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A. COWPERTHWAIT.
SAFETY APPLIANCE FOR AIR BRAKES.

(Application filed Feb. 4, 1901.)

(No Model.)

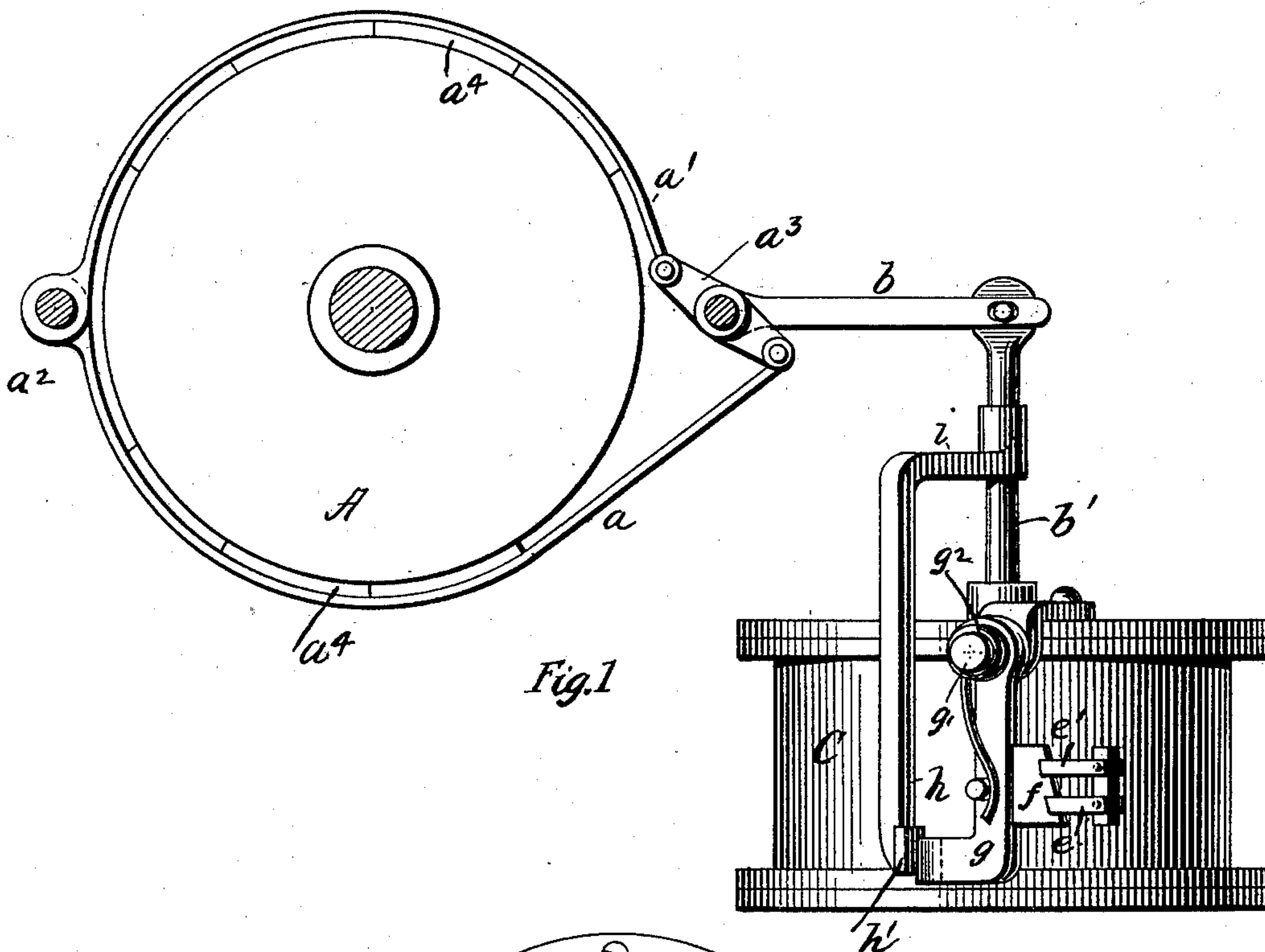


Fig. 1

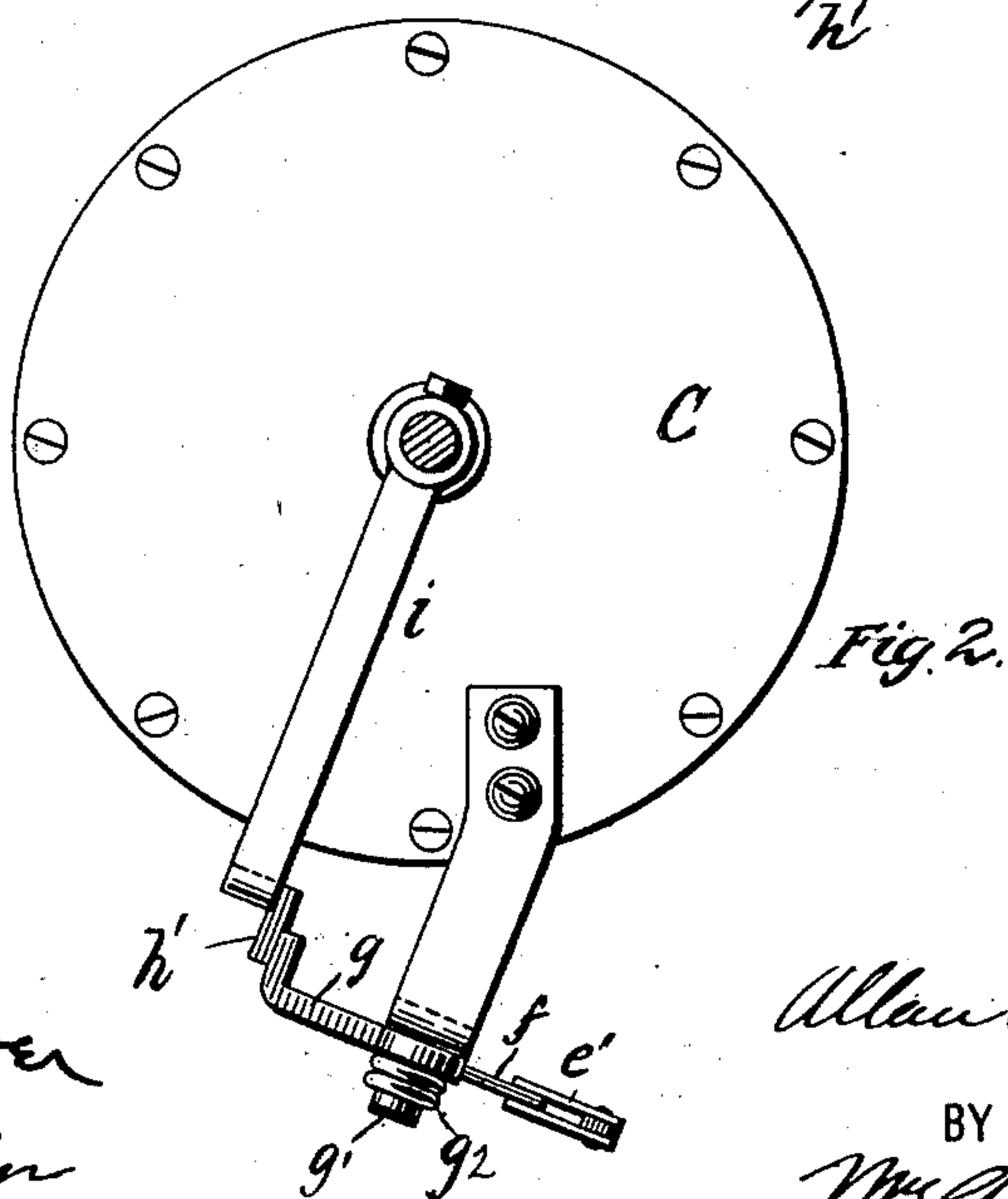


Fig. 2.

WITNESSES:

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SAFETY APPLIANCE FOR AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 671,207, dated April 2, 1901.

Application filed February 4, 1901. Serial No. 45,826. (No model.)

To all whom it may concern:

Be it known that I, ALLAN COWPERTHWAIT, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Safety Appliances for Air-Brakes, of which the following is a full, clear, and exact description.

