

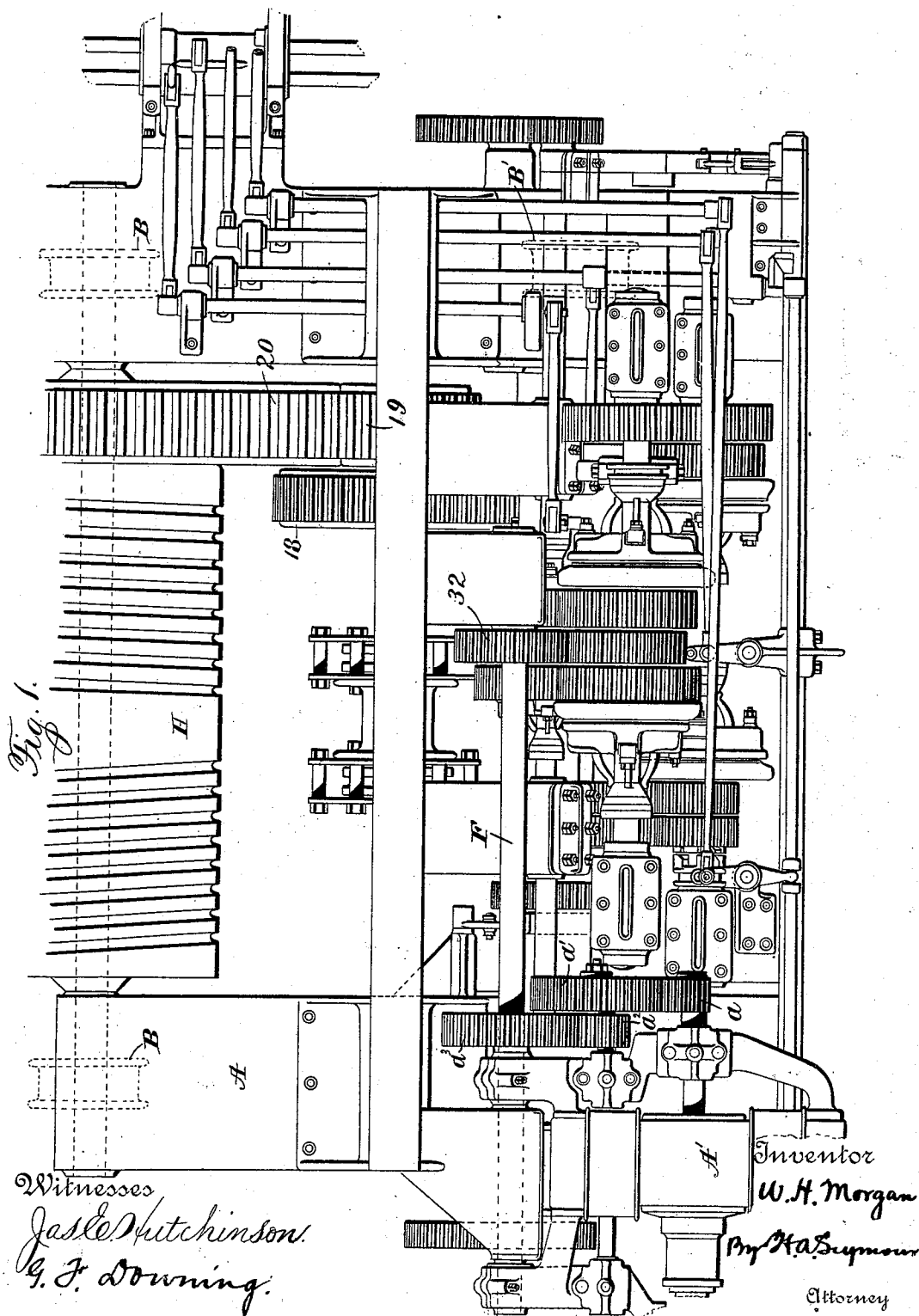
(No Model.)

4 Sheets—Sheet 1.

W. H. MORGAN.
OVERHEAD TRAVELING CRANE.

No. 510,041.

Patented Dec. 5, 1893.



(No Model.)

