April 25, 1933. A. G. A. SCHMIDT 1,906,109

CRANE

Filed June 10, 1931 2 Sheets-Sheet 1

Fig. 1

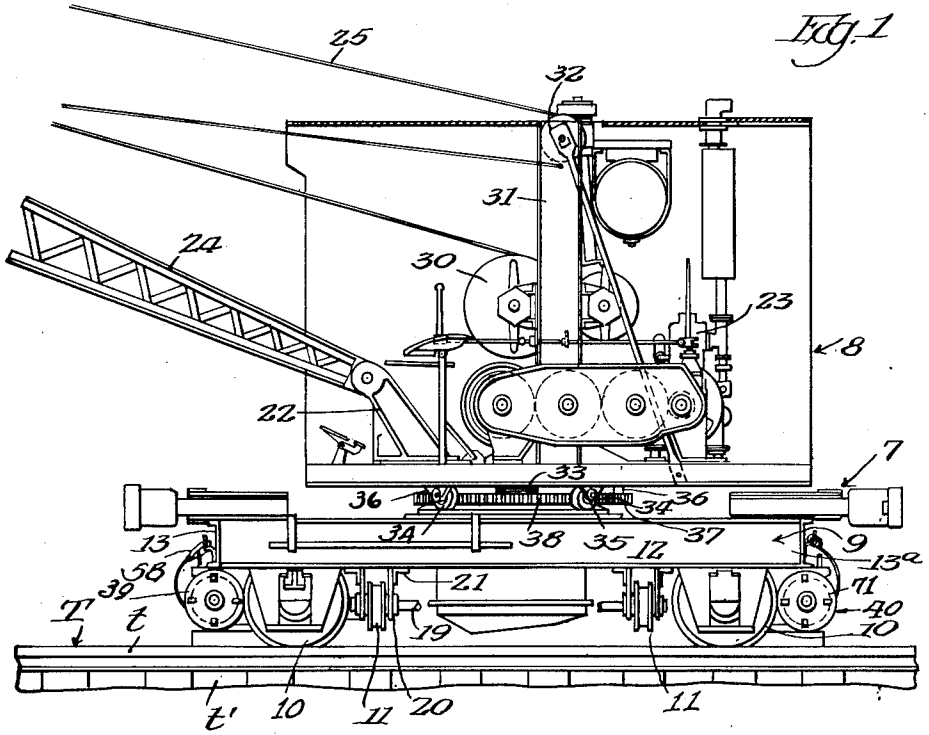


Fig. 2

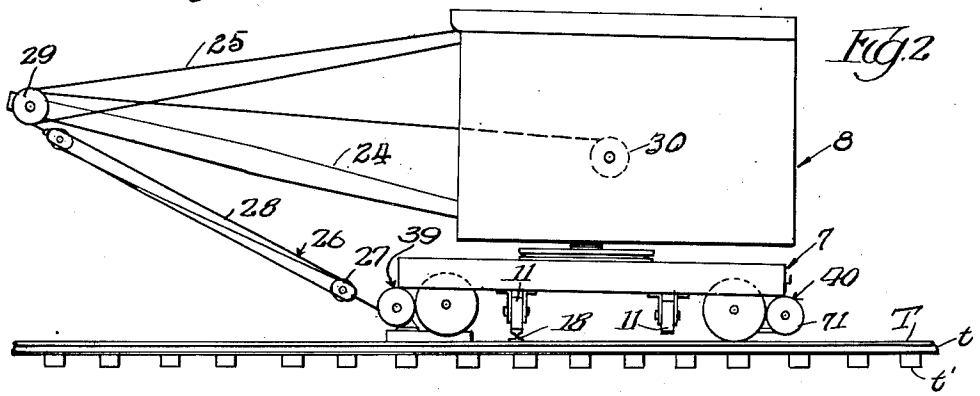
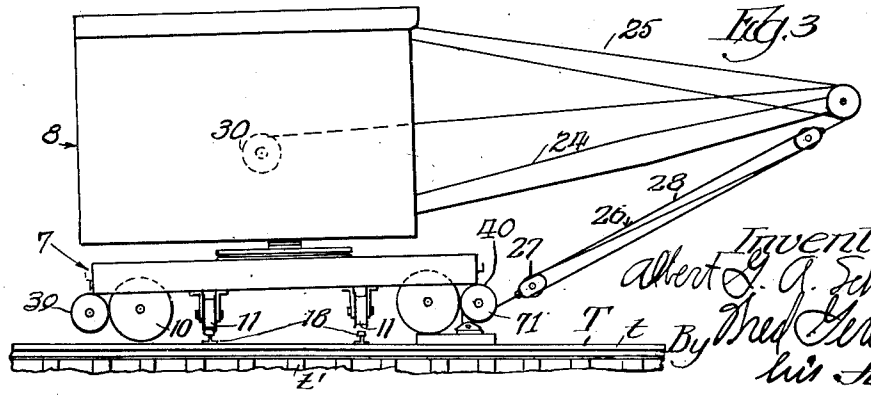


