

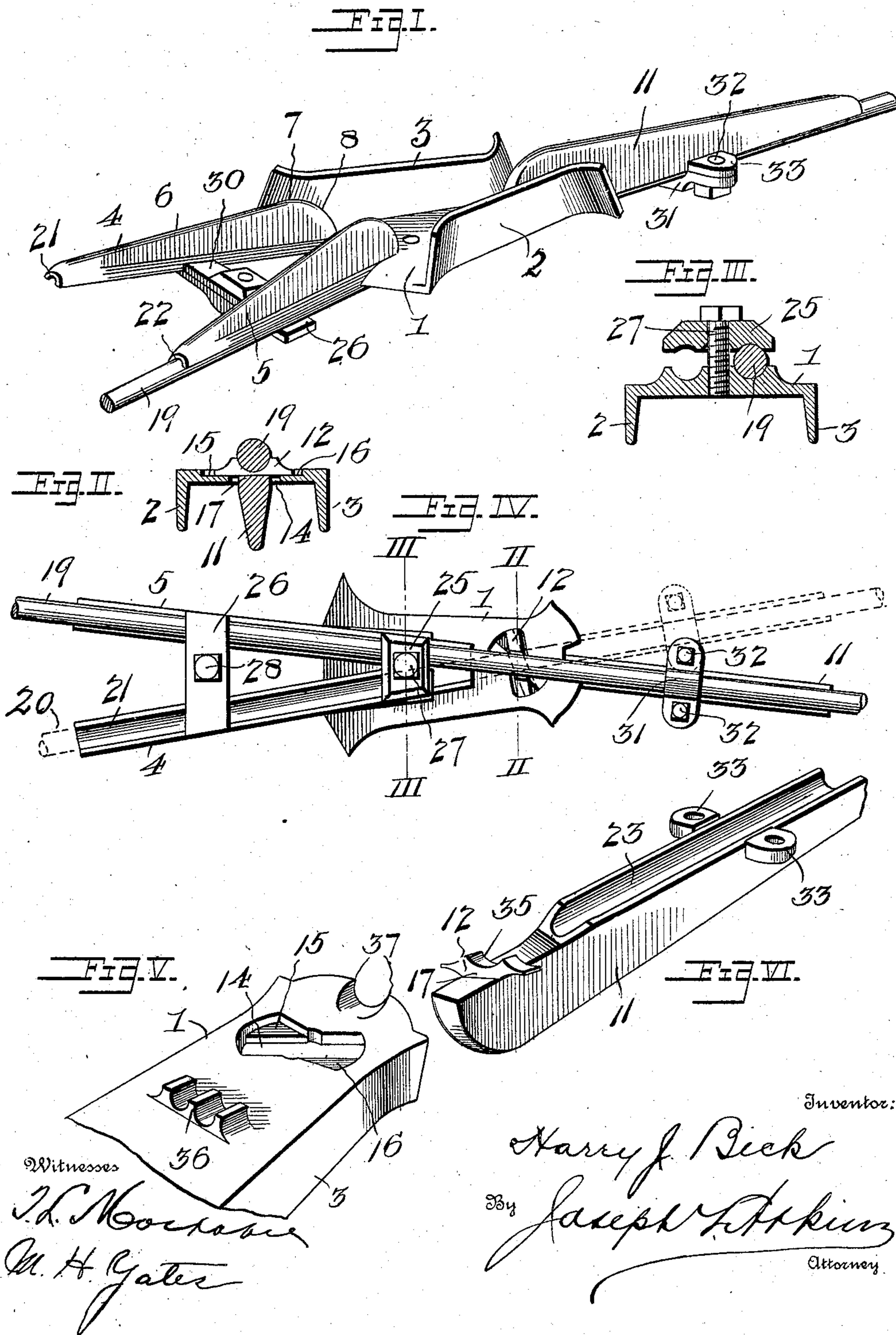
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H. J. BECK.

LINE WIRE SWITCH FROG FOR ELECTRIC RAILWAYS.

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UNITED STATES PATENT OFFICE.

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LINE-WIRE SWITCH-FROG FOR ELECTRIC RAILWAYS.

No. 867,939.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed January 7, 1905. Serial No. 240,008.

To all whom it may concern:

Be it known that I, HARRY J. BECK, of Winburne, county of Clearfield, State of Pennsylvania, have invented certain new and useful Improvements in Line-Wire Switch-Frogs for Electric Railways, of which the following is a specification.

