

No. 742,311.

PATENTED OCT. 27, 1903.

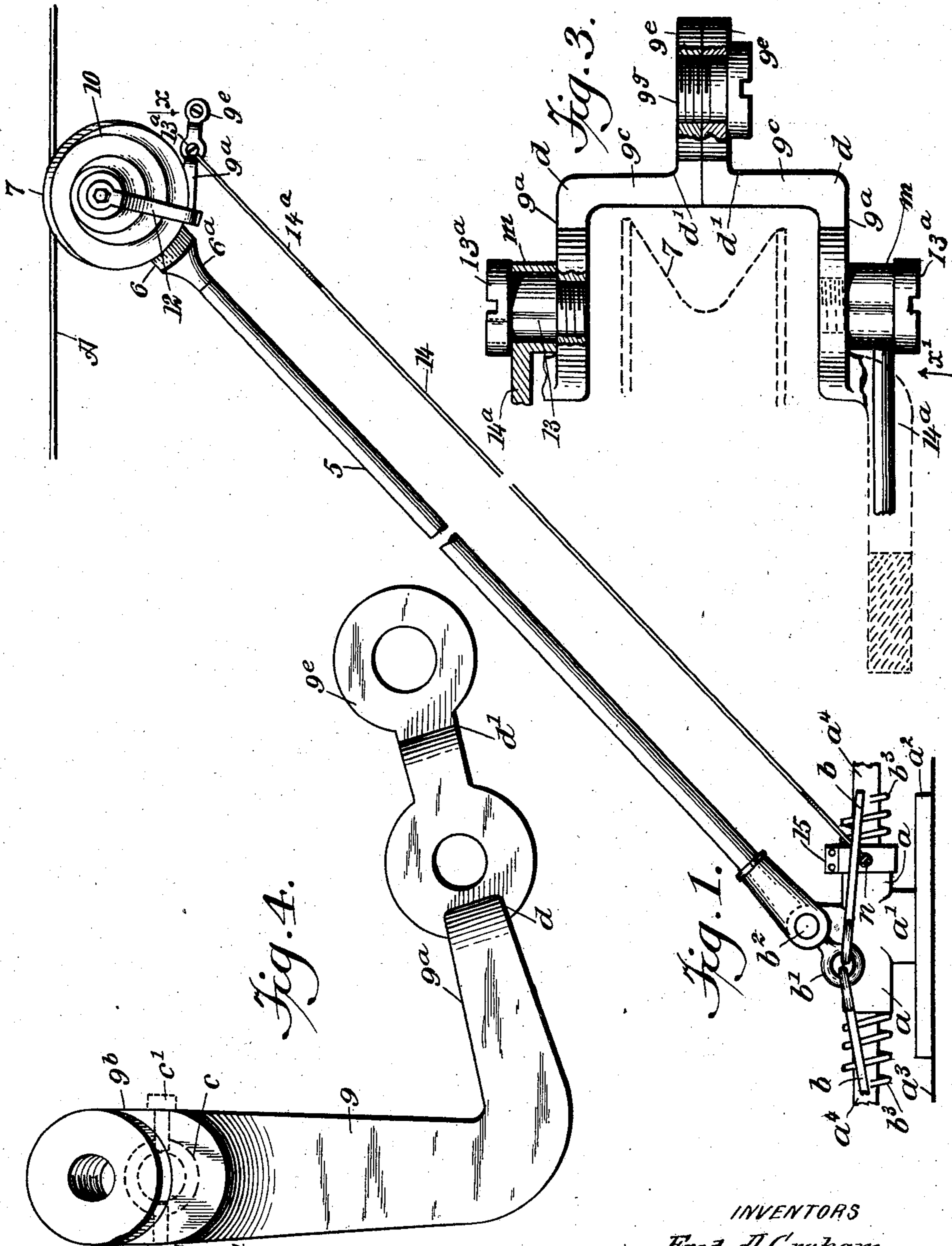
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TROLLEY FINDER.

APPLICATION FILED JAN. 30, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:
A. R. Appelman
A. R. Patton

INVENTORS
Fred A. Graham
Ferdinand F. Carmiencke
John R. Neely

BY *Mum*
ATTORNEYS.

