R. B. SPIKES.

TAKE-UP DEVICE.

APPLICATION FILED JUNE 14, 1920.

1,362,198.

Patented Dec. 14, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

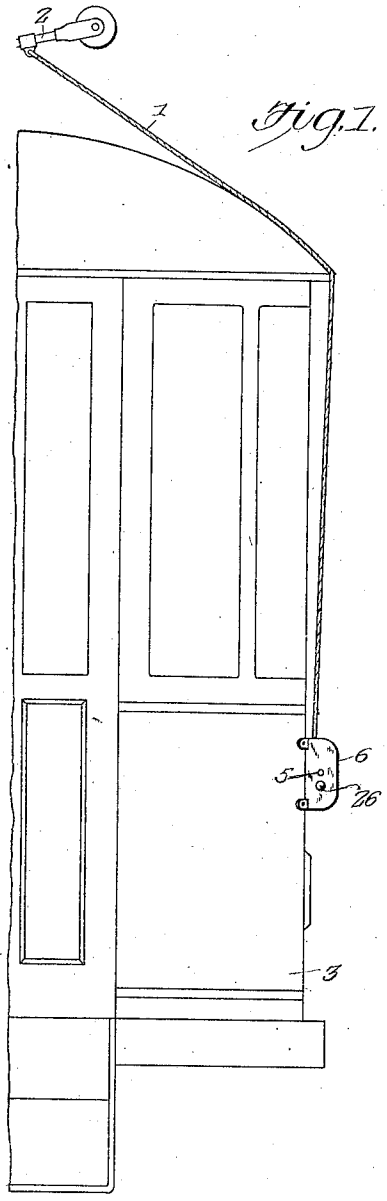


Fig. 2.

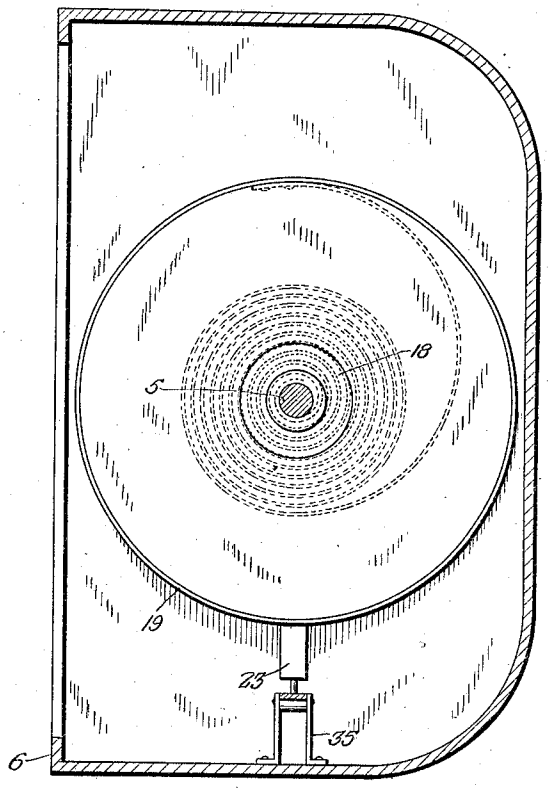


Fig. 5

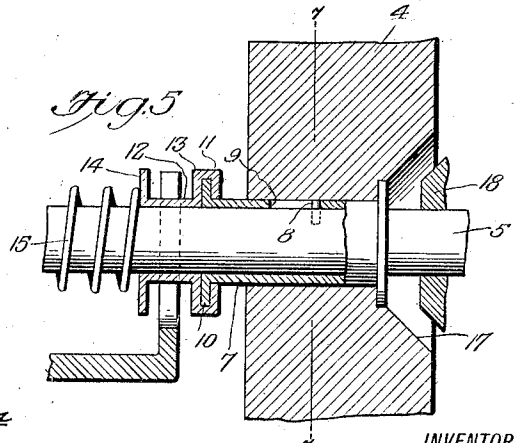
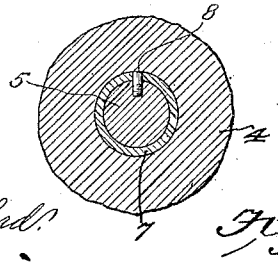


