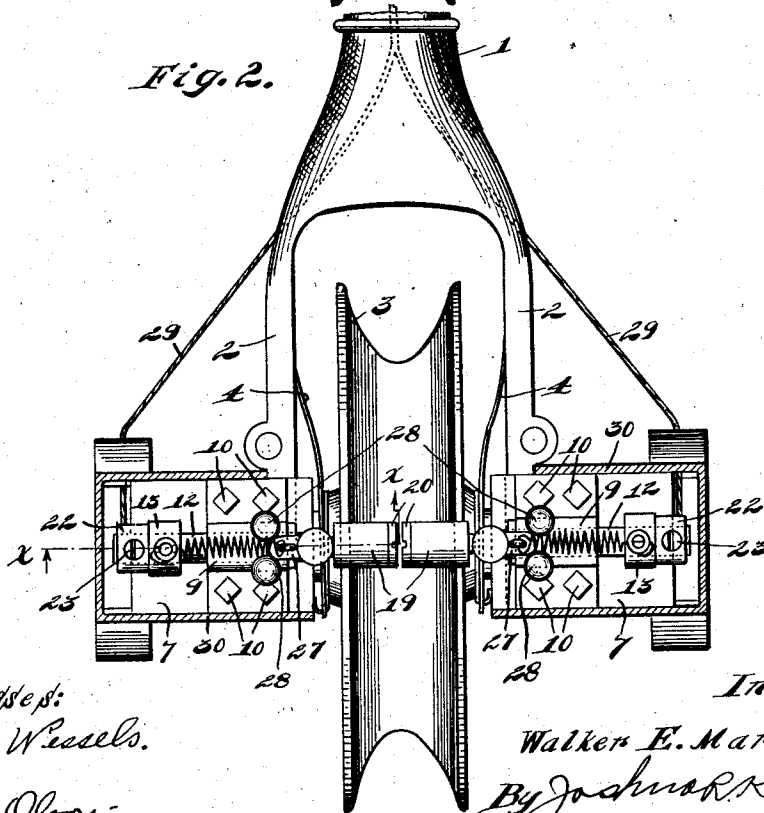
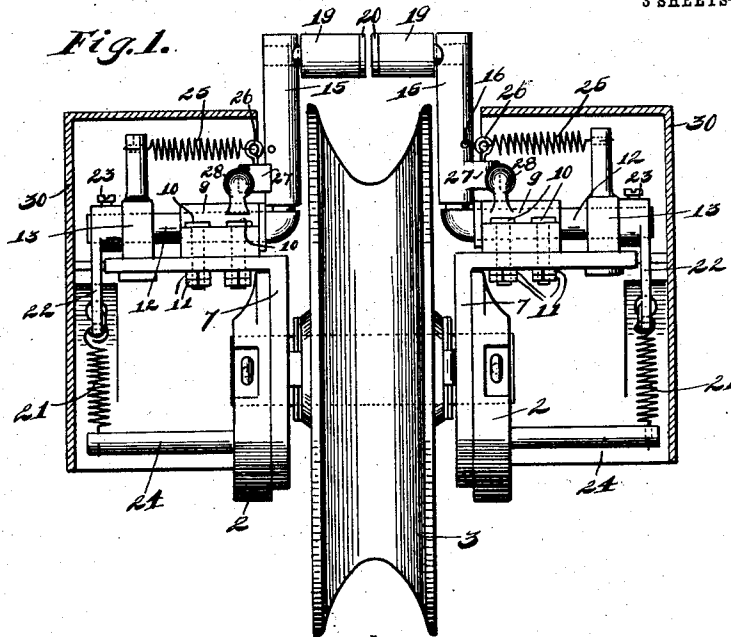


W. E. MARSHALL.
TROLLEY.
APPLICATION FILED MAR. 8, 1911.

1,011,462.

Patented Dec. 12, 1911.

