

No. 690,387.

Patented Jan. 7, 1902.

F. M. ASHLEY.
ELECTRIC RAILWAY.

(Application filed Feb. 26, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

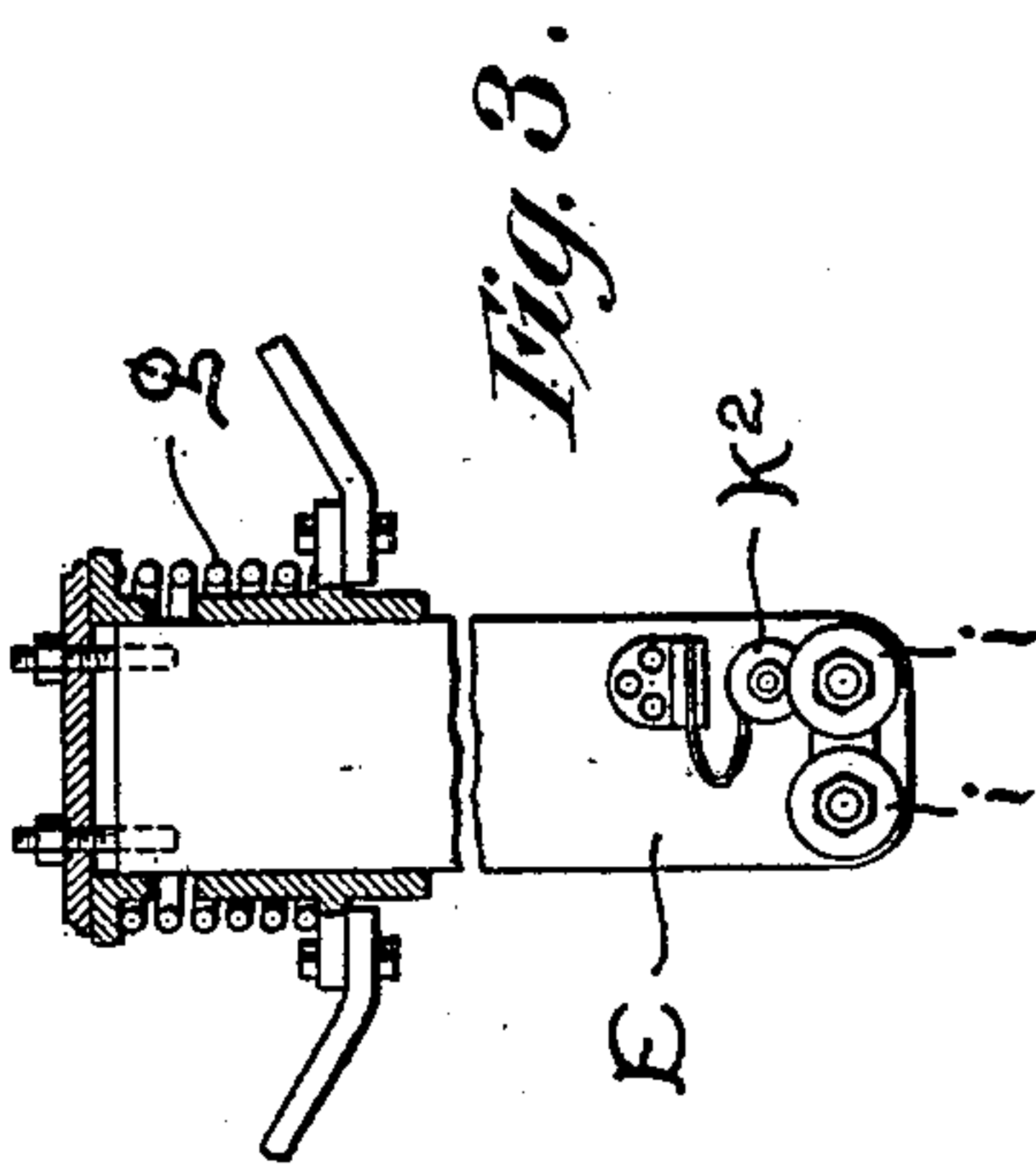
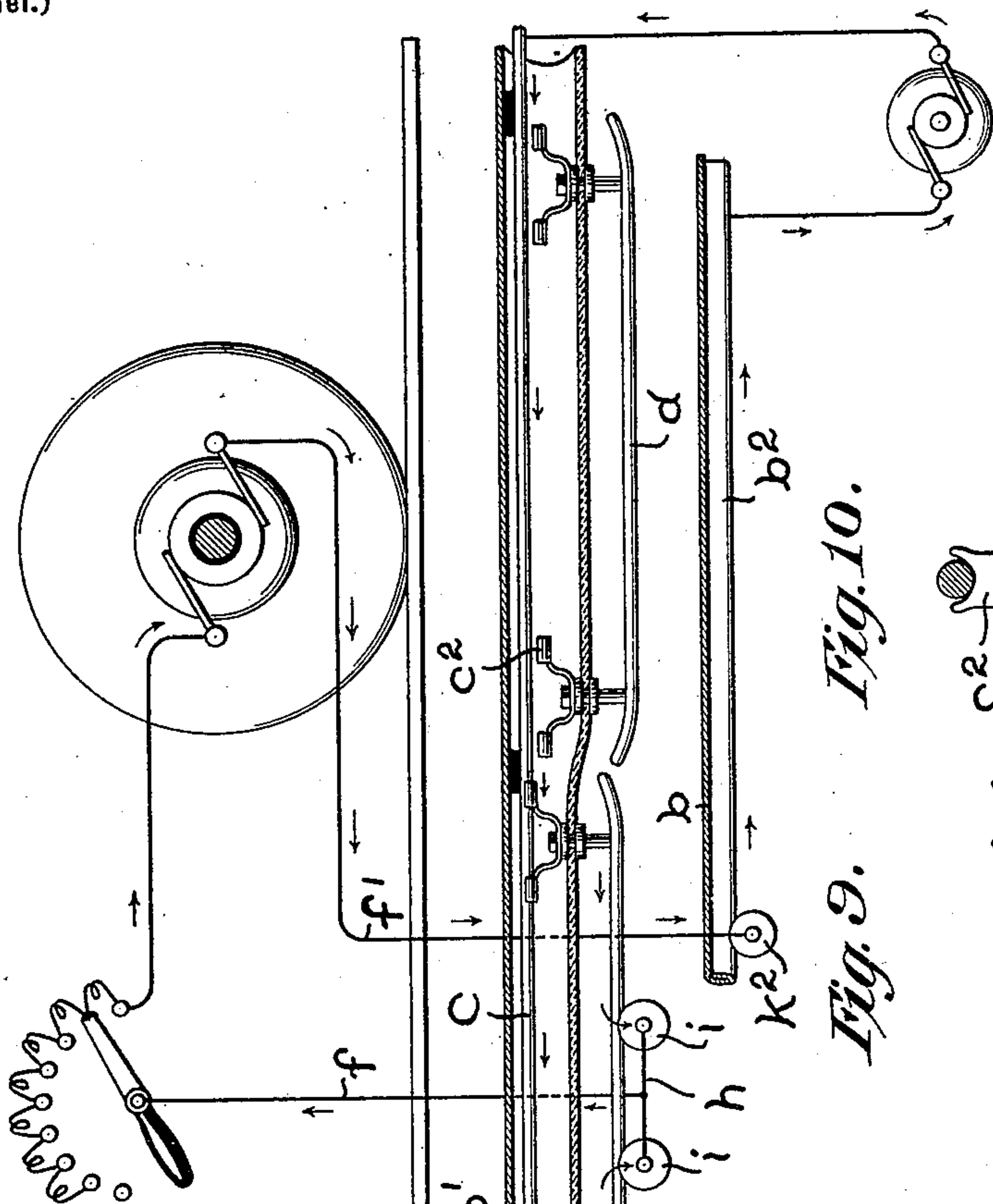


