

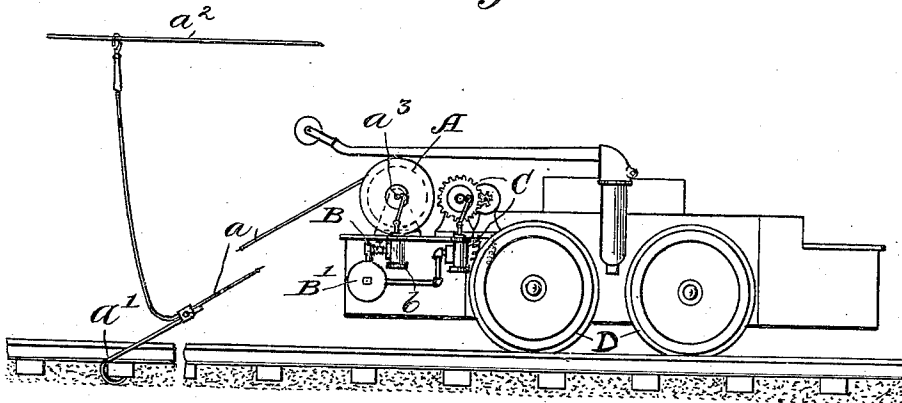
D. J. JORDEN.  
 REEL FOR ELECTRIC CABLES AND THE LIKE.  
 APPLICATION FILED OCT. 9, 1909.

990,987.

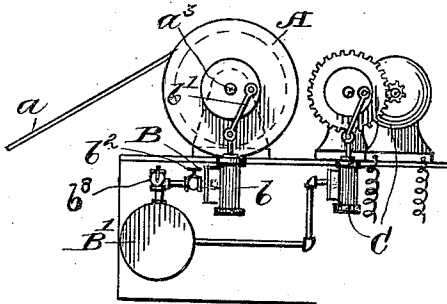
Patented May 2, 1911.

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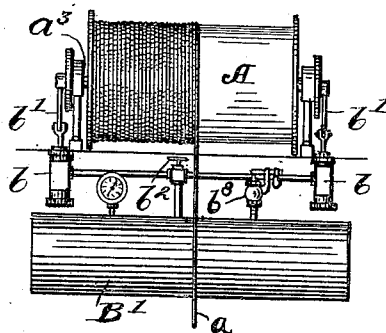
*Fig. 1*



*Fig. 2*



*Fig. 3*



Witnesses  
*J. C. Turner*  
*Jno. F. Oberlin*

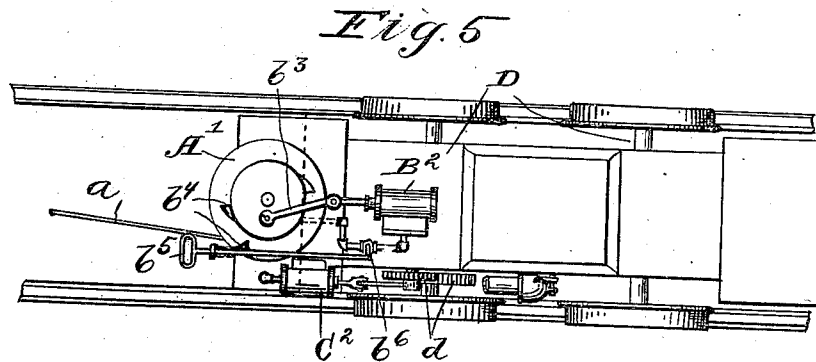
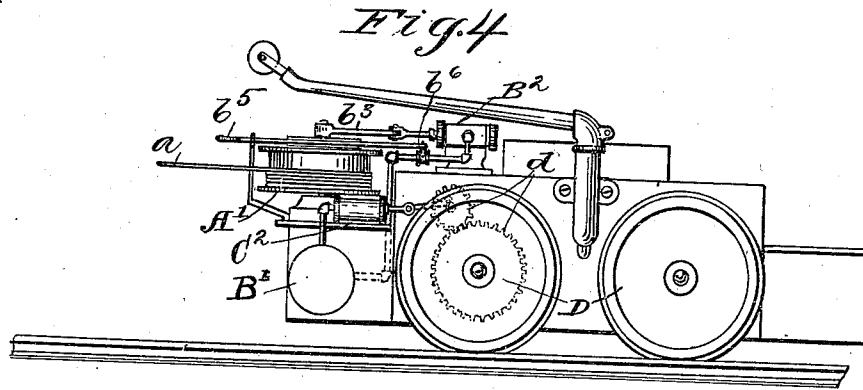
Inventor:  
*Dennis J. Jordan*  
*J. B. Fay*  
 Attorney.