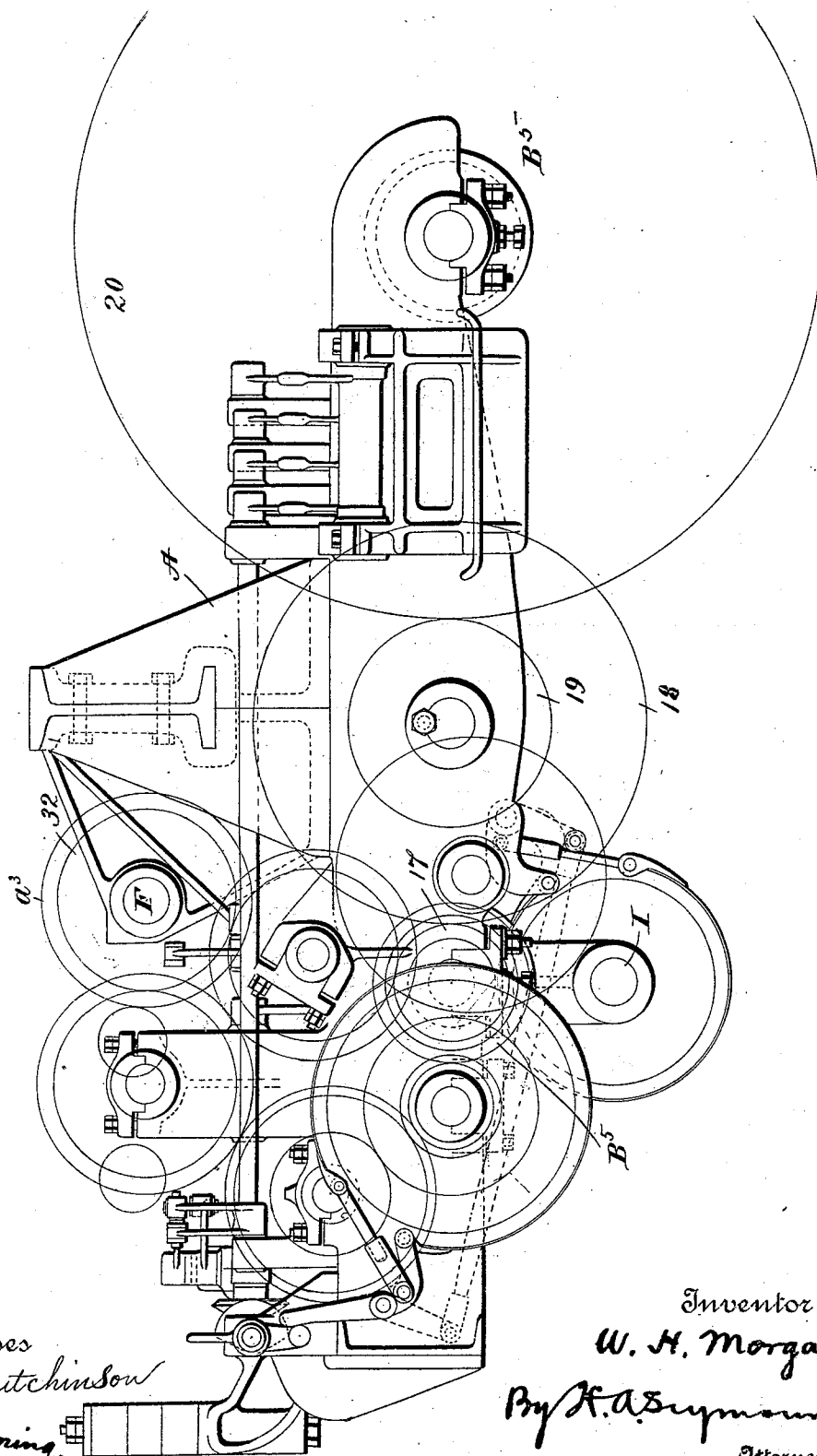
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Fig. 2.



