

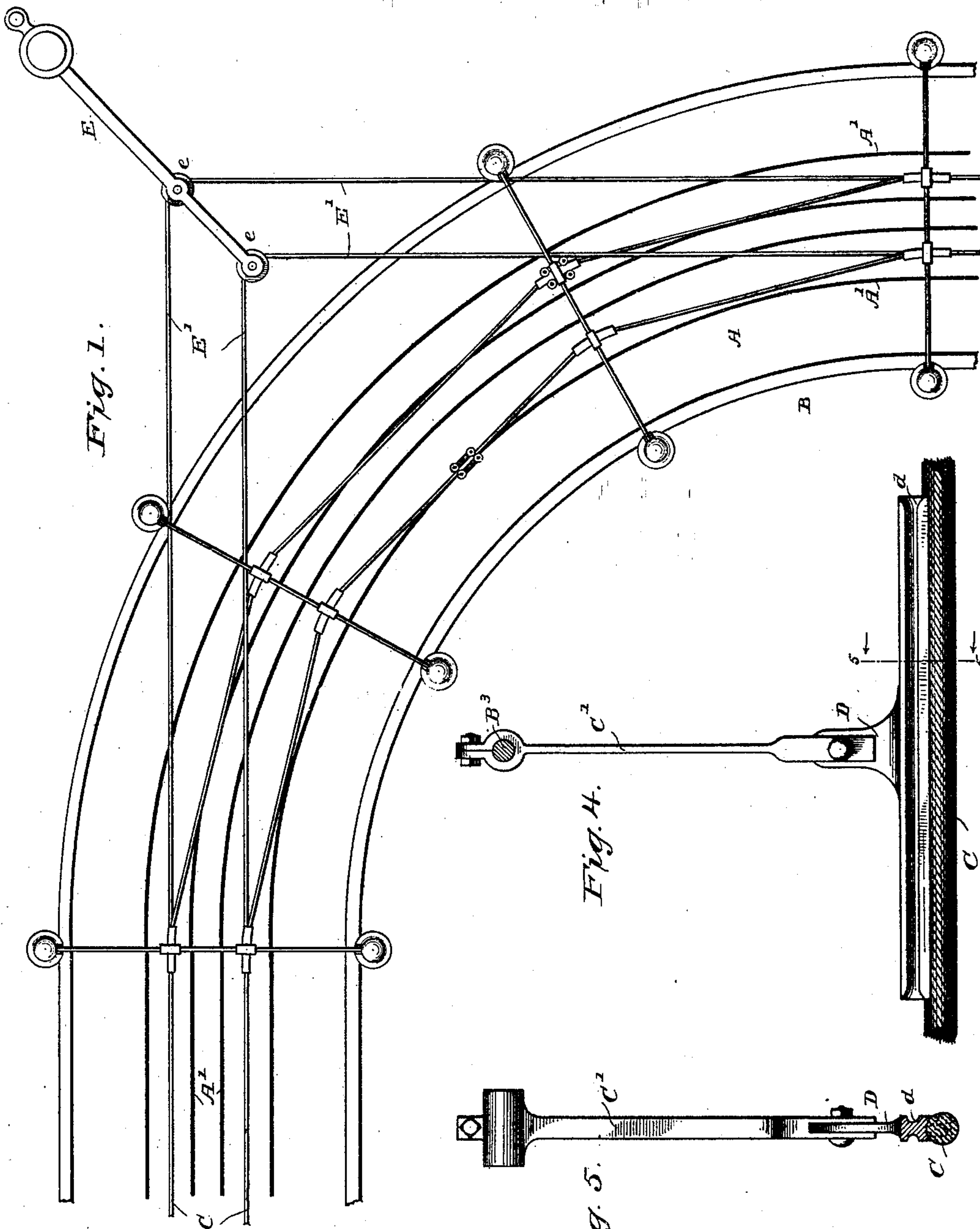
(No Model.)

4 Sheets—Sheet 1.

C. J. VAN DEPOELE.
OVERHEAD CONDUCTOR FOR ELECTRIC RAILWAYS.

No. 336,453.

Patented Feb. 16, 1886.



Witnesses
Geo. W. Young
H. A. Lamb.

Inventor
Charles J. VanDepoele.
By his Attorneys
Jammes & Skinkle.

(No Model.)

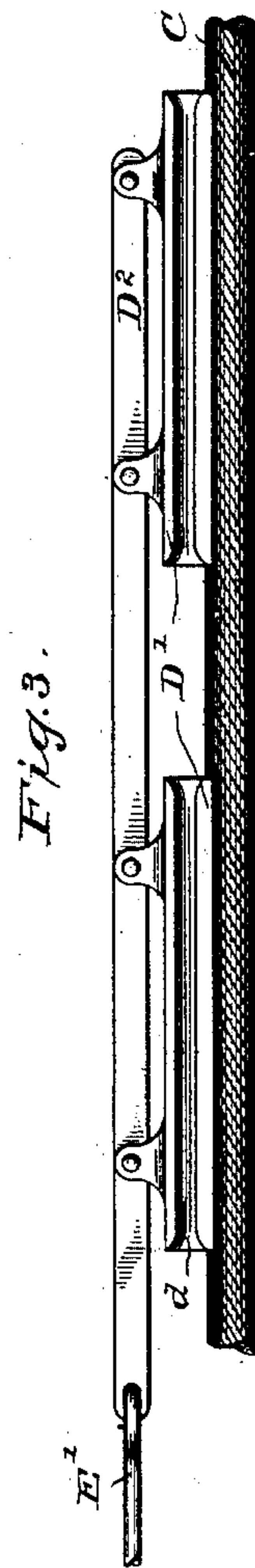
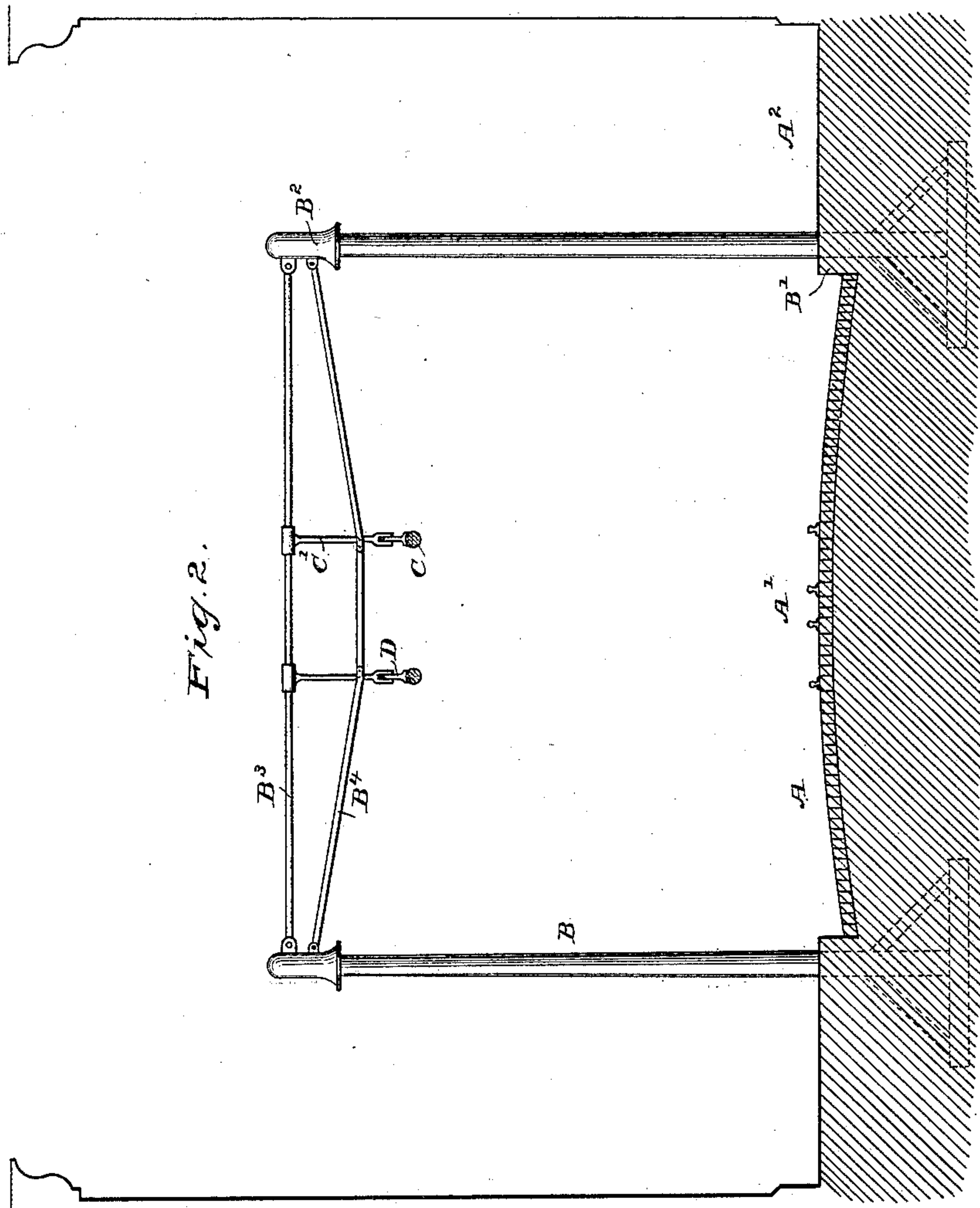
4 Sheets—Sheet 2.

