

C. A. AHL.
 TRACKLESS TROLLEY.
 APPLICATION FILED OCT. 26, 1909.

Patented Jan. 9, 1912.
 3 SHEETS-SHEET 1.

1,014,556.

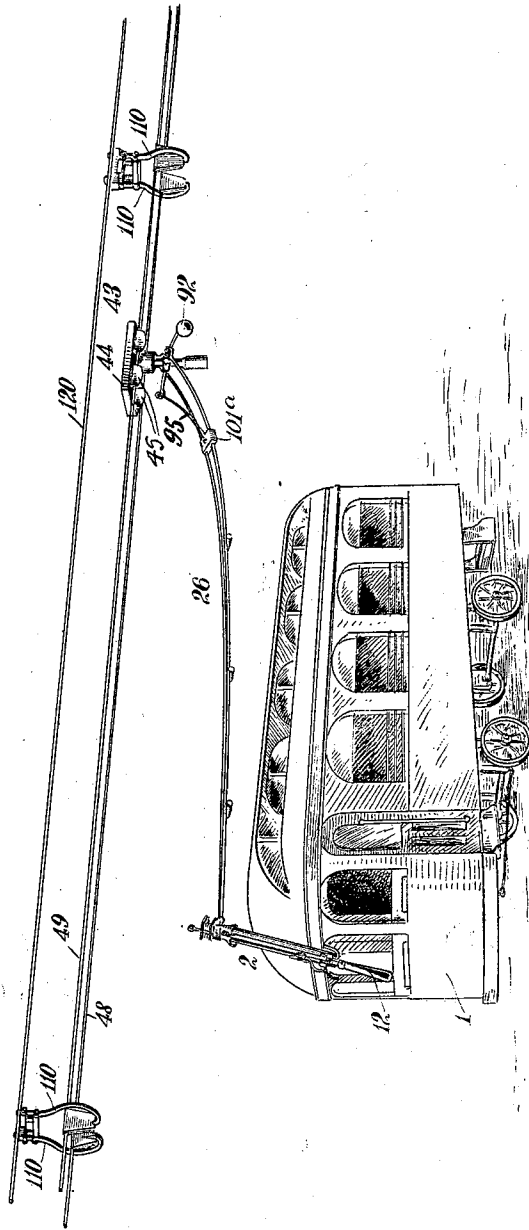


Fig. 1.

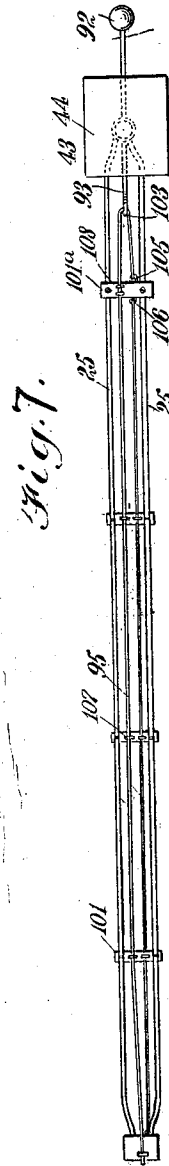


Fig. 7.

WITNESSES

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3 SHEETS—SHEET 2.

Fig. 3.

