



(No Model.)

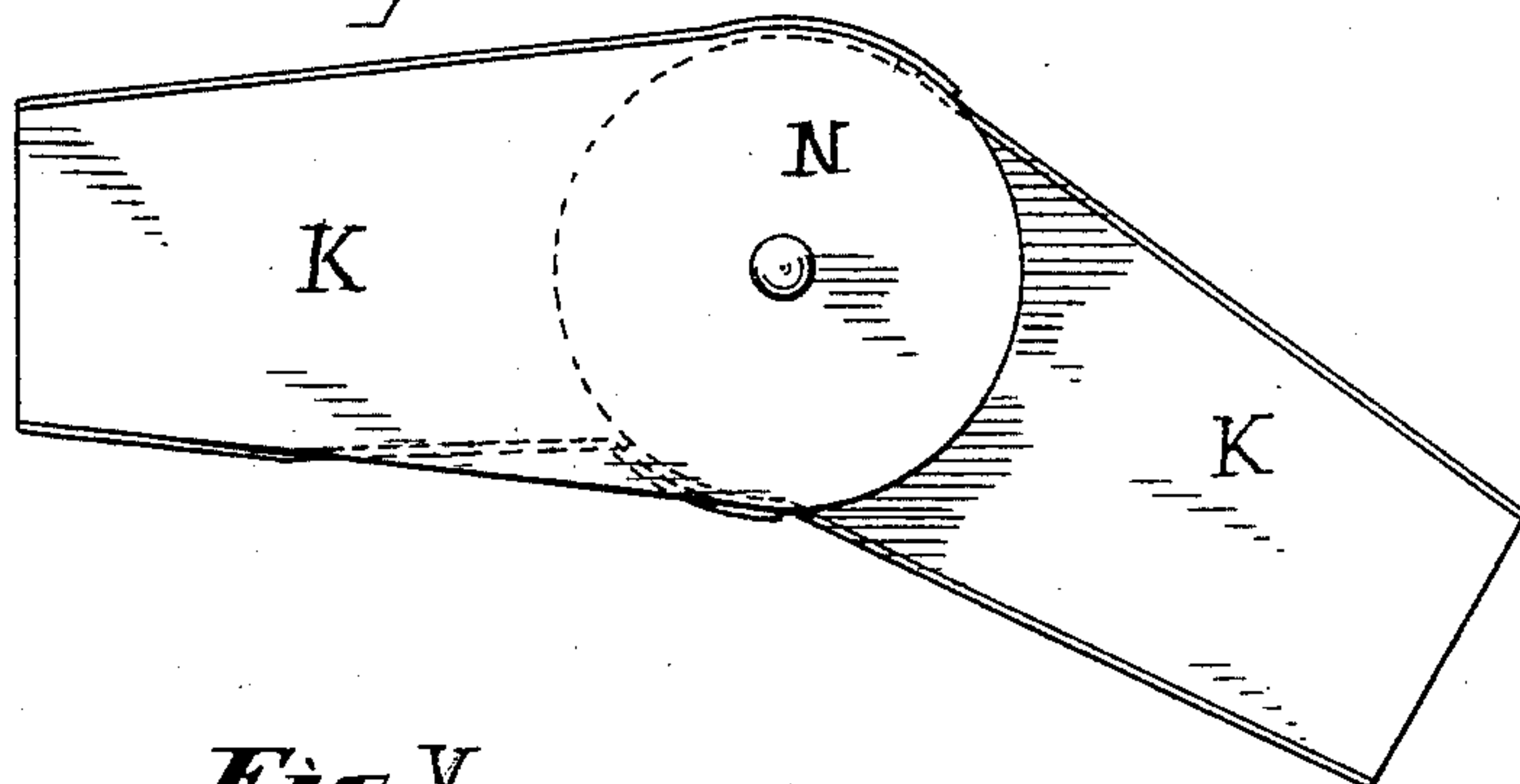
3 Sheets—Sheet 2.

