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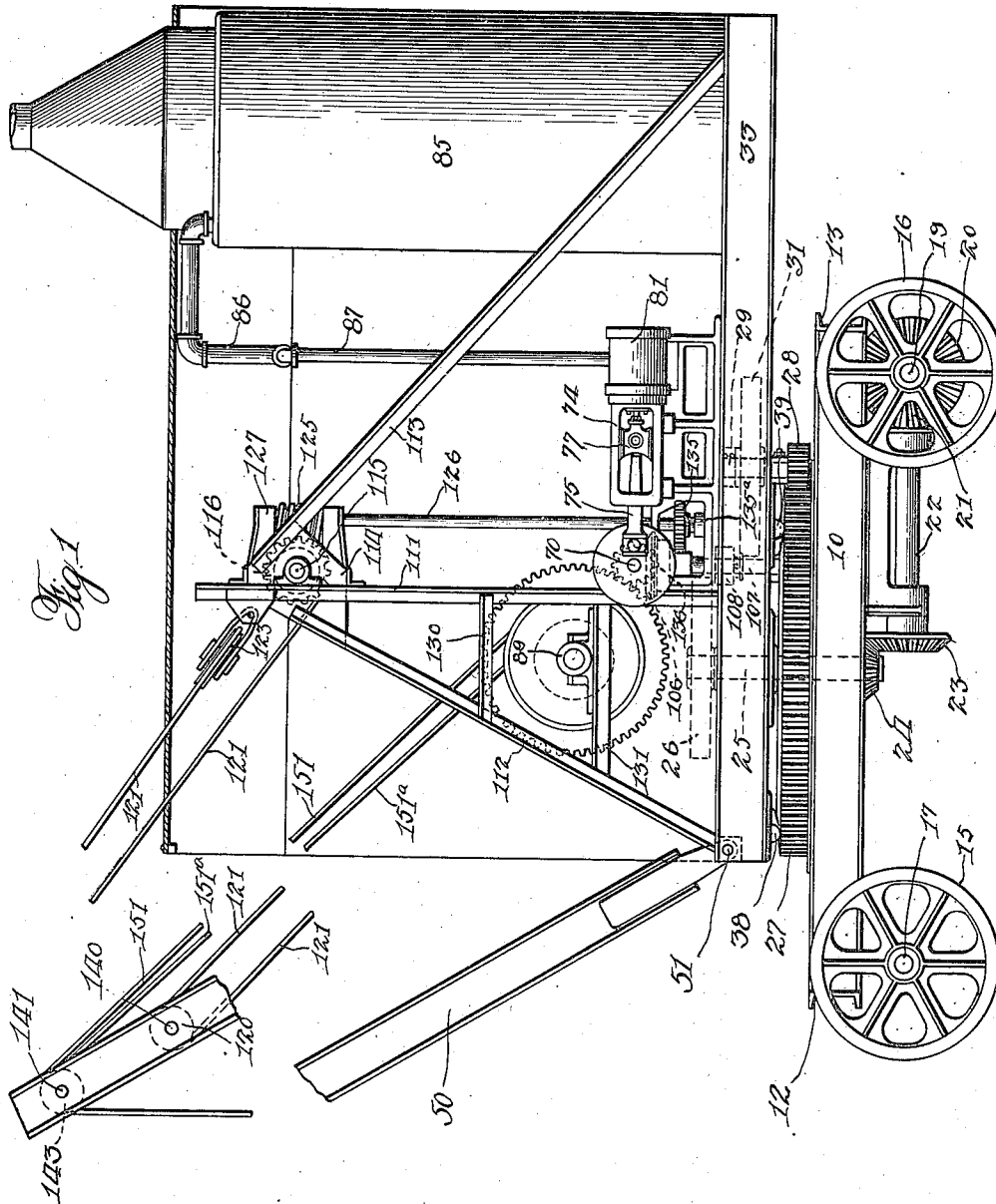
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E. J. KANE

POWER OPERATED CRANE

Filed Nov. 1, 1920

3 Sheets-Sheet 1



Witness:
Carl E. Magnusson

Inventor:
Edmund Joseph Kane,
By Arthur L. Sprinkle,
Att'y.

