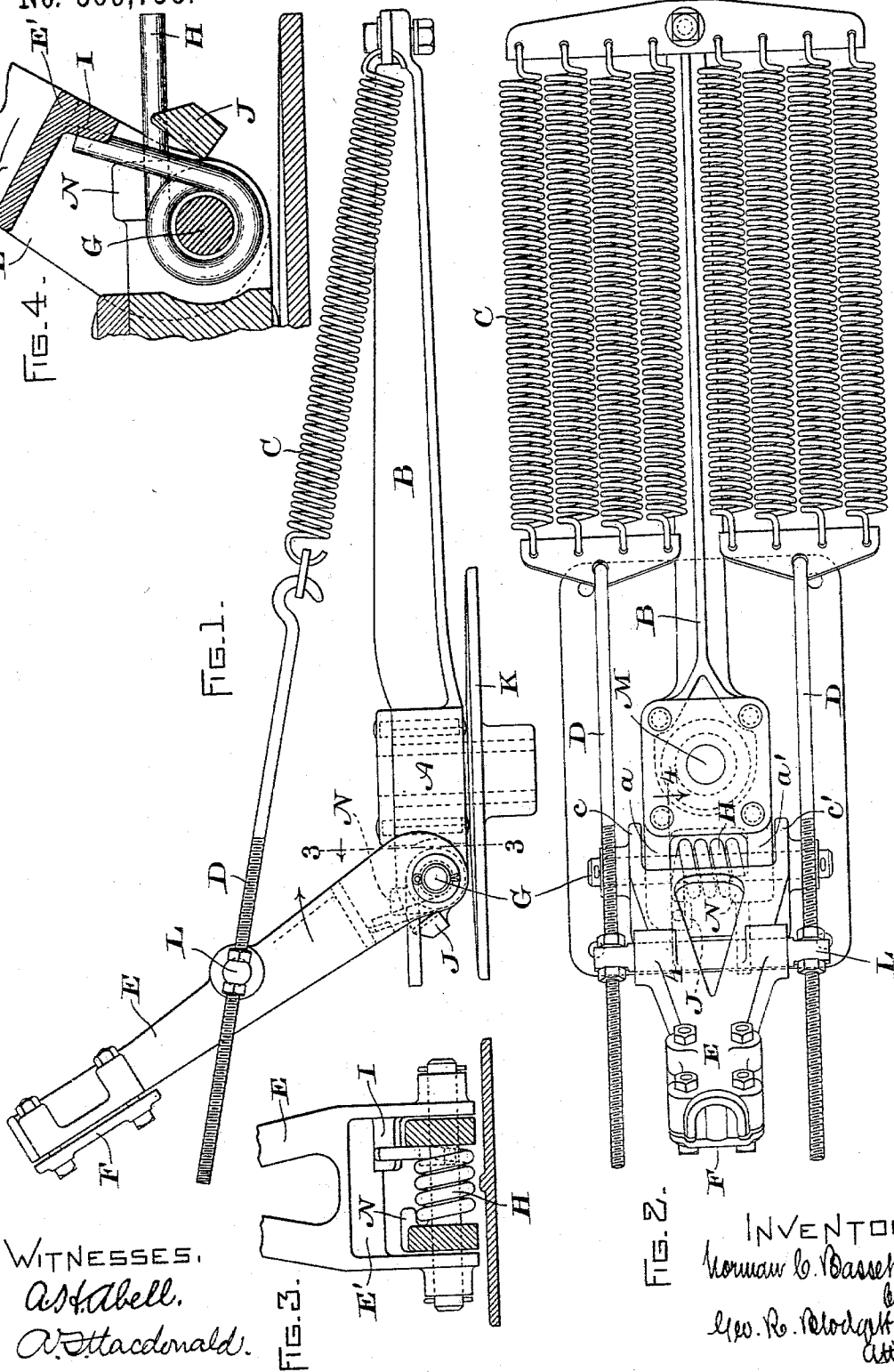
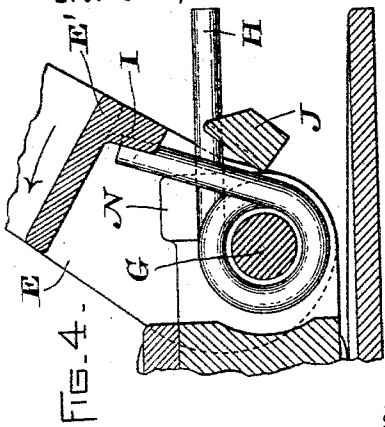