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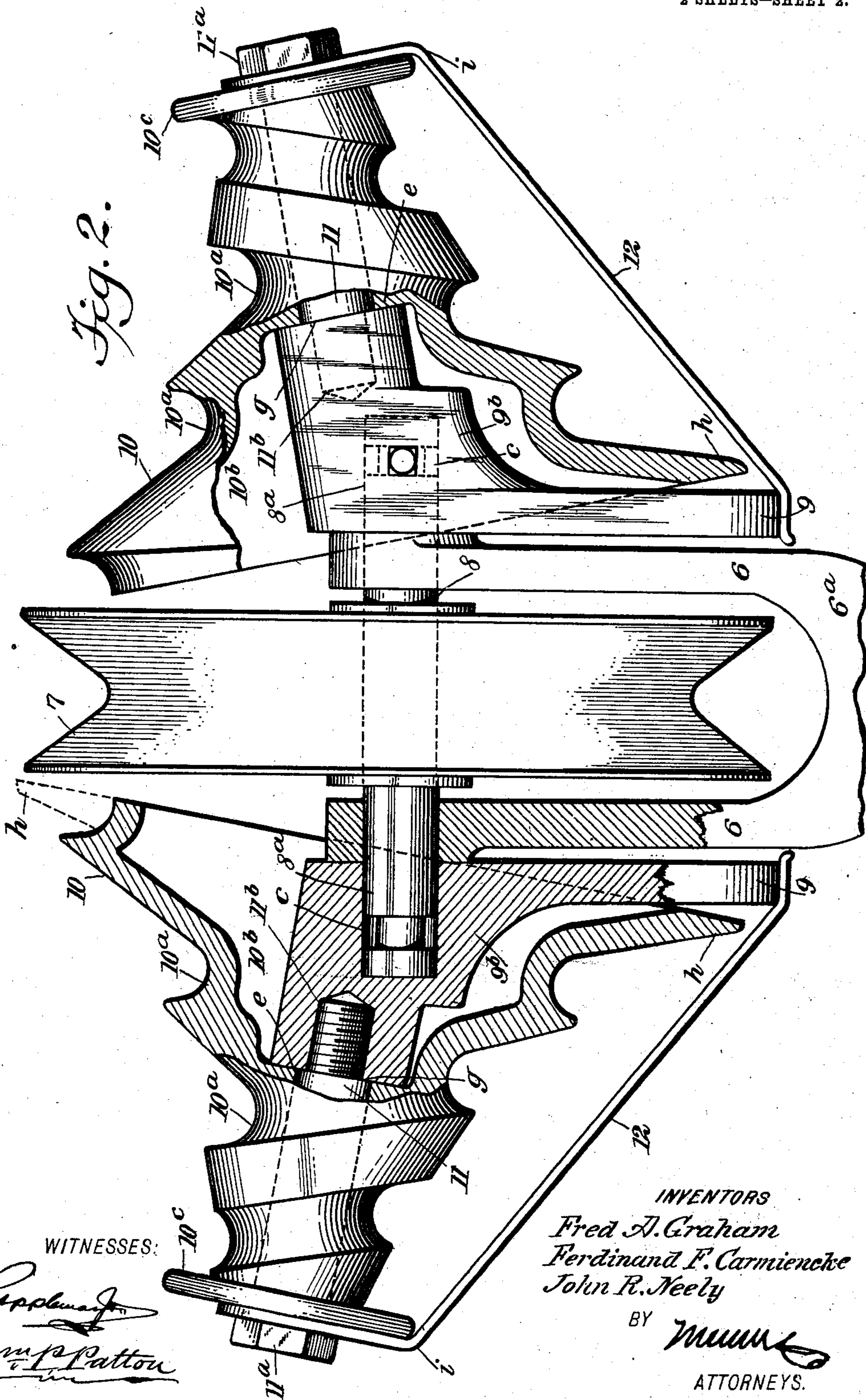
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UNITED STATES PATENT OFFICE.

FRED A. GRAHAM, FERDINAND F. CARMIENCEKE, AND JOHN R. NEELY,
OF MUNCIE, INDIANA.

TROLLEY-FINDER.

SPECIFICATION forming part of Letters Patent No. 742,311, dated October 27, 1903.

Application filed January 30, 1903. Serial No. 141,222. (No model.)

To all whom it may concern:

Be it known that we, FRED A. GRAHAM, FERDINAND F. CARMIENCEKE, and JOHN R. NEELY, all citizens of the United States, and residents of Muncie, in the county of Delaware and State of Indiana, have invented a new and Improved Trolley-Finder, of which the following is a full, clear, and exact description.

This invention relates to trolley-finders that afford means for replacing the trolley when it leaves the line-wire, and has for its object to provide a novel simple attachment for a trolley-supporting pole which will automatically replace the trolley-wheel upon the line-wire when displaced therefrom at either side thereof, a further object being to so construct the improved trolley-finder that there are no obstructive projections above the trolley-wheel that might interfere with the free action of the trolley or the improved finder.