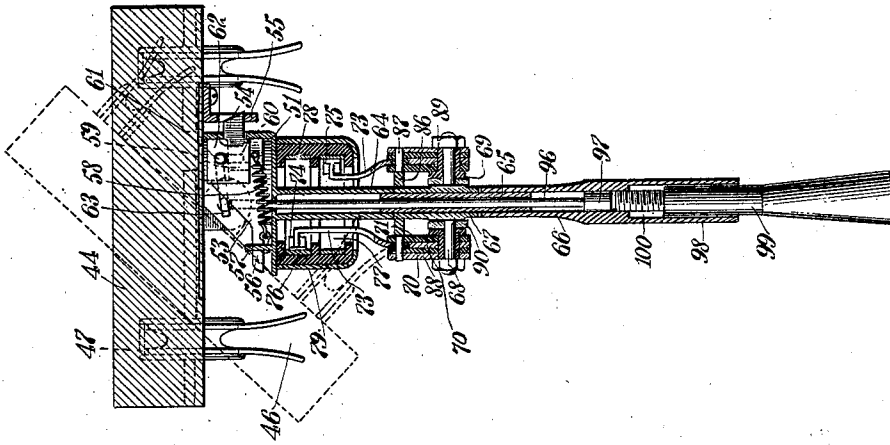
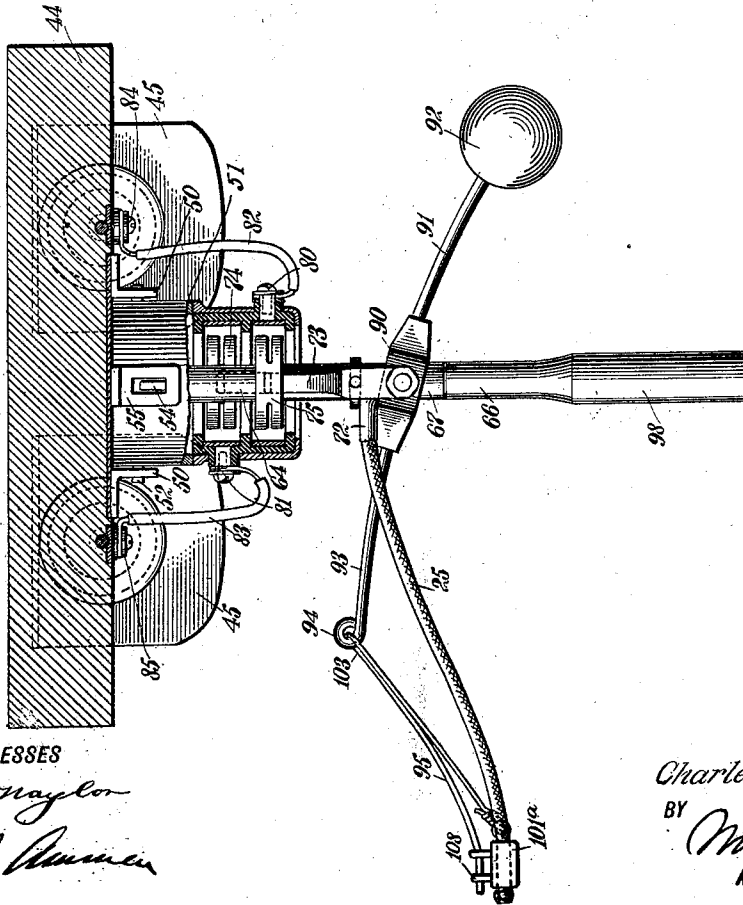


Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

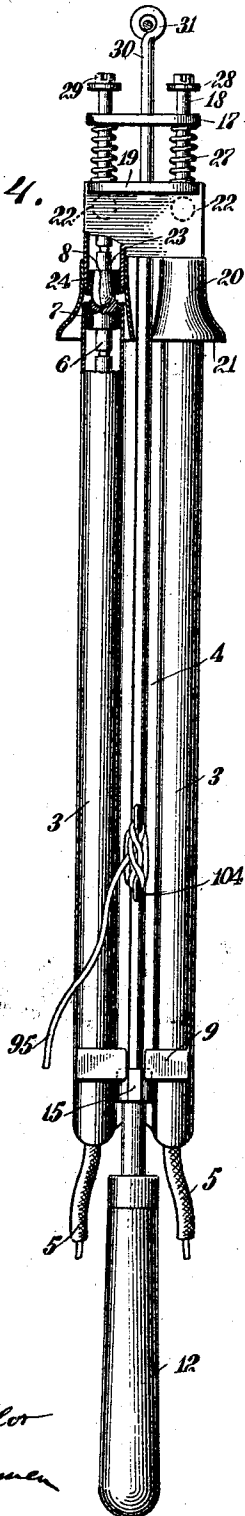


Fig. 5.