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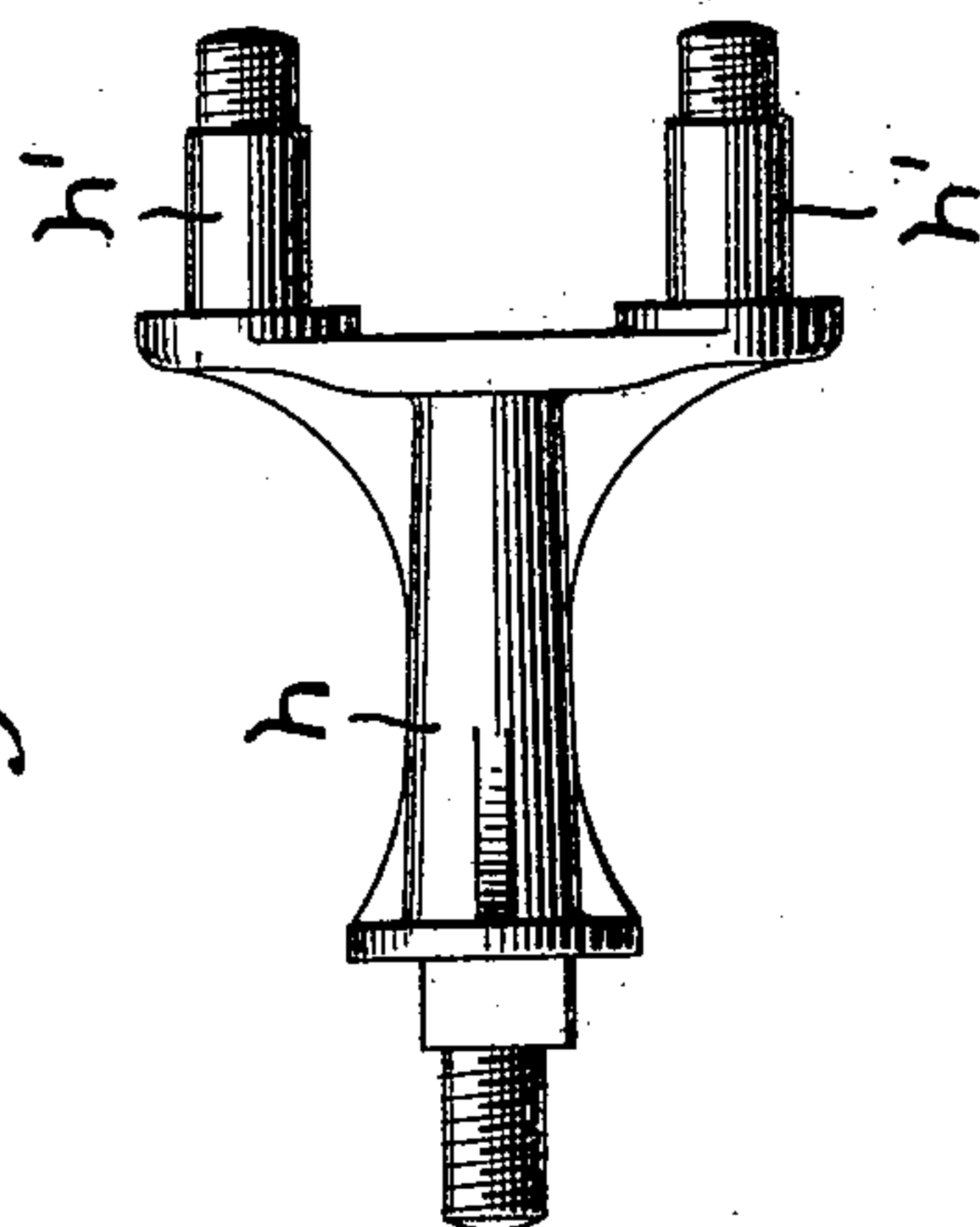