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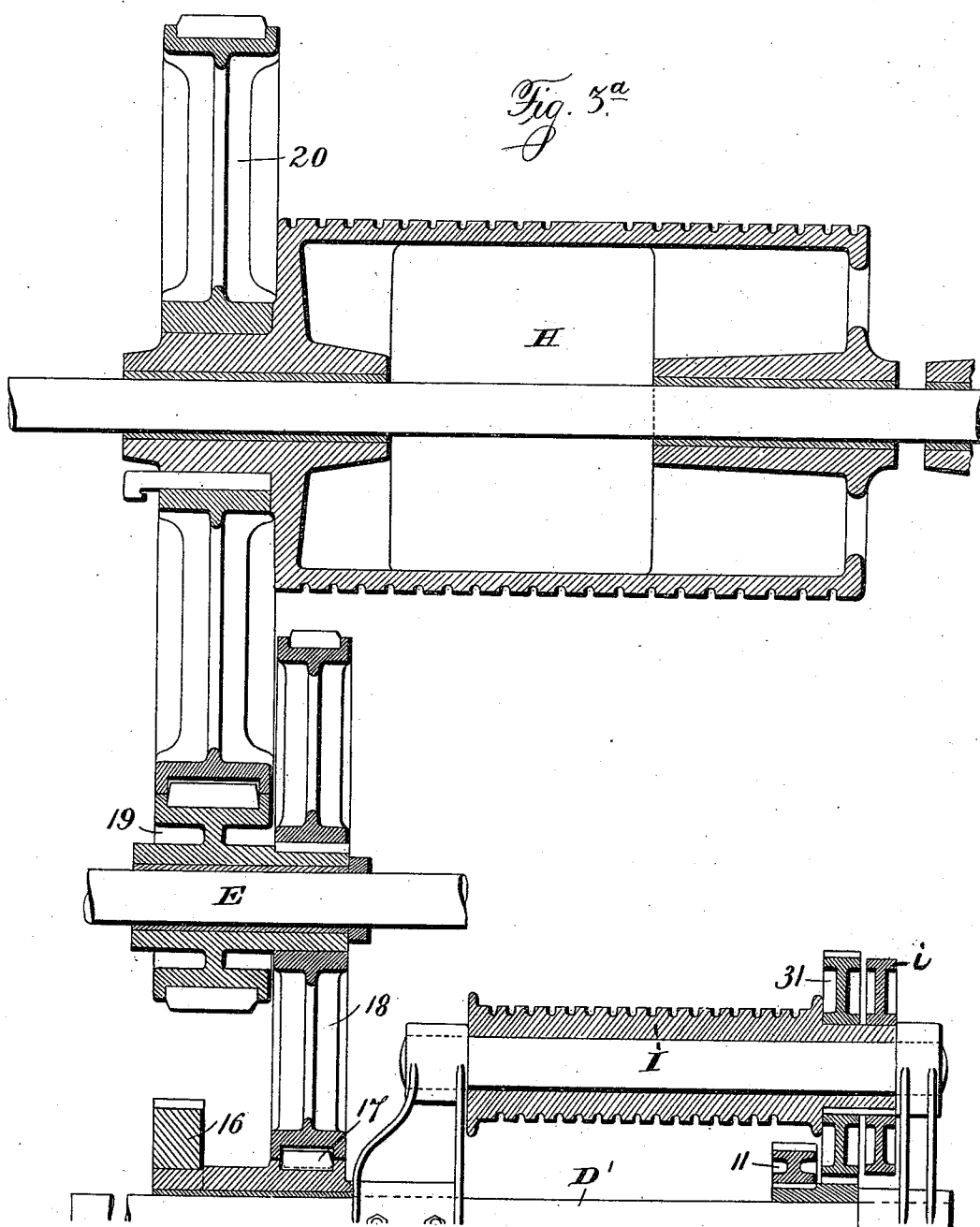
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UNITED STATES PATENT OFFICE.

WILLIAM HENRY MORGAN, OF ALLIANCE, OHIO, ASSIGNOR OF THREE-FOURTHS TO THOMAS R. MORGAN, SR., THOMAS R. MORGAN, JR., AND JOHN R. MORGAN, OF SAME PLACE.

OVERHEAD TRAVELING CRANE.

SPECIFICATION forming part of Letters Patent No. 510,041, dated December 5, 1893.

Application filed May 28, 1892. Serial No. 434,774. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY MORGAN, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Overhead Traveling Cranes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in overhead traveling cranes, and more particularly to the trolley employed in connection with such crane, the object being to provide means for actuating from a single source of power, gearing for imparting movement to the main hoisting drum, auxiliary drum, and cross travel of trolley.

