(No Model.)

S. T. WELLMAN, J. W. SEAVER & C. H. WELLMAN.

TRAVELING CRANE.

No. 594,304. Patented Nov. 23, 1897.

FIG. 1

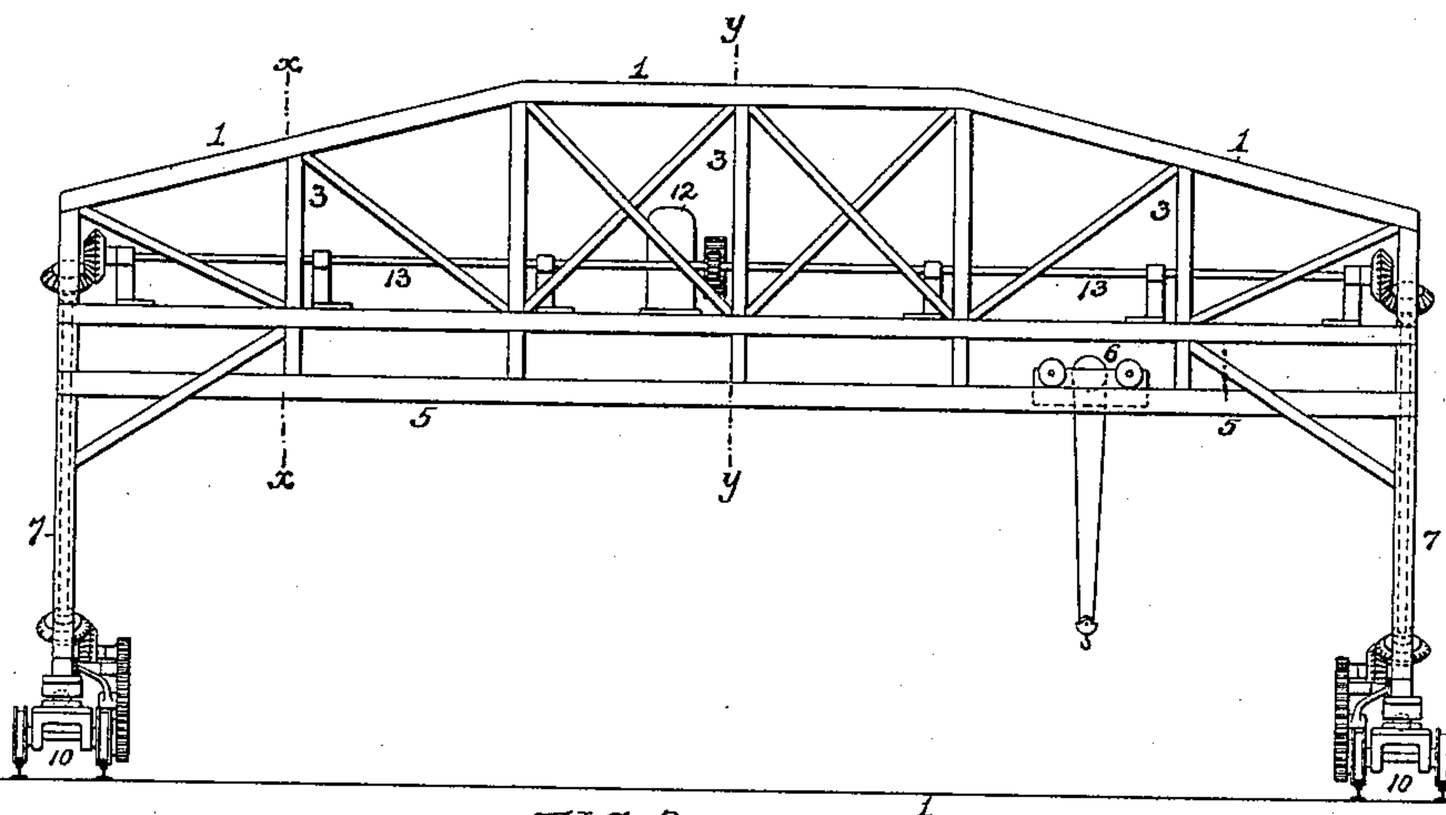


FIG. 3.