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2 Sheets—Sheet 2.

Fig. 2.

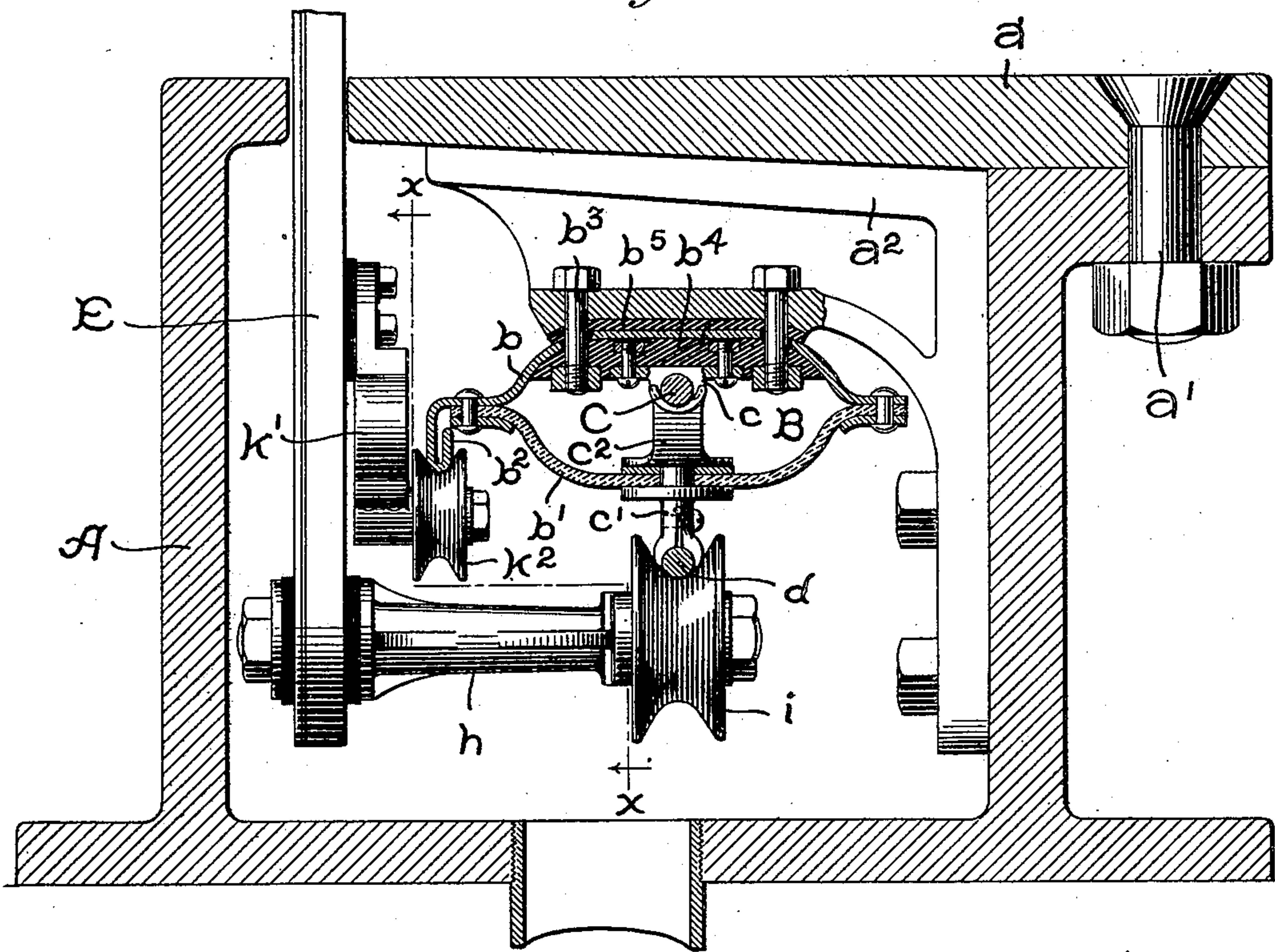


Fig. 4.