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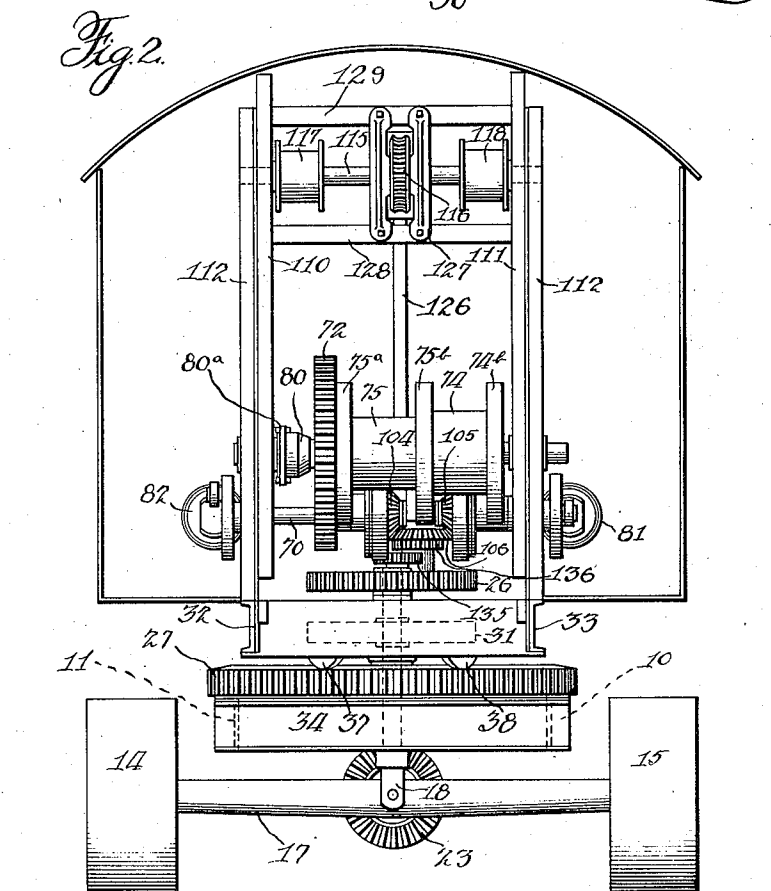
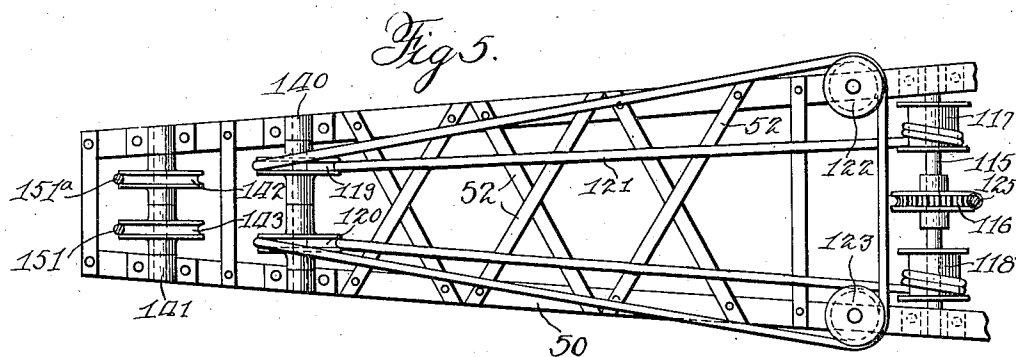
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Filed Nov. 1, 1920

3 Sheets-Sheet 2



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Apr. 24, 1923.

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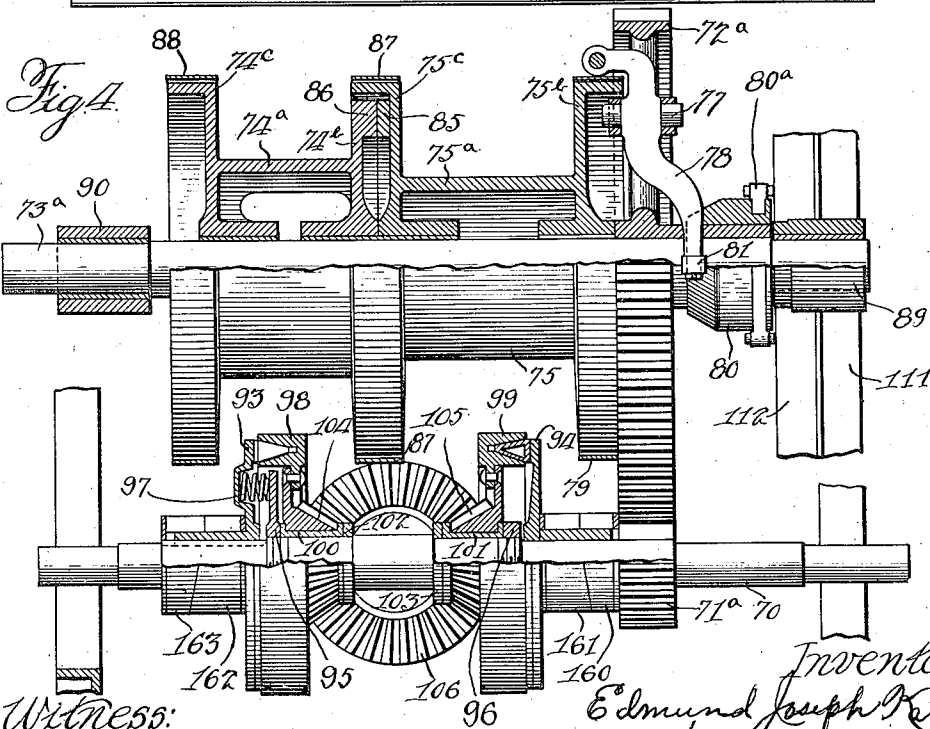
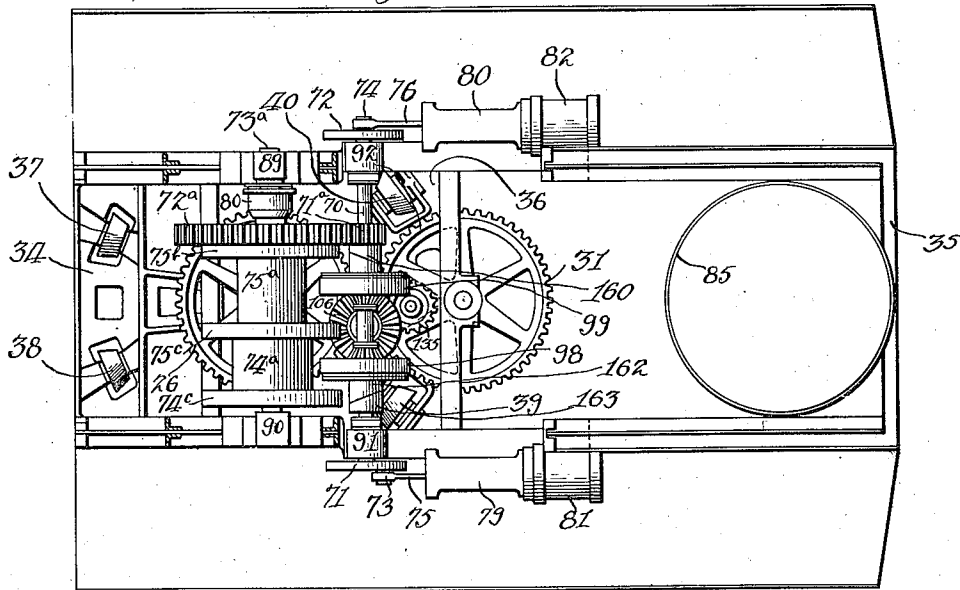
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3 Sheets-Sheet 3

