F. B. DEANS AND B. K. KIRK.

MECHANISM FOR OPERATING THE REELS OF MINE LOCOMOTIVES.

APPLICATION FILED DEC. 5, 1917.

1,337,048.

Patented Apr. 13, 1920.

2 SHEETS—SHEET 1.

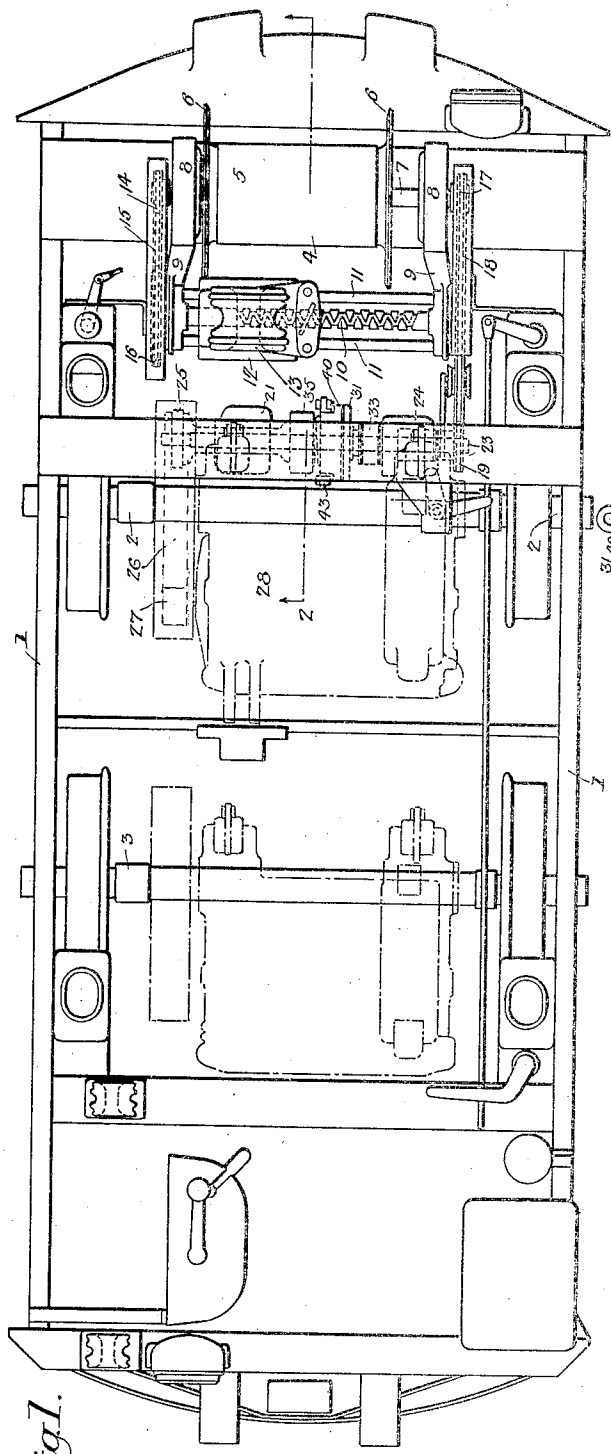


Fig. 1.

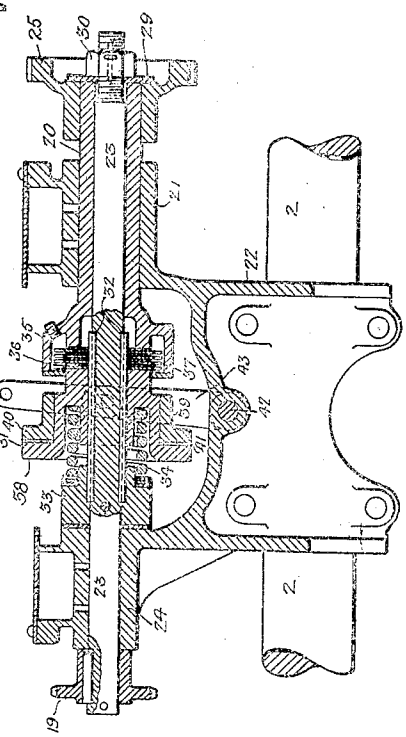


Fig. 3.

