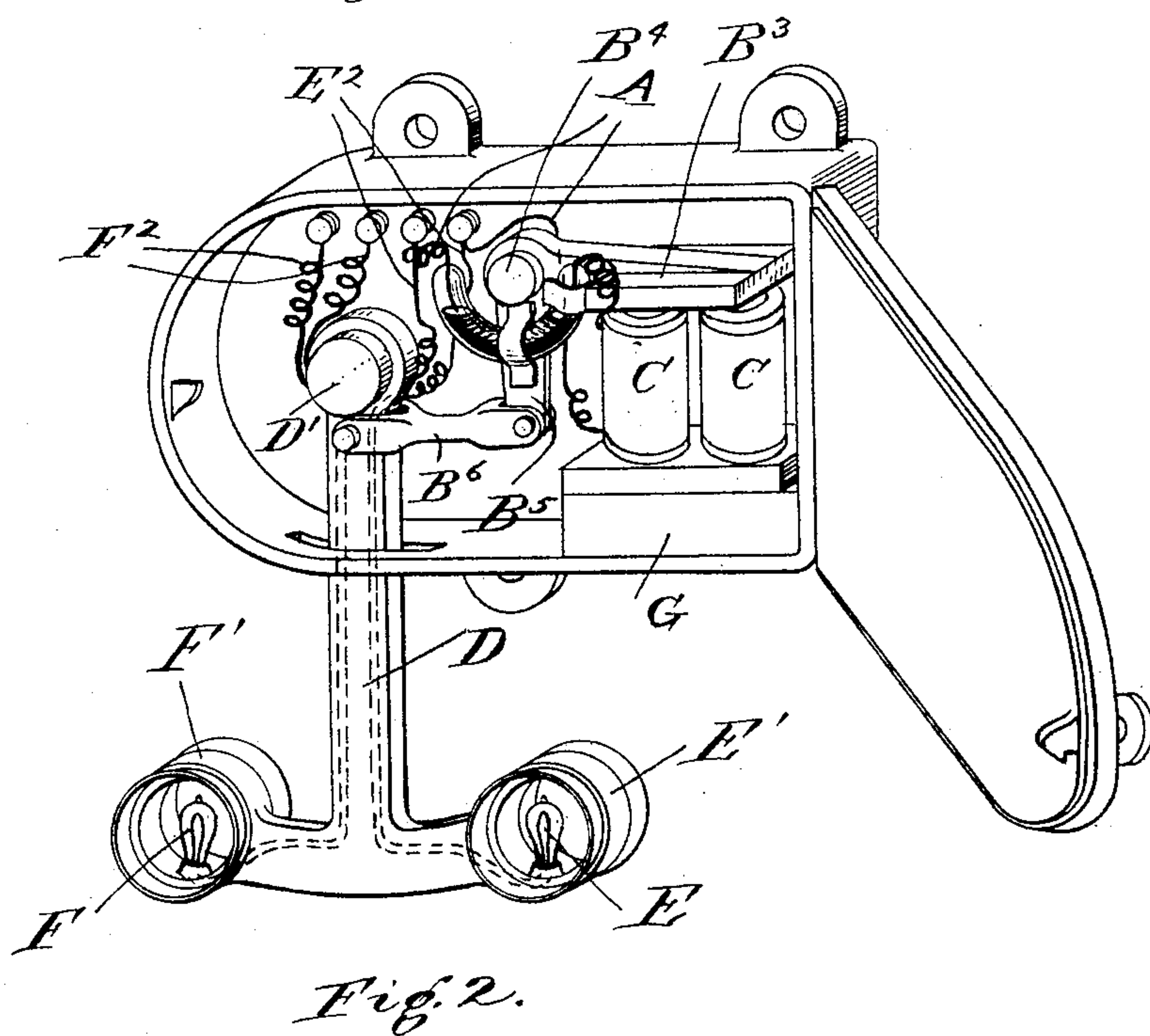
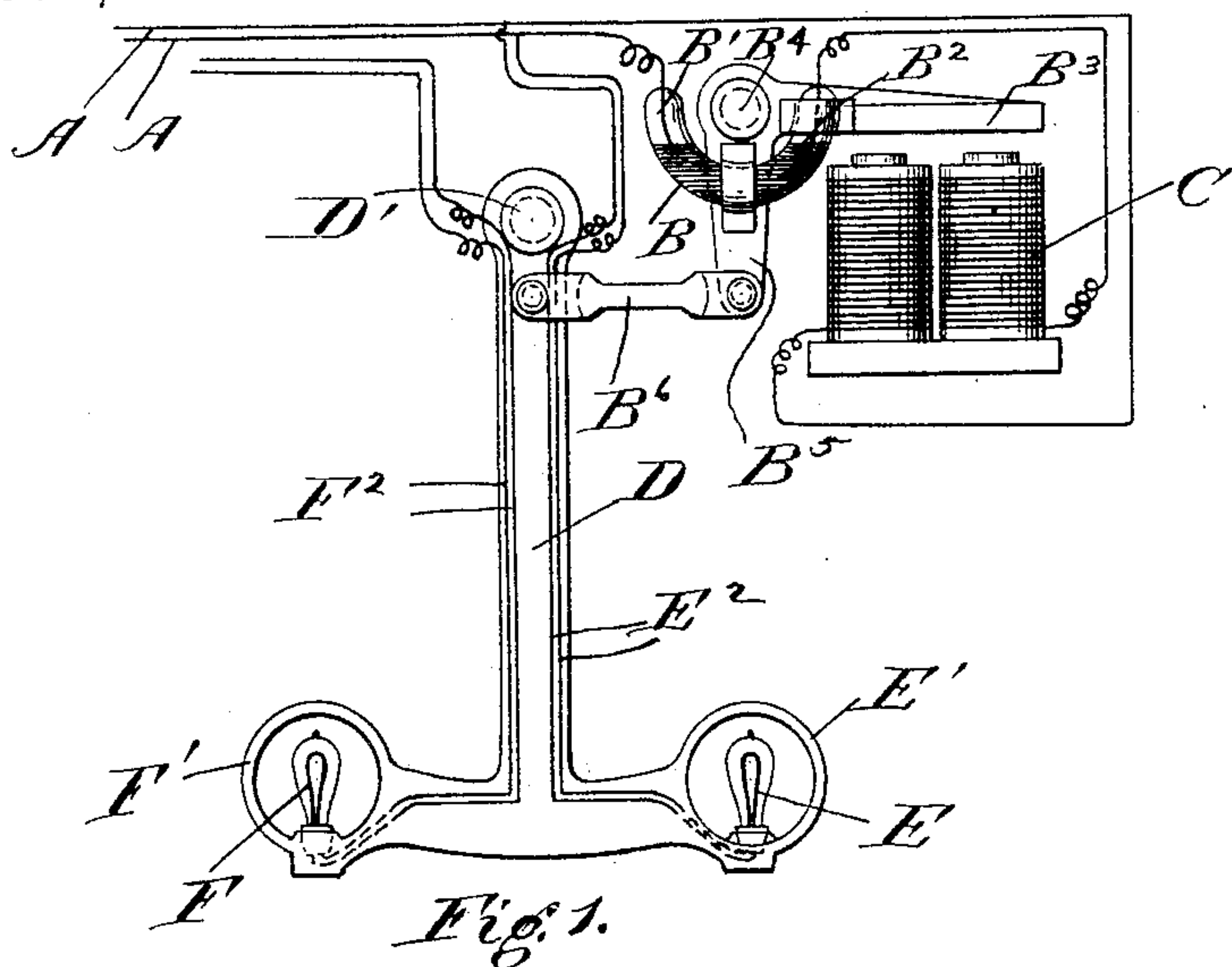