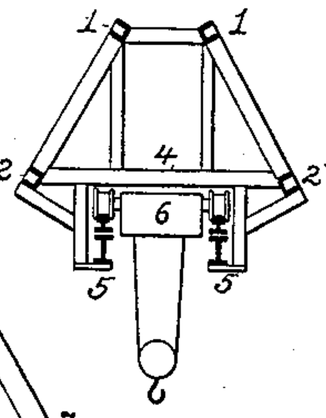


FIG. 4.

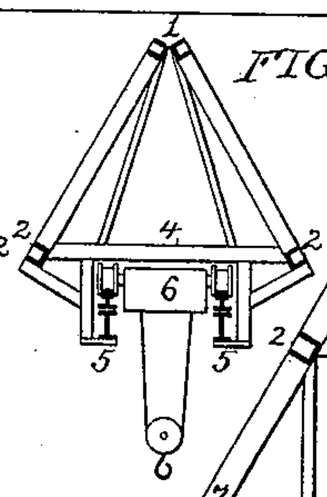


FIG. 2.

FIG. 8.

FIG. 5.

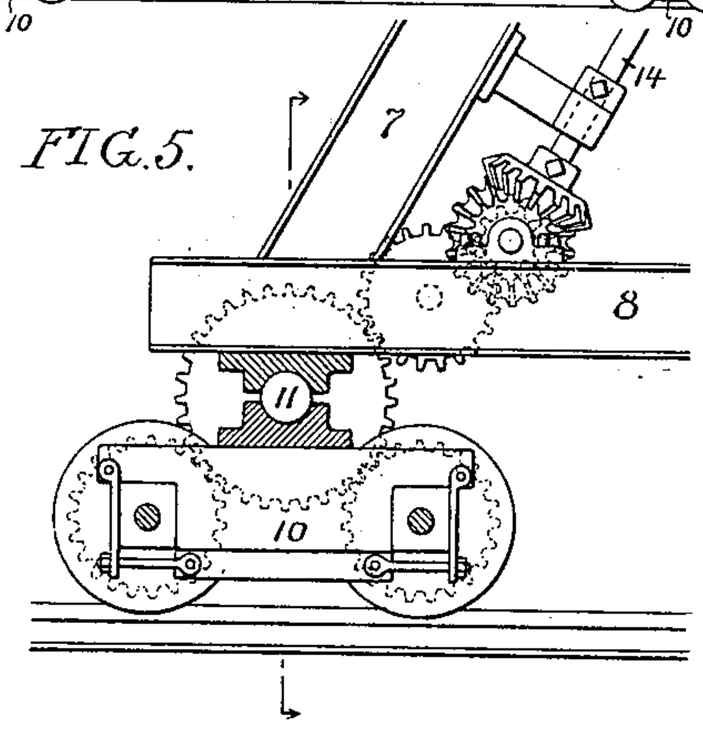


FIG. 7.

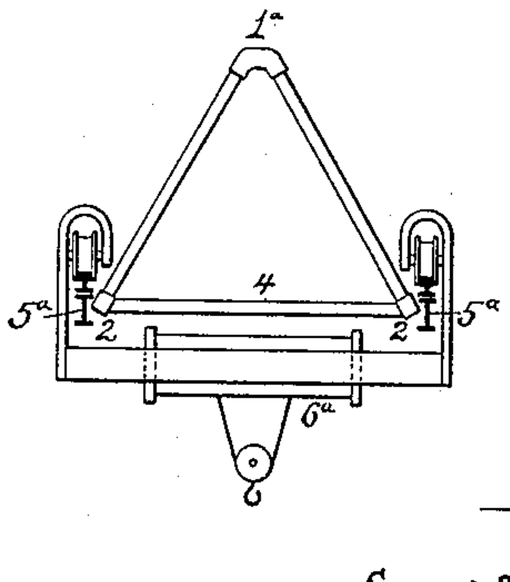
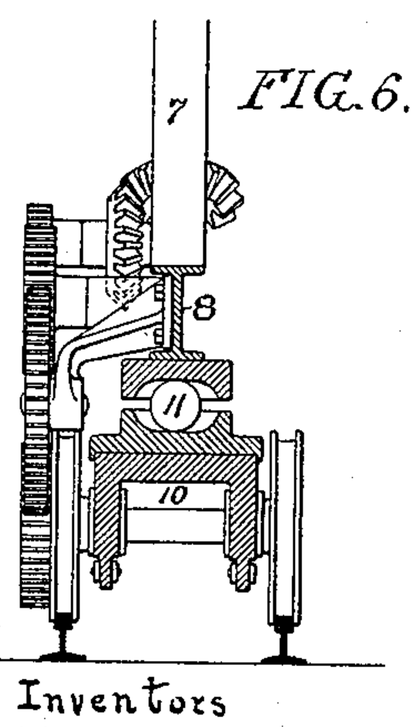


