No. 612,413.

J. W. GUERNSEY.

Patented Oct. 18, 1898.

CRANE.

(Application filed Sept. 3, 1897.)

(No Model.)

4 Sheets—Sheet 1.

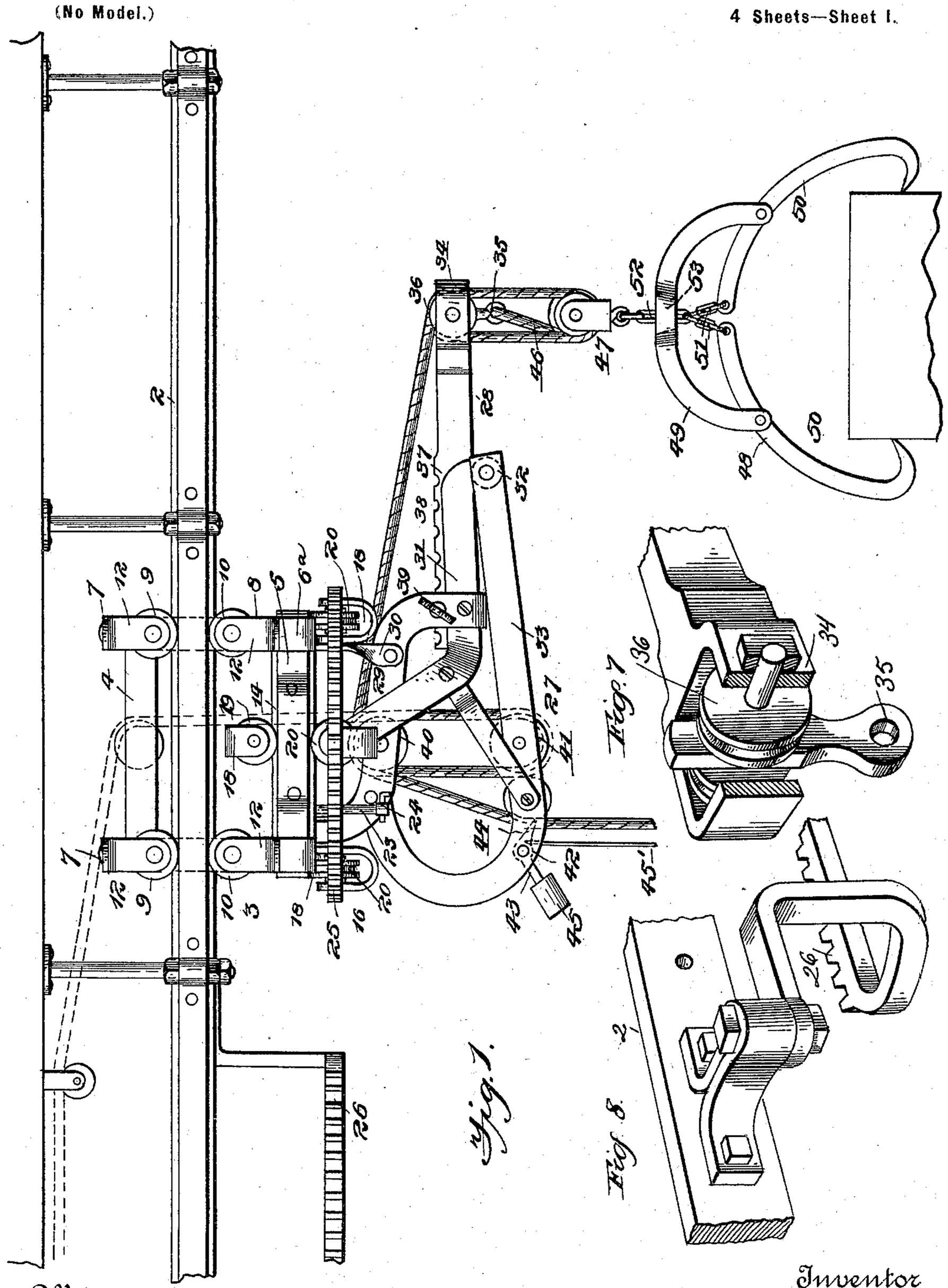


Fig. 1.

