

(No Model.)

C. J. VAN DEPOELE.
STANDING CONTACT ARM.

No. 405,750.

Patented June 25, 1889.

Fig. 3.

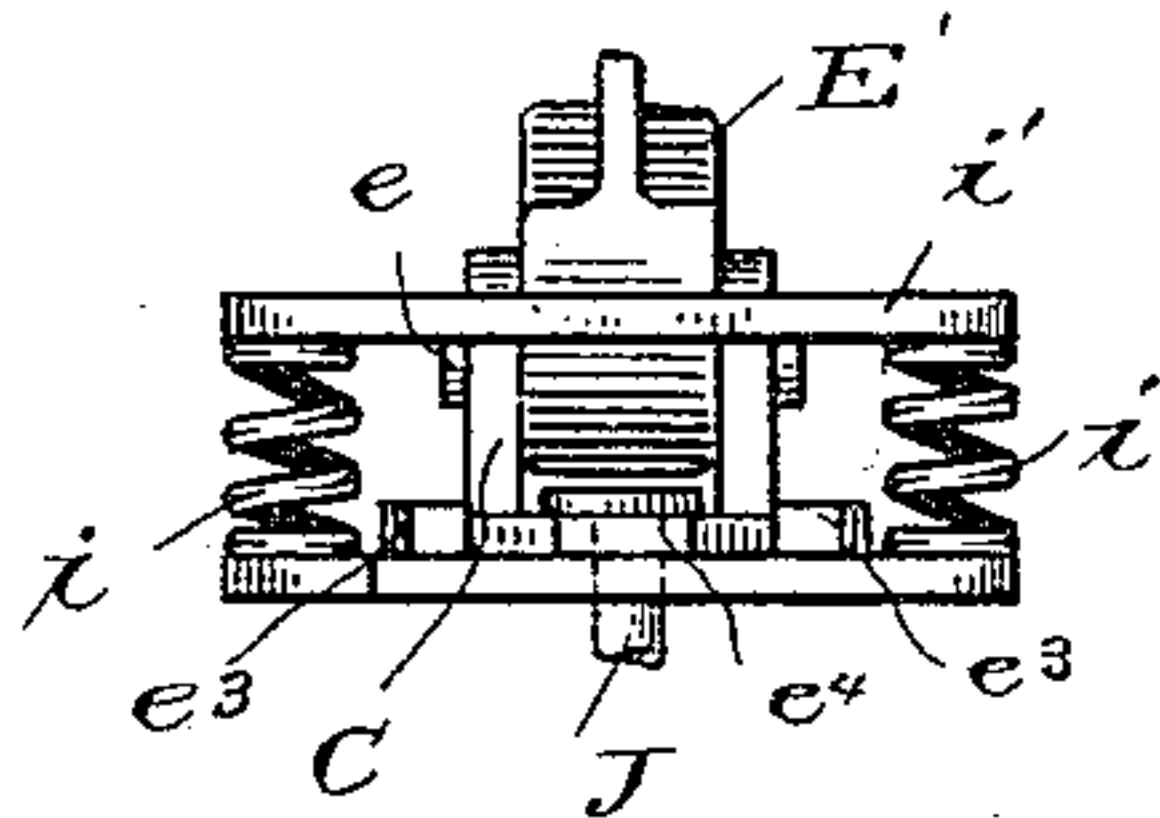


Fig. 6.