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No. 533,938.

Patented Feb. 12, 1895.



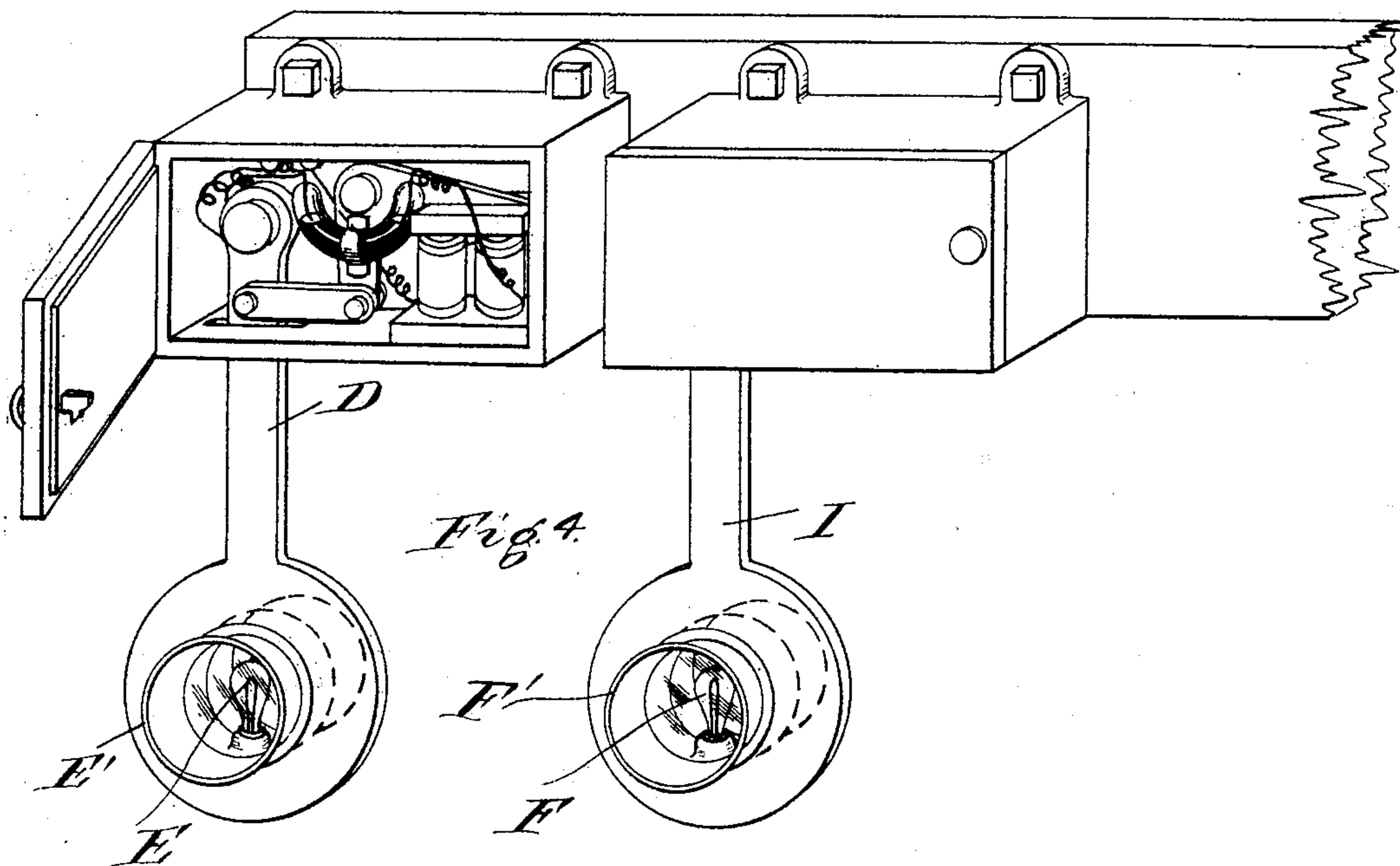
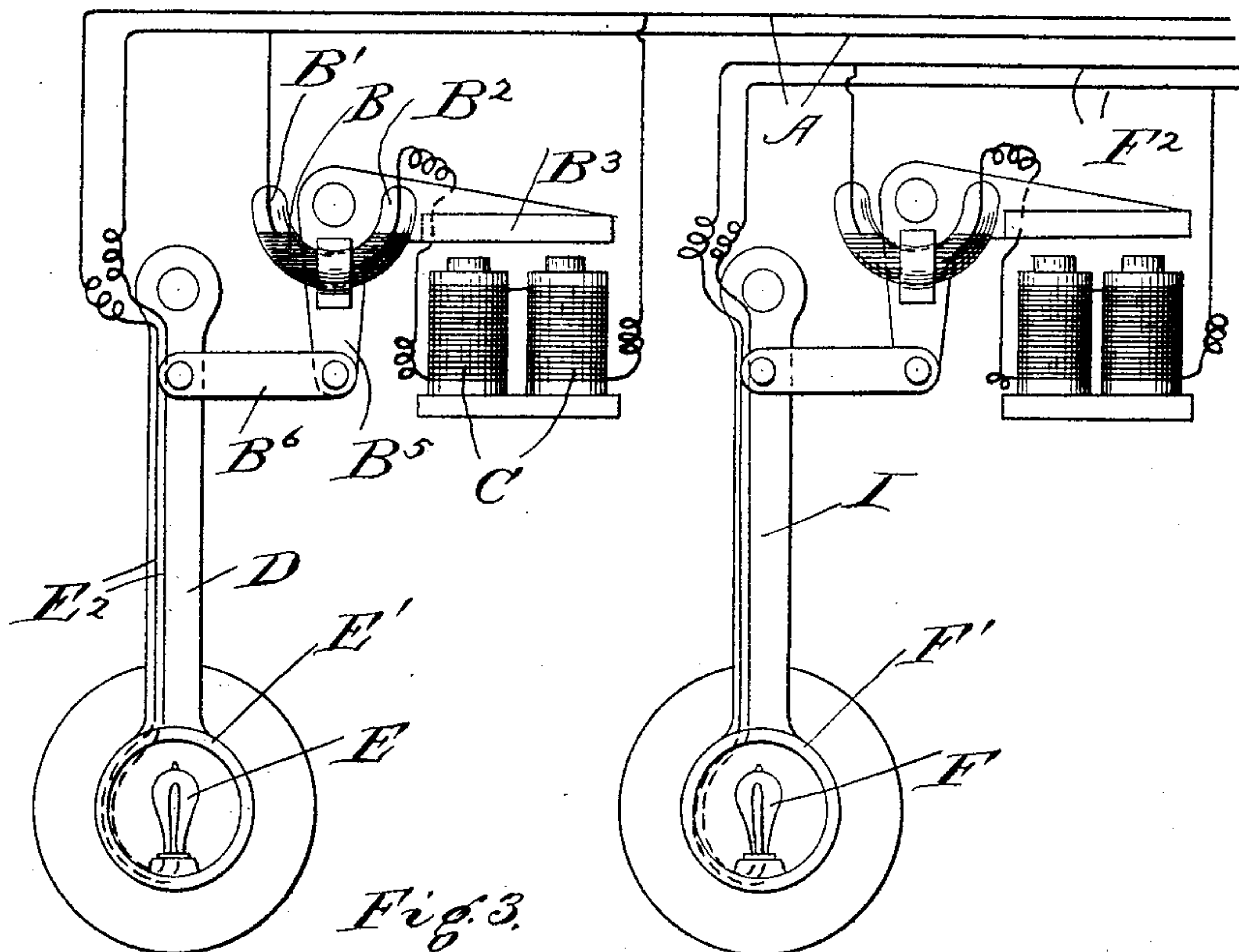
Witnesses:  
Walter J. Gunthorp  
D. McArthur

