

(No Model.)

2 Sheets—Sheet 1.

O. F. JÖNSSON.  
INDICATOR FOR ELECTRIC CIRCUITS.

No. 341,918.

Patented May 18, 1886.

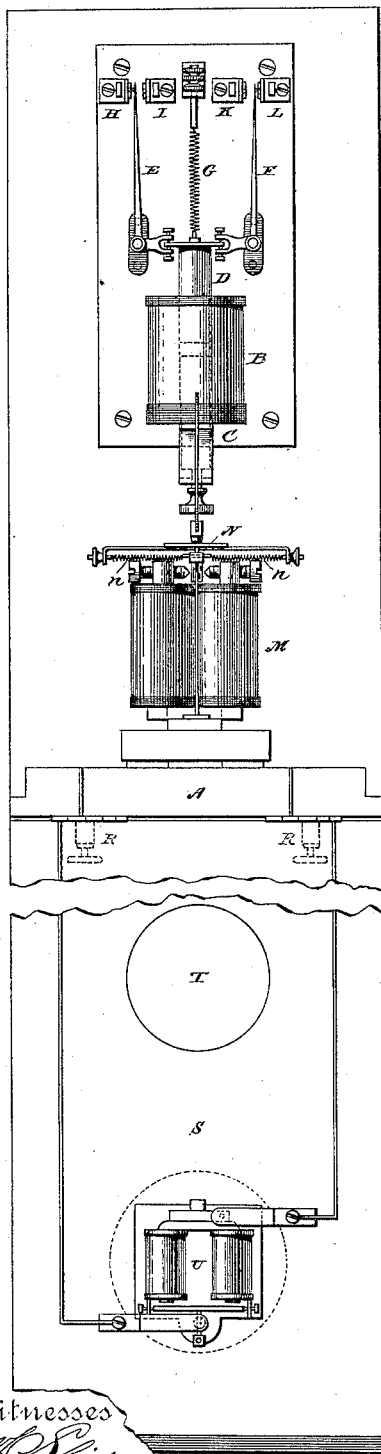


Fig. 1.

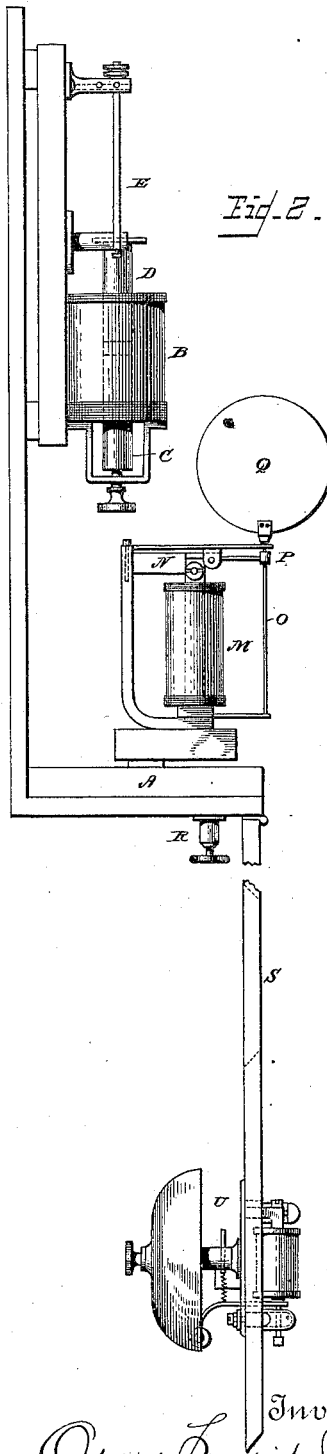


Fig. 2.

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By his Attorneys  
*Richard H. Hopkins & Co.*

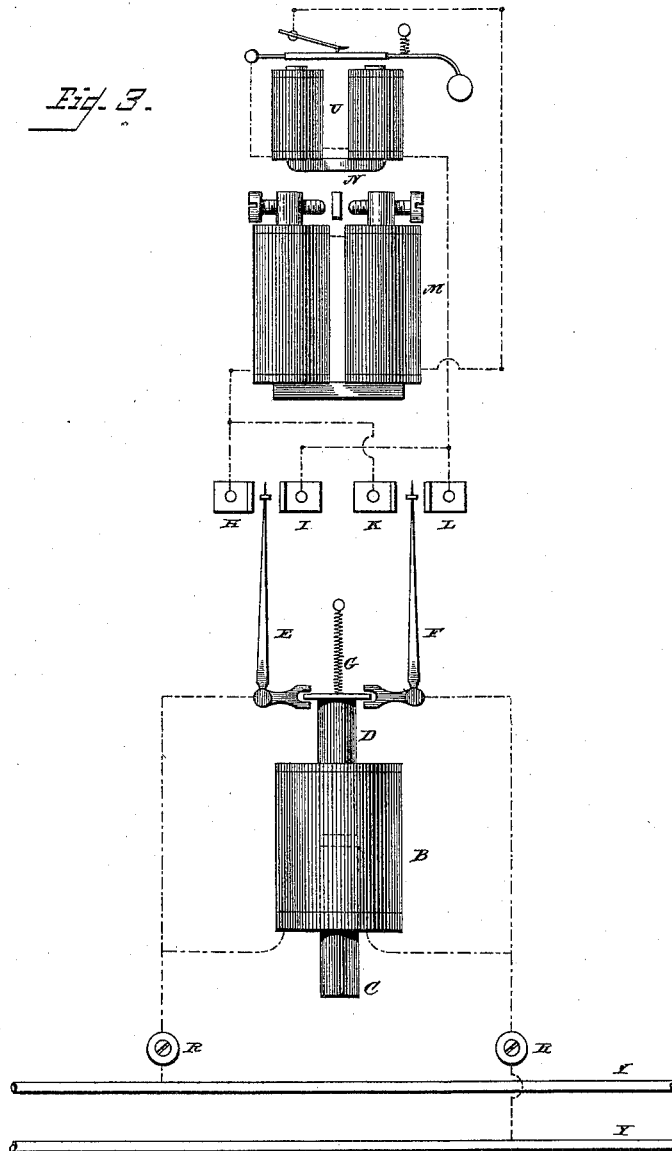
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

