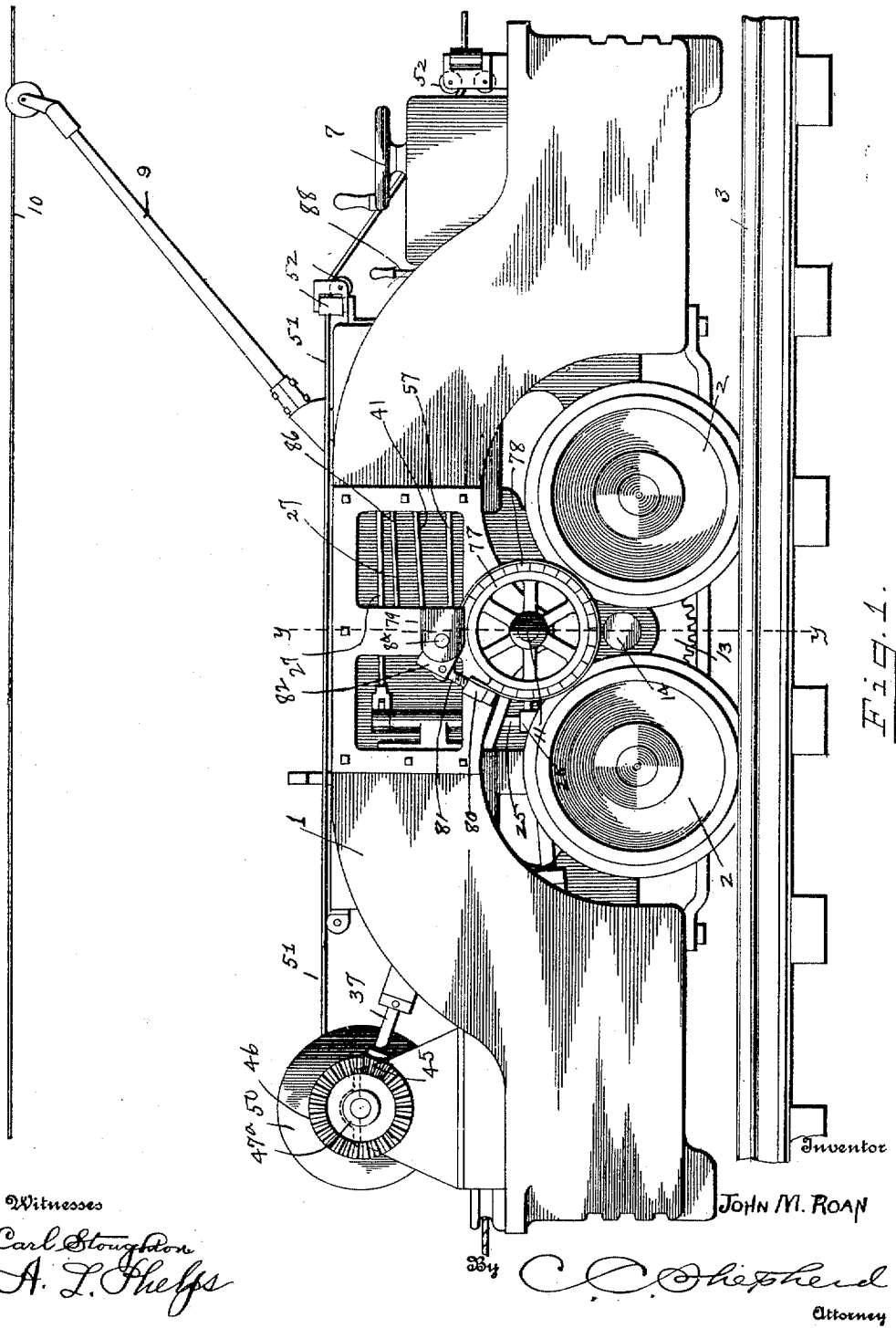


J. M. ROAN.
HAULAGE LOCOMOTIVE.
APPLICATION FILED DEC. 30, 1908.

980,338.

Patented Jan. 3, 1911.