The invention consists in the novel construction and combination of parts, as is hereinafter described, and defined in the appended 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 side elevation of the improved trolley-finder in position on a trolley-pole. Fig. 2 is an enlarged partly-sectional front view of the improved trolley-finder and an edge view of the trolley-wheel supported to rotate between the duplicate replacer-scrolls, that are details of the improvement. Fig. 3 is an enlarged plan view in part of two connected rock-arms and of a supporting-rod therefor seen in the direction of the arrow x in Fig. 1, and Fig. 4 is a side view of one of the rock-arms complete seen in the direction of the arrow x' in Fig. 3.

The trolley-pole 5 is of any preferred construction, and at its lower end is pivoted upon the ordinary stand, consisting of a hollow casting having two opposite horizontal tubular arms a on a short standard a' , seated upon a flat base-plate a^2 , mounted on a car-roof, (indicated by the line a^3 .) The pole 5 is yieldingly supported upright for depression into

an inclined position, as indicated in Fig. 1, by the two link-bars b , each having one of its ends engaged with a ring b' , projected below the trolley-pole pivot b^2 , said bars, which are shown broken away, in complete form having engagement with duplicate springs b^3 , mounted on extensions a^4 of the arms a . The disposal of the springs and bars b is such that the stress of the springs pulling oppositely on the ring-eye b' with equal force serves to elevate the trolley-pole; but the latter is adapted for depression in opposite directions to engage beneath a line-wire A, as indicated in Fig. 1.

The yoke-frame, technically known as the "harp," comprises two similar arms 6, held spaced apart and parallel with each other by their integral junction at the lower ends with the hub portion 6^a , mounted upon and secured to the upper end of the pole 5 in any preferred manner. The arms 6 of the trolley-harp are separated sufficiently to permit the free introduction of the trolley-wheel 7 between them, said wheel being secured upon a shaft 8, that extends centrally through and projects at each side of the wheel to afford journal ends 8^a , which loosely engage lateral and opposite perforations in the upper ends of the arms, as shown by full and dotted lines in Fig. 2. The journal ends 8^a of the shaft 8 extend an equal degree outside of the arms 6 and respectively receive and support loosely the two similar members of a rockable frame constructed as follows: Each frame member consists of a bent arm, of which 9 is an upright portion and 9^a an integral laterally-projected portion. Upon the upper end of each arm member 9 a boss-like hub 9^b is formed, that projects from the normal outer side of the arm in an outwardly and upwardly inclined plane. The hub 9^b of each arm member 9 is perforated a suitable depth from the normal inner side of said arm axially at a right angle with the vertical plane of said side, these socketed perforations having such a diameter and depth as adapts them to respectively receive the projecting journal ends 8^a of the shaft 8, as shown in Fig. 2. For the retention of the arm members 9 in rockable engagement with the ends 8^a of the shaft 8

said ends are respectively grooved peripherally a short distance from their outer ends, and opposite each of said circumferential channels *c* an internally-threaded perforation is formed in the side wall of a respective hub 9^b to receive the threaded body of a set-bolt c' , which at its inner end has a loose engagement within the channel *c* opposite which it is disposed, whereby the arms 9 are held to rock and are prevented from displacement. Each lateral member 9^a , which extends nearly at a right angle from the lower end of the depending member 9, is bent at a suitable point *d* intermediately of its ends, so as to project a limb 9^c at a right angle therefrom, and at a proper distance from the bend *d* the arm portion 9^a is again bent at a right angle, as shown at *d'* in Fig. 3, thus providing a short outwardly-extending flange 9^e in a plane parallel with that of the main portion 9^a . In assembling the two main portions of the rockable frame the flanges 9^e are secured together with a tap-bolt 9^f , and it will be seen that this connection of parts will space apart the arm members 9^a sufficiently for the free introduction and rotation of the trolley-wheel 7, as indicated in Fig. 3. The free end portions of the similar hubs 9^b , which project beyond the parts thereof that are laterally perforated for the reception of the set-bolts c' , may with advantage be reduced diametrically and rendered cylindrical, as shown in Fig. 2, and each hub is axially bored to produce a socket which is threaded in its defining-wall.

