Aug. 25, 1925. 1,551,206

W. E. NEWNAM

TROLLEY REEL

Filed July 30, 1923

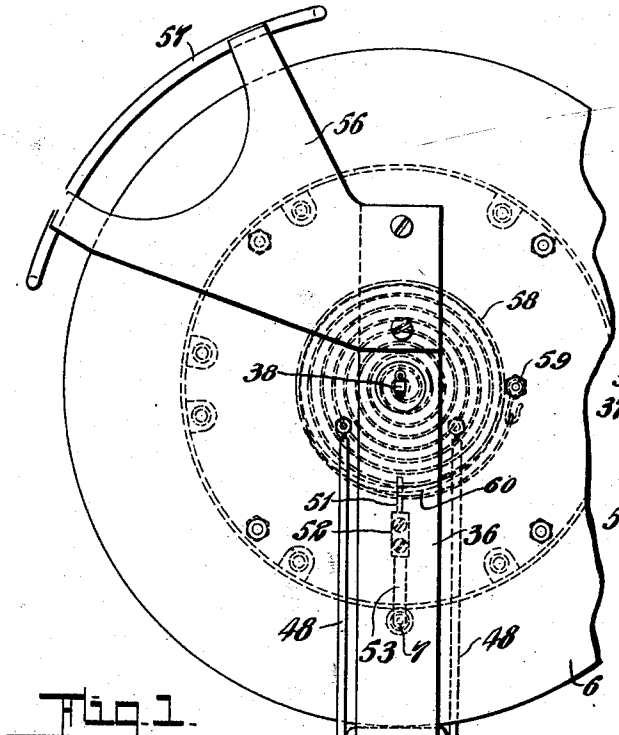


Fig. 1.

Fig. 2.

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UNITED STATES PATENT OFFICE.

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TROLLEY REEL.

Application filed July 30, 1923. Serial No. 654,689.

To all whom it may concern:

Be it known that I, WILLIAM E. NEWNAM, a citizen of the United States, and residing at Collinsville, county of Madison, State of Illinois, have invented the new and useful Improvement in Trolley Reels, of which the following is a specificaton.

Ths invention relates in general to a flexible connection between a source of electric current and some current utilizing device which is movable relatively to the source, and more particularly to a reel for taking up the slack in a flexible conductor for supplying a trolley truck.

One of the objects of this invention is to provide a reel which will effectively take up the slack in a cable supplying a moving truck or similar device.

Another object of this invention is to provide such a reel which will not only take up the slack in the cable, but which will maintain electrical connection between the power utilizing device and the source of supply.

Another object of this invention is to provide improved means for maintaining good electrical connections throughout the movement of the reel.

Further objects will appear from the detail description taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevation of a reel embodying this invention; and

Figure 2 is a central vertical section of the same.

Referring to the accompanying drawing, 1 designates a base or pedestal adapted for mounting on any suitable support on the moving truck. Mounted in the base 1 is a vertically supported tube 2 forming a standard to support the reel. This standard carries at its top a bearing 3 within which a vertical spindle 4 is mounted for rotation on a vertical axis. The spindle 4 carries at its upper end a carrier 5 upon which a cable drum 6 is mounted for rotation as will be hereinafter more fully described. By this construction the drum 6 may revolve on a horizontal axis on the carrier 5, and the carrier itself may revolve about a vertical axis on the spindle 4, so that the cable 7 may be reeled off of or on the drum from any direction. The spindle 4 is in the shape of a hollow tube working in the bearing 3 at the top and provided with a plug 8 at its bottom having a bearing in the base 1 as shown in Figure 2. Means for conducting electric current to the utilizing device mounted on the truck, are mounted on the standard 2 and the spindle 4. The spindle 4 is provided with a metal ring 9 surrounding the spindle and fixed thereto by means of a pin 10 or other suitable fastening. Resting on the ring 9 is an insulating ring 11 of fibre or other suitable insulating material which is provided with a recess adapted to receive a metallic contact ring 12. A second insulating ring 13 recessed to correspond with the ring 11 is placed over the ring 12, so that the latter will be seated in the recesses in both rings as illustrated in Figure 2. The ring 13 is provided with a second recess adapted to receive a second contact ring 14 and a third insulating ring 15 correspondingly recessed is placed over the ring 14. A second metal ring 16 may then be placed upon the ring 15. A bearing block 17 is next placed over the spindle and upon the ring 16 and carries the bearing 3. When the bearing 3 has been assembled, the head 18 is placed thereupon and finally the base 19 of the carrier 5 is threaded on to the end of the spindle and down upon the head 18. As the base 19 is screwed down, all of the various rings described are crowded one upon the other against the fixed ring 9, and thus serve to clamp the contact rings 12 and 14 firmly in their recesses in the insulating rings 11, 13 and 15. The contact rings 12 and 14 are thus securely mounted on but insulated from the spindle and are adapted to rotate therewith.