Fig. 7.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

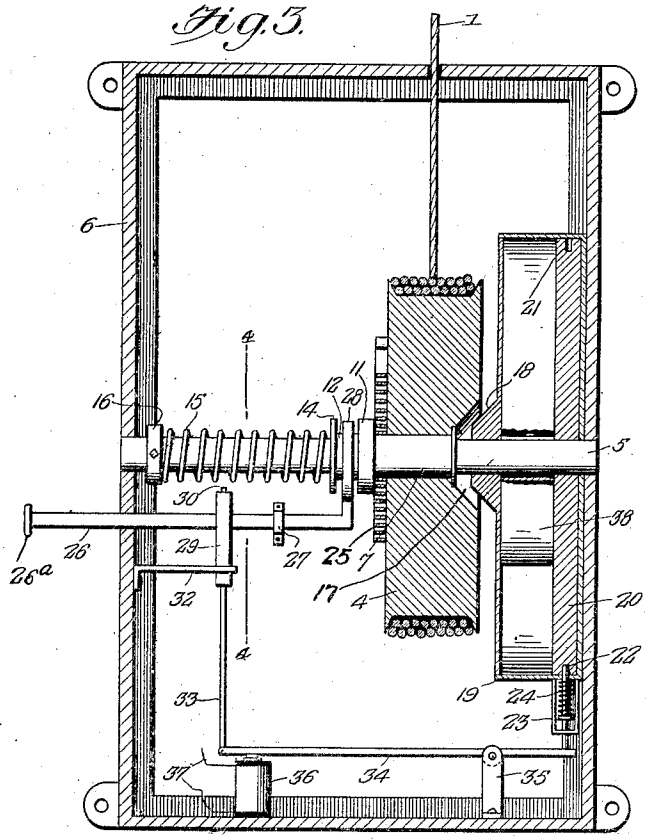
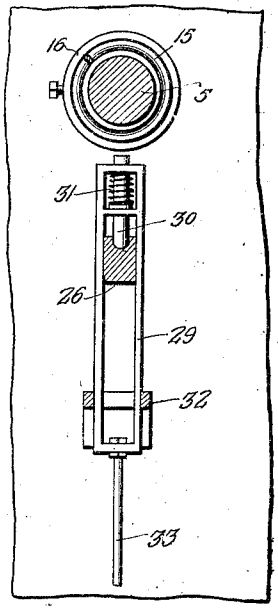


Fig. 4.



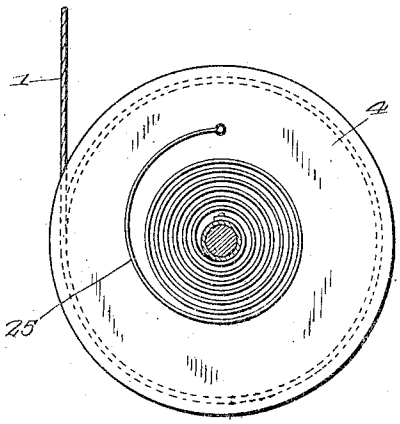


Fig. 6.

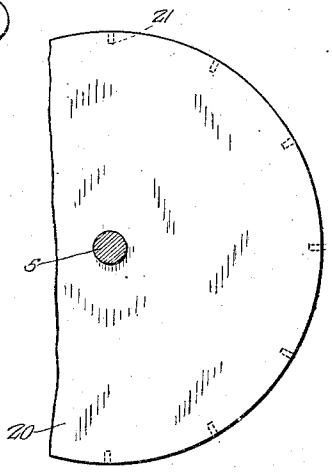


Fig. 8.

WITNESSES

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UNITED STATES PATENT OFFICE.

RICHARD BOWIE SPIKES, OF FORT BRAGG, CALIFORNIA.

TAKE-UP DEVICE.

1,362,198. Specification of Letters Patent. Patented Dec. 14, 1920.

Application filed June 14, 1920. Serial No. 389,043.

To all whom it may concern:

Be it known that I, RICHARD B. SPIKES, a citizen of the United States, and a resident of Fort Bragg, in the county of Mendocino and State of California, have invented certain new and useful Improvements in Take-up Devices, of which the following is a specification.

My invention is an improvement in take-up devices, and has for its object to provide mechanism for automatically taking up the slack in the rope and for permitting slack to run out, as the pole moves up and down with the varying height of the wire, and especially designed for use with the trolley pole arrester forming the subject matter of my co-pending application No. 341,996, filed December 2, 1919.

In the drawings:

Figure 1 is a side view of a portion of a car having the improved arrester;

Fig. 2 is a side view, with the casing in section;

Fig. 3 is a vertical section in the plane of the axis of the reel;

Fig. 4 is an enlarged section;

Fig. 5 is an enlarged detail section at the axis of the reel;

Fig. 6 is a face view of the reel;

Fig. 7 is a section on the line 7—7 of Fig. 5;

Fig. 8 is a partial face view of the controlling disk.

