

No. 679,615.

Patented July 30, 1901.

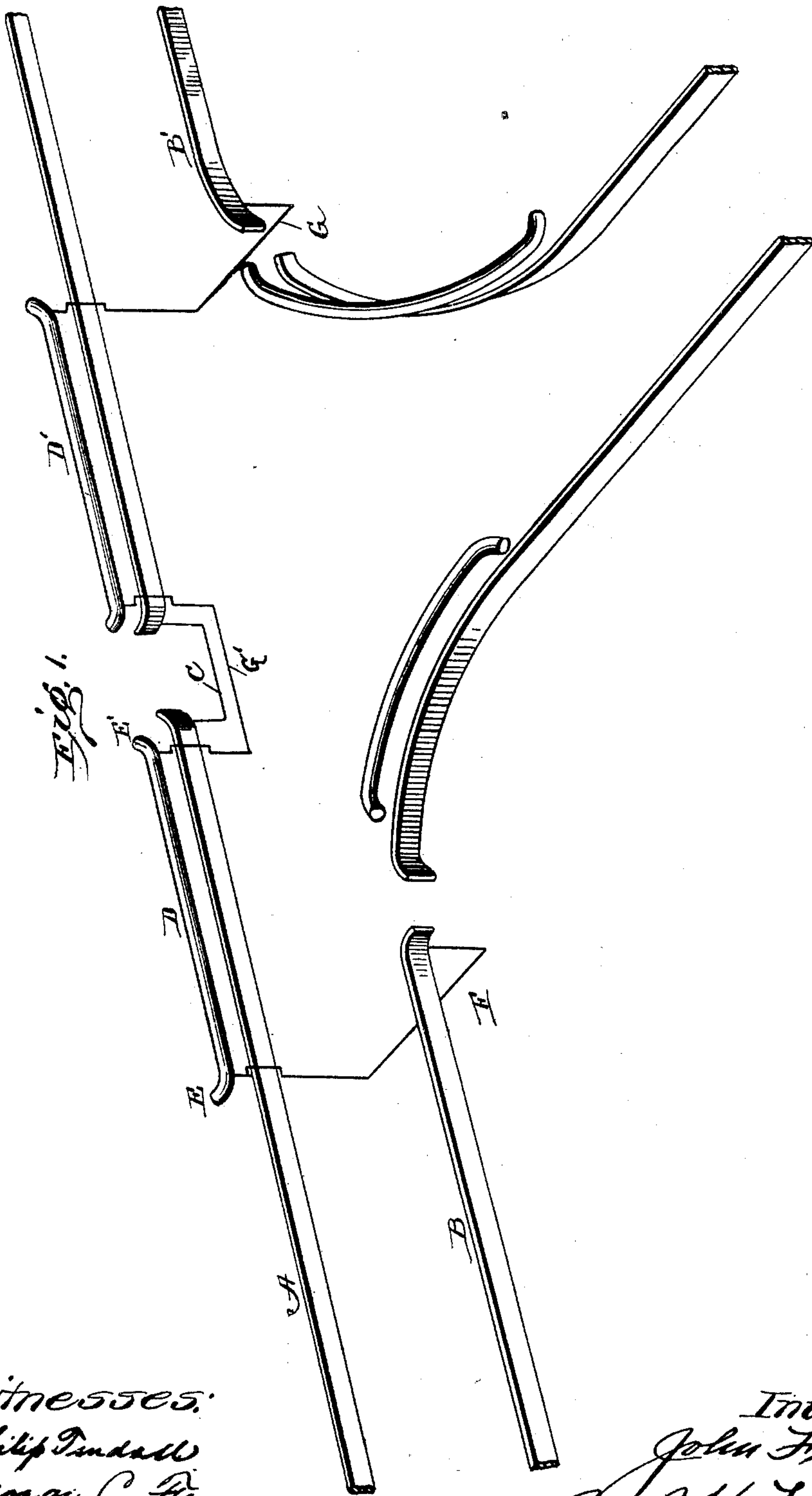
J. FLOYD.