Fig. 3



Witness:

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UNITED STATES PATENT OFFICE.

EDMUND JOSEPH KANE, OF CHICAGO, ILLINOIS.

POWER-OPERATED CRANE.

Application filed November 1, 1920. Serial No. 420,976.

To all whom it may concern:

Be it known that I, EDMUND JOSEPH KANE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Power-Operated Cranes of the Traversing Type, Commonly Known as Locomotive Cranes, of which the following is a specification.

The invention relates to locomotive cranes of the power operated traversing hoist type and has for its object the provision of certain improvements and refinements in the mechanisms for operating the boom and the tools carried thereby.

It is a further object of the invention to provide improved means by which a crane of the type to which the invention herein shown is applied may be transported under its own power from place to place.

It is a further object of the invention to provide improved means interposed between the source of power on the swing body and the car body for operating the swing body including the boom and lifting devices carried thereby.

The objects above recited together with certain other improvements in the construction of my improved crane are set forth in the subjoined specification which has particular reference to the drawings forming a part thereof and the novel features of the invention are finally set forth in the appended claims.

In the said drawing, Fig. 1 is a side elevation of a locomotive crane embodying my invention showing a part of the boom broken away.

Fig. 2 is an end elevation of the same with the boom removed.

Fig. 3 is a top plan view of the device of Fig. 2 with the covering over same removed.

Fig. 4 is an enlarged detail view of the cable hoisting drums including the holding or take-up drum and the main power drum for operating the tools carried by the boom, the said drums being shown in section as are the clutches on the engine shaft or power supplying shaft, in order to disclose the details of construction of both drums and clutches.

Fig. 5 is a plan view of the boom and mechanism associated therewith for controlling the boom and operating the tools with

parts broken away, the tool operating cables being shown in section.

My invention is shown applied to a locomotive crane having the usual car body which in this case, as will be seen by reference to Figs. 1 and 2, is formed of sturdy channel iron and is of a general rectangular form, the side members of the same being indicated by reference characters 10 and 11, and the front member by reference character 12, and the rear member by reference character 13. The car is supported by four carrying wheels, the front wheels being designated by reference characters 14, 15, and the rear wheels, only one of which is shown, designated by reference character 16. The front wheels 14 and 15 are on a pivotally mounted axle 17 to enable the car body in transportation to be guided, but no specific means for steering this axle is shown herein, as the same forms no part of the present invention, the axle 17 being merely shown connected to a king pin 18 pivotally mounted at the front end of the car body frame. The rear wheels, one of which is shown at 16, are keyed to a solid rear axle 19 (see Fig. 1), and the latter is rotatably mounted in suitable bearings, not shown, on the car body frame, so that both the rear wheels will be rotated whenever rotation is imparted to the axle 19, the latter carrying the face gear 20, which is engaged by the bevel gear 21 on the longitudinally extending drive shaft 22, the latter being supported in suitable bearings on the car body main frame and being provided with a bevel gear at its forward extremity, as indicated at 23, engaged by a co-operating bevel gear 24 on vertical shaft 25, which latter has keyed thereto at its upper extremity the gear 26, which is engaged by suitable driving means to be described, whereby power will be imparted from the source of power for imparting rotation to the driving axle 19 and enabling the car body to be moved by the rotation of the driving wheels either in the forward or in the reverse direction. The car body has rigidly attached to the upper side thereof the large swing gear which is externally toothed, as indicated by reference character 27, the latter being engaged by the spur gear 28, which is rotatably mounted in the frame of the swing body by being attached to vertical shaft 29, the latter being journaled in suitable bearings on the

