D. T. FISHER.

CABLE WINDING MECHANISM FOR LOCOMOTIVES.

APPLICATION FILED SEPT. 24, 1907. RENEWED NOV. 8, 1911.

1,132,839.

Patented Mar. 23, 1915.

2 SHEETS—SHEET 1.

Fig. 2.

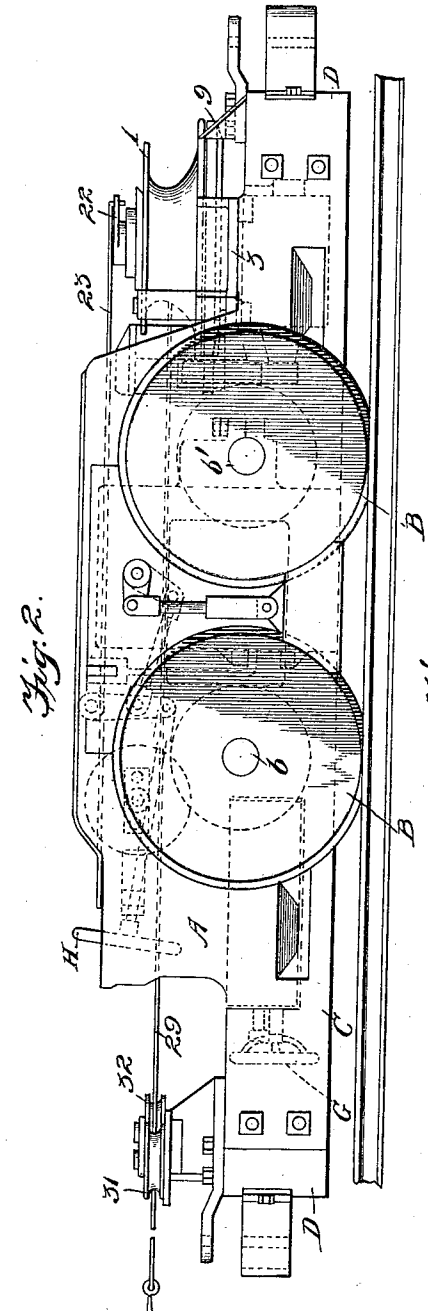
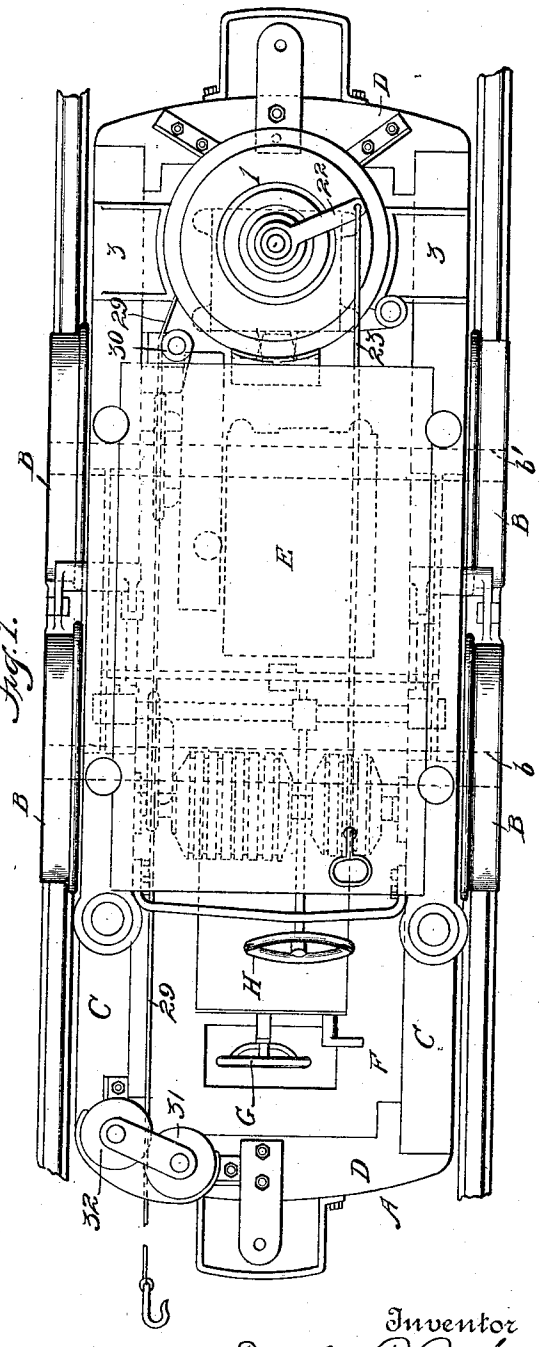


Fig. 1.