UNDERGROUND ELECTRIC CONDUCTOR FOR STREET RAILWAYS.

(No Model.)

(Application filed Nov. 21, 1900.)

3 Sheets—Sheet 1.



Witnesses:

Philip Tindall

George C. Howe.

Inventor

John H. Floyd

By A. H. Fowler  
Atty.

**No. 679,615.**

**Patented July 30, 1901.**

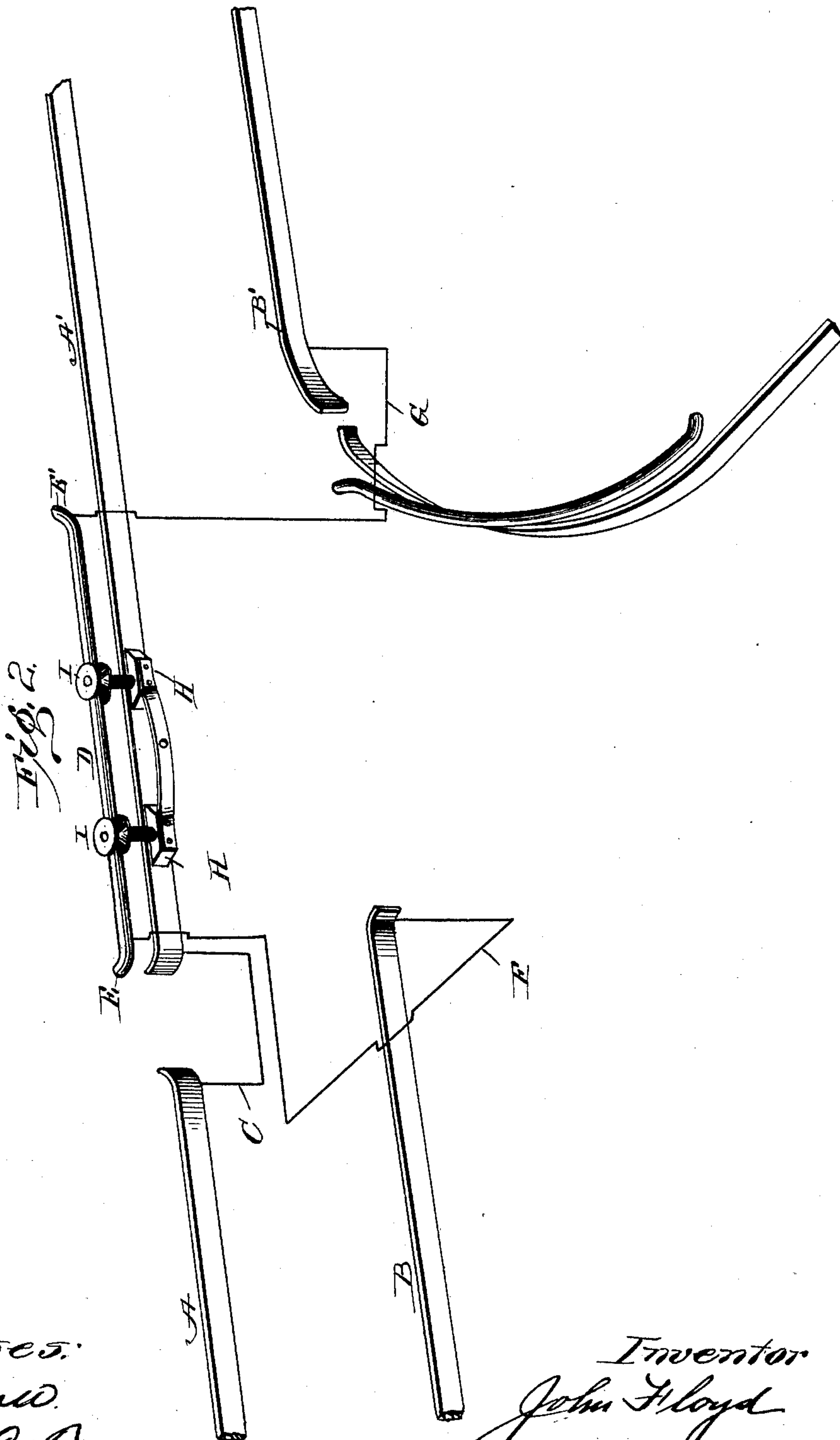