5 SHEETS—SHEET 1.



Witnesses

Carl Stoughton
A. L. Phelps

JOHN M. ROAN

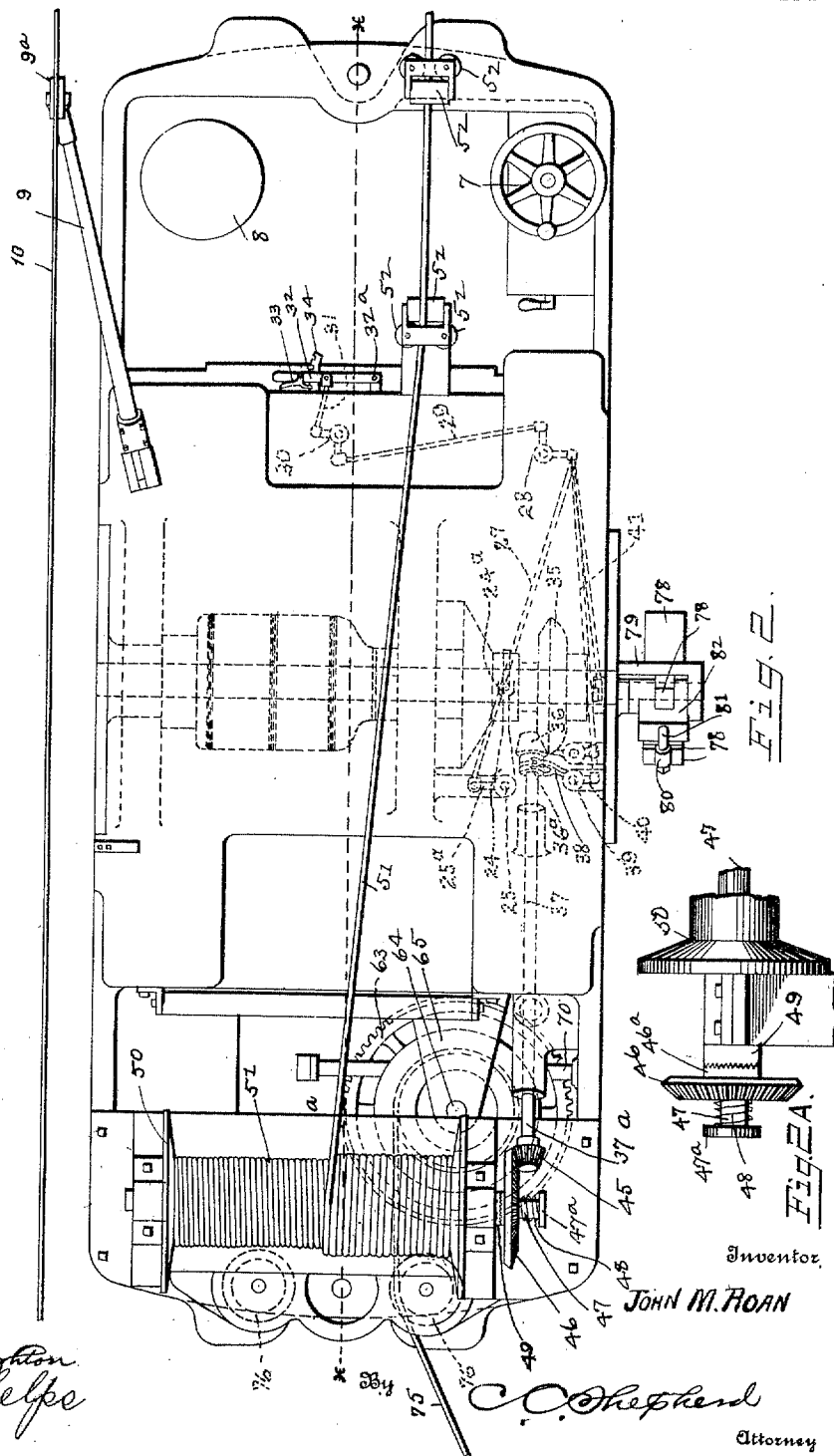
C. C. Shepherd
Attorney

J. M. ROAN.
HAULAGE LOCOMOTIVE.
APPLICATION FILED DEC. 30, 1908.

980,338.

Patented Jan. 3, 1911.

