

**No. 667,073.**

**Patented Jan. 29, 1901.**

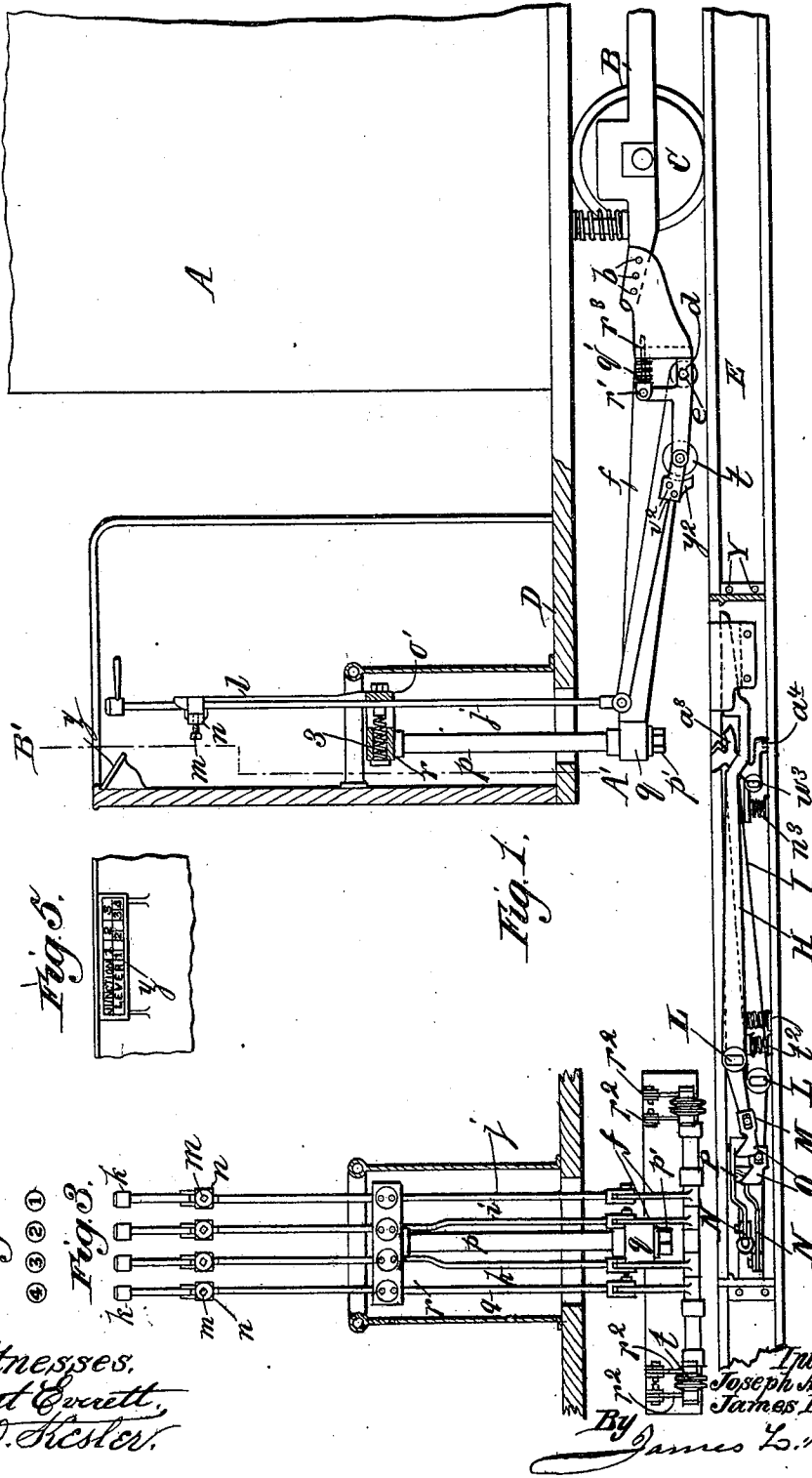
**J. A. & J. DIXON.**

## SWITCH TONGUE OPERATING MECHANISM FOR TRAMWAYS.

(Application filed Sept. 5, 1900.)