My invention relates to devices intended to guide with precision the trolley or contact-maker of an electric vehicle having fixed lines of travel to or from any one of a plurality of branch lines, which may be selected at will, from or to any single or common main line. Such devices are conveniently designated switch frogs in the arts to which they relate.

The object of my invention is to produce an improved frog of the kind above referred to, in which provision is made for conveniently shifting, at will, the angle of inclination of the main line splice-piece or arm into alinement with any one of a plurality of branch lines. Moreover, I provide for convenience or making repairs, for shifting or switching and other purposes, means for securely fastening said adjustable splice-piece or arm to the frog plate and for disengaging it therefrom at will. Recognizing that however convenient and desirable it is to render the arm of the frog both adjustable and detachable, I am aware of the necessity of rendering it stiff, rigid and stable in service and therefore provide special means for firmly fixing the parts against accidental displacement in operation and against disarrangement, in practice, through side pull upon the frog.

What constitutes my invention will be hereinafter specified in detail and succinctly set forth in the appended claims.

In the accompanying drawing, which constitutes a part of this application: Figure I is a perspective view of my frog inverted but otherwise having its parts assembled as in operation. Fig. II is a transverse section on the line II—II of Fig. IV looking towards the adjustable arm. Fig. III is a section on the line III—III of Fig. IV. Fig. IV is a top plan view of my frog showing it as in service on the line wire, one position of the arm thereof being shown in full lines, with the line wire, to which it is secured, in full lines, and the other position of the arm, with its line wire attached, being shown in dotted lines. Fig. V is a perspective view of one end of the back of the frog plate with a slight modification, showing the tongue-slot and guide lugs thereof, the tongue being removed from the slot. Fig. VI is a perspective view of the tongued arm detached from but in juxtaposition to the frog plate shown in Fig. V.

Referring to the numerals on the drawing, 1 indicates the frog plate or body-part of my device which upon its under side, shown bottom upwards in Fig. I, is provided with the usual lateral guards 2 and 3.

4 indicates one of the branch-line splice-pieces and 5

another, each being provided with any ordinary or preferred contour for the traveling over it of the trolley whose function it is to guide. I prefer the contour of each of the splice-pieces to be substantially identical and composed of the gradual inclined plane 6 leading from the line wire to the highest point 7 and a snubbed end 8 leading from the point 7 to the face of the plate 1. The preference expressed for the contour specified immediately above is entertained because it is believed to contribute effectually to the performance of the function for which each of the splice-pieces is designed, namely, to raise gradually the trolley wheel from the line wire upon which it ordinarily travels until its flange may ride upon the face of the frog plate 1 and cross it between the guards 2 and 3 to the splice-piece set opposite to and in alinement with the splice-piece which the trolley has last left before it passes over the frog-plate 1.

I prefer to make the frog-plate and its branch-wire splice-pieces, 4 and 5 for example, in one integral casting of brass or other suitably conductive metal. The guards 2 and 3 being separated at one end of the plate 1 by a space sufficient to accommodate the branch-line splice-pieces with which said plate is provided, the opposite ends thereof converge to a narrowness sufficient to operatively accommodate between them an adjustable splice-piece, which although substantially identical in contour with the splice-pieces 4 and 5, yet being distinguishable from them in respect to its mobility, I designate for convenience the arm 11.

The function of the adjustable arm 11 in the form of embodiment herein illustrated, demands that the said arm shall be adjustable into either of the two positions, indicated, by full and dotted lines respectively, in Fig. IV of the drawing, that is to say, into alinement with the splice-piece 4 or the splice-piece 5; but my invention contemplates the employment of an arm 11, manually detachable as well as manually adjustable. By the terms "manually detachable" and "manually adjustable" I refer to means for detachment and means for adjustment which may be operated by the use of the hands alone without the aid of tools. To meet that condition, I provide mechanism which will preserve the adjustable feature and also permit separation of the parts at will, and prefer for that purpose to employ upon the arm 11 a tongue 12 adapted to engage the defining sides of a tongue-slot 14 in the plate 1, preferably nearer its narrower end. The shapes of the tongue 12 and tongue-slot 14 may be varied at will, provided a proper correspondence between them be preserved. In order to preserve in connection with the connecting devices specified the desired adjustability of the arm 11, the tongue 12 may be set at an angle slightly oblique to the longitudinal axis of said arm, and the slot 14 is then correspondingly disposed with respect to the plate 1. In

order to provide for the employment of a suitable weight of metal, both in the plate 1 and in the tongue 12, the thickness of the plate 1 may be somewhat reduced by oppositely disposed sectoral recesses 15 and 16, thereby
 5 permitting a corresponding increase of the size of the tongue without distortion of its relative proportions and the several functions required of it. Incidentally the opposite side walls of the recesses 15 and 16 respectively, serve as stop members to the oscillation of the arm
 10 about the stud support 17 of the tongue 12 as a pivotal connection.