Fig. 3



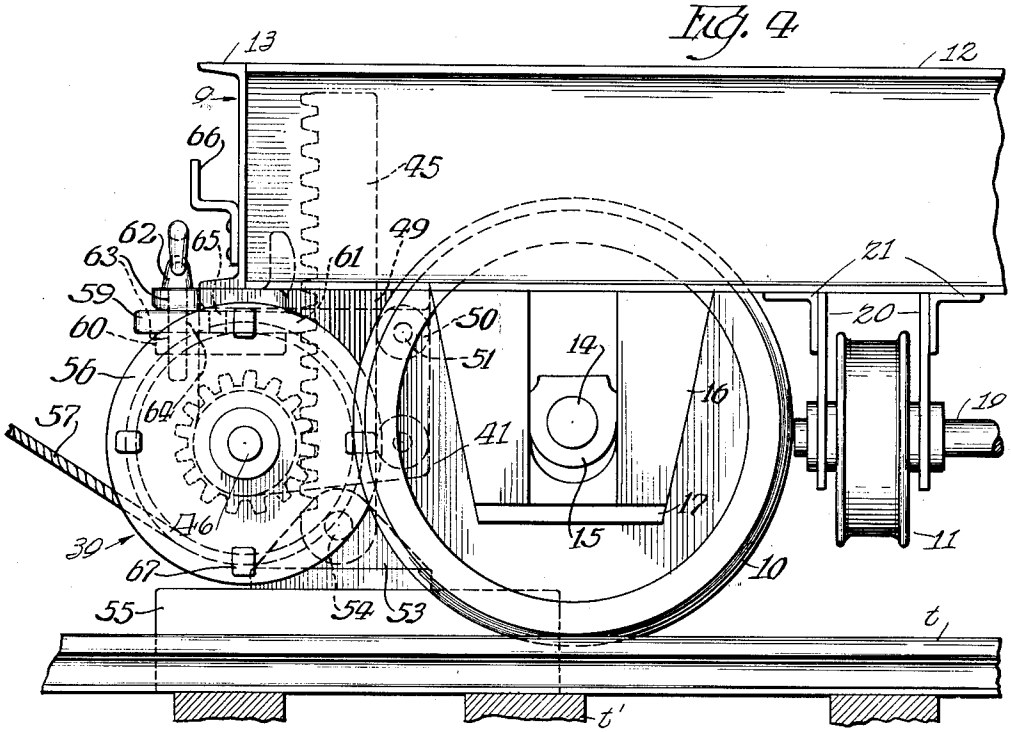
Inventor
Albert G. A. Schmidt
By Fred Gerlach
his Atty.