5 SHEETS—SHEET 2.



Witnesses

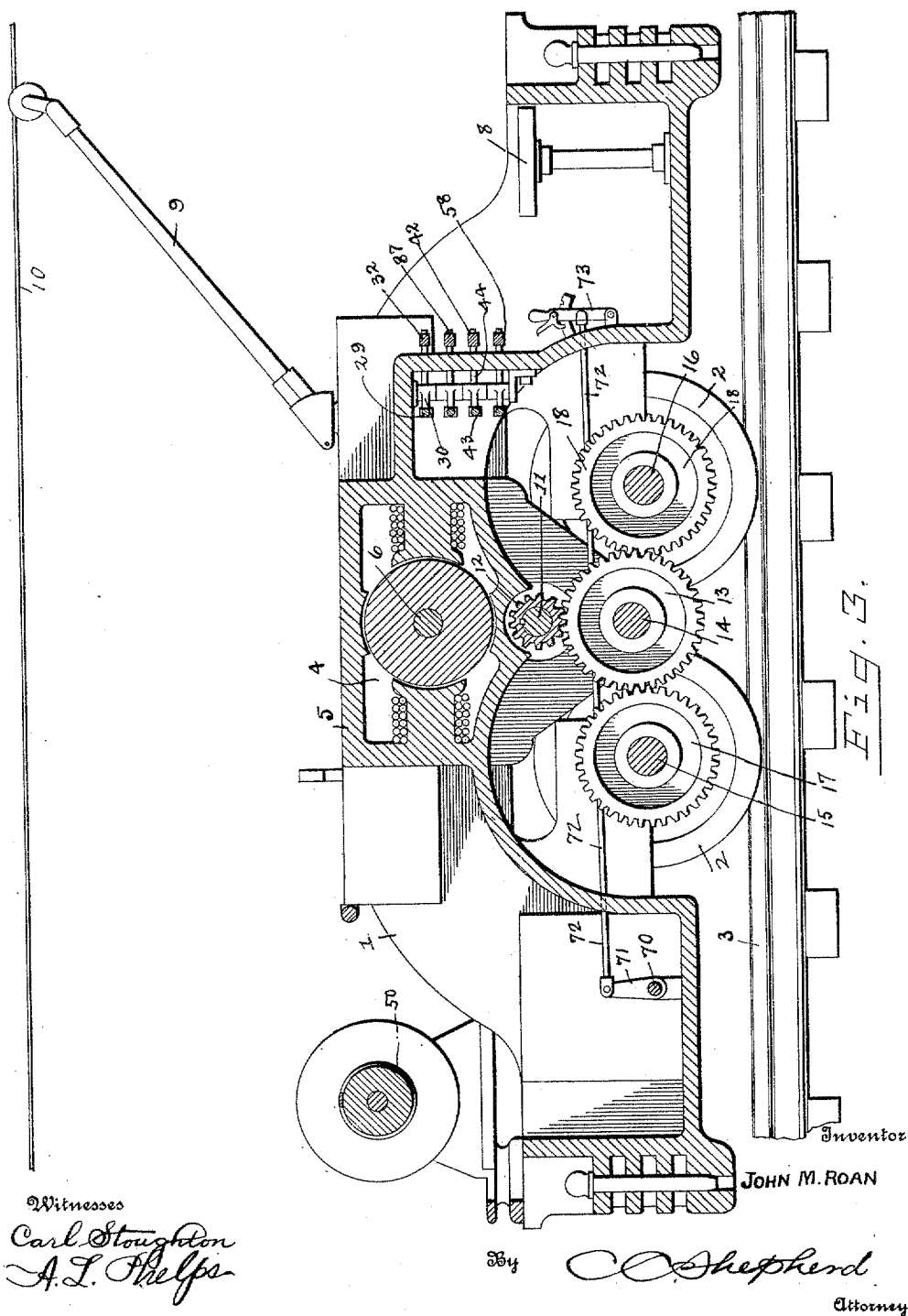
Carl Stoughton
A. L. Phelps

980,338.

J. M. ROAN.
HAULAGE LOCOMOTIVE.
APPLICATION FILED DEC. 30, 1908.

Patented Jan. 3, 1911.

5 SHEETS—SHEET 3



980,338.

J. M. ROAN.
HAULAGE LOCOMOTIVE.
APPLICATION FILED DEC. 30, 1908.

Patented Jan. 3, 1911.

5 SHEETS—SHEET 4.

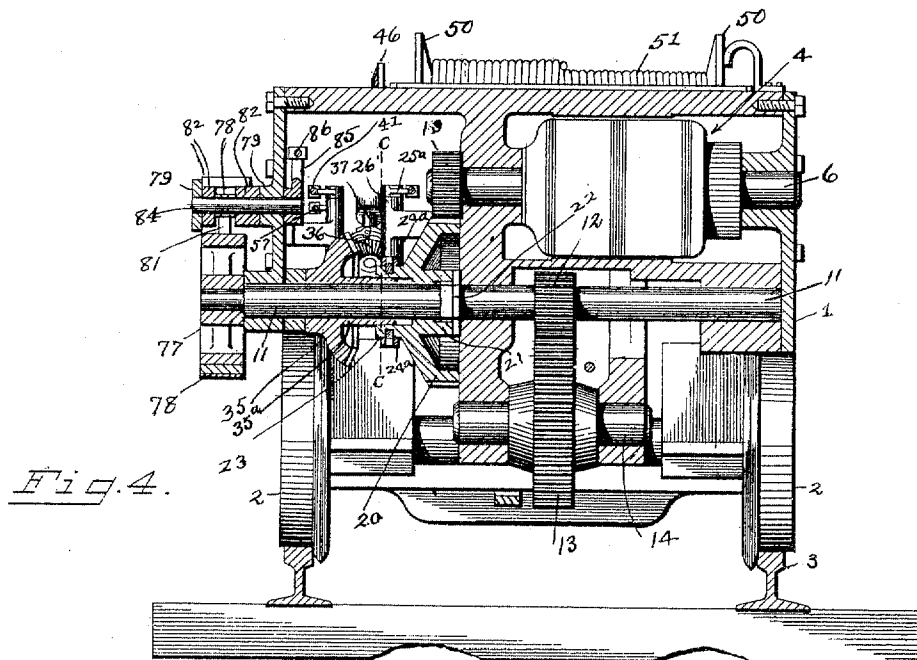


Fig. 4.