In the present embodiment of the invention the usual rope 1 is connected with the trolley pole 2 of the car 3 and this rope, at the end remote from the pole, winds upon a reel 4 journaled on a shaft 5 which is held in a housing 6 secured to the end of the car, as shown.

The reel 4 is mounted on a sleeve 7 which is movable longitudinally of the shaft 5 and is held from rotation with the reel by means of a pin 8 which engages a longitudinally extending slide 9 in the sleeve, it being understood that the shaft 5 is fixed.

At its outer end the sleeve has a marginal flange 10, which is engaged by an inwardly extending web 11 supported by a collar 12 mounted to move longitudinally of the shaft 5. This collar, as shown more particularly in Fig. 5, is flanged at each end, as at 13 and 14. One of the flanges 13 carries the web 11 and the other flange 14 is engaged by a coil spring 15 which encircles the shaft 5 between the collar 12 and a fixed stop 16 on the shaft, the said stop being in the form of a collar, which is secured in adjusted position by a set screw, as shown.

Referring to Fig. 3, it will be seen that the reel 4 has a conical recess 17 in the face remote from the spring 15, and this recess is adapted to engage a conical extension 18 on a drum or casing 19 journaled on the shaft 5. A disk 20 is arranged within this casing, at the end remote from the extension 18 and is secured thereto, and the said disk has in its periphery a series of radial openings 21, the casing 19 having openings registering therewith.

These openings are adapted for engagement by a locking pin 22 which is mounted in a guide 23 to move radially of the disk and casing and is normally pressed away from the disk and casing by a coil spring 24. The spring is arranged between the casing and a stop on the pin, as shown, and it will be evident that when the pin engages an opening 21 the casing will be locked to the disk.

The reel 4 is normally pressed toward the casing 19 by the spring 15, and when the action of the spring is unopposed the reel will be clutched to the casing 19, to rotate therewith. When the reel is in the position of Fig. 3 however, it is free from the shaft 5 and from the casing 19 and may move under the influence of a spring 25. This spring, as shown in Fig. 2, has one end secured to the reel in a direction to wind up the rope 1. The reel, however, is normally held out of position to engage the extension 18 and to be clutched to the casing 19 by means of an angle bar 26.

This bar has a portion mounted to slide through a guide 27 in the casing 6, parallel with the shaft 5, and a portion which is forked, as indicated at 28, and the arms of the fork engage the collar 12 between the flanges 13 and 14. The first named portion of the bar extends outside of the casing and has a head 26ª as shown, for convenience in operating the bar, and when the bar is moved outwardly the collar will be moved therewith, as will also the reel, and the reel will be disengaged from the casing 19. When so placed, the reel may move under the influence of the rope and under the influence of the spring, the spring winding up the rope when the tension thereon slackens and permitting the same to move outwardly when tension is increased.

Means is provided for engaging the bar 26 to hold the reel in the position shown in Fig. 3. This mechanism is shown more particularly in Fig. 4, and comprises a substantially rectangular frame 29 through which the bar 26 extends. This frame carries a pin 30 which is adapted to engage an opening in the upper edge of the bar, as shown, and the pin is normally pressed toward the bar by means of a spring 31 arranged between the upper end of the frame and the side of the bar. The pin is slidable in the frame and the frame is slidable through a guide bracket 32 extending inwardly from the casing. The lower end of the frame is connected by a link 33 with a lever 34 which is pivoted to a bracket 35 extending upwardly from the bottom of the casing, and the end of the lever remote from the link 33 is in position to engage the pin 22 and to press the pin into engagement with one of the openings 21 of the disk when the end of the lever remote from the pin is drawn downwardly.

An electro-magnet is arranged beneath the said outer end of the lever 34 and the magnet, when it is energized, acts to draw down and hold the outer end of the lever down, that is, the end remote from the pin, and to hold the pin in engagement with one of the openings of the disk. The lever also acts to hold down the frame 29, and to keep the pin 30 in engagement with the opening in the bar 26, and to hold the bar from inward movement and to hold the wire in the position shown in Fig. 3.

The winding of this electro-magnet 36 is interposed in the lighting circuit indicated at 37, and it will be evident that when the pole is pulled down so that the wheel does not engage the trolley wire, and the actuating circuit is broken, the lighting circuit being also broken, the magnet will be deenergized, and that end of the lever remote from the pin may move upwardly. This upward movement of the outer end of the lever permits the spring 24 to move the pin 22 downwardly, to release the disk 20.

The same operation permits the frame 29 to move upwardly to release the bar 26, and the spring 15 forces the reel toward the casing 19, and clutches the reel to the said casing. The casing 19 is a spring casing, containing a spring 38 having one end connected with the shaft and the other with the casing.