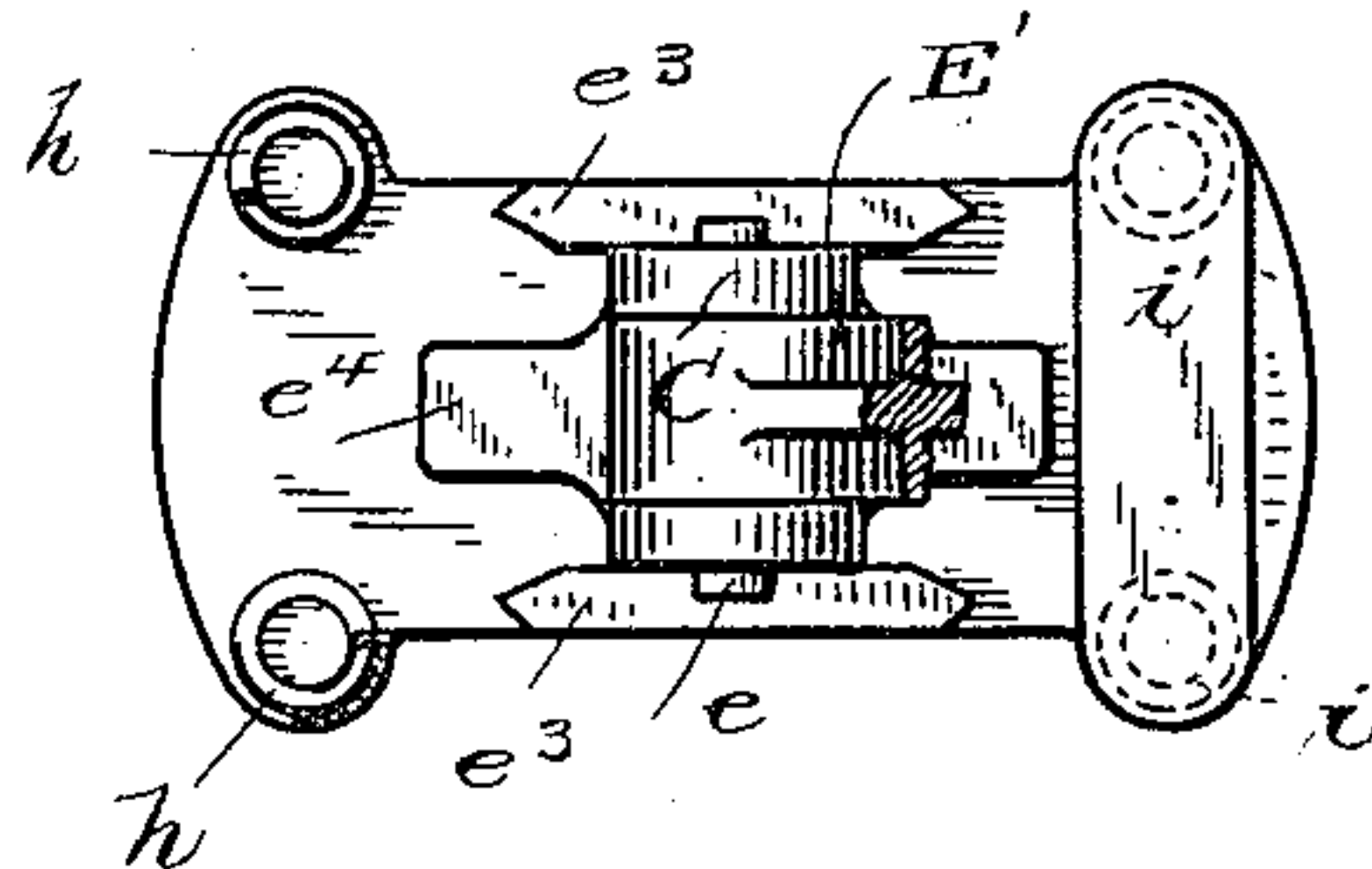


Fig. 7.