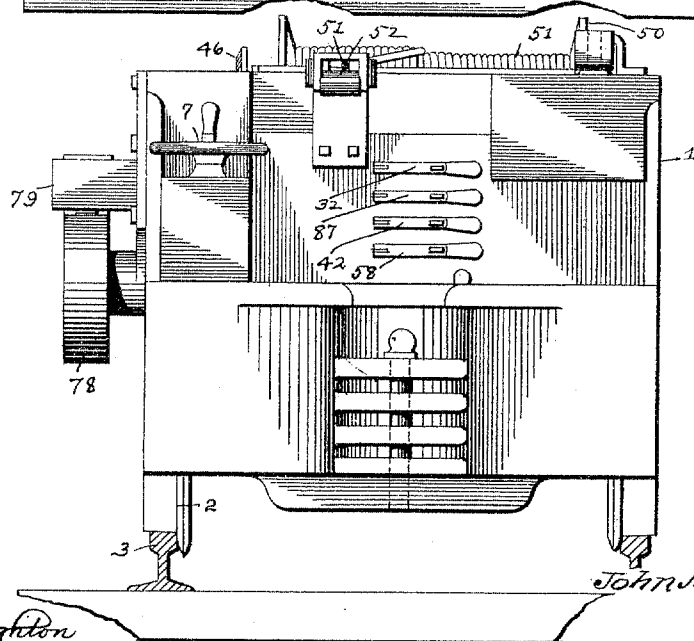


Fig. 5.

Witnesses
Carl Stoughton
A. L. Phelps

Inventor
John M. Roan

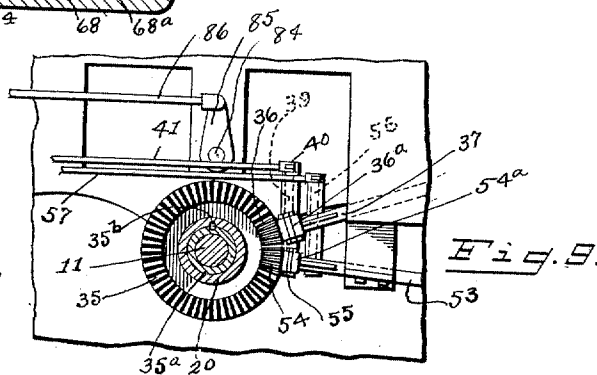
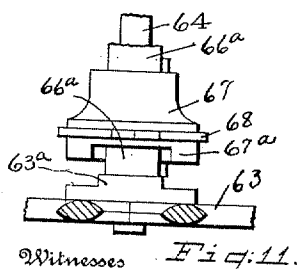
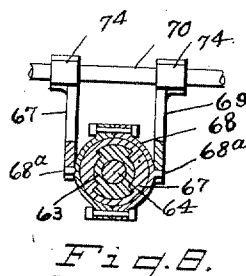
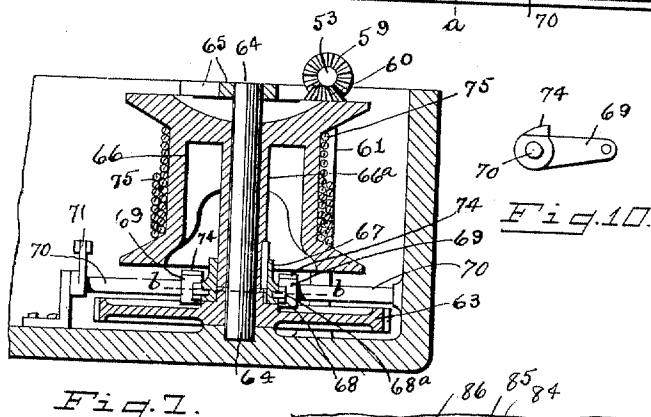
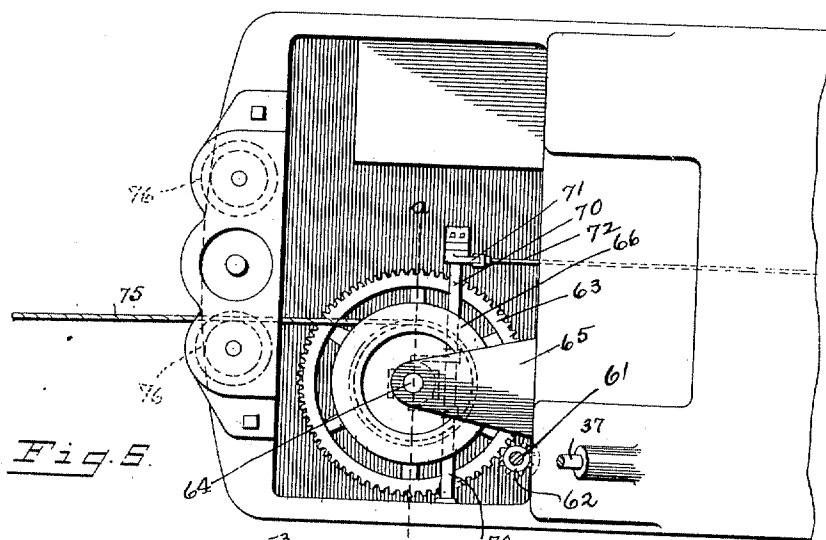
C. C. Shepherd
Attorney