3 SHEETS—SHEET 1.



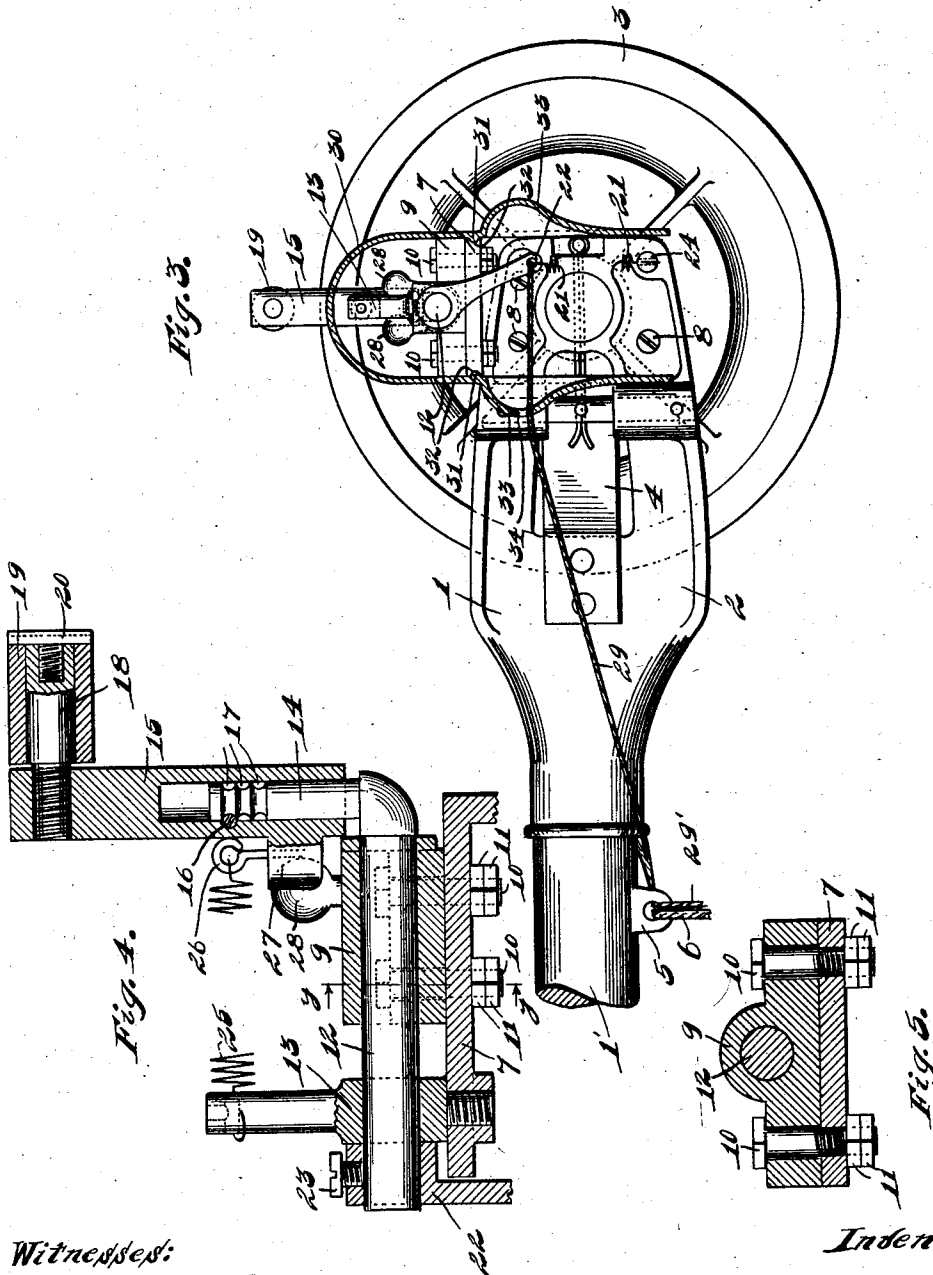
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