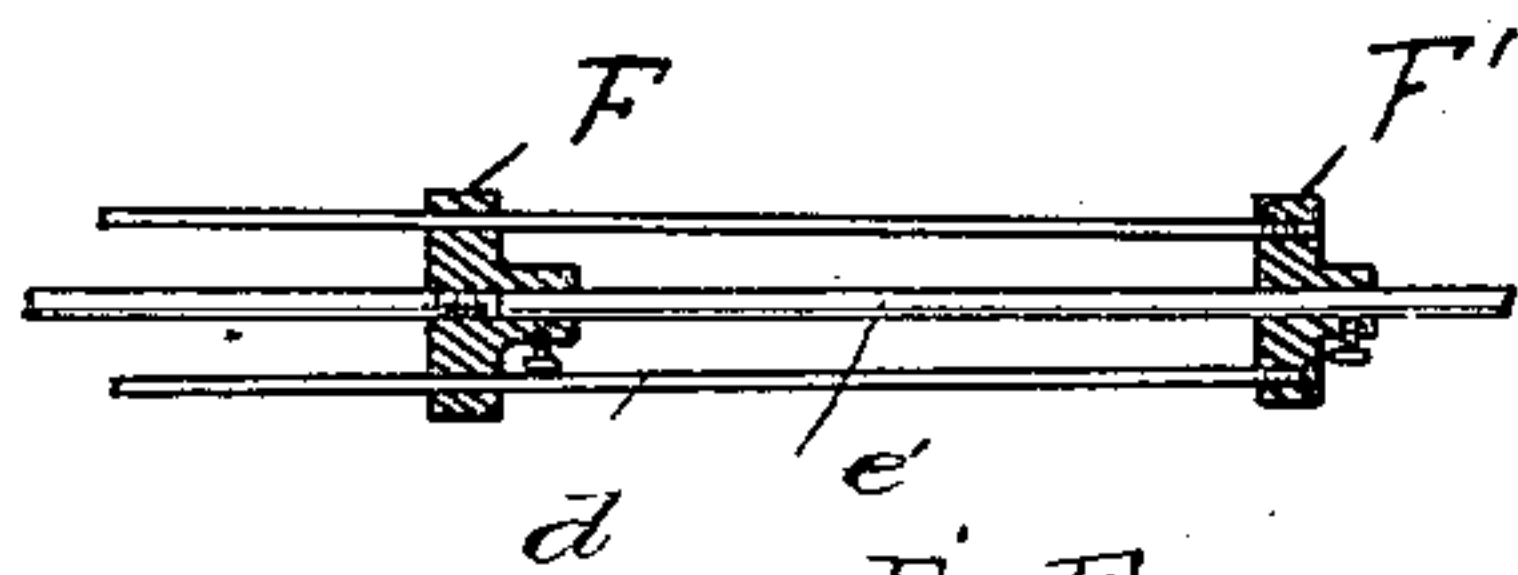


Fig. 4.