Fig. 8.

Witnesses
C. E. Hunt.
Victor J. Evans

Inventor
James W. Guernsey,
by John Wedderburn.
Attorney

No. 612,413. Patented Oct. 18, 1898.

J. W. GUERNSEY.

CRANE.

(Application filed Sept. 3, 1897.)

(No Model.) 4 Sheets—Sheet 2.

Fig. 2.

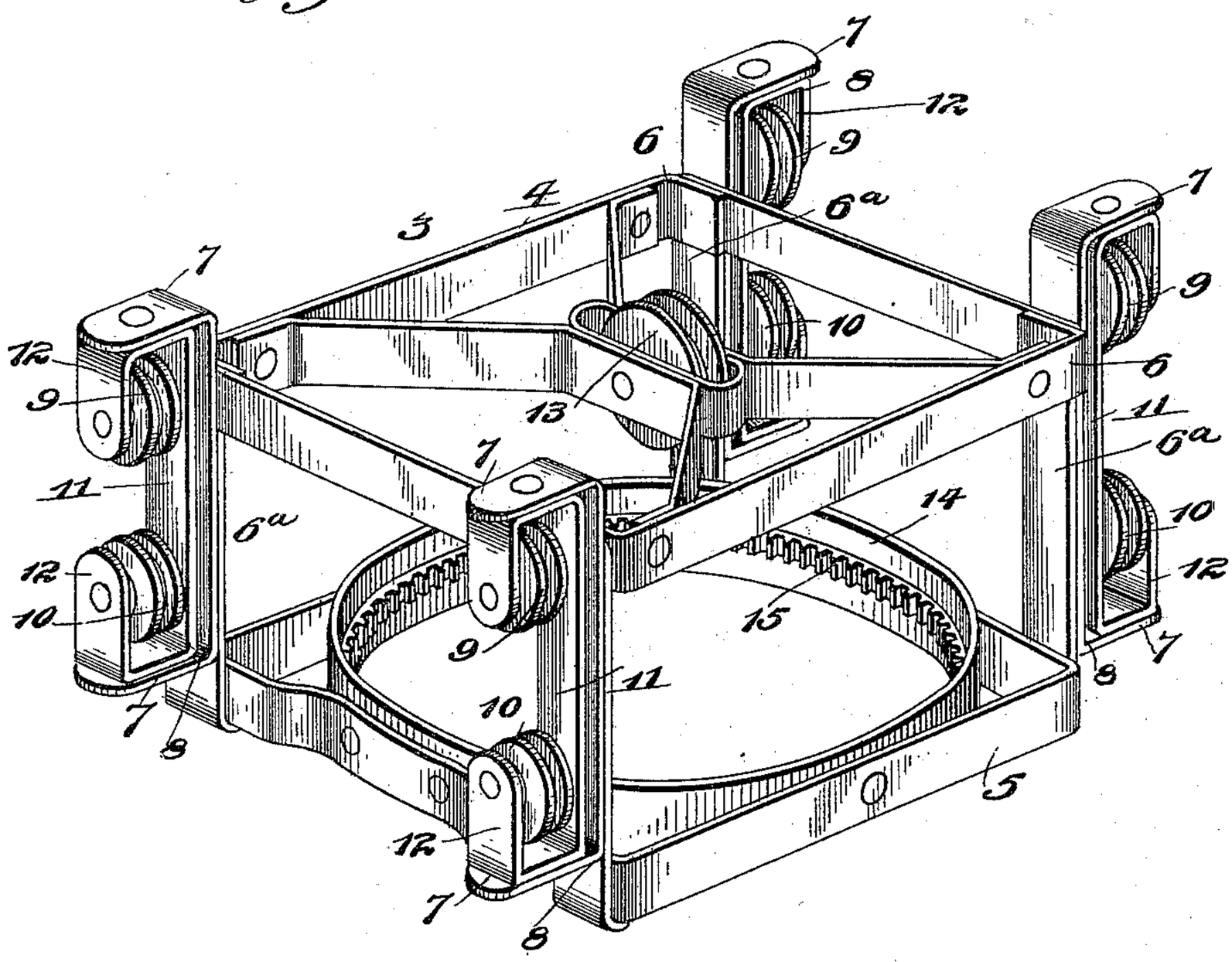
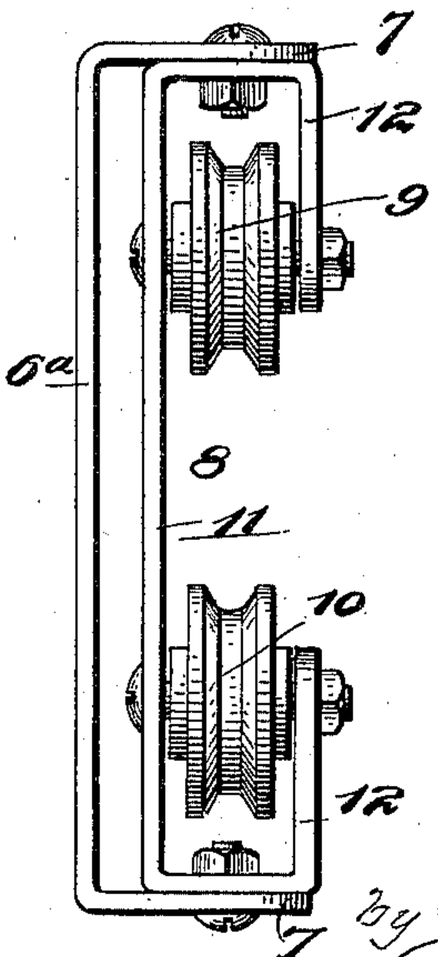


