No. 789,413. PATENTED MAY 9, 1905.

P. J. DARLINGTON.

OVERLOAD CUT-OUT FOR HOISTS.

APPLICATION FILED OCT. 5, 1904.

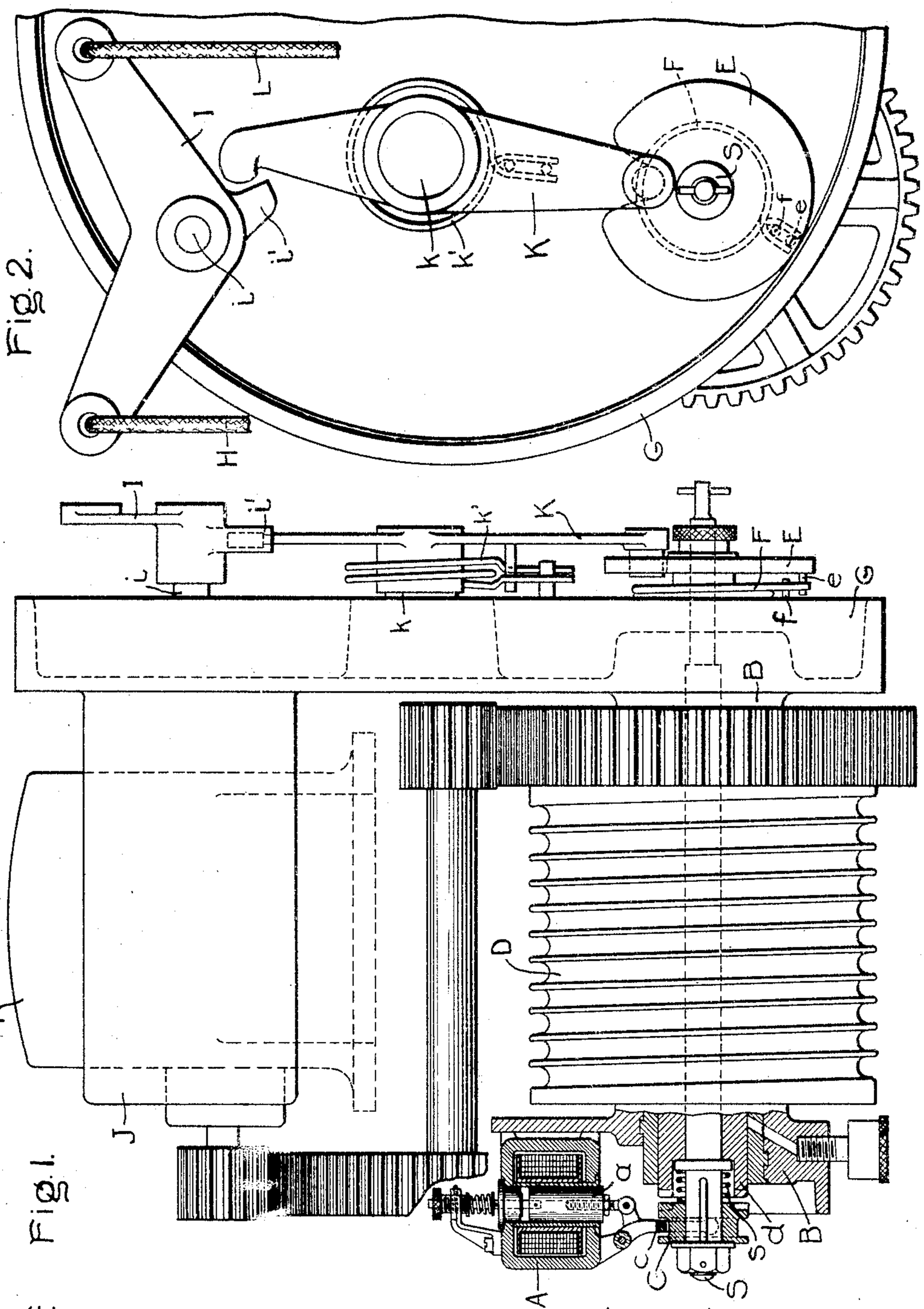

Fig. 2.

Fig. 1.

Witnesses.
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Att'y.

No. 789,413. Patented May 9, 1905.

UNITED STATES PATENT OFFICE.

PHILIP J. DARLINGTON, OF GLENRIDGE, NEW JERSEY, ASSIGNOR TO SPRAGUE ELECTRIC COMPANY, A CORPORATION OF NEW JERSEY.

OVERLOAD CUT-OUT FOR HOISTS.

