(No Model.)

E. L. LANGHEINZ.

TROLLEY POLE CATCHER.

No. 494,871. Patented Apr. 4, 1893.

Fig. 1

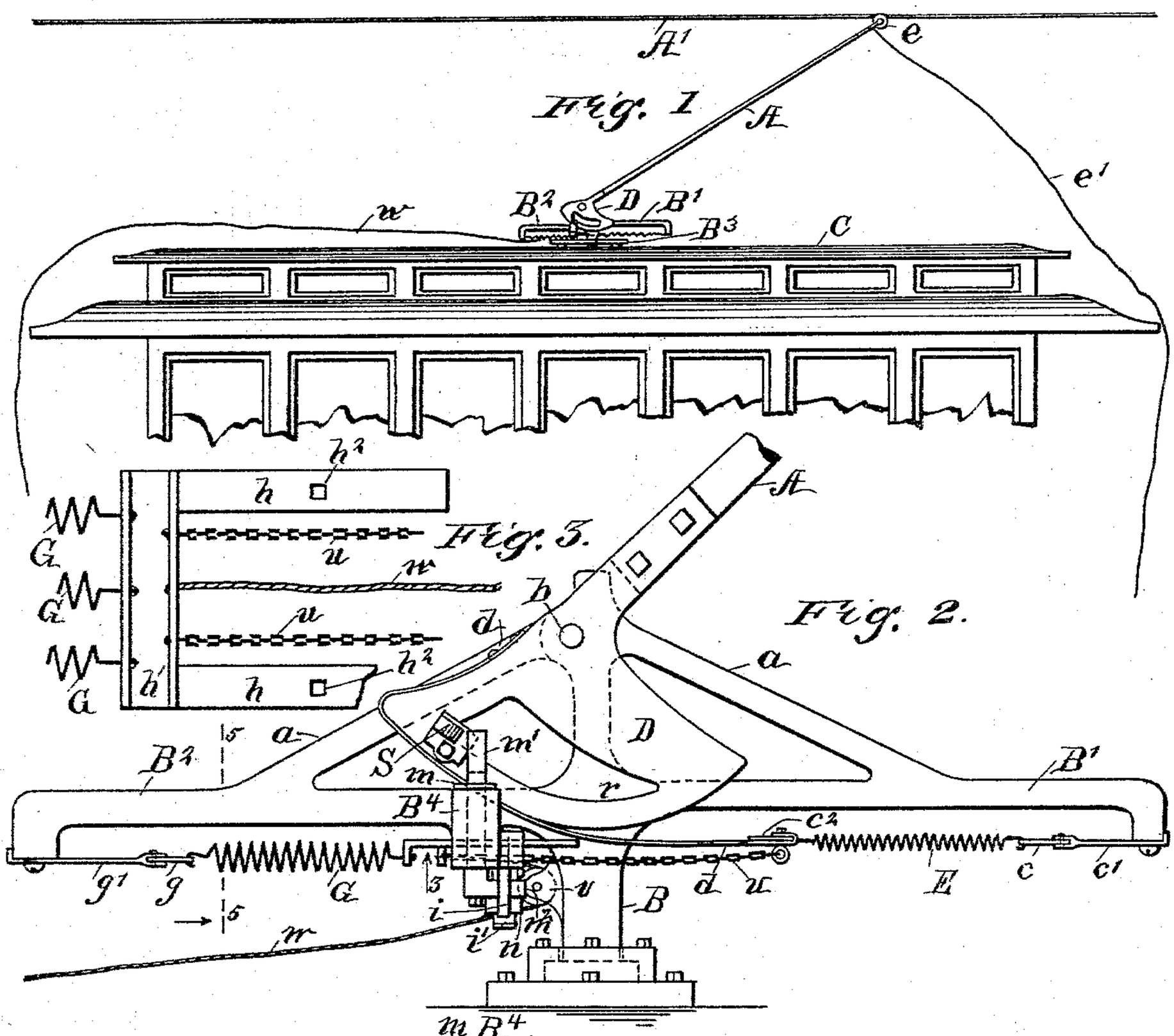


Fig. 3.

Fig. 2.

Fig. 4.