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2 SHEETS—SHEET 2.



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*J. C. Turner*  
*Jos. F. Oberlin*

Inventor:  
*Denis J. Jordan*  
 by *J. B. Fay*  
 Attorney.

# UNITED STATES PATENT OFFICE.

DENIS J. JORDEN, OF CLEVELAND, OHIO.

REEL FOR ELECTRIC CABLES AND THE LIKE.

990,987.

Specification of Letters Patent.

Patented May 2, 1911.

Application filed October 9, 1909. Serial No. 521,885.

*To all whom it may concern:*

Be it known that I, DENIS J. JORDEN, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Reels for Electric Cables and the Like, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present invention, relating as indicated to reels, has more especial regard to the construction of reels for winding in the electric cables, such as are employed in connection with portable electric machines in order to maintain electrical connection between the same and a relatively fixed source of current supply.

A particular field of use, although by no means the only one for the invention, is found on the electrically driven "gatherers" in coal mines, as the electric locomotives employed in gathering up the cars from the rooms of the mine, and hauling them either to the foot of the shaft, or other point of egress, are called. In mines, where this system of haulage has been installed, the entries are usually provided with a trolley wire corresponding to the trolley wire, or third rail, of surface traction lines. These trolley wires, however, cannot be conveniently extended into the newer workings and particularly into the rooms where the coal is being mined and loaded onto the cars, although it is obviously necessary that the locomotives operate here, as well as along the main entries. Accordingly a cable is provided for each locomotive, the outer end of which is attached to the trolley line at the point nearest adjacent the scene of operation, while its inner end is wound on a reel carried by the locomotive, such cable being unwound as the locomotive proceeds into a room, and then wound up again as it emerges therefrom.

The object of the present invention is to provide suitable means for automatically thus operating said reel, so as to keep the cable wound up, irrespective of the movements of the locomotive, and, what is more important, without putting any undue strain on such cable, such as might break the same. To the accomplishment of these and related

ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention such disclosed means constituting, however, but several of the various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 is a side elevation of an electric gatherer, or locomotive, showing installed thereon a form of my improved reel; Fig. 2 is a similar elevation of such reel and appurtenant parts on a larger scale; Fig. 3 is a rear elevational view of the same; while Figs. 4 and 5 respectively illustrate in side elevation and plan, a modified form of the invention, adapting the same for use with another type of reel.

In Figs. 1 to 3 inclusive, a reel in the form of a drum A, with horizontally disposed axis, is illustrated. From said reel or drum, the cable *a* is carried to the trolley wire, being held against such pull as may be placed thereon, by means of a hook *a'* adapted to be attached to a tie on the track, or some other fixed object. In this way the less stably secured trolley wire *a''* is saved against damage. Connected with the shaft *a'''* of the drum, is a suitable compressed air motor B shown as comprising a pair of cylinders *b*, one at each end, having their connecting rods *b'* so arranged as to render it impossible for both to be on dead center at once.

The air for the operation of the pistons in these cylinders is supplied from a suitable storage tank B' carried by the car, wherein the air is stored at a pressure not exceeding a predetermined limit. While this tank may be charged from an external supply it is contemplated that it will be more convenient to provide a compressor directly on the locomotive, and one C is accordingly thus shown, said compressor being electrically driven by a motor C' separate from that of the locomotive, but connected to be operated by the same current as the latter. Such electrically driven compressor may be automatically controlled by the pressure in the reservoir or storage tank by any one of the various well known arrangements that have been devised for this purpose, or as shown in Fig. 3 a safety valve *b''* may be

simply attached to the tank  $B^1$  and the compressor allowed to run without intermission whenever the locomotive is in use.

From the foregoing construction it will be apparent that as long as there is pressure fluid available in the storage tank, the motor will tend to rotate the reel, such rotation being in a direction to wind up the cable. Accordingly, whether the locomotive be advancing or receding from the point of attachment of the outer end of the cable, such cable will be held taut, the maximum rate of operation of the motor being properly correlated with the maximum rate of movement of the locomotive. Since, however, the pressure of the compressed air supplied to the motor never can exceed a predetermined limit, the motor never exerts more than a predetermined pull on the cable, so that any tendency to tear the latter is avoided. Ordinarily, of course, during the advance of the locomotive the motor will be rendered inoperative by throttling the supply of air thereto, allowing the cable merely to unwind, and the motor will actually only be used when it becomes necessary to wind up the cable. For such throttling operation, any suitable control valve, as  $b^2$ , may be used, being interposed in the line leading from tank  $B^1$  to the motor cylinders.

