No. 798,389. PATENTED AUG. 29, 1905.

H. BOOKER.

REEL FOR MINE LOCOMOTIVES.

APPLICATION FILED APR. 4, 1905.

Fig. 1.

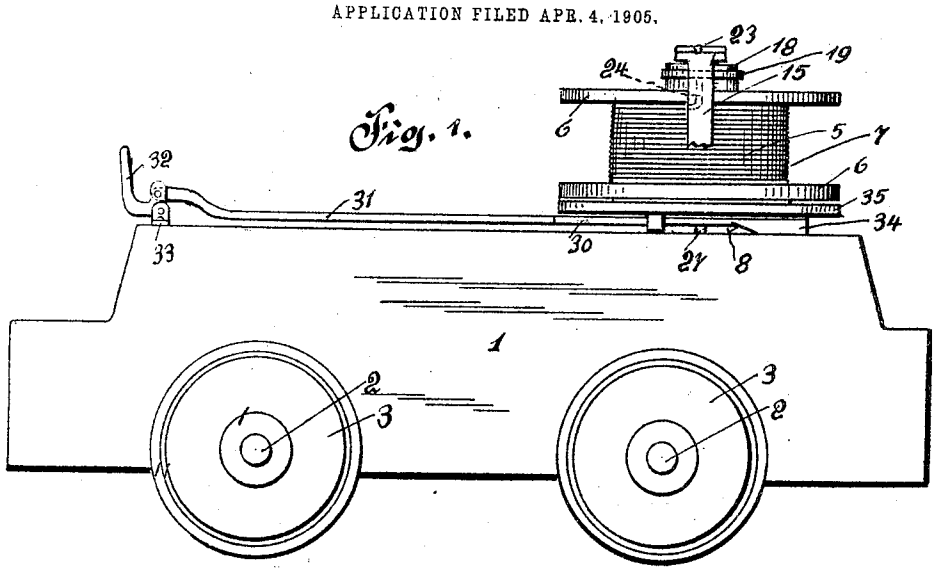



Fig. 2.

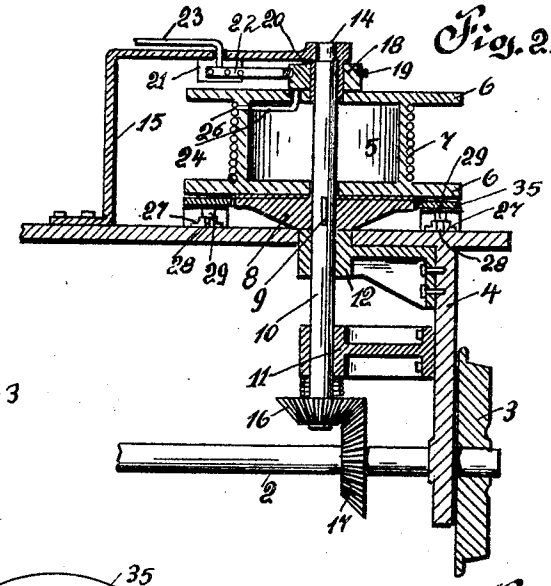
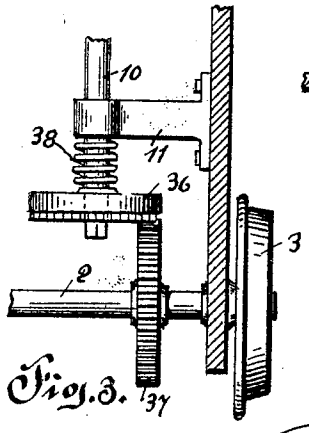



Fig. 3.



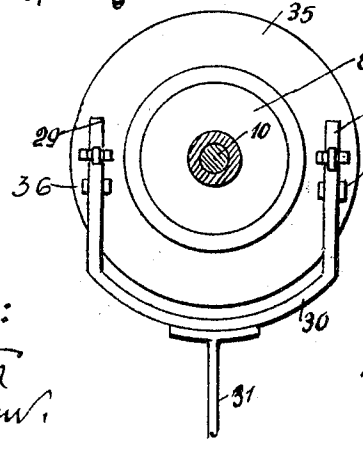
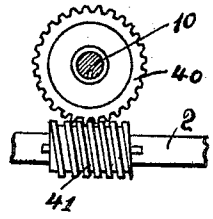




Fig. 4.

Fig. 5




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# UNITED STATES PATENT OFFICE.

HARRIS BOOKER, OF CALIFORNIA, PENNSYLVANIA.

## REEL FOR MINE-LOCOMOTIVES.

No. 798,389. Specification of Letters Patent. Patented Aug. 29, 1905.

Application filed April 4, 1905. Serial No. 253,875.

