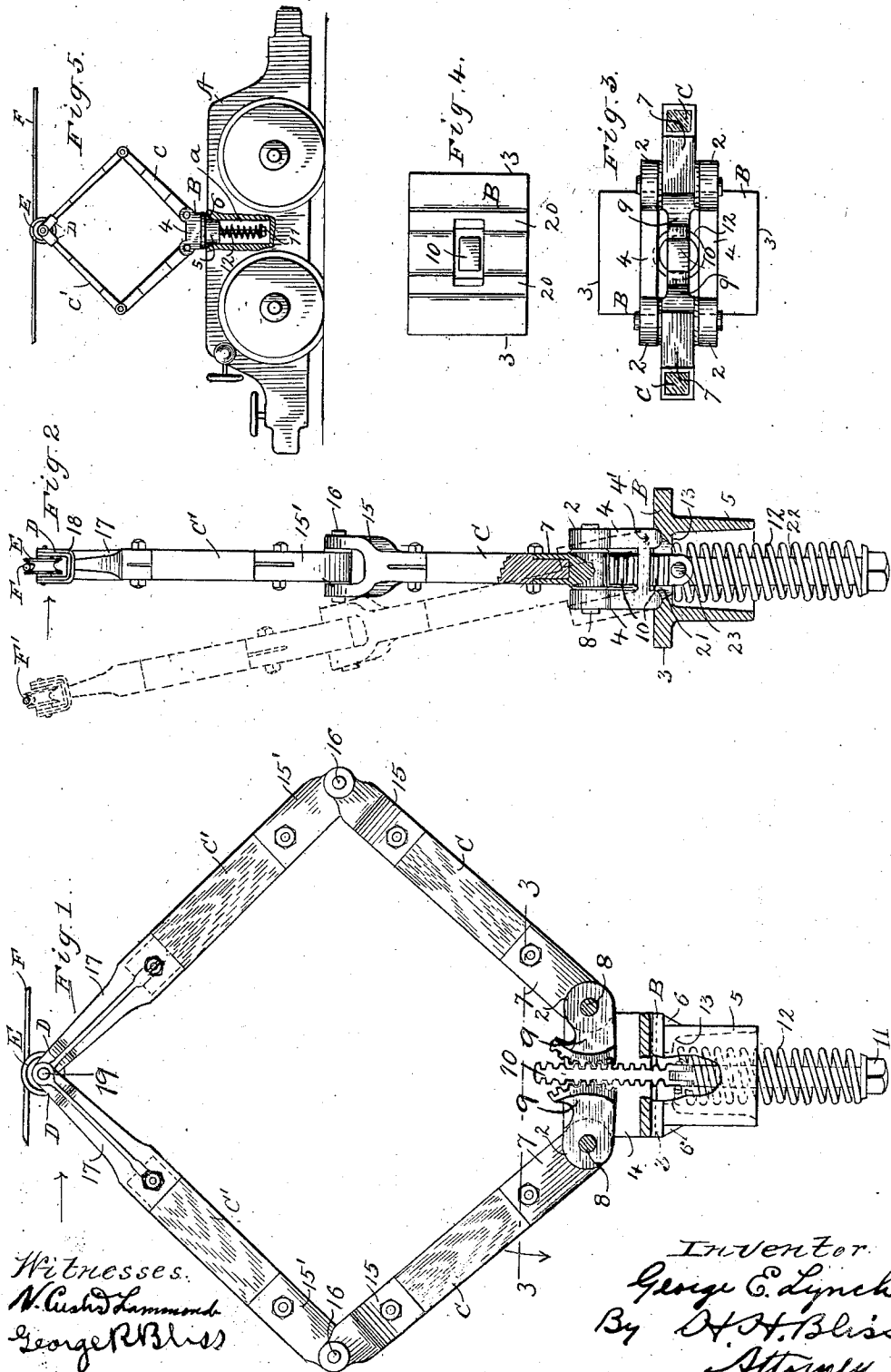


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TROLLEY.

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TO THE JEFFREY MANUFACTURING COMPANY, A CORPORATION OF OHIO.

TROLLEY.