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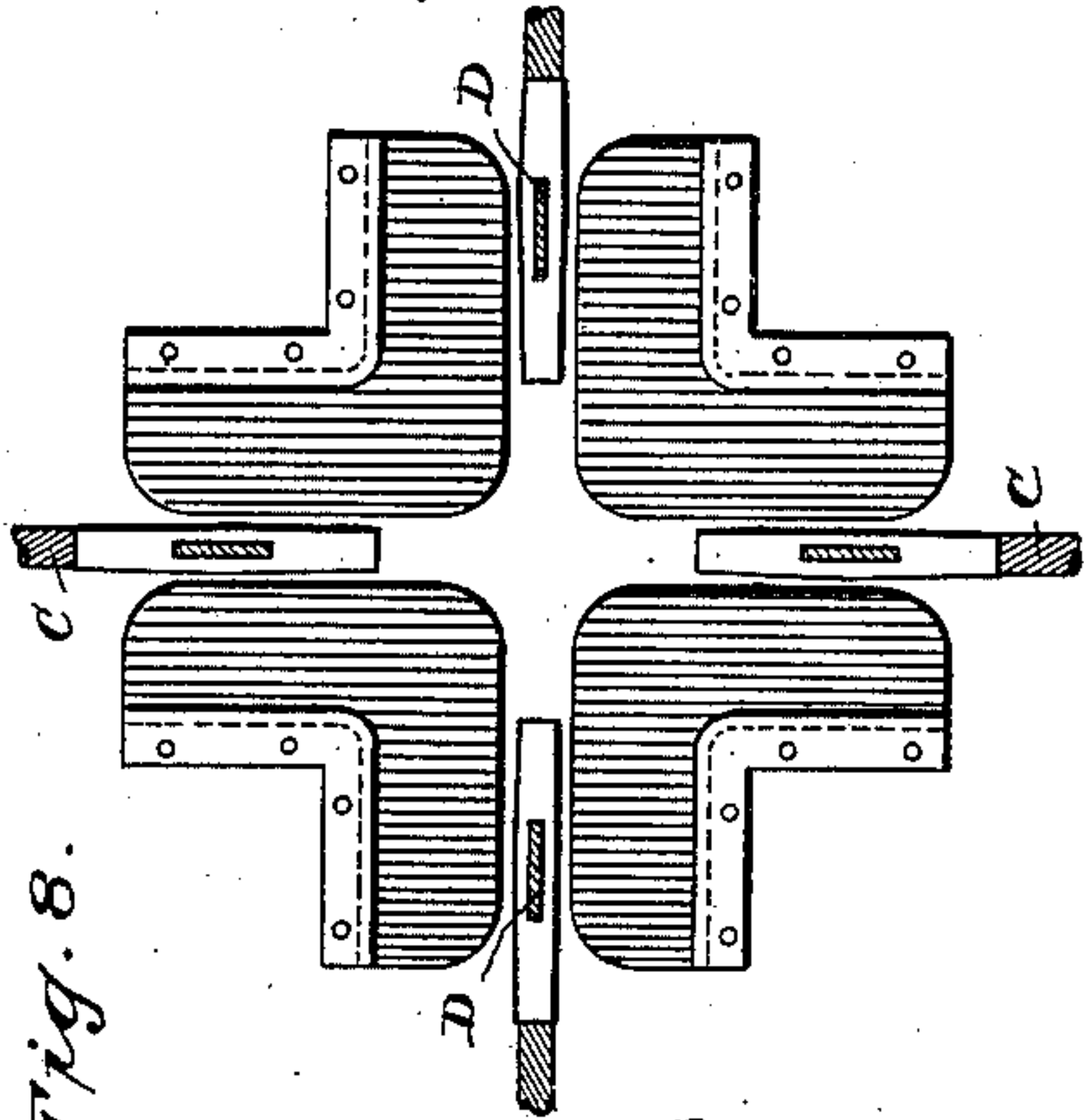


Fig. 9.