N. C. BASSETT.
UNDER RUNNING TROLLEY.

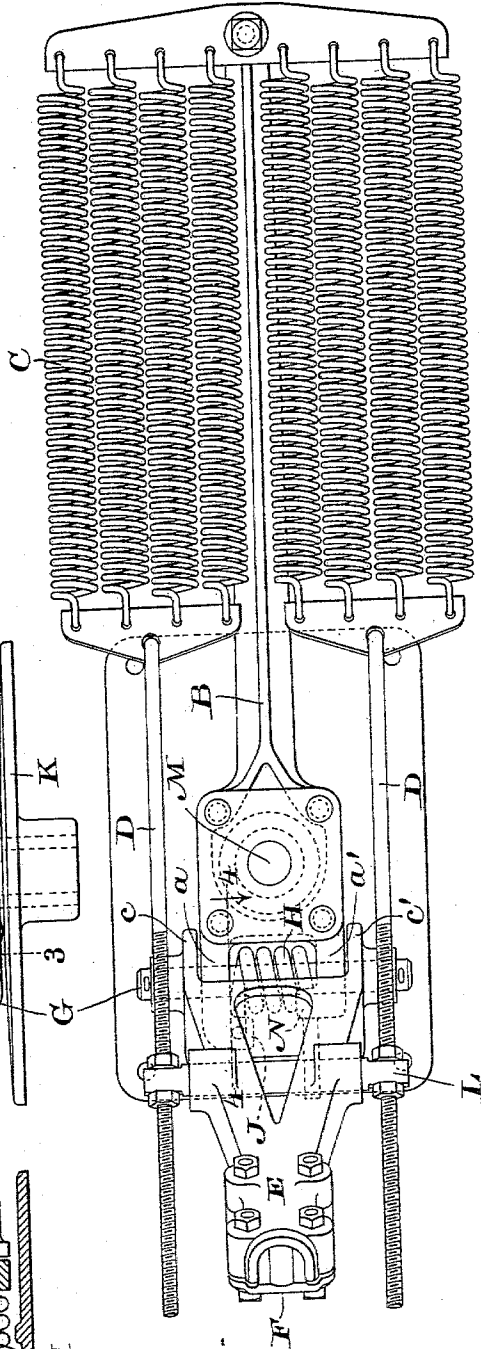
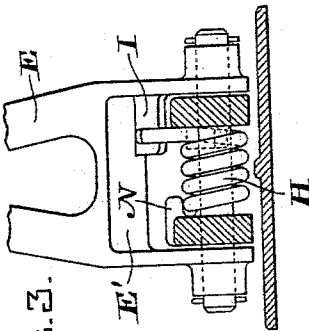
No. 569,738.



WITNESSES.

A. S. Abell.

A. MacDonald.



INVENTOR,
Norman L. Bassett,
by
Geo. R. Blodgett,
Attor:

UNITED STATES PATENT OFFICE.

NORMAN C. BASSETT, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE
GENERAL ELECTRIC COMPANY, OF NEW YORK.

UNDERRUNNING TROLLEY.

SPECIFICATION forming part of Letters Patent No. 569,738, dated October 20, 1896.

Application filed June 26, 1896. Serial No. 597,046. (No model.)

To all whom it may concern:

Be it known that I, NORMAN C. BASSETT, a citizen of the United States, residing at Lynn, county of Essex, and State of Massachusetts, have invented certain new and useful Improvements in Underrunning Trolleys, (Case No. 401,) of which the following is a specification.

The present invention relates to underrunning trolleys, and has for one of its objects to utilize the buffer-spring for the purpose of assisting the lifting-springs when the trolley is in its lowest or horizontal position, at the same time using it in the usual manner to relieve the shock when the trolley leaves the overhead conductor and moves upward, due to the lifting-springs.

A further object of the invention is to provide a trolley which is capable of a very wide range of movement, and one in which the upward pressure on the trolley-pole is less in the lower positions than in the upper, and provided with a base occupying a minimum amount of vertical space.

In carrying out my invention the support for the trolley-pole is mounted on a transverse shaft which is supported by means of a suitable base mounted on the car-roof. Between the support and an extending arm, mounted on the base, are the lifting-springs, which are so arranged that their lifting effect is much less in their extreme lower positions than in the upper. This prevents to a large degree the tendency of the trolley to leave the overhead conductor when in places where the roof of the car and the conductor approach each other closely. The buffer-spring is made in the form of a spiral and is mounted on the shaft, which forms a transverse axis of the support for the trolley-pole. This spring is provided with two free ends, which are adapted to be engaged by lugs on the base and on the trolley-pole support. The spring is so arranged that an extreme movement of the trolley-pole in both the horizontal and vertical direction will increase the tension of the spring. In the former case it will assist the action of the lifting-springs and in the latter case oppose them.