(No Model.)

**3 Sheets—Sheet 1.**





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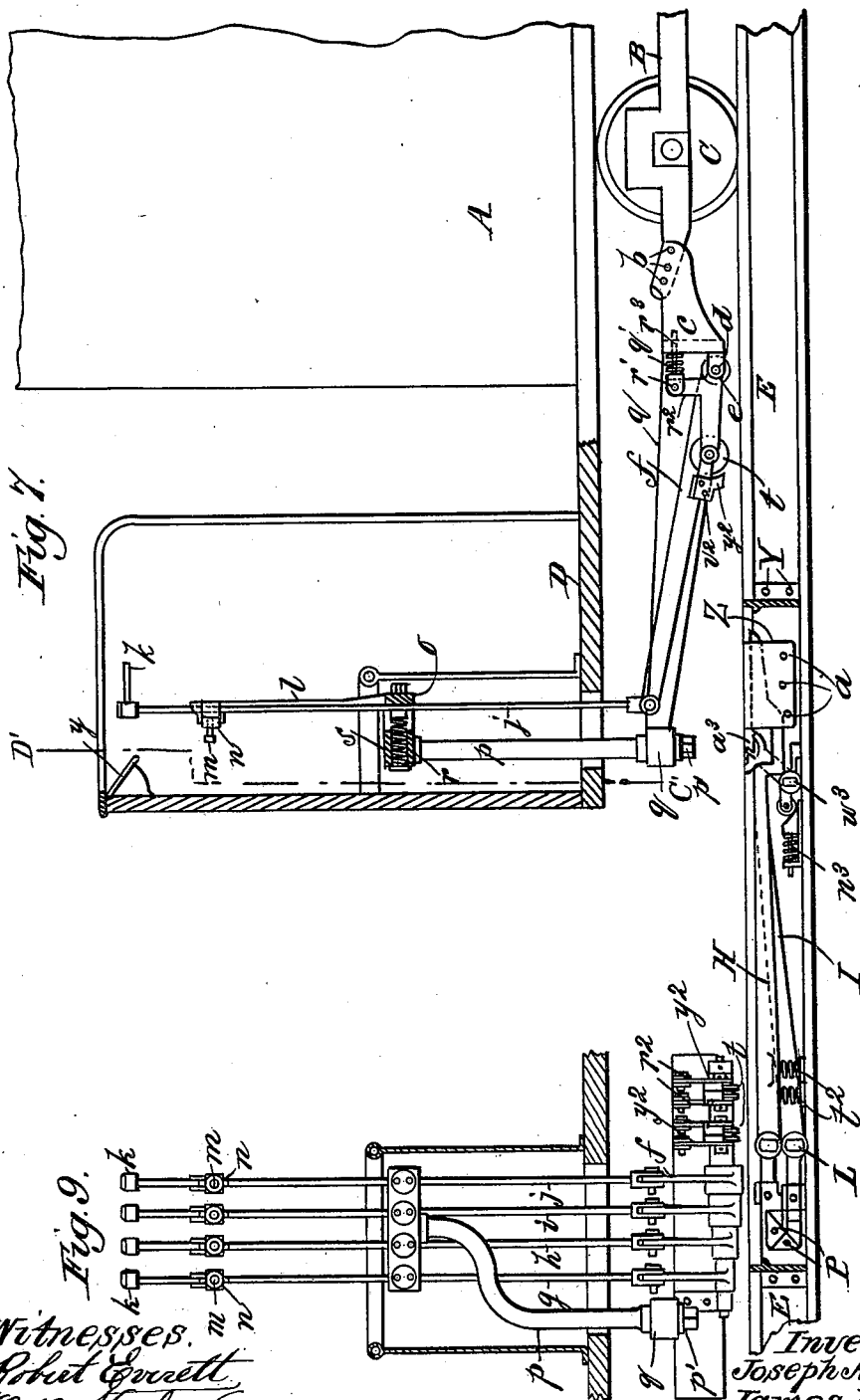
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**3 Sheets—Sheet 3.**



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# UNITED STATES PATENT OFFICE.

