

(No Model.)

2 Sheets—Sheet 1.

B. JENNINGS.

CONDUIT ELECTRIC RAILWAY.

No. 395,442.

Patented Jan. 1, 1889.

Fig. 1.

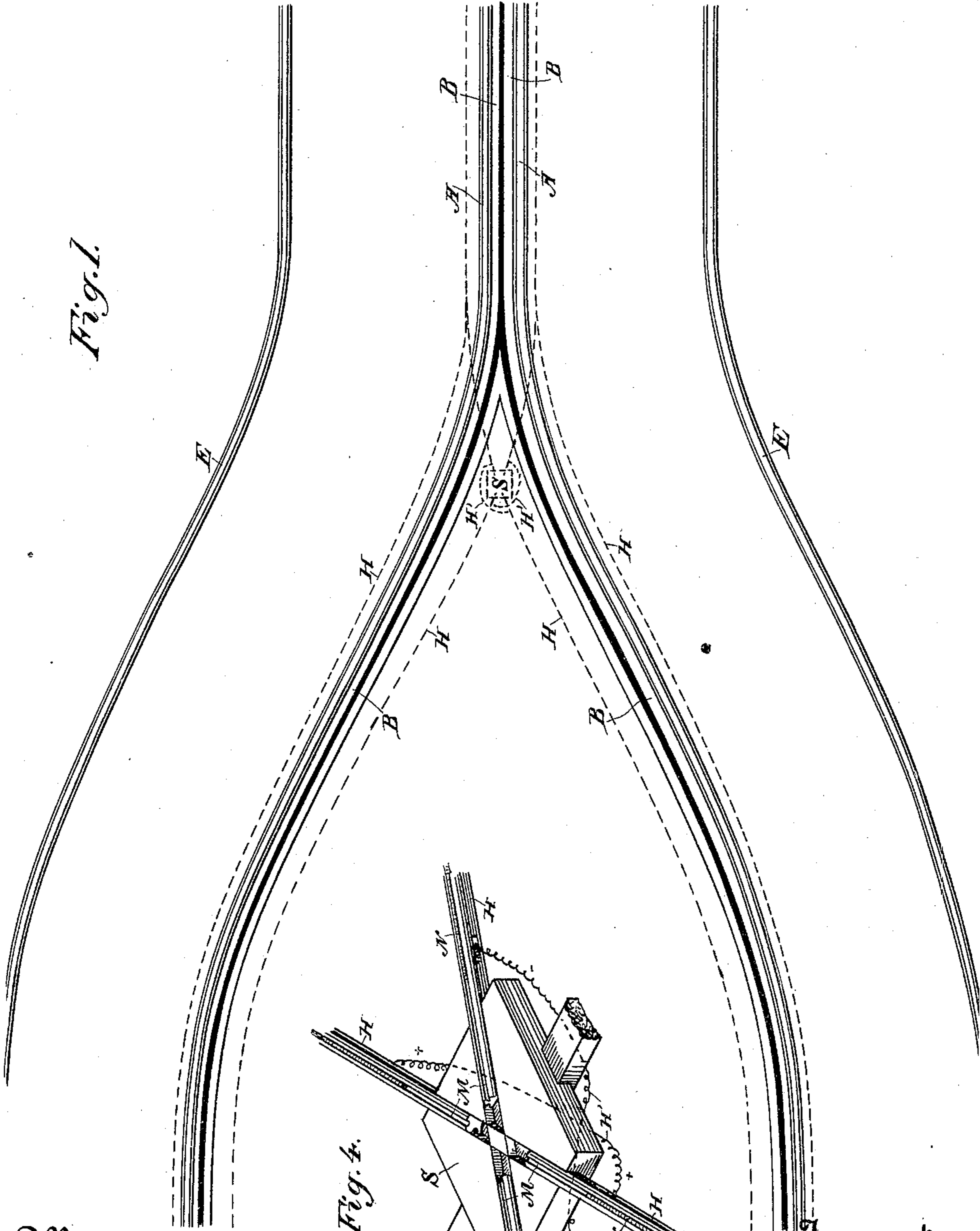
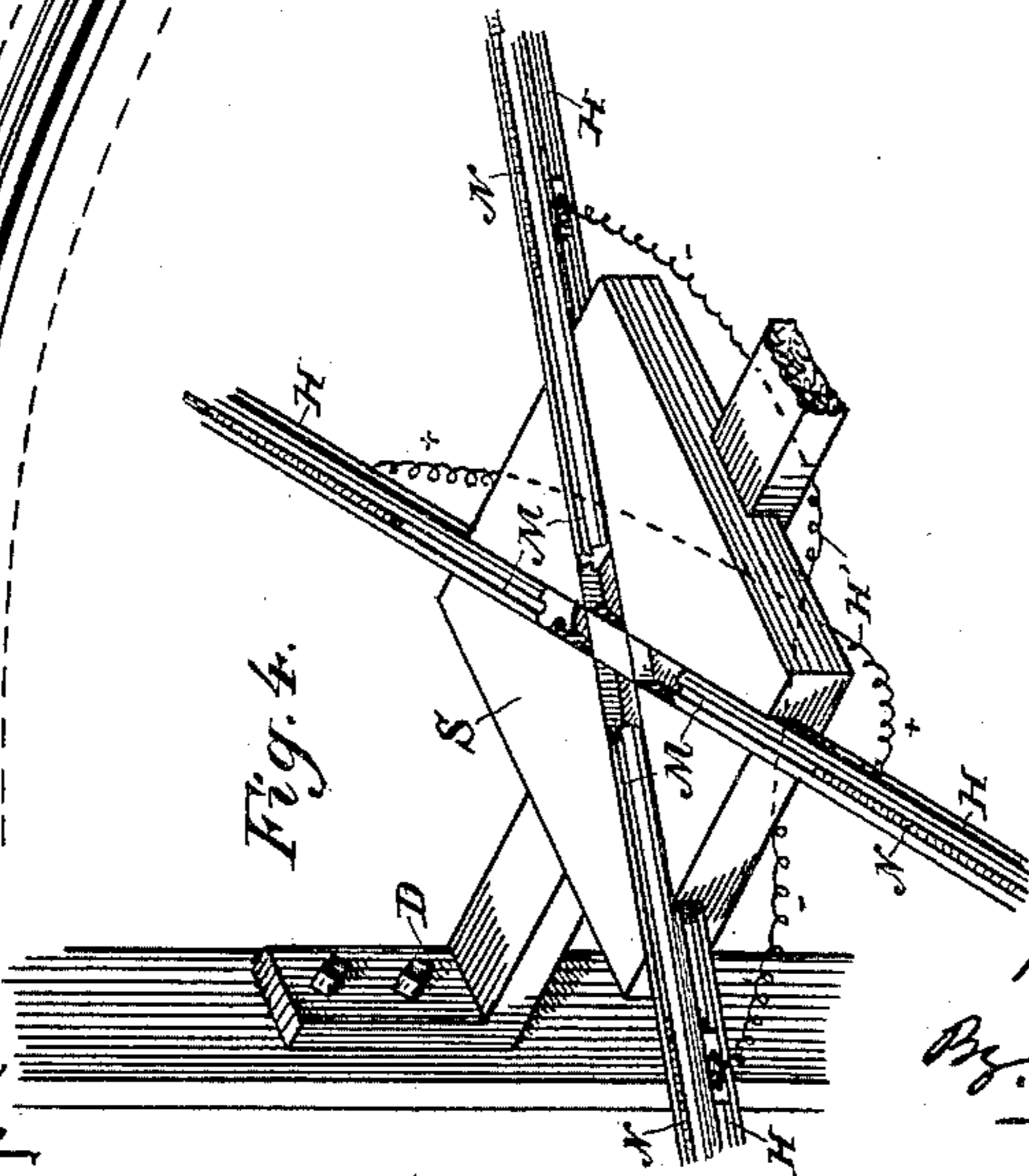


