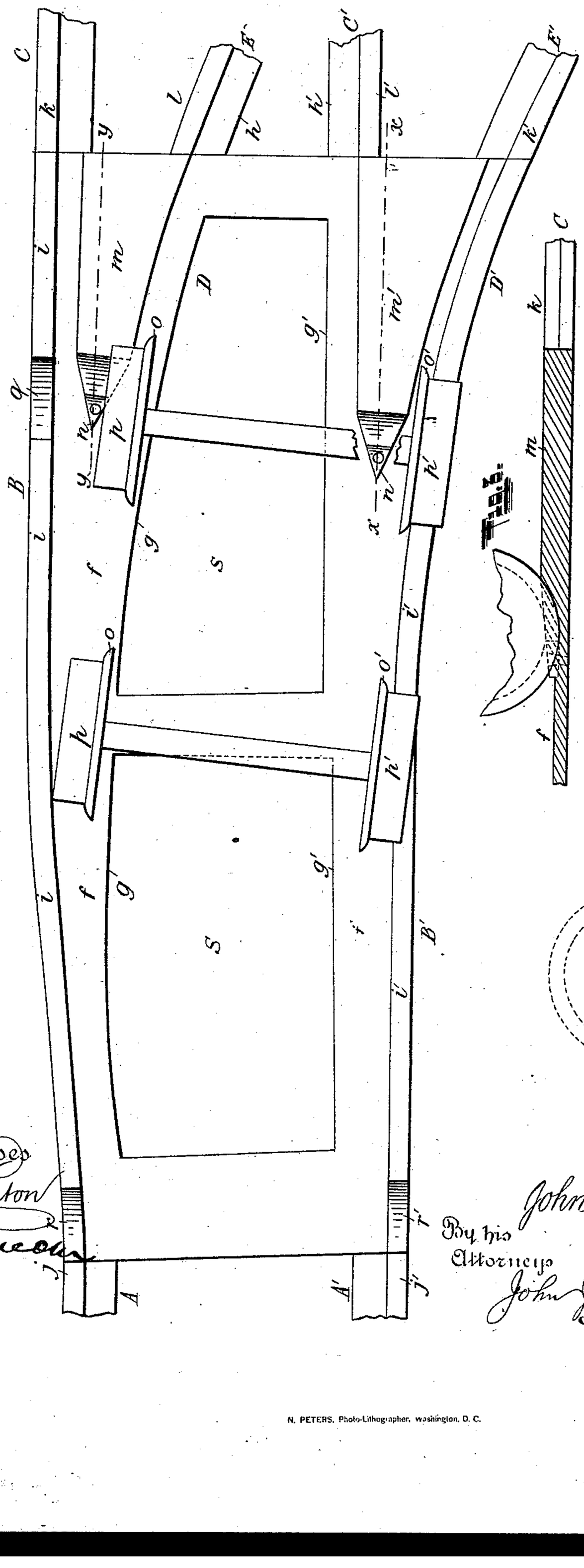
(No Model.)

2 Sheets—Sheet 1.

J. HOPE, Jr.

STREET RAILWAY SWITCH FROG.

No. 376,479. Patented Jan. 17, 1888.



Witnesses
Will't Norton
C. P. Lincoln

Inventor
John Hope, Jr.
By his
Attorneys
John J. Hasted & Son.

(No Model.) 2 Sheets—Sheet 2.

J. HOPE, Jr.

STREET RAILWAY SWITCH FROG.

No. 376,479. Patented Jan. 17, 1888.