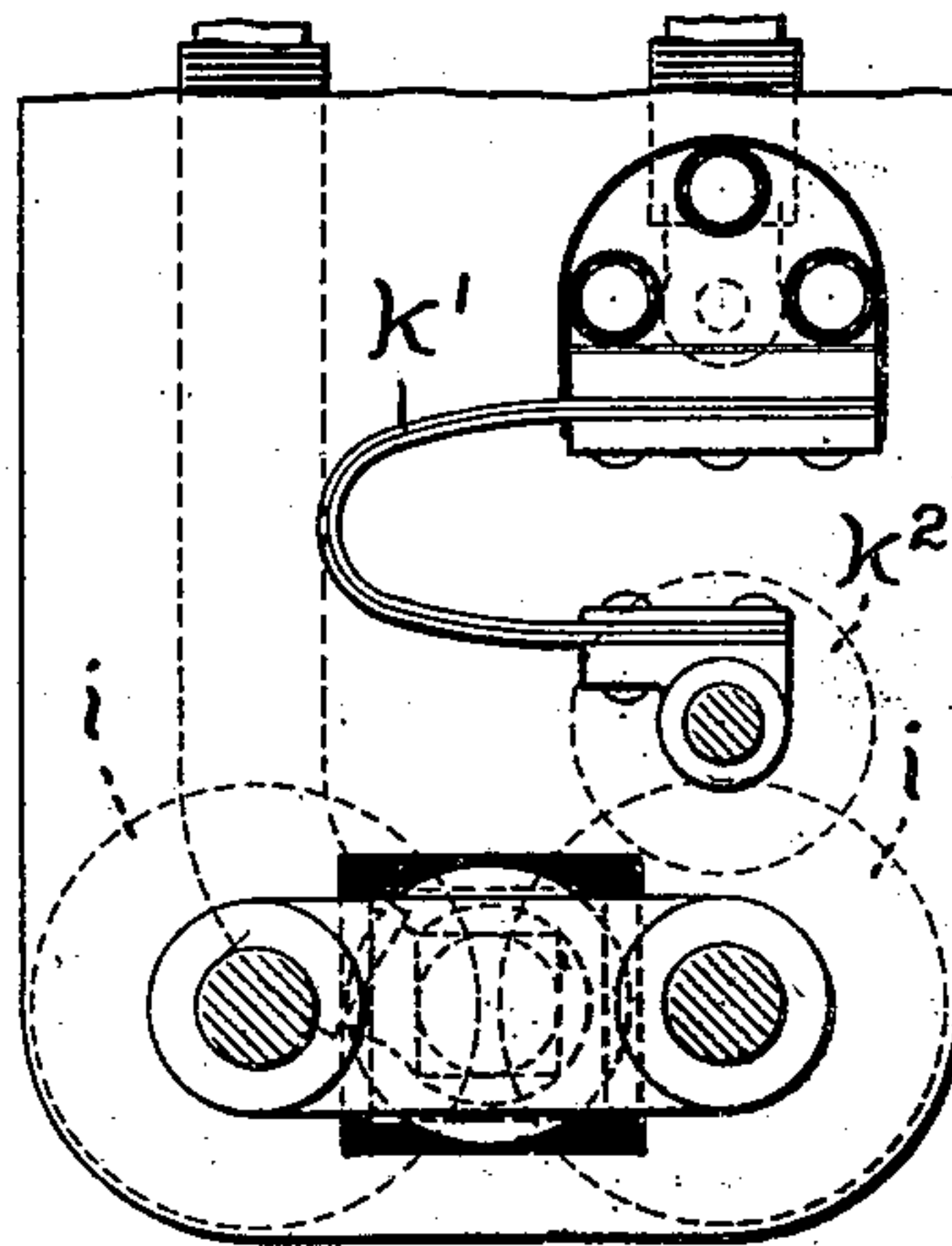


Fig. 5.

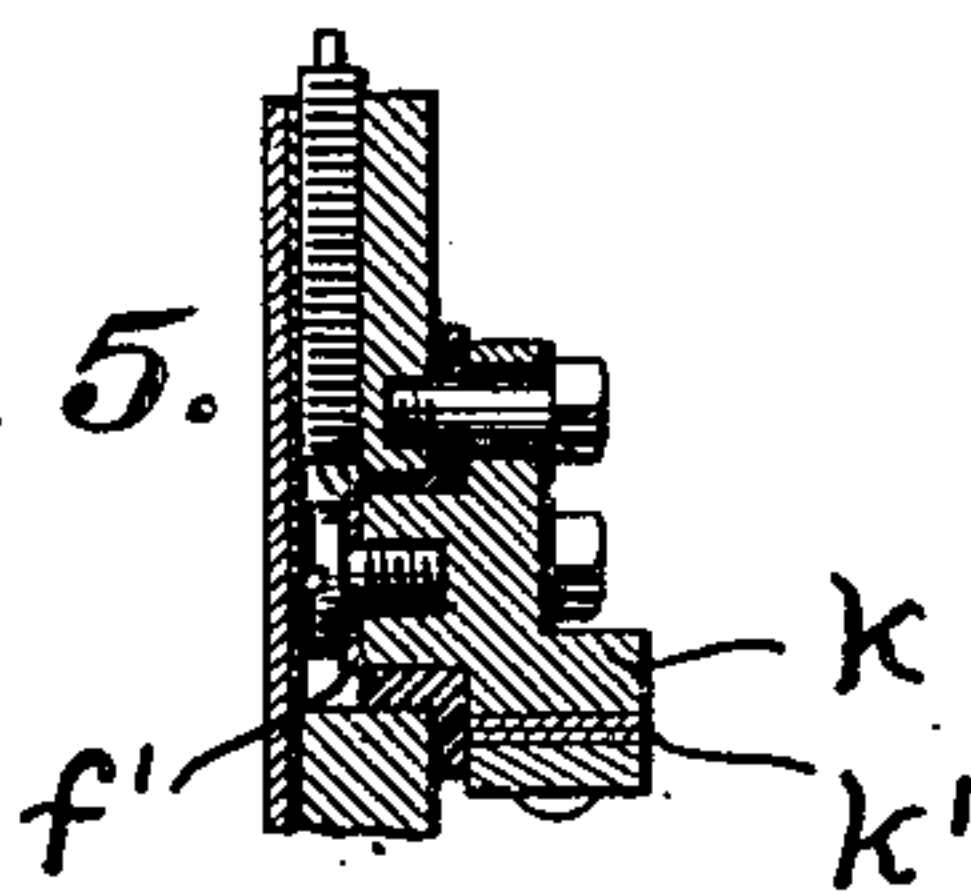


Fig. 6.