An insulating plug 20 of fibre or other suitable material is placed within the spindle 4 and seated against the pin 10. This plug is recessed to receive a metallic connector 21 connected by a stud 22 to the contact ring 12, this stud being suitably bushed to insulate the same where it passes through the wall of the spindle 4. A second insulating plug 23 is seated on the first plug 20 and recessed to receive a connector 24 similar to the connector 21 and similarly connected to the contact ring 14. Insulated conductors 25 and 26 pass downwardly within the spindle 4 so as to connect with the connectors 21 and 24 respectively, the conduc-

tor 25 passing through the block 23 to reach the connector 21 as illustrated in Figure 2

Mounted in insulating bushings 27 are a pair of sliding contacts or brushes 28 and 29 adapted to contact respectively with the rings 12 and 14 so as to carry the current from said rings to the insulated conductors 30 and 31 which are connected to the brushes 28 and 29 and serve to convey the current to the utilizing device on the truck. The brushes 28 and 29 are provided with insulating heads 32 adapted to receive the pressure of contact springs 33 while insulating the brushes therefrom.

The bearing block 17 is adapted to seat in the upper end of the standard 2 and is fixed in place therein by means of pins 34 or other suitable fastening. The spindle 4 is thus adapted to turn in the bearing 3 and guided by the plug 8 in its bearing in the base 1, and during such rotation the brushes 28 and 29 will slide on the contact rings 12 and 14, being held in firm contact therewith by the springs 33 so as to provide efficient and reliable current collecting devices.

The base 19 is provided with end brackets 35 machined with recesses to receive a pair of up-rights 36, the base and up-rights together comprising the carrier 5. An axle 37 having squared ends 38 is fixed in the up-rights 36. This axle carries bearings 39 upon which a drum 6 having a barrel 40 and side plates or flanges 41 is adapted to rotate.

Mounted upon each of the side plates 41 and surrounding the bearing 39 is an insulating washer 42. Mounted on each of the up-rights 36 is a dished plate or housing 43 and mounted on the interior of each housing 43 is an insulating washer 44. Mounted so as to surround the bearing 39 and between the insulating washers 42 and 44 is a barrel 45 of insulating material. Mounted on the housing plate 43 but within the washer 44 and surrounding the barrel 45 is a metallic contact ring 46. This ring is connected by a suitable stud 47 passing through but insulated from the housing plate 43, with an insulated conductor 48 passing downwardly along the up-rights 36 and through a suitable insulating bushing 49 to the interior of the base 19 where it is connected with one of the conductors 25 and 26, a second contact ring 50 being mounted upon the barrel 45 and bearing against the ring 46 throughout its circumference. The ring 50 has fixed thereto a conductor 51 connected by means of any suitable connector 52 with one of the conductors 53 of the cable 7. The conductor 51 serves both to convey the current to or from the ring 50 and also to mechanically hold said ring against rotation. A coil spring 54 loosely surrounds the barrel 45 bearing at one side against the insulating washer 42 and at the other against the contact ring 50 so as to maintain the ring 50 in yielding contact throughout its circumference with the stationary contact ring 46. It will be noted that by means of the insulating washers 42 and 44 and the barrel 45, the contact rings 46 and 50 and also the spring 54 are thoroughly insulated from all other parts of the reel.

The current arriving by the cable 7 passes by one of the conductors 53 to one of the conductors 51 and the ring 50, to the corresponding contact ring 46, thence via the stud 47, to the conductor 48, to one of the conductors within the spindle 4, say the conductor 26, to the contact ring 14, the brush 29, to the conductor 31 and to the utilizing device. Returning from the utilizing device, the current passes by the conductor 30, brush 28, contact ring 12, conductor 25, the other conductor 48, to the corresponding contact ring 46, corresponding ring 50 and conductors 51 and 53 to the cable 7 and back to the source of supply.

