J. A. HANSON.

TROLLEY BASE.

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914,719. Patented Mar. 9, 1909.

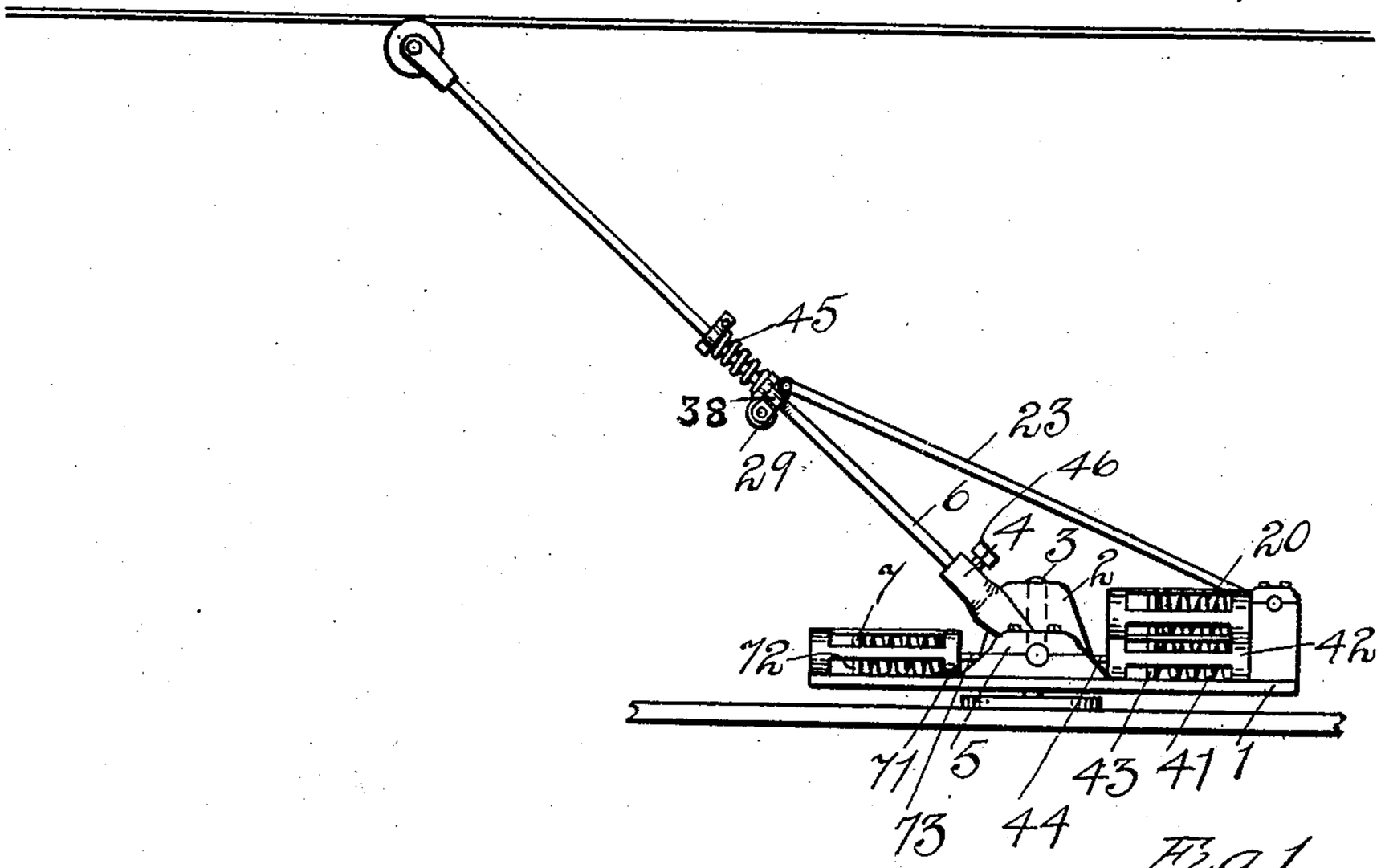

Fig. 1.