H. T. CLAY.  
ELECTRIC RAILWAY.

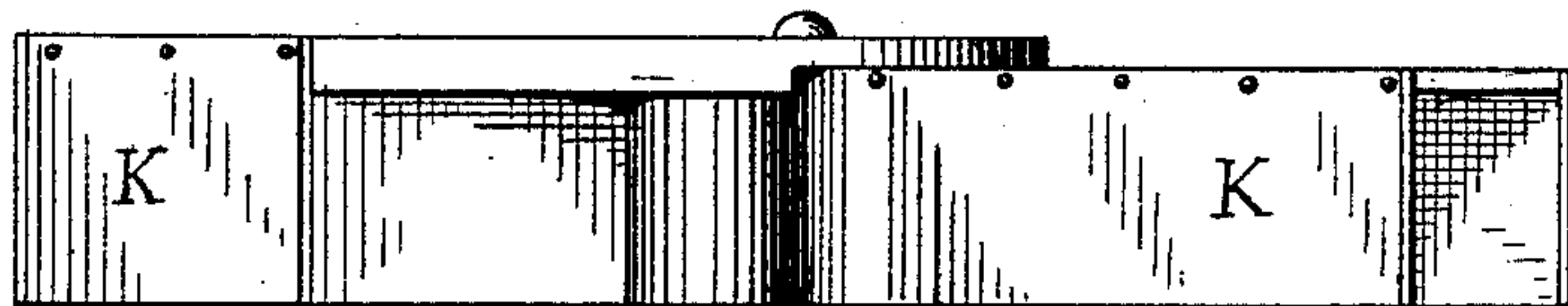
No. 327,381.

Patented Sept. 29, 1885.