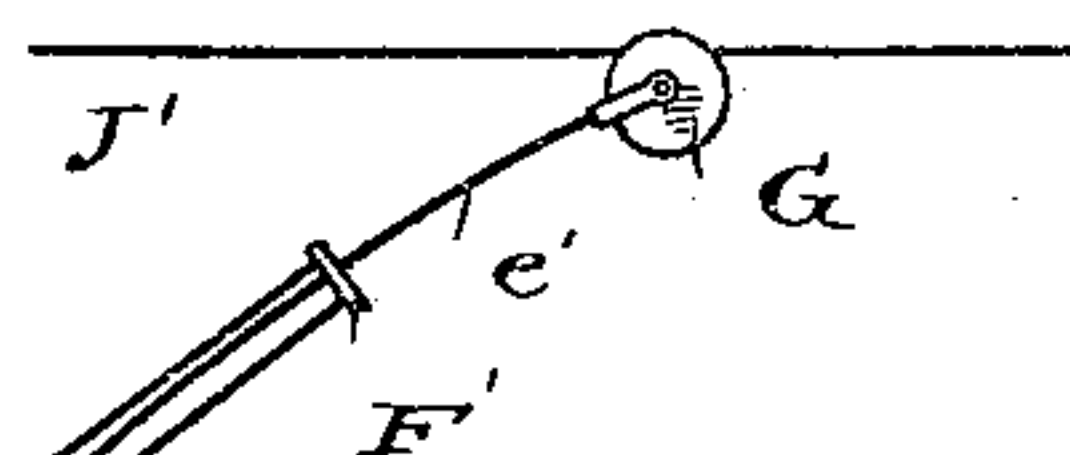
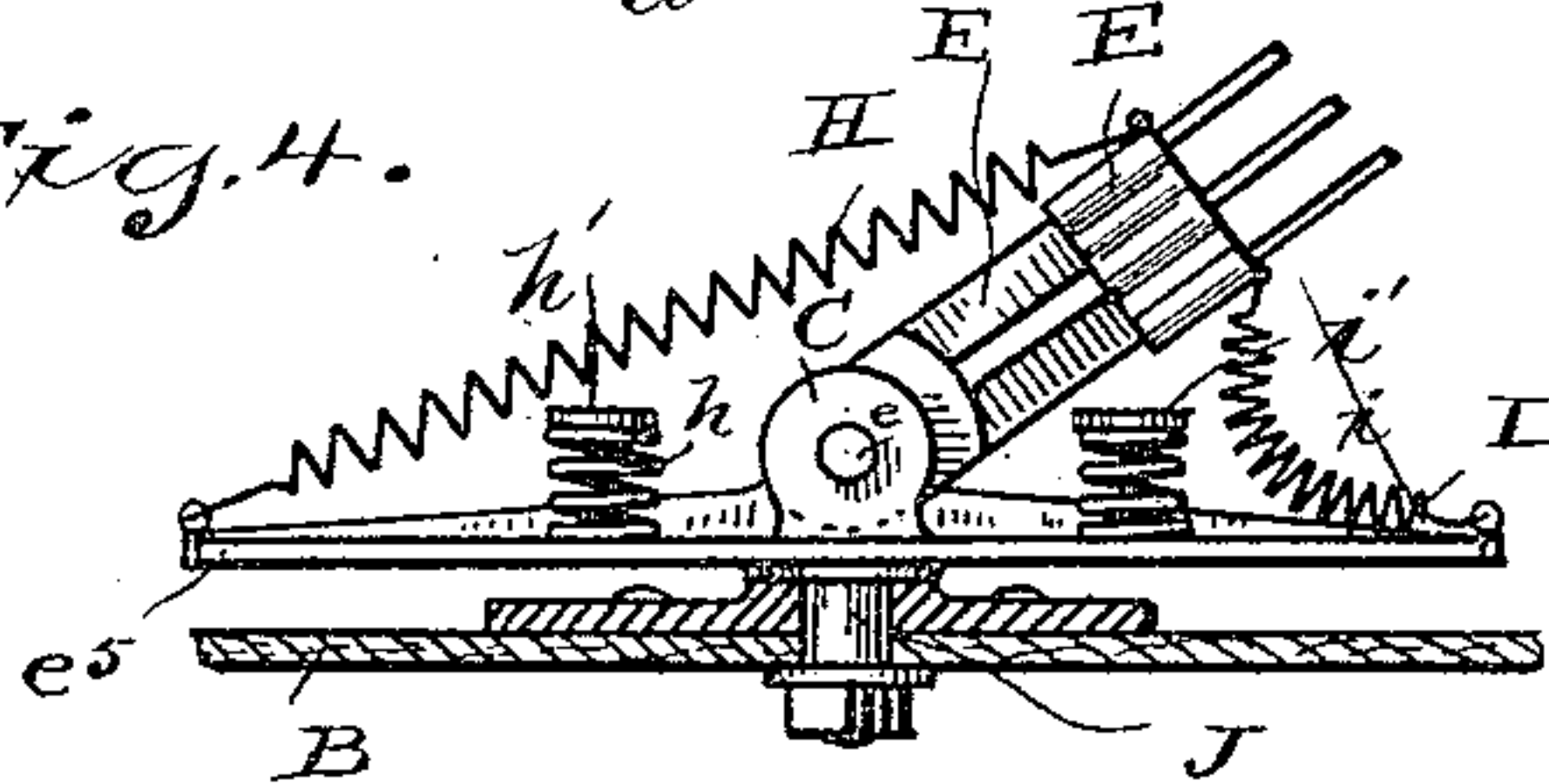


Fig. 5.