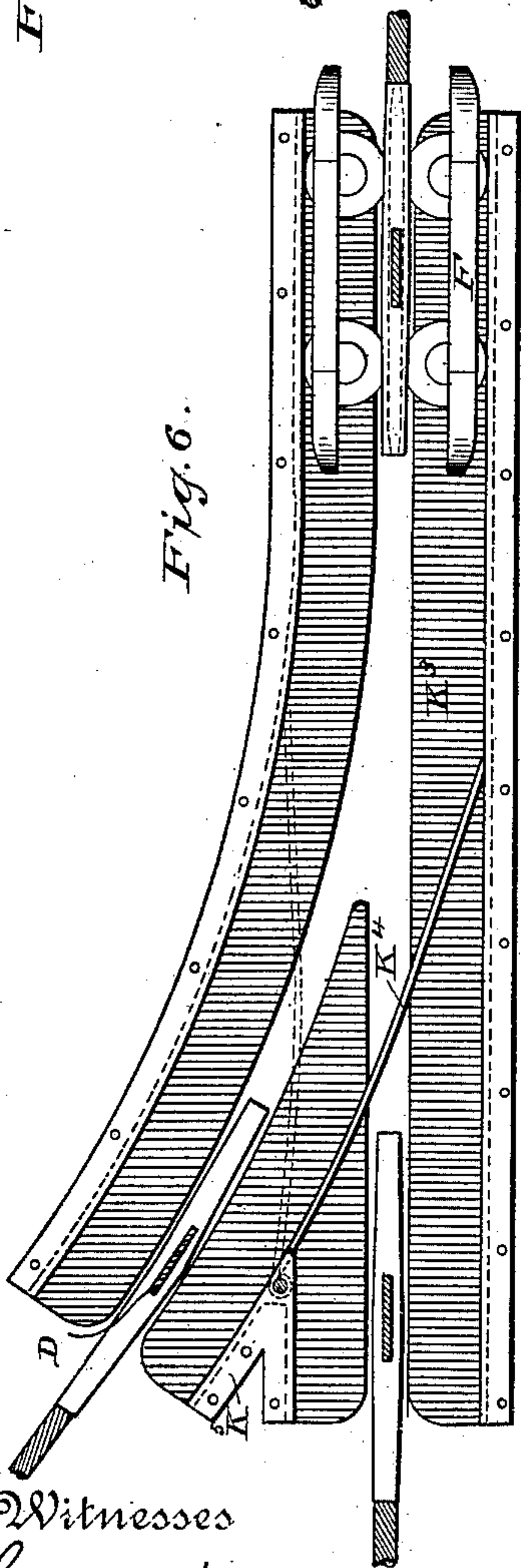
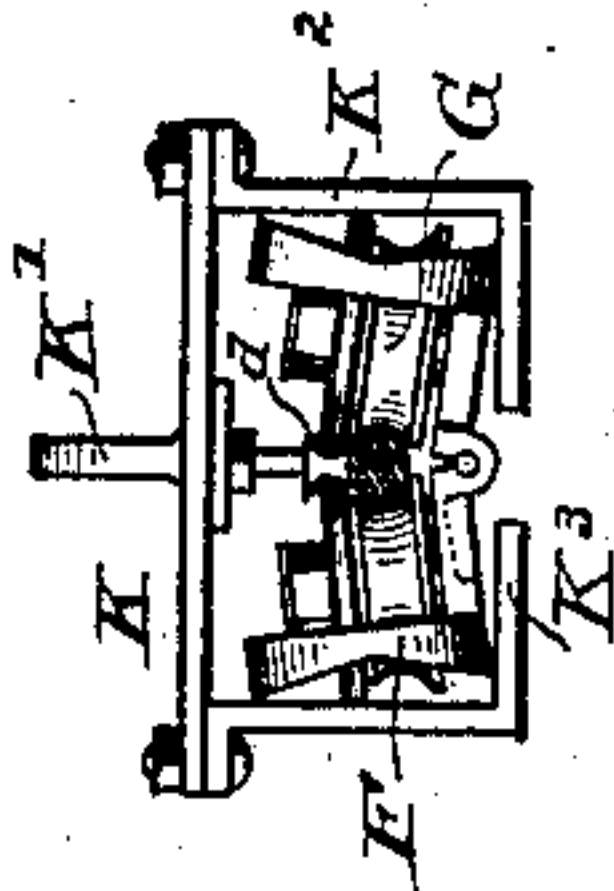


Fig. 7.

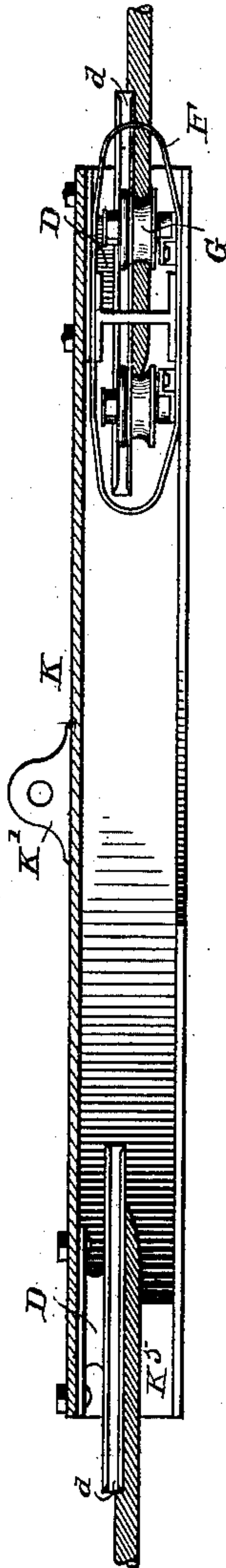
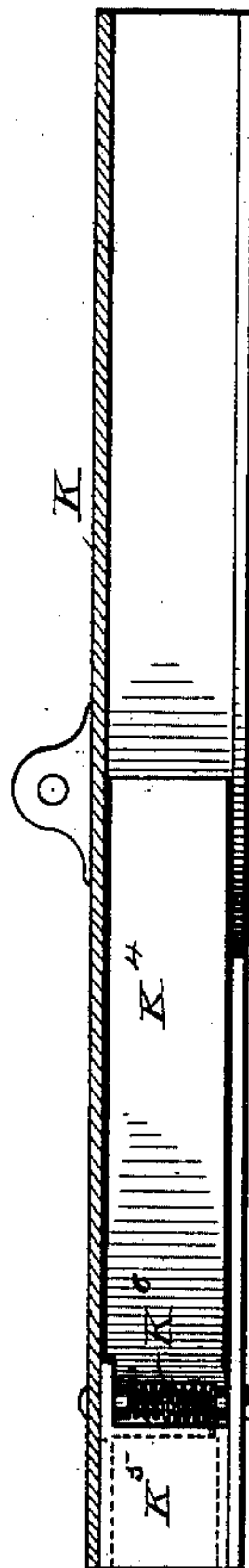


Fig. 10.



