Aug. 9, 1938. F. CARTLIDGE 2,126,172

CABLE REEL

Filed July 29, 1935 2 Sheets-Sheet 1

Fig. 1

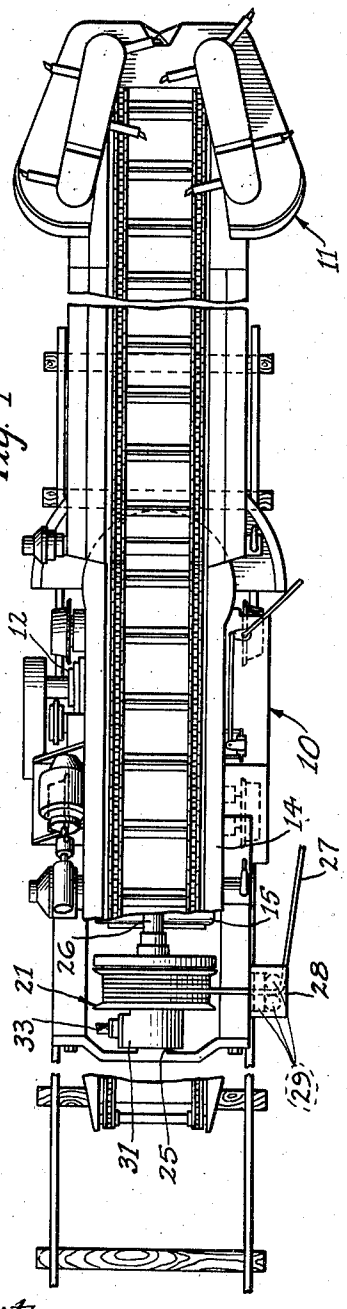

Fig. 3

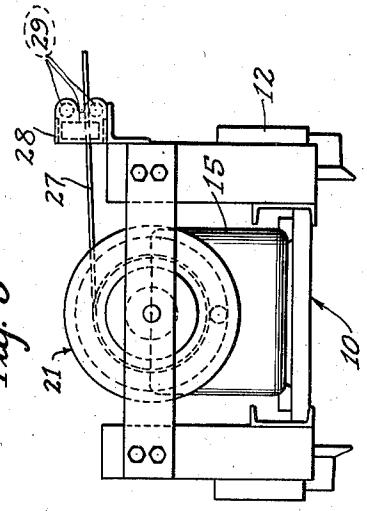

Fig. 2

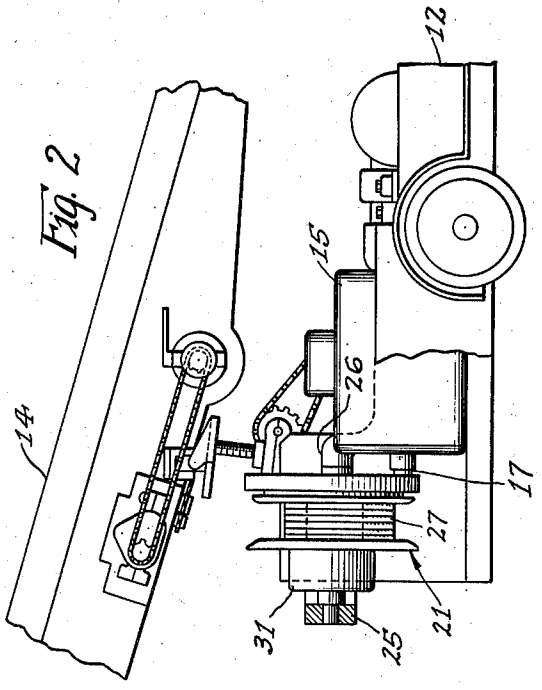

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Fig. 4

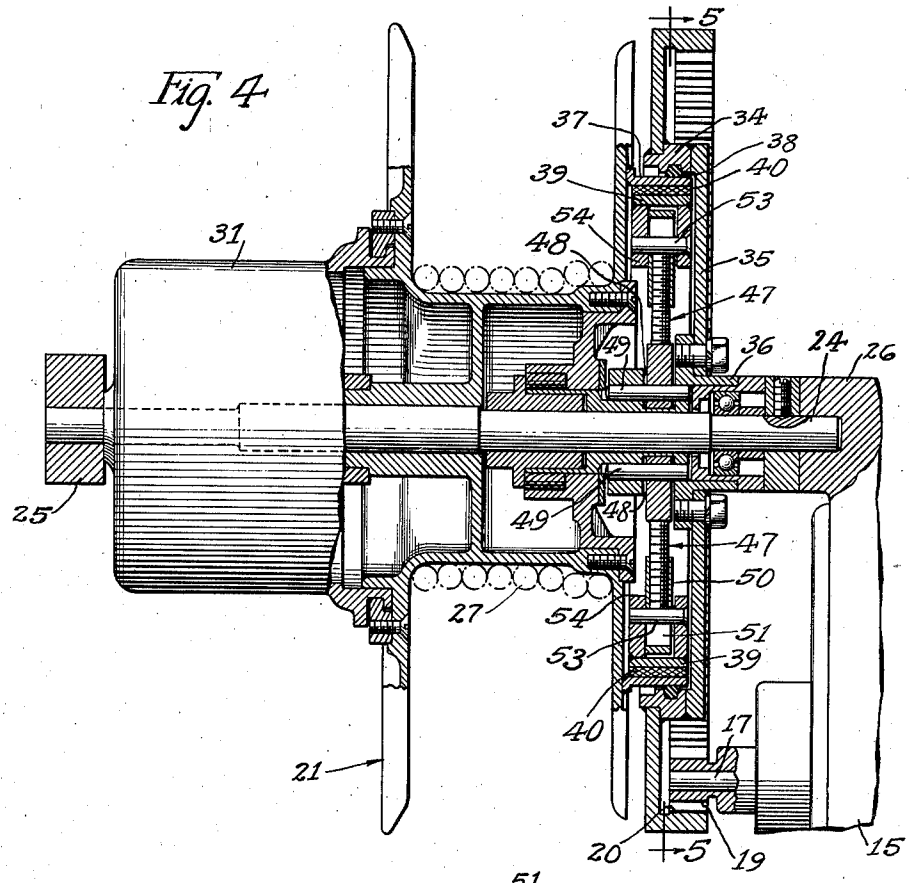
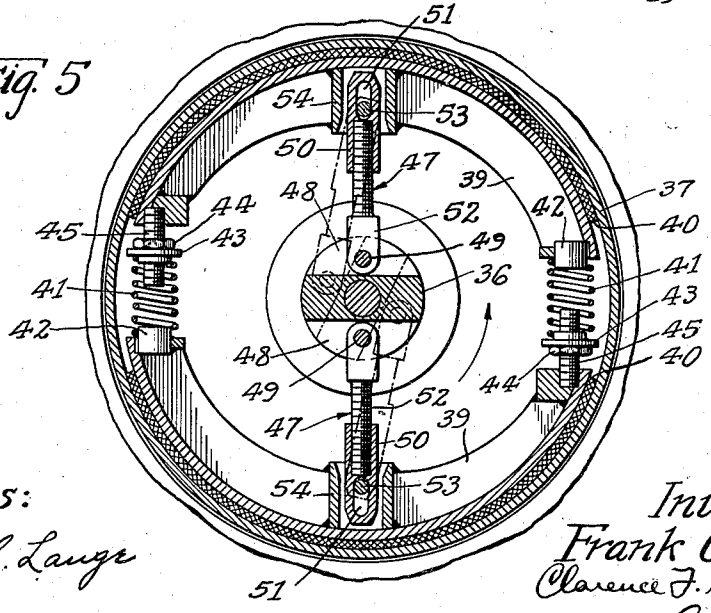


Fig. 5



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Patented Aug. 9, 1938 2,126,172

UNITED STATES PATENT OFFICE

2,126,172

CABLE REEL

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Application July 29, 1935, Serial No. 33,714

2 Claims. (Cl. 242—91)

This invention relates to improvements in cable reels of the type adapted to be mounted on loading machines which load by movement along a mine track remote from a source of power.

The principal objects of my invention are to provide a new and improved device of the class described directly connected to the loading machine drive motor and so arranged that a conductor cable may readily be paid off from the reel or wound thereon while the drive motor is rotating in a direction to wind cable on the reel and the machine is moving in a forward or return direction along the track during the gathering operation, and which is also so arranged that tension may be maintained on the cable when the machine is stationary on the track and the drive motor is continuously rotating in the same direction as formerly.

My invention consists in the construction, arrangement and combination of parts as will hereinafter be described in connection with the accompanying drawings and defined in the appended claims.

In the drawings:

Figure 1 is a top plan view of a loading machine of the class described, having a cable reel constructed in accordance with my invention mounted thereon;

Figure 2 is an enlarged fragmentary side elevation of the rearward portion of the machine illustrating the drive from the loading machine motor and the mounting of the cable reel on the machine;

Figure 3 is a partial rear end view of the device shown in Figure 1;

Figure 4 is an enlarged side elevation of the gathering reel with parts broken away and shown in substantially vertical section; and

Figure 5 is a sectional view taken substantially along line 5—5 of Figure 4.