980,338

J. M. ROAN.
HAULAGE LOCOMOTIVE.
APPLICATION FILED DEC. 30, 1908.

Patented Jan. 3, 1911.

5 SHEETS-SHEET 5.



Witnesses Fig. 11.

Carl Stoughton
A. L. Phelps

Inventor
John M. Roan

By *C. C. Shepherd.*

Attorney

UNITED STATES PATENT OFFICE.

JOHN M. ROAN, OF DANTE, VIRGINIA.

HAULAGE-LOCOMOTIVE.

980,338.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed December 30, 1908. Serial No. 469,980.

To all whom it may concern:

Be it known that I, JOHN M. ROAN, a citizen of the United States, residing at Dante, in the county of Russell and State of Virginia, have invented certain new and useful Improvements in Haulage-Locomotives, of which the following is a specification.

My invention relates to improvements in haulage locomotives of that class which are used in mines and has particular relation to the improvement of the construction shown in my former United States Patent #851,837, issued under date of April 30, 1907.

The objects of my invention are to provide a gathering locomotive of the type set forth, of improved construction and arrangement of parts, by means of which mine cars from the various entries or passages of a mine may be readily drawn into the main entry and assembled therein; to provide improved means for throwing into and out of operation the various moving parts of my device; to so locate and arrange the various parts of the machine, as to facilitate the convenient and ready operation thereof; to provide improved means for imparting a winding operation to the electric cable carrying reel; to provide improved means in connection with the electric cable reel for relieving said cable of undue strain and preventing the breaking of the same, and to produce other improvements, the details of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of my improved gathering locomotive, Fig. 2 is a plan view, Fig. 2^A is a detail view in elevation of one of the outer end portions of the electric cable reel shaft, Fig. 3 is a central longitudinal section of the machine on line *x—x* of Fig. 2, Fig. 4 is a transverse section on line *y—y* of Fig. 1, Fig. 5 is a rear end view of the machine, Fig. 6 is a plan view of one end of the machine with the electric cable reel and its supporting plate removed, Fig. 7 is a central vertical section on line *a—b* of Fig. 6, Fig. 8 is a transverse section on line *b—b* of Fig. 7, Fig. 9 is a sectional view on line *c—c* of Fig. 4, Fig. 10 is a detail side elevation of one of the clutch raising arms which are employed in connection with the haulage reel, and Fig. 11 is a view in

elevation of the clutch mechanism which I employ in connection with said haulage reel.

Similar numerals refer to similar parts throughout the several views.

As indicated by the drawings, I employ the usual or a desirable form of locomotive body or frame 1, which is transversely recessed on its underside in the usual manner to provide locomotive track wheel spaces, said body being supported upon the usual form of track wheels 2 which are adapted to run upon the rails 3 of a main track. At the center of the frame and in the upper portion thereof, I provide a transversely arranged electric motor of suitable construction which is indicated at 4, which is inclosed in a suitable housing 5 which is integral with the frame and in which is mounted rotatably, the armature shaft 6, the latter being at right angles with the length of the locomotive body. At the rear end of the body or frame of the locomotive, I provide a suitable form of electric controller 7 near which is conveniently arranged the operator's seat 8.

9 represents a suitable trolley pole which is connected with the motor in the usual manner and the trolley wheel 9^a of which is adapted to run against a trolley wire 10. Below and parallel with the armature shaft, is journaled in the framework a shaft 11. This shaft 11 carries near the center of its length a pinion 12, the latter gearing with a gear wheel 13, which is carried on a short journaled shaft 14 below the shaft 11. and 16 represent the front and rear wheel axles on which the track wheels 2 are carried. Upon these axles are carried gear wheels 17 and 18, the teeth of which mesh with those of the gear wheel 13 which is arranged between said axle gear wheels.