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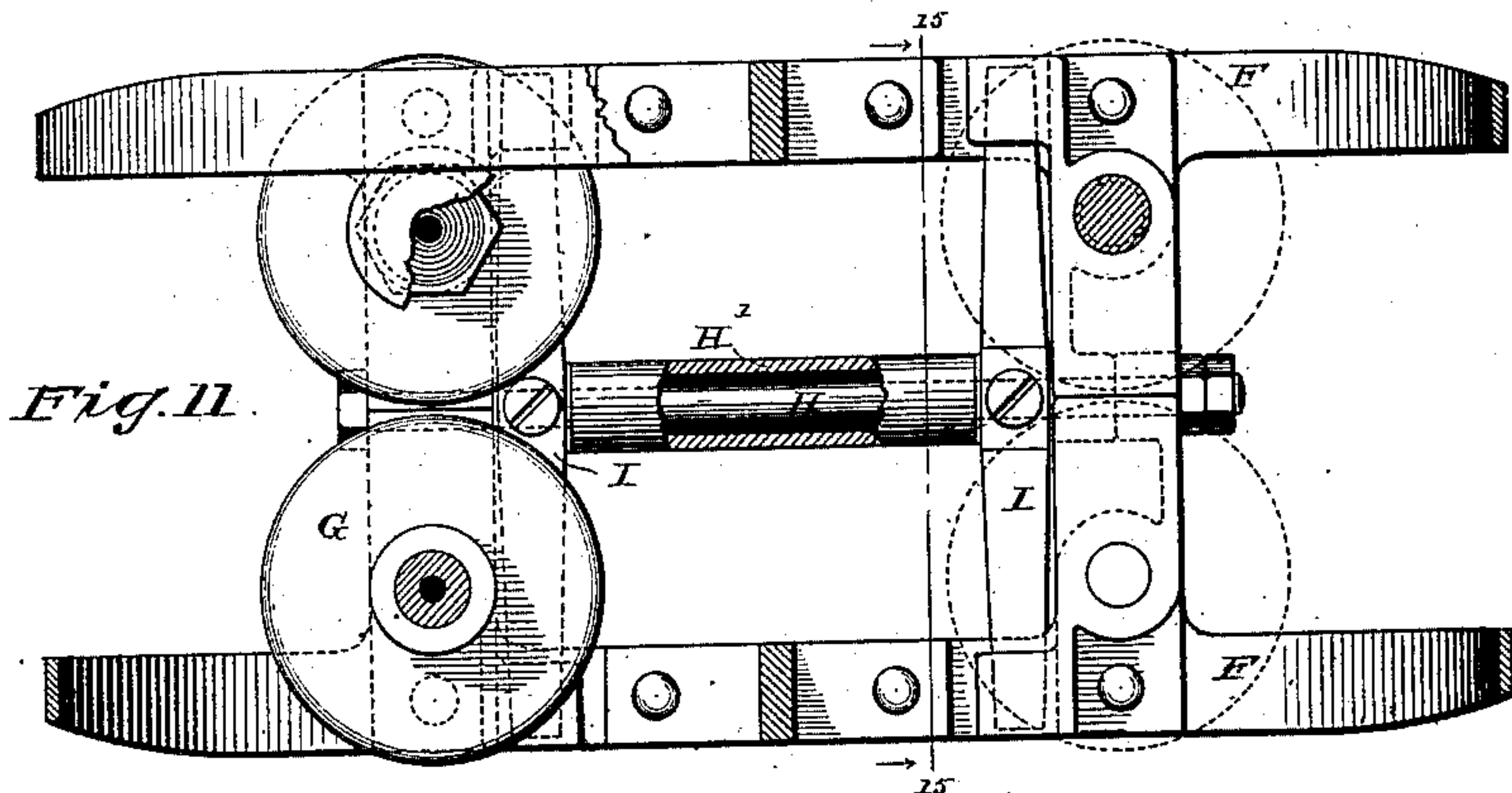


Fig. 11.

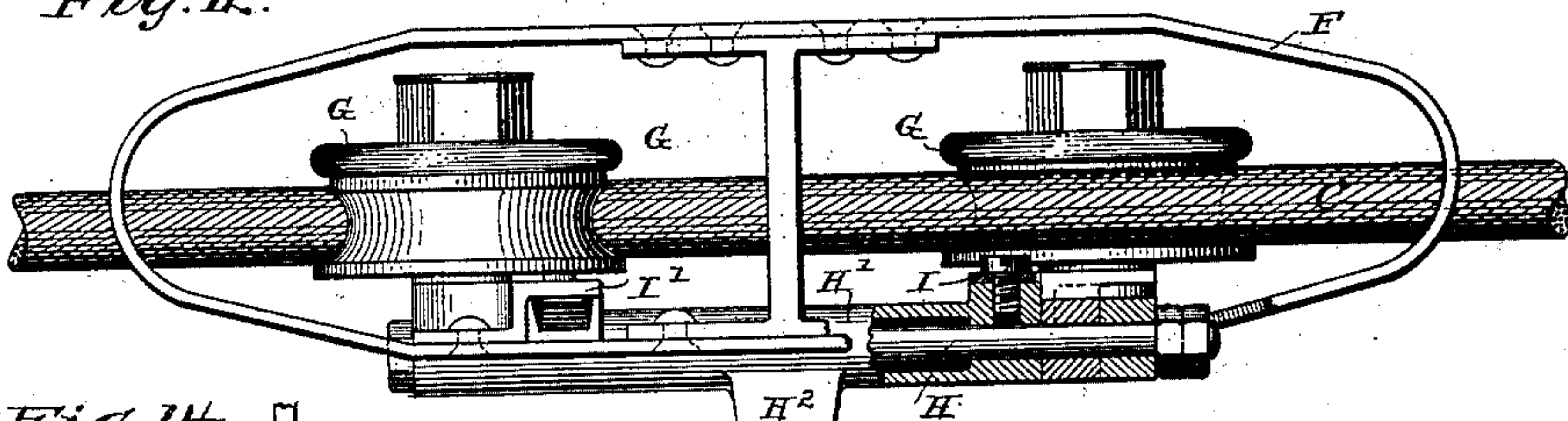


Fig. 12.