Fig. 5.



Witnesses
C. E. Hunt.
Victor J. Evans

Inventor
James W. Guernsey,
by John Wedderburn.
Attorney

No. 612,413. Patented Oct. 18, 1898.

J. W. GUERNSEY.

CRANE.

(Application filed Sept. 3, 1897.)

(No Model.)

4 Sheets—Sheet 3.

Fig. 3.

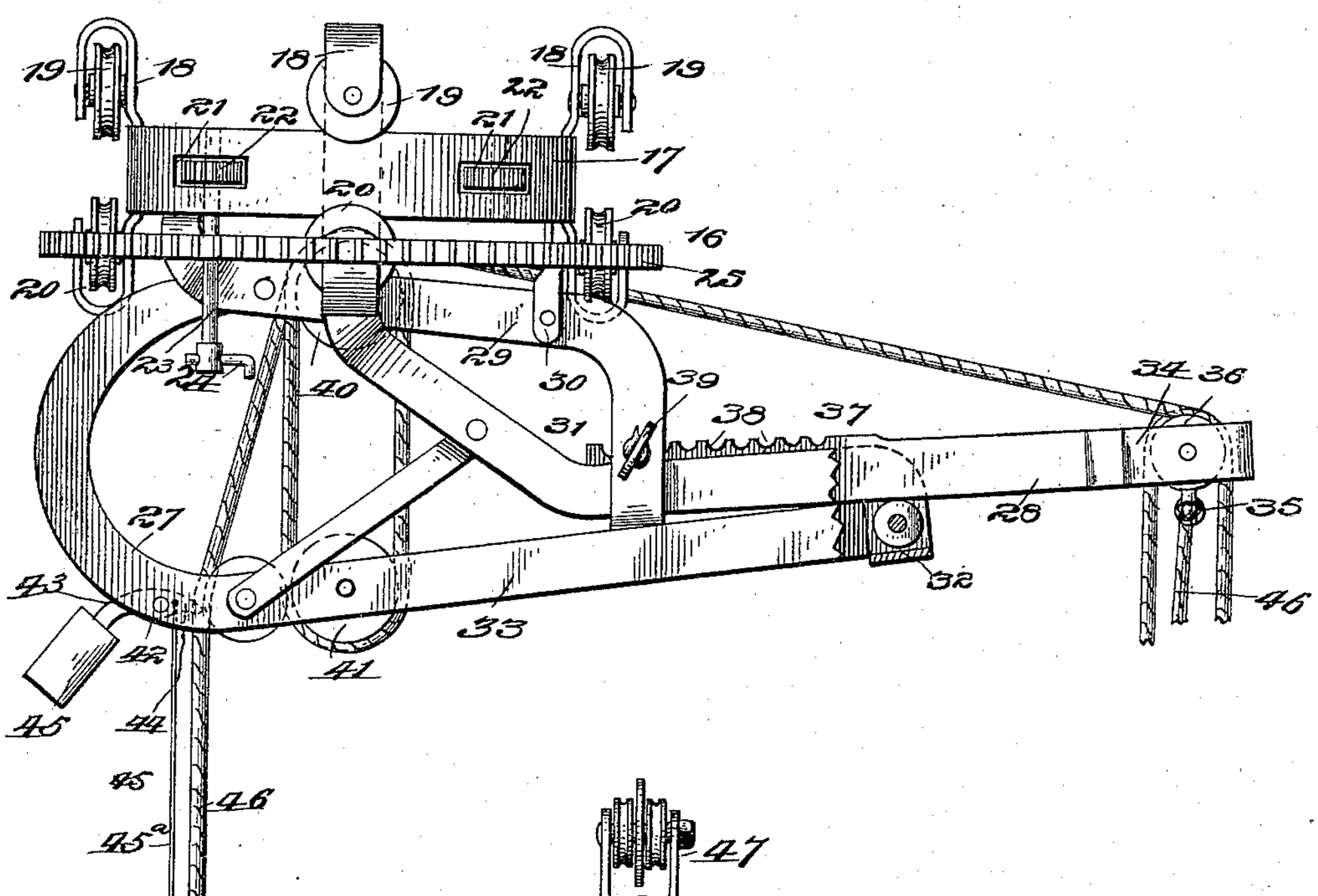
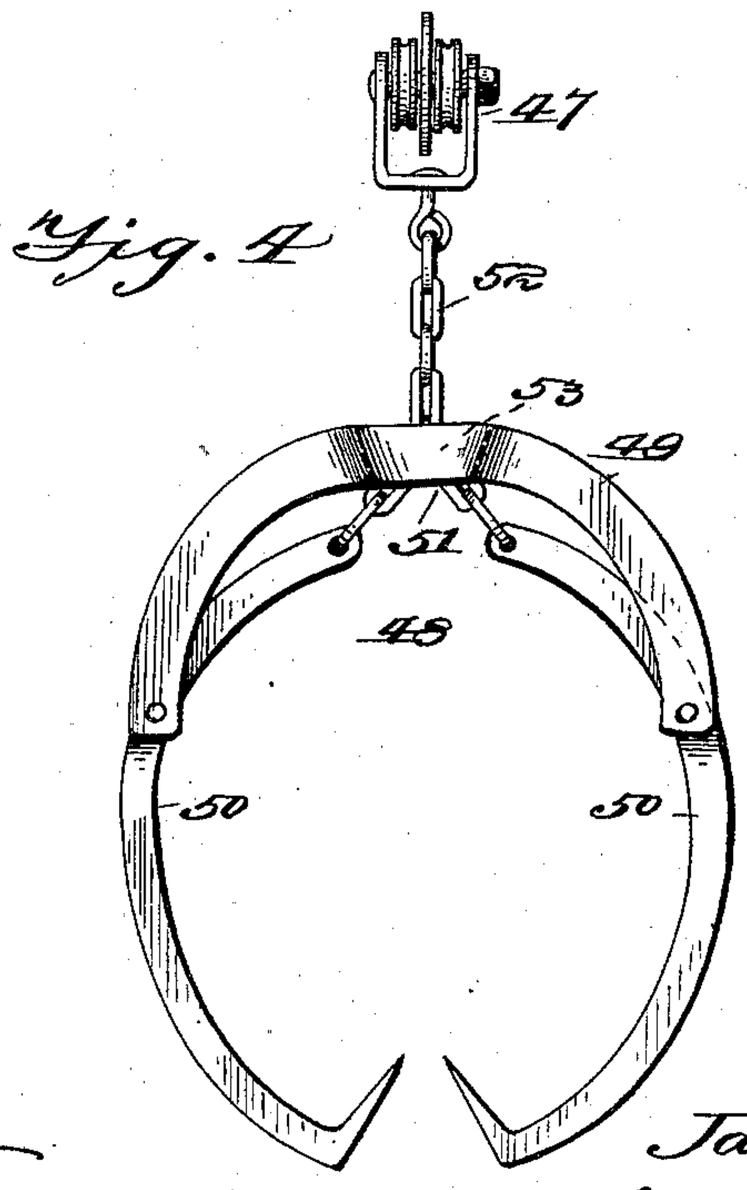