frame of the swing body and having keyed thereto the gear 31, the latter being externally toothed for engagement with gearing for supplying the power for rotating the swing body. The swing body comprises a supporting frame of sturdy construction adapted to support the power source of supply as well as the boom and the devices carried thereby, together with the various power transmission devices to be described. The frame of the swing body is constructed in a manner similar to the frame of the car body, being made of rectangular form comprising the two lateral channel members 32, 33 which are connected at the front and rear by suitable cross connecting members, the forward member consisting of an irregular shaped casting indicated generally by reference character 34, and the member at the rear being of channel form like the lateral or side members and indicated in Fig. 3 by reference character 35. There are suitable cross connecting members in addition to the end members 34, 35 between the longitudinal side members 32 and 33 of the swing body frame, one of which is an irregular casting similar to the cross member 34 spaced on the opposite side of the center of the swing gear 27 and indicated generally by the reference character 36. These castings 34 and 36 not only serve to support the swing body frame but are also provided with bearings and suitable openings or housings to support anti-friction rollers, of which there are four shown, and designated by reference characters 37 to 40 inclusive (Fig. 3). The upper side of the swing gear 27 is formed with a suitable bevelled track surface inclining downwardly and outwardly from the center of the swing gear, and the supporting wheels or rollers 37 to 40 inclusive are conically formed to correspond, thereby tending to cause the weight and strains thrown upon these parts by the swing body to tend to centralize the swing body on its pivot, which consists of the aforesaid vertical shaft 25, journaled at the center of the swing gear and in suitable bearings on the swing body frame.

At the front end of the swing body frame is the boom which is designated generally by the reference character 50 and is pivotally connected, as indicated in Fig. 1, by pivot pins 51 in suitable bearings in the forward edge of the front connection 34 of the swing body frame. The boom 50 may be of the usual or any ordinary construction and is shown in the embodiment thereof in Figs. 1 and 5 as formed of channel members, of which there are usually two in number, spaced apart and arranged to converge toward their outer extremities and being suitably braced by cross connections, shown herein as indicated at 52. In Fig. 5 is shown a plan view of the boom of a conventional

form in which the sheaves and cables are in position for operating the boom hoist.

The motive power for operating the boom hoist cables and the swing body may be of any desired form, as the steam engine, the hydro-carbon motor or an electric motor. In the present embodiment the motive power is illustrated in the form of steam engines of the twin cylinder type, the cylinders being located in line with the opposite ends of a crank shaft 70 (Figs. 1 to 3 inclusive) which carries suitable cranks or wheels 71, 72 carrying crank pins 73, 74 and connecting rods 75, 76 connecting with cross heads, as indicated by reference character 77, Fig. 1, carried by guides 79, 80, which are also associated with piston rods and the usual pistons in the steam cylinders 81, 82. The reference character 85, Figs. 1 and 3, designates generally a steam boiler and in Fig. 1 is shown a conventional form of conduit or pipe 86 leading to pipes, one of which is designated by reference character 87 intended to convey steam to the cylinders 81, 82. Since however, the specific form of motive power is not pertinent to the invention no attempt has been made to show these details except in a general way and for the same reason no means for controlling the steam from the boiler to the engine is illustrated. Power will be applied to the shaft 70 by motive power as described, which shaft is journaled to rotate in either direction as desired. Attached to rotate with shaft 70 is a spur gear 71^a in engagement with the large reduction gear 72^a which is journaled on transverse shaft 73^a carrying the holding or take-up and power drums, the former being designated by reference character 74^a and the latter by 75^a. The power drum is preferably the smaller in diameter of the two in order to multiply the leverage or lifting power of the cable carried thereby, which is intended to do by far the heaviest work in connection with operating the tools carried by the boom hoist. The gear 72^a will preferably be mounted to rotate with shaft 73^a while the drums 74^a and 75^a will be journaled loosely on said shaft but adapted to be rotated with the gear 72^a by means of suitable friction devices which will now be described.

Pivotally connected on the inside of the toothed periphery of the large gear 72^a at 77 is an arm 78 connected with an expansible band 79 engaging the periphery of one enlarged flanged end of the power drum 75^a in such a manner that as the lever 78 is rocked on its pivot 77 in a well known manner in one direction the friction band 79 will be tightened around the flanged portion 75^b of the power drum while movement of the lever 78 in the opposite direction will obviously result in loosening the friction band 79. The preferred construction is that

