

(No Model.)

2 Sheets—Sheet 1.

G. F. CARD.
ELECTRIC SWITCH.

No. 525,332.

Patented Sept. 4, 1894.

FIG. 1.

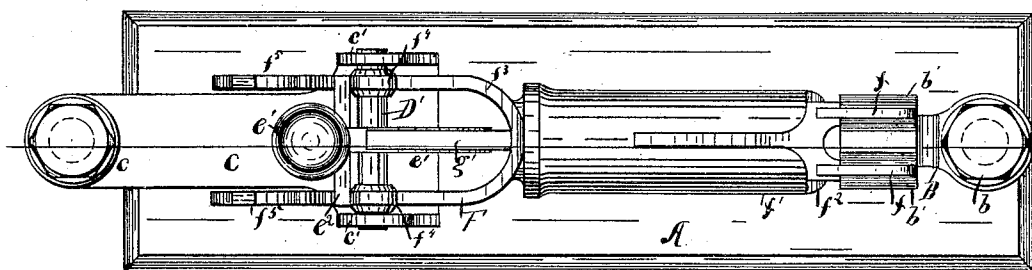
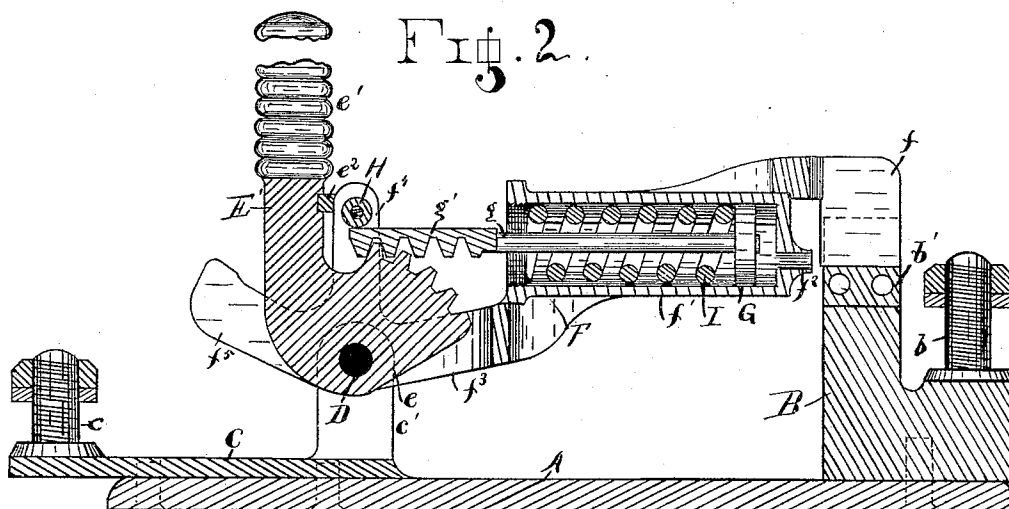


FIG. 2.



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BY Geo. C. Dickinson,
His ATTORNEY.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