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## SWITCH-TONGUE-OPERATING MECHANISM FOR TRAMWAYS.

SPECIFICATION forming part of Letters Patent No. 667,073, dated January 29, 1901.

Application filed September 5, 1900. Serial No. 29,099. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH ABRAHAM DIXON, mechanic, and JAMES DIXON, metal-planer, subjects of the Queen of England, residing at 2 Reformation street, Folds road, Bolton, in the county of Lancaster, England, have invented certain new and useful Improvements in Switch - Tongue - Operating Mechanism for Tramways, of which the following is a specification.

This invention refers to improvements in or relating to the means for automatically operating the switch-tongues of tramways from the cars or vehicles traveling thereon and apparatus connected therewith; and it consists in disposing on the sides of the tram-rails suitable levers by means of pins or centers, one end of each being connected to each switch-tongue by means of rods, levers, and pins, the other ends of the pivoted levers extending into a slot or receptacle on the side of the tram-rails. The rods and levers extending across the tram-track are protected by metallic or other casings or covers. One end of each pivoted lever is provided with an incline, with which operate bowls or rollers or their equivalents disposed on the lower ends of sliding rods mounted in guides attached to levers pivoted to the under side of the tram cars or vehicles, the said levers being connected by rods, adjustable or otherwise, to hand-levers suitably mounted in fixings on the front or leading end of the car or vehicle. The hand-levers are provided with swiveling centers and springs to allow of their being locked in position on stationary catches secured in any convenient or suitable position on the front or leading end of the car or vehicle. Immediately the hand-levers are released from the stationary catches the levers and their adjuncts carrying the bowls or rollers are placed in position by their own weight and the aid of the aforesaid springs to operate the pivoted levers and actuate the switch-tongues. The number of hand-levers employed is determined according to the greatest number of switch-tongues disposed on the route in which the car or vehicle is intended to travel. The hand-levers are each numbered and operate in conjunction with an index or dial, stating the number of the switch-tongues and their corresponding levers.

Figure 1 is a part longitudinal and sectional elevation of the leading end of a car or vehicle employed on tramways, together with a side elevation of the track provided with our improvements in or relating to the means for automatically operating the switch-tongues of tramways from the cars or vehicles traveling thereon and apparatus connected therewith; Fig. 2, a part sectional plan of tramway-track, showing our said invention disposed on each side of the same; Fig. 3, a front elevation of part of car or vehicle through line A' B' in Fig. 1; Fig. 4, a plan of top side of rods for operating levers pivoted to the under side of the car or vehicle; Fig. 5, a front view of index mounted on front of car or vehicle; Fig. 6, a part side elevation of cover for metallic casing located between the tramway-rails. Fig. 7 is a part longitudinal and sectional elevation of the leading end of a car or vehicle employed on tramways, together with a side elevation of the track provided with our improvements in or relating to the means for automatically operating the switch-tongues of tramways from the cars or vehicles traveling thereon and apparatus connected therewith disposed on each side of a single line or rail forming the track; Fig. 8, a part sectional plan of tramway-track, showing our invention disposed on each side of a single line or rail; and Fig. 9, a front elevation of part of the car or vehicle through line C' D' in Fig. 7.

In order that our invention may be readily and clearly understood, we will now specifically describe the drawings, wherein like letters of reference indicate corresponding parts throughout the several views, and in which—

A represents so much of a tramway car or vehicle as is necessary to illustrate our invention for improvements in or relating to the means for automatically operating the switch-tongues of tramways from the cars or vehicles traveling thereon and apparatus connected therewith; B, the framework of car or vehicle; C, the wheel of car or vehicle; D, the platform of car or vehicle; E, the tramway-rails, and G the switch-tongues.

In all the figures the same letters are employed to indicate corresponding parts.