A further object is to provide means for actuating simultaneously the gearing for imparting movement or cross travel to trolley and the gearing for actuating the main hoisting drum.

With these ends in view my invention consists in the parts and combinations of parts as will be more fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in plan of a trolley embodying my invention. Fig. 2 is a view in side elevation thereof, and Figs. 3 and 3^a are diagrammatic views of the parts of the trolley, Fig. 3^a being a continuation of Fig. 3.

In Figs. 1 and 2 the relative positions of the several parts are shown while in Fig. 3 the parts except the main driving shaft are shown in the same horizontal plane, so as to show up more clearly the connections between the several shafts.

The trolley shown in the several views consists essentially of a frame A mounted on wheels B⁵ and B' which latter are preferably flanged as shown in Fig. 1 for preventing lateral displacement of the trolley. These wheels run on trackways located lengthwise of the bridge, (not shown) and the latter is ordinarily mounted at its ends on trucks, which latter traverse tracks located lengthwise of the shop. A single electric motor (not shown) imparts movement to the bridge, and a single motor A' (see Fig. 1) moves the

trolley lengthwise of the bridge, and operates the drums through the mechanism to be now described.

The electric motor A' is mounted on the trolley frame preferably at one side thereof, and is provided on its armature shaft with a small toothed wheel *a* which latter imparts motion to the main driving shaft F through the toothed wheels *a'* *a*² and *a*³, (see Fig. 1) the wheels *a'* and *a*² being keyed or otherwise secured together, and the wheel *a*³ being fast on shaft F. This shaft F is located as shown in Fig. 1, and is provided with wheel 32 which latter meshes with the toothed wheels 2 and 21. (See Fig. 3).

The wheels 2 and 21 impart movement to the shafts A² and G through the intervention of friction clutches on each shaft. Located on shaft G are the clutches G' G², each of which is composed of two parts *g* and *g'*, the parts *g* of each clutch being rigidly secured to the shaft, while the parts *g'* of each are loose thereon and only rotate with the shaft when locked to the sections.

The construction of the clutches forms no part of my present invention, and it is sufficient to say that the loose part *g'* of each clutch carries a toothed wheel 22, and 23, and that both clutches G' and G² cannot be locked to their wheels at the same time, as the cones *g*³ are coupled up by means of a feather or yoke. Thus it will be seen that both cones are moved simultaneously in the same direction; hence when one clutch, say G², locks its wheel 23 to shaft G the wheel 22 of the other clutch is loose, and when wheel 22 is locked wheel 23 is loose. The spur wheel 21 is not mounted directly on the shaft G, but as clearly shown in Fig. 3 is keyed to the hub of wheel 23, and hence when wheel 23 is locked to shaft G motion can be imparted to shaft G through wheels 21, 23 and clutch G², and from said shaft G through wheels 24 and 27, short shafts H⁵, and wheels 30 on shafts H⁵ and wheel 31 on the axle D carrying the driving track wheels B⁵. By this arrangement of parts I secure movement of the trolley in one direction, and to secure a reversal of travel of trolley I transmit motion to shaft G through the intervention of the clutches and toothed wheels on shaft A². The clutches G³ and G⁴

are identical in construction with clutches G' and G^2 and the wheel 2 which corresponds in position and location to wheel 21 is keyed to clutch G^4 .

5 The operation of the parts for actuating the travel of the trolley back and forth on the bridge is as follows: The cones g^3 are moved to the right to lock wheel 23 to shaft G. As the wheel 21 meshes with wheel 32 motion
10 is imparted directly to shaft G through wheel 23 and clutch G^2 , and from said shaft to the track wheels by the gearing heretofore described. In order to reverse the direction of movement of shaft G, the cones g^3 should be
15 shifted to the left so as to lock clutch G' and release clutch G^2 . Wheel 32 is also in engagement with wheel 2, which latter is keyed to clutch G^4 mounted on shaft A^2 . This clutch G^4 also carries the toothed wheel 1
20 which latter meshes with wheel 22 on shaft G. These two wheels 2 and 1 are also keyed together and hence motion can be transmitted through them to wheel 22 without clutching them to shaft A^2 .