Upon one end of the armature shaft 6 is carried a pinion wheel 19, the teeth of which mesh with those of a gear wheel 20 which is slidably mounted upon the shaft 11. This gear wheel 20 is provided with a central inwardly projecting sleeve-like hub or clutch member 21 having the usual clutch projections which are adapted to engage a fixed clutch member 22 of the usual or any well known form, carried by the shaft 11. The gear wheel 20 is also formed with an outwardly projecting central tubular extension 23 with which are connected at opposite points on said extension, the yoke

arms 24^a of a forwardly extending lever 24, which lever is connected at its outer end with the upper end portion of a vertical rod or shaft 25, which is journaled in a vertical bracket 26 projecting from the frame of the machine. At its upper end the rod 25 is provided with a laterally extending arm 25^a which in turn is pivotally connected with a rearwardly extending rod 27, said rod at its rear end being pivotally connected with one arm of a pivoted bell crank 28, the remaining arm of which is connected by means of a rod 29 with a second pivoted bell crank 30 which through an arm 31 is jointedly connected with a pivoted operating lever 32 at the rear of the machine. This lever 32 which is pivoted at its lower end as indicated at 32^a, is preferably provided with a pivoted dog 33 which is adapted to engage the desired notch of a curved fixed rack 34. The parts just described and indicated by the numerals 24, 25^a and 27 to 31, are best shown in dotted lines in Fig. 2 of the drawing.

On the outer side of the gear wheel 20 and on the shaft 11 is loosely mounted a gear wheel 35, which is provided with an inwardly projecting sleeve-like hub 35^a which extends within the outwardly projecting hub member of the gear wheel 20 and is slidably connected with said hub member by a key connection indicated at 35^b in Fig. 9. The gear wheel 35 is in the nature of a bevel gear wheel and has its teeth meshing with those of a bevel pinion 36 which is carried on the rear end of an inclined forwardly extending shaft 37. The pinion 36 is formed with a collar-like extension 36^a, which extension, together with the pinion, is slidably keyed on said shaft 37. With the pinion collar 36^a are connected the yoke arms of a lever 38 shown more clearly in dotted lines in Fig. 2 of the drawing, said lever being connected with the lower end of a vertically journaled shaft 39 from the upper end of which extends laterally an arm 40 with which is jointedly connected the forward end of a rearwardly extending operating rod 41 (see Figs. 9 and 2). The operating rod 41 is connected with an operating lever 42 at the rear of the machine, through the medium of bell crank and rod connections corresponding to those indicated at 28, 29, 30 and 31, the rod corresponding with the rod 29 being indicated at 43 in Fig. 3 of the drawing, and the rod corresponding with the rod 31 being indicated in said figure at 44. The forward and upper end of the shaft 37 carries a bevel pinion 45 which meshes with a bevel gear wheel 46 which is loosely mounted on a transverse horizontal reel carrying shaft 47, the latter being journaled at the front of the machine, as shown. The shaft 47 is provided on its outer end with a head or enlargement 47^a between which and the

bevel gear wheel 46 is interposed a coiled spring 48. The bevel wheel 46 has projecting from its inner face a friction hub 46^a which is preferably serrated or formed with shallow teeth or corrugations and which through the spring 48 is normally held in frictional engagement with a collar 49 which is carried on the shaft 47. This shaft 47 carries between its bearings a suitable form of reel 50 on which is adapted to be wound an electric current conducting cable 51, which leads rearwardly from said reel between and in contact with pivoted guide rollers 52 on the machine frame, to the trolley wire 10 with which it is connected at a suitable point.

53 represents an inclined journaled shaft which has its rear end portion provided with a beveled pinion 54 which, together with a collar extension 54^a is keyed slidably upon said shaft 53, said collar 54^a having connected therewith the yoke arm projections 55 of a vertically journaled shaft shown in dotted lines at 56 in Fig. 9 of the drawing. With the upper end of this shaft 56 is connected an operating rod 57 which through the medium of rod and bell crank connections which run beneath the connections to the lever 42 is connected with a pivoted operating lever 58 at the front of the machine. On the forward end of the shaft 53 is carried a beveled pinion wheel 59 which meshes with a bevel pinion 60 carried on the upper end of a vertical rotatably mounted shaft 61 (see Fig. 7) which at its lower end carries a pinion wheel 62. This pinion 62 meshes with a gear wheel 63 which is rotatably mounted on the lower end of a vertical reel shaft 64 which has its lower portion supported in a horizontal member of the frame 1 and which has its upper end supported in the outer end of a horizontal plate or bracket 65 which projects from a suitable portion of the frame or body 1. Upon the shaft 64 is rotatably mounted the central vertical tubular member 66^a of a spool or reel body 66. As shown, the lower end of the reel sleeve 66^a bears upon the upper side of the hub of the gear wheel 63 and surrounding said bearing parts and keyed in connection with the reel member 66^a is a vertically slidable sleeve 67 with which are connected at opposite points through the medium of an external band 68 and projecting pins 68^a as indicated in Fig. 8 of the drawing, the outer ends of parallel arms 69 which are rigidly connected at their remaining ends with a horizontal rocker shaft 70 which is suitably pivoted at each end. This rocker shaft is provided near one end with an arm 71 with which is connected the forward end of a rod 72, the latter extending rearwardly as indicated more clearly in Fig. 3, to the rear portion of the machine, at which point it is pivotally connected with