Fig. 4.



Witnesses
C. E. Hunt,
Victor J. Evans

Inventor
James W. Guernsey.
by John Wedderburn
Attorney

No. 612,413.

J. W. GUERNSEY.

Patented Oct. 18, 1898.

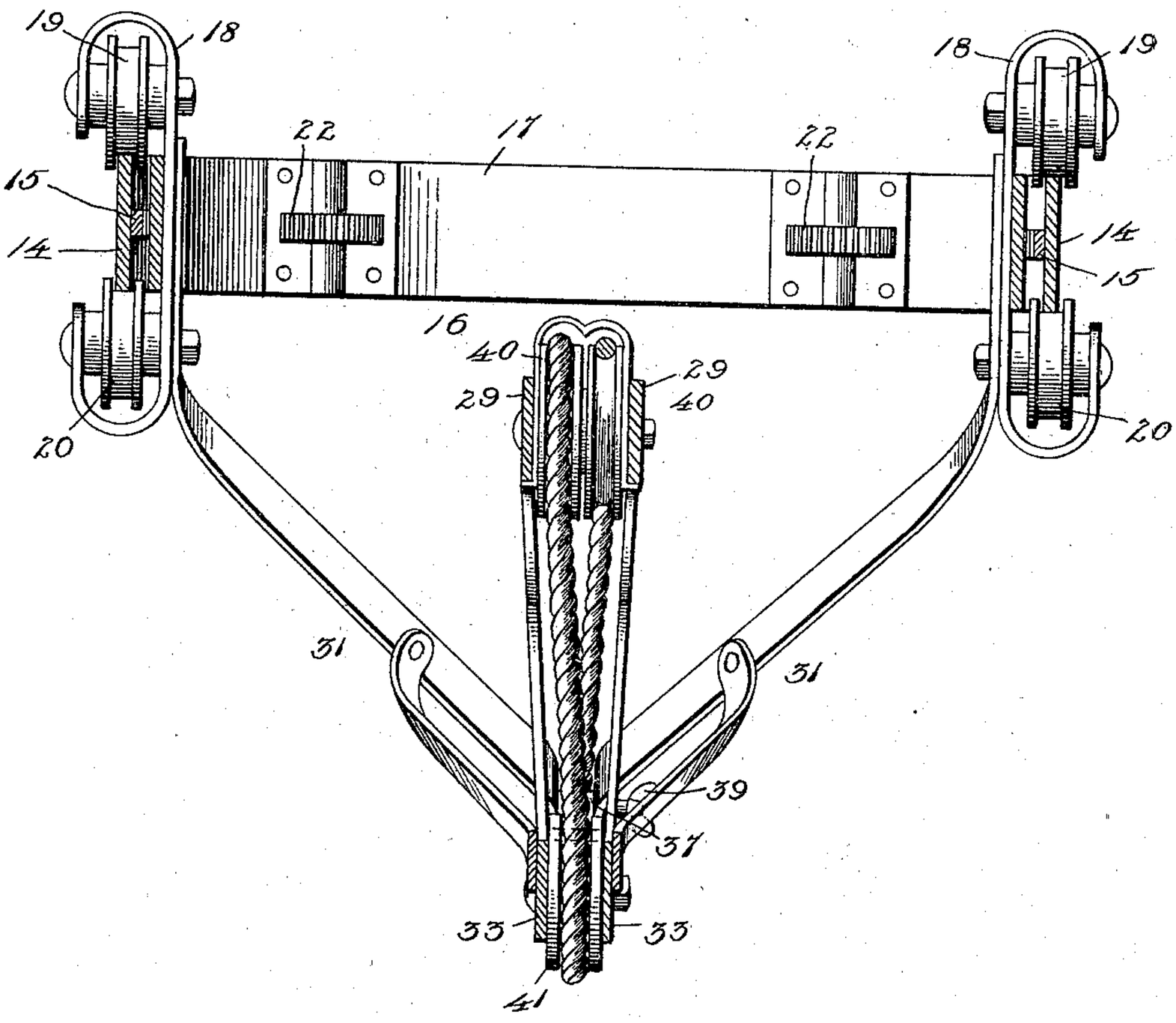
CRANE.