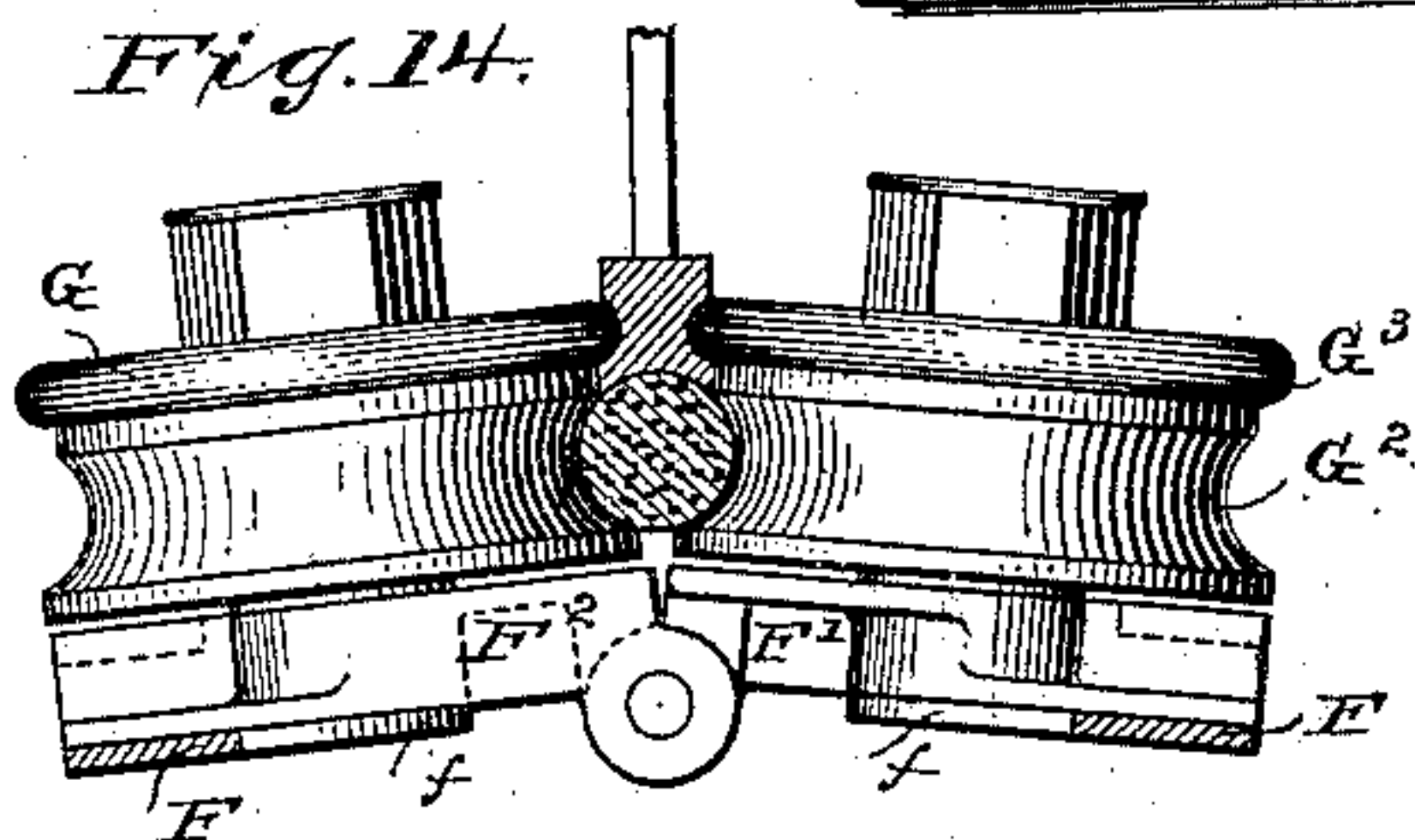


Fig. 13.

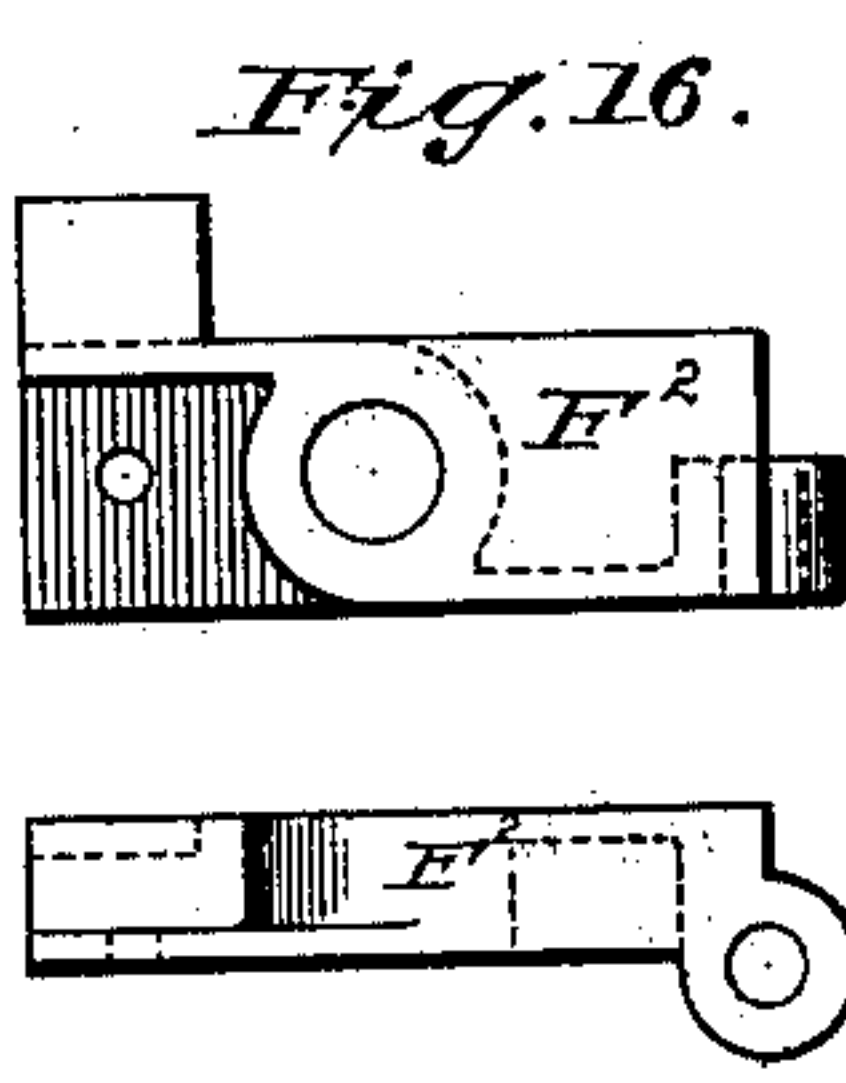


Fig. 16.