OSCAR FREDRIK JÖNSSON, OF STOCKHOLM, SWEDEN.

## INDICATOR FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 341,918, dated May 18, 1886.

Application filed February 10, 1885. Serial No. 155,516. (No model.)

*To all whom it may concern:*

Be it known that I, OSCAR FREDRIK JÖNSSON, a subject of the King of Sweden, residing at Stockholm, Sweden, have invented certain new and useful Improvements in Indicators for Electric Circuits, of which the following is a specification.

My apparatus is preferably placed near the motor of a dynamo-machine. It indicates by means of signals any change in the current of the dynamo-circuit.

In the accompanying drawings, Figure 1 is a front view of the signal apparatus open. Fig. 2 is a side view of the same; and Fig. 3 is a diagram of the circuits.

The apparatus consists of a box the lid and sides of which may be turned outward. The bottom A is fixed to the back. On the back is a plate, to which a solenoid, B, is attached. At the bottom of this solenoid is a stationary adjustable iron core, C, and at the top a movable one, D, provided with a flange embraced by the fork-shaped ends of the bell-crank circuit-changing levers E and F. The regulating-screws in these forks have points of ebonite or other insulating matter. The iron core D is suspended by an adjustable spring, G. The longer ends of the levers E and F play between contact-pieces H I and K L, which are provided with contact-springs.

On the bottom plate, A, is an electro-magnet, M, with a polarized armature, N, pivoting on a pin behind the magnet, and attracted to one or other side as the current passes in one or other direction through the coils of the magnet.

nn are two springs tending to keep the armature in a middle position between the poles of the electro-magnet M. The armature N is prolonged with an arm, on the extremity of which is a toothed segment gearing with a pinion, O, attached to a standing shaft, P. This shaft has at the top a signal-disk, Q, the sides of which are painted different colors.

R are pole-screws.

In the lid or front S of the box is a hole, T, opposite the signal-disk Q, which is visible through the hole when the box is closed. On the same front is also a ringing apparatus, U. Y indicates the main dynamo-circuit.

The solenoid B is introduced in derivation into the main circuit from the dynamo-ma-

chine, so that the current acts upon the apparatus in the following manner: Suppose the dynamo-machine to be at work and the lamps introduced into the circuits to be shining with full power. Should other lamps be introduced, the resistance in the main circuit is lessened, and so also the potential difference between the pole-screws of the solenoid B. The spring G will consequently get the mastery and pull the core a little out of the solenoid, causing the bell-crank levers E and F to come into contact with their respective outer contact-pieces, H and L. Thus another derived circuit of great resistance is closed and one part of the current will pass through E, H, M, U, L, and F. The armature N will then be drawn to one side, causing the signal-disk Q to be turned, exposing one side to view. At the same time the ringing apparatus U will sound and call the engineer's attention, so that he may increase the speed of the motor. When the current has been regulated, the attractive force of the solenoid will have again increased sufficiently to draw the core D and the bell-crank levers E and F into their original positions away from all the contacts. The magnetism of the electro-magnet M will then cease, and the polarized armature N will resume its middle position, the edge only of the signal-disk Q will be visible, and the ringing apparatus will cease to sound. If, on the contrary, some of the lamps are disconnected from the circuit, the reverse takes place—that is to say, diminishing the number of lamps will increase the potential difference at the pole screws of the solenoid B, thus increasing the attractive power of the latter, thereby causing the core D to be further drawn in. A derived current will then pass through the electro-magnet M and sounding apparatus U in the opposite direction, owing to the bell-crank levers E and F coming into contact with the inner contact-pieces, I and K. The signal-disk will be turned in the opposite direction and show its reverse face, and the sounding apparatus will call the attention of the engine-man to lessen the supply of steam until equilibrium is effected.

I have described a complete apparatus for indicating visibly and audibly changes in an electric current; but, so far as part of my invention is concerned, the indicating devices

may be omitted and part of the apparatus employed wherever it is desirable to change the course of an electric current.

I claim as my invention—

- 5 1. The combination of the dynamo-circuit, the solenoid B, traversed by a current generated by the dynamo, the core D, the operating or circuit-changing levers E and F, connected with the core, and the contact-stops H I and  
10 K L, whereby electric circuits are closed, substantially as and for the purpose set forth.

2. The combination of a dynamo-circuit, the solenoid B, traversed by a current generated by the dynamo, the movable core D, the circuit-changers, the contact-stops, the derived circuit, and an indicating device included in the  
15 derived circuit.

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Witnesses:

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