Fig. 4.



Witnesses,
Geo. H. Strong,
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(No Model.)

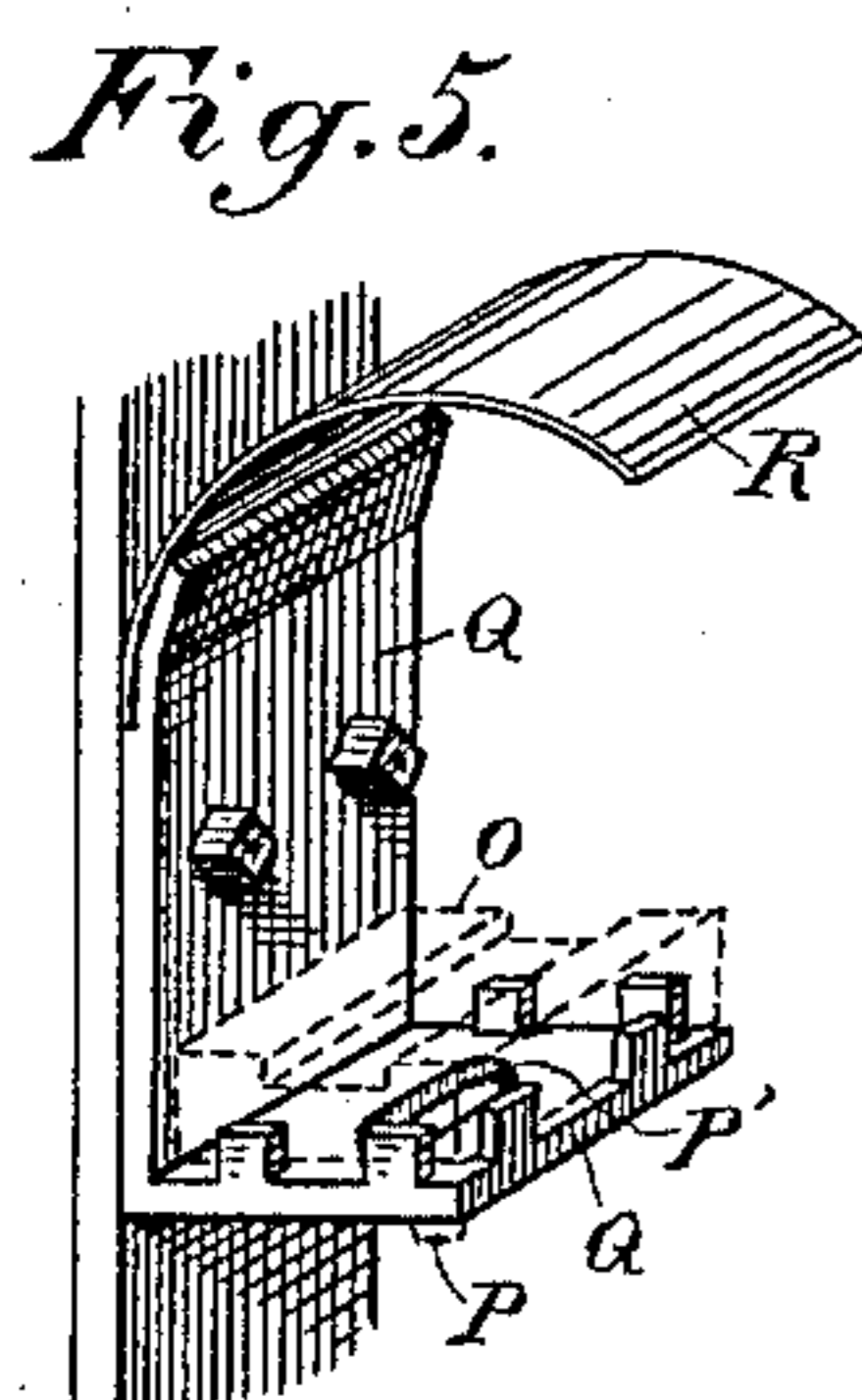
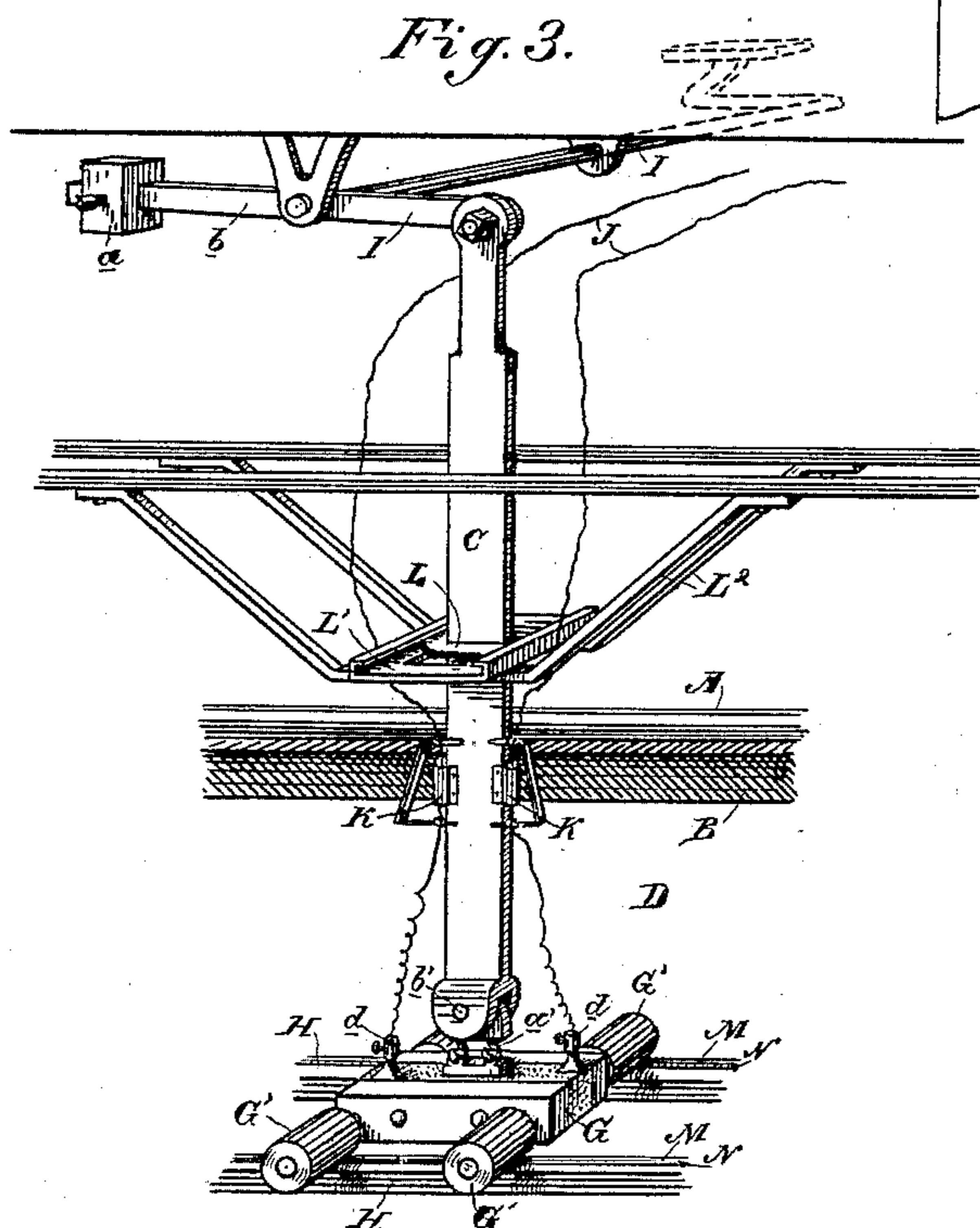
