June 29, 1926. 1,590,990

C. E. FULLER

GANTRY CRANE

Filed July 8, 1924 2 Sheets-Sheet 1

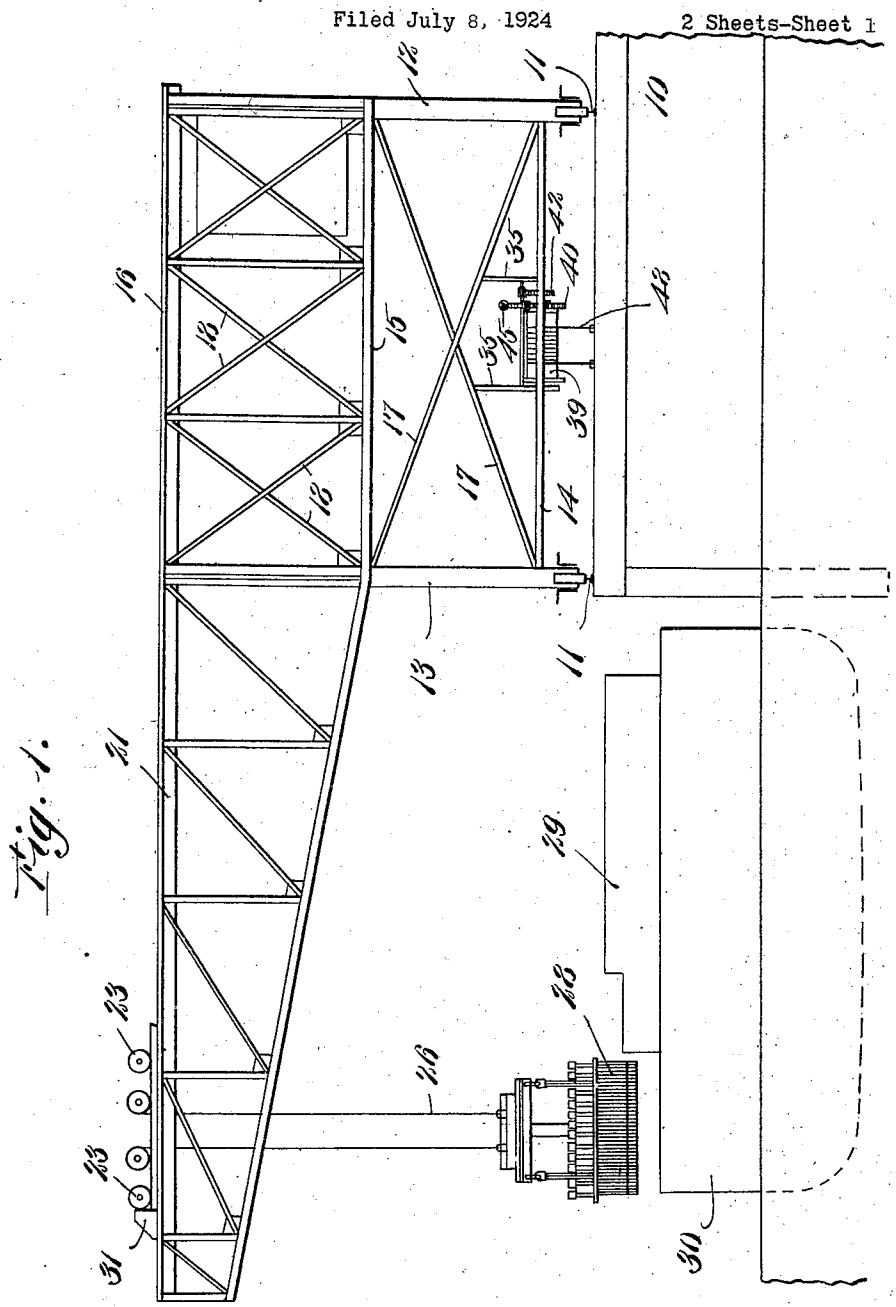


Fig. 1.

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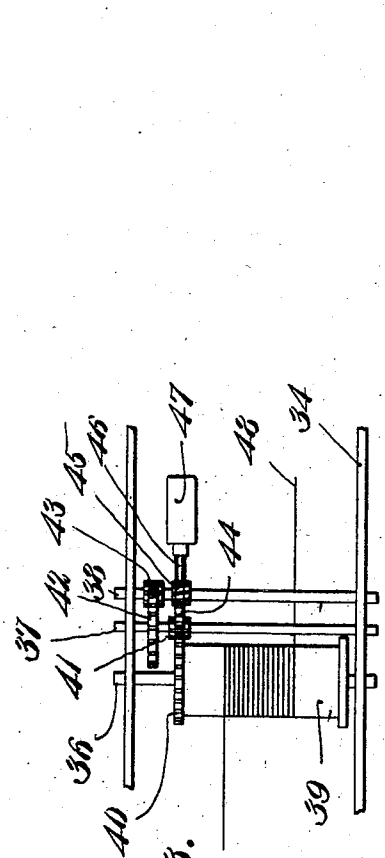


Fig. 3.