Witnesses

J. F. Pattison

George E. Edelin

Inventor

Dudley T. Fisher

By H. H. Bliss

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 4.

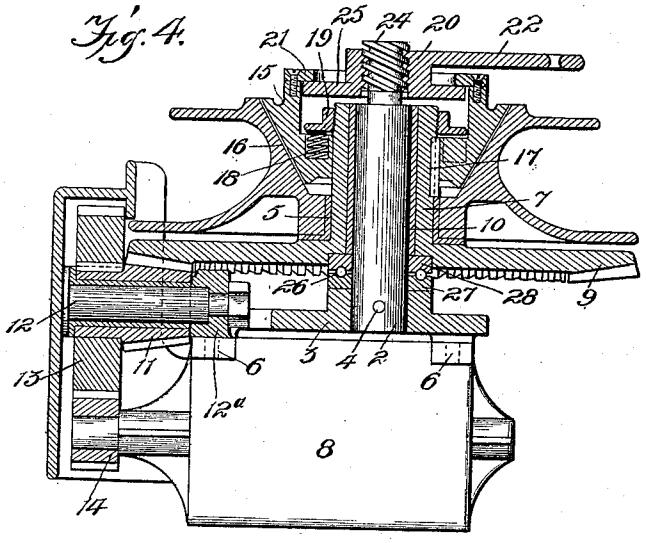
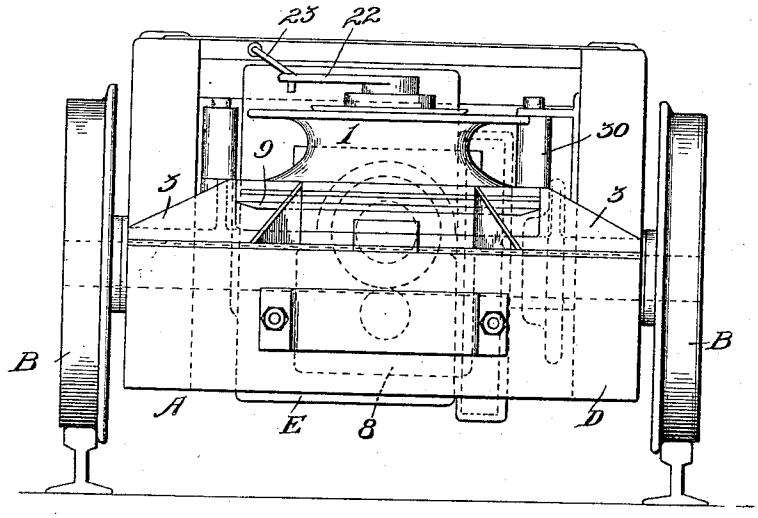


Fig. 5.



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J. F. Pattison

George E. Edelin

Inventor

Dudley T. Fisher

By H. H. Bliss

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DUDLEY T. FISHER, OF COLUMBUS, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE JEFFREY MANUFACTURING COMPANY, A CORPORATION OF OHIO.

CABLE-WINDING MECHANISM FOR LOCOMOTIVES.

1,132,839. Specification of Letters Patent. Patented Mar. 23, 1915.

Application filed September 24, 1907, Serial No. 394,401. Renewed November 8, 1911. Serial No. 659,246.

To all whom it may concern:

Be it known that I, DUDLEY T. FISHER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Cable-Winding Mechanism for Locomotives, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in draft or haulage mechanism for electric locomotives of the sort employed for pulling from one point to another cars which are not provided with their own engines or motors. For example, in coal mines relatively small cars are used which, while being loaded are separated from each other and scattered over more or less of the mine, one in one room or at one loading point and others at others. The older plan, where animal power was used, was to haul each of these cars singly by an animal from the room, after it had been loaded, to a collecting point where a number of the cars were coupled together to form a train or "trip." Since the introduction of electric power use has been made for this purpose of "gathering" locomotives, each having a reel with an electric cable thereon, the terminal of which can be connected electrically to a current supplying wire, so that as the car moves away from the source of supply, the cable on the reel will maintain a continuity of electric conductors to the motor. In using this apparatus the locomotive is itself run into the rooms successively and coupled to the isolated loaded cars and thereafter hauls them to the gathering point. Under many circumstances these gathering locomotives with cable reels cannot be used to advantage, particularly where the mine roof is low or where the track has been hastily constructed, as the branch tracks frequently are which extend from the entry into the room.