Among the functions of the tongue 12 the one above alluded to especially is that of assisting in the preservation of the alinement between the respective splice-
 15 pieces 4 and 5 and the arm 11, after alinement has been effected by adjustment of the several parts of the device, and particularly against a side pull upon the frog such as is liable in practice to occur in consequence of unequal distribution of tension upon the line wires that
 20 support it.

In order to accommodate the line-wires, indicated by reference numerals 19 and 20 respectively, I provide in the back of each of the splice-pieces, the arm 11 included, a longitudinal groove or channel indicated in
 25 the several splice-pieces respectively by the numerals 21, 22, and 23. Into these channels, which in the assembled device are disposed substantially in the same plane, the respective line-wires are laid and secured therein as by yokes 25 and 26, fastened across the splice-
 30 pieces 4 and 5 as by screw-bolts 27 and 28 respectively, entering respectively threaded apertures provided for them respectively in the plate 1 and bridge 30 extending between the members 4 and 5.

One or the other of the line wires, according to the position to which the arm 11 is adjusted, operates as a
 35 cross-over and alining member between the arm 11 and the splice-member with which said arm is alined, and such line wire is, in service, secured also to the arm 11 as by a split collar 31 and screw bolts 32 entering threaded
 40 apertures provided for them respectively in lugs 33 projecting respectively from opposite sides of said arm.

From the foregoing description it will appear to the mind of a mechanical expert not only that any tendency to disturb the angle of inclination between the
 45 arm 11 and the plate 1 when adjusted and fixed by the aforesaid means will be resisted by a force proportionate to the strength and rigidity of the line wire that alines the fixed and movable splice-pieces respectively, but also, that such resistance may be effectively increased by
 50 diminishing the distance between the bearing points of contact made by the alined member with said splice-pieces. For that reason, I prefer to provide the top of the tongue 12 projecting through the back of the plate 1,

with a line-wire-engaging-groove 35 which serves to reduce and confine to points between the tongue 12 and
 55 yoke 25 the leverage upon the line wire that may be developed, for example, by side pull upon the frog. If desired an intermediate line-wire chair 36 upon the back of the plate 1 (see Fig. V) may be employed. But if desired, the line-wire-engaging-grooves 21 and 22 and
 60 23 respectively may be made continuous, save for the presence of the recesses 15 and 16, by extension of the grooves 21 and 22 into juxtaposition to the tongue slot 14, by providing the groove 35 in the tongue and by providing a grooved lip 37 upon the plate adjacent to the
 65 arm 11.

Assuming that the mode of operation of my device will be, to one skilled in the art, apparent from the foregoing specification, I deem it unnecessary to add thereto more than the statement that I do not herein intend
 70 to limit my invention to mere details of construction, but intend to reserve the right to modify and vary the same at will, within the scope of the principle of my invention.

What I claim is:

1. In a switch frog the combination with its body part and a plurality of splice-pieces, one of which is movable and provided with a pivotal connection with the body part, of means of line wire connection with said splice-pieces including line-wire engaging means upon said movable piece, substantially at its aforesaid point of pivotal connection. 75 80

2. In a switch frog the combination with its body part and a plurality of splice-pieces, one of which is movable and provided with a pivotal connection with the body part, of means of line wire connection with said splice-pieces including line-wire engaging means upon said movable piece substantially at its aforesaid point of pivotal connection, and an intermediate line wire chair upon the body part. 85 90

3. In a switch frog the combination with a body part provided with a plurality of relatively movable splice-pieces and means of effecting line wire connection with said pieces, of a line wire chair upon said body part, between said pieces substantially as and for the purpose specified. 95

4. In a switch frog the combination with its body part and an arm, of means for adjustably and detachably securing said members together, said means consisting of a corresponding obliquely disposed slot and tongue connection located respectively upon either of the members aforesaid. 100

5. In a switch frog the combination with its body part provided with a slot and with oppositely disposed sectoral recesses as shown, of an arm and a tongue upon the arm adapted to enter said slot and by engagement with the side walls thereof, to separably unite said members. 105

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HARRY J. BECK.

Witnesses:

FRANK F. IRWIN,
 ANNA B. SCOTT.