July 9, 1929. R. W. CRIST 1,719,967

TRAVELING GANTRY

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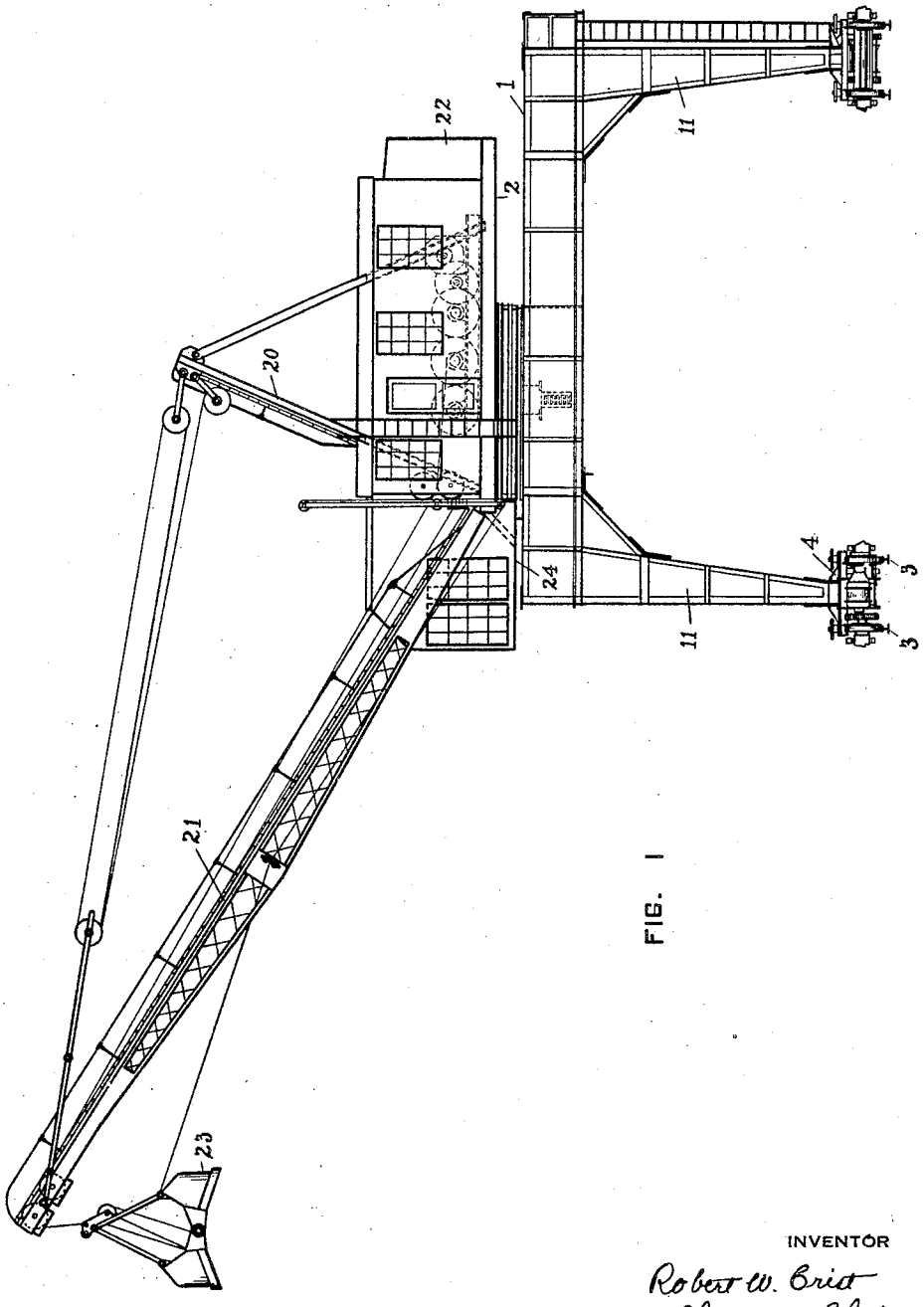