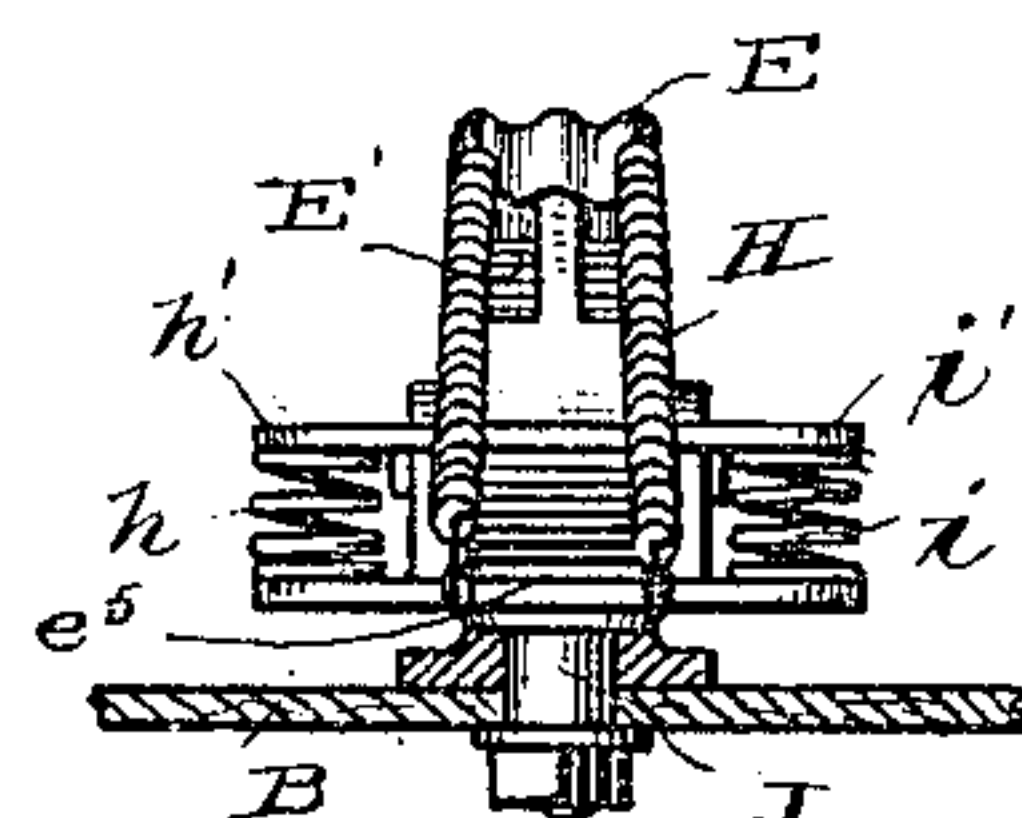


Fig. 1.