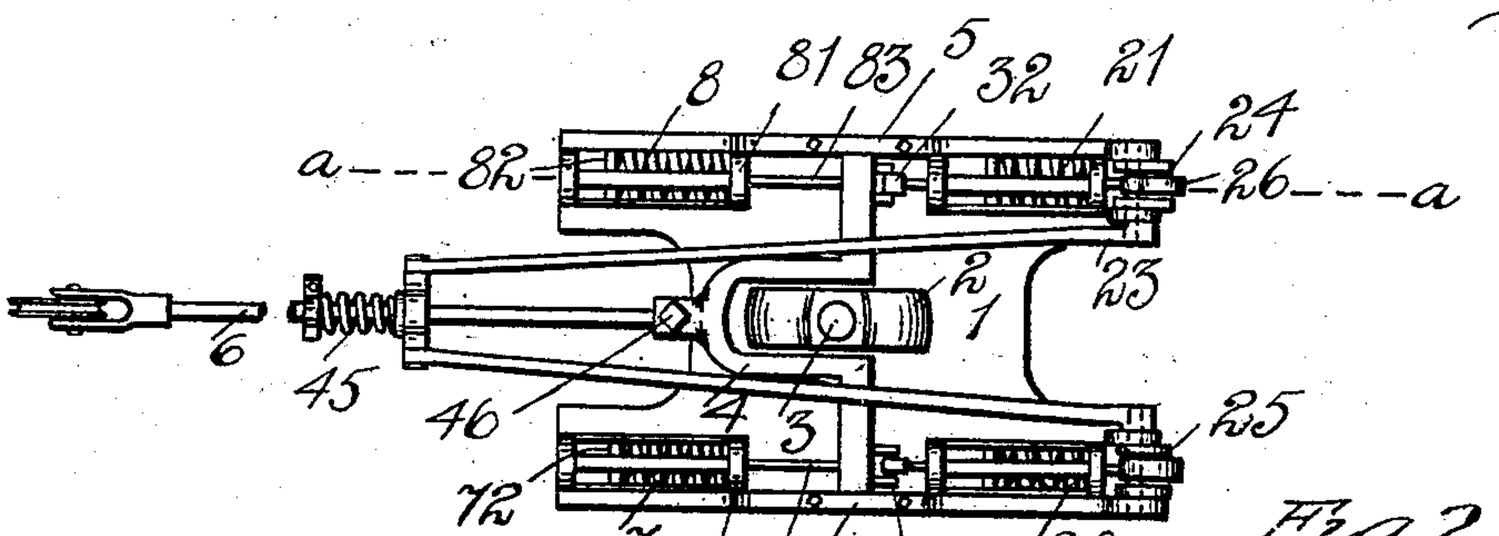

Fig. 2.

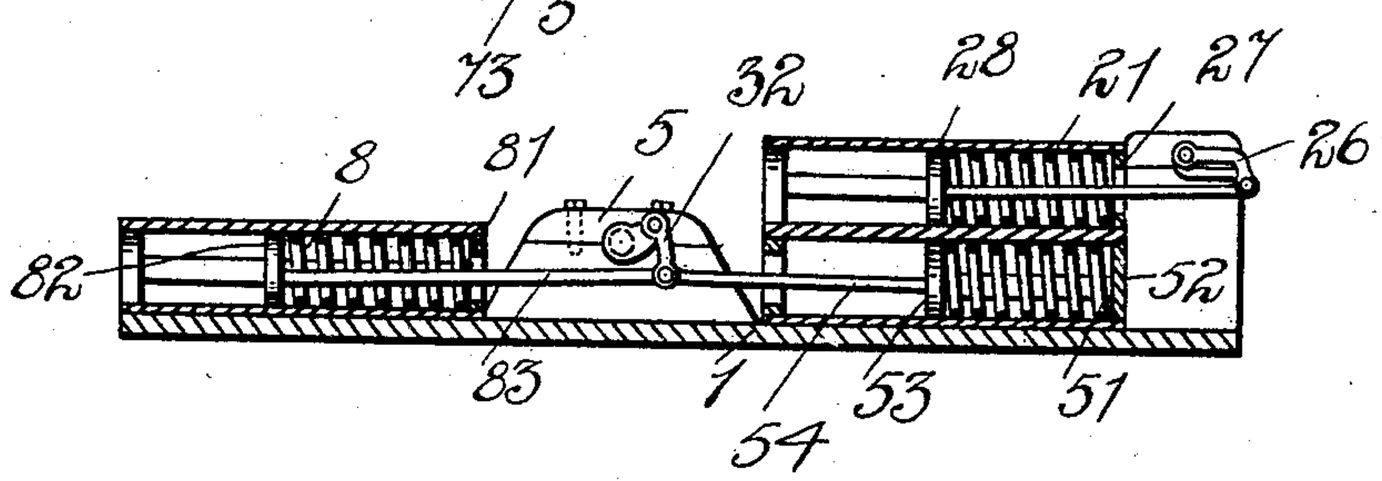

Fig. 3.

WITNESSES

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TROLLEY-BASE.

No. 914,719. Specification of Letters Patent. Patented March 9, 1909.

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To all whom it may concern:

Be it known that I, JOHN A. HANSON, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Trolley-Bases, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to trolley bases, and has for its object an improved trolley base and connections between the base and the trolley pole by means of which the maximum power of the springs used to lift the pole and hold it against the trolley wire is exerted through a limited range, and the greatest power is exerted when the trolley pole is in its normal position taking current from the trolley wire. As the pole is either thrown by the spring to a position beyond the vertical, or forced against the spring to a position approaching the horizontal, the power exerted upon the pole decreases, and it may be drawn down and held to a substantially horizontal position, and requires for such holding very little exertion of power; when entirely horizontal requires almost no exertion.