April 25, 1933. A. G. A. SCHMIDT 1,906,109

CRANE

Filed June 10, 1931 2 Sheets-Sheet 2

Fig. 4



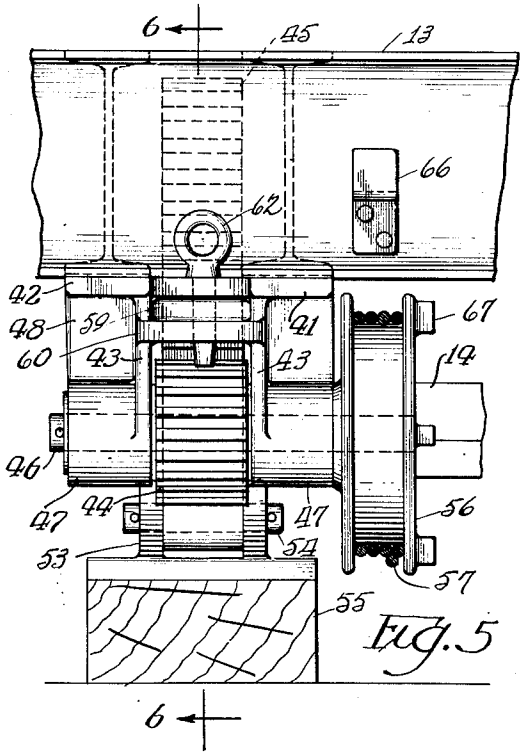


Fig. 5

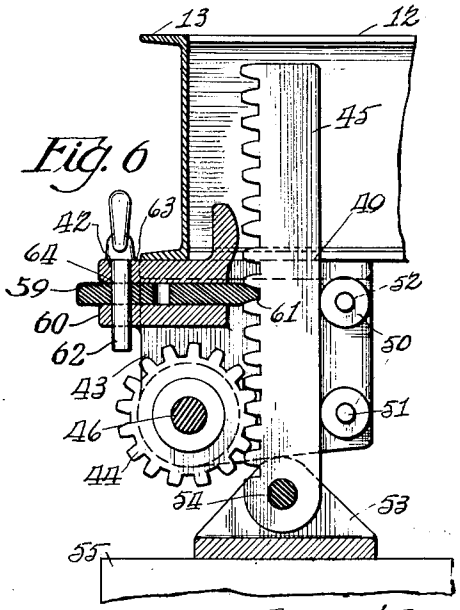


Fig. 6

Inventor
Albert G. A. Schmidt
By Reed Gerlach
his Atty.

Patented Apr. 25, 1933 1,906,109

UNITED STATES PATENT OFFICE

ALBERT G. A. SCHMIDT, OF CHICAGO, ILLINOIS, ASSIGNOR TO CULLEN-FRIESTEDT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

CRANE

Application filed June 10, 1931. Serial No. 543,339.

The invention relates generally to cranes. More particularly the invention relates to that type of crane which is designed to travel on a railroad track and comprises (1) a truck which embodies flanged wheels for supporting the crane on the track; (2) a deck which is mounted rotatably on the truck and is equipped with an outwardly projecting boom, hoisting mechanism and an engine for driving the various operating parts of the crane; and (3) set-off wheels which are disposed on the underside of the truck and operate, in conjunction with set-off rails laid across the track rails, to permit the crane to be shifted laterally and removed from the track so as to clear the track for the passage of a train.

One object of the invention is to provide a crane of this type in which the truck is provided at the ends thereof with a pair of jacks which are of novel construction and are adapted, when operated alternately, to tilt upwardly one end of the truck and then the other so as to permit the set-off rails to be laid across the track and under the set-off wheels, when it is desired to remove the crane from the track.

Another object of the invention is to provide a crane of the aforementioned character in which the jacks for raising the truck into tilted positions are designed so that they are operable from the deck.

A further object of the invention is to provide a crane of the type under consideration which is generally an improvement upon previously designed cranes of the same general design.