25 From the foregoing it will be seen that by transmitting motion to shaft G, through wheels 32 21 and clutch G^2 the shaft G is caused to revolve in one direction, and by transmitting motion through wheels 32, 2, 1,
30 22 and clutch G' the shaft G is revolved in the opposite direction.

Motion is transmitted to the main hoisting drum H, (the position of which is shown in Figs. 1 and 3) by the main driving shaft F. This shaft, as before stated, carries a toothed
35 wheel 32 meshing with toothed wheel 2 on shaft A^2 and toothed wheel 21 on shaft G. By clutching or locking wheels 1 and 2 to shaft A^2 (which by the way can be done while the trolley is traveling) motion will be transmitted
40 through them from wheel 32 directly to shaft A^2 and from the shaft A^2 to toothed wheel 4, which latter meshes with wheel 5 on shaft B, thus revolving shaft B in one direction. To
45 change the direction of rotation of shaft B it is simply necessary to release clutch G^4 and lock clutch G^3 to the shaft. The cones g^4 for actuating these clutches are also coupled together so as to move in unison. Hence when clutch
50 G^3 is locked clutch G^4 is released. Spur wheel 3 on shaft A^2 is keyed to the hub of clutch G^3 , also on said shaft, and it receives motion from wheel 32 through wheels 21 and 23, and consequently rotates loose part of clutch G^3
55 in a direction opposite to the direction of rotation imparted to loose part of clutch through wheels 32, 2 and 1.

60 Motion is transmitted to the drum H through shaft B, the direction of movement, however, of the drum being governed by the clutches on shaft A^2 and toothed wheels on shafts G and A^2 .

65 Shaft B, carries the speed clutches for the main hoisting drum for changing the speed of rotation independently of the direction of rotation.

Toothed wheel 5 is fixed on shaft B, and as

before stated rotates the shaft B in one direction or the other, the direction of rotation being dependent on the clutches G^3 and G^4 . 70

Mounted on shaft B is the clutch G^5 , one section g^5 being keyed thereto and the other section g^6 being loose and carrying the toothed wheel 6. This wheel 6 meshes with a small wheel 14 on shaft C, and hence drives said
75 shaft C, at one speed, while the toothed wheel 7 carried by the loose section g^8 of clutch g^7 , and meshing with toothed wheel 9 carried by shaft C, operates to drive said shaft at a slower rate of speed. Both clutches are actuated by a double cone g^{10} , and are so placed
80 relative to the cone that but one clutch can be locked at a time.

Shaft C is provided with a brake wheel g^{11} , against which a brake strap or band can be employed for sustaining the load, and it is also provided with a toothed wheel 15 meshing with toothed wheel 16—fast to the hub of the smaller wheel 17. This smaller wheel is
85 loosely mounted on shaft D' , and meshes with the larger wheel 18 fast on the hub of wheel 19 loosely mounted on shaft E. This wheel 19 engages the large wheel 20 keyed to drum H and actuates the latter.

90 From the foregoing it will be seen that the trolley is moved back and forth, and the main drum H actuated by the shaft F, which, when the crane is in use, or rather when the trolley or parts thereon are in motion, revolves in one direction, the direction of movement
95 of the trolley being governed by the clutches G' and G^2 , the direction of rotation of the drum H being governed by the clutches G^3 and G^4 , and the speed of the drum by the clutches on shaft B. It will also be seen that the drum H can be rotated in either direction while the trolley is traveling in either
100 direction and that the speed of the drum can be changed either while the trolley is in motion or at rest.

105 I is an auxiliary drum designed for lifting light weights and as shown is arranged to run at one speed only. This drum I is actuated from shaft B by toothed wheel 8, loosely mounted on said shaft. This wheel can be
110 locked to the shaft B by the positive clutch γ which is of ordinary construction, and when so locked imparts motion to wheel 33 rigidly secured to the hub of the smaller wheel 10, the latter being loosely mounted on shaft C. This toothed wheel 10, engages wheel 11—
115 rigidly secured to the hub of the smaller wheel 12 loosely mounted on shaft D' . This wheel 12 meshes with wheel 13—fast on the drum I and actuates the same. The drum I also carries the brake wheel i against which a brake band or shoe is applied for sustaining the load.