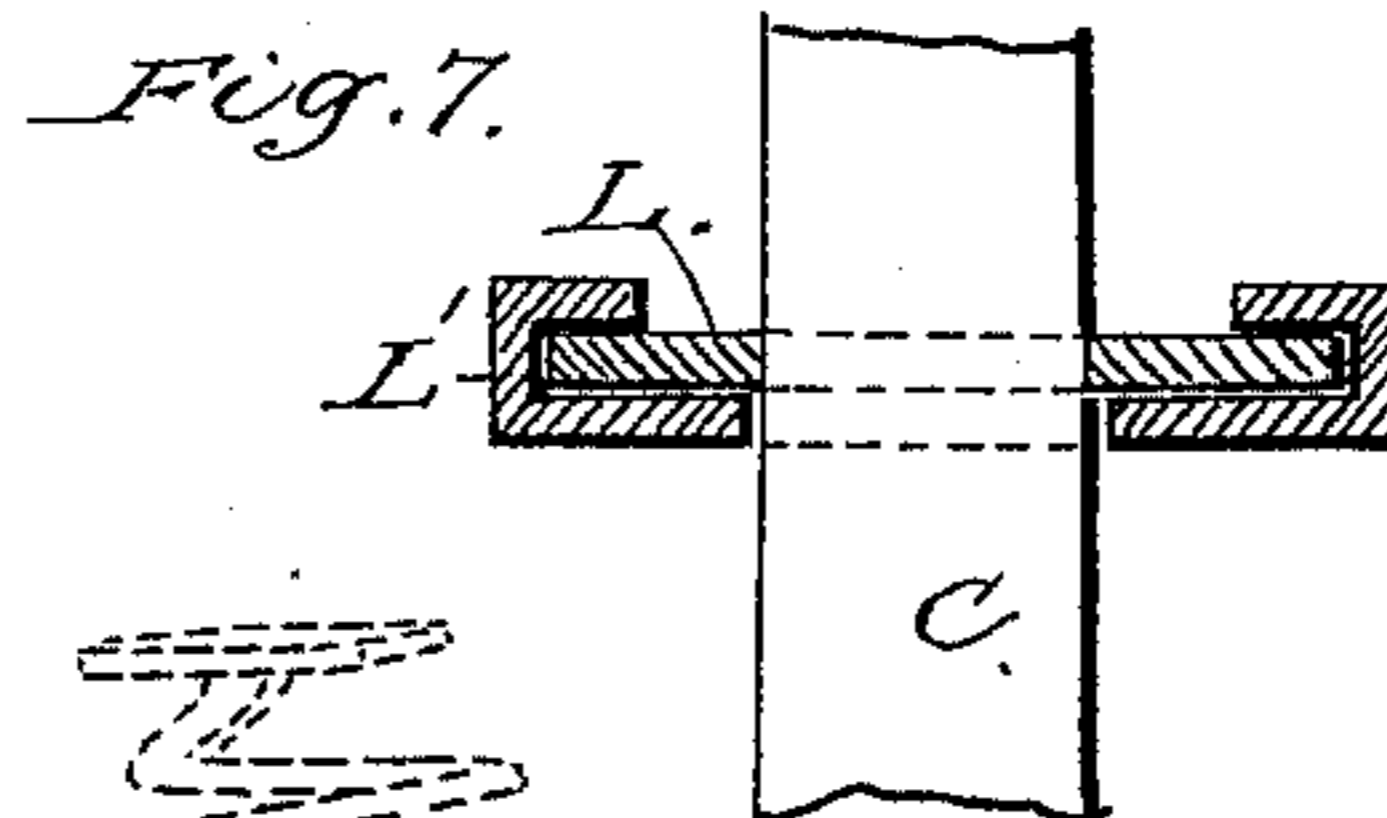
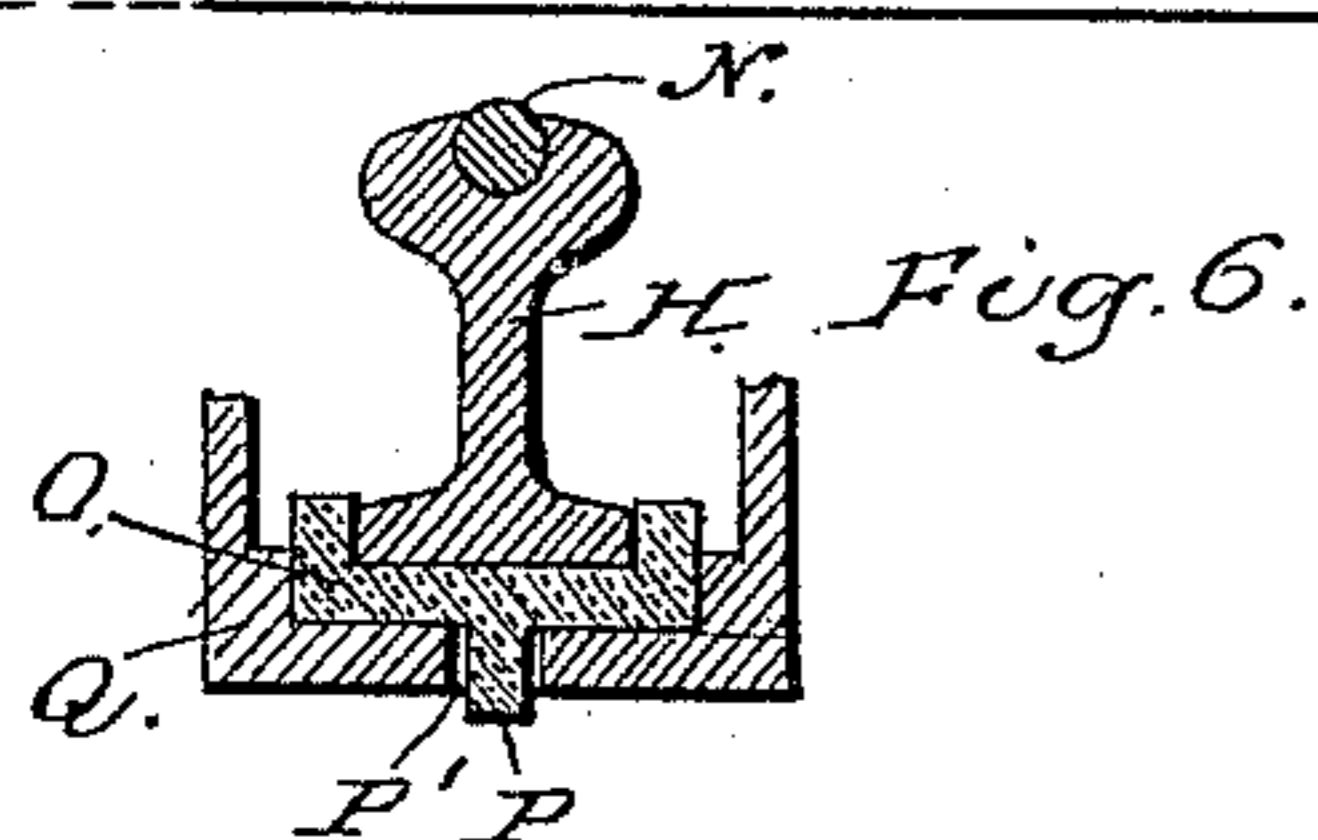