FIG. 6.



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UNITED STATES PATENT OFFICE.

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TRAVELING CRANE.

SPECIFICATION forming part of Letters Patent No. 594,304, dated November 23, 1897.

Application filed December 29, 1896. Serial No. 617,395. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL T. WELLMAN, JOHN W. SEAVER, and CHARLES H. WELLMAN, citizens of the United States, and residents of Cleveland, Ohio, have invented certain Improvements in Traveling Cranes, of which the following is a specification.

Our invention has for one of its objects the construction of a traveling crane at a low cost, owing to a reduction of material therein as compared with traveling cranes as ordinarily constructed, and as a further object the construction of the frame of the crane in such manner as to provide for expansion and contraction and insure the proper working of the crane, even although the supporting-tracks are not properly in line.

In the accompanying drawings, Figure 1 is a front elevation of our improved crane. Fig. 2 is an end view of the same. Fig. 3 is a transverse section on the line *x x*, Fig. 1. Fig. 4 is a transverse section on the line *y y*, Fig. 1. Figs. 5 and 6 are enlarged views of one of the supports of the crane, and Figs. 7 and 8 are views illustrating modifications of the invention.

In the general construction of traveling cranes it has been usual to provide two main trusses or girders for carrying the trolley, these trusses or girders being disposed vertically and with their webs parallel to each other, the tracks or runways for the trolley being either located on the tops of the girders or connected to the bottom flanges of the same. If the tracks are placed upon the top flanges of the girders and it is desired to use transverse bracing for connecting the girders, it is necessary for the trolley to overhang the tracks, so that the lifting chains or ropes can pass along the outside of the girders, thus necessitating a cumbersome and expensive construction of the trolley. If, on the other hand, the trolley rails or tracks are placed upon the bottom flanges of the girders, it is necessary to have the cross-bracing connecting the girders at a sufficient height to clear the top of the trolley, and this prevents the rigid bracing of the bottom flanges, which is a very desirable object, because in a structure of this character great stiffness is required on account of the severe lateral strains to which the girders are subjected when the crane is suddenly started and stopped while a load is suspended from the trolley. Because of the above-noted objections, however, the girders are not usually connected by transverse braces, the trolley traveling upon the top of the two main girders and the lifting-chains passing between them; or if it is attempted to brace the girders this is commonly done by adding auxiliary trusses or girders, one upon the outside of each main girder and connected thereto by means of a system of braces. This is a very expensive form of construction on account of the large amount of material required.

In carrying out our invention, therefore, we dispose the main girders at an angle, so as to form a structure of triangular cross-section. Thus, as shown in Fig. 1, said main girders comprise top chords or flanges 1, bottom chords or flanges 2, and web members or braces 3, the top chords being brought closely together and properly connected to each other, or, if desired, constituting but a single member, as shown in Fig. 7, instead of two separate members. The girders may have greater depth at the center than at the ends, as shown in Fig. 1, or may be of uniform depth throughout. The variation in depth may be effected, as shown in Fig. 1, by curving or inclining the top chord at the ends, or the same effect may be gained by a like conformation of the lower chord, if desired.

When the chord is made with the greater depth at the center than at the ends, as shown in Fig. 1, the top chords are close together throughout the deep portion of the girder and are gradually separated as the girders diminish in depth, the bottom chords being separated from each other to the proper distance and the whole structure being suitably braced by the horizontal lateral braces 4, which may be applied to the lower chords themselves or at a slight distance above them.