The present invention relates to an apparatus adapted to be attached to an ordinary locomotive and of such nature that the locomotive can remain in the entry or at some distant point and yet the loaded car can be hauled by power toward it while it remains stationary.

The object of the invention is to provide improved structural features and an improved arrangement of parts.

A further object is to provide improved means for controlling the operation of the reel.

Figure 1 is a top plan view of a mining locomotive embodying my improvements, some of the parts indicated conventionally by dotted lines. Fig. 2 is a side elevation of the same. Fig. 3 is an end elevation looking toward the car at the reel carrying end. Fig. 4 is a view showing the reel and the power transmitting devices in vertical central section and showing an electric motor conventionally by outline.

A indicates a car, an electric locomotive of the kind used in coal mines being selected for the purposes of illustration. Its wheels B are fitted to the track rails. Its body is formed of a heavy cast frame having the side parts C, C, and the end connecting parts D, D. Many of the parts of the car or locomotive are indicated conventionally by dotted lines. At E the electric motor is situated in the space between the two axles b, b'. This motor is geared to one of the axles in any suitable way, and by preference the axles are geared together or connected by chains and sprockets. At F there is a chamber or space left for the motorman and for the parts which he is called upon to manipulate frequently, such as the wheel of the controller at G and the hand wheel of the brake mechanism at H. At the end of the locomotive opposite to that where the motorman is placed I arrange a reel for the haulage cable. This is indicated by 1 and is mounted on a vertically arranged shaft 2. This shaft is secured to a base 3 which is in the form of a strong bar extending across from one of the side elements C of the car body to the other, and firmly bolted thereto. The shaft 2 is fastened by a key 4 in this base in such way that it is held firmly against rotation. The reel 1 can rotate loosely and freely around this shaft when it is disengaged from the other parts.

8 indicates an electric motor having a suitable field frame and situated below the base 3 to which it is firmly secured at 6.

9 indicates a relatively large bevel gear wheel which is mounted upon the shaft 2, there being between the wheel hub or sleeve 7 and the shaft a lining or bearing 10. The reel 1 is not mounted directly upon the shaft 2, but has its bearing upon the sleeve part or hub 7 of the wheel 9 which, however, surrounds and is concentric with the shaft.

Between the reel and the hub there is a lining or bearing 5. The reel can be loosened from the shaft and the wheel hub 7 so that it can turn freely when desired.

11 is a bevel pinion meshing with the wheel 9, this pinion being mounted on a horizontally arranged shaft 12 supported in a bracket at 12ª. On the shaft 12 there is also a wheel 13 which meshes with the pinion 14 on the armature shaft.

The reel can be frictionally clutched to its driving mechanism as follows: 15 is a cone forming one member of the friction clutch and the reel is formed with a concave conical surface in the part 16 with which the convex cone 15 can engage. The cone 15 is connected to the hub 7 of the master wheel 9 by a feather or spline at 17 so that it can slide thereon and be held against rotation. Normally the cone 15 is pressed to the hollow cone 16 by a series of springs 18 seated in cavities in the cone 15 and bearing at their upper ends against a stationary adjustable abutment consisting of a collar 19 fastened by screw threads to the upper end of hub 7 of wheel 9. The cone 15 can be lifted and drawn out of engagement with the cone 16 by means of the plate 25 which is situated under an overlapping ring flange 21 fastened to the upper end of the cone. This plate part 25 is carried by, and preferably formed integrally with, a nut 20, the interior thread of which fits the thread 24 on the upper end of the stationary shaft 2.

22 is an arm projecting laterally out from the nut and plate 25 and to it is connected the operating rod 23 which extends to the motorman's end of the car. When it is desired to release the reel, the arm 22 and nut are so turned as to bear upward against the flange 21 and lift the cone 15. As soon as the arm 22 and the nut are turned in the opposite direction the springs 18 force the cone clutch surfaces together.

The weight of the gear wheel, the reel and the clutch is supported by a ball bearing comprising a series of balls at 26, a lower member of a ball race 27 and an upper member 28. This ball bearing is interposed between the base 3 and the wheel 9. The haulage cable 29 may be taken off from the reel 1 at any angle but I prefer to pass it over a vertical guide roller 30 and thence to the opposite end of the locomotive where I provide a pair of guide sheaves 31, 32 which permit said cable to be taken off for draft purposes at a great variety of angles.