a pivoted operating lever 73. Upon the upper side of the outer end of each of the arms 69 is formed a cam-like projection 74, which when the shaft 70 is rocked, are designed to contact with the underside of the reel body 66.

As shown more clearly in Fig. 11 of the drawing, the lower portion of the sleeve 67 is formed on its underside with clutch projections 67^a which normally engage clutch recesses or clutch members 63^a in the upper side of the hub of the wheel 63, thereby providing means for interlocking the reel 66 and the gear wheel 63. The reel 66 is designed to have wound thereon a suitable steel haulage cable 75 which runs from said reel forwardly over the desired one of a plurality of pulleys 76 which are journaled at the front end of the body. On the outer end of the shaft 11 is carried a brake wheel 77 about which is provided a brake band or flexible brake member 78. One end of this brake band is connected with a bracket 79 which projects from the side of the machine frame and the other end thereof is connected with a collar 80 which is slidably mounted on a bolt or threaded pin 81, the upper end of which is pivotally connected with a block 82 which in turn is pivoted in the bracket 79. On the lower end of the bolt or pin 81 is carried a nut 83 against which said collar is adapted to bear. Journaled in the machine frame and in the outer member of the bracket 79 is a short horizontal shaft 84 which forms the pivot for the block 82 (see Fig. 4) and with which one end of the brake band 78 is connected. On the inner end of the shaft 84 is carried an arm 85 with which is connected a rearwardly extending rod 86, the latter running to the rear of the machine and connecting with an operating lever 87.

I will now proceed to describe the operation of the hereinbefore described locomotive: It will be understood that gathering locomotives of this class, are ordinarily employed in the main entries of mines and in order to produce a traveling motion of the entire locomotive upon the track rails 3, the motor is set in operation by a preliminary operation of the controller 7, with the result that through the gear connections described, with the gear wheels 18 and 17, the desired rotary motion is imparted to the track wheels 2. In order to provide a means for reversing the direction of the travel of the locomotive on the tracks, I have provided a suitable current reversing means which is controlled by a lever indicated at 88. Assuming now that the locomotive has been run to a point opposite a side entry, from which it is desired to draw one or more cars into the main entry for the purpose of assembling the same therein, the gears which control the ground wheels, are first thrown

out of action by an outward movement of the lever 32 shown at Fig. 2, which through the connections described, results in moving the gear wheel 20 outward until its clutch projection 21 is disengaged from the clutch member 22. In the construction of the gear wheel 20, however, it will be observed that the width of the teeth thereof is such as to retain said gear teeth in connection with the teeth of the pinion 19, after the clutch members have been disengaged as described, thus providing for a continued revolution of the wheel 20 after the motion of the track wheel controlling gears has been discontinued. It will be seen that the motion of wheel 20 is always imparted to the bevel gear wheel 35, so that by means of the bevel pinions and the two shafts connected with this gear, one reel or the other, or both, can be driven from the motor, the direction of drive being dependent upon the direction of revolution of the motor. By pulling outward on the brake lever 87, the locomotive track wheels will be held against rotation, owing to the fact that through the connections described, a sufficient rotary movement is imparted to the shaft 84 (see Fig. 4) to cause an upward pull on the block 82 and threaded pin 81 which in turn will cause a binding of the brake band 78 against the periphery of the brake wheels 77, and prevent said brake wheel, together with the track wheels with which said brake wheel is geared, from rotation. There being no necessity for the employment of the electric cable 51 or its reel, the latter is thrown out of operative connection with the motor by moving the lever 42 outward and through the connections described, which connections include the rod 41, shaft 39 and yoke 38, the bevel pinion 36 is thus caused to slide outward on the shaft 37 until out of gear connection with the wheel 35 (see Fig. 9). It will be understood that in order to connect the haulage rope or cable 75 with a car to be drawn into the main entry, it will be first necessary to unwind said cable from the reel 66 and in order to permit of this unwinding movement, the lever 73 shown in Fig. 3, is pulled outward, resulting through the rearward pull on the rod 72, in turning the shaft 70 until through the lifting movement of the arms 69 (Figs. 7 and 8) the clutch sleeve 67 is lifted out of engagement with the hub of the wheel 63, thus disconnecting said reel from said rotating wheel 63 and permitting a paying out of the haulage cable which is on the reel. The cable being attached to the car to be drawn from a side entry, the shaft 70 is again rocked to cause a clutch engagement of the sleeve member 67 with the wheel 63, which through the rotation of said wheel, will result in the reel being properly rotated to wind the haulage cable thereon, thereby drawing the