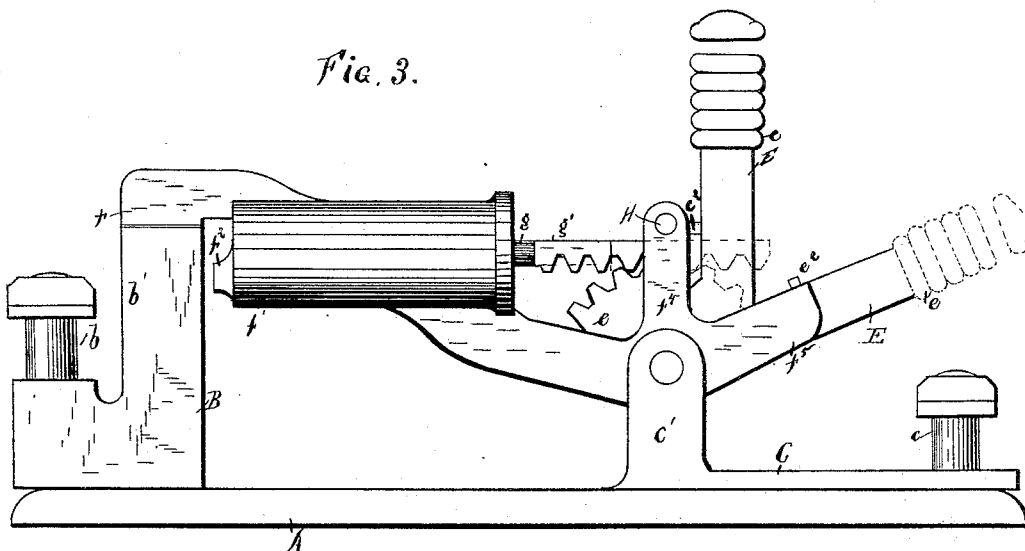
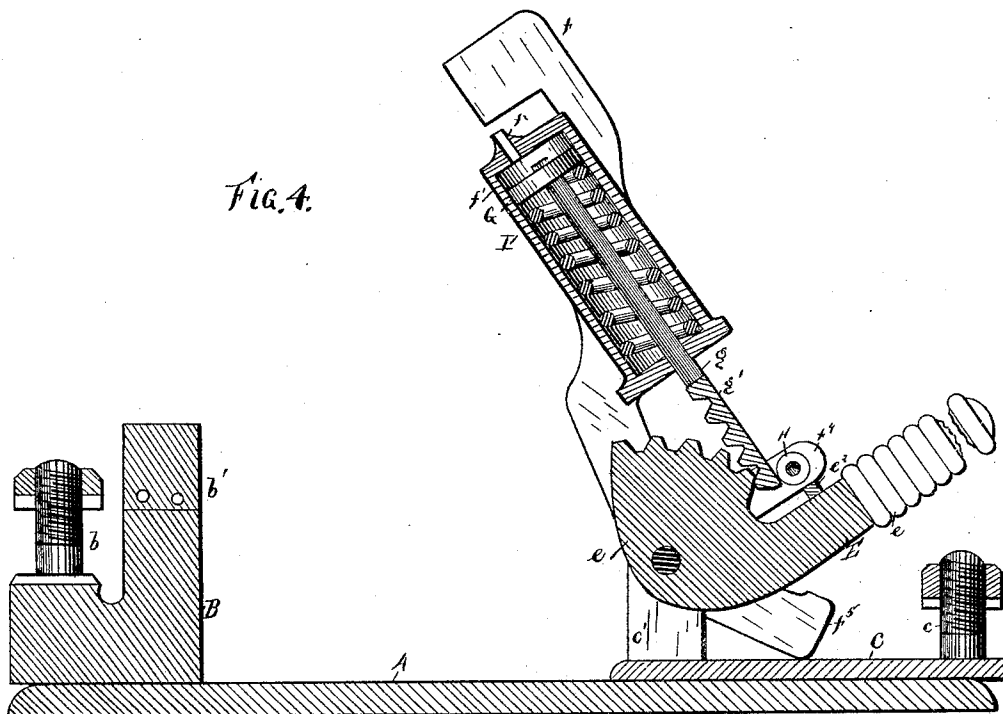


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE F. CARD, OF COVINGTON, KENTUCKY, ASSIGNOR TO THE CARD
ELECTRIC COMPANY, OF MANSFIELD, OHIO.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 525,332, dated September 4, 1894.

Application filed April 14, 1894. Serial No. 507,619. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. CARD, a citizen of the United States of America, residing at Covington, in the county of Kenton and State of Kentucky, have invented a new and useful Improvement in Electric Switches, of which the following is a specification.

It has been found in practice that when a line carrying a current of high potential, or high ampérage, is broken by means of a switch, or cut out, an electric arc follows the disengaging contact and burns the switch out. To extinguish this arc devices known as blow

outs have been used. The object of my invention is to provide a combined switch and blow-out adapted to be controlled by means independent of electric current, and the invention consists in the combined switch and blow-out hereinafter described and claimed.

In the drawings, Figure 1 is a plan, a portion of the mechanism being cut away; Fig. 2 a sectional elevation on line 2—2 of Fig. 1; Fig. 3 a descriptive elevation showing a partial movement of the operating lever; Fig. 4, a sectional elevation of the switch when open.

A represents a base, preferably of slate or other non-conducting material. Mounted on one end of the base, A, is a standard, B, provided with a binding post, *b*, and one or more contact plates, *b'*. On the other end of the base, A, a plate, C is mounted carrying binding post, *c*, and vertical standards, *c'*, which form pivotal points for a shaft, D, upon which is rigidly mounted a lever, E', carrying at one end a segmental gear, *e*, and at the other end a handle, *e'*, of a non-conducting material. Pivotaly mounted on the shaft, D, is a frame, F, one end of which carries one or more contact plates, *f*, adapted to engage with the contact plates, *b'*. On the frame, F, is a cylinder, *f'*, having at one end an aperture, *f²*, adjacent to the contact points. Extending from the other end of the cylinder is a U-shaped piece, *f³*, carrying standards, *f⁴*, and terminating in extensions, *f⁵*.

G, is a piston adapted to reciprocate in the cylinder, *f'*, and having a piston rod, *g*, terminating in a rack bar, *g'*, which is adapted

to intermesh with the segmental gear, *e*. Extending from the frame, F, are standards, *f⁵*, which carry a roller, H, adapted to engage with the piston rod and hold the rack in mesh with the segmental gear. The roller, H, is shown in section in Fig. 2 but cut away in Fig. 1 in order to show the shaft, D. Interposed between the piston head, G, and the cylinder head is a spring, I, adapted to be compressed as the piston is moved away from the aperture, *f²*. The lever, E', is provided with a stop, *e²*, adapted to engage with the standards, *f⁴*, and the extensions, *f⁵*.