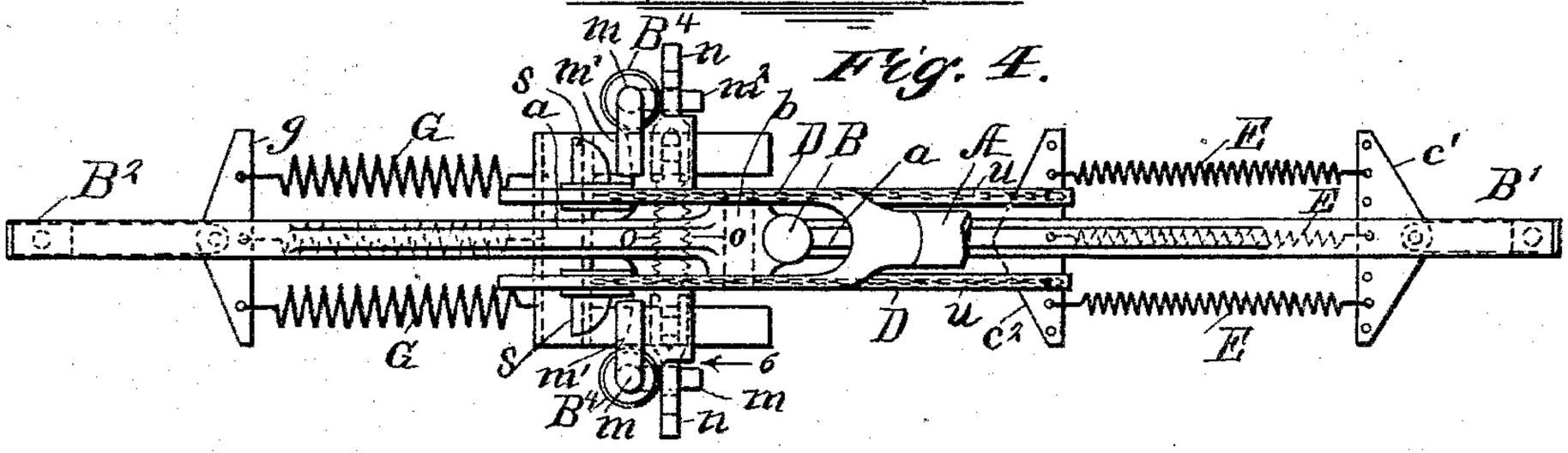


Fig. 5.

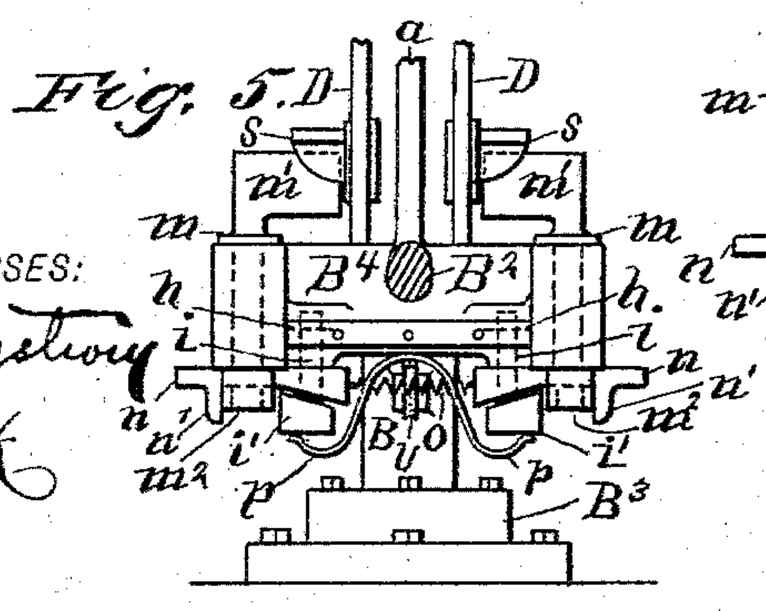
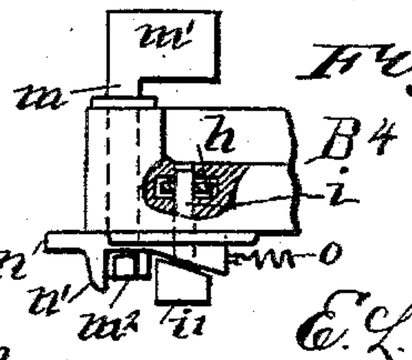


Fig. 6.