car from its position in the side entry to a position in the main entry.

In the operation of paying out the cable and particularly in lowering a car down an inclined surface, it is desirable to regulate the speed at which the cable unwinds from the reel and this I accomplish by imparting a sufficient rocking action or rotation to the shaft 70 to cause the cam projections 74 of the arms 69 to press the reel upward until its upper side is in frictional or brake contact with the underside of the plate 65. It will be understood that by throwing the lever 58 outward and thereby producing a rearward pull on the rod 57 and a turning of the shaft 56, the bevel pinion 54 may be moved rearward on the rod 53 until out of engagement with the teeth of the wheel 35, thereby disconnecting the operating parts of the haulage reel from the other operating or running parts of the machine.

Assuming that it is desired to run the locomotive from the main entry into a side entry where no trolley wire is provided and consequently where no trolley pole can be employed, the current necessary for running the motor is supplied by the electric current conducting cable 51. In order to utilize the electric cable for this purpose, it is desirable to pay out said cable from the reel 50 at the same speed at which the locomotive is traveling on the tracks and assuming that the brake band 78 has been released by the inward movement of the lever 87 and that by the inward movement of the lever 32, the clutch member 21 of the wheel 20 is again brought into engagement with the clutch member 22 of the shaft 11 to effect an operative gear connection with the track wheels, the method of transmitting motion to the electric cable reel 50, for the purpose of paying out said cable, is as follows: The bevel gear wheel 36 being in engagement with the teeth of the wheel 35, it is obvious that rotary motion will be imparted to the shaft 37, its pinion 45 and through the latter to the bevel gear wheel 46, thus imparting the desired rotary motion to the shaft of the reel 50 which will result in the paying out of the electric cable 51, thus permitting the locomotive to travel into a side entry in which no trolley wire is provided. It will be understood that when the motor is reversed for the purpose of running the locomotive to the main entry, a corresponding reversal of movement will be imparted to the reel operating rod 37 and to the reel shaft, thereby resulting in a winding of the electric cable upon the reel 50 at desirable speed. In case the winding strain on the cable 51 should for any cause, be increased to such an extent

as to create a liability of breaking said cable, it will be understood that the tendency of the reel shaft to revolve at a greater speed, will be sufficient to release the frictional engagement of the members 46^a and 49, thus temporarily relieving the strain, after which said members will again come into operative engagement through pressure of the spring 48.

From the construction and operation which I have described, it will be observed that improved means are provided for producing a positive operation of the various parts of my device and that the operation of collecting and distributing cars in a mine, is adapted by my improved locomotive to be accomplished in a rapid and convenient manner. It will be seen that two separate reels, a haulage reel and a conductor reel, are provided these reels being capable of being independently driven by the clutches and gearing described, from the motor which drives the car.

What I claim, is:

1. In a haulage locomotive, a motor, means for transmitting motion from the motor to the locomotive, a reel, a haulage cable carried by the reel, means for transmitting motion from the motor to said haulage cable reel, a second rotatably mounted reel, an electric current conducting cable carried on said second reel, and means for transmitting motion from the motor to said electric cable reel in either direction.

2. In a haulage locomotive, a motor for transmitting motion from the motor to the locomotive, a reel, a haulage cable carried by said reel, a second rotatably mounted reel, and means for transmitting motion from the motor to either or both of said reels.

3. In a haulage locomotive, a motor and motor shaft, a pinion carried on the motor shaft, a main operating shaft 11, a gear wheel slidable on said main operating shaft, said gear wheel adapted to be disengaged from said operating shaft but retained in engagement with the motor shaft pinion, a reel, a haulage cable carried thereon, a gear wheel 35 loose on said operating shaft and having a hub engagement with said slidably mounted gear wheel, an electric cable reel and a cable carried thereon, and means whereby motion may be transmitted through the rotation of said sliding gear wheel and said gear wheel 35 to either or both of said reels.

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

JOHN M. ROAN.

Witnesses:

JESSIE G. GREEN,
E. L. JONES.