illustrated by which movement toward the gear 72^a of the conical sliding member 80 will by engaging the roller 81 on the extremity of the arm 78 rock the arm so as to tighten the friction band 79 thereby causing the power drum 75^a to be rotated in unison with the gear 72^a which will be continuously driven from the power shaft 70. The holding or take-up drum 74^a has the effective cable reel thereon preferably of a slightly larger diameter than the corresponding part of the power drum 75^a and the drum 74^a is mounted loosely to rotate on the shaft 73^a under the control of a frictional device consisting of a suitable frictional surface designated by reference character 85 attached to the enlarged flanged portion 75^c on the power drum 75^a. The flanged portion 75^c of the power drum will be preferably engaged by a suitable frictional brake band indicated by reference character 87 shown in Fig. 4. This brake band may be of the conventional type and no specific means is shown for operating same as this forms no part of the invention. The function of the brake band 87 will be to control the power drum 75^a against over-running in a well known manner. The holding or take-up drum 74^a is provided at one end with a flange 74^b which carries a counter-part frictional surface 86 for engaging with the frictional surface 85. This engagement between the frictional surfaces 85 and 86 will be constant so that whenever the brake band 88, which co-operates with the enlarged flanged end 74^c of the holding or take-up drum 74^a, is tightened, the drum 74^a will be caused to remain stationary while the power drum is operated, but whenever the brake band 88 is loosened, the holding or take-up drum will be frictionally operated in a manner sufficient to take up the slack in the line carried thereby for the purposes to be presently described.

The frictional brake bands, 87, 88 may be of the same type and operated in the manner similar to the band 79 heretofore described. The operating means for the bands 87 and 88 is not shown as same may be of any common and well known construction for contracting these bands and the same forms no part of the present invention. 89 and 90 respectively designate the bearings carrying the shaft 73^a on the main frame. The main power shaft or engine crank shaft 70 is carried by suitable bearings 91 and 92 (Fig. 3) and is an integral shaft having splined thereon so as to be slidable in relation to the shaft, but to turn constantly therewith, two clutch disks 93, 94 (Fig. 4). Associated with each of the slidable clutch disks 93, 94 are the spiders 95, 96. These may be of a disk like form or contain arms for supporting a plurality of coiled springs 97, the latter being adapted to normally press against the clutch disks 93 and 94 to hold them out of engagement with the co-operating frictional disks 98, 99. The last said disks will have co-operating frictional surfaces, as for example, the grooves shown in Fig. 4 which take the projections on the disks 93 and 94 in a well known manner in this type of frictional clutches. The disks 98 and 99 of the clutches will be journaled to rotate loosely on suitable supporting collars as indicated at 100 and 101 on the shaft 70 and any suitable means as the locking collars 102, 103 may be used to retain the bearing collars 100, 101 in position. This construction allows the friction disks 98 and 99 to rotate freely on the shaft 70 when the co-operating parts of the clutches are released and they also carry bevelled gears which are designated by reference characters 104, 105 which are both in mesh with the large bevelled gear 106, which is keyed to the upper end of vertical shaft 107, the latter being journaled in suitable bearings on the swing body frame. 108 is a spur gear splined on the vertical shaft 107 and adapted to be operated to a position where the teeth thereon will engage the teeth on the large gear 26. When adjusted to this position, by some suitable shifting mechanism not shown, as same forms no part of the present invention, it will be seen that the gear 31 and shaft 29, which operate the spur gear 28 for imparting a swinging movement to the swing body, will be at rest and power from the driving shaft 70 through either of the bevelled gears 104 or 105 will be transmitted to and result in rotation of the vertical shaft 25 and the longitudinal drive shaft 22 communicating with the rear live axle, so that motion either in the forward or reverse direction will be imparted to the rear driving wheels 16 and will propel the car body either in the forward or reverse direction, as desired. It will also be seen that a simple shifting movement of the gear 108 from the neutral position shown in Fig. 1 into engagement with the teeth on the gear 31 will result in imparting rotation from the power shaft 70 to the swing body operating shaft 29 and pinion or gear 28 carried thereby, which will result in a swinging movement being imparted to the swing body on the pivotal or center shaft 25. In order to properly support the bearings of the mechanism just described there is an upper structure erected on the swing body frame, consisting of the parts 32 to 36 inclusive and, this may conveniently consist of suitable uprights as the vertical angle bars 110, 111 supported by suitable angular braces at each side as designated by reference characters 112 and 113, the latter being connected to the base of the swing body frame adjacent the longitudinal side rails 32, 33 thereof and joined to the vertical uprights 110, 111 by some suitable

anchoring means as bearing plates at each side designated by reference character 114, which may conveniently rotatably support a shaft 115 carrying a worm gear 116 and the two spaced reels or drums 117, 118, fixed to rotate therewith. The drums 117, 118 are adapted to carry the cable for the boom hoist, the two extremities of the cable being secured to these respective drums and looped thence over the sheaves 119, 120 respectively, of the boom hoist. The cable co-operating with these drums is designated generally by the reference character 121, Fig. 5, as is also the manner of mounting the same, from which it will be seen that the strands of the cable after being passed over the sheaves 119, 120 will extend downwardly and toward the drums 117, 118 and will pass over the sheaves 122, 123 with a strand thereof uniting the parts of the cable over these respective sheaves, with the result that as the boom hoist shaft 115 is rotated to synchronously wind up the ends of the cable on each of the drums 117, 118 respectively, this shortening of the cable will in a well known manner by shortening the loops in the cable over the sheaves 119, 120 elevate the outer end of the boom hoist on its pivotal connections 51 with the swing body frame. Motion to the shaft 115 carrying the boom hoist cable drums will be imparted by means of worm 125 engaging worm gear 116 carried on the upper end of the vertical shaft 126 which is journaled in a suitable bracket 127 forming a part of the bearing for the boom hoist drum shaft 115 and will preferably be supported by the transverse connecting bars 128, 129 which extend between and are anchored to the vertical members 110, 111 of the upper structure of the swing body frame. This structure including the vertical members 110, 111 and the angular braces 112 will preferably be strengthened by the cross ties at each side shown in Fig. 1 and designated by reference characters 130, 131, there being one pair of each of these on opposite sides of the swing body frame.

