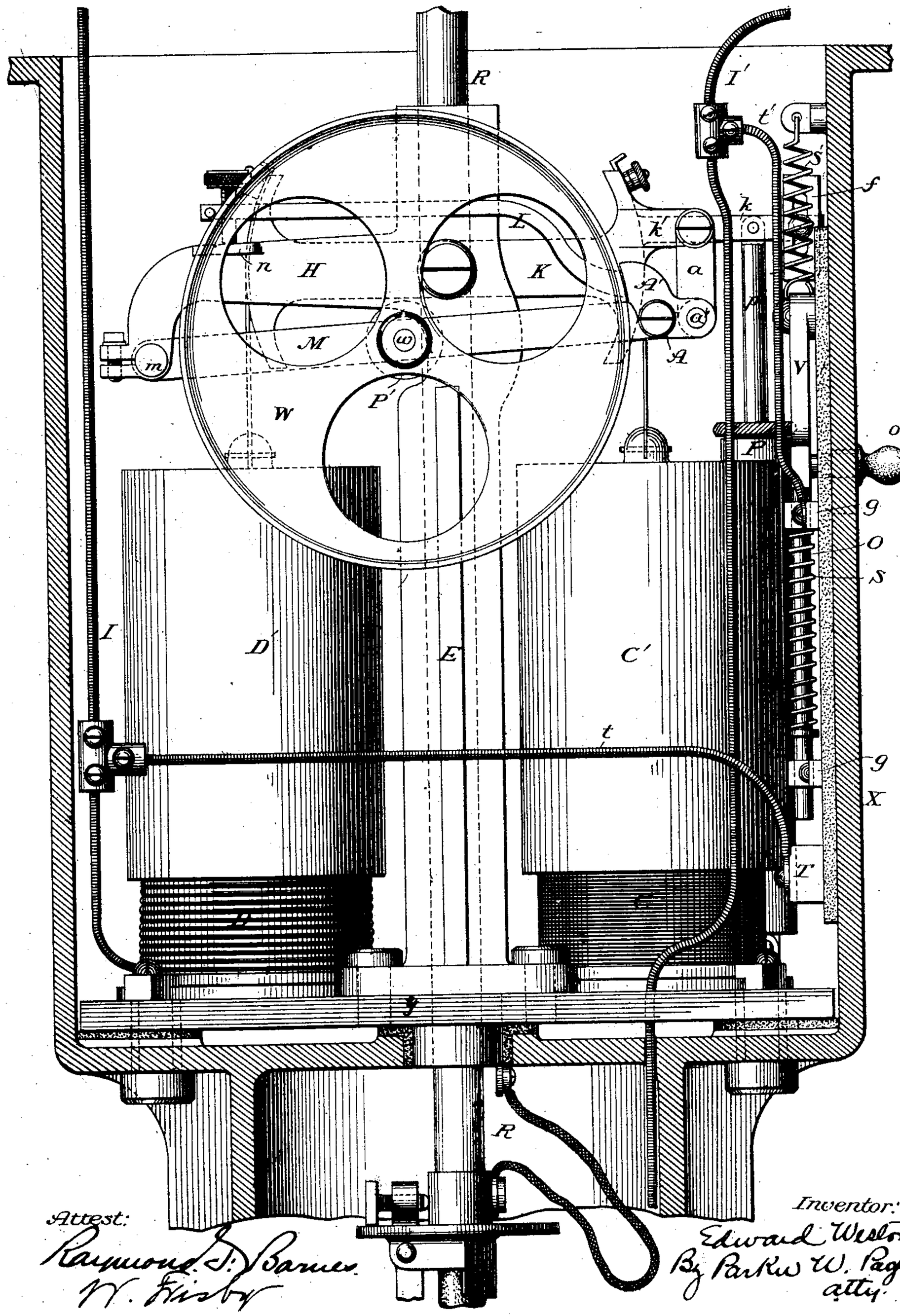
(No Model.) 3 Sheets—Sheet 1.

E. WESTON.

SHUNTING DEVICE FOR ELECTRIC LAMPS.