On the outsides of the tramway-rails E are mounted the operating-levers H, I, J, and K

by means of the pins or centers L, the end M of each of the aforesaid levers being provided with the inclines O, operating in conjunction with the inclines P on the ends of the switch-tongue-shifting or bell-crank levers N, secured to the centers R, held loosely in any convenient manner in the frame S of box form. To the upright centers R are attached the movable points or junctions G. To the switch-tongue-shifting or bell-crank levers N are secured the rods T by the pins or centers U, the other ends of the rods T being secured to the slides V, located one above the other in the metallic or other casing W, disposed between the tramway-rails E, as shown in Fig. 2. The other ends of the pivoted levers H, I, J, and K extend along the side of the tramway-rails E into the slot or receptacle X, secured to the outside of each tram-rail E by the bolts Y. The upper side of each receptacle X is covered by the metallic plate *x*. The outer ends of the levers H, I, J, and K are held and guided in their up and down motions by the guide Z, secured to the tramway-rails E by the bolts *a*. The levers H, I, J, and K after being operated or depressed by the bowls or rollers *t* on the levers *f* are reset by the spiral springs *t*<sup>2</sup> immediately the bowls or rollers *t* have passed clear of the same. To the framework B on the under side of the tram cars or vehicles A is secured by the bolts *b* the fixing *c*, extending across the tram car or vehicle A, to which is attached the shaft or center *d*, held in the bearings *e*. On the shaft or center *d* are mounted the levers *f*, to the outer end of which are pivoted the rods *g*, *h*, *i*, and *j*, extending upward sufficiently high so as to be within a workable position for the attendant, the upper ends of the said rods being provided with the handles *k* for operating the same. To the rods *g*, *h*, *i*, and *j* are attached the adjustable slides *l* by means of the set-screws *m* in the boss *n*. The lower ends of the adjustable slides *l* rest or sit when not in action on the cross-bar *o'*, secured to the pillar *p*, carried by the arm *q* from the fixing *c*. The pillar *p* is secured to the arm *q* by the nut *p'*. The pillar *p* is provided at its upper end with the metallic head *r*, provided with circular or other chambers in which are disposed the spiral springs *s*, each of the latter operating against one of the aforesaid rods *g*, *h*, *i*, and *j* to maintain the same in position on the cross-bar *o'* when the lever *f* and its adjuncts are raised out of action. Immediately the adjustable slides *l* are released from the cross-bar *o'* the levers *f* and their adjuncts, carrying the bowls or rollers *t*, are placed in position by their own weight and the aid of the spiral springs *q'*, secured to the said levers *f* by the pin or center *r'*, coupling the same to the lever *r*<sup>2</sup> and pin or center *r*<sup>3</sup>, mounted loosely in the fixing *c* across the front of the tram car or vehicle A. The number of hand-levers *k* and rods employed is determined according to the number of points or junctions disposed on

the route in which the car or vehicle A is intended to travel. The hand-levers *k* are each numbered and operate in conjunction with the index or dial *z*, (shown in Figs. 1 and 5,) stating the number of point and its corresponding lever, each upright rod *g*, *h*, *i*, and *j* being correspondingly numbered, as shown in Fig. 4 on Sheet 1 of the drawings.