Inventor:  
David H. Wilson  
By James W. Parker  
Att'y

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Hatter J. Gunthorp  
D. Mearns

Inventor:  
David H. Wilson  
By Francis W. Parker,  
Att'y



# UNITED STATES PATENT OFFICE.

DAVID H. WILSON, OF CHICAGO, ILLINOIS.

## SEMAPHORE FOR RAILWAY-SIGNALS.

SPECIFICATION forming part of Letters Patent No. 533,938, dated February 12, 1895.

Application filed April 23, 1894. Serial No. 508,626. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID H. WILSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Semaphores for Railway-Signals, of which the following is a specification.

My invention relates to semaphores or visual signals for a system of railway signals, and has for its object to produce a new and improved visual signal of which the following is a description, reference being had to the accompanying drawings, wherein—

Figure 1 is a diagrammatic view of the semaphore and operating mechanism. Fig. 2 is a view of the semaphore and case or box containing the mechanism. Figs. 3 and 4 show the preferred form of my device.

Like letters refer to like parts throughout the several figures.

In most systems of electrically operated railway signals the semaphore or visual signal is operated by an electric motor or the like, the circuit being closed through such motor by the train as it passes into any given section. In my device A A' represents the wires of such circuit. The mercury tube B and electro-magnet C are in series on this circuit. The tube B is partly filled with mercury, entirely exhausted of air, and then sealed, the contacts B' B<sup>2</sup> being sealed into its ends. The said tube B is fastened in any convenient manner so as to move with the armature B<sup>3</sup> of the electro-magnet C. As shown in the drawings the tube is fastened to a bell crank lever pivoted at B<sup>4</sup>. The arm B<sup>3</sup> of said lever is the armature of the magnet C, the other end B<sup>5</sup> being connected by the link B<sup>6</sup> to the semaphore D which is pivoted at D'. To the bottom or cross arm of the semaphore are attached the electric lamps E F which are protected by the reflecting hoods E' F'. The lamp E is connected to the wires A A by wires E<sup>2</sup> E<sup>2</sup>. The lamp F is connected to the wires F<sup>2</sup> F<sup>2</sup> of a separate circuit which is only closed when two trains are in adjoining sections.

Fig. 2 shows the semaphore and mechanism in a box G so as to be easily and quickly put in place along the track. In Figs. 1 and 2 I have shown one semaphore with two lamps attached. The semaphore is set in motion and one lamp lighted when it is to be a for-

ward or rearward signal for one train. When two trains are in adjoining sections the second lamp in the semaphore between the two sections is lighted in addition to the first lamp. Since lamps cannot be seen very well in the day time, I will generally use two semaphores each provided with one lamp as shown in Figs. 3 and 4. The semaphore D is set in motion and lamp E lighted when the circuit is closed through the wires A A; and the semaphore I is set in motion and lamp F lighted when the circuit is closed through wires F<sup>2</sup> F<sup>2</sup>.