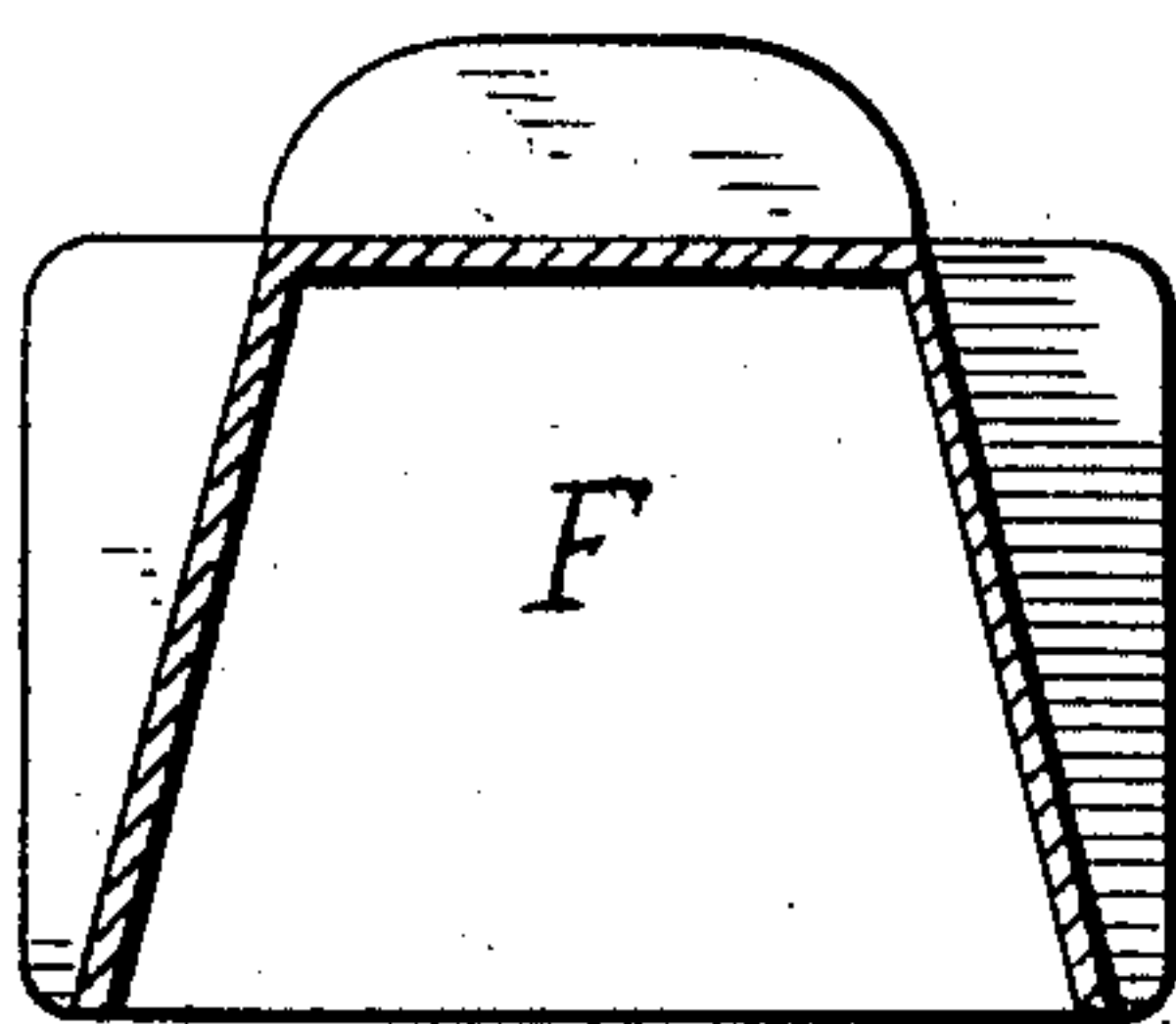
*Fig. IV*



*Fig. V*



*Fig. VI*



WITNESSES:

*Avery D. Harrington*  
*James Brown*

INVENTOR

*H. T. Clay*  
*by his atty H. H. H. H.*

(No Model.)

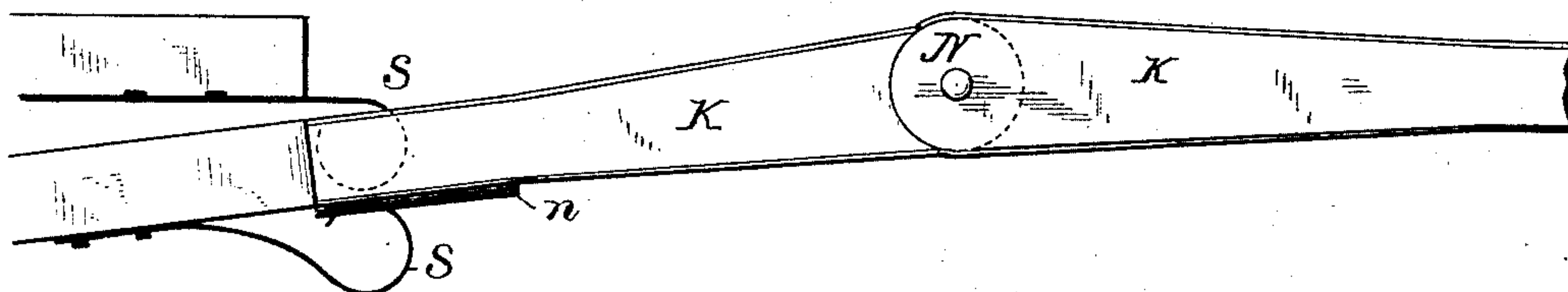
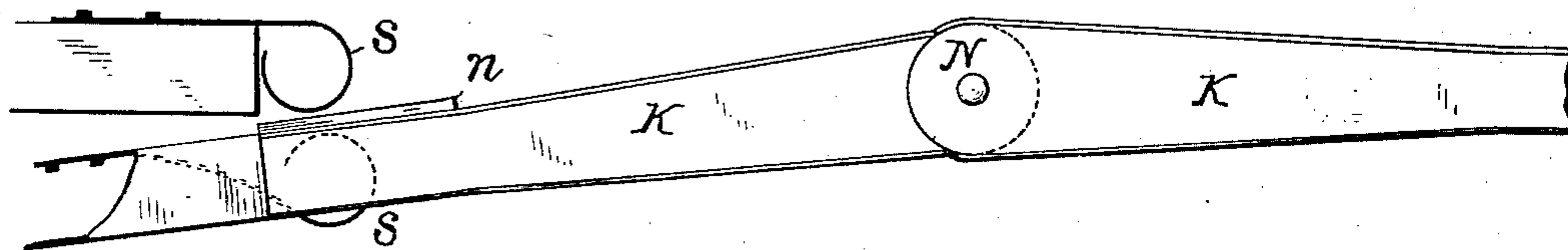
3 Sheets—Sheet 3.