Inventors,
Frank B. Deans
Benjamin K. Kirk
by their Attorneys
Howson & Howson

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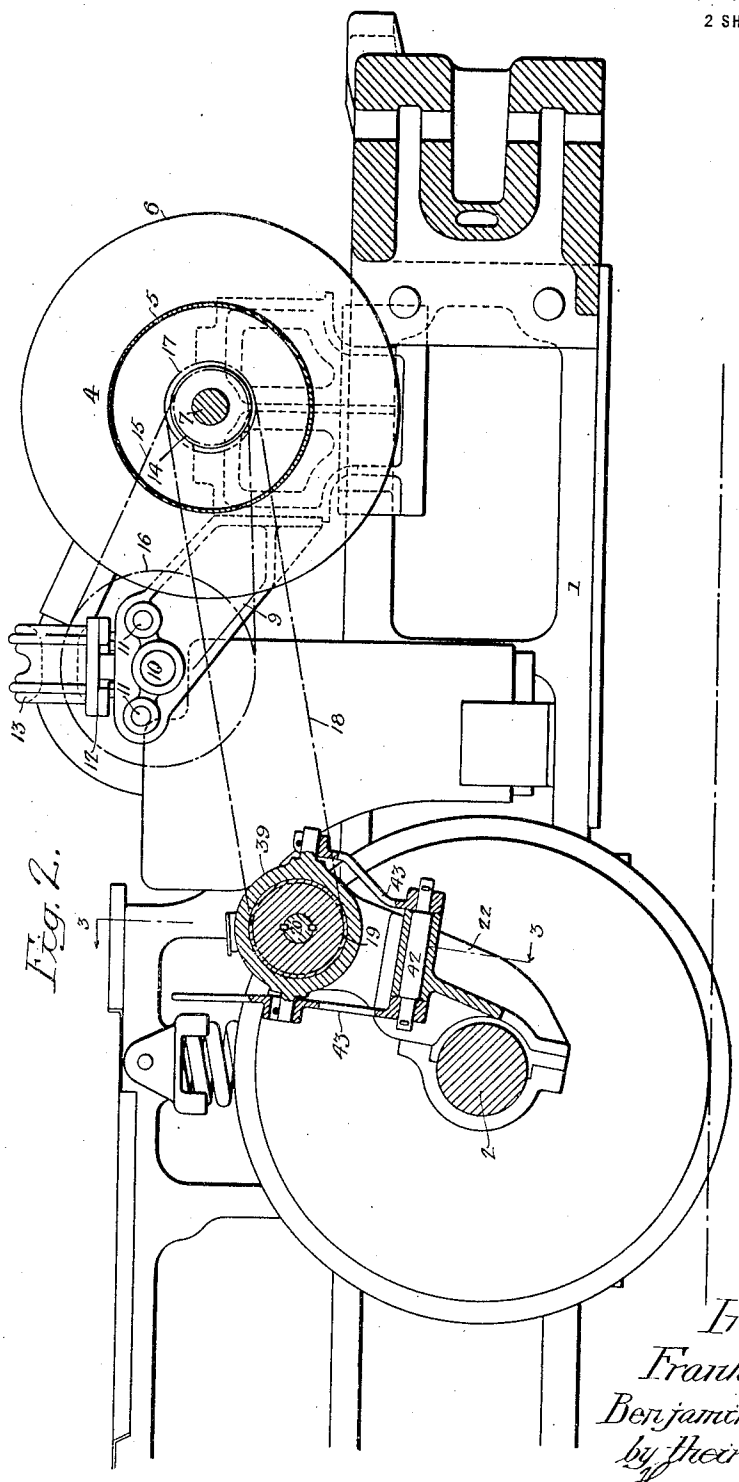


Fig. 2.

Inventors,
Frank B. Deans,
Benjamin K. Kirk,
by their Attorneys,
Howson & Howson

UNITED STATES PATENT OFFICE.

FRANK B. DEANS, OF SHARON HILL, AND BENJAMIN K. KIRK, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO THE BALDWIN LOCOMOTIVE WORKS, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MECHANISM FOR OPERATING THE REELS OF MINE-LOCOMOTIVES.

1,337,048. Specification of Letters Patent. Patented Apr. 13, 1920.

Application filed December 5, 1917. Serial No. 205,572.

To all whom it may concern:

Be it known that we, FRANK B. DEANS and BENJAMIN K. KIRK, citizens of the United States, and residents of Sharon Hill, county of Delaware, State of Pennsylvania, and Philadelphia, county of Philadelphia, State of Pennsylvania, respectively, have invented certain Improvements in Mechanism for Operating the Reels of Mine-Locomotives, of which the following is a specification.

This invention relates to certain improvements in clutch and brake mechanism through which the reels of mine locomotives are operated.

The invention is an improvement on that set forth in the patent granted to us on the 12th day of December, 1916, No. 1,208,511.

One object of this invention is to separate the clutch mechanism from the reel.

A further object of the invention is to construct the mechanism so that the driving chain for the reel will not be driven continuously.

This invention relates to other details, which will be fully described hereinafter, reference being had to the accompanying drawings, in which:

Figure 1 is a plan view of sufficient of an electric locomotive to illustrate our invention;

Fig. 2 is an enlarged sectional view on the line 2—2, Fig. 1; and

Fig. 3 is a transverse sectional view on the line 3—3, Fig. 2.