Other objects of the invention and the various advantages and characteristics of the present crane construction will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawings which accompany and form a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Fig. 1 is a view, partly in side elevation and partly in section, of a crane embodying the invention;

Figs. 2 and 3 are diagrammatic views disclosing the manner in which the jacks operate to tilt the truck of the crane so as to permit the set-off rails to be laid across the track and under the set-off wheels;

Fig. 4 is a side view of one of the jacks;

Fig. 5 is a front view of the jack which is shown in Fig. 4; and

Fig. 6 is a vertical longitudinal section taken on the line 6—6 of Fig. 5.

The crane which forms the subject matter of the invention is adapted to travel on a railroad track T and comprises a truck 7 and a horizontally rotatable deck 8. The track T on which the crane is adapted to travel consists of a pair of rails *t*. The latter are arranged in parallel relation and are supported on a series of ties *t'*. The truck 7 supports the deck and comprises a frame 9, four single flanged wheels 10 and four double flanged set-off wheels 11. The frame 9 is rectangular and consists of a pair of longitudinal I-beams 12 and a pair of transverse channel beams 13 and 13ª. The transverse beams are secured to the ends of the longitudinal beams and serve to hold the longitudinal beams in spaced relation. The single flanged wheels 10 are adapted to travel on the track rails *t* and are secured together in pairs by means of axles 14. The latter are mounted in journal boxes 15 which are connected slidably to pedestals 16 and are retained in connected relation with respect to the truck by means of plates 17. The pedestals are connected to and depend from the longitudinal beams 12

and have the plates 17 secured to the lower ends thereof. The set-off wheels 11 extend at right angles to the wheels 10 and are adapted in conjunction with a pair of set-off rails 18 to permit the crane to be shifted laterally and removed from the track rails *t* so as to clear the track for the passage of a train. The set-off rails 18 are adapted to be placed across the track rails *t*, as illustrated in Figs. 2 and 3, and serve, when positioned beneath the set-off wheels, to support the crane in an elevated position with respect to the track T and so that it is free to be shifted to one side of the track. The set-off wheels 11 are secured together in pairs by means of axles 19. The latter are arranged in parallel relation, extend longitudinally with respect to the truck 7 and are journalled in plates 20 which are connected to and depend from angle brackets 21 on the longitudinal beams 12. The set-off wheels are considerably smaller than the wheels 10 and are supported by the axles 19 and the plates 20 so that they are located above the track rails *t* when the truck 7 is supported on the track T by the wheels 10.

The deck 8 of the crane is provided at the front end thereof with a pair of brackets 22 and has mounted on its rear end an internal combustion engine 23. The brackets 22 project upwardly from the deck and form a pivotal support for the inner end of an outwardly projecting boom 24. The boom is supported by a cable 25 and is equipped with hoisting mechanism 26. The latter consists of a hook-equipped block 27 and a cable 28. The cable 28 extends around a sheave 29 at the outer or distal end of the boom 24 and is connected to a horizontally extending drum 30. This drum is supported rotatably on a pair of uprights 31 on the deck and is driven by the engine 23 in one direction or the other so as to cause the cable 28 to be drawn in or paid out in order to raise or lower the hook-equipped block 27. The drum 30 is of the type that is commonly employed in connection with locomotive cranes and is controlled by the usual clutch and brake mechanism. The cable 25 for supporting the boom has one end thereof connected to the outer or distal end of the boom 24 and its other end passes around a drum 32. The latter is journalled in brackets on the upper end of the upright 31 and is driven in one direction or the other by the engine 23 so as to wind up or pay out the cable in order to raise or lower the boom. The deck is connected rotatably to the frame of the truck 7 by means of a vertically extending sleeve 33 and an annular series of rollers 34. The rollers 34 are arranged concentrically with respect to the sleeve 33. They ride on a circular track 35 on the truck frame and are mounted on brackets 36 which are secured to the under part of the deck. Rotation of the deck relatively to the truck is effected by means of a pinion 37 which is driven by the engine 23 and meshes with a ring gear 38 on the upper part of the truck frame.

In order to raise the truck so as to permit the set-off rails 18 to be placed readily under the set-off wheels 11, a pair of jacks 39 and 40 are provided. These jacks are located at the ends of the frame 9 of the truck and are adapted to be operated alternately so as to cause one end of the truck to be tilted upwardly and then the other for set-off rail positioning purposes.