In the drawing:—Figure 1, is a side elevation. Fig. 2, is a plan view. Fig. 3, is a vertical longitudinal section taken at line *a*—*a*, Fig. 2.

The base 1 is provided at its central point with a hub 2 adapted to engage over a stud 3 on the roof of the car, and to turn on a vertical axis around said stud. On opposite sides of the plate 1 and at the middle thereof, are ears or bearings 5 in which is journaled a yoke 4, adapted to swing over the hub 2. The yoke 4 is provided with a socket for the reception of the trolley pole 6. The base 1 supports a number of springs; preferably four of these are arranged to the front of the yoke and two are arranged to the rear of the yoke. Of these, the two springs 7 and 8 engage between abutments 71 and 81, which rise from the base, and between collars 72 and 82 on links 73 and 83, and are compressed by drawing the links 73 and 83, and the collars 72 and 82 against the spring. The springs 41 and 51 engage between abutments 42 and 52, and collars 43 and 53 on rods 44 and 54; the springs are put into compression by the shifting of the rods. The rods are connected to crank stirrups 31 and 32 on the journal members of the yoke. The springs acting upon the stirrup cranks of the yoke tend to rock the yoke and the trolley arm carried by it, and swing the yoke from the position shown in Fig. 1 to the right. If, however, the free end of the trolley pole be forced downward, the pivotal connection between the stirrups and the links approaches more and more a position such that the pivot travels in an arc around the centers upon which the yoke swings, and approaches the "dead-center" in which position, while the springs are under the strongest tension, the leverage of the trolley pole is in position to most easily hold them there, and the springs themselves exert their reacting force to the least advantage so far as swinging the pole is concerned. The springs exert their reaction force to the best advantage when the stirrup is in the position shown in Fig. 3, and act to less and less advantage when the stirrup swings to either side of the position shown in Fig. 3, the reacting force of the springs is exerted at a lessening degree in one direction because the stirrup pin is approaching the dead-center, and in the other direction because the reactionary force of the spring is decreasing.

The springs previously described are supplemented by another set of springs 20 and 21, which are linked to an auxiliary yoke arm 23, that is pivotally connected to bearings 24 and 25 which rise from the frame, and which are connected by crank arms, one of which 26 is seen in Fig. 3. The springs which actuate the auxiliary member are between abutments 27 and collars 28, and are placed under tension by the same swinging movement of the trolley arm which places the main springs under tension. The crank connection is arranged to exert maximum pressure on the yoke when the trolley arm is in the position shown in Fig. 1; the auxiliary member is slidingly connected with the trolley arm 6 by the yoke 38 which abuts against a cushion spring 45. When all the crank arms are swung to bring them all in the dead-center position, the auxiliary member and the trolley arm 6 are in substantial parallel relation, and as they swing from this position the auxiliary member assumes an angular relation with the trolley arm, which increases its action upon the trolley arm more rapidly than its force is decreased by the relaxation of the spring which actuates it, and this continued

increase of advantage in the location of the parts continues until the trolley arm has reached an angle of substantially sixty or seventy degrees from the horizontal, or twenty or thirty degrees from the vertical, through which range of ten degrees, or perhaps somewhat more, the springs exert their most efficient power in swinging the end of the trolley arm upward, and causing it to bear strongly against the trolley line. As the arm departs from this angle in either direction, the swing of the trolley arm is effected with the application of less force to the end of the trolley arm, or the action of the trolley arm in pressing against any power applied to the end of it diminishes. This result is produced in part by the location of the springs 20 and 21, on a higher plane than the springs which directly control the trolley arm 6, and also by reason of the varying angle between the auxiliary arm and the main trolley arm. The connection between the auxiliary arm 23 and the main trolley arm 6 is made by means of a yoke 28 provided with an anti-friction wheel 29, and is mechanically as free from friction as it is possible to make it. The cushioned stop 45 prevents the arm from swinging beyond a vertical or beyond any angle to which the cushion may be adjusted. This trolley pole is held from escaping from the socket in any suitable way as by a set screw.

What I claim is:—

1. In combination with a trolley arm and means for actuating it, an auxiliary arm and means for actuating the same, a sliding connection member between the auxiliary arm and the trolley arm, and means for shifting the actuating means of said trolley arm to a position of relative inactivity when the arm is depressed from its position of use, substantially as described.

2. In combination with a trolley arm, a spring adapted to actuate the trolley arm directly, an auxiliary arm in sliding connection with the trolley arm adapted to assume a range of angular relation thereto, a cushioned engagement between said arm and auxiliary arm, and a spring adapted to actuate said auxiliary arm, substantially as described.

In testimony whereof, I sign this specification in the presence of two witnesses.

JOHN A. HANSON.

Witnesses:

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