(No Model.)

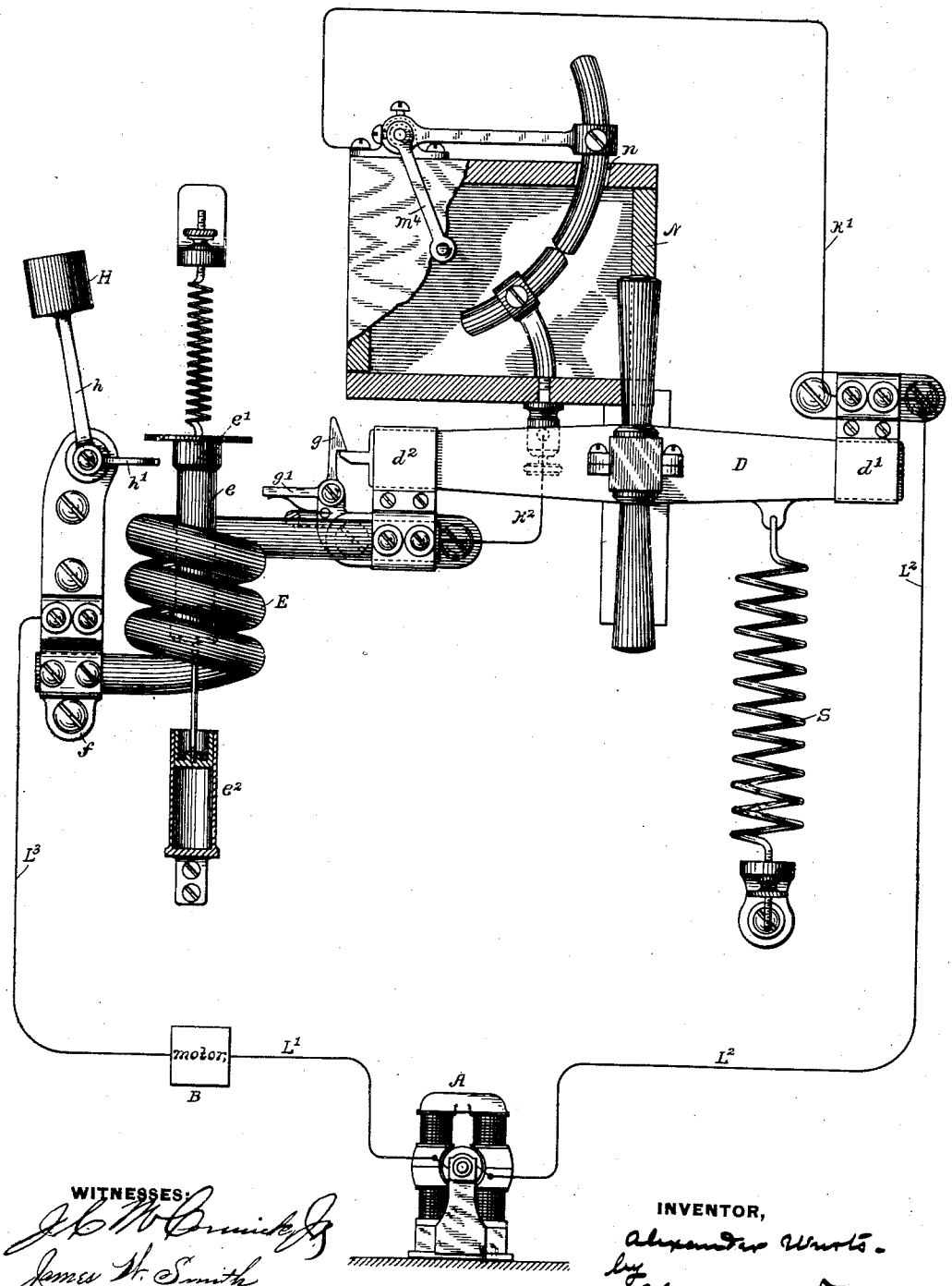
3 Sheets—Sheet 1.

A. WURTS.

CIRCUIT INTERRUPTING DEVICE.

No. 470,161. Patented Mar. 1, 1892.

Fig. 1.



WITNESSES:

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Att'y.