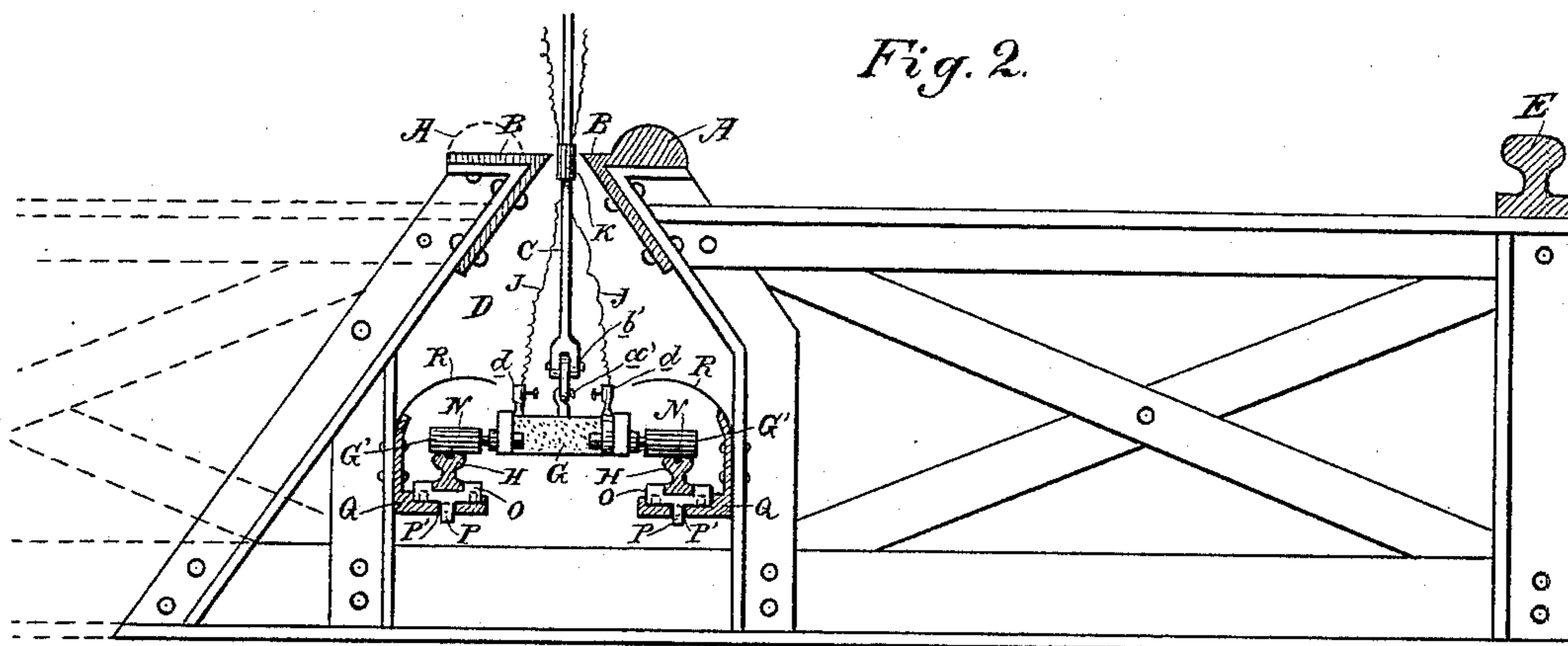
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