**J. FLOYD.**

# UNDERGROUND ELECTRIC CONDUCTOR FOR STREET RAILWAYS.

(No Model.)

(Application filed Nov. 21, 1900.)

**3 Sheets—Sheet 2.**



Witnesses:  
Philip Tinsall.  
George C. Fouse.

Inventor  
John Floyd  
By O. H. Fowler  
Atty.

No. 679,615.

Patented July 30, 1901.

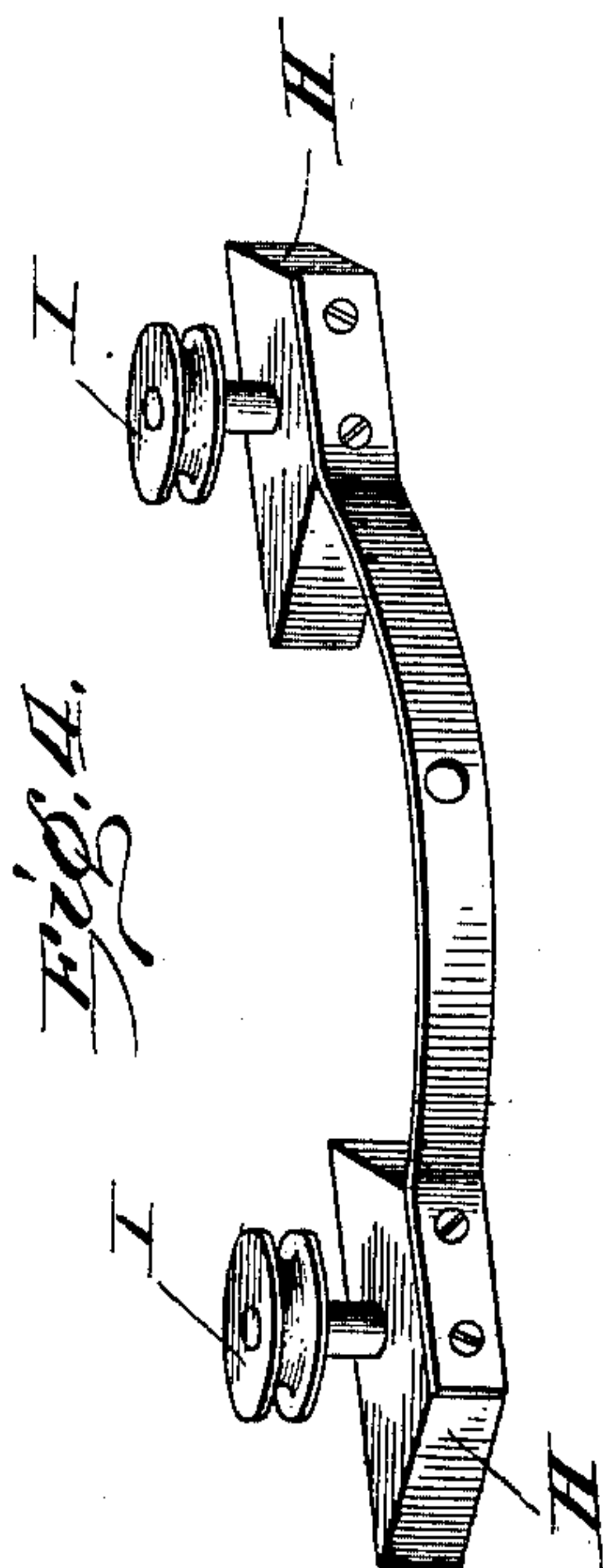
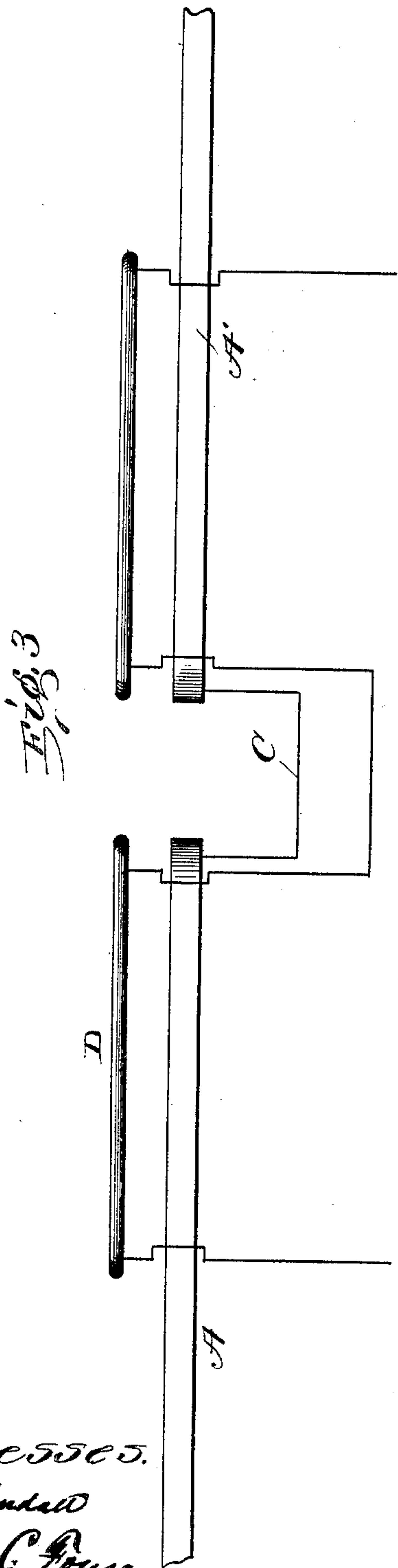
J. FLOYD.