The manner of using an apparatus of the kind above described will be readily understood. The locomotive is stopped in the mine entry in such position that the motorman can look through the passage-way or the "mouth" into the room. His assistant, the "trip rider", takes the end of the cable and carries it into the room and couples it to the car to be drawn out. The motorman first by the draw-rod 23 and the nut 20 opens the friction clutch lifting the cone 15 away from the hollow cone 16, allowing the reel to freely rotate. After the end of the cable is coupled to the car the motorman can, by means of the rod 23 and the nut 20, allow the springs 18 to force the clutch cones tightly together. He then starts the motor 8 and the reel is caused to wind up the cable and draw the car from the room to the track in the entry. When a loaded car is sufficiently close to the locomotive the latter is set in motion by means of its motor E and the loaded car is drawn to the point where the trains or "trips" of several cars are made up.

I do not herein claim the general arrangement of the reel, the motor and the cable guide devices with respect to the locomotive as a whole, nor do I herein claim broadly the relative arrangement of the motor, the reel and the gearing, these features being presented and claimed in my co-pending application for locomotives with haulage cable mechanisms, Serial No. 393,829, filed September 20, 1907.

What I claim is:

1. A cable reeling mechanism for an electric mine locomotive comprising in combination a cable reel with its axis vertical, a stationary shaft on which the reel is mounted, an electric motor arranged in vertical alinement with the shaft and close to the reel, with its armature shaft horizontal, a master gear wheel mounted on the stationary shaft in the space vertically between the motor and the reel, gearing connecting the motor to the master gear wheel, a friction clutch interposed between the master wheel and the reel, and a mechanism for operating the clutch.

2. A cable reeling mechanism for an electric mine locomotive, comprising in combination a reel formed with an external peripheral cable cavity and a relatively enlarged interior conical clutch cavity, a vertically arranged stationary shaft about which the reel may rotate, a motor, a master gear wheel, gearing between the motor and the master gear wheel, a conical friction clutch member mounted in the said interior cavity in the reel and positively connected to the master wheel, and means normally held against rotation for adjusting the clutch member while the master wheel is in rotation.

3. A cable reeling mechanism for an electric locomotive comprising in combination a reel having an upward enlarging conical opening at its upper end, a drive element upon which the reel is supported and with

respect to which it is freely rotatable, a central shaft rigid with the drive element and disposed within the reel, and a manually controllable clutch element for engaging the walls of the conical opening in the reel, the said clutch element being splined upon the drive element and vertically movable within said opening.

4. The combination with a cable reel rotatable about a vertical axis, and a rotatable concentrically mounted driver upon which the reel rests, of a friction clutch for the reel mounted concentrically with respect to the reel and the driver and having an adjustable member, a nut mechanism for elevating the adjustable member and thereby opening the friction clutch, and springs for depressing the adjustable member and thereby closing the clutch.

5. In a cable winding mechanism, the combination of a vertical non-rotatable shaft, a supporting and driving element rotatable on the shaft, a reel supported on the said element and rotatable with respect thereto, a motor, gearing between the motor and the supporting and driving element, a friction element rotatable with the supporting and driving element but vertically movable with respect thereto, and means for moving said friction element vertically into or out of engagement with the reel, the said means being supported independently of the reel and of the supporting and driving element.

6. In a cable winding mechanism, the combination of a vertical non-rotatable shaft, a supporting and driving element rotatable on the shaft, a reel supported on the said element and rotatable with respect thereto, a motor, gearing between the motor and the said supporting and driving element, a friction clutch element rotatable with the supporting and driving element but vertically movable with respect thereto, and means engaging with the said vertical non-rotatable shaft for controlling the upward or downward movement of the clutch element out of or into engagement with the reel.

7. In a cable winding mechanism, the combination of a vertical non-rotatable shaft, a supporting and driving element, a reel supported on the said element and rotatable with respect thereto, a motor, gearing between the motor and the said supporting and driving element, a friction element rotatable with the supporting and driving element but vertically movable with respect thereto, a non-rotatable screw at the upper end of the stationary non-rotatable shaft, a threaded nut engaging the said screw, connections between the nut and the friction element, and means for rotating the nut to cause the friction element to move vertically into or out of engagement with the reel.

In testimony whereof I affix my signature, in presence of two witnesses.

DUDLEY T. FISHER.

Witnesses:
E. P. SNIVELY,
R. R. DUNLOP.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."