*To all whom it may concern:*

Be it known that I, HARRIS BOOKER, a citizen of the United States of America, residing at California, in the county of Washington and State of Pennsylvania, have invented certain new and useful Improvements in Reels for Mine-Locomotives, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in reels for mine-locomotives; and the invention has for its object to provide a novel form of reel upon which an electric cable can be automatically wound or unwound at any time desired.

My invention aims to provide a novel form of reel adapted to be carried and operated by a mine-locomotive for shifting and moving cars within a mine. It is a well-known fact that in some parts of a mine it is impractical and oftentimes impossible to construct a trolley within the rooms of a mine, and it has been the practice to employ electric cables to convey a current of electricity to the locomotive when it enters rooms to couple to cars being loaded within the mines. Considerable danger is experienced in manipulating the electric cables in order that the locomotives may enter the rooms of a mine, and for this reason I have provided a reel in connection with a locomotive, upon which the electric cable can be automatically wound and unwound when it is desired to use the same.

With the above and other objects in view the invention finally consists in the novel construction, combination, and arrangement of parts, which will be hereinafter more fully described and then specifically pointed out in the claims, and, referring to the drawings accompanying this application, like numerals of reference designate corresponding parts throughout the several views, in which—

Figure 1 is a side elevation of a locomotive as equipped with my improved reel. Fig. 2 is a vertical fragmentary sectional view of a locomotive constructed in accordance with my invention. Fig. 3 is a detail sectional view of a portion of the locomotive, illustrating a modified form of construction employed for transmitting power from the locomotive to my improved reel. Fig. 4 is a bottom plan view of my improved reel, illustrating novel means which I employ for controlling the movement of the reel; and Fig. 5 is a detail view of still another modified construction employed for transmitting power from the locomotive to the reel.

To put my invention into practice, I have constructed my improved reel upon a conventional form of locomotive used at present in connection with mines. In the present illustration the locomotive comprises a body portion 1, mounted upon the axles and wheels 2 and 3. The body of the locomotive contains a motor and the operating mechanism employed for moving and driving the locomotive, it being deemed unnecessary to illustrate these parts, as they are common to the ordinary type of mine-locomotive. However, I have illustrated the hood or casing 4, which incloses the above-named mechanism, and upon this hood or casing I mount my improved reel. The reel consists of a drum 5, having flanged sides 6 6, and upon said drum is adapted to be wound a cable 7. The drum in operation is supported by a disk or table 8, mounted upon the casing 4 and keyed, as indicated at 9, to a shaft 10, mounted within the casing 4. The shaft 10 is supported and journaled in brackets 11 and 12, secured to the inner wall of the casing 4, and said shaft extends upwardly through the drum and has its upper end journaled, as indicated at 14, in a bracket 15, carried by the top of the casing. The lower end of the shaft 10 is provided with a beveled gear-wheel 16, adapted to mesh with the beveled gear-wheel 17, mounted upon the axle 2 of the locomotive. Upon the top of the drum 5 I mount a wheel 18, carrying a contact-ring 19, which is preferably made of brass. Interposed between the wheel 18 and the shaft 10 is a sleeve of brass 20, and washers of a similar material are interposed between the wheel 18 and the bracket 15. The bracket 15 is provided with a brush-holder 21, to which is connected a brush 22, adapted to engage the brass contact-ring 19. A cable or wire 23 is connected to the brush-holder, and this wire is adapted to connect with the motor of the locomotive. The drum 5 is provided with a contact-arm 24, which extends upwardly through an insulated opening formed in the top of the drum. The upwardly-extending end of the arm 24 contacts with the wheel 18, while to the opposite end of the arm is connected the end of the cable 7, as indicated at 26. In Fig. 2 of the drawings I have illustrated the

position of the reel when in operation—that is, when the cable 7 is being wound or unwound upon the reel.

To hold the reel stationary and prevent it from rotating, I have devised a novel form of elevating mechanism, which is illustrated in Figs. 1, 2, and 4 of the drawings. Mounted upon the top of the casing 4 directly beneath the reel 5 and diametrically opposite one another are brackets 27 27, in which are journaled rollers 28 28. Upon the rollers 28 28 are mounted the ends 29 29 of a substantially U-shaped yoke 30, said yoke being connected to a lever 31, that extends rearwardly upon the top of the locomotive and is connected to a bell-crank lever 32, pivotally connected to a bracket 33, carried by the casing 4. The ends 29 of the yoke 30 are provided with depending integral portions 34, adapted to engage the top of the casing and assist in supporting the yoke when it is reciprocated by the bell-crank lever 32.

The reference-numeral 35 designates an annulus or ring mounted upon the ends of the yoke 30, and the bottom face of the annulus is provided with depending brackets or lugs 36 36, adapted to engage the ends 29 of the yoke and guide the yoke during its movement. By referring to Fig. 2 of the drawings it will be observed that the annulus or ring 37 surrounds the disk or table 8 and is therefore limited from moving longitudinally or laterally upon the locomotive.