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TROLLEY-POLE CATCHER.

SPECIFICATION forming part of Letters Patent No. 494,871, dated April 4, 1893.

Application filed November 10, 1892. Serial No. 451,508. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. LANGHEINZ, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Trolley-Catcher, of which the following is a full, clear and exact description.

This invention relates to improvements in trolleys for electric railways employing overhead wires hung from poles.

As ordinarily constructed, when a trolley truck is accidentally dislodged from below a line wire, or said wire is broken and the trolley pole left free to swing and move upwardly, it is instantly forced above the plane it usually moves in, by the pressure of the spring on the foot bracket of the pole. This improper elevation of the pole and trolley truck is liable to cause expensive breakage of the pole and other parts of the trolley mechanism, by the forcible impinge of the pole on the line wire supports that are arranged transversely of the railway track.

The object of my invention is to provide a novel, simple and effective attachment for a trolley bracket foot on a car, which will serve as a guard, and counteract the force of the lifting spring for the pole on said foot piece, and prevent a sudden, abnormal elevation of the pole and trolley on it, if the latter is dislodged or otherwise released from contact with the line wire.

To this end, my invention consists in the provision of a counteracting device for the lifting spring of a trolley pole, which will be thrown into action automatically when the trolley on the pole is freed from contact with a line wire; and also consists in the construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of the upper portion of a car, and a trolley device having the improvement located on the car in engagement with a line wire. Fig. 2 is an enlarged side view of the pole-supporting mechanism, a pole in part, and the novel counteracting device connected with said mechanism. Fig. 3 is an enlarged and detached reverse plan view of part of a reciprocating frame that is a feature of the invention, the view being taken opposite the arrow 3, in Fig. 2. Fig. 4 is a plan view of the trolley pole in part, the lifting devices for the pole, and the novel counteracting mechanism in connection with said lifting devices. Fig. 5 is a transverse sectional view on the line 5—5 in Fig. 2, the novel retracting spring device being removed, and the upper part of the trolley pole support shown in part; and Fig. 6 is an enlarged partial side view of parts taken opposite the arrow 6 in Fig. 4.

The bracket frame support for the foot of the trolley pole A, on the roof of a car, comprises an upright post B, from which are laterally and oppositely extended the limbs B′, B^2, that are braced from the post above, as shown at *a* in Fig. 2. A swivel connection is preferably formed between the lower end of the post B and a base plate B^3, as shown, which plate is secured on the car roof C, to sustain the trolley pole on said roof. The post B is of sufficient height to sustain other parts in proper relative positions, and the limbs B′ B^2 are projected therefrom, having a nearly equal length, for a like purpose. Upon each side of the post B, a sector plate D, is pivoted upon a transverse bolt *b*, that is inserted in a lateral perforation in and near the top of the post, and through perforations of like diameter in the sector plates, which perforations are produced at or near the radial center of the sectors.

Forwardly on the bracket frame A, and below the limb B′, a set of spiral springs E is supported in connection with the end of the limb and also with the sector plates, this being effected forwardly by yoking the springs together at spaced intervals on a yoke plate *c* that is clipped fast to the link plate *c′* which is secured by its outer end to the depending end portion of the limb mentioned; and rearwardly by provision of a mating yoke plate c^2, that is attached to the other ends of the spaced springs, and is also connected near its ends with the flexible and thin strap plates *d*, which have a loose contact with the arched edges of the sector plates D, and are secured thereto by their opposite end portions that extend upwardly on the side edges of the sector plates, as shown in Fig. 2. The plates D, may be joined at their upper ends to a socket, see

Fig. 4, that receives the lower end of the trolley pole A, or they may be attached as separate pieces upon the sides of the lower end of said pole, by transverse bolts, as represented in Fig. 2.