The jack 39 comprises a frame 41 and is associated with the transverse beam 13 of the truck frame 9. The frame 41 is preferably formed of a one-piece casting and consists of a top wall 42 and a pair of side walls 43. The side walls 43 are spaced laterally apart and depend from the top wall 42. The top wall is flat and fits against the bottom flange of the transverse beam 13. It is secured by rivets or bolts to the beam 13 and is positioned so that the frame is centrally positioned with respect to the ends of the transverse beam 13. In addition to the frame 41 the jack 39 comprises a pinion 44 and a vertically extending rack 45. The pinion 44 is positioned between the side walls 43 of the frame and is keyed or otherwise secured to a horizontally extending shaft 46. The latter is journalled in a pair of bearings 47 which are formed integrally with and project outwardly from the side walls 43. Vertical webs 48 extend between and are formed integrally with the bearings 47 and the outer side margins of the top wall 42 of the frame. The rack 45 meshes with the pinion 44 and is adapted to be raised when the pinion is rotated in one direction and lowered when the pinion is rotated in the opposite direction. It extends through a slot or opening 49 in the top wall 42 of the frame 41 and is guided for vertical sliding movement by means of a pair of rollers 50. The latter extend between the side walls of the frame of the jack and are provided at the ends thereof with pintles 51 which are journalled in openings 52 in the side walls. The lower end of the rack 45 is provided with a shoe 53. This shoe is pivotally connected to the rack by a pin 54 and is adapted to be placed or seated upon a block 55 on the ties *t'* of the railroad track. Rotation of the pinion 44 for rack shifting purposes is effected by means of a drum 56 and a line 57. The drum 56 is mounted on one end of the shaft 46 and is keyed or otherwise secured to the shaft so that it operates, when turned, to rotate the pinion 44. The line 57 is provided at one end thereof with a loop 58 and has its other end wound around and anchored to the drum 56. The end of the line that is wound around the drum is so arranged that when

the line is pulled away from the drum, the drum is rotated so as to cause the pinion to shift downwardly the rack 45. The loop 58 is designed to be connected to the hook on the block 27 of the hoisting mechanism of the crane. When the hook of the block and the loop of the line are connected together and the drum 30 is driven by the engine 23 so as to effect winding of the cable 28 thereon, the line 57 is drawn outwardly. This causes the drum 56 to be rotated in such a manner that the pinion 44 shifts downwardly the rack 45. During downward movement of the rack 45, the shoe 53 is brought into engagement with the block 55 and thereafter the truck is swung upwardly into a tilted position. When the truck is tilted sufficiently to permit one of the set-off rails 18 to be placed beneath the set-off wheels nearest the jack 39, the supply of power to the drum 30 is cut off. After placement of the set-off rails beneath the set-off wheels 11, the drum 30 is driven by the engine 23 so as to pay out the cable 28 and release the tension on the line 57. When the tension on the line 57 is released, the jack 39 becomes inoperative with the result that the crane recedes to a position wherein it is supported on the two set-off wheels 11 nearest the jack. During raising or upward tilting of the crane, the wheels 10 adjacent the transverse beam 13[a] serve as the fulcrum. The drum 56 and line 57 together with the hoisting mechanism of the crane, exemplify power-operated means for operating the jack from the deck of the crane. A lock-bar 59 serves to hold the rack 45 in its raised or inoperative position. This lock bar is slidable between the top wall 42 of the jack-frame 41 and a cross wall 60 and is provided with a tooth 61 for engagement with the teeth of the rack. The cross wall 60 extends between and is formed integrally with the side walls of the frame 41 and is positioned directly beneath the top wall 42. A pin 62 serves to lock the lock-bar in its operative or inoperative position. This pin extends through alinged openings 63 in the top wall 42 and the cross wall 60 of the frame. The lock-bar is provided with an opening 64 and an opening 65. The opening 64 is arranged so that when it is aligned with the openings 63 and the pin 62 is inserted therethrough, the lock-bar is held in its operative position. The opening 65 is disposed between the opening 64 and the tooth 61 and is so arranged or positioned that when it is aligned with the opening 63 and the pin 62, the lock-bar 59 is held in its inoperative position. A bracket or hook 66 is secured to the channel beam 13 of the truck frame 9. This bracket is positioned directly above the drum 56 and serves to support the loop 58 when the jack is not in use. To permit the jack to be shifted manually into its inoperative position, an annular series of lugs 67 is formed on the drum 56. By inserting a bar or lever into interlocked relation with the lug, the drum may be turned so as to shift the rack 45 upwardly into its inoperative position.