(Application filed Sept. 3, 1897.)

(No Model.)

4 Sheets—Sheet 4.

Fig. 6.



Witnesses
T. L. Mocatabee
H. L. Amer.

Inventor
James W. Guernsey,
by V. S. Lockbridge
his Attorney

UNITED STATES PATENT OFFICE.

JAMES W. GUERNSEY, OF LIBERTY, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO Z. ELLIS KIMBLE, OF SAME PLACE.

CRANE.

SPECIFICATION forming part of Letters Patent No. 612,413, dated October 18, 1898.

Application filed September 3, 1897. Serial No. 650,470. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. GUERNSEY, a citizen of the United States, residing at Liberty, in the county of Tioga and State of Pennsylvania, have invented certain new and useful Improvements in 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.

This invention has reference to a novel construction in a crane and grapple therefor, the object being to provide a simple, inexpensive, and effectual device of this character.

The invention consists of features of construction hereinafter described, and specifically claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of the crane and grapple complete. Fig. 2 is a perspective view of the carriage in detail. Fig. 3 is a side elevation, partially in vertical section, of the hoisting-arm and support therefor. Fig. 4 is a side elevation of the grapple. Fig. 5 is a detached view of the bracket carrying the supporting and guide wheels. Figs. 6, 7, and 8 are views in perspective of details.

Referring now to said drawings, 1 indicates the ceiling or stationary support, from which are hung the rails 2, forming a track. It is understood, of course, that these rails can be curved or straight, as found most convenient, according to the particular place or building where the crane is employed. Mounted upon said track is a carriage 3, comprising a suitably-braced frame 4 and a lower frame 5. These frames are connected at the corners 6 by uprights 6^a, having at their upper and lower ends outwardly-extending fingers 7, between which are situated the brackets 8, that are pivotally connected thereto and which are provided at their upper ends with the supporting-wheels 9 to rest upon the rails 2 and near their lower end with the guide-wheel 10 to receive the lower edge of the rail 2 for the purpose of keeping the carriage always upon the track. The said brackets 8 comprise upright rear pieces 11, with downwardly and upwardly projecting fingers 12 on the outer side, between which and the upright rear pieces the wheels 9 and 10 are mounted. These swiveled brackets 8 permit the wheels to adjust themselves to the curvature of the track. The upper frame 4 is provided at about its center with a pulley 13, while the lower frame is provided interiorly with a circular rail 14. On the inner face of this circular rail 14 is a toothed rack 15, extending entirely around the same. The hoisting-arm and support therefor is indicated as a whole by 16 and is provided at its upper end with a circular frame 17, smaller than the circular track 16 and situated within the same. This circular frame 17 is provided at intervals with a plurality of brackets 18, that extend above and below the same and which are provided at their upper ends with supporting-wheels 19 and at their lower ends with guide-wheels 20. It is understood, of course, that the supporting and guide wheels of the carriage as well as of this frame 17 have double flanges to receive the edges of the track. The said circular frame is also provided with a plurality of slots 21, situated opposite the toothed rack 15 of the circular rail, and mounted upon the circular frame 17 and extending through the slot are rotatable gear-pinions 22, that intermesh with said toothed rack. One of the gear-pinions is provided with a depending shaft 23 and crank 24, by means of which it can be turned, while the other gear-pinion serves to center the circular frame within said circular rail. It is seen that by rotating said pinion that is provided with the shaft and a crank the hoisting-arm and support 16 can be turned to any desired position when the crane is at rest, so that the end of the hoisting-arm can be moved to whatever point it is desired to receive or deliver goods or for other purposes. Mounted upon the support 16 is also an outwardly-facing circular toothed rack 25, that extends entirely around the support and below the lower end of the carriage 3 and is adapted to intermesh with a stationary toothed rack 26, situated in the path thereof and preferably secured to one of the rails 2 of the track. This stationary rack can be situated in any desired position, or there can be a plurality thereof, and they serve to move