The construction of parts that has been described, is substantially such as is ordinarily used to press the pole A upwardly against a line wire A′, the usual trolley wheel *e* being provided to have a rolling contact on the under side of the line wire, and transmit electricity through an attached conductor wire *e′* to a motor, not shown, on the car. It will be evident that if the springs E are unrestricted in their retractile movement, when the trolley wheel *a* is accidentally displaced from the wire A′, they will force the pole A upwardly, so that it will be brought into contact with transverse line wire supports, (not shown,) and incur breakage.

The features of improvement that are attached to the parts already described, consist of a spring mechanism that is dormant while the pole A, remains in contact with the line wire A′ in service, but that will instantly become active and counteract the energy of the springs E, so as to prevent the pole A from an abnormal elevation; these features of improvement, comprising essentially the set of similar springs G, which are of greater strength than the springs E, and other co-acting parts connected therewith.

The counteracting springs G, are attached to a yoke plate *g*, by an end of each spring at spaced distances apart, and this yoke plate is clipped to a link plate *g′*, which is secured by its other end upon the depending portion of the limb B^2. The opposite ends of the springs G, are attached at spaced intervals upon the transverse cross bar *h′* of a frame shown in part in Fig. 3, which frame is provided with two parallel bars *h*, that project from the ends of the cross bar in the same direction, and are perforated oppositely at h^2, the perforations being designed to receive the end portions of the slide bolts *i*. The pair of similar bolts *i* are sustained vertically and oppositely upon a transverse portion B^4, that is formed on the limb B^2, at a proper distance from the upright post B, the bolts being fitted to slide freely in perforations near the ends of the part B^4, as shown in Figs. 5 and 6.

Between the vertically adjustable slide bolts *i* and the terminals of the cross piece B^4, other perforations are formed in the latter named part, parallel with and evenly spaced from the slide bolt holes therein, these outer holes being designed to receive two vertical rock shafts *m* of a like form. As shown, the rock shafts have each an abutment wing *m′* formed on or secured to their upper projecting ends, and said wings are shaped at their lower edges to adapt them to seat upon the upper faces of the cross piece B^4. The lower end portions of the rock shafts *m*, project below the cross piece they are located in, so as each to receive an arm m^2, and these latter being held in place firmly, extend in the same direction, or toward the springs E, and at a right angle to the vertical plane of the wings *m′*, as indicated in Fig. 4.

Upon the lower ends of the slide bolts *i*, the heads *i′*, are formed, that have their upper surfaces sloped from the outer sides of the heads inwardly and downwardly, and a sufficient space is allowed between the sloped faces of these bolt heads and the lower surface of the cross piece B^4, to permit the introduction and sliding engagement with each bolt body, of a releasing dog *n*. The part of each dog that has a sliding contact with the sloped head of a slide bolt *i*, is bifurcated so as to straddle its body above the head; and upon the lower side of each limb on these furcated portions of the dogs *n* an incline is produced, which slopes from a thicker terminal end of the limb to the flat body of the dog, as represented in Fig. 6. Near the outer end of each releasing dog *n*, a depending toe *n′*, is formed on its lower side, which toes are so spaced from the wedge shaped furcations of the dogs that the free ends of the arms m^2, may be located between and occupy the space provided for the same between the toes and adjacent sides of the bolt heads *i′*.

There is a pair contractile springs *o* provided for the releasing dogs *n*, which springs have their ends attached to the inner ends of the dogs, as shown in Figs. 4 and 5, said springs serving to draw the wedge shaped furcated ends of the dogs toward each other when free to do so. Below on the heads *i′* of the bolts *i*, the ends of an undulating plate spring *p* are adapted to press upwardly, said spring having its bowed center portion seated upon and secured to the central portion and lower surface of the cross piece B^4, see Fig. 5, so that the slide bolts are held normally elevated thereby. The sector plates D, are each slotted at a proper distance from their arched edges, said slots permitting a curved bar *r* of suitable length to remain intact with the other portion of each sector plate; and upon each bar a tripping block *s*, is adjustably secured so as to project a curved lug on its forward side, outwardly in the path of the wing *m′* of a shaft *m*. Upon a depending flange on the cross bar *h′* of the frame that is connected to the inner ends of the springs G, two chains or other flexible connections *u*, have one end of each secured; these chains extending between the frame side bars *h* on each side of the post B, have their other ends shackled to the lower side of the yoke plate *c′*, thereby connecting the strong contractile springs G with the forward weaker springs E. The sliding frame which is attached to the ends of the springs G, has its side bars *h*, inserted through slots in the cross piece B^4 at such points as will locate each of said bars at a right angle to and in the path of, one of the vertical slide bolts *i*. Preferably the bodies of the slide bolts *i* are made square in cross-