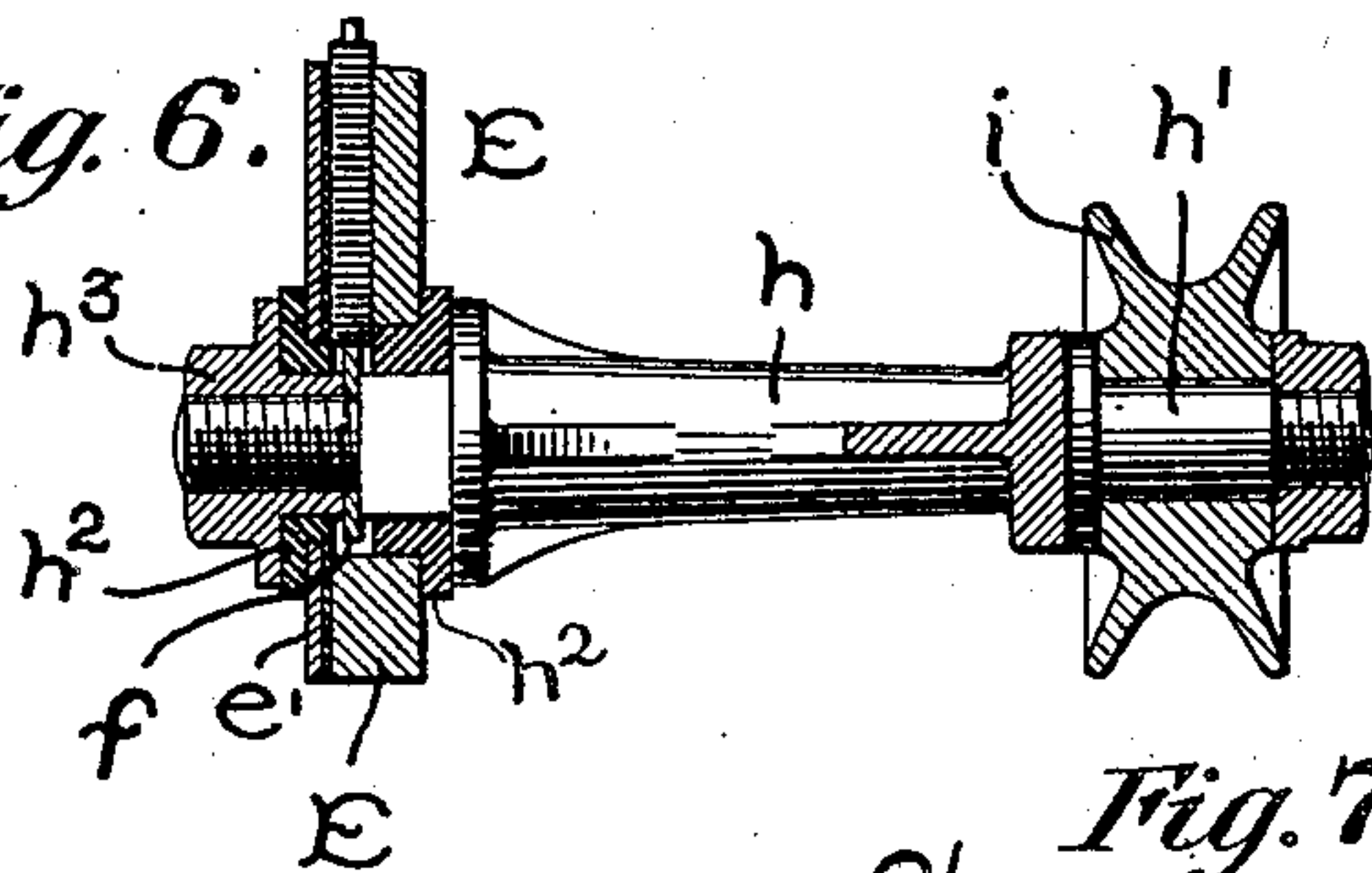
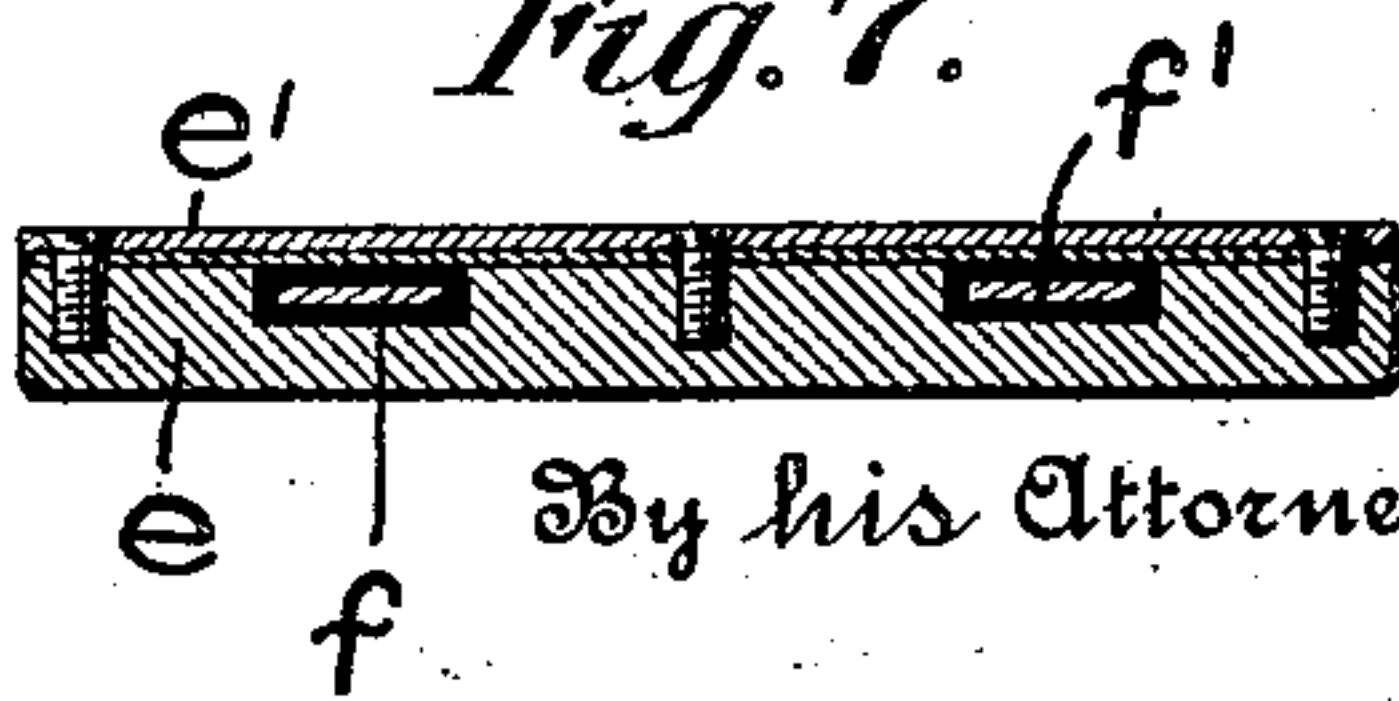