No. 266,739. Patented Oct. 31, 1882.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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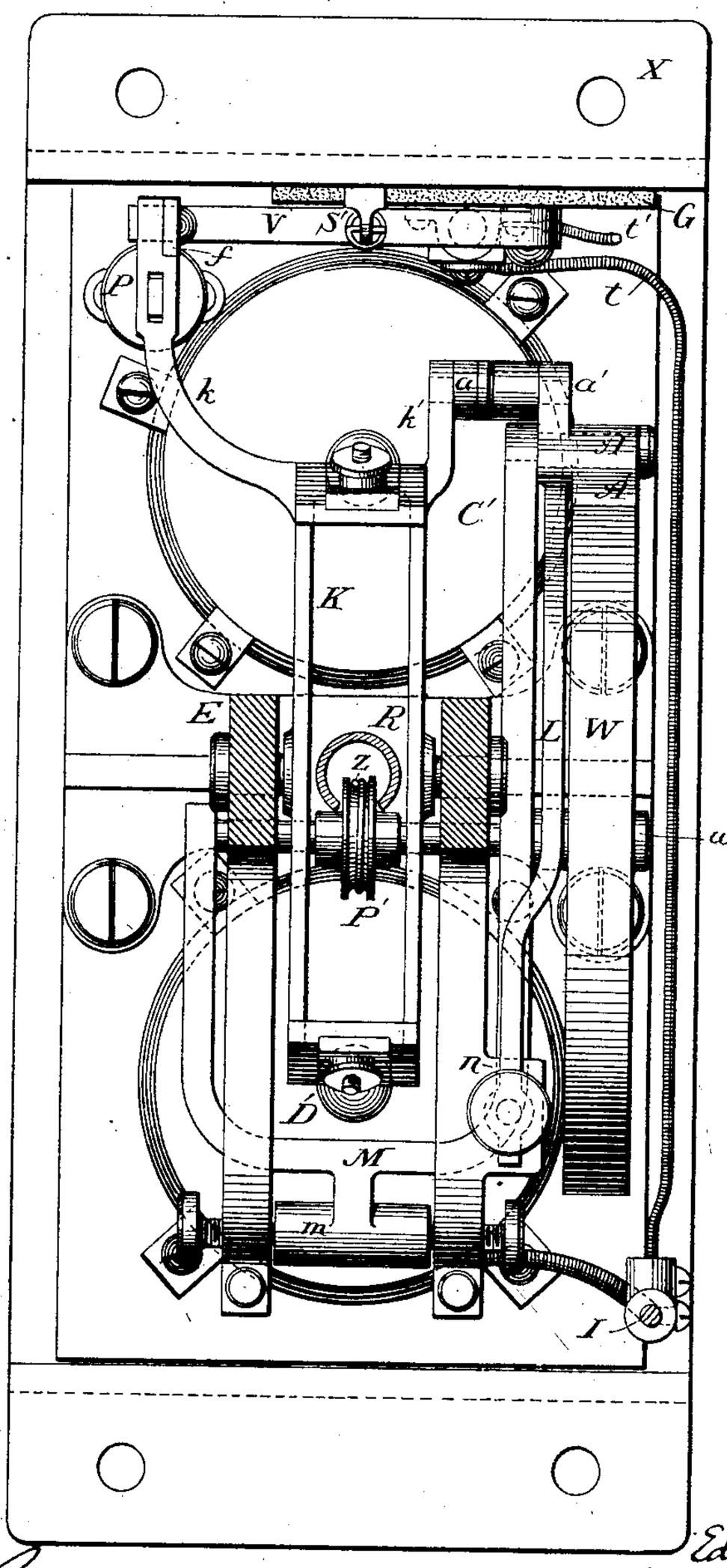
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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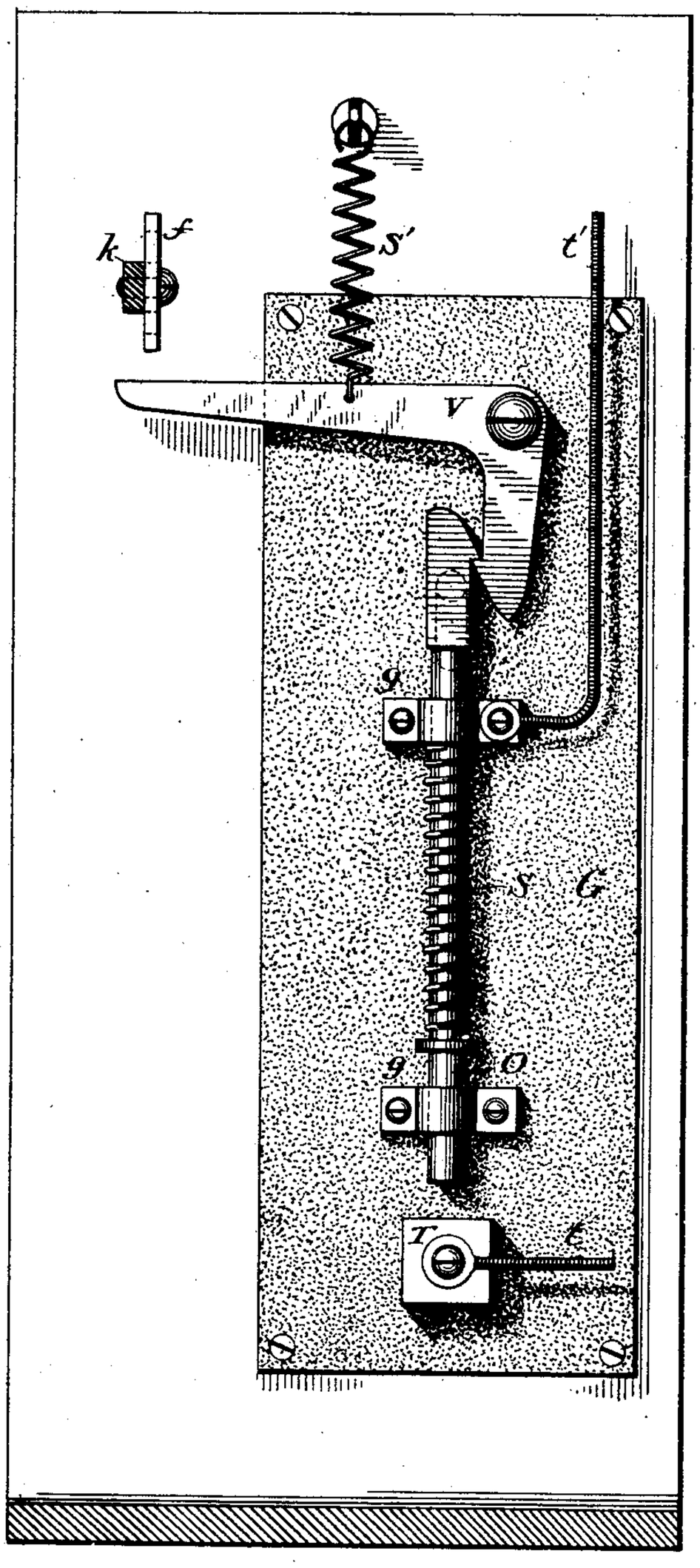
Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD WESTON, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE UNITED STATES ELECTRIC LIGHTING COMPANY, OF NEW YORK, N. Y.