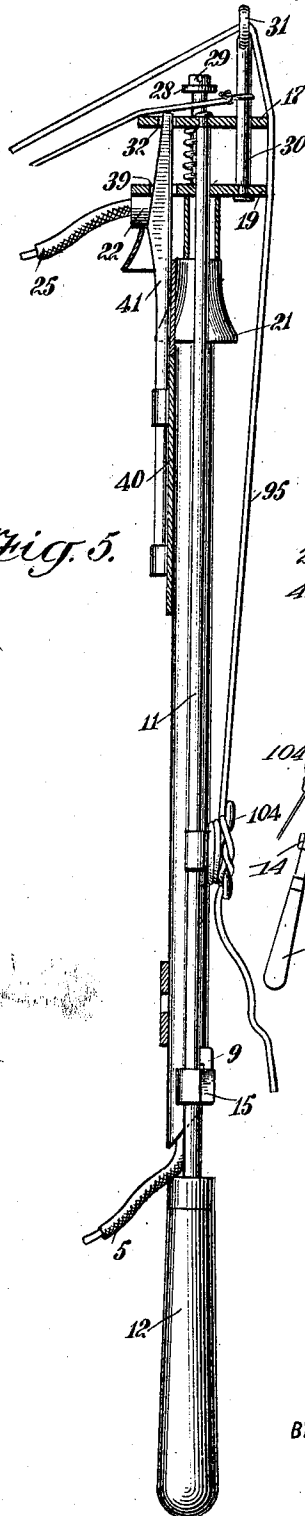
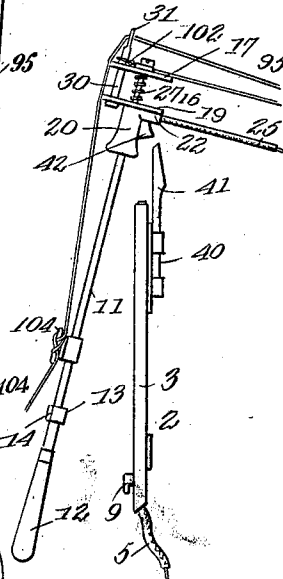


Fig. 6.



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TRACKLESS TROLLEY.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES A. AHL, a citizen of the United States, and a resident of Salem, in the county of Salem and State of New Jersey, have invented a new and Improved Trackless Trolley, of which the following is a full, clear, and exact description.

This invention relates to trackless trolleys, that is, to trolleys the wheels of which do not run upon rails. Trolley systems of this kind are used largely with omnibuses and similar vehicles for carrying street traffic. At a suitable point the roof of the car or omnibus is connected by a flexible trolley cord the vehicle can deviate from a course directly under the trolley wire without disconnecting the trolley shoe which runs upon the trolley wire or wires.

The object of this invention is to provide an improved construction which will facilitate the exchange of the trolley poles of two vehicles which may meet. In this way I get substantially the same effect as though the trolley shoes were arranged so that they could pass each other.

A further object of the invention is to improve the construction of the shoe so as to facilitate its being placed on the trolley wires, and to improve the details of the construction in other particulars.

The invention consists in the construction and combination of parts to be described more fully hereinafter and particularly set forth in the claims.

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

Figure 1 is a perspective illustrating the manner in which the invention is applied in practice; Fig. 2 is a longitudinal section through the trolley shoe in a vertical plane, a swivel below the shoe being shown partly in elevation; Fig. 3 is a vertical cross section of the shoe and showing the swivel head and its contiguous parts also in cross section, in this view the shoe is shown in dotted outline in a tilted position to illustrate the manner in which it is applied to the trolley wire; Fig. 4 is a front elevation of the trolley post and showing the trolley pole attached thereto, in this connection it should be understood that the trolley pole which

carries the lower end of the trolley cord is detachable from the post, the post being permanently secured to the vehicle, in this view certain parts are broken away and shown in section; Fig. 5 is a side elevation and partial section of the trolley post and pole, and further illustrating the means for detachably securing the pole to the post; Fig. 6 is a side elevation showing the trolley pole about to be attached to the post; Fig. 7 is a plan of the shoe and the flexible trolley cord, and indicating the means by which the cord may be shortened when desired.

Referring more particularly to the parts, and especially to Fig. 1, 1 represents a car or omnibus to which the invention has been applied. At a suitable point on the roof of this vehicle a trolley post 2 is attached rigidly; said trolley post is clearly shown in Fig. 6. It comprises a pair of parallel barrels or sheaths 3, as shown most clearly in Figs. 4 and 5. These sheaths are rigidly connected by a channel plate 4 which extends longitudinally through the entire length of the post, as indicated. The lower ends of these barrels or sheaths are open so as to permit the entrance of conductors 5 which extend upwardly through the interior of the said barrels or sheaths throughout practically the entire length thereof, the upper ends of the said conductors being attached to contact heads 6, as indicated in Fig. 4. These contact heads 6 have insulating blocks 7 in their upper ends, and the upper faces of the heads are formed into concave or dished seats 8; as illustrated. Near the lower end of the post, the sheaths 3 are provided with catch plates 9 which project toward each other so that they hang over the channel or gutter formed by the channel plate 4.