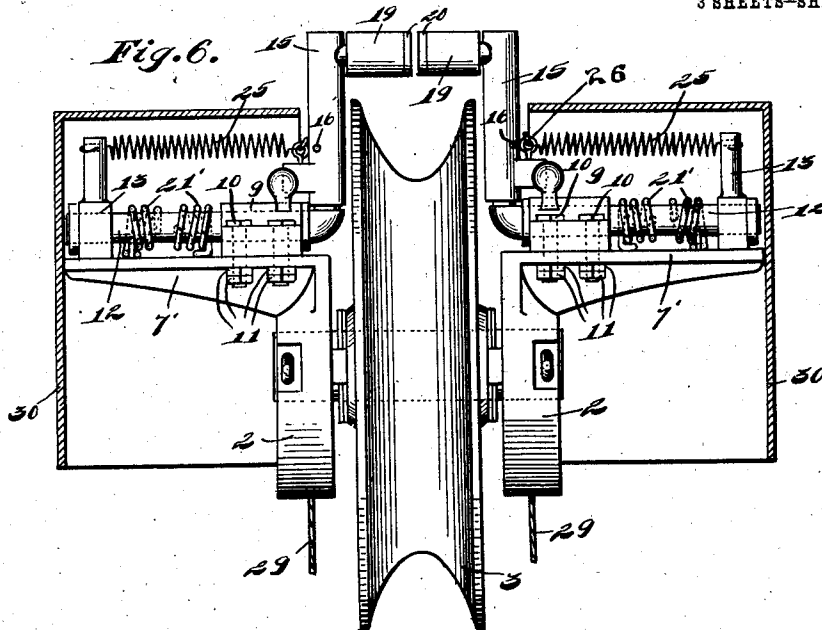
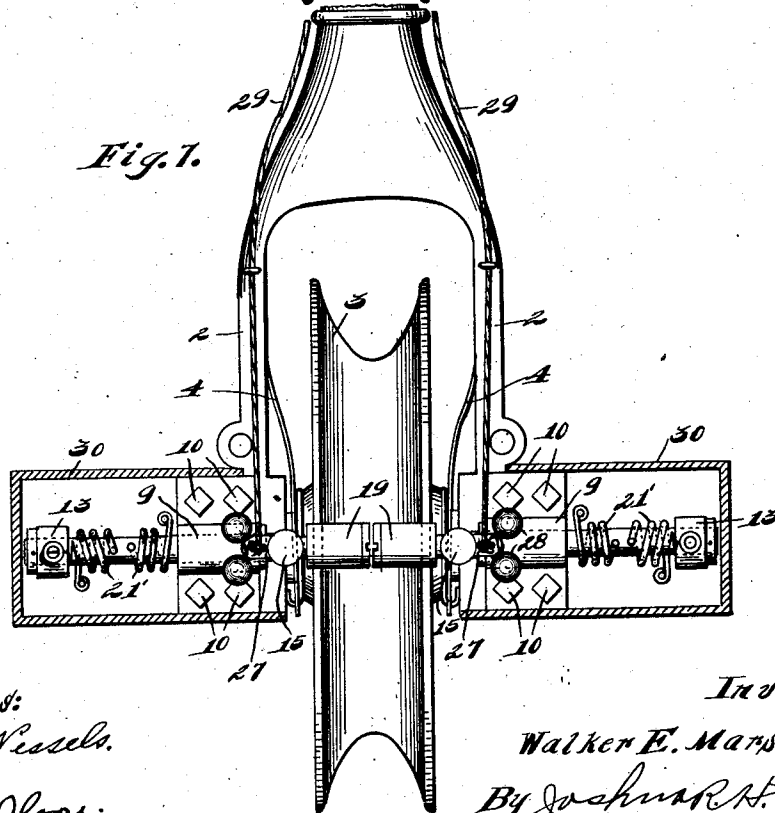


Fig. 1.



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UNITED STATES PATENT OFFICE.

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TROLLEY.

1,011,462.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed March 8, 1911. Serial No. 613,161.

To all whom it may concern:

Be it known that I, WALKER E. MARSHALL, a citizen of the United States, residing at Logansport, county of Cass, and State of Indiana, have invented certain new and useful Improvements in Trolleys, of which the following is a specification.

My invention relates to improvements in trolleys and has for its object the production of a device of this character which will be adapted to maintain itself in engagement with the supply wire with which the same coöperates; it being my object to provide a trolley through the employment of which the possibility of jumping or accidental displacement of the trolley wheel with the wire will be precluded.

A further object of the invention is the production of a trolley as mentioned which will be of durable and economical construction and efficient in operation.

Other objects will appear hereinafter.