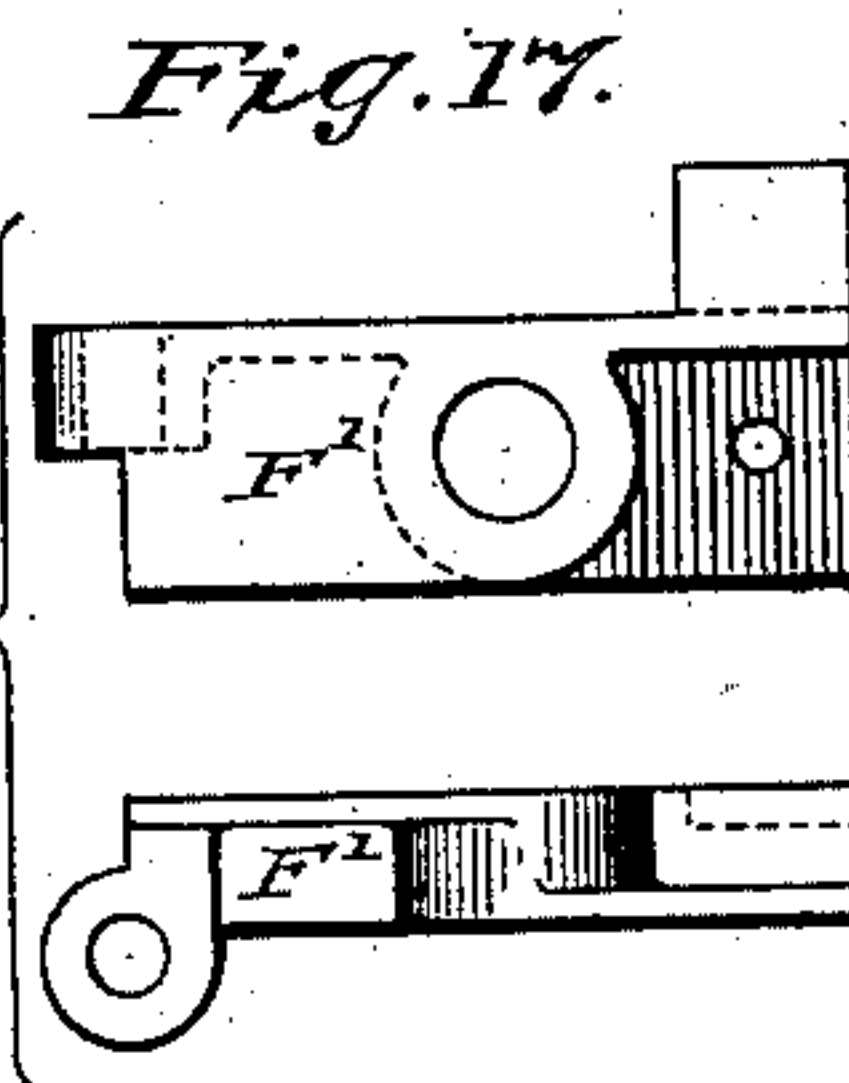


Fig. 17.

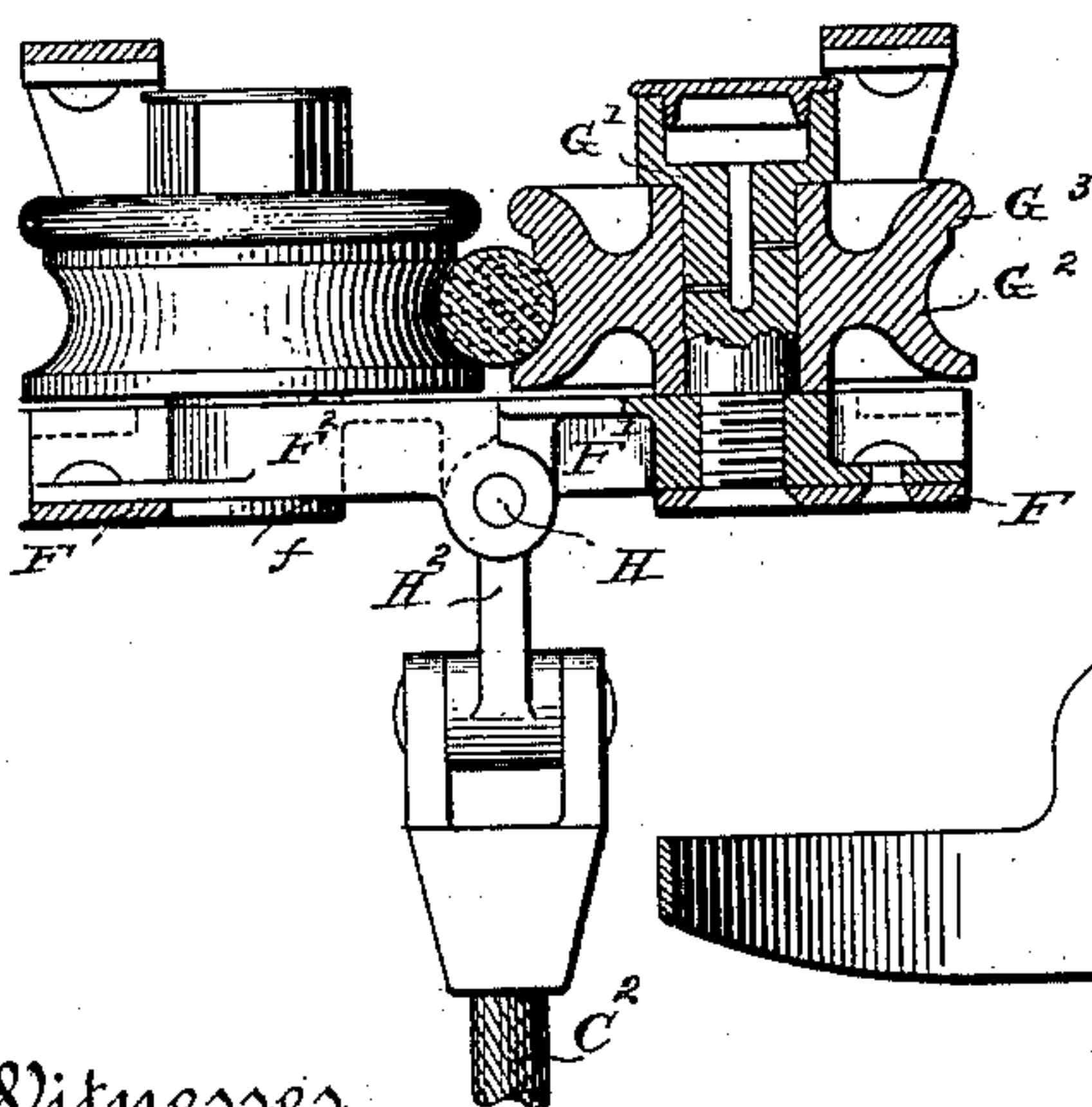


Fig. 15.