Each of the side plates 41 is provided with an outwardly extending barrel or housing 55 extending toward and cooperating with the housing plate 43 so as to enclose the bearings and the contact rings on the reel. These parts are thus protected against accidental injury and the accumulation of dust and dirt thereon. The up-rights 36 may have mounted thereon brackets 56 carrying a cable guide 57 adapted to guide the free part of the cable 7, so that it will pass on to the reel from any direction. The guide 57 also serves to turn the reel on its spindle 4 when the direction of approach of the cable is out of line with the reel.

A pair of spiral springs 58 are each fixed at their inner ends to the axle 37 and at their outer ends to a cross-bolt 59 joining the side plates 41. A plate or diaphragm 60 is placed on the axle 37 and between the springs 58 so as to prevent the various convolutions of the springs from interfering with each other. The cable is first all wound on the reel so that upon being unwound, the springs 58 will be tensioned so as to maintain a corresponding tension on the cable to rereel the same whenever there is any tendency for it to slacken. In this way the unreeled portion of the cable is always maintained taut in whatever position the truck may be with respect to the current supply.

It is obvious that various changes may be made in details without departing from the spirit of this invention; it is, therefore, to be understood that this invention is not to be limited to the specific details shown and described.

Having thus described the invention, what is claimed is:

1. A cable reel, comprising, a carrier, a drum mounted for rotation thereon, means for winding a conductor on said drum, a

contact ring rigidly mounted on but insulated from said carrier, a contact ring mounted on but insulated from said drum to move therewith, and means for maintaining said rings in yielding engagement during the rotation of said drum.

2. A cable reel, comprising, a carrier, a drum mounted for rotation thereon, means for winding a conductor on said drum, a contact ring rigidly mounted on but insulated from said carrier, a contact ring mounted on but insulated from said drum to move therewith, and an insulated spring adapted to maintain said rings in yielding engagement during the rotation of said drum.

3. A cable reel, comprising, a carrier, a drum mounted for rotation thereon, a bearing for said drum, a contact ring mounted on but insulated from said carrier, an insulated barrel surrounding said bearing and engaging said ring, a contact ring mounted on said barrel and insulated from but adapted to move with said drum, and means for maintaining said rings in yielding engagement during the rotation of said drum.

4. A cable reel, comprising, a carrier, a drum mounted for rotation thereon, a bearing for said drum, a contact ring mounted on but insulated from said carrier, an insulated barrel surrounding said bearing and engaging said ring, a contact ring mounted on said barrel and insulated from but adapted to move with said drum, and an insulated spring on said barrel adapted to maintain said rings in yielding engagement during the rotation of said drum.

5. A cable reel, comprising, a carrier, a drum mounted for rotation thereon, means for winding a conductor on said drum, a contact rigidly mounted on but insulated from said carrier, a cooperating contact mounted on but insulated from said drum and movable therewith, means for maintaining said contacts in engagement with each other during the rotation of the drum, and a housing for said contacts.

6. A cable reel, comprising, a carrier, a drum mounted for rotation thereon, means for winding a conductor on said drum, a contact mounted on but insulated from said carrier, a cooperating contact mounted on but insulated from said drum and movable therewith, means for maintaining said contacts in engagement with each other during the rotation of the drum, a housing on said drum, and a housing on said carrier cooperating with said first housing to enclose said rings.

7. A cable reel, comprising, a standard, a spindle revolubly mounted on said standard and carrying a cable drum, a contact on said standard, a contact ring on said spindle, and an insulated clamping ring adapted to support said contact ring.

8. A cable reel, comprising, a standard, a spindle revolubly mounted on said standard and carrying a cable drum, a contact on said standard, a contact ring on said spindle, and an insulated clamping ring having a recess adapted to receive and support said contact ring.

9. A cable reel, comprising, a standard, a spindle revolubly mounted on said standard and carrying a cable drum, a contact on said standard, a contact ring on said spindle, an insulated clamping ring adapted to support said contact ring, a carrier on said spindle, a drum mounted for rotation on said carrier, means for winding a conductor on said drum, a contact ring mounted on but insulated from said carrier, a contact ring mounted on but insulated from said drum to move therewith, and means for maintaining said rings in yielding engagement during the rotation of said drum.

In testimony whereof I affix my signature this 21st day of July, 1923.

WILLIAM E. NEWNAM.