In operation, under normal conditions the parts are arranged as shown in Fig. 3, that is, the bar 26 is moved outwardly to withdraw the reel from engagement with the casing 19, and the pin 30 is engaged with the notch in the bar 26 to hold the bar in withdrawn position. The pin 22 is engaged with one of the openings of the disk 20, and with the lighting circuit of the car closed, the electro-magnet 36 will hold the parts in such position. As the pole moves up and down following inequalities of the wire, the spring 25 will actuate the reel to wind up the loose rope or permit the rope to run out, so that the rope is held taut. Should, however, the wheel leave the wire the lighting circuit will be interrupted and the magnet 36 will be deënergized. The bar 26 will be released and the spring 15 will move the reel toward the casing 19 and will clutch the reel to the said casing. At the same moment the pin 22 will be withdrawn from engagement with one of the openings 21, thus releasing the casing, which will at once be rotated under the influence of the spring 38, to turn the reel in a direction to wind up the cord and pull the pole downwardly and hold the same down.

It will be evident that so long as the trolley wheel engages the wire the parts will be held in the position of Fig. 3, that is, with the reel free from the casing and free to follow the movements of the rope under the influence of the light spring 25, which is merely strong enough to wind up the slack rope. In case, however, the circuit is broken, as when the trolley pole jumps the wire, the spring operated casing 19 will be released, while at the same time the reel will be clutched thereto to cause the reel to be rotated by the spring 38 to wind up the rope and pull down the pole.

I claim:

1. In a trolley car, in combination, a reel upon which the rope from the trolley pole winds, said reel being journaled on the car, a spring normally acting to move the reel in a direction to wind up the rope, a spring controlled casing normally acted upon by the spring to turn in a direction to wind up the rope on the reel, said reel being normally pressed toward the casing and said casing and reel having interengaging means for clutching the reel to the casing, releasable means for holding the reel in withdrawn position and released from the casing, means for restraining the rotation of the casing under the influence of the spring, means for simultaneously releasing the reel and the casing to permit the casing to turn under the influence of the spring and to clutch the reel thereto and controlled by the lighting circuit of the car, said controlling means comprising an electro-magnet interposed in the circuit and an armature connected with the restraining means for the casing and for the reel and acted upon by the electro-magnet.

2. In a trolley car, in combination, a reel upon which the rope from the trolley pole winds, said reel being journaled on the car, a spring normally acting to move the reel in

a direction to wind up the rope, a spring controlled casing normally acted upon by the spring to turn in a direction to wind up the rope on the reel, said reel being normally pressed toward the casing and said casing and reel having interengaging means for clutching the reel to the casing, releasable means for holding the reel in withdrawn position and released from the casing, means for restraining the rotation of the casing under the influence of the spring, and means for simultaneously releasing the reel and the casing to permit the casing to turn under the influence of the spring and to clutch the reel thereto and controlled by the lighting circuit of the car.

3. In a trolley car, in combination, a reel upon which the trolley pole rope winds, a spring acting to move said reel in a direction to hold the rope taut, a second spring acting normally to move the reel in a direction to wind up the rope and of a strength sufficient to pull down the pole, means for restraining the operation of the sectond spring, said spring being normally disconnected from the reel, spring controlled means for connecting the reel to the said second spring, means for restraining the operation of said last named spring, and a common means controlled by the lighting circuit of the car for controlling the said restraining means of the spring.

4. In a trolley car, in combination, means normally active for pulling down the trolley pole, and controlled to inactive position by the circuit, said means being normally connected to the pole, and means for holding said connection released, and controlled by the circuit.

5. In a trolley car, in combination, a reel upon which the trolley pole rope winds, a spring acting to move said reel in a direction to hold the rope taut, normally active means for turning said reel in a direction to wind up the rope, said reel being normally moved into engagement with the said winding means, means for restraining the operation of the said winding means, means for holding the reel out of engagement with the said winding means, and means controlled by the circuit for controlling both of the said means.

6. In a trolley car and in combination, means for pulling down the trolley pole, said means including a reel upon which the trolley rope winds, and a spring for turning the reel, the reel being disconnected from the spring, means acting normally to connect the reel and the spring, and means controlled by the circuit for restraining the action of the said connecting means, and released by the breaking of the circuit.

7. In a trolley car and in combination, means engaging the trolley rope for pulling down the pole, means for controlling said pulling down means and normally disconnected from the rope, means acting normally to connect the said means and the rope, and means controlled by the circuit for restraining the action of the connecting means and released by the breaking of the circuit.

RICHARD BOWIE SPIKES.