The trolley-replacer proper comprises the duplicate coniform scrolls 10, that are spirally grooved, as at 10^a , throughout their length and are so proportioned that their largest ends will be substantially equal in diameter with that of the trolley-wheel 7. The replacer-scrolls 10 receive support from the hubs 9^b on the arms 9^a , and to permit them to be mounted thereon for free rotation said scrolls are recessed a proper depth from their larger ends toward their smaller ends, these recesses 10^b each terminating in a true flat-bottom wall *e* for a loose contact with the true free ends of the hubs 9^b . The solid portion of each replacer-scroll 10 is longitudinally and centrally bored for the reception of a journal-stud 11, that loosely fits therein and is provided with a head 11^a on its outer end. The other end portion of each journal-stud 11 is reduced in diameter so as to form a shoulder *g*, and the reduced portion 11^b of each stud is threaded to screw into the socket in the outer end of a respective hub 9^b . As the outward and upward inclination given to each journal-stud 11 is the same, it will be evident that the upper surfaces of the scrolls 10 at their innermost ends will be inclined an equal degree toward the upper side edges of the trolley-wheel 7 when the parts are operatively assembled. The spiral formation of the coarse peripheral groove 10^a in each scroll 10 obviously

cuts away a portion of the material from the periphery at one side of the same, at and near the inner end thereof, so that there will result a radial projection *h* of the defining side wall of the groove at the side of each scroll opposite that which is reduced, and a corresponding increase in weight will be produced by this defining-wall *h*, that terminates the inner end of the spiral groove. The trend of the spiral groove 10^a in each coniform scroll 10 is from the outer end inwardly, so that if the line-wire is lost by the trolley 7 and seats upon either scroll while the car having the trolley-pole 5 is in motion the pressure on the scroll due to the weight of the wire will rotate the scroll oppositely from the direction of movement of the car and transfer the line-wire toward the trolley. Upon the outer end of each replacer-scroll 10 a collar 10^c is formed or secured, that serves as a check against the sliding movement of the line-wire off this smaller end of either replacer-scroll with which it may engage. A guard-arm 12 is provided for each replacer-scroll 10, and comprises a metal strip having one end perforated to slip upon the corresponding journal-stud 11 and be held thereon by the head 11^a of the stud, said arms being respectively bent at *i* below the adjacent collar 10^c , so as to incline the main portion of each guard-arm downward and toward the harp-arms 6, where said guard-arms terminate and are fastened to the arms 9. The guard-arms 12 are provided to prevent the line-wire or another overhead wire that may fall on either replacer-scroll 10 and that may rebound therefrom from catching beneath the replacer-scroll, and thus impeding the replacer in its operation, as it will be evident that such a misplaced wire will slide outward and upward on the guard-arm and leave it.

Upon the lateral member 9^a of each depending arm 9 at a suitable distance from the angularly-disposed limbs 9^c said arms are oppositely perforated and threaded for the reception of the short arms 13, that each have a head 13^a on their outer ends, whereby said arms are held outwardly and oppositely projected from the parts 9^a , upon which they are thus loosely mounted.

A connecting-rod 14 is provided for the support of the rocking frame, comprising the bent arms 9, and to this end said rod is furcated at each end and is afforded a proper length to extend between the members 9^a of the arms 9 and the arms *a* on the trolley-pole-supporting stand. The two forked limbs 14^a of the connecting-rod 14, which are uppermost in service, are loosely secured by their upper extremities upon the outwardly-projected fixed arms 13, as shown at *m* in Fig. 3. A clamp 15 is preferably employed for connecting the forked lower end of the rod 14 with the support of the trolley-pole 5. Said clamp, which is of ordinary form, is held clasped upon one of the horizontal portions *a* of the stand, and upon each side of the

clamp an extremity of a respective limb of the forked lower end of the connecting-rod 14 is pivoted, as is indicated in Fig. 1 at *n*, as to one of said limbs.

5 For the proper operation of the complete device the frame comprising the bent arms 9 may in some cases be supported by the rod 14, so that these arms 9 will be upright, or substantially so, and the frame members 9^a projected away therefrom. Furthermore, 10 the points of pivotal attachment of the furcated ends of the rod 14 upon the trolley-stand and rocking-frame arms 9 9^a are preferably so arranged that the trolley-pole 5 and con- 15 necting-rod 14 will be disposed parallel with each other, and it will be seen that said parallelism will be preserved at all points of rocking movement given to the trolley-pole.

As before explained, the terminal portion 20 *h* of the defining-wall between the turns of the groove 10^a in each scroll 10 adds slight weight to the side on which it is formed, so that on coming to rest each scroll will rock on its supporting-stud 11 until the portion *h* 25 of the defining rib or wall between the turns of the grooves 10^a hangs in a vertical plane below the axis of the shaft 8, which will dispose the inner edge portions of the replacer- 30 scrolls 10, that are directly above the portions *h*, slightly below the periphery of the trolley 7, when the replacer-scrolls hang normally on their supporting-studs 11.