To the lower cross ties 131 the bearings 89 and 90 for supporting the shaft 73^a carrying the holding or take-up and power drums 74^a and 75^a will be attached. Adjacent the lower end of the vertical shaft 126 there is splined a gear 135. This gear has a hub 135^a attached thereto or formed integrally therewith which is shown in Fig. 1 as provided with a slot adapted to take a shifting fork, the latter not being shown, as any common form of gear shifting mechanism may be employed, and by which the gear 135 may be caused to engage with the teeth of a gear 136 secured to the vertical shaft 107. From the foregoing construction it will be seen that whenever the operator shifts the gear 135 into engagement with the gear 136, rotation of the power shaft 70 will result in the

actuation of the vertical shaft 126 and operate the worm and worm gear 125 and 116 respectively, whereby rotation will be imparted to the boom hoist drums 117 and 118, with the result that the outer end of the boom hoist frame 50 will be either raised or lowered as desired. From this construction it will also be seen that if it is desired to cause the boom hoist to remain in a suspended position the disconnection of the gear 135 from the gear 136 on the vertical power shaft will secure the desired result, the boom hoist drums 117 and 118 being held against giving off the cable by reason of the locking effect of the worm 125 engaging the gear 116 on the drum shaft 115. The reference character 140 on the boom hoist designates a suitable shaft furnishing bearings for the sheaves 119, 120 of the boom hoist cable 121. At a point preferably a little nearer the extremity of the boom hoist is secured a transverse shaft 141 furnishing a bearing for the sheaves 142, 143 over one of which will be passed a cable from the power drum 75^a and the other of these sheaves will take the holding or take-up cable from the drum 74^a. Since the sheave 143 is on the side of the holding or take-up cable drum 74^a it is preferred that this cable which is designated by reference character 151 (Fig. 5) be passed over the sheave 143 and used as the holding or take-up cable while a cable wound on the power drum 75^a will be passed over the sheave 142 as designated by reference character 151^a. This arrangement of cables for operating the boom hoist and the tools carried thereby is common in this class of machines and the construction of the boom hoist and mechanism carried thereby forms no part of the present invention.

In the aforesaid embodiment of the invention as shown in the drawings and in the description no attempt has been made to illustrate detail means for shifting or operating the clutches on the power shaft 70 or the brake bands controlling the cable drums, as these features together with the specific means for operating sliding gears such as the gear 135 on vertical shaft 126 operating the boom hoist drums, and the sliding gear 108 on vertical shaft 107, may be controlled by gear shifter devices of a variety of constructions well known to those skilled in this art, keeping in mind that these controlling means are usually brought to a convenient position adjacent the operator on the swing body frame.

I show however, in connection with the main power shaft 70 and the clutches thereon a pair of eccentrically splined collars 160, 161 interposed between the gear 71^a and the splined sliding member or clutch plate 94. A similar pair of collars 162, 163 are mounted on a sleeve of the sliding clutch plate 93,

the former preferably mounted thereon and the latter being non-rotatively connected with the sleeve of the clutch plate 93 and fixed against sliding longitudinally of the shaft 70. From the construction of the collars 160, 161 and 162, 163 it will be seen that by rotating the movable collar of each pair an action will be secured causing the clutch plates 93 and 94 to engage their counter-part clutch members 98 and 99 respectively with whatever pressure may be desired, under the control of the operator, for imparting movement in the desired direction to the traction devices operated by the gear 106 on the vertical shaft 107. No specific means are herein illustrated for imparting rotation to the movable members of the clutch shifting collar as same forms no part of the present invention and the mode of operation of clutch shifting devices of this character are old and well known to those skilled in the art.

From the foregoing description of my improved locomotive crane construction, and particularly the driving and power applying mechanisms connected with the swing body and the truck body, it will be seen that I have simplified the construction of these parts of the locomotive crane making the same more economical to manufacture and at the same time providing for a simple and satisfactory application of power for the various purposes required with a minimum amount of mechanisms involved, resulting in the elimination of a large number of parts of complicated and expensive mechanisms, heretofore employed in constructing a machine of this character to function in the manner herein described. I have shown in connection with each feature of my invention the preferred mode of operation where there has been any departing from prior and accepted art, but it is not desired to be limited to the details described and illustrated except as defined by the claims, for it will be apparent that persons skilled in this art may resort to various modifications of the novel features shown, described and claimed without departing from the purpose and spirit of my invention.