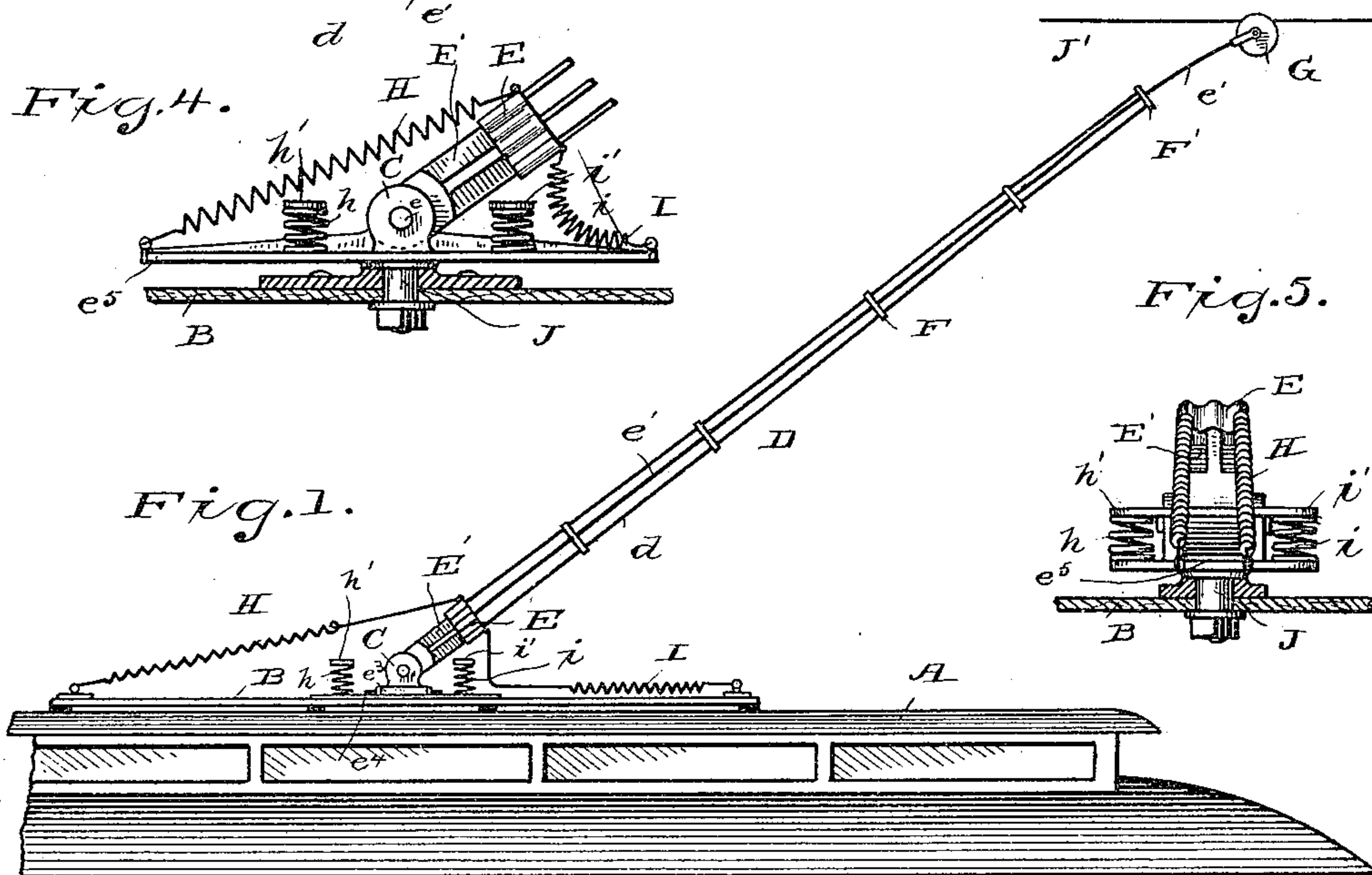
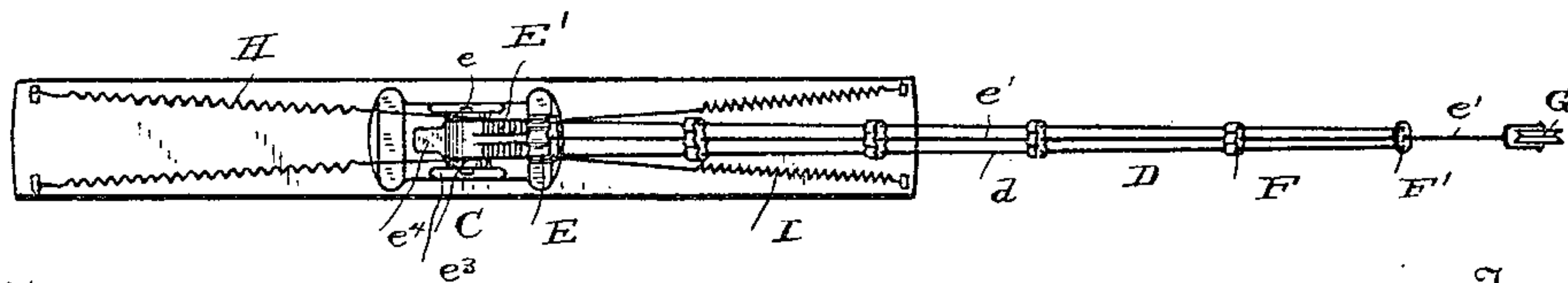


Fig. 2.



