(No Model.) 2 Sheets—Sheet 1.

J. C. WHITE.

ELECTRICAL RAILWAY SIGNAL.

No. 405,815. Patented June 25, 1889.

Fig. 4.

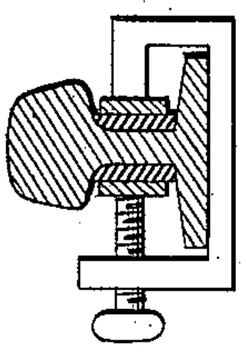


Fig. 3.

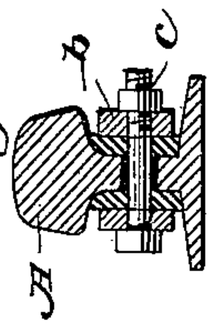
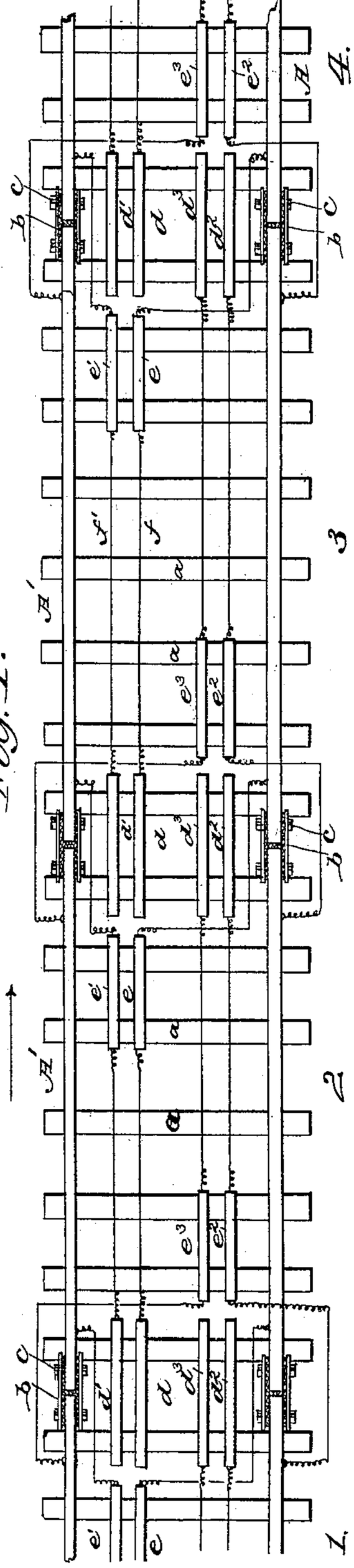


Fig. 2.

Fig. 1.



WITNESSES:

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C. Sedgwick

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BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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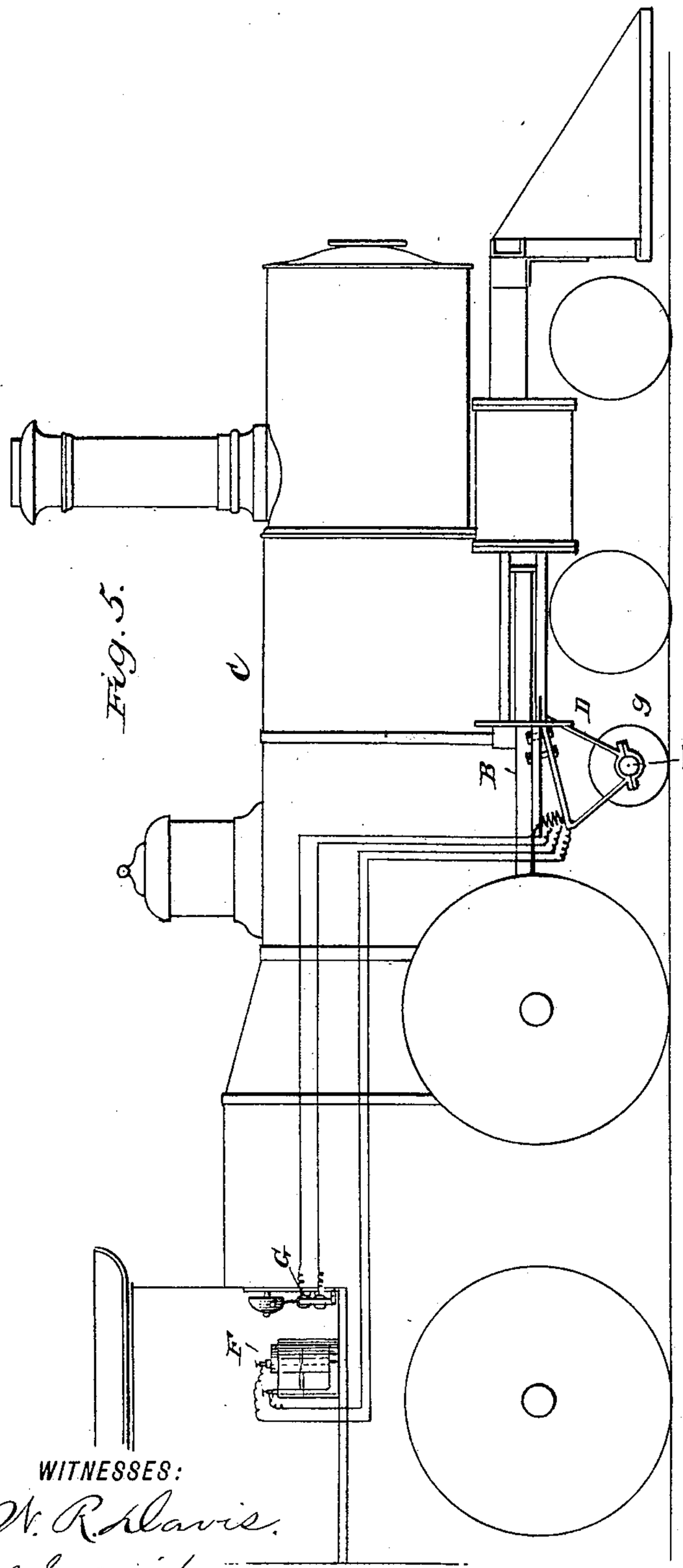