H. T. CLAY.  
ELECTRIC RAILWAY.

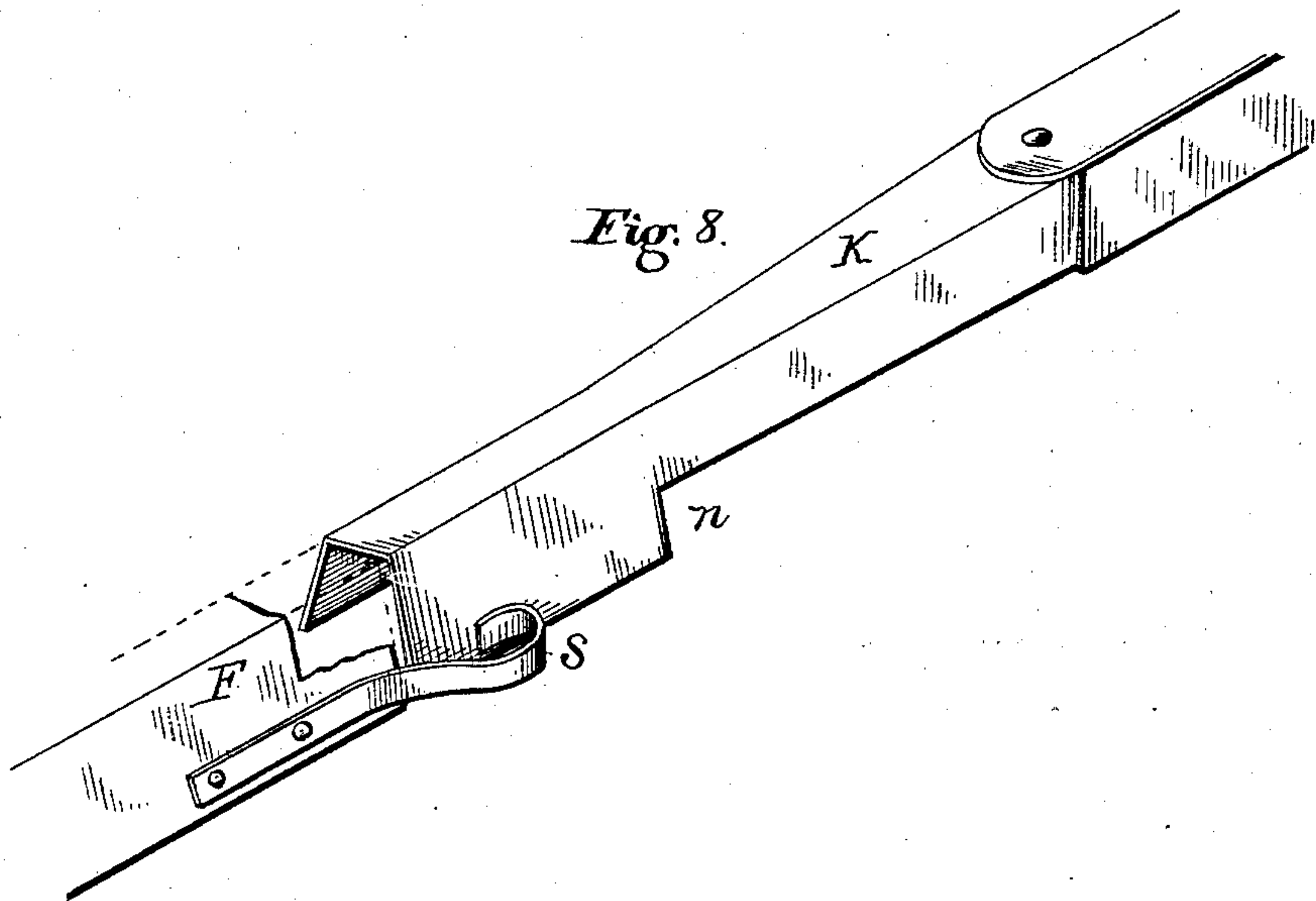
No. 327,381.

Patented Sept. 29, 1885.

*Fig. 7.*



*Fig. 8.*



WITNESSES:

Henry A. McMurrow  
Edward Hopkinson

INVENTOR

Henry T. Clay  
by his atty H. D. Sealer



# UNITED STATES PATENT OFFICE.

HENRY T. CLAY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO SAMUEL G. DIEHL, OF SAME PLACE.

## ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 327,381, dated September 29, 1885.

Application filed February 7, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY T. CLAY, a citizen of the United States, residing in the city of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Electric Railways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention consists of an improved rigid metallic conductor leading the electric current from the dynamo to the motor in the car; in a switch forming part of said rigid metallic conductor, and in the contact spring-brush traveling in said rigid metallic conductor.