1 is the frame of an electric locomotive. 2 and 3 are the axles having the flanged wheels. These axles are adapted to boxes in the frame in the ordinary manner. At one end of the locomotive is a reel 4 having a body portion 5 and flanges 6. The reel is mounted on a shaft 7 adapted to bearings 8 secured to the frame 1 of the locomotive. Projecting at an angle from the bearings 8 are brackets 9 carrying the bearings for the double screw shaft 10. These brackets also act as supports for the guide rods 11. Mounted on the guide rods is a traveler 12, which engages the double threaded screw so that as the screw is turned the traveler will be reciprocated in front of the reel 4. On the traveler is a block 13 in which is an eye through which the insulated wire cable passes to the reel. By this means the cable is wound evenly on the reel.

On one end of the shaft 7 is a sprocket wheel 14 around which passes a chain 15, shown by dotted lines in Fig. 1, to a sprocket wheel 16 on the screw shaft 10. On the opposite end of the shaft 7 is a sprocket wheel 17 around which passes a drive chain 18 from a sprocket wheel 19 on an intermediate shaft 23 mounted in the bearing 24 and extending through a hollow shaft 20, mounted in a bearing 21. On the hollow shaft 20 is a gear wheel 25, which meshes with a gear 26 on the axle, which, in turn, meshes with a gear 27 on the shaft of the armature of the motor 28. In the present instance, the motor is hung from the axle of the locomotive. On the intermediate shaft 23 is a nut 30, resting on a washer 29. By means of this nut the tension of the spring 34 is regulated.

31 is a sliding clutch member mounted on the intermediate shaft 23 and keys 32 extend partly in the shaft and in grooves in the clutch member so that while the clutch member can slide longitudinally on the shaft it must turn therewith. Also keyed to the shaft is a collar 33 between which and the clutch member is a heavy spring 34. This collar is also pinned to the shaft, as shown, so that the shaft is prevented from moving longitudinally by the collar and the hub of the sprocket wheel 19. In the present instance, mounted between the spring and the collar 33 is a series of washers. Between the sliding clutch member 31 and a clutch member 35, forming part of, or secured to, the hollow shaft 20 is a series of disks 36, alternating with other disks 37 forming what is termed a "disk clutch" one set of disks being keyed to the shaft 23 and the other set of disks being secured to the clutch member 35. The sliding clutch member 31 has a flange 38, and sliding on this clutch member is a brake ring 39 having a flange 40, and between the two flanges is a steel washer 41. Mounted in the frame 22 is a rock shaft 42 having two arms 43 which engage trunnions on the brake ring 39, and one of these arms is continued forming a lever to which is attached an operating rod which controls the clutch.

The operation is as follows:

Electric locomotives of the type illus-

trated are usually intended for use in mines, and when a locomotive is traveling in a completed gallery equipped with wires, then the reel is not used, but when the locomotive enters a gallery in which the wires have not been located, then one end of the wire is hooked to the electric conductor in the main gallery, and when the locomotive travels into the gallery the clutch is released and the brake is simultaneously applied. In the present instance, with the same lever so that while the cable will pull freely from the reel, the reel will not rotate faster than the removal of the cable thus avoiding slack of the cable.

When the locomotive has received its load and reverses its direction of movement, then it is necessary for the reel to be turned in the opposite direction and the electric cable is coiled on the reel. This is accomplished by shifting the lever and allowing the clutch to drive the reel. By the use of the friction clutch, the first coil is wrapped upon the drum practically without slipping, but when the second coil is placed on the drum there is a certain amount of slip due to the increased diameter of the drum, and when the third coil is placed thereon there is considerably more slip. The coiled spring 34 back of the clutch member 31 allows for this slip, but is of sufficient strength to permit the cable to be tightly wound on the drum. As the cable is wound on the drum, it is traversed backward and forward over the face of the drum by the carrier 12. We have not shown the electric connections between the cable and the drum and the motor, as this forms no part of the present invention.

By arranging the clutch mechanism on an independent shaft within the locomotive and driving the drum shaft by a drive chain from this shaft, the drive chain is only in motion when the reel is in motion, and all of the mechanism at the reel is stationary. This prevents accidents, due to carelessness and as the locomotive generally travels in a very cramped space, it is essential that every precaution should be taken to safeguard the miners and those connected with the mine.

We claim:

1. The combination in a mine locomotive, of a frame; an axle; a motor on the axle; a reel; a shaft carrying the reel and mounted on the frame; two shafts between the motor and the reel, one of said shafts being disposed internally of the other; positively operated clutch mechanism between the two shafts, one of said shafts being driven from the motor and the other driving the shaft on which the drum is mounted so that when the clutch members are thrown open the inner disposed shaft, connected to the reel, is stopped.

2. The combination in a mine locomotive, of a frame; an axle; a motor; a reel; a shaft on which the reel is mounted; an intermediate shaft; a hollow shaft through which said intermediate shaft extends; positively operated clutch mechanism between the hollow shaft and the intermediate shaft; means for driving the hollow shaft from the motor; and means for driving the reel from the intermediate shaft.

In witness whereof we affix our signatures.

FRANK B. DEANS.
BENJAMIN K. KIRK.