Fig. 5.

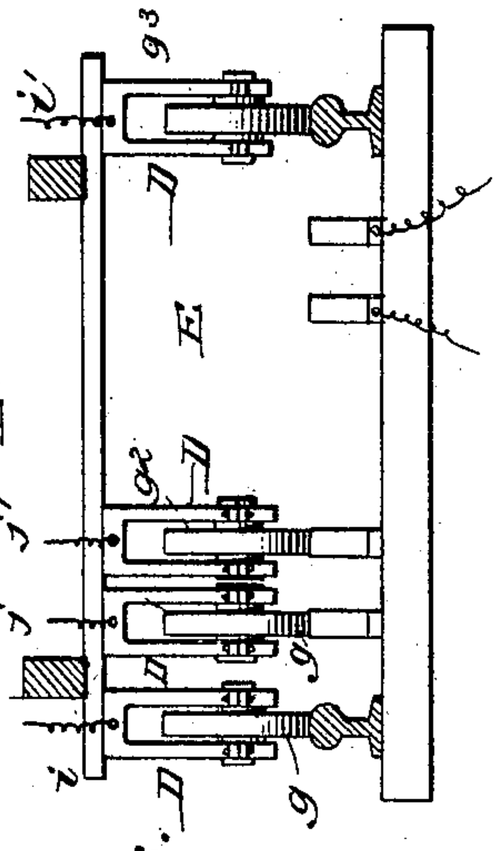

Fig. 6.

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UNITED STATES PATENT OFFICE.

JAMES COLLORD WHITE, OF SEWICKLEY, PENNSYLVANIA.

ELECTRICAL RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 405,815, dated June 25, 1889.

Application filed January 10, 1889. Serial No. 295,914. (No model.)

To all whom it may concern:

Be it known that I, JAMES COLLORD WHITE, of Sewickley, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Electrical Railway-Signal, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a plan view of the track-rails, contact-rails, and the electrical connections of my improved system. Fig. 2 is a side view of one of the contact-rails. Fig. 3 is a transverse section of one of the track-rails fastened with bolts. Fig. 4 is a transverse section of one of the track-rails fastened with clamps. Fig. 5 is a diagrammatic representation of a locomotive, showing the application of my improved signaling apparatus. Fig. 6 is a transverse section of the same, and Fig. 7 is a transverse section of one of the contact-wheels.

Similar letters of reference indicate corresponding parts in all the views.

The object of my invention is to provide a simple and efficient system of block-signaling for railroads, by means of which the engineer of a locomotive may always be informed as to whether the track is clear.

The invention consists in the peculiar construction and arrangement of parts, as hereinafter fully described, and pointed out in the claims.