With these objects in view my invention consists in a trolley characterized as above mentioned and in certain details of construction and arrangement of parts all as will be hereinafter fully described and more particularly pointed out in the appended claims.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a front elevation of a trolley embodying my invention, protecting casings included in the construction being shown in section in order to expose underlying parts, Fig. 2 is a top plan view thereof, Fig. 3 is a side elevation, Fig. 4 is an enlarged section taken on line $x-x$ of Fig. 2, Fig. 5 is a transverse section taken on line $y-y$ of Fig. 4, Fig. 6 is a view similar to Fig. 1 of a slightly modified form of my invention, and Fig. 7 is a top plan view, partially in section of said modified form.

Referring now to the drawings 1 indicates an ordinary trolley harp which is mounted at the upper end of the trolley pole 1'. Arranged in the harp 1 between the arms 2 thereof is the usual trolley wheel 3.

4 indicate spring conductors which are secured to the arms 2, the free ends of said springs engaging the opposite sides of the

wheel serving as a positive means to conduct the current from said wheel to the harp. Provided upon the under side of the trolley pole 1 adjacent the harp 2 is the usual perforated lug 5 to which is connected the trolley rope 6. The specific construction of the harp and the method of mounting the trolley wheel therein, however, form no part of this invention, a conventional construction in this regard being illustrated.

Referring now particularly to Figs. from 1 to 5 inclusive I have illustrated angular supporting members 7 oppositely arranged at the respective sides of the wheel 3, the depending portions of the member 7 which rest against the inner sides of the harp arms 2 being secured to the latter by means of screws 8. The constructions or mechanisms mounted upon the members 7 are similar in all details, therefore the description of one construction will suffice since this description will apply to the other as well. Arranged upon the upper side of the outwardly or horizontally projecting portion of the member 7 is a bearing member 9 which is secured to the member 7 through the medium of bolts 10 and nuts 11 threaded upon the lower extremities of said bolts. Rockingly mounted in the bearing 9 is a shaft 12 said shaft being so mounted that the axis thereof extends substantially perpendicular to the plane of the trolley wheel. The outer end of said shaft is mounted in a bearing post 13 the lower extremity of which is threaded in the supporting member 7 as clearly shown in Fig. 4. Provided at the inner extremity of the shaft 12 is an upwardly projecting stud 14 formed preferably integral with said shaft. Mounted upon the stud 14 for free oscillation thereon is an arm 15 the lower end of said arm being tubularly formed, as shown in Fig. 4, for the reception of the upper end of the stud 14. The member 15 is locked against longitudinal movement upon the stud 14 by means of a transversely extending pin 16 arranged in the former, said pin engaging a circumferentially extending groove 17 provided in the upper end of said stud. In order to permit of vertical adjustment of the member 15 upon said stud, the latter is preferably provided with a plurality of grooves 17. With this provision, it will be seen that vertical adjustment of

the arm 15 may be readily effected by simply removing the pin 16, said pin being reinserted into the member 15 into engagement with the corresponding groove 17 when the member 15 has been adjusted as desired. Secured, preferably threaded in the upper end of the member 15 is an angularly projecting stud 18, upon which is rotatably mounted a roller 19, the latter being held against longitudinal movement thereon through the medium of a screw 20. The studs 18 of the mechanisms at the opposite sides of the trolley wheel terminate at their inner extremities in close proximity with each other, as clearly shown in Figs. 1 and 2, directly over the center of the groove provided in said wheel. When so positioned, it is apparent that said studs 18 will be adapted to prevent displacement of the trolley wheel from engagement with the wire, since upon lowering of the trolley wheel said studs will be brought to engagement with the wire. The rollers 19 are evidently provided in order to alleviate friction with the wire when brought into contact therewith as in the manner just mentioned.