Referring especially to Fig. 6, the trolley pole 10 comprises a stem 11, the lower end of which is provided with a handle 12, and near this handle a collar 13 is rigidly attached to the stem. This collar is cut away so as to form oppositely disposed shoulders 14 extending longitudinally of the stem, and between these shoulders 14 a broad longitudinally extending rib 15 is formed. On the upper end of the stem 11, a trolley head 16 is mounted, the details of which are most clearly illustrated in Figs. 4 and 5. This trolley head comprises a fixed plate 17 on the end of the stem, and through this plate guide bolts 18 pass loosely, the lower ends of the said bolts being secured in a spring

plate 19. On the under side of this spring plate 19 a pair of elbows 20 are attached. These elbows have bell mouths 21, the axes of which are disposed parallel with the stem 11, and they have side extensions 22 which are disposed substantially at right angles to the stem, as indicated. In the bell mouths 20 contacts 23 are provided which have rounded lower ends adapted to come upon the seats 8, aforesaid. These contacts 23 are held in position by insulating plugs or bushings 24, as indicated. Each of these contacts 23 is connected with one of the strands 25 of the double trolley cord 26. Around the guide bolts 18, springs 27 are provided, the lower ends of which seat on the spring plate 19. These springs normally thrust upwardly against the under side of the plate 17 and hold it against washers 28 under the heads 29 which are carried by the upper ends of the bolts. The plates 17 and 19 are further connected by a guide stud 30, the lower end of which is fixed in the plate 19. The upper portion of the stud passes loosely through a guide opening in the plate 17. The upper end of this stud is formed with an eye 31, as shown. In addition to this the plate 17 is provided with a guide opening 32, and the plate 19 is provided with a similar but larger guide opening 39. The purpose of these guide openings will presently appear.

Referring again to the trolley posts, near their upper ends the sheaths 3 are connected by a saddle plate 40, and in this saddle plate there is attached a guide tongue 41 having a tapered extremity which projects beyond the end of the post, as shown. The guide openings 32 and 39 are in alinement with this tongue and are adapted to receive the tongue when the trolley is to be attached to the post. Below the plate 19 a bell-shaped guide mouth 42 is provided, and this bell mouth operates as a guide in introducing the tongue 41 into the openings 39 and 32. In attaching the trolley pole to the trolley post, this tongue 41 is introduced in the bell mouth 42 with the pole in about the position shown in Fig. 6. The pole is then pulled downwardly and the lower end of the pole is made to approach the lower end of the post. This movement seats the bell mouths over the upper ends of the sheaths or barrels 3 and when the movement is completed, the contacts 23 will seat on the contacts 6. This movement also compresses the springs 27. As the movement is completed the stem 11 is swung down into the channel of the channel plate 4, and between the sheaths or barrels 3. The collar 13 will then come just below the catch plates 9, and when released the springs 27 will advance the stem upwardly so that the shoulders 14 will pass under the lower and inner edges of the catch plates, as indicated most clearly

in Fig. 4. The springs will then retain the pole on the post, as will be readily understood. When it is desired to disengage the pole it is only necessary to reverse the movements just described.

The invention also comprises a shoe 43, the body of which is in the form of a plate or block 44 of wood or similar material. On its under side this shoe is formed with downwardly projecting guide plates 45 arranged in pairs, the lower edges of the individuals of the pairs being bent outwardly so as to form enlarged receiving throats 46. In the upper part of these contact plates, and between each pair a friction roller 47 is mounted, against the under sides of which the trolley wires 48 and 49 are received, as will be readily understood. On the under side of the block 44, a pair of hinge brackets 50 are attached, and between these brackets a catch head 51 is pivotally mounted on gudgeons 52 which are received in the hinge brackets 50. This catch head 51 is formed of sheet metal or similar material, and is of substantially circular form. It is provided with a catch plate 53, the forward edge of which is formed into a catch 54 which projects through an opening in the catch head. This catch 54 has a beveled edge which enables it to snap into the opening of a keeper or keeper bracket 55 which is attached to the under side of the block, as indicated in Fig. 3. The rear end of the catch plate 53 is reduced so as to form a tail 56, and this tail slides in a guide lug 57 which projects up from the bottom of the catch head, as indicated. The catch 54 is removable relatively to the catch head and is guided by the engagement of the tail 56 with the lug 57 and the engagement of the catch 54 with the catch head when the catch extends through the catch head. A coiled compression spring 58 is provided which tends to hold the catch projecting into the keeper, as indicated in Fig. 3. On its side the catch plate 53 is provided with a laterally projecting lug 59, and this lug is adapted to be engaged by a finger 60 on a rocker 61, said rocker being mounted to rock in bracket plates of which there are two, exactly alike, formed in the upper part of the catch head and located parallel with each other upon opposite sides of the catch plate. This rocker 61 has an arm 63 which projects out over the center of the catch head, as indicated. In Fig. 3 the bracket plate is partly broken away, in order to show the catch 54. The catch head 51 is formed with a tubular shank 64 which extends vertically downward, as shown. In the lower part of this shank 64 an inner sleeve 65 is fixed. This sleeve 65 extends downwardly, and to its lower end there is rigidly secured a tubular handle 66. Between the tubular handle 66 and the shank

