

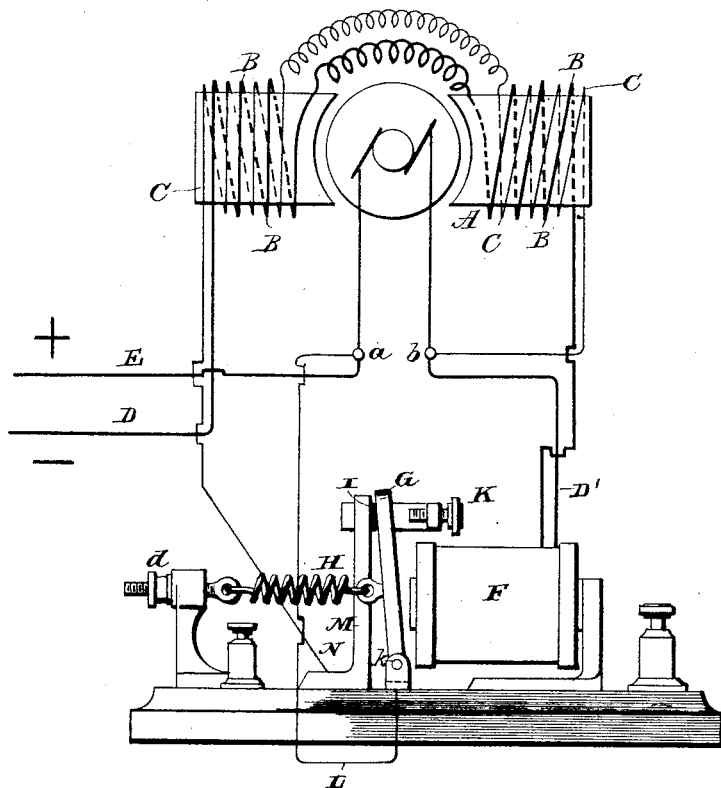
(No Model.)

S. H. SHORT.

AUTOMATIC CUT-OUT FOR DYNAMO ELECTRIC MACHINES.

No. 458,666.

Patented Sept. 1, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

SIDNEY H. SHORT, OF CLEVELAND, OHIO, ASSIGNOR TO THE SHORT ELECTRIC RAILWAY COMPANY, OF SAME PLACE.

AUTOMATIC CUT-OUT FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 458,666, dated September 1, 1891.

Application filed October 29, 1889. Serial No. 328,544. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY H. SHORT, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Automatic Cut-Outs for the Shunt-Coils of Compound-Wound Constant-Current Dynamo-Electric Machines; and I 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.

My invention relates to an improved automatic cut-out for the shunt-coils of compound-wound constant-current dynamo-electric machines.

The object of the invention is to provide a device which will automatically open-circuit the shunt-coils of a compound-wound dynamo on the breaking of the external or working circuit, whereby when the external circuit is closed through a human body, as by taking hold of the broken ends in the attempt of repairing, a greatly-diminished current will be generated and all danger to workmen will thus be avoided.

With this end in view the invention consists in the combination, with the shunt-coils of a compound-wound dynamo-electric machine, of a circuit-controlling device for maintaining the shunt-coil circuit of the dynamo closed while the machine is generating its normal supply of current, and for automatically opening said circuit on the breaking of the external circuit, and thereby reducing the current generated by the machine.

The invention further consists in certain features of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

The drawing is a diagram illustrating the invention.

In the accompanying drawing, illustrating one embodiment of my invention, A represents a compound-wound dynamo having low-resistance field-coils B coupled in series with the armature and line and high-resistance shunt-coils C, the ends of the latter being connected to the terminal contacts or binding-posts *a b* of the machine.

D E represent the two wires or branches

of the external or working circuit, which are connected to the binding-posts *a b*. In the branch D' is included an electro-magnet F, the armature G of which is retracted by a spring H, the tension of which is adjusted by the set-screw *d* or other suitable device.

I is an insulated block or stop, against which rests the upper and free end of the armature G when retracted by its spring.

K is an adjustable contact, with which the armature engages when drawn forward by the electro-magnet. To the pivotal end *k* of the armature is electrically connected a conductor L, the opposite end of which is electrically connected with the binding-post *a*. One end N of the shunt-coil of the dynamo is electrically connected with the contact K by being attached to the standard M or in any other desired manner.

The operation of the improvement is briefly as follows: When the dynamo is generating the normal current, the pull of the electro-magnet F will be sufficient to retain the armature G in contact with the contact K, and thus maintain a closed circuit from binding-post *a*, through conductor L, armature G, contact K, stand M, and conductor N, to the shunt-coils on the field-magnets, and thereby cause the shunt-coils of the machine to be energized by the current diverted thereto. Should a break occur in the main or external circuit, or the circuit be opened for any cause, magnet F will be instantly weakened to such an extent by the drop in the current as to allow the spring H to retract the armature against the insulated stop I, and thus break the circuit conveying current to the shunt-coils of the machine. The electro-motive force of the machine then becomes exceedingly small and continues so until a very low-resistance path is made for the current on the external circuit, which will allow the series coils of the machine to build up the current to its normal strength, when the electro-magnet will be sufficiently energized to close the circuit of the shunt-coils and again bring the latter into action.

By the employment of my improvement with dynamos constructed to generate high-tension currents the danger to life and property resulting from breakage or opening of

the external circuit is practically obviated, as the current generated by the machine will on the breaking or opening of the external circuit be automatically and instantly reduced to such an extent as to be harmless.

It is evident that many changes in the construction and relative arrangement of parts might be resorted to without departing from my invention, and hence I would have it understood that I do not restrict myself to the construction and arrangement of devices and circuits herein shown and described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a compound-wound dynamo-electric machine, of a cut-out electro-magnet in the external or working circuit and a circuit making and breaking device in the shunt-circuit of the dynamo controlled by the electro-magnet, substantially as described.

2. The combination, with a compound-wound dynamo-electric machine, of a cut-out electro-magnet in the external or working circuit, constructed to act in response to a current of normal strength in the main circuit, and a circuit making and breaking device in

the shunt-circuit of the dynamo controlled by the electro-magnet, whereby the shunt-coils of the dynamo are automatically open-circuited on the opening or breaking of the working circuit and are again automatically closed when the current in the external circuit has regained its normal strength, substantially as described.

3. The combination, with the shunt-coils of a compound-wound dynamo-electric machine, of a circuit making and breaking device included in the circuit of the shunt-coils, an electro-magnet included in the external or series circuit of the machine, constructed to actuate the circuit making and breaking device in response to a current of normal strength in the external circuit to close the shunt-circuit, and means for automatically opening the shunt-circuit when the current through the magnet falls below a predetermined point, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

SIDNEY H. SHORT.

Witnesses:

J. C. WILLIAMS,
E. H. MORRISON.