The studs 14 and hence the members 15 are held normally in vertical position through the medium of tension springs 21, said springs being connected at their upper extremities with the outer extremities of arms 22 which are secured to the outer extremities of the shafts 12 by means of set screws 23, said arms 22 depending from said shafts as clearly shown in Figs. 1 and 3. The lower extremities of the springs 21 are connected with the outer extremities of the posts 24 which are secured, preferably threaded, in the harp arms 2. With this arrangement it will be seen that the studs 14 and hence the members 15 will be yieldingly held normally in vertical position, the construction being such that tilting or rocking of the members 15 in a plane parallel with the plane of the trolley wheel will be permitted. The studs 18 of the members 15 are normally held in alinement or in traversing position relative to the groove of the wheel 3 by means of tension springs 25 the outer extremities of which are secured to the upper extended extremities of the bearing posts 13, the inner extremities of said springs being secured to eyes 26 which are provided upon lugs 27 provided adjacent the lower extremities of the members 15. With this provision, it will be observed, that the studs 18 will normally assume the alining positions as shown but when force is applied to the inner extremities thereof the same may be rocked to non-alinement and non-traversing positions. Provided upon the upper side of each of the bearing members 9 are preferably spherical lugs 28 the same being spaced apart slightly for the re-

ception of the outer end of the adjacent lug 27 of the member 15. With this arrangement it will be observed that upon rocking of the shaft 12 and hence of the member 15 as above described, said member 15 will be simultaneously oscillated by reason of the lug 27 engaging against one or the other of the lugs 28, the member 15, upon rocking thereof, through the medium of the shaft 12 being oscillated to such an extent as to prevent the contacting of the stud 18 or the roller 19 carried thereby with the adjacent peripheral edge of the wheel 3.

With a construction then as described when in operation the studs 18 will be normally positioned to prevent accidental displacement of the trolley wheel. Upon abutments or enlargements such as are found at joints in the wire or at supports which are provided at intervals in the wire, the inner ends of said studs 18 will be swung outwardly so as to permit of the passage of such enlargements. When passing supporting wires or wire intersection plates, the arms 15 will be free for downward swinging so as to permit of such passage without interruption. The mounting as described is such that the rocking and oscillatory movements of the shafts 12 and members 15 may be effected with very little exertion so that wear upon the members 15 or the rollers 19 and also consequently upon the parts of the line system engaged thereby will be reduced to a minimum.

When it is desired to lower the trolley out of engagement with the wire or to effect the engagement of the trolley wheel with the wire rocking of the shafts 12 in order to position the studs 18 in non-traversing positions, may be effected through the medium of cords 29 which are connected to the outer extremities of the arms 22, said cords 29 being united forming a common cord 29' which passes through the lug 5 of the trolley rope depending co-extensively with the latter for ready engagement. With this arrangement then it will be observed that rocking of the shafts 12 as above mentioned may be readily and quickly effected from a position upon the ground by simply pulling downwardly upon the cord 29'. The mechanism at each side of the trolley wheel is preferably covered by a metallic protecting casing 30. The casing 30 at each side of the trolley wheel is detachably secured to the outwardly projecting portion of the corresponding supporting member 7, tongs or beads 31 provided upon the inner sides of the opposite walls of said casing slidably engaging grooves 32 provided in the adjacent edges of said portion of said supporting member, as clearly illustrated in Fig. 3. In order to provide clearance for the free end of the arms 22 the opposite sides of the casings 30 in the paths of said arms are pro-

vided with enlargements 33. Also, in order to permit of the passage of the operating cords 29 said casings are perforated at 34.

In Figs. 6 and 7 wherein is shown a modified form of the construction I have shown the supporting members, which were designated as 7 in the preferred form, formed integral with the harp arms 2 as illustrated at 7' thus dispensing with the attaching screws 8 and otherwise simplifying the construction. Also, in this form I have dispensed with the parts 21, 22, 23 and 24 and in lieu thereof I have provided at each side of the trolley wheel right and left-hand springs 21' which are arranged, as will be observed, to oppose each other, each set of springs 21' serving to normally maintain the shaft stud 14 and hence the member 15 of the shaft 12 coöperating therewith in the vertical position, this being the function of the spring 21 as will be remembered; the springs 21' coöperating with the shaft 12 in exactly the same manner as the spring 21. In this form, the arms 22 being dispensed with, the upper ends of the operating cords 29 are attached to the eyes 26 thereby adapting the same to serve in the same capacity as the cord 29 provided in the first described form. Except for the modifications noted, the construction shown in Figs. 6 and 7 is identical with the construction first described, hence no further description thereof is here necessary. The form first described as will be noted is especially designed as an attachment, being adapted for attachment to a trolley already in use, the construction shown in Figs. 6 and 7 being adapted to be incorporated in the trolley simultaneously with the manufacture thereof.

