur C. Webb,
David S. Otis

INVENTOR,
Edward R. Knowles,
By *Emmet Webb*
Attorney.

UNITED STATES PATENT OFFICE.

EDWARD R. KNOWLES, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE
MUTUAL ELECTRIC MANUFACTURING COMPANY, OF NEW YORK.

AUTOMATIC SWITCH FOR ELECTRIC-ARC LAMPS.

SPECIFICATION forming part of Letters Patent No. 397,729, dated February 12, 1889.

Application filed September 24, 1885. Renewed December 21, 1888. Serial No. 294,283. (No model.)

To all whom it may concern:

Be it known that I, EDWARD R. KNOWLES, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a certain new and Improved Automatic Switch for Electric-Arc Lamps, of which the following is a full, clear, and exact description.

This invention relates to an improved device for use in multiple-carbon electric-arc lamps for the purpose of automatically switching the current from one pair of carbons when consumed to the next, so that a lamp can be kept burning for a very long period of time.

My invention consists in an automatic switch for transferring the current, substantially as hereinafter described and claimed, reference being had to the accompanying drawing, in which—

A B denote two carbon-holders in an electric-arc lamp, with carbons *c c'* attached. *d d'* denote the lower carbons. The carbon-holder A carries an insulated stud, *a*, at its upper end, which projects over the end of a latch, C, pressed upward against a stop-piece, *e*, by a spring, *f*.

D is a second latch or switch locking into the first and pressed downward by the same spring, *f*.

If the end of the latch C is carried down—as by the stud *a* pressing upon it—its tooth *x* will be released from the tooth *x'* of the latch D. When this takes place, by the action of the spring *f* the latch D will be carried downward to the limit of its stroke, determined by a projection, *y*, upon the boss or stud F. Immediately above the stud F is another stud, E. When the latch D occupies its highest position, it covers the stud E, and is held firmly against it by the spring *g*, which bears in a direction perpendicular to the plane of action of the spring *f*.

The line *m* denotes one of the main wires through which the current passes. This wire communicates with the latch D. From the stud E a wire, *l*, passes to the carbon-holder A. From the stud F a wire, *l'*, passes to the carbon-holder B.

Proper regulating machinery—such as used

in arc lamps—can be placed somewhere on the lines of wire. From *d* and *d'* wires *n* and *n'* run into the line.

The operation of the apparatus is as follows: When the lamp is started with new carbons, the carbon-holders are pressed up to their highest limit and the stud *a* is above and out of contact with the latch C. Before turning on the current the switch D is pushed up by any suitable means—as by the pin H or a stud, Q, on the carbon-holder B; or it may be set automatically, when the rod B is pushed up until it locks its tooth *x'* into the tooth *x* of the latch C, and is pressed by the spring *g* against the stud E. Then when the current is turned on it enters by the wire *m*, passes through the switch D, stud E, wire *l*, regulating mechanism of the lamp, to the carbon-holder A, and out by the wire *n* to the line. As the carbon *c* is consumed under the action of the voltaic arc, the stud *a*, descending, comes in contact with the latch C, presses it down, and releases the detent at *x x'*. When this takes place, the switch D moves down under the action of the spring *f* until it strikes the stop *y*, and remains pressed against the stud F by the spring *g*. This switches the current from A to B, so that, entering, as before, by the switch D, it passes, by way of the stud F and wire *l'* and regulating mechanism of the lamp, to the other carbon-holder, B, starting a new arc between *c'* and *d'*. Thus by the use of one of my automatic switches two pairs of carbons may be made to succeed each other in the formation of a voltaic arc. By using more switches more pairs of carbons can be brought successively into action, so that a long period of burning may thus be secured.

The latch C by proper insulation must be kept from forming an electrical contact with the carbon-holder A, with the ground, or with the line-wire.

What I claim as my invention, and desire to secure by Letters Patent, is—

In a multiple-carbon arc lamp, a lever, C, its tooth *x*, and a stop, *e*, for limiting the upward movement of said lever, the lever D, having a tooth, *x'*, to engage the tooth of the

other lever, the connecting and operating
spring *f*, common to both levers, the contacts
E and F, and the spring *g*, to hold the lever D
in electrical contact therewith, combined with
5 the carbon-holder A, provided with means to
operate the lever C, all arranged in electric
circuit and adapted to operate substantially
as shown and described.

In testimony whereof I have hereunto set my
hand this 17th day of July, A. D. 1885.

EDWARD R. KNOWLES.

Witnesses:

E. GRENING,
ARTHUR C. WEBB.