The track-rails A A′ are of the usual description and are supported by ties *a*. The ends of the rails A A′ are connected by fish-plates *b* and bolts *c;* but the said fish-plates and bolts are separated from the rails by insulating material to prevent the electric current from running from one rail to another. I do not confine myself to this construction, as the rails may be secured to separate supports and insulation may be effected by an air-space between the ends of the rails or secured to the same support with no metallic communication between the rails.

In the present case I have combined with the railway-track two sets of contact-rails and electrical connections to adapt the road to trains running in the same or opposite directions. For trains going in the direction indicated by the arrow I have provided the contact-rails *d d′ e e′*, and for trains going in the opposite direction I have provided the contact-rails d^2 d^3 e^2 e^3. In the present case each rail represents a block; but in actual practice the block is represented by a number of rails, and may be from one to two or more miles in length. The contact-rails *d d′* d^2 d^3 are arranged opposite the joints of the rails, and the contact-rails *e e′* of the adjoining sections are arranged near the rails *d d′*. The contact-rails e^2 e^3 of the adjoining sections are arranged near the rails d^2 d^3.

To facilitate the understanding of my improved system, I have numbered the sections 1 2 3 4. In describing the electrical connections of the rails I will begin with section 3, in which the contact-rail *d* is connected electrically with the contact-rail *e* by the wire *f*, and in like manner the contact-rail *d′* is connected by the wire *f′* with the contact-rail *e′*. The contact-rail *e′* is connected with the track-rail A′ of section 4, and the contact-rail *e* is connected with the track-rail A of section 4. The connections thus far described represent all the connections required for one section for trains running in one direction. The wires *f f′* will preferably be arranged on telegraph-poles.

For trains running in the opposite direction the contact-rails e^2 e^3 of section 3 are connected with the track-rails A A′ of section 2. They are also connected electrically with the rails d^2 d^3, which are located at the junction of sections 3 and 4. The construction of the contact-rails is clearly shown in Fig. 2. These rails are adapted to be mounted upon the ties *a* in the usual way, and may consist of two or more rails.

From the main frame B of the locomotive C are suspended four hangers D, in which are journaled the contact-wheels *g g′* g^2 g^3, the wheels *g* g^3 being arranged to roll upon the main track-rails A A′, and the wheels *g′* g^2 being arranged to roll upon the rails *e e′ d d′* when the train is running in the direction of the arrow, and upon the rails d^2 d^3 e^2 e^3 when the train is going in the opposite direction. The hangers D of the wheels *g g′* g^2 g^3 are pivotally connected with the locomotive-frame, and the said hangers are electrically insulated from each other. An electrical connection with each wheel is effected by a wire attached to the hangers and running to the cab of the locomotive, the wheels *g* g^3 being connected by

wires *i i'* with the poles of the battery F, and the wheels *g' g²* being connected by wires *j j'* with the electric bell G in the cab of the locomotive.

When the locomotive moves forward in the direction indicated by the arrow, if there is no locomotive on the next section provided with a battery no signal is given in the cab when the wheels pass over the contact-rails, and the locomotive may proceed; but if there is upon the section occupied by the locomotive another locomotive provided with a battery, when the wheels *g' g²* of the locomotive C touch the contact-rails *d d'* the circuit will be closed upon the bell and the bell will ring, indicating that there is an engine in the adjoining section. Should that engine be approaching, it will also be signaled when it passes its contact-rails. After passing the rails *d d'* the locomotive may proceed slowly to the rails *e e'*, when, if the next section in advance is occupied by a locomotive, (either running or still,) the alarm will again be sounded, when the engineer will stop his locomotive and investigate the cause of the trouble or proceed with caution. This operation will be repeated for every section, and where the track is provided with a double set of contact-rails and connections, it will work in the same manner for trains running in opposite directions.

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

1. In an electric railway-signal, the combination, with a railroad-track divided into sections insulated from each other, of four contact-rails arranged in pairs in each section and connected together and to the track-rails of the next section, one pair of the contact-rails being opposite the joints of the sections, hangers suspended from the locomotive, contact-wheels journaled in the hangers, a bell and battery on the locomotive, and wires extending from the said hangers to the bell and battery, substantially as herein shown and described.

2. In an electric railway-signal, the combination of the track-rails A A', contact-rails *d d' e e'*, the hangers D, contact-wheels *g g' g² g³*, battery F, electric bell G, and the electric connections, substantially as specified.

JAMES COLLORD WHITE.

Witnesses:
J. W. S. WHITE,
JOHN N. WHITE.