the end of the hoisting-arm to any point where it is desired to deliver or receive goods automatically by reason of the movement of the carriage and hoisting-arm upon the track. The said stationary racks 26 are adjustably secured in position, preferably by means of set-bolts, as shown, whereby they can be moved so as to cause the hoisting-arm of the crane to swing at any desired point. For instance, in use there is a particular delivery or receiving station in a building, warehouse, or yard, to which point it is always desired to throw the hoisting-arm as the carriage approaches, and it will be seen that by placing one of these stationary racks at such point the hoisting-arms will be moved to either side in an obvious manner.

The crane or swinging arm proper comprises three pairs of bars—namely, the upper bars 29, that are fastened at their upper ends to the circular frame 17 and extend forwardly and downwardly and are connected at their lower ends and are secured by means of straps or hangers 30 to the opposite side of said circular frame 17, intermediate bars 31, secured at their upper ends to two of the brackets 18, extending downwardly and inwardly and then forwardly between the upper bars 29 and provided at their outer ends with an antifriction-roller 32, and lower bars 33, which are secured at their upper ends to the upper end portion of the upper bars 29 and then are curved rearwardly, downwardly, and forwardly and extend forward and are connected with the forward ends of the intermediate bars, preferably by the pivot of the antifriction-rollers 32. The adjustable end portion 28 of the hoisting-arm is provided with a loop-head 34, having an eye 35 and two pulleys 36. The stem 37 of said adjustable end portion 28 is provided with notches 38 in its upper edge, and said stem is situated between the forwardly-extending portions of the intermediate bars 31 and rests upon the antifriction-roller 32. The rear end of said adjustable end portion 28 is held in place by a removable pin 39, that passes through the lower end portion of the upper bar 29 and is so situated that it passes also through the notches 38 of the stem 37. Said pin is provided at one end with a wing, and the openings through the lower end of the upper bars are in the form of key-slots, whereby said pin is effectually held in place.

Mounted between the upper bars 29 and near the rear ends of the same are two pulleys 40, and below said pulleys and mounted between the lower bars 33 are two pulleys 41, the upper pulleys being arranged side by side, while the lower pulleys are arranged close to each other, but with different axes. Just in the rear of the rear pulley 41 is a clutch 42, comprising a lever 43, having a clutch-jaw 44 at one end and a weight 45 at its outer end. The said clutch-jaw is normally held in contact with said rear pulley 41 by means of said weight, while a cord 45^a is connected with the clutch-jaw, so that the latter may be moved downwardly and away from the pulley 41. The operating-cable 46 is connected at one end with an eye 35 at the end of the adjustable end portion of the arm 28 and passes around the pulleys of the block 47 and the pulleys 36 of the arm. It then passes rearwardly over one of the pulleys 40 downwardly and around one of the pulleys 41, then upwardly and around the other pulley 40, and then downwardly and between the other pulley 41 and the clutch 42.