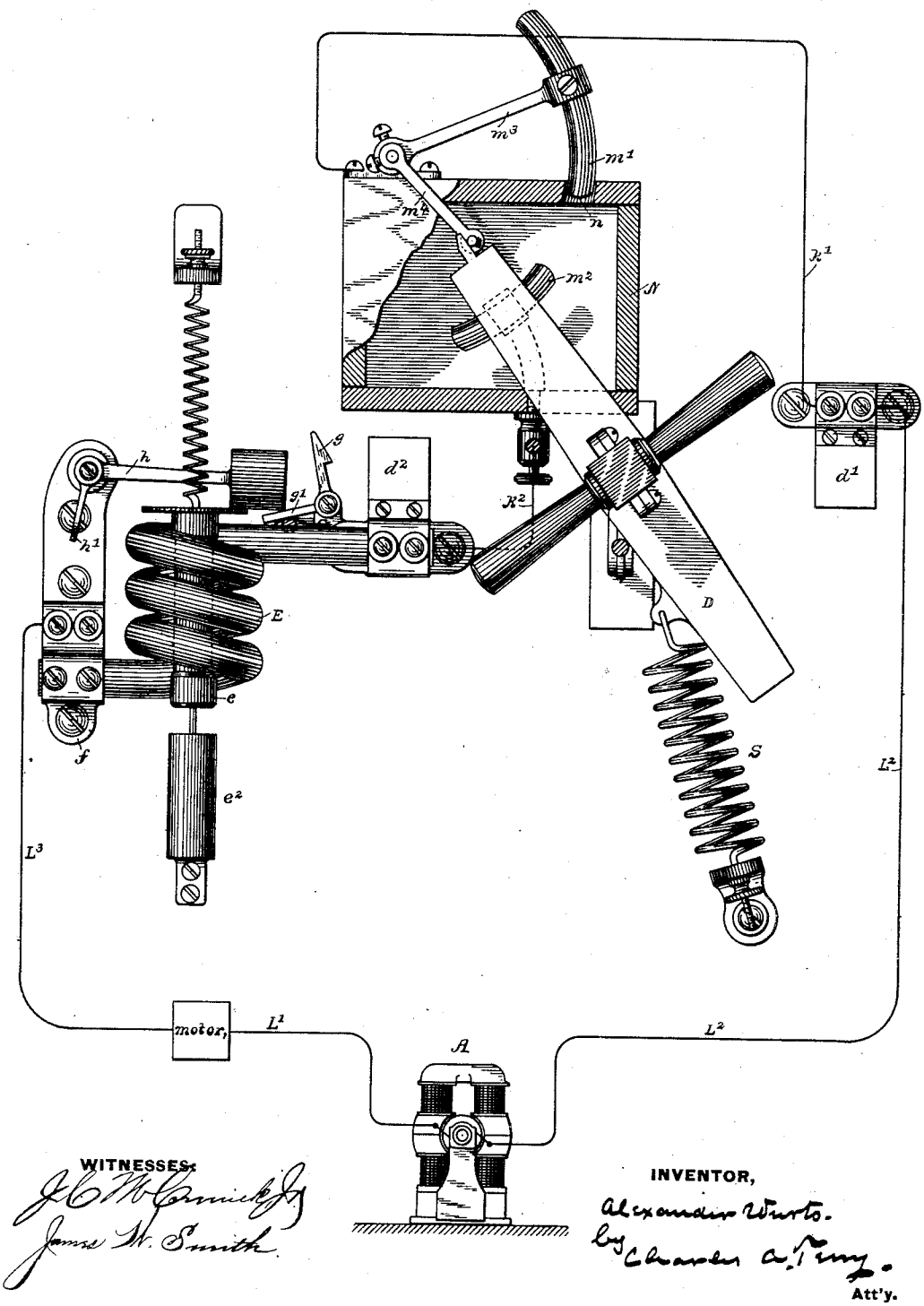
(No Model.) 3 Sheets—Sheet 2.

A. WURTS.

CIRCUIT INTERRUPTING DEVICE.

No. 470,161. Patented Mar. 1, 1892.

Fig. 2.



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(No Model.)