In the second form of my invention, illustrated in Figs. 4 and 5, I show a horizontally disposed reel  $A'$ ; that is, one rotatable about a vertical axis. Here it is convenient to employ a motor with a single cylinder  $B^2$  only, such cylinder, likewise, being horizontally disposed. Moreover, I here show the compressor  $C^2$  as being directly driven from the motor that propels the locomotive, or rather from the gearing  $d$  intermediate between said motor and the truck  $D$  on which the locomotive is mounted. Since but a single cylinder and piston is here employed, I further provide means for starting the mechanism should the connecting rod  $b^3$  of said piston be on dead center. These means comprise a pawl and ratchet device  $b^4$ , associated with the lever  $b^5$  that operates the throttle valve  $b^6$  whereby the admission of the pressure fluid to said motor cylinder is controlled. Whenever, accordingly, said lever is thrust forwardly to open the valve, the pawl carried thereby will engage and impart a partial rotation to the reel, should it have stopped with the aforesaid connecting rod in inoperative position.

Aside from the detail last described the operation of such second form of my invention is obviously the same as that of the one first set forth. The same advantageous result is secured in either case, viz. the winding in of the cable without danger of breaking the same. I am aware that mechanical devices, usually directly driven from the locomotive truck have been employed here-

tofore to automatically wind up the reel on locomotives of the class in hand, but these have depended upon frictional clutches or the like, to transmit the necessary power for rotating the wheel, while still permitting the latter to slip when the cable is wound up taut. The difficulty in adjusting a clutch of this character, however, and the uncertainties arising in its operation from varying conditions of dampness and the like, afford no surety against breaking the cable, as experience has amply demonstrated. The present invention, on the contrary, while equally, if not more positive in its operation, absolutely protects the cable from injury in the manner just referred to.

It has not been thought necessary to describe or to illustrate the detailed manner in which the power is carried from the wire on the reel to the motor. This connection may obviously be made in any suitable way.

As has been previously indicated, the use of my invention is not of necessity limited to the particular field here drawn on for illustrative purposes, but a similar operation of the reel may be found advantageous in connection with various types of portable electric machines.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In mechanism of the class described, the combination of an electrically operated machine movable from place to place, a cable for supplying current to said machine, the outer end of said cable being adapted for connection with a relatively fixed source of current supply, a reel for said cable, a fluid pressure motor for operating said reel, a fluid supply for said motor, and means for admitting said fluid to said motor under a predetermined constant pressure, whereby the maximum pull on said cable is likewise predetermined, substantially as described.

2. In mechanism of the class described, the combination of an electrically operated locomotive, a cable for supplying current to said locomotive, the outer end of said cable being adapted for connection with a relatively fixed source of current supply, a reel for said cable, a fluid pressure motor for operating said reel, a fluid supply for said motor, and means for admitting said fluid to said motor under a predetermined constant pressure, whereby the maximum pull on said cable is likewise predetermined, substantially as described.

3. In mechanism of the class described, the combination of an electrically operated lo-

comotive, a cable for supplying current to said locomotive, the outer end of said cable being adapted for connection with a relatively fixed source of current supply, a reel  
 5 for said cable mounted upon said locomotive, a fluid pressure motor for operating said reel to wind in said cable, a fluid supply for said motor, and means for admitting said fluid to said motor under a predetermined  
 10 constant pressure, whereby the maximum pull on said cable is likewise predetermined, substantially as described.

4. In mechanism of the class described, the combination of an electrically operated locomotive, a cable for supplying current to  
 15 said locomotive the outer end of said cable being adapted for connection with a relatively fixed source of current supply, a reel for said cable mounted upon said locomotive, a compressed air motor for operating  
 20 said reel to wind in said cable, an air storage tank connected with said motor, and means tending to maintain a predetermined constant pressure of air in said tank, where-  
 25 by the maximum pull on said cable is like-

wise predetermined, substantially as described.

5. In mechanism of the class described, the combination of an electrically operated locomotive, a cable for supplying current to  
 30 said locomotive the outer end of said cable being adapted for connection with a relatively fixed source of current supply, a reel for said cable mounted upon said locomotive, a compressed air motor for operating said  
 35 reel to wind in said cable, an air storage tank connected with said motor, an electric air compressor, connected to be driven by the current operating said vehicle, for supplying  
 40 air to said tank, and control means for maintaining the pressure in said tank constant, whereby the maximum pull on said cable is likewise predetermined, substantially as described.

Signed by me this 14th day of September, 45  
 1909.

DENIS J. JORDEN.

Attested by—

ANNA L. GILL,  
 JNO. F. OBERLIN.