Suspended beneath the horizontal braces 4 is a runway 5 for the trolley 6, which may be provided with any available form of hoisting mechanism for raising and lowering the load of the crane and also with mechanism for traversing the trolley on its runways 5 from one end of the crane to the other.

In case a suspended track beneath the braces is not desired the runway may be attached directly to the bottom chords of the crane, as shown, for instance, at 5ª in Fig. 7, the construction of the trolley being modified, as shown in said figure, to accord with this modified construction of runway.

When it is desired to construct the crane in the gauntree form, the end supports or legs 7 of the gauntree may be carried down at the same angle as the main trusses or girders, as shown, for instance, in Fig. 2, the lower portions of the legs being joined by a suitable transverse tie-beam 8, which may be braced by means of struts or supports 9, or if desired to leave a clear way for loads at the end of the crane the struts may be disposed as shown at 9ª, Fig. 8.

When the ends of the crane are provided with supports of the character described, said supports rest upon trucks 10, which are provided with suitable grooved wheels running upon rails or tracks upon which the crane travels, and in this case each of the trucks, as well as the end support of the crane above each truck, is formed with a socket or cup for the reception of a ball 11, of steel or other metal, capable of resisting wear, these sockets or cups being elongated transversely, as shown in Fig. 6, so that while the crane structure is properly supported upon the trucks the latter can have movement to a limited extent independently of the superstructure in order that they may accommodate themselves to irregularities of the track and permit expansion and contraction of the crane structure.

When the legs 7 are not used, the cup or socket and ball connection may be formed between the trucks and the lower chords of the girders for the same purpose.

One pair or, if desired, both pairs of trucks may be driven from a common motor 12, mounted on the superstructure of the crane, this motor operating a shaft 13, which is connected by bevel-gearing to shafts 14, mounted in suitable bearings on the legs 7 at the opposite ends of the crane, this shaft driving, by means of suitable bevel and spur gears, the axles of the truck, the center of the driving-gear which meshes with the pinions on the axles being by preference as nearly as possible coincident with the center of the ball 11, so as to provide for considerable vibration of the truck without disturbing the alinement of the gearing to any injurious extent.

Having thus described our invention, we claim and desire to secure by Letters Patent—

1. A traveling-crane structure consisting of a pair of longitudinal girders disposed side by side and inclined toward each other at the top, each of said girders comprising upper and lower longitudinal members extending throughout the length of the girder, and web members or braces connecting the said upper and lower longitudinal members at intervals, said longitudinal girders being combined with transverse braces so as to form a structure of substantially triangular cross-section from end to end, substantially as specified.

2. A crane structure consisting of a pair of longitudinal girders disposed side by side and inclined toward each other at the top, each of said girders consisting of upper and lower longitudinal members extending throughout the length of the girder and connected by web members or braces at intervals, one of the longitudinal members being bowed so as to lessen the depth of the girder at the ends, and said longitudinal girders being combined with transverse braces so as to form a structure of approximately triangular cross-section from end to end, substantially as specified.

3. A traveling-crane structure comprising girders inclined toward each other at the top and connected and braced so as to form a structure of approximately triangular cross-section with trolley-runways carried by the lower portion of said structure, substantially as specified.

4. A traveling-crane structure consisting of girders inclined toward each other at the top and connected and braced so as to form a structure of approximately triangular cross-section, in combination with trolley-runways suspended from the lower transverse braces of the structure, substantially as specified.

5. A traveling-crane structure consisting of a pair of longitudinal girders disposed side by side and inclined toward each other at the top, each of said girders being composed of upper and lower longitudinal members extending throughout the length of the girder and connected by web members or braces at intervals, said longitudinal girders being also connected by transverse braces so as to form a structure of approximately triangular cross-section, and said structure being supported at each end by means of legs or supports carried down at the same, or approximately the same angle as the girders, substantially as specified.

6. A traveling crane in which are combined a structure mounted upon trucks by means of a pivotal joint, in combination with gearing for driving the axles of the trucks, the axis of the main driving-wheel of the gearing being coincident with the axis of the pivotal connection between the trucks and superstructure, substantially as specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

SAMUEL T. WELLMAN.
JOHN W. SEAVER.
CHARLES H. WELLMAN.

Witnesses;
JOHN M. GEORGE,
C. W. COMSTOCK.