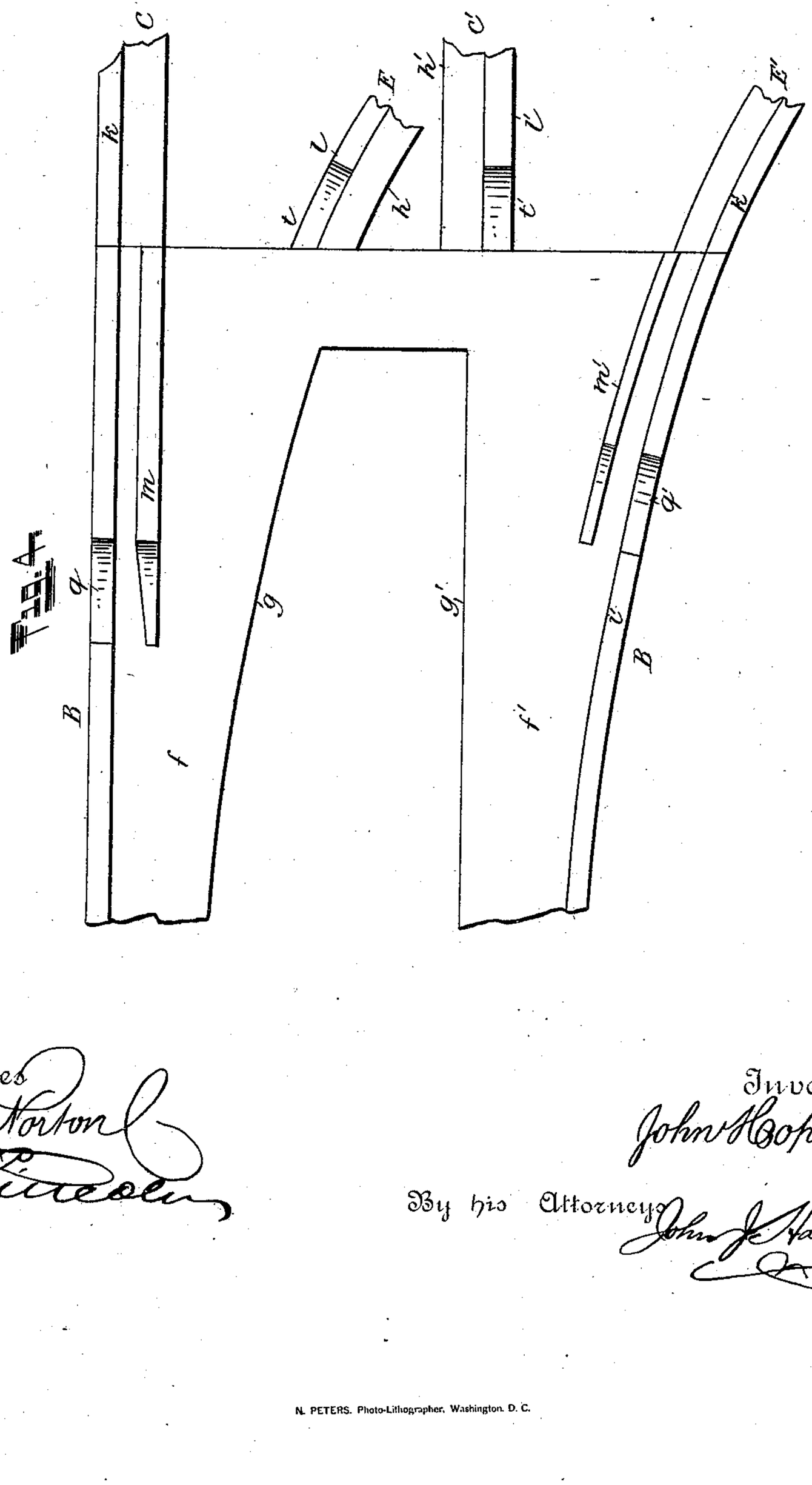


FIG. 1.

Witnesses
Wills Norton
C. P. Lincoln

Inventor
John Hope, Jr.

By his Attorneys
John J. Halsted & Son

UNITED STATES PATENT OFFICE.

JOHN HOPE, JR., OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO WILLIAM V. DABOLL, OF SAME PLACE.

STREET-RAILWAY SWITCH-FROG.

SPECIFICATION forming part of Letters Patent No. 376,479, dated January 17, 1888.

Application filed March 31, 1887. Serial No. 233,125. (No model.)

To all whom it may concern:

Be it known that I, JOHN HOPE, Jr., of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Street-Railway Switches and Frogs; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to furnish a stationary switch for street-railways that will avoid all necessity for movable parts, which are liable to get out of order or broken, and thus render the switch inoperative; and my invention consists in such a switch or double frog, all as more particularly described and set forth.

In the accompanying drawings, Figure 1 illustrates a plan view of my stationary switch of two frogs, showing the position of the car-wheels when the forward ones have just entered upon the branch track. Fig. 2 is a section in the line *x x* of Fig. 1. Fig. 3 is another section in the line *y y* of Fig. 1, and Fig. 4 is a modification.

Similar letters represent like parts in all the figures.

A A′ are the rails of the main or straight track, which adjoins the smaller ends of the two frogs B B′. These frogs increase gradually in width from the smaller to the larger end, the flange or tread *i* of the frog B being curved slightly outward to facilitate the guiding of the wheels onto the continuation C of the straight track, which merges into said track C, and the straight branch of the frog B′ merging into the continuation C′ of the main rail A′, the curved branches D D′ of the frogs B B′ merging into the rails E E′ of the side track. The lower portions, *f f′*, of the frogs gradually increase in width from their smaller to their larger ends, the inner edge *g* of the part *f* merging into the inner edge *h* of the branch rail E, while the inner edge *g′* of the part *f′* merges into the inner edge *h′* of the straight rail C′. The outer raised portion or tread *i* of the frog B is continuous with the flanges or treads *j* and *k* of the main rail A and its continuation C, while the outer flange or tread *i′* of the frog B′ is continuous with the treads *j′* and *k′* of the rails A′ and E′. The treads *l* and *l′* of the rails E and C′ start from the projecting guides or frogs proper, *m m′*, and these guides gradually incline from their apices to a few inches beyond the same. These inclines are for the purpose of preventing the parts *p p′* of the wheels from striking abruptly against said projections, and thus injuring them as well as the wheels. The treads *i i′* are also slightly beveled or inclined at the parts *q q′* opposite the inclines of the guides *m m′* to correspond with the inclines on said guides, and the treads *i i′* are also correspondingly inclined at *r r′* from a few inches from the smaller ends of the frogs to said ends, the parts of treads *i i′* between said inclines *q r* and *q′ r′*, respectively, being lower than the treads of the main rails, so as to allow the car-wheels to ride over the frogs without the parts *p p′* resting upon said treads. This is for the purpose of sliding the wheels readily and with as little friction as possible on the parts *f f′* of the frogs and from one track to another.