Witnesses

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STANDING CONTACT-ARM.

SPECIFICATION forming part of Letters Patent No. 405,750, dated June 25, 1889.

Application filed March 27, 1889. Serial No. 305,028. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. VAN DEPOELE, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Standing Contact-Arms, of which the following is a description, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon.

This application includes a portion of an application filed by me August 9, 1888, Serial No. 282,331.

My invention relates to electric railways; and it comprises a device for maintaining connection between an electrically-propelled car moving along the line of travel and an overhead supply-conductor.

The improvements are illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the upper portion of a car, the contact-arm, supply-conductor, and connected parts. Fig. 2 is a plan view of the contact-arm and those parts immediately connected therewith. Fig. 3 is a detail of the arm-supporting joint. Fig. 4 is an elevation, and Fig. 5 an end view, of a somewhat different arrangement. Fig. 6 is a plan view of the arm-supporting joint seen in Fig. 1. Fig. 7 is an enlarged detail showing removable end section.

As illustrated in the drawings, A is the top or upper portion of a car, upon which is mounted a board B or other suitable piece of insulating material, to which is attached at about its central portion a hinged and pivoted or universal joint C. The board B may be mounted upon any part of the top of the car, but is desirably and for convenience located at the center thereof to facilitate the operation of the car from either end, it being only essential, however, to place it in such position as will afford a sufficiently strong foundation for the contact-arm and springs.

D is the contact-carrying arm referred to as the "contact-arm," and said arm is composed of a number of light steel rods *d*. Said rods are securely attached at their lower ends to a metallic block E, the lower portion of which is formed into a shank E', and fitted

to engage a horizontal pivot *e* in the joint C. The rods *d*, of which the contact-arm is principally composed, are arranged around a central bar *e'*, and said rods are supported and held apart by light metallic plates F, through which said rods pass and to which they are rigidly secured in desired positions. In the case of the outer supporting-plate F', however, while the rods *d* are securely connected thereto, the central rod *e'* is free to move therein, as would be necessary to admit of its bending easily, and the said rod also projects a foot or so beyond the said outer plate F'. The outer end of the rod *e'* is bifurcated or fitted with a fork between the extremities of which is journaled a grooved contact-wheel G or other contact device. From the hinge at the base of the arm D to the cross-plate F the contact-arm is practically stiff and rigid, but from the cross-plate F' to the contact-roller G the central rod *e'* is free to bend, and being quite flexible will impart all necessary or desirable resiliency to the contact-arm, and so prevent the power by which the contact-arm is maintained in an approximately upright position from bringing the said contact-arm G into very sudden or violent contact with any depending parts of the supports of the conductor, and will also prevent displacement of the contact by sudden jars or shocks and the otherwise resultant sparking.

At the corners of the base B are secured tension-springs H and I. The springs H are of sufficient strength to hold the contact-arm in an approximately upright position and to continuously maintain the contact between the wheel G and the under side of a conductor J', suspended along the line of travel of the car, and said springs are attached to the lower part of the contact-arm at a suitable distance above its pivotal point.

The springs I are similar to those marked H, but arranged and connected upon the opposite end of the board and to the opposite side of the contact-arm. The contact-arm being thus pivotally mounted between two oppositely-acting sets of springs, if released would normally assume a vertical position. This, however, is not its operative position,

the suspended conductor J' being desirably suspended at a less height above the car than the length of the contact-arm.