In the accompanying drawings, attached to and made part of this specification, Figure

1 is a side elevation of a trolley embodying my invention. Fig. 2 is a plan view. Fig. 3 is a section on the line 3 3 of Fig. 1, and Fig. 4 is a sectional view taken on the line 4 4 of Fig. 2.

The base A is mounted on a suitable bearing K, the latter being secured to the roof of the car, and is so arranged that the trolley-base is free to revolve thereon around the shaft M as a center. The base A is provided on one side with an arm B, which forms a support for the lifting-springs C, and on the other side with two arms or projections *a* and *a'*. These are provided with lugs J and N, respectively, which engage with the ends of the buffer-spring H. In addition to the above the projections *a* and *a'* form a support for the shaft G, the latter forming a pivot for the trolley-support E.

The trolley-support E is provided at its lower end with two arms *c c'*, extending outside of the projections *a a'* of the base, and connecting them is a web E', provided on its under side with a lug I, adapted to engage with the buffer-spring H. On the upper end of the trolley-support E is a clamp F, adapted to clamp the trolley-pole in position. The pole is not shown for the reason that it forms no part of the invention. Any suitable connection may be employed, either metal or wood.

On the outer end of the arm B is a cross-piece to which all the springs C are secured. The springs are supported at the other end by means of two plates connected to the screw-threaded rods D. Extending through the support E is a shaft L, provided at its outer ends with flattened portions, which form bearing-surfaces for the adjustment-nuts on the rods D, this shaft being free to turn as the trolley moves up and down.

Referring to Figs. 3 and 4, the action of the trolley will be described. The longer end of the buffer-spring H is under the lug N, which is formed integral with the projection *a'* of the base A, and is held thereby against upward movement. The lug I on the under side of the web E' engages with the shorter end of the spring H, and a movement of the trolley in the direction of the arrow tends to wind up the spring around the shaft G as an

arbor, and if for any reason the trolley comes off the overhead conductor the spring H will relieve the shock occasioned thereby. The spring H when the trolley is approaching its upward limit opposes the action of the lifting-springs C, but the latter are in such a position that they greatly overpower it. If now the trolley is moved in the opposite direction a certain distance, the short end of the spring H will engage with the lug J, which is formed integral with the base, and the trolley-support E is relieved from the pressure of this end of the spring. If the trolley continues its downward movement until it assumes a position substantially horizontal with respect to the roof of the car, the longer end of the spring H will be engaged by the end of the web E' (shown in dotted lines) and press it downward, thus increasing its tension, the opposite end remaining in engagement with the lugs J. When this end of the spring is in engagement with the web E', the lifting-spring C and the center of revolution of the support E will be very nearly on the same line, so that the springs will exert very little lifting effect, but the spring H, being under torsional strain, (the amount depending upon the position of the trolley,) will aid them in raising the arm to a position where the effective strength of the lifting-springs C is sufficient to raise the trolley.

The spring H and the lugs N and J and the lug I and the web E' are so arranged that when the spring is to be used as an assisting-spring it is wound or coiled up from the longer end, whereas when it is to be used as a buffer-spring it is wound up from the shorter end.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a trolley, the combination of a support for the trolley-pole, a base to which the support is pivoted, lifting-springs secured to the support and the base, and a spring acting

to assist the lifting-springs when the trolley is in the lower position.

2. In a trolley, the combination of a support for the trolley-pole, a base to which the support is pivoted, lifting-springs secured to the support and the base, and a spring acting as a buffer-spring in the upper positions of the trolley, and as an assisting-spring in the lower positions.

3. In a trolley, the combination of a base, an arm extending from the base forming a support for the lifting-springs, projections from the base forming a support for a shaft upon which the trolley-support is pivoted, lugs on the base and on the support, and a spiral spring engaging with a lug on the support and a lug on the base.

4. In a trolley, the combination of a base provided with two projecting arms, a support for the trolley-pole provided with a similar pair of arms, a shaft extending through the arms and forming a pivot for the support, a spiral spring surrounding the shaft, a lug on the support, and a lug on the base engaging with the spring in certain positions of the trolley and other lugs on the base and support engaging with the spring in certain other positions of the trolley.

5. In a trolley, the combination of a base to which the lifting-springs and the support for the trolley-pole are secured, springs tending to raise the trolley to a vertical position at all times, and a spiral spring adapted to be coiled or wound from one end when used as a buffer-spring, and wound or coiled from the other end when used as an assisting-spring.

In witness whereof I have hereunto set my hand this 23d day of June, 1896.

NORMAN C. BASSETT.

Witnesses:

JOHN W. GIBBONEY,
HENRY M. HOBART.