120 When the double cone g^{10} is in position shown in Fig. 3, neither clutch is locked to the shaft, and hence the drum H which is actuated through the medium of the clutches, is at rest. Shaft B revolves however and imparts movement through the positive clutch
125

y to the train of gears which actuates the auxiliary drum, thus permitting the latter to be rotated while the main drum is rotating.

From the foregoing it will be seen that by a single motor actuating shaft F, I secure the cross travel of the trolley, and actuate the main and auxiliary hoisting drums, and by the interposition of the clutches am enabled to reverse the movements of the trolley and main hoisting drum and change the speed of the main drum.

It is evident that many slight changes and alteration of the relative parts of my invention might be resorted to without departing from the spirit and scope of my invention. Hence I would have it understood that I do not confine myself to the exact construction and arrangement of parts herein shown; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an overhead traveling crane, the combination with a trolley, a main hoisting drum, an auxiliary drum, and a main driving shaft, of gearing actuated by said main driving shaft for propelling the trolley and rotating the main and auxiliary drums, and clutches intermediate the main driving shaft and the drums and driving wheels of the trolley, whereby either drum or the trolley can be actuated independently of the other parts, substantially as set forth.

2. In an overhead traveling crane, the combination with a trolley and a main driving shaft thereon, of gearing actuated by said main driving shaft for propelling the trolley, a main hoisting drum, gearing driven by said main driving shaft for rotating said drum, an auxiliary drum and gearing actuated by said main driving shaft for rotating said auxiliary drum, and clutches interposed between the main driving shaft and the parts actuated thereby whereby any one of the said parts can be actuated independently of others substantially as set forth.

3. In an overhead traveling crane, the combination with a trolley frame, and a main driving shaft thereon, of gearing driven by said main shaft for propelling the trolley, a main hoisting drum actuated by said main driving shaft clutches, one member of each comprising a loose pinion and interposed between the main driving shaft and parts to be actuated for reversing the direction of movement of said parts.

4. In an overhead traveling crane the combination with a main driving shaft and two driven shafts each having a wheel loose thereon the latter meshing with a wheel on the main shaft, of clutches for locking the loose wheels to the shafts, track wheels, a drum, and gearing actuated by said loose wheels for propelling the trolley and rotating the drum, substantially as set forth.

5. In an overhead traveling crane, the com-

bination, with a trolley, a motor thereon, a main drum, an auxiliary drum, and a main shaft actuated by said motor, of gearing between the main shaft and main and auxiliary drums and also between the driving wheels of the trolley and main shaft and clutches whereby any one of the movable parts actuated by the motor can be actuated independently of the other parts, substantially as set forth.

6. In an overhead traveling crane, the combination with a trolley and a drum, of a single motor, gearing whereby said parts can be moved together or either actuated while the other is at rest, and speed clutches for changing the speed of the hoisting drum, substantially as set forth.

7. In an overhead traveling crane the combination with a trolley and a drum, of a main driving shaft, a toothed wheel thereon two driven shafts each carrying loose wheels and clutches, one of the wheels on each of said driven shafts meshing with the wheel on the main driving shaft, the other wheels on the one driven shaft meshing with the corresponding wheels on the other shaft, and gearing connecting the two driven shafts with the trolley propelling wheels and drum, substantially as set forth.

8. In an overhead traveling crane the combination with a trolley and drum, of a single motor, gearing for actuating said parts singly or together, clutches for changing the direction of movement of either or both of said parts and speed clutches for changing the speed of rotation of the drum.

9. In an overhead traveling crane, the combination with a trolley and a main hoisting drum, of a driving shaft having a toothed wheel thereon, two driven shafts each carrying two clutches two toothed wheels carried by one of the clutches on each shaft, one of said wheels on each clutch engaging the wheel on the driving shaft and the other engaging a wheel carried by a clutch on the opposite shaft, and gearing connecting said driven shafts with the track wheels of the trolley and with the drum, substantially as set forth.

10. In an overhead traveling crane, the combination with a trolley, a driving shaft, and a drum, of reversing gearing located between the driving shaft and trolley propelling wheels, and between the driving shaft and drum, and speed changing devices located between the reversing gear and drum, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM HENRY MORGAN.

Witnesses:

JOHN H. LLOYD,
H. W. HARRIS.