In the accompanying drawings, Figure I is a vertical cross-section through the body of the car, rails, and metallic conductor. Fig. II is a vertical section of the rigid metallic conductor and spring contact-brushes; Fig. III, a similar view of the brush-arm, showing how it is connected with the motor, and insulated therefrom. Figs. IV and V are top and side views, respectively, of the switch in the metallic conductor, and Fig. VI a vertical section of the coupling between the joints in the metallic conductor. Figs. VII and VIII are top and side views, respectively, of the switch and conductor, showing the movable connections between them to bring them in and out of circuit.

It is unnecessary to describe in this specification the construction and operation of the car, its motor, and the apparatus connected therewith, all these parts being old and well known.

Between rails C C, held on sleepers D D in the usual manner, are placed supporting-blocks E E, against which are secured, respectively, two rigid metallic conductors, F F, constructed of the form shown in Fig. VI—that is to say, open at the bottom and with a flat upper surface on the interior. These conductors are electrically connected with the dynamo which provides the current, and by means of these conductors the current is passed to a contact-brush caused to travel therein by means of mechanism connecting with the car. These brushes are constructed, as shown in

Fig. II, of two flat springs curved substantially as shown therein, for the purpose hereinafter described.

The springs G' G<sup>2</sup> are secured to the arm G, and are flat metal springs acting as contact-brushes. They are so arranged that in normal position neither G' or G<sup>2</sup> are in contact with the rigid metallic conductor, and to start the car an ordinary pressure on the lever L brings the springs G<sup>2</sup> in contact with the interior upper flat surface of the conductor F, thereby leading the electric current to the motor through the wires M M. An increased pressure on the lever L, for the purpose of obtaining increased current and speeding the car, will bring also the springs G' into contact with said conductor. The said arm G is secured to the lever-arm P by means of a bolt, H', and is insulated by means of rubber H, placed between said arms and said bolt. (See Fig. III.)

The rigid metallic conductor F is composed of sections flanged at each end, (see Fig. VI,) and so secured together as a whole. At suitable or desirable places in said rigid metallic conductors, corresponding with switches in the road-bed, are placed switches. (Shown in Figs. IV and V.) The switch consists of two connecting-pieces, K K, corresponding in shape with the conductor E, connected together by a knuckle-joint, N, and may be automatically turned by any suitable means or mechanism. When in position, the upper inner surface is in line with upper interior flat surface of the conductor, and presents a continuous surface for the contact-brush springs. When it is desired to shift the current to a new conductor, one of the sections K is moved to bring it in line therewith.

In Fig. VII is seen a pair of such conducting-switches in circuit with one pair of rigid metallic conductors, and out of circuit with another pair, and in Fig. VIII is seen the switch in detail in circuit with the conductor F. The switch-arm K is provided with a lip, n, against which an inwardly-bearing spring, S, attached to the conductor F, constantly presses to preserve a continuous electrical connection between the switch and conductor until a like spring on the rigid conductor to



which the switch is to be shifted shall form an electrical connection therewith by means of such spring pressing against the other and inner side of the said lip *n* of the switch, this construction being shown and its operation indicated in Fig. VII.

It is obvious that the spring *S* may be secured to the lip *n* of the switch-arm *K*, instead of to the conductor, as shown.

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

1. In a railway for the propulsion of a car provided with an electric motor, a rigid metallic conductor, *F*, constructed, as described, with a flat upper internal surface, and supported between the rails, in combination with one or more adjustable contact spring-brushes, *G' G<sup>2</sup>*, with means to support the same and bring one or more of them, while moving in said conductor, against the upper internal surface thereof, whereby the electric current is supplied or led from said conductor to said motor, substantially as set forth.

2. The combination, with the rigid metallic conductor of an electric railway, of an adjustable contact device consisting of the insulated arm *G* and flat metallic spring *G<sup>2</sup>*, with mechanism, substantially as described, to bring said spring-brush *G<sup>2</sup>* into electrical contact with the interior surface of said conductor from time to time, as may be desired, as and for the purpose set forth.

3. In an electric railway provided with a rigid metallic conductor, the switch herein described, consisting of arms *K K*, joint *N*, lip *n*, and spring *S*, constructed and operating substantially as set forth.

In testimony whereof I have hereunto affixed my signature this 17th day of January, A. D. 1885.

HENRY T. CLAY.

Witnesses:

FRANCIS S. BROWN,  
HENRY A. McMURROW.