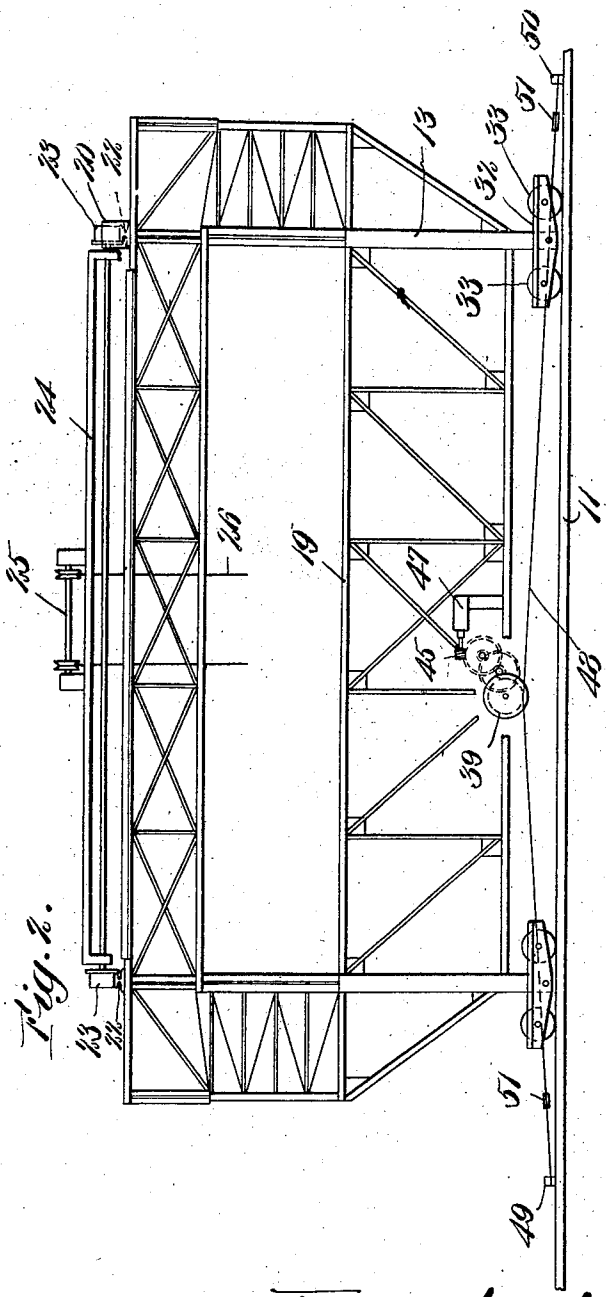


Fig. 2.

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UNITED STATES PATENT OFFICE.

CLAUD E. FULLER, OF NEW YORK, N. Y., ASSIGNOR TO NEW YORK BRICK HANDLING CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

GANTRY CRANE.

Application filed July 8, 1924. Serial No. 724,782.

My present invention relates to cranes, and more particularly to an improved driving mechanism for cranes of the gantry type.

In gantry cranes as present constructed, the complicated mechanism consisting of a great many gears with considerable shafting is used in order to get power to the wheels on which the crane is supported for the purpose of moving such crane along the tracks with which it is associated. This method of construction renders the cost of a crane of this type so high as to preclude its use in situations to which it is admirably adapted. One of such situations is in connection with the unloading of bricks from barges where the character of the material is such as to prohibit, from a mechanical standpoint, the installation of expensive machinery. I have, therefore, in my present invention, devised an improved form of driving mechanism for gantry cranes and in which such driving mechanism no connection whatever is made to the wheels supporting the crane. I so construct my device as to have the crane driven in either direction from a single drum on which is secured and wound a plurality of ropes or cables, such ropes or cables being anchored at one end of the track and the other cable being anchored at the other end of the track. By rotating such crane through a worm gear operated by an electric motor, the rotating of the drum is prevented except by means of the motor and the cables extending to either end of the track act as brakes or locking devices for the gantry, which is thus locked in position against wind pressure or any other outside cause.

The object of my invention, therefore, is an improved propelling mechanism for gantry cranes and the like.

In the accompanying drawings illustrating a preferred embodiment of my invention,

Fig. 1 is an end elevation;

Fig. 2 is a front elevation, and

Fig. 3 is a fragmentary detail plan view of the driving mechanism.