On both sides of one of the tramway-rails E are mounted the operating-levers H, I, J, and K by means of the pins or centers L, the end M of each of the aforesaid levers being provided with the inclines O, operating in conjunction with the inclines P on the ends of the levers N, secured to the centers R, held loosely in any convenient manner in the frame S, of box form. To the upright centers R are attached the movable points or junctions G. The other ends of the pivoted levers H, I, J, and K extend along the side of the tramway-rails E into the slot or receptacle X, as shown in Fig. 2 on Sheet 1 of the drawings, and secured to the sides of the tram-rail E by the bolts Y. The upper side of each receptacle X is covered by the metallic plate *x*. The outer ends of the levers H, I, J, and K are held and guided in their up and down motions by the guide Z, secured to the tramway-rail E by the bolts *a*. The levers H, I, J, and K after being operated or depressed by the bowls or rollers *t* on the levers *f* are reset by the spiral springs *t*<sup>2</sup> immediately the bowls or rollers *t* have passed clear of the same. To the framework B on the under side of the tram cars or vehicles A is secured by the bolts *b* the fixing *c*, extending across the tram car or vehicle A, to which is attached the shaft or center *d*, held in the bearings *e*. On the shaft *d* are mounted the levers *f*, to the outer ends of which are pivoted the rods *g*, *h*, *i*, and *j*, extending upward sufficiently high so as to be within a workable position for the attendant, the upper ends of the said rods being provided with the handles *k* for operating the same. To the rods *g*, *h*, *i*, and *j* are attached the adjustable slides *l* by means of the set-screws *m* in the bosses *n*. The lower end of each adjustable slide *l* rests or sits, when not in action, on the cross-bar *o'*, secured to the pillar *p*, carried by the arm *q* from the fixing *c*. The pillar *p* is secured to the arm *q* by the nut *p'*. The pillar *p* is provided at its upper end with the metallic head *r*, provided with circular or other chambers, in which are disposed the spiral springs *s*, each of the latter operating against one of the aforesaid rods *g*, *h*, *i*, and *j* to maintain the same in position on the cross-bar *o'* when the lever *f* and its adjuncts are raised out of action. Immediately the adjustable slides *l* are released from the cross-bar *o'* the levers *f* and their adjuncts, carrying the bowls or rollers *t*, are placed in position by their own weight and the aid of the spiral springs *q'*, secured to the said levers *f* by the pin or center *r'*, coupling the same to the lever *r*<sup>2</sup>, and pin or center *r*<sup>3</sup>, mounted loosely in the fixing *c* across the

front of the tram car or vehicle A. The number of hand-levers  $k$  and rods employed is determined according to the number of switch-tongues disposed on the route in which the car or vehicle A is intended to travel. The hand-levers  $k$  are each numbered and operate in conjunction with the index or dial  $z$ , (shown in Figs. 1 and 5 on Sheet 1 of the drawings,) stating the number of switch-tongues and its corresponding lever, each upright rod  $g, h, i$ , and  $j$  being correspondingly numbered, as shown in Fig. 4 on Sheet 1 of the drawings.

For resetting the adjustable slides  $l$  in case they have not been raised by the attendant to the position shown in Figs. 1 and 7 and it is not intended or necessary to operate a switch-tongue the levers  $r^2$  are fitted with the projecting arm  $y^2$ , secured by the bolts  $v^2$ . When the levers  $r^2$  are at their lowest position, the projecting arm  $y^2$  comes into contact with the inclined lever  $a^3$ , and as the car or vehicle A moves forward the said projecting arm  $y^2$  moves the lever  $a^3$  into a vertical position, which action raises the rods  $g, h, i$ , and  $j$  and arrests the same in the raised position by placing the lower end of each adjustable slide  $l$  onto the cross-bar  $o'$ . After the latter has been effected the lever  $a^3$  again assumes its original position by means of the spiral spring  $n^3$  and the stop or toe-ended lever  $a^4$ . The lever  $a^3$  is pivoted to the tramway-rail E by the pin or center  $w^3$ .

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. In a switch-tongue-operating mechanism for tramways, the combination with a series of switch-tongues, of a series of shifting-levers connected thereto and each provided at its free end with an incline, a series of spring-actuated levers provided at one end with an incline adapted to engage the incline of the shifting-levers for operating the same, and a series of hand-operated levers adapted to engage and operate said spring-actuated levers, causing thereby the shifting of the switch-tongues.

2. In a switch-tongue-operating mechanism for tramways, the combination with a series of switch-tongues, of a series of shifting-levers connected thereto and each provided at its free end with an incline, a series of spring-actuated levers provided at one end with an incline adapted to engage the incline of the shifting-levers for operating the same, a series of hand-operated levers adapted to engage and operate said spring-actuated levers, causing thereby the shifting of the switch-tongues, and means for automatically returning said hand-operated levers to an inoperative position.