Operation: We will assume that the locomotive is operating in a mine and a number of cars have been loaded within one of the rooms of the mine and that the trolley system of the mine does not extend within the room, but a temporary track has been constructed upon which the locomotive can travel to couple to the cars within the room. It has been the practice to carry a cable into the room through which the electric current is adapted to pass to the locomotive. This has occasioned considerable danger to the operators and attendants of locomotives, also the miners working in the mine, no means whatever having been devised to take up the slack cable occasioned by the locomotive traveling out of the room with the cars. We will therefore assume that the loose end of the cable 7 is thrown over the trolley-line or connected thereto and that a current is passing through the cable to the motor of the locomotive. As the car withdraws from the room of the mine the drum 5 is rotated through the medium of the beveled gears 16 and 17 and shaft 10, and the cable is wound upon the drum 5, a circuit at all times being maintained in the cable through the medium of the brush 22, wheel 18, and contact-arm 24. When the car has passed out of the room and the cable has been entirely wound upon the drum 5, the bell-crank lever 32 is operated by the motorman or attendant of the locomotive and by pulling upon the lever the yoke 30 is moved rearwardly, the enlarged depending portion 34 traveling upon the rollers 28 and elevating the annulus or ring 35. This operation causes the ring to engage the bottom of the drum 5 and elevate it above the disk or table 8. The weight of the drum 5 and the cable wound around it has caused sufficient friction to exist between the drum and the disk to cause it to rotate when the drum rests upon the disk; but when the drum is elevated above the disk by the mechanism just described the disk 8 and the shaft 10 can revolve freely without interfering with the stationary position of the drum 5.

In Fig. 3 of the drawings I have illustrated a slight modification in the driving mechanism of the shaft 10 and the disk 8, this modified form of construction being employed to compensate for the movement of the locomotive-body, which is generally mounted upon springs. (Not shown.) It will be observed in Fig. 3 of the drawings that I have slidably keyed a toothed wheel 36 upon the lower end of the shaft 10 and have mounted a pinion 37 upon the axle 2, adapted to mesh with the wheel 36. This wheel is normally retained in engagement with the pinion 37 by a coiled spring 38, interposed between the wheel and the bracket 11. This construction permits of the axle 2 and the pinion 37 moving independently of the shaft 10 and the locomotive-body.

In Fig. 5 of the drawings I have illustrated still another modified form of construction that may be employed for transmitting power from the shaft 2 to the shaft 10, this construction, consisting of a gear-wheel 40, being slidably keyed upon the shaft 10. A worm 41 is slidably keyed upon the shaft or axle 2 and is adapted to mesh with the gear-wheel 40.

While I have herein illustrated numerous ways in which power may be transmitted from the locomotive to my improved wheel, it is obvious that various other means than these illustrated can be readily employed, and suitable means may be provided for compensating for the jar and movement of the locomotive-body during its operation.

I do not care to confine myself to the electrical-contact connection made between the cable 7 and the wire or conductor 23, as a conventional form of brush apparatus may be used in connection with the reel for accomplishing the same purpose.

It will be noted that various changes may be made in the details of construction without departing from the general spirit and scope of the invention.

What I claim, and desire to secure by Letters Patent, is—

1. In a reel of the type described, the combination with a locomotive, of a revoluble

shaft supported by said locomotive, a disk carried by said shaft, a reel loosely mounted upon said disk, a cable carried by said reel, an annulus mounted beneath said reel, a yoke mounted beneath said annulus, means to elevate said yoke, and means to connect said cable to said locomotive, substantially as described.

2. The combination with an electric locomotive for mines, of a revoluble shaft operated by said locomotive, a disk carried by said shaft, a drum loosely mounted upon said disk, a cable carried by said drum, means to establish an electric connection between said locomotive and said cable and means to hold said drum in a stationary position, substantially as described.

3. In a reel, the combination with an electric locomotive for mines, of a revoluble disk carried by said locomotive, and operated therefrom, a reel carried by said disk, a cable carried by said reel, means to establish electrical connections between said cable and said locomotive, and means to hold said drum in a stationary position, substantially as described.

4. In a reel, the combination with an electric locomotive, of a revoluble disk, carried by said locomotive and operated therefrom, a reel carried by said disk, a cable connected to said reel, means to connect said cable to said locomotive, and means to elevate said reel, substantially as described.

5. In a reel, the combination with an electric locomotive, of a revoluble disk, carried by said locomotive, and operated therefrom, a reel carried by said disk and adapted to revolve at times with said disk, and means to hold said reel in a stationary position independent of said revoluble disk, substantially as described.

6. In a reel, the combination with an electric locomotive for mines, of a disk carried by said locomotive, a reel carried by said disk, a cable carried by said reel, means to establish electric connections between said cable and said locomotive, means to revolve said drum, and means to hold said drum in a stationary position, substantially as described.

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

HARRIS BOOKER.

Witnesses:
RICHARD BELL,
J. M. YORTY.