When in operation, the contact arm is lowered to the rear of the car and allowed to rise, under the influence of springs H, until it engages the under side of the conductor. Both sets of tension-springs being alike, the arm will work precisely the same in either direction, and it will readily be understood that when depressed in either direction, the tension of the opposite set of springs being nil, they, as indicated in the drawings, will simply rest upon their support and exert no influence whatever. The central pivot J, supporting the hinge-block C, will permit the arm to move laterally to follow the course of the wire, should it be for any purpose or in any manner deflected from a position directly above the center of the track. Should it be found necessary to depress the contact-arm down to or near to the roof of the car, as when passing under bridges or obstructions, buffer-springs *h i*, united by cross-plate *h' i'*, are provided and located in such positions in front and rear of the joint C that the shank of the block E will, when the arm approaches a horizontal position, rest thereon and compress one set thereof, the result being that if the arm is depressed to a position as near the horizontal as to render the tension-springs H inoperative and powerless to raise it the resiliency of the buffer-springs *i i* (or *h h*) will, when its outer extremity is released, throw it up a sufficient distance to enable the springs H (or I) to again exert their influence. To reverse the position of the contact-arm, it is only necessary to free the contact from the conductor, when it will immediately assume a vertical position, from which it can be pulled down below and allowed to rise into engagement with the conductor from either front or rear of the car, as desired, being thus movable in an arc including either end of the car.

The central hinge C is a universal joint, the shank E' of the block E being hinged therein and the hinge-block C itself pivotally secured upon its support by pin J. The hinge-block C is provided with extensions *e⁴*, located between fixed side checks *e³*, which are cut away, substantially as shown, for the purpose of permitting a desired amount of lateral swing to the hinge-block and contact-arm, beyond which the extensions *e⁴* will engage the checks and prevent further movement.

When the springs H I are secured to the base B, it will of course be apparent that the side checks *e³* are necessary to prevent complete rotation of the arm D upon its pivot, since that would break its connections with the springs H and I, and in ordinary use complete rotary movement of the arm I is not required. Such movement might, however, be desirable in some cases, and is readily provided for by omitting the checks *e³* and securing the tension-springs H I to prolonga-

tions *e⁵* of the extensions *e⁴*. The buffer-springs *h i* are in this instance also secured upon the extensions *e⁵*, so that the entire mechanisms for controlling the upward movements of the arm D are supported upon the pivot J.

The end portion of the central rod *e* may be removable, as seen in Fig. 4. As there shown, an end section *e²* is removably secured in a socket formed in the second cross-plate F, and may be further secured by a set-screw in the end plate F'. With this construction longer or shorter end sections may be used and stiffer or more flexible pieces may be employed, as found desirable under the particular circumstances.

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

1. The combination of a suitable support located centrally upon the top of an electric-railway car, and a contact-carrying arm mounted at its lower extremity in a hinge in said support, said hinge having a limited rotary movement thereon, whereby said arm is rendered movable in an arc including either end of the car, substantially as described.
2. The combination of a suitable support mounted upon an electric-railway car, a contact-carrying arm mounted at its lower extremity in a hinge having a limited rotary movement upon its support, said arm being thereby rendered movable in an arc including either end of the car, and tension-springs engaging the lower part of the arm for imparting an upward tendency to its free end, substantially as described.
3. The combination, with an electric-railway car, of a contact-arm and support therefor, a universal joint mounted upon the support and connected with the lower end of the contact-arm, and lateral stops adapted to engage a projection upon the universal joint for limiting the lateral swinging movement of the contact-arm, substantially as described.
4. The combination, with an electric-railway car, of a contact-arm and hinged support therefor, and buffer-springs mounted upon the support near the hinge of the contact-arm for supporting and raising the same from an approximately horizontal position, substantially as described.
5. The combination, with an electric-railway car, of a contact-arm having a removable end section and a contact device carried thereby.
6. A contact-arm for electric-railway vehicles, having a removable flexible contact-carrying end section, substantially as described.
7. A contact-arm composed of a number of metallic rods rigidly connected to and united by suitable supporting or stay plates, one of said rods being movable in the outer end plate, and a contact device secured to said last-mentioned rod, substantially as described.

8. A contact-arm composed of rigid metallic rods, and a flexible central rod movable in the end thereof and carrying a contact device at its outer extremity.

- 5 9. The combination of a suitable support mounted upon an electric-railway car, a contact-arm mounted at its lower extremity in a hinge rotatably mounted upon said support, and tension-springs engaging the lower part

of the arm for imparting an upward tendency to its free end, substantially as described.

In testimony whereof I hereto affix my signature in presence of two witnesses.

CHARLES J. VAN DEPOELE.

Witnesses:

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C. L. STURTEVANT.