A trolley of the construction as set forth is durable and economical, and the same, when in use, will not be susceptible to becoming disengaged from the trolley wire, that is, jumping the same. Because of the easy and free operation of the movable parts of the construction the same will be long-lived and the parts of the line system with which the parts of the construction come into contact when the trolley is in operation will be subjected to a minimum degree of wear.

While I have illustrated and described the preferred construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction as set forth but desire to avail myself of such variations and modifications as fairly fall within the spirit and scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a device of the character described,

the combination of a harp; a trolley wheel mounted in said harp; two angular arms arranged at opposite sides of said wheel having their outer ends rockingly mounted upon said harp and having their inner ends terminating in close proximity with each other and directly beyond the groove in said trolley wheel, said outer ends of said arms being mounted for rocking in planes parallel with the plane of said wheel, the free ends of said arms being free for oscillation in planes perpendicular to said first mentioned planes; means adapted, when said arms are rocked, to simultaneously effect oscillation of the free ends thereof; and means for normally yieldingly holding said arms with their inner ends registering and traversing the groove in said trolley wheel, substantially as described.

2. In a device of the class described, the combination of a harp; a trolley wheel mounted in said harp; two substantially aligned shafts mounted in bearings provided at opposite sides of said wheel and extending substantially perpendicular to the plane of said wheel; vertically extending arms mounted for horizontal oscillation at the inner ends of said shafts, the upper ends of said arms overlying the groove of said wheel and terminating in close proximity with each other, substantially centrally above said groove; resilient means connected with said shafts for normally holding said arms in upright positions; means coöperating with said arms adapted, when said shafts are rocked, to effect oscillation of said arms to non-overlying positions relative to said wheel groove; and resilient means for normally maintaining said arms in overlying positions, substantially as described.

3. In a device of the character described, the combination with a harp and a trolley wheel mounted in said harp, of a pair of supporting members secured to said harp at opposite sides of said wheel; bearing members secured upon said supporting members; two substantially aligned shafts mounted in said bearing members and extending substantially perpendicular to the plane of said wheel; vertically extending arms mounted for horizontal oscillation at the inner ends of said shafts, the upper ends of said arms overlying the groove of said wheel and terminating in close proximity to each other substantially centrally over the groove in said wheel; resilient means connected with said shafts for normally holding said arms in upright positions; means coöperating with said arms adapted, when said shafts are rocked, to effect oscillation of said arms to non-overlying positions relative to said wheel groove; and resilient means for normally maintaining said arms in overlying positions, substantially as described.

4. In a device of the character described,

the combination of a harp; a trolley wheel mounted in said harp; two substantially alined shafts mounted in bearings provided at opposite sides of said wheel and extending substantially perpendicular to the plane of said wheel; vertically extending arms mounted for horizontal oscillation at the inner ends of said shafts, said arms being vertically adjustable relative to said shafts, the upper ends of said arms overlying the groove of said wheel and terminating in close proximity to each other substantially centrally of said wheel groove; rollers on the overlying ends of said arms; resilient means connected with said shafts for normally holding said arms in upright positions; means cooperating with said arms adapted, when said shafts are rocked, to effect oscillation of said arms to non-overlying positions relative to said wheel groove; and resilient means for normally maintaining said arms in overlying positions, substantially as described.

5. In a device of the character deccribed, the combination of a harp; a trolley wheel mounted in said harp; two angular arms ar-

ranged at opposite sides of said wheel having their outer ends rockingly mounted upon said harp and having their inner ends terminating in close proximity with each other and directly beyond the groove in said trolley wheel, said outer ends of said arms being mounted for rocking in planes parallel with the plane of said wheel, the free ends of said arms being free for oscillation in planes perpendicular to said first mentioned planes; means adapted, when said arms are rocked, to simultaneously effect oscillation of the free ends thereof; means for normally yieldingly holding said arms with their inner ends registering and overlying the groove in said trolley wheel; and means for manually rocking said arms to non-overlying positions, substantially as described.

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

WALKER E. MARSHALL.

Witnesses:

JOHN W. SNELL,
JOHN J. RIFE.