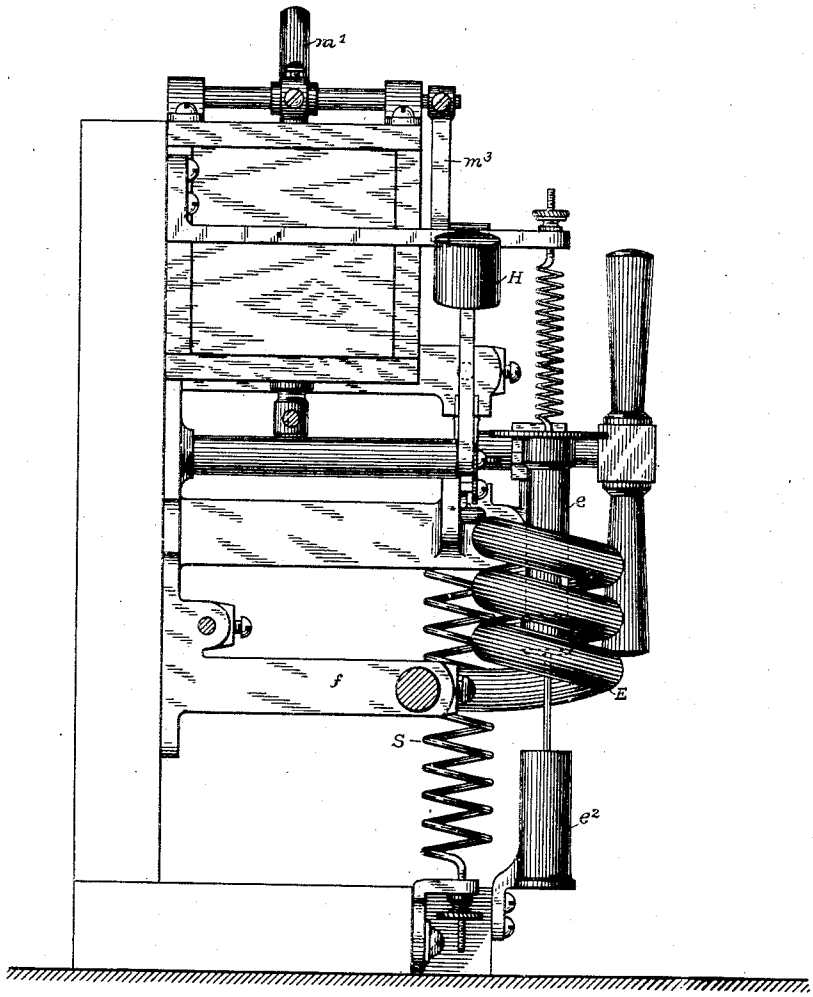
3 Sheets—Sheet 3.

A. WURTS.

CIRCUIT INTERRUPTING DEVICE.

No. 470,161. Patented Mar. 1, 1892.

Fig. 3.



WITNESSES:

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INVENTOR,

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by Charles A. Terry.

Att'y.

UNITED STATES PATENT OFFICE.

ALEXANDER WURTS, OF PITTSBURG, PENNSYLVANIA.

CIRCUIT-INTERRUPTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 470,161, dated March 1, 1892.

Application filed April 23, 1891. Serial No. 390,108. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER WURTS, a citizen of the United States, residing in Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Circuit-Interrupting Devices, (Case No. 455,) of which the following is a specification.

The invention relates to the construction of apparatus for the automatic interruption of electric circuits when traversed by currents of abnormal strength; and the purpose is to provide means whereby the result may be secured without producing destructive electrical discharges at the points of interruption.

The invention in general terms consists in completing a shunt-circuit of high resistance around the contact-points of the main-circuit interrupter and causing its connections to be severed subsequently. This shunt-circuit is so organized as to prevent the occurrence of destructive electrical discharges.

There are many different ways of carrying the invention into effect, one of which will be described in connection with the accompanying drawings.

Referring to the drawings, Figure 1 is a front elevation, partly in diagram, showing the general organization of the apparatus while in a position of rest, the circuit being closed. Fig. 2 is a similar view showing the apparatus in operation. Fig. 3 is a side elevation of the device.