It is evident that these several parts may be varied in form, construction and arrangement without departing from the spirit of my invention, and I therefore do not wish to be limited to the exact construction shown.

The use and operation of my invention are as follows: It will be understood that this semaphore can be used in any system of electrical signaling. I have shown and described the semaphore with circuits suitable to be used in connection with a system of signals such as I have described in my application filed February 10, 1894, Serial No. 499,733, wherein, when a train enters a section it sets a rear and forward signal; and when two trains are in adjoining sections the signal between the two sections is acted upon by both trains by two circuits. In the accompanying drawings the circuit completed by the forward train is represented by the wires A A, and the circuit completed by the rear train by wires F<sup>2</sup> F<sup>2</sup> when the trains are in this condition.

Referring to Figs. 1 and 2, the operation is as follows: When the semaphore is to show as a rear or forward signal for one train, the circuit is completed through the wires A A, mercury tube B, and magnet C. As magnet C is energized it attracts its armature B<sup>3</sup>, and since the tube B is attached to said armature said tube is rocked and the mercury displaced so that the circuit is broken. The movement of the armature B<sup>3</sup> is communicated to the semaphore D by means of the arm B<sup>5</sup> and link B<sup>6</sup>. When the circuit is broken in the tube B the semaphore brings the tube back to its normal position and the circuit is again completed, magnet C energized, and this operation repeated. It will thus be seen that the semaphore D and the lamp E, which is lighted when the circuit through the wires A



A is completed, are moved back and forward while the signal is acting. If now this is the rear signal of a train, and a second train following the first, enters the section to the rear, the circuit through the wires  $F^2 F^2$  and lamp F is completed, and two vibrating lights are shown which indicate to the rear train that there is a train in the section ahead. As shown in Figs. 3 and 4 two semaphores D and I are used, each provided with a lamp. The semaphore D and lamp E are worked by the circuit A A', and the semaphore I and lamp F by circuit  $F^2 F^2$ . In this case the semaphore D and lamp E are operated when a forward or rearward signal is displayed, and both the semaphores D and I and lamps E and F are operated when the signal is between two adjoining sections in each of which there is a train. In this construction I use a semaphore for each light displayed as it is difficult to see lights in the day time, but an easy matter to see a vibrating semaphore.

I have said nothing about the color of the lights displayed, as that is a matter left to the discretion of the company using the signals. The globes of the lamps may be of any desirable color, or colored glasses may be put in the ends of the hoods E' F', or glasses of different colors may be put in the opposite ends of the said hoods. In the latter case it might be found necessary in some instances to divide the hoods by an opaque partition and use two lamps in multiple, instead of one to avoid confusing the colors.

It will be seen that I have here a vibrating semaphore, with lights attached which are only lighted when the semaphores are in motion, and hence the color of the lights is not material, and people who are color blind can interpret the signals as well as persons who can distinguish colors.

One of the chief dangers in displaying stationary lights as signals is the fact that white or open track signals are often confused with

other stationary lights, and even with the headlight of an approaching train, and hence the results obtained by such signals are not satisfactory.

It will be seen that with my device all such danger is obviated, and that there can be no confusion of stationary lights and the displayed signals.

I claim—

1. The combination of an electro-magnet, an armature for the same to which is attached a tube containing mercury and having the air exhausted therefrom, contacts sealed into the ends of said tube, a semaphore and connections between the semaphore and the said armature, whereby the semaphore is vibrated while it is acting as a signal.

2. The combination in a visual signal for a system of railway signals, of two semaphores each carrying a light, an electric device associated with each semaphore and light by which such semaphore and light are vibrated when acting as a signal, said electrical device comprising an electro magnet, an armature for the same to which is attached a tube containing mercury and having contacts sealed into the ends thereof whereby, when the track is clear only one semaphore and lamp are set in motion, and when the track is obstructed both are vibrated substantially as described.

3. The combination of an electro-magnet, an armature for the same to which is attached a tube containing mercury and having the air exhausted therefrom, contacts sealed into the ends of said tube, a semaphore and connections between the semaphore and the said armature, whereby the semaphore is vibrated while it is acting as a signal, and a light or lights attached to said semaphore so as to vibrate therewith.

DAVID H. WILSON.

In presence of—

DONALD M. CARTER,  
WALTER J. GUNTHERP.