In the drawings the embodiment of my invention illustrated is shown as affording a means for conducting electric power to a loading machine 10, of the ordinary track mounted type. Said loading machine consists of an inclined gathering and loading element 11 extending forwardly from a track-mounted main frame 12 and a discharge conveyor 14 disposed beneath and extending rearwardly of said gathering and loading element for discharging material gathered thereby onto a mine car or other suitable receptacle, and said machine gathers and loads material in a well known manner as said gathering and loading element is swung across the front of the track and as the entire machine is moved backwardly and forwardly along the track.

A motor 15, herein shown as being an electric motor of an ordinary construction, is provided on the rearward end of the main frame 12 and affords a source of power for the major operating parts of the machine. Said motor is provided with a longitudinally extending armature shaft 17, the forward end of which shaft serves as a means for driving the main operating parts of the machine and the rearward end of which affords a means for driving a cable reel 21.

The cable reel 21 is of an ordinary drum type construction and, as herein shown, is arranged to pay off cable directly therefrom laterally to either side of the machine. Said cable reel is mounted on a shaft 24 extending longitudinally of the machine which is supported at its ends in a rearward bracket 25 secured to said main frame above the lower end thereof and a forward bracket 26 extending from said motor.

A suitable current conducting means is attached to said cable reel and adapted to be wound thereon or unwound therefrom. Said current conducting means, as herein shown, consists of a double conductor electric cable 27. Said cable is adapted to extend laterally from the machine through a cable guiding member 28 consisting of a plurality of pairs of perpendicularly disposed rollers 29, 29 so arranged that said cable may pass therebetween and be trained upwardly or downwardly therefrom and forwardly or rearwardly of the machine. The free ends of said cable are adapted to be connected to a source of power remote from the machine proper in the usual manner for conducting current thereto. The opposite ends of said cable are adapted to be connected to suitable collector rings (not shown) mounted within a housing 31 extending rearwardly of said drum and having a main conductor cable 33 connected thereto.

With reference now particularly to Figures 4 and 5 illustrating in detail the novel means for yieldably driving said winding drum or reel, a pinion 19 is mounted on the rearward end of the motor shaft 17 and meshes with and drives an internal gear 20. Said internal gear serves as a driving member for said cable reel and has an annular surface extending from one side thereof inwardly towards its center which is mounted on an annular ring 34 in a suitable manner, such as welding. Said annular ring extends inwardly of said internal gear and has an annular disk 35 secured to the outer face thereof, which disk is secured to a hub 36 by means of suitable cap

screws. Said hub is journaled on the shaft 24 for free rotation with respect thereto in an ordinary manner, which will not herein be described in detail since it is no portion of my present invention.

An annular flange 37 extends outwardly from the flange of the reel 21 adjacent said driving member. Said flange extends inwardly of the inner periphery of the annular ring 34 and the outer periphery of said flange is engaged with a bearing member 38 secured to and extending inwardly from the inner periphery of said annular ring.

A pair of oppositely disposed shoes 39, 39 having friction bands or shoes 40, 40 thereon is adapted to engage the inner periphery of the annular flange 37 for driving the reel 21. Said friction bands are yieldably engaged with the inner periphery of said annular flange by means of a pair of compression members, such as compression springs 41, 41. As herein shown, one end of one of said compression springs encircles a lug 42 extending outwardly from one end of one of said friction bands, and the opposite end of said compression spring is adapted to engage a shouldered collar 43 abutting a nut 44 threaded on a stud 45 which stud is threaded within one end of the opposite shoe 39. The opposite compression spring is mounted in a similar manner and is disposed oppositely to the first mentioned compression spring so that movement of the nuts 44, 44 will adjust the tension of said springs and the driving force of said friction bands.

The shoes 39, 39 and friction bands 40, 40 are rotated by means which react against the compression springs 41, 41 for yieldably driving the reel 21 from the driving member 20. Said means, as herein shown, comprises a pair of oppositely disposed links 47, 47 pivotally mounted in slots 48, 48 in the hub 36 on pivot pins 49, 49. Said pivot pins are disposed adjacent but eccentric of the axis of rotation of said driving member on opposite sides thereof and the centers of said pins are intersected by a diametral line passing through the center of rotation of said driving member.

As herein shown, each of the links 47 includes an internally threaded member 50 having a slot 51 formed therein, and an externally threaded member 52 threaded in said internally threaded member in such a manner that the length of said links may be adjusted. The slot 51 in each member 50 extends longitudinally thereof, when the parts are positioned as shown in Figure 5 and said slot is adapted to be pivotally connected to the inside of the shoe 39 adjacent the center thereof on a transversely disposed pin 53. Said pin is mounted between the side walls of a housing 54 depending from and disposed in the central portion of said shoe. The outer ends of said housing are beveled to permit rocking movement of said links with respect to said shoes in opposite directions, and thus permit driving of the drum 21 when the hub 36 is rotating in either direction.