What I claim as new and desire to secure by Letters Patent is:

1. In a locomotive crane, the combination with a truck body, of a swing body pivotally connected therewith, and means for operating the swing body in relation to the truck body, comprising a gear rigidly connected to the truck body, a shaft journaled in the swing body and carrying a gear engaging the aforesaid gear on the truck body, a second shaft extending on the axis of the pivotal connection between the swing body and the truck body, a power shaft, a shaft carrying a plurality of cable drums operatively connected with said power shaft, a shaft operatively connected with said power shaft, and

a shiftable gear on the last said shaft adapted to engage in different positions of adjustment a gear on the aforesaid shaft on the pivotal axis of the swing body or a gear on the aforesaid shaft which carries the gear for operating the swing body in relation to the truck body gear.

2. In a locomotive crane, the combination with a truck body of a swing body pivotally connected therewith and means for operating the swing body in relation to the truck body comprising a gear rigidly connected to the truck body, a vertical shaft journaled in the swing body and carrying a spur gear engaging the aforesaid gear on the truck body, a vertical shaft extending on the axis of the pivotal connection between the swing body and the truck body, a horizontal power shaft, a second horizontal shaft carrying a plurality of cable drums operatively connected with the power shaft, a vertical shaft geared to rotate with the horizontal power shaft, and a shiftable gear on the last said vertical shaft adapted to engage in different positions of adjustment a gear on the aforesaid vertical shaft on the pivotal axis of the swing body, or a gear on the aforesaid vertical shaft carrying the gear for operating the swing body in relation to the truck body gear.

3. In a locomotive crane the combination with a truck body, of traction means for supporting said truck body, a swing body pivotally connected with the truck body, a horizontal power shaft carried by the said swing body, a vertical shaft geared to rotate with the power shaft, a second vertical shaft on the swing body operatively connected with the first said vertical shaft by gearing means under control of an operator for engaging and disengaging said gearing between said shafts, gearing operatively connected between the last said vertical shaft and the truck body for operating the swing body on its pivotal connection with the truck body, a cable drum shaft mounted on the swing body, gearing for operating said cable drum shaft from said power shaft, a plurality of cable drums operatively connected with said cable drum shaft, and means under the control of an operator for connecting said cable drums whereby they will be rotated by said cable drum shaft.

4. In a locomotive crane, the combination with a truck body, of traction means for supporting said truck body, a swing body pivotally connected with the truck body, a boom hoist pivotally connected with the swing body a power shaft, a vertical shaft geared to rotate with the power shaft, a pair of friction clutches interposed between said power shaft and said vertical shaft whereby to operate said vertical shaft in opposite directions, a second vertical shaft on the swing body operatively connected with the first said

vertical shaft, and gearing operatively connected between the last said vertical shaft and the truck body for operating the swing body on its pivotal connection with the truck body.

5 5. In a locomotive crane, the combination with a truck body, of traction means for supporting said truck body, a swing body pivotally connected with the truck body, a horizontal power shaft carried by the swing
10 body, a vertical shaft geared to rotate with the power shaft, a second vertical shaft on the swing body operatively connected with the first said vertical shaft, gearing operatively connected between the last said vertical
15 shaft and the truck body for operating the swing body on its pivotal connection with the truck body, a third vertical shaft mounted axially of the pivotal connection
20 between the swing body and the truck body, means interposed between the third said vertical shaft and the traction devices for operating the latter, and gearing interposed between the third said vertical shaft and the
25 first said vertical shaft which is geared with the power shaft whereby to operate the traction means.

6. In a locomotive crane, the combination with a truck body of traction means for supporting said truck body, a swing body pivotally connected with the truck body, a horizontal power shaft carried by the swing
30 body, means for imparting power to said power shaft, a vertical shaft geared to rotate with said shaft, means interposed between said power shaft and said vertical shaft for both releasing and reversing the gearing between
35 said shafts, a second vertical shaft on the swing body being operatively connected by gearing with the first said vertical shaft, gearing operatively connected between the second vertical shaft and the truck body for
40 operating the swing body on its pivotal connection with the truck body, a shaft journaled in the swing body frame, and being rotatably connected with the first said vertical shaft, a shaft journaled in the swing
45 body frame and carrying a plurality of cable drums thereon, and gearing for operating said shaft from the last said vertical shaft.

7. In a locomotive crane, the combination with a truck body of a swing body pivotally connected therewith, means for operating the
55 swing body in relation to the truck body comprising a vertical shaft operatively connected with the power source, a gear rigidly connected to the truck body, a second vertical shaft journaled in the swing body and carrying
60 a spur gear engaging the aforesaid gear on the truck body, a third vertical shaft extending on the axis of the pivotal connection between the swing body and the truck body, gearing by which the said second and third vertical shafts are driven from the
65 first said vertical shaft, a horizontal power

shaft, a second horizontal shaft carrying a plurality of cable drums operatively connected with the power shaft, and a third horizontal shaft carrying a cable drum, the last said shaft being operatively connected
70 with the power shaft.