64, a swivel 67 in the form of a sleeve is attached rigidly to the inner sleeve 65. This swivel has oppositely projecting pivot pins 68, and on these pivot pins 68 insulating bushings 69 are provided. On these bushings contact plates 70 are provided which are held between insulating plates 71, and these contact plates 70 are in metallic contact with the terminals 72 of the strands of the trolley cord 26. These contact plates 70 are extended upwardly so as to form arms 73 which are offset inwardly toward the axis of the tubular shank 64. The upper ends of these arms 73 are provided with shoes 74 and 75, which shoes are adapted to run around on the inner sides of contact rings 76 and 77. Said contact rings are mounted on the inner side of the insulating bushing 78 which is secured within a metallic cap 79. This metallic cap is rigidly attached to the under side of the catch head, 51. At suitable points the rings 77 and 76 are provided with terminals or binding posts 80 and 81, to which conductors 82 and 83 are respectively attached. These conductors attach to binding posts 84 and 85. One of these binding posts is in contact with the wheels which engage one of the trolley wires, and the other terminal is in metallic contact with the wheels which engage the opposite trolley wire. On the upper part of the swivel sleeve 67 a rigid collar 86 is provided and this collar is provided with dowel pins 87 which pass through insulated openings in the arms 73, and also pass through the insulating plates 71. On the outer ends of the insulating bushings 69, outside clamping plates 88 are provided, and the upper portions of these plates have openings receiving the dowel pins, as shown. The ends of the pins 68 are provided with nuts 89 which clamp the plates 88 in position. On the pins 68 adjacent to the swivel sleeve 67, a yoke 90 is provided, and to this yoke an arm 91 is attached which extends rearwardly and carries a counterweight 92, preferably in the form of a ball, as shown. The yoke 90 has an inwardly extending arm 93, the forward end of which is formed into an eye 94, to which a flexible line or rope 95 is attached. The purpose of this rope 95 will be described more fully hereinafter.

Referring again to the shoe, and especially to Fig. 3, within the tubular shank 64 I provide a sliding stem 96, the upper end of which is disposed directly under the arm 63 of the rocker 61. The lower end of this stem 96 is formed into an enlarged head 97 which is disposed near the lower part of the handle 66. The lower part of the handle 66 is formed into a tubular socket 98, and this socket 98 is adapted to receive a releasing plug 99. The upper end of this releasing plug 99 is formed into a stem 100 which has a threaded engagement with the interior

of the handle 66 near the head 97 so that if the releasing plug is screwed into position its upper end will strike the head 97 and raise the stem 96. The purpose of this construction is to enable the catch 54 to be released from below so that the block 44 can be swung upwardly on its hinge brackets 50 toward the inclined position in which it is indicated in Fig. 3. In swinging the block upward in this way it is disengaged from one of the trolley wires and rocks upon the other one as a center, thus presenting practically less width in a horizontal plane than before so that the block may be readily drawn downwardly between the wires. At 99 is a releasing plug which is formed upon the upper end of a pole, this pole being long enough, when held by a person standing on the rear platform of a car or upon the ground, to reach the handle 66. With the construction described above, it should be clear that the shoe runs along on the upper side of the trolley wires, and each trolley wire is metallically connected with one of the contact rings 77 and 78. The swivel 67 can twist on the longitudinal axis of the tubular shank 64, so as to accommodate itself to the positions of the trolley cord 26 running to the vehicle. In other words, at this point there is formed a swivel head which maintains a perfect metallic contact whatever may be the position of the trolley cord.