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To all whom it may concern:

Be it known that I, GEORGE E. LYNCH, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Trolleys, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to diamond or double toggle lever trolleys or contact devices for electric locomotives and has for its object to improve the construction of apparatus of this character.

In the accompanying drawings—Figure 1 is a side view of a trolley device embodying my invention adapted to be applied to a mine motor car, parts being broken away. Fig. 2 is an end view of the trolley, parts being broken away and other parts being represented in section. Fig. 3 is a sectional view taken on the line 3, 3, of Fig. 1. Fig. 4 is a top plan view of the trolley base. Fig. 5 is a view, on a small scale, representing the trolley applied to a mine locomotive.

In the drawings, A represents an electric motor car, which may be of any usual or preferred construction, that represented being of the mine locomotive type.

B represents the base of the trolley, which is shaped to fit into a socket or recess *a* provided therefor in the framework of the car. The trolley frame which, as stated, is of diamond shape, comprises the lower arms C, C, the upper arms C', C', the harps D, D, secured to the upper ends of the arm C', and the contact wheel E, carried by the harps. The trolley base or support B comprises a top plate 3, and a skirt 5, extending downward from the plate and adapted to enter the socket *a*, which may be either formed directly in the body or frame of the locomotive, as stated, or in a separate attachment, as may be found desirable.

6, 6 indicate fins or projections carried by the base and arranged to prevent rotation thereof in its socket. These are used when the skirt 5 is cylindrical in shape, but could be dispensed with when it is of other configuration, that is a configuration that would of itself prevent rotation of the base in the socket into which it is inserted.

The lower ends of the trolley arms C, C, are mounted in a frame that rests upon, though it is separate from, the base B. This

frame comprises the side plates or pieces 4, 4, united by cross-pieces 4', 4', and each formed with perforated ears or lugs 2, 2, at their upper outer corners. Pins 8 extend through these perforated lugs and upon them are mounted the arms C. The frame just described constitutes a sort of casing in which the gearing shortly to be described is mounted, and by which it is largely protected.

9, 9, indicate toothed or gear segments secured respectively to the socket-pieces 7, 7 (being preferably integral therewith) in which are secured the lower ends of the trolley arms C, C.

10 represents a rack bar mounted between the two gear segments 9 and engaged thereby. The stem of the rack bar extends downward through the plate 3 and into the skirt 5 of the base where it is pivotally connected with a link 22, the lower end of which is screw-threaded to receive a nut 11. A spring 12 surrounds the link or rod 22, bearing at its upper end against a shoulder 13 in the base, and at its lower end against the nut 11, or a bearing plate interposed between the nut and the end of the spring.

The adjacent ends of the arms C, C' of the toggle frame are preferably provided with socket-pieces 15, 15', united by pins 16. Each harp D is formed with a socket portion 17 in which the upper end of an arm C' is secured, and with two arms 18. The upper ends of the arms 18 are perforated and a pin or shaft 19 is mounted therein, upon which is supported the trolley or contact wheel E.

As the position of the current-supplying wire F with which the trolley wheel engages is liable to vary considerably from a line parallel with the track upon which the car travels, provision should be made for allowing a lateral movement of the trolley frame, as well as for a vertical movement thereof. In order that the trolley wheel follow the wire whatever its position, I provide for this lateral movement as follows, reference being had particularly to Figs. 2 and 4.

20, 20, represent longitudinally disposed grooves formed in the upper face of the top plate 3 of the base or support for the trolley frame, these grooves being disposed so as to be parallel with the track upon which the car rests. The lower edges of the side plates 4 of the frame in which

the trolley is mounted, are constructed so as to rest in the grooves 20, as represented in Fig. 2. The pin 23 that unites the rack 10 with the link or rod 22 is disposed longitudinally of the apparatus, that is its axis is parallel with the grooves 20.

With this description, and by reference to Fig. 2 it will be seen that if the trolley wire be supported so as to occupy a position laterally to one side of the trolley base, as indicated at F', Fig. 2, the engagement of the trolley wheel therewith will cause the trolley frame to be laterally inclined, as indicated in dotted lines, the supporting frame in which the trolley is mounted then resting upon one edge only of that frame, the opposite edge being lifted out of its groove 20. The pivotal connection between the rack 10 and the rod 22 permits the swinging of the trolley frame without causing an inclination of the spring 12, which however, operates to hold the trolley supporting frame securely upon the base. This the spring does whatever the vertical position of the trolley frame and whether it occupies its normal upright position, or be inclined to one side or the other as the trolley wheel follows the supply-wire.