3. In a switch-tongue-operating mechanism for tramways, the combination with a series of switch-tongues and a casing arranged in suitable relation to the tram-rails, of a series of shifting-levers mounted in said casing and

connected to said tongues for shifting the same, each of said levers provided on its free end with an incline, a series of spring-actuated levers mounted in said casing and having one end formed with an incline adapted to engage the incline of the shifting-levers for operating the same, a guide for the opposite end of said spring-actuated levers, a series of hand-operated levers suitably supported from a car, and means carried by each of said hand-operated levers and engaging the free end of said spring-actuated levers for operating the same, causing thereby the operation of the shifting-levers and the throwing of the switch-tongues.

4. In a switch-tongue-operating mechanism for tramways, the combination with a series of switch-tongues and a casing arranged in suitable relation to the tram-rails, of a series of shifting-levers mounted in said casing and connected to said tongues for shifting the same, each of said levers provided on its free end with an incline, a series of spring-actuated levers mounted in said casing and having one end formed with an incline adapted to engage the incline of the shifting-levers for operating the same, a guide for the said spring-actuated levers, a series of hand-operated levers suitably supported from a car, means carried by each of said hand-operated levers and engaging the said spring-actuated levers for operating the same, causing thereby the operation of the shifting-levers and throwing the switch-tongues, and means for automatically returning said hand-operated levers to an inoperative position.

5. In a switch-tongue-operating mechanism for tramways, the combination with a series of switch-tongues and a casing arranged in suitable relation to the tram-rails, of a series of shifting-levers mounted in said casing and connected to said tongues for shifting the same, each of said levers provided on its free end with an incline, a series of spring-actuated levers mounted in said casing and having one end formed with an incline adapted to engage the incline of the shifting-levers for operating the same, a guide for the said spring-actuated levers, a series of hand-operated levers suitably supported from a car and provided with means adapted to engage the spring-actuated levers for operating the same, causing thereby the throw of the switch-tongue, inclined levers mounted in said casing, and a series of levers connected to a car and each carrying a projection adapted to engage said inclined levers for returning said hand-operated levers to an inoperative position.

6. In a switch-tongue-operating mechanism for tramways, the combination with a series of switch-tongues and a casing arranged in suitable relation to the tram-rails, of a series of shifting-levers mounted in said casing and connected to said tongues for shifting the same, each of said levers provided on its free end with an incline, a series of spring-

actuated levers mounted in said casing and having one end formed with an incline adapted to engage the incline of the shifting-levers for operating the same, a guide for the said  
5 spring-actuated levers, a series of hand-operated levers suitably supported from a car and provided with means adapted to engage the spring-actuated levers for operating the same, causing thereby the throw of the switch-  
10 tongue, inclined levers mounted in said casing, a series of levers connected to a car and each carrying a projection adapted to engage said inclined levers for returning said hand-operated levers to an inoperative position,  
15 and means for retaining said hand-operated levers in an inoperative position.

7. In a switch-tongue-operating mechanism for tramways, a series of shifting-levers connected to the switch-tongues, a series of spring-  
20 actuated levers slidably engaging said shifting-levers for operating the same, a series of hand-operated levers carrying means adapted to engage the spring-actuated levers for operating the same, and a spring-actuated means

for automatically returning said hand-oper- 25  
ated levers to an inoperative position, substantially as described.

8. In a switch-tongue-operating mechanism for tramways, a shifting-lever connected at one end to the switch-tongue and at its free 30  
end provided with an incline, a spring-actuated lever having one end engaging said incline for operating the shifting-lever, a hand-operated lever carrying means engaging said spring-actuated lever for operating the same, 35  
an inclined spring-actuated lever, and a spring-actuated means engaging said inclined lever for returning the hand-operated lever to an inoperative position.

In testimony whereof we have hereunto set 40  
our hands in presence of two subscribing witnesses.

JOSEPH ABRAHAM DIXON.  
JAMES DIXON.

Witnesses:

EDMUND CHADWICK,  
JAMES STEWART BROADFOOT.