As illustrated most clearly in Figs. 1 and 7, the strands 25 of the trolley cord 26 are attached to a plurality of blocks 101 which are arranged at intermediate points along the length of the cord, as shown. The strands are disposed near the ends of the blocks, as shown, and between the strands the line or rope 95 extends. This rope 95 at a point adjacent to one of its ends is wound upon the cleat 104 as indicated in Fig. 5. The rope extends along the general direction of the strands 25 of the double trolley cord and through the eye 103 thence back again being doubled upon itself and connected with the rod 30 as shown in Fig. 5. By releasing the line 95 from the cleat 104, the operator may take up this line or let it out longer as desired, and in so doing this he varies at will the distance from the car to the trolley shoe. The purpose of the operator in thus varying the distance from the car to the shoe may be readily understood if it be remembered that the car does not run upon a track and consequently has no definite and fixed relation to the position of the trolley wire. As the car moves ahead, it may move slightly away from the wire toward one side or the other of the road. If now a portion of the road be rough and uneven the movements of the car laterally to the trolley wire must increase the friction of the trolley shoe upon the wire if the shoe

be close to the car for the reason that the general direction of the trolley rope may be at considerable angles from that of the trolley wire. While traveling upon this part of the road the operator should let out the rope, thereby decreasing the angles referred to. On the other hand, where a portion of the road is better, it is desirable that the slack of the rope be taken up. Again, it is desirable that the distance from the shoe to the trolley be decreased in turning a short curve for the reason that by so doing the guiding of the shoe around the curve by aid of the car is rendered more accurate, and the friction of the trolley upon the wire is thus diminished. The block, 101^a, which is the uppermost of all the blocks 101, as indicated in Fig. 7, is arranged with the trolley strands 25 passing through it, as indicated. Beyond the loop 103 the cord 95 is attached at 105 to the rear side of the block 101^a. At 106 on the forward side of the block, another section of the line or rope 95 is attached. On the blocks 101 the cord 95 passes through guide eyes 107, and a similar guide eye 108 is provided on the block 101^a. It will be evident that by taking up the line 95, the block 101^a can be made to approach nearer to the swivel head, which will have the effect of drawing the shoe nearer to the car. It should be understood that the rope 95 constitutes a drag cord for drawing the shoe, and substantially no tension comes upon the trolley cord 26 carrying the conductors. In this connection attention is called to the function of the counterweight 92. In case there should be a sudden jerk upon the drag cord, this jerk is absorbed largely by the counterweight which will be pulled upwardly. In this way the drag of the cord upon its shoe is made more constant and there is less tendency to pull the shoe off of the wires.

In connection with the block 44, it should be stated that the axis of rotation of the gudgeons 52 is not directly under the center of gravity of the block, so that the block will tend to assume the position in which it is indicated in dotted outline if the catch 54 is disengaged from the keeper 55.

The general mode of operation of the invention will now be described: In order to place the shoe on the trolley wires, the catch 54 should be released from the keeper and with the block 44 in an inclined position, as indicated in Fig. 3 in dotted lines, the block is passed up between the wires 48 and 49. Contact being made between one of the wires and the corresponding trolley wheels carried by the block 44, the block is now turned until the other trolley wheels carried by the block rest upon the other wire. In order to apply the shoe in this manner it should be attached on the end of a pole of sufficient length, the upper end of which pole

is formed into the plug 99 referred to above. With the block above the wires, it is then drawn downwardly so as to seat the contact plates 45 on the wires; then the pole referred to is rotated so as to unscrew the stem 100 from the handle 96. This will remove the pressure from the stem 96 and allow the spring 58 to restore the catch 54 to its normal condition. By means of the pole the handle will then be moved so as to snap the catch 54 into the keeper. By means of the pole 10 which is attached to the lower end of the trolley cord, the trolley cord is then connected with the conductors which pass into the post from the car. The manner of attaching the pole and detaching the same from the post has been fully described above. When two omnibuses, cars, or similar vehicles, operating through the agency of the trolley wires, meet each other upon their routes, it is of course impossible for the shoes of the respective vehicles to pass each other on the trolley wires. However, in order to attain virtually the same effect, it is only necessary to detach the trolley poles and interchange them; for instance, the trolley pole of the car going east will be attached to the trolley car going west. The cars may then proceed on their way. The length of the trolley cords will be sufficient to deviate from their routes sufficiently to enable them to pass each other as suggested. By paying out the drag cord, or taking up the same, the position of the block 101^a can be adjusted, which changes the distance from the shoe to the car. Whatever be the direction in which the trolley cord extends from the shoe, the swivel 67 adapts itself to this position and will constantly maintain metallic contact at the rings 77 and 78.