SHUNTING DEVICE FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 266,739, dated October 31, 1882.

Application filed June 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WESTON, a subject of the Queen of Great Britain, and resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Shunting Devices for Electric Lamps, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

My invention consists in the combination, with an electric lamp, under conditions hereinafter specified, of a mechanical shunting or short-circuiting device, the functions of which are to cut out of the circuit the lamp in conjunction with which it is employed when the high-resistance coils forming part of the lamp mechanism are endangered by the passage of an abnormally great proportion of the current, due to the protracted extinguishment, or to an undue elongation of the arc, or to an abnormal increase in the resistance of the main circuit of the lamp.

In the accompanying drawings, where the invention is illustrated in combination with a lamp of peculiar construction, Figure 1 represents in side elevation the upper and operative portions of an electric lamp with my improved cut-out combined therewith, the casing or box inclosing said portions being shown in section. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a face view of the shunting device, showing the manner in which the same is applied to the frame or casing of the lamp.

The lamp mechanism proper, being identical with that shown and described by me in other applications, will not be described herein at greater length than is necessary to an understanding of the present case.

In the bottom of a box or casing, X, the plate *y* is clamped and insulated from the casing. From the plate *y* rises a standard or V-shaped bracket, E, on the sides of which, near the top, are cast or clamped two arms, H H. Through the ends of these arms passes a shaft, *m*, from which extends a forked lever, M, one arm of which is shorter than the other, as shown in Fig. 2. Between the sides of the bracket E, and about on a line with the rigid arms H, there is pivoted a divided lever or frame, K, from one end of which extend suitably-shaped arms, *k k'*, the arm *k* being joined to the piston *p* of a dash-pot, P, hinged to the plate *y*. Arm *k* is extended somewhat beyond the point at which the piston-rod *p* is hinged. Arm *k'* is connected with the clamping mechanism. This latter consists of a hub, A, working on a pin extending from the end of arm M, and formed with a lug or arm, *a'*, for connection with a link, *a*, depending from the arm *k'* of lever K. It has also a lug, A', extending from it, and a a long arm or tail-piece, L, the end of which is designed to come into contact with a fixed stop or detent, *n*.