Fig. 7.



Witnesses
C. E. Ashley
J. W. Lloyd.

By his Attorney

Inventor
Frank M. Ashley,
Albert G. Davis

UNITED STATES PATENT OFFICE.

FRANK M. ASHLEY, OF BROOKLYN, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 690,387, dated January 7, 1902.

Application filed February 26, 1898. Serial No. 671,795. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. ASHLEY, a citizen of the United States, residing at Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Electric Railways, of which the following is a specification.

This invention relates to electric railways of that class in which the working conductors are located in a subway.

The object of the invention is primarily to provide a method of insulating a bare continuous conductor, so that the current may be taken therefrom by the vehicle as it moves along without undue loss by leakage.

The invention consists of the details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal section of the conduit with a conventional illustration of a portion of the apparatus and the circuits. Fig. 2 is a transverse section of the conduit, showing the collecting device carried by a car. Fig. 3 is a side view, on a small scale, of the collecting device, illustrating its connection with the car. Fig. 4 is a side elevation of the collecting device, the wheels of collectors being removed on the line indicated by xx in Fig. 2. Figs. 5, 6, and 7 are sectional details of the collecting device. Fig. 8 is a view of the arm or bracket which supports the positive trolley. Fig. 9 is a detail of a contact device. Fig. 10 is a section through the main and working conductors and the contact devices, and Figs. 11 and 12 show different forms of working conductor.

The conduit, Fig. 2, is represented by A. It is preferably provided with a removable cover a , secured in place by bolts a' and supported by brackets a^2 , located at suitable intervals inside of the conduit. These brackets also support a continuous tube B, which is formed by two semi-elliptical plates b and b' , respectively. The upper plate b is preferably of rigid conducting material, while the lower plate is of flexible non-conducting material, such as leather, rubber, or metal coated with an insulating material. The two plates are secured together at their edges by rivets, as shown, and the upper rigid plate has a projecting curled edge b^2 for a purpose which

will hereinafter be described. The tube B is secured to the brackets a^2 by bolts b^3 , which pass through openings in the upper plate and rest against the under side of cross-blocks b^4 , of insulating material. The plate is insulated from the brackets by the material b^5 .

C represents the main conductor. It is bare and extends through the tube B, being held in place by clips c , screwed to the cross-blocks b^4 .

To the flexible plate b' are secured at intervals short vertical rods c' . These pass through the plate, but are firmly fastened thereto by washers, which clamp the plate on each side, as shown. The end of the rod inside of the tube carries a double contact-clip c^2 , having U-shaped contact-surfaces adapted to be moved into electrical connection with the conductor C. Outside of the tube B and beneath it the rods c' support a sectional conductor d , the two rods being connected to each section at the respective extremities thereof. The weight of the sectional conductor normally being supported by the plate b keeps the latter well separated from the other plate and holds the contact device c^2 away from the conductor C.