When the hub 36 is rotating in a counter-clockwise direction, as shown in Figures 4 and 5, to wind cable on the reel, which is trained laterally from the machine from the top side of said reel as shown in Figure 1, the links 47, 47 will be angularly disposed with respect to a line intersecting the centers of the pins 53, 53 as is shown by dotted lines in Figure 5. Thus, rotation of said hub will cause said links to exert a pull against the friction bands 40, 40 and rotate said friction bands. The pull of said links will also tend to move said friction bands towards the center of rotation of said driving member against the compression springs 41, 41.

When the torque required to wind cable on the reel is less than the force of friction of said friction bands on the inner periphery of said flange, said reel will be rotated through said links, but when the pull on the cable becomes greater than the force of friction of said friction bands on the inner periphery of said flange, the torque on the hub 36 required to drive the reel will be increased to such an extent that the pull of said links on the shoes 39, 39 will be correspondingly increased. This will compress the compression springs 41, 41 and contract said friction bands until the pull on the cable again decreases, at which time the torque on said hub will diminish and said friction bands will be expanded by said compression springs for driving said drum.

In a like manner, when the motor 15 is rotating in a direction to normally wind cable on the reel 21 and the machine is moving in a direction to unwind cable therefrom, the links 47, 47 will react against the shoes 39, 39 and compress the springs 41, 41. This will contract the friction bands 40, 40 and release said friction bands from the inner periphery of said annular flange. Thus cable may be paid off said reel when the machine is moving away from the point of connection of the free end of said cable to the source of power, and the instant the machine moves towards the point of connection of the free end of said cable to the source of power, said reel will again be driven by said motor and cable will be wound thereon. Also when the machine is stationary with the motor running in a direction to wind cable on said reel, the force of friction of said friction bands against the inner periphery of said flange is sufficient to maintain the cable in a taut condition and permit said cable to be unwound from said drum against said friction bands or permit said bands to engage said drum to wind said cable on said drum the instant the machine moves in a direction to put slack on said cable.

While I have herein shown and described one form of my invention, I do not wish to be limited to the precise details of construction or arrangements of parts herein shown and described except as specifically limited in the appended claims.

I claim as my invention:

1. In a reeling mechanism, a cable reel drum, a cable adapted to be wound on said drum, a drive shaft, yieldable means releasable upon a predetermined load on said cable reel drum for driving said drum from said shaft and maintaining tension on said cable, while said drive shaft is continuously rotating in one direction, during stalling of said reel when the machine is stationary and the free end of said cable is connected to a source of power or during the unwinding operation comprising a driving member rotatable about an axis coaxial with the axis of rotation of said drum, an annular flange projecting outwardly from said drum, a pair of internal expanding friction bands having engaging faces corresponding to the inner periphery of said annular flange, compression springs interposed between opposite ends of said friction bands for yieldably engaging said friction bands with the inner periphery of said flange whereby rotatable movement of said bands will rotate said flange and drum, and means connected between said driving member and friction bands for rotatably

driving said friction bands when said driving member is rotating in either direction comprising a pair of oppositely disposed links, each of said links comprising a threaded member pivotally connected to said driving member adjacent to but eccentric of the center of rotation thereof, and a slotted member having threaded engagement with said threaded member whereby the length of said links may be adjusted, and having slidable engagement with its associated friction band intermediate the ends thereof.

2. In an apparatus of the character described, a shaft, a reel freely mounted on said shaft, a cable adapted to be wound on said reel, a motor, and a drive connection from said motor to said reel releasable upon a predetermined load on said reel for driving said reel and maintaining tension on said cable while said motor is continuously rotating in one direction, during stalling of said reel when the machine is stationary and the free end of said cable is connected to a source of power, or during the unwinding operation comprising a hub on said shaft rotatably driven by said motor, an annuular flange projecting outwardly from said reel, a pair of opposed internal expanding friction bands of a contour corresponding to the inner periphery of said flange disposed within said flange and adapted to engage the inner periphery thereof, a pair of compression springs engaging opposite ends of said friction bands for engaging said bands with said flange, and means operating against said springs for rotating said bands and reel when said hub is driven in either direction comprising a pair of opposed links, each of said links including a threaded member pivotally connected to said hub adjacent to but on opposite sides of the centers thereof so their centers intersect a common line extending through the center of said driving member, and a slotted member having threaded engagement with said threaded member whereby the length of said links may be adjusted to compensate for wear of said friction bands, said slotted member having a slot extending longitudinally therealong, and a pin extending through said slotted portion and connecting said link with said friction band intermediate the ends of said friction band.

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