It will be understood that the spring 12 when put in place is under sufficient compression to force downward the rack bar 10 and extend the trolley arms, that is, move them, through the engagement of the rack bar with the segments 9, into an elevated position. This insures that the contact roller of the trolley device shall be held against the underside of the supply-wire, and will follow the latter in its vertical undulations.

From the foregoing description, taken in connection with the drawings, it will be seen that I have provided an exceedingly compact construction, possessing few and simple parts. The spring is largely protected by the skirt of the trolley base, and is entirely concealed when the trolley is mounted upon a car.

When considering certain features of my invention, the base in which the toggle arms are mounted may be understood as comprising a part, corresponding with that lettered B in the drawings, adapted to provide an attachment to the car, and parts corresponding to the side plates 4, without regard to whether such parts are of integral construction, or separate from each other, as illustrated.

What I claim is:

1. In a trolley device, the combination of a collector, a pair of toggle arms supporting the collector, a gear segment at the lower end of each of the arms, a gear rack engaging the said segments, a spring operating upon the gear rack and arranged to force the collector into engagement with the

supply wire, and means cooperating with the toggle for directing its up and down movements, substantially as set forth.

2. In a trolley device, the combination of a collector, a diamond-shaped or double toggle supporting frame thereof, a pair of segments at the ends of the lower arms of the said frame, a rack bar mounted between and in engagement with the said gear segments, and a spring operating upon said rack bar, substantially as set forth.

3. In a trolley device, the combination of a collector, a pair of toggle arms that carry the collector, a separable base to which the lower toggle arms are pivoted, adapted to be inserted into and removed from a receiving socket, means for preventing the base from turning in its socket, and means for holding the collector in engagement with the supply wire, substantially as set forth.

4. In a trolley device, the combination of a collector, a pair of toggle arms supporting the collector, a gear segment at the lower end of the lower link of each of said arms, a separable base in which the said links are pivoted, adapted to be inserted into a receiving socket, a rack bar engaging with the said segments, and a spring supported by the said base and operating through the rack bar to hold the contact in engagement with the supply-wire, substantially as set forth.

5. In a trolley device, the combination of a base adapted to be secured to a car, a traveling contact, a diamond frame for carrying the contact, a frame in which the lower arms of the diamond frame are mounted, free to incline laterally relative to said base, and a single spring for holding the contact up against the supply-wire, and for maintaining the diamond frame in an upright position, substantially as set forth.

6. In a trolley device, the combination of a base adapted to be secured to a car, a frame loosely resting on the said base, and free to incline laterally to one side or the other, a trolley support pivotally mounted in the said frame on a transverse axis, and means for holding the said frame in a central upright position, and the trolley against the supply-wire, substantially as set forth.

7. In a trolley device, the combination of a base adapted to be secured to a car and having an open seat at its upper end, a trolley arm, a frame in which the trolley arm is pivotally supported, on a transverse horizontal axis, said frame resting in the said open seat in the base, and being free to incline laterally, and a spring for holding the frame upon the base and tending to maintain it in a central upright position, substantially as set forth.

8. In a trolley device, the combination of a base adapted to be secured to a car having a top plate in which are formed open seats, a trolley arm, a frame in which the trolley

arm is pivotally supported, resting in the said open seats in the top plate of the base, a spring situated on the opposite side of the said top plate from the frame, and connections between the trolley arm and the said spring, the spring and connections being arranged to maintain the trolley in a substantially upright position, substantially as set forth.

10 9. In a trolley device, the combination of a traveling contact, a diamond shaped supporting frame therefor, such frame being free to incline laterally to one side or the other, a pair of gear segments at the lower

ends of the lower arms of the said frame, a rack bar mounted between and in engagement with the said gear segments, a rod or link connected with the rack by a pivot whose axis is longitudinally disposed, and a spring acting through the said link to hold the diamond frame in working position, substantially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

GEORGE E. LYNCH.

Witnesses:

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BLANCHE PARDRIDGE.