Referring to the figures, A represents a dynamo-electric generator or other suitable source of electric currents, and L' L^2 its circuit. The circuit may be employed for supplying any suitable current-consuming apparatus, as indicated diagrammatically at B, for instance. If for any reason an abnormal current should be caused to traverse the circuit or be drawn from the dynamo, it is desirable that its circuit connections should be immediately interrupted, and thus injury to the dynamo averted. For this purpose a circuit-interrupting device is connected in series with one or both of the conductors, as shown in connection with the conductor L^2, for instance. This conductor L^2 leads to contact-plates d' at one end of a suitable switch-arm D. The other end of this arm is provided with contact-plates d^2, and these in turn are connected with the conductor E, forming a solenoid for a movable core *e*. The connections are continued from this solenoid to the binding-plate *f*, from which the circuit is continued by the conductor L^3 to the work-circuit.

The switch-arm D is normally held in the position shown in the drawings, so as to continue the connections between the conductors L^2 and L^3, by means of a suitable latch *g*, which engages the switch-arm. A spring S normally tends to pull the arm against the latch and to withdraw the ends from the respective contact-plates d' and d^2 and to thus interrupt the circuit connections. When, therefore, it is desirable to open the circuit, it is simply necessary that the latch *g* be tripped. This is accomplished by means of the movement of a core *e* in the coil or solenoid E when that solenoid is traversed by currents of abnormal strength. Since the direct pull of the solenoid upon the core might not be sufficient to disengage the latch if considerable stress is exerted by the spring S, I provide a trip-hammer or weight H for striking the tail g' of the latch. This weight H is carried upon a pivoted arm *h*, and a flange e', carried by the core *e*, engages the short arm h' of the arm or lever *h*. Normally the weight H is poised, as shown in Fig. 1, so as to tend to fall toward the left hand; but a slight thrust upon the arm h' is sufficient to throw the weight to the right of its center of suppport, whereupon it falls upon the arm g', as indicated in Fig. 2, and this releases the switch-arm D, interrupting the switch connections at both plates d' and d^2. This interruption of the circuit would necessarily cause large discharge-sparks at the points of interruption unless means were provided to avoid it. For this reason I provide the shunt-circuit k' k^2 around the switch and through the high-resistance electrodes m' m^2. These electrodes are usually of hard carbon. The electrode m' is carried upon the pivoted arm m^3, while the electrode m^2 may be stationary, and they are respectively connected with the conductors k' and k^2. So long as the switch is in the position shown in Fig. 1 the electrodes m' m^2 carry little or none of the current; but the moment the circuit is interrupted by the movement of the switch D all of the current is forced through these electrodes. The resistance offered by them, how-

ever, reduces the flow of current to a considerable extent, and they are then immediately caused to separate, thus completely interrupting the circuit. The method of separating the electrodes m' m^2 which I prefer to employ is as follows: An arm m^4 is secured to the axis of the arm or lever m^3, and it is extended into the path of the end of the lever D, so that when the latter yields to the pull of the spring S it engages the arm m^4 and raises the arm m^3 and its electrode m', thus separating the electrodes. To still further insure the proper separation of the electrodes m' m^2, they may be contained in a box or chamber N, the electrode m' extending through a vent n. The expansion of the air within the box due to the heating of the electrodes will tend to cause a sudden rush of air through the vent, thus forcing the electrode m' outward quickly. This not only insures complete separation of the electrodes, but the rush of air through the vent immediately blows out any arc which might persist.

For the purpose of preventing too sudden a movement on the part of the core e a dash-pot e^2 may be provided in a manner well understood.

I claim as my invention—

1. A circuit-interrupting device consisting of a switch, two sets of contact-plates therefor, a mechanical latch or detent normally holding said switch in contact with its respective contact-plates, carbon electrodes constituting a shunt-circuit around said switch, a solenoid in series with said switch, a core or armature operated by said solenoid for releasing the switch upon being traversed by an abnormal current, and means for separating the carbon electrodes after releasing said switch.

2. The combination, with the arm D and its respective contact-plates, of the latch normally holding said arm in engagement with said contact-plates, an electro-magnetic tripping device therefor, the carbon electrodes m' m^2 and a shunt-circuit connecting the same around the switch, and means for separating said carbon electrodes, substantially as described.

In testimony whereof I have hereunto subscribed my name this 30th day of March, A. D. 1891.

ALEXANDER WURTS.

Witnesses:
J. W. ROSS,
JAMES W. SMITH.