The projecting guides, instead of being triangular, as shown in Figs. 1, 2, and 3, may be made as shown in Fig. 4, their object being simply to guide the wheels upon the tracks. In such case the ends *t t′* of the treads *l l′* should incline similarly to the ends of the projecting guides *m m′*, and for the same purpose.

The entire double frog or stationary switch is preferably cast in one piece, the lower parts, *f f′*, of the rails being formed from part of the base of the casting, as shown in the drawings. This construction avoids the necessity of close and careful calculations in the matter of getting the curves of the tracks to correspond, and thus avoids the expense of a skilled workman. It also allows of the frogs being put down in at least one-fourth the time required to put down two separate frogs.

To make the guides *m m′* more durable and better able to withstand the wear from the car-wheels, a portion, *n*, of the guides at and beyond their apices may be made of steel welded or riveted into the iron of the frogs; but I prefer to make the entire casting of chilled iron.

If a car be approaching the switch and it be

desired to turn onto the side track, the horses are guided to the right, and when the car reaches the frogs the flanges *o' o'* of the right-hand wheels will be pressing upon and guided by the side of the treads or flanges *j' i' k'*, and the parts *p'* of the wheels still resting on these treads, while the flanges *o* of the left wheels will have left the treads *j i* of A and B. The left wheels will run for a short distance on their flanges *o* over the part *f* of the frog B, until these wheels are guided by their flanges and the inclined projection *m* so that the part *p* of the wheels rides upon the tread *l* of the rail E. The part *p'* of the right-hand wheels will at the same time ride over the tread *k'* of the side rail, E'.

If it be desired to run the car on the straight track, the horses are guided to the left, so that the flanges *o o* of the left wheels will hug the treads *j i k* of the left track and frog. The flanges of the right wheels will run over the part *f'* of the frog B', and the part *p'* of the right wheels will be guided by the projection *m'* onto the tread *l'* of the rail C'.

By my invention I avoid all necessity for movable tongues and other parts which are liable to get out of order or broken, and no deep and narrow grooves are needed, in which dirt and stones may collect, and thus render the switch inoperative, or in which carriage-wheels may be caught and broken. As my construction has no movable parts, the necessity of the services of a workman for keeping the switch in repair and oiling, cleaning, salting it, &c., is avoided.

Some other great advantages of my invention are its simplicity of construction, its very moderate cost, and its entire practicability.

Whenever the casting is made in one piece, there is no necessity of using nails or spikes to fasten it down, for the dirt and stones of the roadway can fill up the open spaces *s s* of the casting and hold the same firmly in place.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A switch-frog for a street-railway, having its lower portion, upon which the flange of the wheel is adapted to run, made with its upper surface on the same level throughout its entire length and gradually widened until it reaches the projecting guide or frog proper, said guide being gradually inclined from its apex to the higher portion of the same, substantially as shown, and for the purposes described.

2. The two switch-frogs of a street-railway, each having its lower portion, upon which the flange of the wheel is adapted to run, made with its upper surface on the same level throughout its entire length and gradually widened until it reaches the projecting guide or frog proper, said guide being gradually inclined from its apex to the higher portion of the same, the incline of one frog merging into the higher portion of the branch rail, and the incline of the other frog merging into the higher portion of a continuation of the main rail, all substantially as shown, and for the purposes described.

3. The double switch-frog or stationary switch, all cast in one piece, each frog having its lower portion, upon which the flange of the wheel is adapted to run, made with its upper surface on the same level throughout its entire length and gradually widened until it reaches the projecting guide or frog proper, said guide being gradually inclined from the apex to the higher portion of the same, the incline of one frog merging into the higher portion of the branch rail, and the incline of the other frog merging into the higher portion of a continuation of the main rail, all substantially as shown, and for the purposes described.

4. A switch-frog for a street-railway, having the higher portion or flange of the same lower than the flange of the main rail, and having its lower portion gradually widened until it reaches the projecting guide or frog proper, said guide being gradually inclined from its apex to the higher portion of the same, and the flange of the frog also being gradually inclined opposite to the incline of the projecting guide to correspond with said incline, all substantially as shown, and for the purposes described.

JOHN HOPE, JR.

Witnesses:
DAVID G. HASKINS, JR.,
PENNINGTON HALSTED.