This invention relates to air-brakes in which a piston is moved a certain distance to apply the brake shoe or strap by the pressure of air admitted to the cylinder in which the piston plays. As the brake shoe or strap is subjected to considerable wear, the stroke of the piston necessarily varies, it being least when new shoes or straps are in use and greatest when the shoes or straps have been a long time in service. In some constructions of brake apparatus the stroke of the piston has a predetermined length, and when the wear on the shoe or strap has become excessive it sometimes happens that the piston will complete its stroke before the shoe or strap can grip the shaft sufficiently to bring it to a stop within the proper time. For elevator purposes it is absolutely essential that the brake shall be efficient at all times, and any construction which would permit the power-shaft to rotate after the brake has been applied would not be permissible.

The object of my invention is to provide means whereby the motive power which operates an elevator shall be made inoperative whenever the wear upon the brake shoe or strap becomes so great that the brake can no longer act with its normal efficiency. The elevator to which my apparatus is applied is electrically driven and the motor is supposed to control the shaft positively whether the car is going up or down and regardless of the counterbalancing of the car, so that when the motor is stopped the elevator is necessarily stopped. The function of my improved apparatus is to stop the motor or to open a circuit controlling the motor whenever the wear on the brake shoe or strap becomes excessive or when it is so great as to require renewal of the friction-surface.

My invention will be described with reference to the accompanying drawings, in which—

Figure 1 is a conventional representation of a brake and a power-cylinder fitted with my improved apparatus, and Fig. 2 is a plan of the cylinder.

A represents a disk or drum upon one of the shafts through which the power is transmitted. It is surrounded by a brake of usual construction consisting of straps a and a' , hinged together at a^2 and connected, respectively, to the opposite ends of a short lever a^3 , pivoted at its middle point. The straps are each provided with leather or other suitable working faces a^4 , which make contact with the periphery of the disk, and thus are subjected to wear. The lever a^3 is connected at its pivot with another lever b , which in turn is connected with the end of a piston-rod b' in such a manner that the reciprocations of the rod will cause the brake-straps to approach or recede from the rim of the disk. The piston-rod is connected with a piston (not shown) located in a power-cylinder C. This cylinder is of large diameter and short length, so as to afford great pressure through a short stroke. e and e' are two electrical contacts in a circuit controlling said motor. The contacts are normally bridged and the circuit maintained by a connecting-plate f , carried by a lever g , pivoted at g' . The axis of this lever is surrounded by a torsion-spring g^2 , which tends to swing the lever to one side and carry the plate f out of connection with the contacts $e e'$. The spring is prevented from accomplishing this normally by a retaining-bar h , which is provided with an offset or extension piece h' , resting against the free end of lever g . The bar h is parallel to the side of the cylinder, but extends beyond the head of the same and connects with the transverse arm i , bolted to the piston-rod b' . The bar h therefore rises and falls with the piston-rod, and the offset on the bar slides along the free end of the lever g . The extent of the contact between the lever g and the extension h' is so related to the stroke of the piston in the cylinder that so long as said stroke is of the normal length the extension h' will never go beyond the end of lever g , and will thus act as a lock to hold the plate f in connection with the contacts $e e'$; but when the wear of

the contact material α^4 on the brake-straps exceeds a predetermined amount the stroke of the piston thereby becomes longer and the extension h' passes entirely beyond the end of lever g , thus permitting the spring g' to act and quickly throw the lever to one side. This opens the control-circuit of the motor by disconnecting the contacts $e e'$, and the driving-motor cannot thereafter be started until the connecting-plate f has been replaced, which obviously will not be done until the friction-surfaces α^4 of the brake have been renewed.

Having described my invention, I claim—

15 1. In an air-brake, the combination of a brake shoe or strap, a piston adapted to operate the same, an electric controlling-circuit, and means whereby the length of travel of the piston will determine the continuity of said circuit.

20 2. In an air-brake, the combination of a brake shoe or strap, a piston adapted to op-

erate the same, an electric controlling-circuit, a cut-out in said circuit and means whereby the cut-out will be locked in its closed position while the stroke of the piston is normal, and unlocked when the stroke becomes abnormal.

3. In an air-brake, the combination of a brake shoe or strap, a piston adapted to operate the same, an electric controlling-circuit, a cut-out lever controlling said circuit, an arm connected with said piston and normally bearing against said cut-out lever, but adapted to pass beyond the lever when the piston makes an abnormal stroke, and means for moving said cut-out lever when the piston releases it.

In witness whereof I subscribe my signature in presence of two witnesses.

ALLAN COWPERTHWAIT.

Witnesses:

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