UNDERGROUND ELECTRIC CONDUCTOR FOR STREET RAILWAYS.

(No Model.)

(Application filed Nov. 21, 1900.)

3 Sheets—Sheet 3.



Witnesses.  
Philip Tindall  
George C. Howe

Inventor  
John Floyd  
By A. H. Fowler  
Atty



# UNITED STATES PATENT OFFICE.

JOHN FLOYD, OF PHILADELPHIA, PENNSYLVANIA.

## UNDERGROUND ELECTRIC CONDUCTOR FOR STREET-RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 679,615, dated July 30, 1901.

Application filed November 21, 1900. Serial No. 37,267. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN FLOYD, a citizen of the United States of America, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Underground Electric Conductors for Street-Railways, of which the following is a specification.

10 This invention relates to electric conductors, and more particularly to that class known as "underground" electric conductors for street-railways.

One object of the invention is to provide an underground electric conductor for street-railway systems in which there is a continuous current adapted to be taken by the controller at any point along the conductors, and more particularly at those points known as "cut-outs" and "switches."

Another object of this invention is to so construct or arrange the conductors for underground-electric-railway systems that it will not necessitate the shutting off of current in passing over crossings, switches, and the other cut-outs, a system by which the power and light would be always retained and one by which the car would be moved gently over the cut-out and not by the momentum of the car, which is the case in the present systems now in use.

With these ends in view and such other objects as may hereinafter appear my invention consists of certain parts and details and the combinations, arrangements, and construction of the same, as will be more fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of a double switch for underground-electric-railway systems embodying my invention. Fig. 2 is a perspective view of a single switch for underground-electric-railway systems embodying my invention. Fig. 3 is an enlarged detail view of a portion of a conductor-rail, illustrating the supplementary rail or wire in its relative position thereto. Fig. 4 is a perspective view of the contact-block and trolley-wheel.