section, so as to prevent their heads from turning and thus interfere with the proper operation of the device, and it will also be necessary that the upper ends of the slide bolts be adapted to pass freely into and through the holes h^2 in the frame bars h, as indicated in Fig. 6. Upon the side of the post B, between the frame bars h, a grooved pulley v is loosely sustained, bracket ears being provided for the introduction of a pintle through the ears and pulley, so as to permit a free rotation of the latter. A wire strand or similar flexible connection w, is attached to the frame bar h', between the chains u, and made to engage with the loose pulley v, the main portion of the wire rope extending from below the pulley to a point within the car for a convenient manipulation.

The parts of the device being all connected and arranged as shown and described, it will be evident that if the flexible connection w is drawn upon it will slide the frame bars h toward the springs E until the bolts i are projected through the holes h^2 in said bars and thus lock the springs in an expanded condition, while the chains u, are slackened sufficiently to permit a slight vibration of the trolley pole A, which may be necessary to adapt its wheel e, to press with proper force upon the under side of the line wire A'. At any time that the wheel e, is detached from the wire A', the lifting springs E, will forcibly rock the sector plates D, so as to begin the elevation of the pole A. This will instantly cause the properly adjusted blocks s to impinge on the wings m' of the rocking shafts m, so as to turn the latter and vibrate their arms m^2, which in turn draw the releasing dogs n outwardly. This causes the furcated wedge portions of the dogs n, to slide upon the inclines of the bolt heads i', which will draw said heads and the bolt bodies i downwardly, thereby withdrawing the upper ends of the bolts from their locked engagement with the bars h. The release of the latter brings the springs G into action, which by their superior strength counteract the force of the lifting springs E, and hold the pole A in a slightly depressed position so as to clear it from contact with any transverse wire supports and obviate the injury to the pole and its attachments.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A catcher for a trolley pole, comprising a counteracting spring device, normally dormant, and rendered active when the pole is abnormally elevated, by the impinge on said spring device of projections from parts on the pole near its pivot support, substantially as described.

2. A catcher for trolley poles, comprising a counteracting spring device on the bracket frame support of the pole, the springs of which are stronger than the lifting springs for the pole, and held dormant while the trolley wheel on the pole is engaged with a line wire, and released when said truck is displaced from the line wire, substantially as described.

3. A trolley pole catcher, comprising a set of counteracting springs supported on the bracket frame that sustains the trolley pole foot support, which springs are stronger than the lifting springs for the pole, and are held dormant but in tension, by mechanism adapted to release said counteracting springs when impinged by adjustable blocks on vibratable attachments of the trolley pole, substantially as described.

4. In a trolley pole catcher, the combination, with the trolley pole, its bracket frame support, and lifting springs for the pole, of counteracting springs stronger than the lifting springs of the pole, a sliding frame on the bracket frame support, slide bolts detachably engaging said frame, and adjustable blocks on rocking sectors from which the pole projects, and which are adapted to release the slide bolts when the trolley pole flies upwardly, substantially as described.

5. In a trolley pole catcher, the combination, with the pole, sector plates on the lower end of the pole, a trolley wheel on the upper end of said pole, adapted to bear upon a line wire, a bracket frame supporting the pole and sector plates on a car, and lifting springs for the pole, of stronger counteracting springs, a sliding frame connected therewith, slide bolts detachably engaging the frame and holding the counteracting springs strained and dormant, releasing devices on the bracket frame, adapted to draw the slide bolts, and adjustable blocks on the sector plates, adapted to impinge on the releasing devices and actuate the same when the trolley wheel leaves the line wire, substantially as described.

EDWARD L. LANGHEINZ. [L. S.]

Witnesses:
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MAX BERGER.