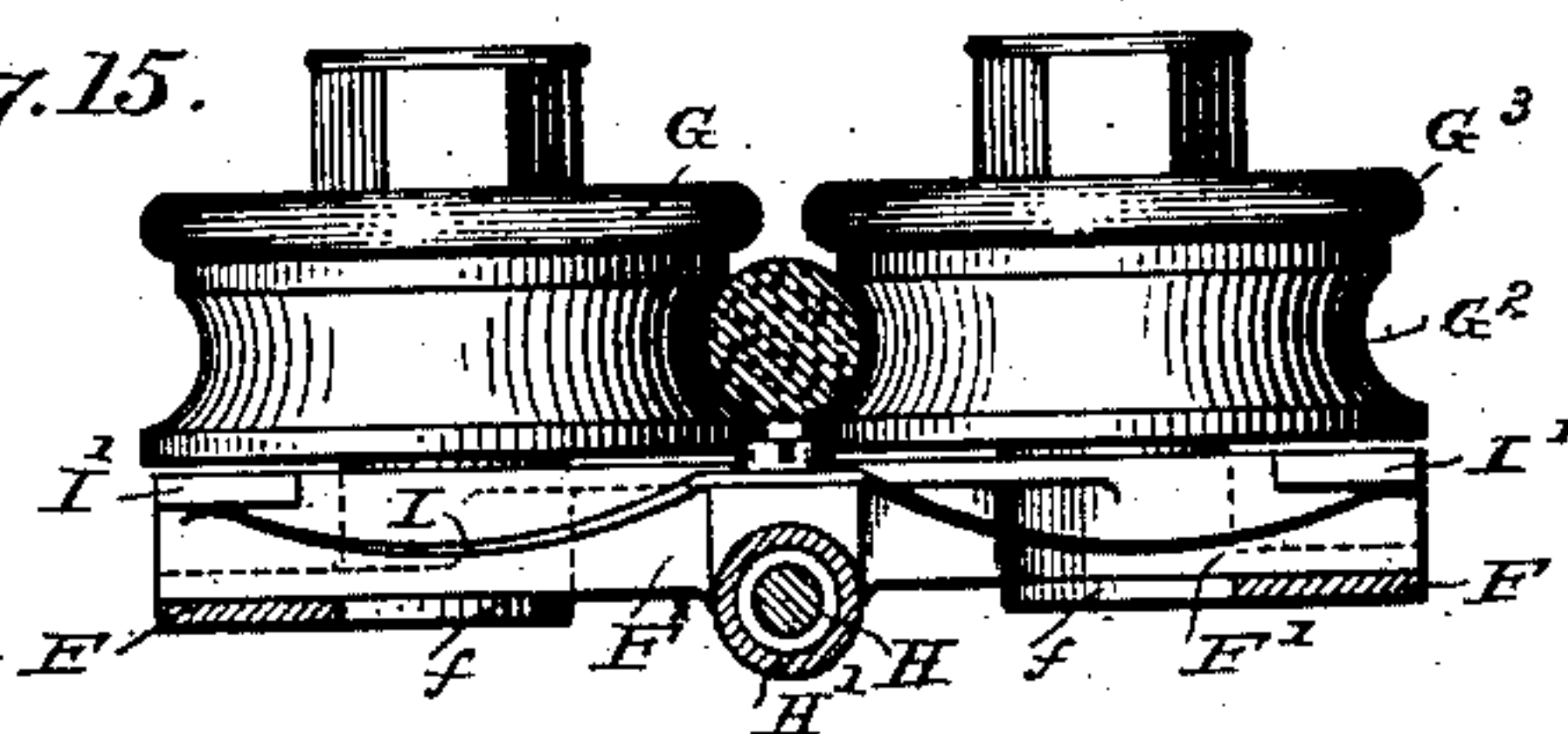


Fig. 18.

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UNITED STATES PATENT OFFICE.

CHARLES J. VAN DEPOELE, OF CHICAGO, ILLINOIS.

OVERHEAD CONDUCTOR FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 336,453, dated February 16, 1886.

Application filed January 9, 1886. Serial No. 188,127. (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 Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Systems of Overhead Conductors for Electric Railways, of which the following is a description.

My present invention relates to improvements in electric railway systems of the class in which a suspended conductor or conductors furnish electric current of one polarity, and the rails form the other side of the circuit, whereby all danger of accidental short-circuiting or injury to persons and animals is entirely avoided, thereby more nearly fulfilling the conditions under which electricity can be advantageously used to propel cars in cities.

I have shown and will describe my system as applied to a street-railway, although it will be obvious that it is peculiarly adapted to mines, tunnels, and in fact any situation where high insulation is necessary, and also where insulation of any kind is unusually difficult.

The following description sets forth the details of the invention.

In the accompanying drawings, Figure 1 is plan view showing the curb, tracks, conductors, supporting devices, contact-carriage, and means for supporting the conductors around a curve, and for maintaining them in an operative condition in such positions. Fig. 2 is a sectional elevation of a street, showing the roadway, sidewalks, track, and the poles and suspending devices by means of which the electrical conductors are permanently supported. Fig. 3 is a detail showing the method of securing the straight portion of the conductor where the line begins to diverge at a curve. Fig. 4 is an elevation of one of the suspenders by which the main conductors are supported. Fig. 5 is a section of Fig. 4 on the line 5 5. Fig. 6 is a plan view of one of the switching-boxes with its top plates removed. Fig. 7 is a sectional elevation thereof. Fig. 8 is a plan of a crossing-box also with its top plate removed. Fig. 9 is an end view of the switch-box and carriage. Fig. 10 is a detail of a portion thereof. Fig. 11 is a plan view of the traveling contact or carriage, cer-

tain of the parts being broken away to more plainly exhibit its construction. Fig. 12 is an elevation of the carriage, partly in section, and Fig. 13 is an end view in elevation, and also partly in section. Fig. 14 is a detail, showing the positions of the contact-rollers when passing one of the conductor-supporting ears. Fig. 15 is an elevation of one pair of rollers in their normal position. Figs. 16 and 17 are details entering into the construction of the hinged supports upon which the rollers are carried. Fig. 18 is a plan view of the lower half of the frame within which the rollers are secured.

Similar letters denote like parts.

A is the roadway, upon which are placed the tracks A'.

A² are the sidewalks, and B are poles placed opposite each other and at suitable intervals along the line of the curb B'. The poles are preferably of wood; but common iron pipe will answer every purpose. On top of each pole is a bell-shaped cast-iron cap, B², which, with wooden poles, is simply fitted on top thereof; but where the pole would otherwise be a good conductor it will be necessary to interpose a layer of insulation between the cap and the tops of the poles, the flaring edges of the caps protecting the said insulation from water and ice. A supporting-rod, B³, and a brace or tie rod, B⁴, unite the top of opposite poles, forming a sufficiently strong framework to carry the conductor or conductors C, which are suspended therefrom by strong metallic straps C', fastened directly to the cross-rod B³, and secured at their lower ends to ears or bails D, which bails are considerably elongated and firmly secured to the upper side of the conductors C by soldering, brazing, or any other suitable means. The bails D are formed with longitudinal grooves d in each side for the reception of the upper portion of the contact-rollers, as will be hereinafter described.

It will be understood that so long as the course of the railway is straight no difficulty will be experienced in supporting the conductors at the desired distance above the roadway by means of the devices just described. Such curves as are numerous on all street-railways cannot, however, be overcome with-

out special provision for the support of the conductors in such position, and in Fig. 2 are shown the means I employ for this purpose.

E is an anchor located at a point opposite the center of the curve to be made, and it is provided at its outer end with suitable sheaves or rollers, *e*. This anchor may consist of an extra strong post, to which the rollers are attached; or it may be a strong bar of iron secured to an adjacent building.

E' E' are strong cables, which follow the lines of the straight portions of the conductors C, and pass around the sheaves *e e*. They are connected at their outer ends to the straight portion of the main conductors C, securely holding them against any and all longitudinal strains, yet at the same time permitting the line to be tightened or the conductors adjusted, as may be found desirable in making repairs, &c., from any particular point. The main conductors being provided for, I then place pairs of poles around the curb at the most convenient and suitable distances, and continue the main conductor from pole to pole between the straight portions. In this manner the sharpest curve can be broken into a number of short straight portions, and the straight portions of the conductors being independently secured all these short sections may be sufficiently slack to yield enough to modify the angles at each point of support, and also to compensate for expansion and contraction. The traction-cables E' are connected to the conductors by two short bails, D' D', so as to afford a sufficiently strong longitudinal connection, which bails are continued with cables by bars D², which latter may be of insulating material, if found desirable.