Referring to the drawings, 10 designates a dock or wharf on the top of which are arranged tracks 11 running parallel to, and spaced apart from, each other any suitable or desired distance. The tracks 11 are of any convenient or desired length, as is usual. Numerals 12 and 13 designate uprights spaced apart from each other and held in such position by cross braces 14, 15, and 16 and strengthened by the usual braces 17—18. Two such frame structures as have just been described are utilized, and extending between the frame structures on each side thereof are bridge girders 19 and a bridge 20, the entire structure thus far described constituting a bridge for the crane. Formed integral with the bridge and extending laterally outward therefrom is a jib member 21, formed in the usual manner. The jib frame members have secured to the top sides thereof and parallel with each other rails 22, which rails also extend across the bridge member 16. Mounted to run on the rails 22 are wheels 23 supporting a frame 24 on which is mounted a hoisting device 25, and at the lower end of the cables 26 of such crane member is a device 27 for lifting a unit stack of brick 28 from the load of bricks 29 on the barge 30 lying along side of, and secured, to, the wharf 10. The crane mechanism 25 is operated in the usual manner, and as the construction of such operating mechanism forms no part of the present invention, it has not been illustrated and will not be further described. On the outward end of each of the jib members 21 is secured a block 31, but one of which is shown, in order to prevent overrun of the carriage 24.

Each of the uprights 12 and 13 at each end of the bridge 16 has secured thereto a frame 32 in each of which frames is rotatably mounted a plurality of flanged wheels 33 which run on the rails 11. From the above it will be obvious that the structure is capable of moving along the rails 11 so as to bring the hoisting mechanism 25 into any position relative to the load of bricks 29 on the barge 30. In order to move the structure along the rails 11, I provide a platform of framework 34 secured to, or suspended from, the cross braces 17 in any suitable manner, as by brace 35, such frame structure lying practically central with respect to the uprights 12 and 13. In the framework is rotatably mounted a plurality of parallelly arranged shafts 36, 37, and 38. On the shaft 36 is secured a drum 39 provided at one end with a gear 40 which meshes with, and is driven by, a pinion 41 secured to the shaft 37. Also secured to the shaft 37 is a gear 42 which meshes with, and is driven

by, a pinion 43 secured to the shaft 38. Also secured to the shaft 38 is a worm wheel 44 which meshes with, and is driven by, a worm 45 secured to, or formed integral with, the shaft 46 of an electric motor 47. The gearing 40–46 inclusive forms a reduction gear between the motor 47 and the drum 39 and the worm and worm wheel 45 and 44 respectively form a brake or locking device which prevents the motor 47 from being driven from the gear 40 should there be a tendency on the part of the gear 40 to rotate because of the momentum of the crane structure due to wind pressure thereon or from other causes.

Wound around the drum 39 and occupying but a portion of the length of such drum is a cable 48, one end of which is anchored at 49 at one end of the tracks 11 and the other end is anchored at 50 to the other end of such tracks 11. It is obvious from the above and from an inspection of the drawings that, if the gear 40 is rotated so as to rotate the drum 39 in any direction, the rotation of such drum will pay off one end of the cable 48 and wind on the other end of such cable. Near each end of the rope at the anchoring points 49 and 50 are turnbuckles 51 and by means of which slack in the rope or cable 48 may be taken up.

It is obvious now that, if the drum 39 is rotated in either direction, a certain amount of one end of the cable 48 is wound up on the drum 39 and an equal amount of the other end is unwound. Should the rope or cable stretch, the turnbuckles 51 will take up all slack therein.

The operation of my improved device is as follows. The gantry crane constructed as above described and mounted for movement over the tracks 11 is controlled in such movement by an operator who operates the motor 47 in the usual manner. The power circuit and control apparatus for such motor is not shown as such form of connection and control is well known in the art. By properly operating the motor 47, the drum 39 is rotated through the train of gearing 40–46 inclusive to wind up one end of the cable 48 on one end of the drum and unwind an equal amount of cable on the other end of the drum, causing the gantry crane structure to be moved longitudinally of the tracks 11. Because of the reduction gearing 40–46 and the worm and worm wheel 45 and 44 respectively, the device for moving the crane along the tracks acts as a brace or brake to prevent accidental movement of the crane.

Having thus described my invention, what I claim as new is:

In combination with a gantry crane, comprising a bridge, wheel mounting for said bridge, tracks on which the wheels are placed for longitudinal movement thereon, a cable, anchoring means for said cable whereby the cable is anchored, one end at each end of the track, a drum rotatably mounted on the bridge and independent of the wheel mounting, a driving motor, a reduction gearing interposed between the motor and the drum, said drum having the intermediate portion of the cable wound thereon and whereby rotation of the drum in either direction will cause a winding up of one end of the cable thereon and a simultaneous paying off of an equal length of the other end of the cable therefrom, said reduction gearing, drum, and cable acting as a braking device to prevent accidental longitudinal movement of the bridge on the rails.

In testimony whereof, I have signed my name to this specification.

CLAUD E. FULLER.