8. In a locomotive crane, the combination with a truck body, of a swing body pivotally connected with the truck body, a horizontal power shaft carried by the swing
75 body, a vertical shaft geared to rotate with the power shaft, a second vertical shaft on the swing body, operatively connected with the said vertical shaft by means of a shiftable gear, and gearing operatively connected
80 between the last said vertical shaft and the truck body for operating the swing body on its pivotal connection with the truck body.

9. In a locomotive crane, the combination with a truck body, of a swing body pivotally connected with the truck body, a boom hoist pivotally connected with the swing
85 body, means for operating the boom hoist, a horizontal power shaft, a vertical shaft geared to rotate with the horizontal power shaft, a pair of friction clutches interposed between said power shaft and said vertical
90 shaft whereby to operate said vertical shaft in opposite directions, a second vertical shaft on the swing body operatively connected with the first said vertical shaft by means of a shiftable gear, and gearing operatively
95 connected between the last said vertical shaft and the truck body for operating the swing body on its pivotal connection with the truck body.

10. In a locomotive crane, the combination with a truck body having a gear ring secured thereto and carried thereby, said gear ring
105 being externally toothed, a swing body carried by the truck body and pivotally connected therewith concentrically of the said toothed gear ring, there being a track surface provided on the said toothed gear ring, anti-friction devices on the swing body for
110 cooperating with the track portion of the gear ring, a vertical shaft journaled in the frame of the swing body and having a spur gear adapted to engage the external toothed gear ring on the truck body, a power shaft,
115 a vertical shaft geared to the power shaft, and a shiftable gear on the last said vertical shaft adapted to drive the vertical shaft carrying the said spur gear engaging the gear ring for imparting a pivotal movement
120 to the swing body.

11. In a locomotive crane, the combination with a truck body having a gear ring secured thereto and carried thereby, said
125 gear ring being externally toothed and provided with a track surface, a swing body pivotally connected with the truck body and having anti-friction means carried thereby for engaging the track surface on the
130 gear ring, a vertical shaft journaled in

the swing body and having a spur gear secured thereto for engaging the gear ring, a second vertical shaft journaled in the swing body, gearing interposed between the said vertical shafts for imparting movement from the last said vertical shaft to the first said vertical shaft carrying the spur gear for engaging the ring gear whereby to impart a swinging movement to the swing body, the pivotal connection of the swing body with the truck body being secured by means of a vertical shaft journaled in both the swing body and in the truck body, the last said vertical shaft being provided with gears for engaging the second said vertical shaft and for imparting movement to the driving mechanism of the truck body, a power shaft, means comprising a pair of bevelled gears for imparting movement from the power shaft to the second said vertical shaft, a cable drum shaft carrying a plurality of cable drums, frictional devices for imparting movement from said cable drum shaft to said cable drums at and under the control of an operator, and gearing interposed between the power shaft and the cable drum shaft.

12. In a locomotive crane, the combination with a truck body of a gear ring secured thereto and carried thereby, said gear ring being provided with a peripherally toothed portion and a track portion on the upper surface thereof, a swing body pivotally connected with the truck body concentrically of said gear ring, a vertical shaft journaled in the swing body and carrying a spur gear for engaging the peripherally toothed portion of the gear ring, a second vertical shaft journaled in the swing body, a gear secured to the first said vertical shaft, a gear slidably mounted on the second said vertical shaft, but adapted to rotate therewith, a power shaft for operating the second said vertical shaft, a third vertical shaft for imparting movement to track devices on the truck body, a gear carried by the third said shaft, a cable drum shaft geared to rotate with the power shaft, frictional devices adapted to control the last said gear, and means for operating the said sliding gear on the second said vertical shaft

into engagement with the respective gears on the first and third said vertical shafts at the will of the operator, or to cause the said sliding gear on the second vertical shaft to be disengaged from the gears on both of the said first and third mentioned shafts.

13. In a locomotive crane, the combination with a truck body, of a swing body, means for imparting a swinging movement to the swing body in relation to the truck body, a horizontal power shaft, a vertical shaft journaled in the swing body adjacent the power shaft, a gear on the said vertical shaft, a pair of gears carried by the power shaft, each of said gears engaging synchronously with the gear on the vertical shaft, friction clutch devices interposed between each of said gears on the power shaft for controlling the movement of the latter in relation to the power shaft, and gearing operated by the said vertical shaft for controlling the swinging movement of the swing body in relation to the truck body and for operating traction devices controlling the truck body.

14. In a locomotive crane, the combination with a truck body, of a swing body pivotally connected therewith, and means for operating the swing body in relation to the truck body, comprising a gear on the truck body, a shaft journaled in the swing body and carrying a gear engaging the aforesaid gear on the truck body, a second shaft extending on the axis of the pivotal connection between the swing body and the truck body, a power shaft, a cable drum shaft operatively connected with said power shaft, a shaft operatively connected with said power shaft, and a shiftable gear on the last said shaft adapted to engage in different positions of adjustment a gear on the aforesaid shaft on the pivotal axis of the swing body or a gear on the aforesaid shaft which carries the gear for operating the swing body in relation to the truck body gear.

In testimony whereof I have signed my name to this specification on this 28th day of October, A. D. 1920.

EDMUND JOSEPH KANE.