As arranged according to the present invention, the car moving upon the rail is provided with a motor, one pole of which is connected to the rail through the wheels and axles, the other pole being connected to the suspended conductor by means of a flexible cable, C², and a contact-carriage, F, secured upon the conductor C, and drawn along after the car by means of the flexible cable C² therefrom to the car. The carriage consists of two or more pairs of rollers, one roller of each pair being secured to a rigid metallic frame. The two frames, with their rollers, are hinged together and provided with springs, normally retaining them and the rollers in position with each, the distance between the opposing series of rollers being that necessary to accommodate the conductor C, against which the rollers are laterally held with sufficient pressure to maintain a good electrical contact between them and the conductor which they embrace.

F F are the two parallel frames, from the lower side of which extend lugs *f*, upon which are secured separate portions, F' F', of a hinge-joint, extending between the two frame-pieces, and securing them parallel with each other. Rollers G are pivoted upon each of the four halves of the two hinges in such position that

the rollers will be parallel and in line with each other, and adapted to be firmly secured by lateral pressure to the conductor upon which the carriage may be placed. A spindle, H, passes through both hinge-joints and unites them longitudinally, and a sleeve, H', is placed upon the outside of the spindle between the two hinges, so as to brace them against longitudinal strains. This sleeve is also provided with a downwardly-extending lug, H², for connection with the cable C². Springs I are secured at each end of the sleeve H', and bear upward against lugs or projections I', holding the rollers firmly toward the central line of the carriage. The rollers G are formed of any good conductor, and mounted upon their supports F' F² by hollow spindles G', secured by suitable screws. These spindles are extended at their outer ends to form oil-cups sufficiently large to contain a supply of oil, which is fed to the wearing-surfaces through suitable lateral apertures in the hollow spindle. The face of the roller is divided into two portions, the lower, G², being adapted to close upon the conductor C and securely hold the carriage thereon, the upper edge, G³, being beaded and somewhat larger in diameter than the grooved portion, so as to engage the longitudinal groove *d* in the suspending-bails D.

In order to prevent the destruction of the carriage by its being thrown at high speed against the bails B, the longitudinal grooves therein are tapered from the center toward their extremities, and the carriage being centrally hinged the rollers are readily separated as soon as their upper portions, G³, come in contact with the extremity of the ears and enter the grooves *d*, the lateral pressure of the springs I keeping them at all times in perfect contact with the conductor or its supporting-bails.

In order to pass from one track to another, I provide switching devices in the form of metallic boxes formed with passages conforming to the direction of the track through which the contact-carriages pass. The boxes are constructed with an upper plate, K, provided with suitable lugs, K', by which they are attached to the supporting-straps C'. To the under side of this plate, at points near its extremities, are secured bails D, to which the conductor is permanently secured and then cut off. Side and bottom pieces, K² K³, depend from the plate K, forming a passage through which the carriage can pass, which passages follow its outline whatever be the exact nature of the desired change of direction, these switches being constructed in accordance with the well-known railway appliances of that name. The lower portion of the box K³ is slitted to allow the passage of the conductor C², which connects the carriage and the car. When the carriage enters a switch-box, it will leave the main conductor, maintaining its electrical connection by contact of the rollers against the side or sides of the switch-box un-

til it again meets a suspended bail D, which bails are located at all exits from the switch-box.

As shown in Figs. 6 and 10, a gate, K⁴, is suitably hinged at the point of intersection, K⁵, of the two passages through the switch-box. The gate is preferably slightly curved, substantially as shown, and should be formed of a plate of resilient metal. It is also provided with a spring, K⁶, by which it is normally held across the straight passage through the box, as shown in full lines in Fig. 6, thus closing the same and compelling the carriage to follow the branch opening, which is intended to conform with the arrangement of tracks at the surface. The spring K⁶ across the straight passage, said plate is easily pushed to one side by the carriage coming in the opposite direction, when it will assume the position shown in the dotted lines, Fig. 6.

The arrangement here shown is especially adapted for a single-track railway, being that found at each end of a turn-out; and in Fig. 8 I have shown a crossing-box, from which, taken in connection with the foregoing description, it will be readily understood how any desired form of lateral connection can be arranged.

In case that the switching is varied or often changed, the spring-plate can be so connected with the railway switch as to be in a corresponding position with the same; but this point will form the subject of a subsequent application.

Only the details of construction of the contact-carriage herein shown and described are claimed in this application, the principle being broadly claimed in another pending application.

Having described my invention, what I claim is—

1. In an electric railway system, the combination, with suitable track, and poles B, provided at their upper end with protecting-caps B², of the supporting-frame B³ B⁴, secured to said caps and provided with straps C', and the conductor C, provided with supporting-bails D, secured to said straps, substantially as described.

2. In an electric railway system, the combination, with the continuous conductor C, of the traction-cables E', and a suitable anchor, E, substantially as described.

3. The combination, with the continuous conductor C, of the traction-cables E' and anchor E, provided with sheaves or rollers e, over which said cables pass and whereby the conductor C is kept taut, of a portion of the conductor C, extending between the terminals of the cables E', and relieved from longitudinal strain thereby, substantially as described.

4. The combination, with the cables E' and support therefor, of the bails D', connected thereto, and the conductor C, to which said bails are permanently secured, substantially as described.

5. The combination, with the conductor C, of the longitudinally-grooved bails D, permanently attached thereto, and a suitable suspending-strap, C', substantially as described.

6. In electric railway systems, a contact-carriage consisting of the combination of the frames F, hinge-plates F' F², rollers G, mounted thereon, a spindle, H, uniting said hinge-plates, and a sleeve, H', extending between said hinges and provided with springs I I, substantially as described.

7. In electric railway systems, a contact-carriage consisting of the combination, with suitable supporting-frames, of a pair of hinges uniting said frames, and rollers mounted upon said hinges and provided with oil-chambers G', substantially as described.

8. In electric railway systems, a switching device consisting of a box slitted at its lower side and formed with passages therethrough conforming in the direction of the track, said passages being provided at their extremities with ears or bails to which are secured the ends of the main conductor, as set forth.

9. In electric railway systems, a switch-box open at its under side and provided with fixed terminals of the main conductor at each opening thereinto, substantially as described.

10. In electric railway systems, the combination, with a switch-box formed with passages extending therethrough and conforming to the direction of the track, said passages being slitted along their under sides and provided with a suspended terminal of the main conductor at the extremity of each passage, of a contact-carriage adapted to pass through said box, as set forth.

11. In electric railway systems, a switching device consisting of a metallic box slitted at its lower side and formed with passages therethrough conforming to the direction of the track, said passages being provided at their extremities with ears or bails to which are secured the ends of the main conductor, and a movable gate adapted to close one of said passages in one direction, substantially as set forth.

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

CHARLES J. VAN DEPOELE.

Witnesses:

WILLIAM A. STILES,
J. R. HOLLISTER.