SPECIFICATION forming part of Letters Patent No. 789,413, dated May 9, 1905.

Application filed October 5, 1904. Serial No. 227,280.

To all whom it may concern:

Be it known that I, PHILIP J. DARLINGTON, a citizen of the United States, residing at Glenridge, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Overload Cut-Outs for Hoists, of which the following is a specification.

My invention relates to electrically-operated hoists; and its object is to provide a novel and efficient cut-out whereby overloads of the motor may be prevented.

My invention consists in providing means responsive to an overload on the motor for mechanically connecting the motor-controller to a moving part of the hoist, whereby the controller is automatically and positively moved to its off position, so as to break the motor-circuit.

More specifically considered my invention consists in a magnet-coil connected in a motor-circuit and a clutch controlled thereby and arranged to establish a mechanical connection between the motor-controller and a moving shaft.

My invention will best be understood by reference to the accompanying drawings, in which—

Figure 1 shows a side elevation of a hoist provided with an overload protective device in accordance with my invention, and Fig. 2 shows a side elevation of the same.

In Fig. 1, M represents an electric motor connected, through the usual speed-reducing gears, to the hoisting-drum D. The drum D is mounted on the sleeve or hollow shaft *d*, supported in bearings B B. Through this hollow shaft or sleeve extends the shaft S, which is rotatably mounted in the sleeve. The shaft S has keyed to it, so as to permit of axial movement only, the clutch member C, which is normally held in the position shown by the compression-spring *s*. A represents a magnet or solenoid connected in the motor-circuit and having its core *a* connected by a lever to a collar *c* on the clutch member C. When the current through magnet-coil A is of sufficient strength to cause it to lift its core, clutch member C is pushed inward, engaging notches in the end of sleeve *d*. Sleeve *d* and shaft S are thus locked together, and shaft S is forced to rotate with sleeve *d*. The other end of shaft S carries a disk E, which in turn carries a pin *e*. This is engaged by a tension-spring F, which also engages a pin *f* on the controller-casing G. Spring *s* consequently serves to hold sleeve *d* and shaft S in the position shown. A notch in disk E is engaged by a pin carried at the lower end of a lever K, which is pivoted on the stud *k* on casing G and which is normally held in the position shown by the spring *k'*.

I represents a lever mounted on the shaft *i* of the motor-controller J. Lever I carries two ropes H and L, by means of which the motor-controller may be operated from the floor and moved to hoisting or lowering position. The lever is shown in its off position. Now as rope H is pulled down to move the controller to hoisting position lever K will be engaged by a lug *i'* on the lever I and rotated against the tension of spring *k'*, also rotating disk E against the tension of spring F. These springs act to return the controller to off position when rope H is released. If when the motor begins to hoist it is overloaded, so as to energize magnet-coil A and to clutch shaft S to sleeve *d* shaft S will be rotated so as to move disk E and lever K back to the position shown in Fig. 2, thereby moving the controller to off position regardless of any pull the operator may exert on rope H. When the controller reaches the off position the magnet-winding A is deënergized and the clutch member C is released from its engagement with the sleeve *d*.

I do not desire to limit myself to the particular construction and arrangement of parts shown, but aim in the appended claims to cover all modifications which are within the scope of my invention.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a hoist, a driving-motor, a controller therefor, and means responsive to an overload on said motor adapted to connect said controller mechanically to a moving part of the hoist, whereby said controller is moved to break the motor-circuit.

2. In a hoist, a driving-motor, a controller

therefor, and means responsive to an overload on said motor adapted to connect said controller mechanically to the hoisting-drum, whereby said controller is moved to its off position.

3. In a hoist, a driving-motor, a controller therefor, a magnet-winding in the motor-circuit, and means controlled by said magnet-winding for connecting said controller to a moving part of the hoist.

4. In a hoist, a driving-motor, a controller therefor, a magnet-winding in the motor-circuit, and a clutch actuated by said magnet-winding and adapted to lock said controller to the hoisting-drum.

5. In a hoist, a driving-motor, a controller therefor, a rotatable sleeve, a hoisting-drum carried thereby, a shaft journaled within said sleeve, means for holding said shaft normally stationary, loose yet positive connections between said shaft and said controller, a clutch adapted to lock said shaft to said sleeve, a magnet in the motor-circuit, and operative connections between said magnet and said clutch.

In witness whereof I have hereunto set my hand this 3d day of October, 1904.

PHILIP J. DARLINGTON.

Witnesses:
PAUL MULLER,
ANNA M. GILLIN.