Referring by letters to the drawings, A and A' represent the positive rails, and B and B' the negative rails, the positive rails being connected by a looped cable C at the point of cut-out, which is the ordinary arrangement in the construction of underground-electric-railway systems. Arranged or situated above the positive rail A is a supplementary negative rail or wire D, which may be braced or held in position in any desirable manner and insulated from the fasteners by any of the usual methods. The ends of this rail or wire are curved, as shown at E and E', in order that the contact block or wheel may readily engage the same and glide smoothly thereon. The negative rail B terminates within a short distance of the cut-out at a point directly opposite the end E of the supplementary rail D and is connected thereto by a looped cable F, which transmits the current to the supplementary rail, through which it passes to the point E', whence it passes through the cable G', connecting the supplementary rail D to the supplementary rail D'. The current travels through the rail D' to the cable G, through which it passes to the negative rail B', thus completing the circuit.

In Fig. 2 the negative rail B terminates within a short distance of the cut-outs at a point directly opposite the end E of the supplementary rail and is connected thereto by a looped cable F, which transmits the current to the supplementary rail, through which it travels to the point E', whence it passes through the cable G, connecting the end E' of the supplementary rail to the negative rail B', thus completing the circuit and providing means whereby the controller may be operative at any point along the line.

In carrying my invention into operation I have found it necessary to provide the traveling contact or plow with an additional set of contact-blocks or trolley-wheels adapted to engage the supplementary rail or wire, and in providing such a plow it is necessary that there should be a negative and positive contact-block on each side, one to rub against the negative or positive conductor-rail and the other to engage the negative or positive supplementary rail in order to complete the circuit and propel the car.

In a previously-allowed application, Serial



No. 14,538, filed April 27, 1900, allowed July 19, 1900, I have provided a plow with four contact-blocks adapted to overlap crossings and similar cut-outs. This form of plow provided  
5 with the additional contact blocks or wheels, as shown in Figs. 2 and 4, in which H represents the contact-block adapted to rub against the conductor-rail, and I the additional contact block or wheel adapted to en-  
10 gage the supplementary rail or wire, is found to be the better form, though other forms of plows may be employed without departing from or sacrificing any of the advantages of this invention.

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

1. In an underground-electric-railway system, a cut-out having the negative and positive  
20 conductor-rails arranged upon one side of the conduit, substantially as shown and described.

2. In an underground-electric-railway system, a cut-out having negative and positive  
25 rails upon one side of the conduit, one of the rails being continuous, the other being connected by cables to oppositely-disposed rails, which are parallel to the continuous rail, substantially as shown and described.

30 3. In an underground-electric-railway system, the combination with the conductor-rails, a supplementary rail, the said supplementary rail mounted in the conduit above

one of the conductor-rails, and of cables connecting the said supplementary rail to the  
35 other conductor-rail, substantially as shown and described.

4. In a switch for underground-electric-railway systems, in combination with the conductor-rails, of a supplementary rail, the  
40 said supplementary rail mounted above one of the conductor-rails, and of cables connecting the ends of the supplementary rails to the other conductor-rail, substantially as shown and described.

45 5. In a switch for underground electric railways, of conductor-rails, one of the conductor-rails being cut out, of a supplementary rail arranged above the other conductor-rail opposite the said cut-out, of cables connect-  
50 ing the ends of the said supplementary rail to the ends of the rail which is cut out, substantially as shown and described.

6. In an underground-electric-railway system, a cut-out, of a conductor-rail extending  
55 through the said cut-out, a supplementary rail arranged above the said conductor-rail, of cables connecting the ends of the supplementary rail to conductor-rails extending in opposite directions yet parallel with respect  
60 to the first-mentioned conductor-rail, substantially as shown and described.

JOHN FLOYD.

Witnesses:

M. M. TEMPLETON,

PAUL R. BROWN.