It will be seen that the gravitation of the portions *h* into depressed positions when the 35 scrolls 10 are not engaged with a line-wire effects a removal of the replacer-scrolls to a point lower than the upper edge of the trolley 7, so that switch-shoes or other attachments to the supports of the line-wire will 40 have proper clearance from the replacer-scrolls. It will be also noticed that the outward and upward inclination of the journal-studs 11 disposes the replacer-scrolls 10 thereon so that the upper sides thereof approach 45 a horizontal plane and enable the spirally-grooved formations thereon to readily move the line-wire toward the trolley-wheel without requiring the scroll to raise the wire up a steep incline.

50 In operation assuming that the trolley 7 leaves the line-wire *A* while the car having the trolley-pole 5 thereon is in motion, then without regard to the scroll 10 upon which it rests said wire will cause a rotatable move- 55 ment of the engaged scroll, which will at rapid intervals raise the portion *h* of said scroll up to the top edge of the trolley-wheel and incline it toward the same, as is indicated by dotted lines in Fig. 2, the height of the 60 part *h* thus periodically turned uppermost being about equal with that of the trolley-rim. As the rotatable movement communicated to the scroll by the imposition of the line-wire *A* thereon serves to transfer the wire toward 65 the trolley-wheel automatically and at every revolution of the scroll the part *h* is raised

to a level with the edge of the trolley 7, it will be evident that when the wire rides upon this high part *h* said wire will drop therefrom into the groove of the trolley, and thus be 70 quickly replaced upon the trolley.

While it is preferred to employ the connecting-rod 14 for the control of the replacer- 75 scrolls 10, it is not indispensable, as in some cases the replacer-scrolls if constructed and supported to rotate as hereinbefore described will operate effectively for the automatic re- 80 placement of the line-wire on the trolley without the aid of the rod 14. Hence we do not restrict the improvement to the cooperative employment of the rod 14 and connections 85 therefor which adapt it to hold the rocking frame 9 9^a in a certain position on the harp whereon the trolley-wheel is held to rotate.

Having thus described our invention, we 85 claim as new and desire to secure by Letters Patent—

1. The combination with a supported trolley-harp, of a transverse journal-shaft carried by arms of the harp, and projected there- 90 from, a frame held to rock on ends of said journal-shaft, hubs on the frame, projected outward and upward, a journal-stud extended outward and upward from each hub, a spirally-grooved replacer-scroll mounted to ro- 95 tate on each journal-stud and having a collar on the outer end, and means for loosely securing the scrolls on the journal-studs.

2. The combination with a supporting-stand, springs thereon, a trolley-pole held to 100 rock on the stud and supported by the springs, and a trolley-harp carried by the pole at its upper end, of a journal-shaft mounted on arms of the harp and projected outwardly therefrom, a trolley-wheel on the journal- 105 shaft, between arms of the harp, a frame having outwardly and upwardly projecting hubs, and held to rock on the projecting ends of the journal-shaft, a journal-stud projected from the end of each hub, coincident with its 110 axis, and two spirally-grooved coniform replacer-scrolls, respectively held to rotate on the journal-studs, each scroll being overweighted on one side by the completed terminal portion of the spiral rib that defines 115 the spiral groove in said scroll.

3. The combination with a supporting-stand, springs thereon, a trolley-pole held to 120 rock on the stand and supported by the springs, a trolley-harp on the upper end of the pole, a trolley-wheel, and a journal-shaft passing through arms of the harp and carrying the wheel, of a frame having depending members from which extend lateral arms and held to rock on extended ends of the journal- 125 shaft, said frame having outwardly and upwardly projected hubs, coniform replacer-scrolls held to rotate on the hubs, and a connecting-rod loosely engaged at its ends, respectively with the lateral members of the 130 frame, and with the supporting-stand.

4. The combination with a supported trol-

ley-pole, a harp thereon, a trolley-wheel, and
a journal-shaft extended through the harp
and carrying the wheel, of two spirally-
grooved replacer-scrolls, journal-supports for
5 said scrolls, a depending frame, supported on
the ends of the journal-shaft and carrying the
journal-supports, and guard-arms extended
from supports of the scrolls downward and
toward depending members of the frame, for
10 engagement therewith.

In testimony whereof we have signed our
names to this specification in the presence of
two subscribing witnesses.

FRED A. GRAHAM.

FERDINAND F. CARMENCKE.

JOHN R. NEELY.

Witnesses:

NATHAN N. SPENCE,

B. BEHYMER.