The operation is as follows:—The switch being closed, the handle, *e'*, is moved to the position shown in dotted lines in Fig. 3. This movement actuates the segmental gear, *e*, which in turn actuates the rack bar, *g'*, draws the piston, G, outward and compressing the spring, I. The grip of the contact plates when in engagement is greater than the tension of the spring, I, and the swinging frame is thus held from any movement while the spring, I, is being compressed. When the handle reaches the position shown in dotted lines in Fig. 3, the stop, *e²*, engages with the extensions, *f⁵*, and further movement of the handle in the same direction will carry them with it, but these extensions being on the opposite side of the fulcruming point of the swinging frame from the contact plates, *f*, these plates will be raised out of engagement with the contact plates, *b'*, and the circuit broken. As soon as the grip on the contact end of the swinging frame is released, the handle being held, the tendency of the spring, I, to regain its normal position exerts force on the piston, *g*, which is transmitted to the segmental gear by means of the rack bar, *g'*, but since the gear is held, the rack bar swings on the gear as a pivot and the contact end of the swinging frame is thrown upward. As this is done the air in the cylinder, forward of the piston is forced out through the opening, *f²*, across the arc on which the moving contact swings, thus extinguishing the electric arc which follows the contact plate. The rotation of the swinging frame is stopped by the extensions, *f⁵*, coming against the stop, *e²*. In

this position the swinging frame is ready to be thrown into engagement with, b' , and complete the circuit.

I claim as my invention—

- 5 1. The combination in an electric switch of a plate carrying one or more electric contacts; a plate electrically insulated therefrom; a lever mounted thereon; a swinging frame carrying one or more electric contacts adapted to engage with the stationary contacts; an air
10 cylinder upon the swinging frame having an aperture adjacent to the contact point; a piston adapted to reciprocate in the cylinder; a spring adapted to press the piston in the direction of the aperture, and a connection between the piston rod and the lever whereby
15 the piston rod may be actuated, substantially as and for the purpose set forth.
2. The combination in an electric switch of
20 a plate carrying one or more electric contacts; a plate electrically insulated therefrom; a lever mounted thereon and carrying a segmental gear; a swinging frame carrying one or more electric contacts adapted to engage with
25 the stationary contacts; an air cylinder upon the swinging frame having an aperture adjacent to the contact point; a piston adapted to reciprocate in the cylinder; a spring adapted to press the piston in the direction of the ap-
30 erture; a piston rod carrying at its free end a rack bar adapted to engage with the segmental gear, and means for holding the rack bar in engagement with the gear, substantially as and for purpose set forth.
3. The combination in an electric switch of
35 a plate carrying one or more contacts; a plate electrically insulated therefrom; a lever mounted thereon and carrying a segmental gear; a stop mounted on the lever; a swinging
40 frame carrying one or more electric contacts adapted to engage with the stationary contacts; standards mounted on the swinging frame and adapted to engage the stop on the lever; an air cylinder upon the swinging frame
45 having an aperture adjacent to the contact

point; a piston adapted to reciprocate in the cylinder; a spring adapted to press the piston in the direction of the aperture, and a piston rod carrying at its free end a rack bar adapted to engage with the gear, substantially as and 50 for the purpose set forth.

4. The combination in an electric switch of a plate carrying one or more electric contacts; a plate electrically insulated therefrom; a lever mounted thereon and carrying a segmen- 55 tal gear; a stop on the lever; a swinging frame carrying one or more electric contacts adapted to engage with the stationary contacts; standards on the swinging frame adapted to limit the independent movement of the lever; an
60 air cylinder upon the swinging frame having an aperture adjacent to the contact point; a piston adapted to reciprocate in the cylinder; a spring adapted to press the piston in the direction of the aperture; a piston rod carrying
65 at its free end a rack bar adapted to engage with the gear, and a roller mounted between the standards adapted to hold the rack bar and gear in engagement, substantially as and for the purpose set forth. 70

5. The combination in an electric switch of a base, A having mounted thereon a plate, B, carrying contact plates b' ; and a plate, C, provided with standards, c' forming pivoting points for a shaft, D, carrying a lever, E, provided with a segmental gear, e , and a stop, e^2 ; 75 a swinging frame, F, provided with standards, f^1 , and extensions, f^5 ; a cylinder, f' having an aperture, f^2 , adjacent to the contact point; a piston, G, adapted to reciprocate in the cylinder; a piston rod, g , terminating in a rack bar, g' adapted to intermesh with the gear, and a roller mounted between the standards adapted to hold the rack bar and gear in engagement, substantially as and for the purpose set forth. 85

GEORGE F. CARD.

Witnesses:

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