The jack 40 is secured to the transverse channel beam 13[a] of the frame of the truck and comprises a frame 68, a pinion 69, a rack 70 and a drum 71. It is the same in construction as the jack 39 and is adapted, when operated, to tilt upwardly the crane so that the second set-off rail may be positioned beneath the two set-off wheels 11 nearest the jack 40.

When it is desired to remove the crane from the railroad track T so as to clear the track for the passage of a train, the block 55 is placed on the ties of the track so that it is positioned beneath the jack 39. The loop 58 of the line 57 is then attached to the hook on the block 27 and the lock-bar 59 of the jack 39 is shifted into its inoperative position. Upon release of the lock-bar 59, the hoisting drum 30 is driven by the internal combustion engine 23 on the deck 8 so as to draw in the cable 28 and cause the drum 57 to be turned so as to effect downward movement of the rack 45 through the medium of the pinion 44. As the rack 45 is moved or shifted downwardly, the crane, as previously pointed out, is tilted upwardly. When the crane is tilted upwardly to the desired degree, the power to the hoisting drum 30 is cut off and one of the set-off rails is placed across the track rails *t* into position wherein they are disposed directly beneath the two set-off wheels 11 nearest the jack 39. After placement of the set-off rails, the drum 30 is driven in the opposite direction by the engine 23 so as to pay out the cable 28 to release the jack 39. After release of the jack, the loop 58 of the line 57 is secured to the bracket or hook 66. In order to place the second set-off rail beneath the two set-off wheels nearest the jack 40, the deck 8 is rotated 180° by use of the pinion 37 and the ring gear 38, and the block 27 of the hoisting mechanism is connected to the line for the drum 71. After connection of the block of the hoisting mechanism to the line for the drum 71, the hoisting drum is rotated by the internal combustion engine 23 so as to operate the jack 40 in order to tilt upwardly the crane for placement of the second rail beneath the two set-off wheels nearest the jack 40. During raising or upward tilt of the crane in response to action of the jack 40, the set-off wheels 11 nearest the jack 39 serve as the fulcrum for the crane. When the crane is supported upon the set-off wheels 11 and the set-off rails 18, it is free so that it may be shifted laterally with respect to the track T. The set-off rails 18 preferably embody hinged sections so that the portions thereof that are

placed upon the track rails *t* may be swung away so as to clear the track.

The crane herein disclosed has greater capabilities of use than previously devised cranes of like character by virtue of the fact that the jacks 39 and 40 permit it to be removed from the track with greater dispatch. If desired, the jack 40 may be omitted. In instances wherein the jack 40 is omitted, the truck is tilted upwardly in order to permit the second set-off rail to be positioned beneath the set-off wheels nearest the transverse bar 13ª by arranging the boom so that it projects over the set-off wheels nearest the transverse beam 13 and hooking the hook of the block onto one of the track rails *t*. After hooking the block into connected relation with respect to the railroad track, the drum 30 is turned so as to draw in the cable 27. This causes the end of the crane opposite the boom to tilt upwardly and permits the placement of the second set-off rail beneath the set-off wheels nearest the transverse beam 13ª.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

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

1. In combination, a truck having wheels adapted to travel on a railroad track, a set of set-off wheels mounted on the truck and adapted in conjunction with a pair of set-off rails laid across the track to support the truck in an elevated position with respect to the track and permit it to be shifted laterally, and a jack for tilting one end of the truck upwardly so as to permit one of the set-off rails to be placed beneath the set-off wheels nearest the said one end of the truck secured to the central portion of the frame of the truck and comprising a vertically movable member having a shoe at the lower part thereof for disposition between the rails of the track, and gearing supported on said truck-frame and operative to raise and lower the member.