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

1. The combination of a pair of trolley wires spaced apart and substantially parallel with each other, a block adapted to tilt into an inclined position so as to be passed upwardly between said trolley wires, a shank mounted upon said block and extending downwardly between said trolley wires, said shank having a jointed connection with said block to facilitate tilting the latter, contact shoes carried by said block and adapted to engage said wires, and means for locking said block to said shank.

2. The combination of a pair of substantially parallel trolley wires spaced apart, a block movable among said trolley wires, a shank connected with said block and extending downwardly therefrom, the connection between said block and said shank being such as to permit the tilting of said block relatively to said shank in order to enable said block to be passed upwardly between said trolley wires, contact devices carried by

said block and adapted to run upon said wires, a catch for locking said block against rotation relatively to said shank, and means for disengaging said catch from below.

5 3. A shoe of the class described, comprising a shank having a catch head at the upper end thereof, a block having a hinge connection with said catch head, contact devices carried by said block adapted to engage the wires, a snap catch for locking said block to said shank, a spring constraining said catch to lock said block to said catch head, a member carried by said shank engaging said catch, and means for engaging said member to release said catch.

15 4. A shoe of the class described, comprising in combination, a shank, a block having a hinge connection therewith and having contact devices adapted to engage the trolley wires, means for locking said block to said shank, said shank having a handle formed therebelow, said handle being provided with a socket, a member adapted to engage said socket, and means actuated by said member for releasing the means for locking said block to said shank.

25 5. In combination, an overhead trolley conductor, a shoe running on said conductor and having a downwardly extending shank, a swivel rotatably mounted on said shank, an electric cord connected with said swivel and adapted to be attached to a vehicle propelled by the current passing in said cord, and means for maintaining metallic contact between said shoe and said swivel in all positions of said swivel.

35 6. In combination, a pair of overhead trolley wires, a shoe running on said trolley wires and having a downwardly extending shank, a swivel rotatably mounted on said shank, a trolley cord having a pair of strands connected with said swivel, and means for maintaining metallic connection between said strands and one of said trolley wires in all positions of said swivel.

45 7. In a device of the class described, in combination, a shoe adapted to run on a trolley wire, comprising a block, a shank extending downwardly from said block, a swivel mounted on said shank, an arm pivotally connected with said swivel, a trolley cord connected with said swivel, said arm having a counterweight, and a drag cord attached to said arm and adapted to pull

said shoe along the trolley wire, said counterweight being arranged so as to be raised by the pull of said drag cord.

8. In a device of the class described, in combination, a block, a shank extending downwardly therefrom, contact devices carried by said block adapted to engage the trolley wire, a swivel rotatably mounted on said shank, a trolley cord connected with said swivel, means for maintaining metallic connection between said trolley cord and said contact devices in all positions of said swivel, an arm pivotally mounted on said swivel and having a counterweight, and a drag cord connected with said arm for pulling said shoe, said counterweight being arranged to rise under the pull from said drag cord.

9. In combination, a trolley wire, a car therebelow, a shoe running on said trolley wire, a member in connection with said shoe presenting an eye, a drag cord forming a loop through said eye and adapted to be connected at its lower end to the car for dragging said shoe, a block connected with said drag cord and adapted to be advanced toward said shoe or withdrawn from said shoe, and a trolley cord connected with said shoe and attached to said block and connected with said car adjacent to said drag cord.

10. In combination, a trolley wire, a shoe running on said wire, a swivel mounted on said shoe and having an arm pivotally attached thereto, said arm having an eye near one end thereof and a counterweight opposite to said eye, a drag cord forming a loop passing through said eye, a block attached to said cord and adapted to be adjusted by said cord to or from said shoe, a trolley cord connected with said swivel and attached to said block, means for connecting said drag cord and said trolley cord at intermediate points throughout the length thereof, and means for attaching the lower ends of said drag cord and said trolley cord to the car.

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

CHARLES A. AHL.

Witnesses.

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WILLIAM CARNEY.