BYRON JENNINGS, OF SAN JOSÉ, CALIFORNIA.

CONDUIT ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 395,442, dated January 1, 1889.

Application filed April 26, 1888. Serial No. 272,002. (No model.)

To all whom it may concern:

Be it known that I, BYRON JENNINGS, of San José, Santa Clara county, State of California, have invented an Improvement in Conduit Electric Railways; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of a double line of parallel surface-tracks upon which the cars travel, the inner rails of which are fixed upon or formed with the two adjacent slot-irons of a single underground tube or conduit, within which a single set of conductors are contained, and these serve for the two lines of cars moving in opposite directions, turn-outs and double tubes being employed where the cars meet and pass each other.

My invention further consists in the employment of a means for protecting said conductors from dirt and connecting them with the cars in which the motor is situated, and a means for connecting the conductors and preventing a break in the current without the use of switches or other mechanism at points where turn-outs are constructed for the purpose of allowing the cars to pass each other.

My invention further consists also in certain details of construction, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a plan view showing the arrangement of the surface-rails on which the cars travel, with a single electric conduit, and also showing a portion of the turn-out and the means for conducting the current at this point. Fig. 2 is a transverse section taken across the surface-rails and the conduit, showing also the conducting-rails and the protecting-guard within the conduit. Fig. 3 is a view of the trolley and its connections. Fig. 4 shows a meeting of the conducting-rails at the turn-out with the insulating-plate and the connecting-wires. Fig. 5 is a detail view of one of the chair-supporting plates. Figs. 6 and 7 are enlarged details of construction to be referred to.

In my improved railway I employ two lines of surface-track, the inner rails, A, of which lie close together and are formed upon the two parallel slot-irons B, through which the trolley-shank C passes upward from the tube or conduit D, which is built beneath the sur-

face of the ground for the purpose of containing the conduit rails and wires.

E E are the two outer rails of the surface-track, which are situated at such a distance from the inner rails as to allow the car-wheels to travel upon them. The position of the slot in the tube being just outside of the rails and the wheels of the car when they are traveling in either direction, the trolley-shank passes up through the slot and connects with the car both when going on one track and returning on the other, and as it will serve by this construction for both outgoing and incoming lines of cars the expense of construction will be thus reduced to making this one line of tube, plus the extra length required to make a double line of tube at the points where the turn-outs are built, to allow the cars moving in opposite directions to pass each other. As the transverse frame forming supports for the tube need only be extended outward sufficiently to support the outer rails of both tracks, the expense is also considerably lessened by this construction.

The shank C, which passes through the slot in the tube or conduit, has its lower end connected with a trolley or truck, G, which travels upon the surface of the conducting-rails H within the tube or conduit D, and its upper end is suspended from one end of the lever I, which is fulcrumed on the bottom of the car, as shown, so that when the foot of the operator is placed upon the opposite end of the lever he can raise the shank C and with it lift the trolley G out of contact with the conducting-tracks H, and thus break the connection whenever desired.

a is a counterbalance-weight adjustable upon an arm, b, so that the power necessary to raise the trolley may be regulated. Two of the tracks H extend along one upon each side of the underground tube. One serves for the positive and the other for the negative current, and when the wheels G' are depressed into contact with the tracks H the current passes upward to the cars through the wires J and a communication is made between the positive and negative conductors through the motor upon the cars. At the point where these wires pass out from the tube-slot they are inclosed in the insulating sleeves or collars K, which prevent contact

with the edges of the slot. In order to stiffen the shank C, and also to allow it to adjust itself to side movements of the car, it passes up through a plate, L, which is fitted to slide transversely upon a guide, L'. This guide is supported by the brace-rods I², which extend between the journal-boxes of the car-wheels.

The wheels or rollers G' of the trolley are mounted upon short shafts, two upon each side, so that the two wheels upon one side travel upon the positive rail and the two upon the other side upon the negative rail. The wheel-shafts are insulated, and the two sides of the truck are also separated and insulated from each other in any suitable manner to prevent the transmission of the current from one rail to the other in any way except through the conducting-wires. The truck-frame is suspended from the lower end of the shank C by a universal or double joint, which allows the truck to adjust itself to irregularities of the track. In the present case I have shown the link or hinge-joint a' to allow transverse adjustment, and a pin or hinge, b', to allow longitudinal adjustment.

d are binding-posts upon collars upon the axles of the trolley-wheels G', and the conducting-wires J have one end fixed in these posts and the other end connected with the motor upon the car.