2. In combination a truck having wheels adapted to travel on a railroad track, a set of set-off wheels mounted on the truck and adapted in conjunction with a pair of set-off rails laid across the track to support the truck in an elevated position with respect to the track and permit it to be shifted laterally, and a jack for tilting one end of the truck upwardly so as to permit one of the set-off rails to be placed beneath the set-off wheels nearest the said one end of the truck, secured fixedly to the frame of the truck and comprising a vertically slidable rack with a pivotally mounted shoe at its lower end for disposition between the rails of the railroad track, a pinion meshing with the rack, and means for rotating the pinion so as to raise or lower the rack.

3. In combination, a truck having wheels adapted to travel on a railroad track, a set of set-off wheels mounted on the truck and adapted in conjunction with a pair of set-off rails laid across the track to support the truck in an elevated position with respect to the track and permit it to be shifted laterally, a cable-operated jack attached to one end of the truck and adapted when operated, to tilt the truck upwardly so as to permit one of the set-off rails to be placed beneath the set-off wheels nearest the said one end of the truck, and power-means associated with the truck and operable to manipulate the cable for jack-operating purposes.

4. In a crane, the combination of a truck having wheels adapted to travel on a railroad track, a boom, hoisting mechanism supported by the boom, a set of set-off wheels mounted on the truck and adapted in conjunction with a pair of set-off rails laid across the track, to support the truck in an elevated position with respect to the track and permit it to be shifted laterally, and a jack on one end of the truck embodying means whereby it may be operated by the hoisting mechanism and adapted when operated, to tilt the truck upwardly so as to permit one of the set-off rails to be placed beneath the set-off wheels nearest the said one end of the truck.

5. In a crane, the combination of a truck having wheels adapted to travel on a railroad track, a boom, hoisting mechanism supported by the boom, a set of set-off wheels mounted on the truck and adapted in conjunction with a pair of set-off rails laid across the track to support the truck in an elevated position with respect to the track and permit it to be shifted laterally, and a jack for tilting one end of the truck upwardly so as to permit one of the set-off rails to be placed beneath the set-off wheels nearest the said one end of the truck, secured fixedly to the said one end of the truck and embodying a cable whereby it may be operated by attachment of the cable to the hoisting mechanism and manipulation of the mechanism or the boom.

6. In combination, a truck having wheels adapted to travel on a railroad track, a deck mounted rotatably on the truck, power-means on the deck, a set of set-off wheels mounted on the truck and adapted in conjunction with a pair of set-off rails laid across the track, to support the truck in an elevated position with respect to the track and permit it to be shifted laterally, and a jack on one end of the truck provided with means whereby it is operable from the power-means on the deck and adapted when operated, to tilt the truck upwardly so as to permit one of the set-off rails to be placed beneath the set-off wheels nearest the said one end of the truck.

7. In a crane, the combination of a truck having wheels adapted to travel on a railroad track, a deck mounted rotatably on the truck, a boom on the deck, hoisting mechanism supported by the boom, a set of set-off wheels mounted on the truck and adapted in conjunction with a pair of set-off rails laid across the track, to support the truck in an elevated position with respect to the track and permit it to be shifted laterally, and a jack on one end of the truck embodying means whereby it may be operated by the hoisting mechanism and adapted when operated, to tilt the truck upwardly so as to permit one of the set-off rails to be placed beneath the set-off wheels nearest the said one end of the truck.

Signed at Chicago, Illinois, this 1st day of June, 1931.

ALBERT G. A. SCHMIDT.