E is a wide flat arm carried by the car and projecting through the slot in the conduit. It is made by bolting two plates e and e' together. One of these plates contains two vertical grooves in which portions of the main and return conductor f and f' are located and insulated. The arm is flexibly connected with the car by the interposition of a spring g , as shown in Fig. 3. At its extreme lower end the arm carries a laterally-projecting arm or bracket h , upon the outer end of which are two studs h' , forming the axles for two trolley-wheels i , one being arranged ahead of the other. The bracket h is connected with the arm E by passing it through an opening provided with non-conducting bushings h^2 . The opening in the arm connects with the groove carrying the main conductor f , and the end of that conductor is clamped by the nut h^3 , in contact with the bracket. The wheels i are adapted to make continuous contact with the sectional conductor d . Arm E also carries another bracket k , to which is electrically connected the lower end of conductor f' , in the

manner indicated in Fig. 5. To this bracket is attached a curved leaf-spring k' , carrying at its free end a trolley-wheel k^2 . This wheel is adapted to run in continuous contact with the curled edge b^2 of the plate b .

The sectional conductor d is shown in Fig. 2 to be a cylindrical rod; but in Figs. 10, 11, and 12 it is illustrated as a truss or rail having a broad contact-surface at its lower edge. This form gives strength and rigidity.

The operation is as follows: As the car moves along the trolley-wheels i make contact successively with the sectional conductor d , and the trolley being held at a higher level than the sections each section is lifted when the trolley strikes it. The flexible plate b' yields to this motion and allows the contact-clips c^2 to make connection with the main conductor C . This energizes the sections with which the trolley is in contact, and the current is delivered to the motor on the car through the bracket h and conductor f . The return-circuit from the motor is through the conductor f' , thence through the bracket k , spring k' , and trolley-wheel k^2 to the rigid connecting-plate b , forming the upper half of the tube B . The tube therefore forms a part of the main circuit.

Having thus described my invention, I claim—

1. In an electric railway, the combination with suitable supporting means, of a rigid metallic strip secured thereto and serving as a main conductor, a second main conductor carried by said supporting means, and a flexible strip of insulating material supported by said metal strip, and forming therewith an inclosure for said second main conductor, a sectional service-conductor carried by said flexible strip, and a car-collector which forces the successive sections against the main conductor.

2. In an electric-railway system, the combination with an inclosing casing, said casing being made in two sections, one of which is of conducting material, and the other of flexible non-conducting material, the non-conductor carrying contact-pieces adapted to be brought into connection with the main conductor, the conductor-section forming the return-circuit of the system, of a main conductor extending freely between said casing-section, and clips supported at intervals in the casing for suspending said conductor.

3. In an electric railway, the combination

with an inclosing casing composed of a metallic section and a section of flexible non-conducting material, of insulators at intervals inside the casing, supports outside the casing, and means for securing the metallic section and the insulators to said supports, a main conductor in the casing and supported by said insulators, and sectional conductors carried by said flexible casing-section.

4. In an electric railway, the combination with an inclosing casing having a flexible portion, of a main conductor supported in the casing, contact devices carried by and extending through the flexible part of the casing and adapted to engage the main conductor in the casing and to support an auxiliary conductor outside the casing, and auxiliary-conductor sections carried outside said casing by said contact devices.

5. In an electric-railway system, the combination with a conductor-tube formed of a flexible insulating and a rigid conducting portion, a main conductor therein, a traveling contact device adapted to engage with the rigid portion, and a second traveling contact device adapted to be electrically connected to the main conductor through the flexible portion of the tube.

6. The combination with suitable supports, of a conduit having a portion of its envelop formed of conductive material and secured to said supports and insulated therefrom, insulators in said conduit and secured to said supports, a main conductor supported by said insulators, and means for completing a circuit from the main conductor through a motor on a car to the conductive envelop of said conduit.

7. The combination with suitable supports, of a conducting-strip secured thereto and insulated therefrom, a flexible strip secured to said conducting-strip to form an inclosed conduit, insulators in said conduit and secured to said supports, a main conductor supported by said insulators, and contact devices carried by a car and adapted to be electrically connected with said conducting-strip and main conductor.

In witness whereof I have hereunto set my hand this 13th day of November, 1897.

FRANK M. ASHLEY.

Witnesses:

WM. A. ROSENBAUM,
HARRY BAILEY.