The electric or conducting rails H are made with a depression or channel, M, on the upper surface, within which lie the conducting-wires N, through which the current passes through the whole length of the line, the surface of this wire being held so that the wheels of the trolley G will travel in contact with it when the shank C is lowered to allow the wheels to form a contact with the conductor. These rails are supported upon non-conducting chairs O, which are preferably made of glass, and they have channels on the upper surface in which the rails rest, and lugs or shanks P on the bottom, which fit loosely in slots P', made through the supporting-plates Q, which are bent at right angles with the sides of the tube to which their vertical portions are bolted or secured.

The plates Q have upturned edges, inside of which the insulating-chairs are supported and by which they are kept in place, even if the lugs are broken off. By this construction the rails are free to move or crawl by expansion without straining or breaking the insulators.

In order to protect the conductor-wires from the dirt which might fall upon them from above, I have shown curved metal plates R, which are bent in the form of an ogee or reverse curve, so that their lower edges may be pressed down behind the supporting-brackets, and their elasticity causes them to be held firmly in place without other fastening. The upper edges of these plates are bent over toward each other, thus preventing dirt from falling upon the conducting tracks and wires.

Wherever the cars running in opposite di-

rections meet and pass each other, the lines or track are temporarily separated, as shown in Fig. 1, so as to allow the cars to pass each other, and at this point the tube or conduit must be made in two branches, one following each separate line of track, and the conductors must also be separated and cross each other, as shown in Fig. 1.

In order to cross the conducting-tracks without the use of switches or interruptions, I employ a glass insulating-plate, S, in which the ends of the rails H terminate. The conducting-wires upon these rails also terminate at these insulating-plates, and their ends are connected by the wires H' passing beneath the plates, as shown.

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

1. The combination, in a railway, of two parallel lines of track, a single underground tube or tunnel between the two with a slot through which connection is made with its interior from above, and parallel slot-irons upon which the inner rails of the two lines of track are formed or secured, substantially as herein described.

2. The underground tube or tunnel with a slot and parallel slot-irons at the top, said irons having rails formed with or secured to their outer edges and forming the inner rails of two lines of railway, the outer rails of which are parallel with the slot-irons upon opposite sides thereof, substantially as herein described.

3. The underground tube or tunnel having the yokes or frames forming its outline and supporting the combined slot-irons and inner track-rails, in combination with the transverse frames secured to the yokes, and the outer line of track secured to and supported on the frames to form a double line of parallel tracks and a single tube in one structure, substantially as herein described.

4. The trolley or truck through which connection is made between the electric conducting-rails within the tube and the motor on a car traveling upon the rails above, the shank C, by which the trolley or tube is suspended, and a movable slide through which the shank passes, in combination with the levers, by which it is raised and lowered to make and break the connection, and the adjustable counterbalance-weight, substantially as herein described.

5. The combination of the truck or trolley with its suspending shank, the movable slide through which said shank passes, the operating-levers, and the double or universal joint whereby the trolley automatically adjusts itself, substantially as herein described.

6. The truck or trolley through which communication is made between the electric conducting-rails and the motor, and the shank C, by which it is suspended and raised and lowered, in combination with the brace-rods

fixed to the car, the guide, and the slide through which the shank C passes, substantially as herein described.

5 7. The conductor-supports bolted to the yokes within the tube and having the horizontal slotted tables, in combination with the glass insulating-chairs upon which the conducting-rails rest, said chairs having shanks extending into the slots in the tables and
10 movable therein, substantially as herein described.

8. The horizontal slotted supports for the conductors bolted to the sides of the tube and having upturned sides or edges, in combination with insulating-chairs resting upon
15 the supports, and the rails supported in the chairs, so as to automatically adjust themselves to the expansion and contraction, substantially as herein described.

20 9. The conducting-rails supported in insulating-chairs and having the depressions or channels formed in the upper surface, in combination with the re-enforcing wire-conductor fitted into said channel, so as to make a contact
25 tact with the truck or trolley, which travels

upon the rails, substantially as herein described.

10. The electric conductors supported within an underground tubular tunnel, in combination with the shields curved upward and outward and extending from the sides of the tunnel toward the center, so as to overhang the
30 conductors and protect them, substantially as herein described.

11. The slotted underground tube or tunnel with the electric conductors, the truck or trolley through which connection with the conductors is made and broken, and the wires leading from the truck through the slot to the motor on the car, in combination with the
35 shank C, having inclosing and protecting sleeves or collars surrounding the wires where they pass between the sides of the slot, substantially as herein described.

In witness whereof I have hereunto set my
45 hand.

BYRON JENNINGS.

Witnesses:

GEO. H. STRONG,
S. H. NOURSE.