The grapple 48 comprises a supporting-bar 49, having downwardly-extending ends, to which are pivoted two jaws 50. The upper ends of these jaws are connected with the branched lower end portion 51 of a supporting-cable 52, that extends forwardly and through an eye 53 in the supporting-bar 49 and is connected with the block 47. The manner in which said grapple operates is obvious from the drawings, it being noted that said grapple is capable of handling large and small packages with the same facility and certainty.

From the foregoing description it is seen that I provide a crane that is of simple construction and consequently inexpensive, and, furthermore, one in which the hoisting-arm is easily controlled. The cable 46 is easily operated to lift the packages held by the grapple and when released is held in position by the clutch 42, but which is easily released by pulling upon the cord 45^a. The carriage of the crane is removed by hand or by power, and a gearing between the support for the hoisting-arm and the carriage or the supporting-track is such that said hoisting-arm is readily moved to any desired position.

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

1. The combination with a track, of a carriage mounted to run thereon, a rotatable supporting-frame mounted upon said carriage, a circular upwardly-extending toothed rack carried by said supporting-frame, and a stationary toothed rack situated in the path of said track upon said supporting-frame.

2. The combination with the track, of a carriage mounted to run thereon, a rotatable supporting-frame mounted upon said carriage and provided with an upwardly-extending circular toothed rack, and a stationary toothed rack adjustably secured to said track and situated in the path of said circular toothed rack of said supporting-frame.

3. The combination with a track, of a carriage provided at its sides with swiveled brackets, supporting-wheels carried by said tracks and resting upon said track, and a hoisting-arm and supporting-frame mounted upon said carriage.

4. The combination with a track, of a carriage provided at its sides with swiveled brack-

ets, flanged wheels mounted at the upper and lower ends of said swiveled brackets and adapted to receive between them the rails of said bracket, and a supporting-frame and hoisting-arm mounted upon said carriage.

5. The combination with the track of a carriage, uprights at the sides of said carriage provided with outwardly-extending fingers, brackets swiveled between said outwardly-extending fingers, flanged wheels at the upper and lower ends of said swiveled brackets and adapted to receive between them the rails of said bracket and a supporting-frame and hoisting-arm mounted upon said carriage.

6. The combination with a carriage provided with a circular rail, of a supporting-frame provided with a circular frame at its upper end that is situated within said circular rail, brackets carried by said circular frame and provided at their upper and lower ends with flanged wheels that receive between them said circular rail, and an arm carried by said supporting-frame.

7. The combination with a carriage having a circular rail, of a supporting-frame provided at its upper end with a circular frame, brackets extending above and below said circular frame and provided with flanged wheels situated above and below and which receive between them the said circular rails, and an arm carried by said supporting-frame.

8. The combination with a carriage provided with a circular rail having a circular toothed rack on the inner face of said rail, of a supporting-frame rotatably mounted upon said circular rail, a plurality of gear-pinions mounted upon said supporting-frame and intermeshing with said circular rack, and means for rotating one of said gear-pinions.

9. The combination with a carriage, of a supporting-frame rotatably mounted thereon, and an arm carried by said supporting-frame and comprising a bifurcated body portion, and an adjustable end portion situated between the sides of said bifurcated portion.

10. The combination with a carriage, a rotatable supporting-frame mounted thereon, an arm secured to said supporting-frame and comprising a bifurcated body portion having an antifriction-roller at its outer end and a removable pin situated inwardly thereof, and an adjustable outer end portion having notches in its upper edge and adapted to lie between the bifurcated sides of the body portion resting upon said antifriction-roller with the pin passing through one of said notches.

11. An arm having a loop-head provided with a pivoted eye and with pulleys, two pulleys near the upper side of said arm, two pulleys near the lower side of said arm, an operating-cable trained around said pulleys, a clutch comprising a lever pivoted to said body portion and having a clutch-jaw resting against one of the lower pulleys and a weighted outer end, and a cord connected with said clutch-jaw.

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

JAMES W. GUERNSEY.

Witnesses:
J. O. MILLER,
J. J. WERLINE.