FIG. 1

INVENTOR

Robert W. Crist

by Christy and Christy

his attorneys

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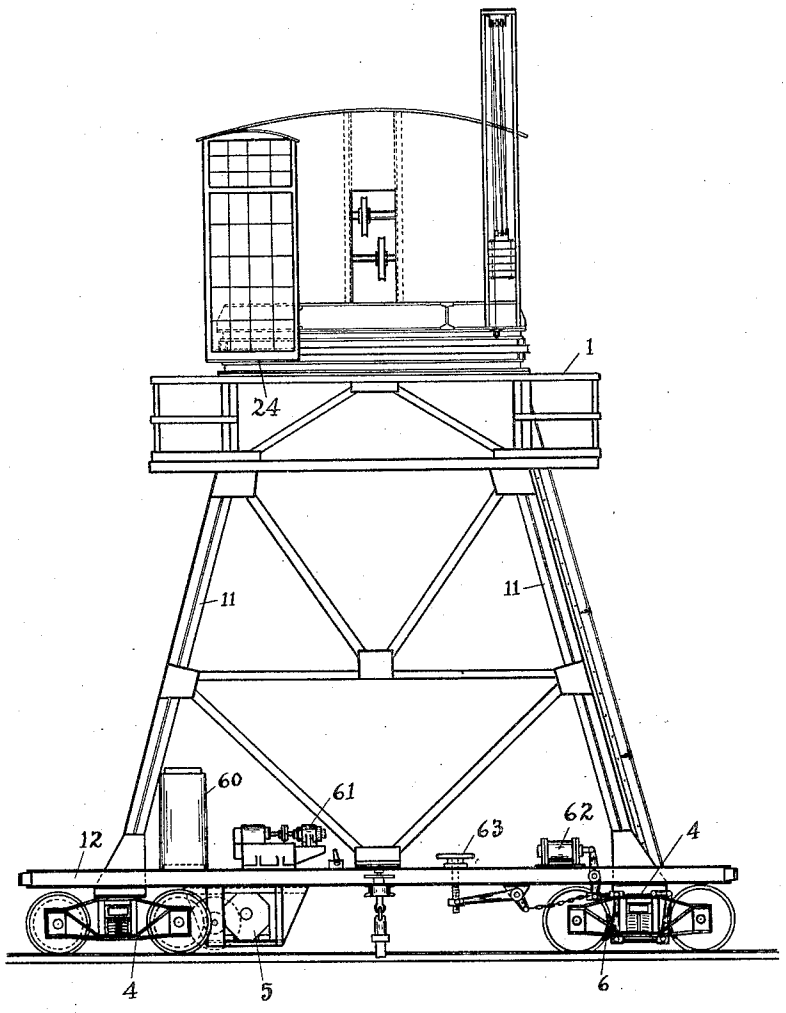


FIG. 2

INVENTOR

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Patented July 9, 1929. 1,719,967

UNITED STATES PATENT OFFICE.

ROBERT W. CRIST, OF CORAOPOLIS, PENNSYLVANIA, ASSIGNOR TO DRAVO CONTRACTING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

TRAVELING GANTRY.

Application filed October 22, 1927. Serial No. 227,956.

My invention relates to traveling gantrys for cranes, and consists in an arrangement of driving mechanism peculiarly suited to the conditions of service, efficient, capable of long continued service with minimum of repair; so arranged as to be out of the way and protected from injury; and so applied as to effect the driving and stopping of the gantry with minimum strain upon the structure.

In the accompanying drawings Fig. 1 is a view in front elevation of a traveling gantry upon which a crane is borne and which in its structure embodies my invention. Fig. 2 is a view of the same structure in side elevation. From the showing of Fig. 2, however, the crane arm is omitted.

The gantry includes a rectangular platform 1 raised upon four rectangularly grouped legs 11. The platform bears a crane rotatably mounted upon it, and the crane includes a platform 2 on which is erected a tower 20 and to which the boom 21 is hinged. On the opposite end of the platform 2 a counterweight 22 for the boom is provided. The platform carries the drum or drums for cables, and motor or motors for rotating the crane platform upon the gantry platform and for operating the drums. In this instance a clam-shell bucket 23 is shown, hung from boom 21. The platform 2 carries a pulpit 24 for the operator.

The intended direction of travel of the gantry whether upon straightaway or curved tracks, is in the direction of the length of the structure, in the direction of the line of view, Fig. 1. The legs 11 are aligned in pairs in that direction.