R is the carbon-carrier, consisting of a hollow slotted tube geared to the pulley P' on the shaft *w* of a brake-wheel, W, by means of a cord or metal wire, *z*, secured to its opposite interior ends and carried once or twice about the pulley.

On opposite sides of the bracket E are the electro-magnets, in this case consisting of helices D C, with armatures composed of cores and inclosing shells, designated by the characters D' C'. Helix D is in the main or arc circuit, helix C in the shunt, and the armatures of both are connected by bands or links to the ends of the lever K, in the manner shown.

In operation the position of the lever K depends upon the relative degree of attraction exerted by the two helices D and C. When the arc is at its normal length the helix D preponderates over helix C, and the brake-wheel is in consequence locked by the lug A'. Should the arc become extinguished or very much elongated, as by the breaking off of a considerable length of carbon or the refusal of the upper carbon and carrier to feed down, the resistance thus interposed in the main or arc circuit diverts an abnormally great proportion of the current through the shunt, which greatly increases the attractive power of the helix included therein, and the armature C' is in consequence drawn down beyond its normal limit of movement. This fact is taken advantage of to cut the lamp out of circuit in the following manner:

Secured to the side of the casing X is a plate, G, of insulating material. In guides *g g*, fixed to said plate, works a pin, O, which, by means of a spiral spring, S, compressed by the

elevation of the pin, is arranged to be forced against a fixed metallic stop, T. A right-angled lever, V, is pivoted on the plate G, and is held up by a spiral spring, S′. The short arm of lever V is caused to engage with the end of pin O when the latter is raised, and holds it up against the force of the spring S.

To the end of the arm *k*, extending from the frame K, is adjustably fixed a plate or bar, *f*, the parts named being so arranged that the long arm of lever V lies in the path of downward movement of the plate *f*, but beyond the limit of its normal movement. An electrical connection by means of a wire, *t*, is established between the plate or stop T and the wire I, that introduces the current to the lamp, and another connection is formed by a wire, *t′*, between the pin O or one of the guides *g* and the wire I′, through which the current leaves the lamp. On the occurrence of a protracted break or an abnormal increase in the length of the arc the helix C draws down its armature and the end of frame K, to which it is connected, so far that the plate *f* encounters the long arm of lever V, sets free the pin O, and forms a short circuit around the lamp. A momentary break or rise in resistance of the arc will evidently not be sufficient to trip the lever V, since the motion of lever K is quite slow, owing to the dash-pot, and before the plate *f* reaches the lever V the carbons, unless there is positive cause preventing them, will have fallen into contact and re-established the arc under normal conditions.

The shunting device, when tripped by the lamp, may be reset by simply raising the pin O, and for this purpose an insulating-handle, *o*, is attached to the pin and brought out through a slot in the side of the lamp-case.

I am aware that the movable armature of an electric lamp has been employed to shunt the circuit about the lamp by itself coming in contact with a stop in its path of normal movement, and, also, that a mechanical circuit-closer, combined with an armature in an electric lamp, has been operated by the movement of the same beyond a predetermined point. Such arrangements therefore I do not claim broadly; but

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

1. The combination, in an electric lamp having main and shunt magnets, with a moving part of the feed mechanism, of a normally-open circuit around the lamp, a circuit-closer contained therein, and a lever or catch for preventing the same from acting, these parts being constructed and combined in such manner that the circuit-closer will be operated by contact therewith of the said moving part of the feed mechanism, due to an abnormal increase in the attraction of the shunt-magnet, as set forth.

2. The combination, in an electric lamp having main and shunt magnets, with a moving part of the feed mechanism, of a contact-plate, T, pin O, spring S, lever V, adapted to engage with and hold the said pin up against the force of spring S, and circuit-connections, as described, these parts being constructed and arranged in such manner that a movement of the feed mechanism beyond the normal range will trip the lever V and cut the lamp out of circuit.

In testimony whereof I have hereunto set my hand this 5th day of June, 1882.

EDWARD WESTON.

Witnesses:
W. FRISBY,
RAYMOND F. BARNES.