As best seen in Fig. 1, I provide a pair of rails 3, 3 for each aligned pair of gantry legs. I run four trucks 4 upon the two pairs of rails, one truck for each leg, and I mount the gantry upon such four trucks. Each truck runs on four wheels.

I provide driving means for two at least of the four trucks, and the two trucks which at least are so provided are a diagonally opposite pair. I employ electric motors, one for each driven truck, and it will be understood that motors so assembled may be controlled by a switch device in the pulpit, that the motors may be simultaneous in operation. By so applying driving power to two diagonally opposite trucks, not only is the propelling force applied (and withdrawn) simultaneously, to and from the gantry along its two lines of support, but also the driving force is centered beneath the load.

The preferred arrangement of the motors with respect to the trucks is that shown in the drawings. The pair of legs 11 of the gantry on each side are braced, and this bracing includes horizontal members 12 extending longitudinally and connecting the pair of legs 11 at their lower ends. Upon the horizontal members 12, and on their under sides, and adjacent the inner pairs of wheels of trucks 4, I mount the motors 5, with their shafts parallel to the axles of the trucks. The adjacent truck axle is geared by spur gears to each motor shaft. The gear wheels are formed with wide faces, the teeth are coarse, and engagement between the gear wheels is loose. Such an arrangement of the motor with spur-gear connection to the truck axle is superior to the usual arrangement of the motor at a higher level and with bevel-gear connection, both because it allows some play of the truck axle, relatively to the shaft of the motor which drives it, and because end thrust which inheres in beveled gearing is avoided. The play of truck axle relatively to motor shaft which the conditions of service here contemplated impose, may be vertical in direction, due, for instance, to roughness of track; or it may be horizontal, and brought about, for instance, when the gantry rounds a curve in the track. As I have said, my arrangement of parts makes provision for and accommodation to these conditions of service. And, in addition to that, the motors, firmly and securely carried, are so situated as to offer no obstruction of the space above the horizontal members 12, and the trucks themselves are accessible from the ends, and the motors so placed are protected from accidental blows and injury.

I provide brakes for the traveling gantry, and preferably air brakes. And, having equipped two diagonally opposite trucks with motors, I find it convenient to apply brakes to the other two trucks of the set. It is of course entirely practicable to also equip with brakes the wheels of the same truck which has been equipped with a drive motor. In Fig. 2 the same horizontally extending member 12 is in diagrammatic manner shown to carry on its upper side component parts of an air brake equipment,—an air reservoir 60, with which

an air compressor 61 is associated, and a brake cylinder 62. The brake cylinder is shown in operative organization with the brake shoes 6 which bear on the wheels of the truck. It will be understood that from the pulpit of the crane a valve may be shifted, which single valve shall control the alternate communication from the air reservoir to the two brake cylinders (one associated with each of two diagonally opposite trucks or one associated with each pair of trucks at one end of the crane as the case may be) simultaneously, and from such two cylinders simultaneously to the atmosphere. The shifting of the valve will ordinarily be effected by the well-known means of a solenoid, and the energizing of the solenoid will be directly effected from the pulpit.

At 63 a hand brake equipment also is indicated, for operating the brakes of one or two trucks. Such supplementary hand brakes may be provided for emergency service, or for application during long periods at a time,—at night, for instance.

Fig. 2 shows the motor 5 associated with the truck on the left, and brake shoes 6 associated with the wheels of the truck on the right. It will be understood that in line with these two trucks and behind them are two other trucks which with these make up the set of four, and that of those other two trucks, the one to the left is equipped with brake apparatus, and the one to the right with a drive motor.

I claim as my invention:

1. A traveling gantry having a plurality of legs, and including in its structure a horizontally extending beam, connecting two of the gantry legs at their lower ends, a corresponding plurality of trucks upon each of which one leg of the gantry bears, a motor rigidly mounted upon the under side of the said beam, and spur gear connection between said motor and the axle of one of the trucks.

2. A traveling gantry borne upon four trucks arranged in rectangular grouping, two pairs of tracks adapted to carry each a pair of said trucks, two motors rigidly borne by the gantry structure arranged in the intervals between the trucks of the two pairs, each of said motors connected by spur gearing to an axle of one of two trucks diagonally placed in the grouping.

3. The structure of claim 2, together with brake mechanism operative on the wheels of the other two trucks of the group.

In testimony whereof I have hereunto set my hand.

ROBERT W. CRIST.