No. 608,227. Patented Aug. 2, 1898.

H. SAWYER.

CRANE.

(Application filed Apr. 1, 1897. Renewed Feb. 16, 1898.)

(No Model.)

Fig. 1.

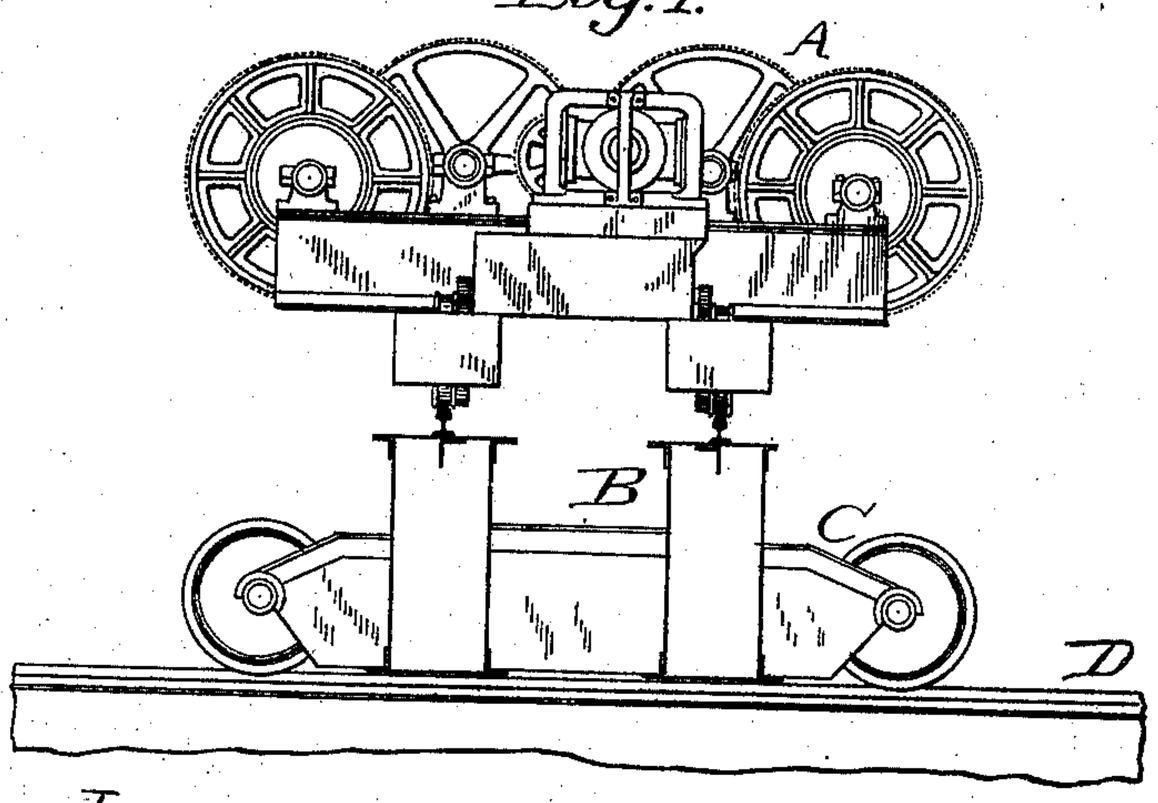


Fig. 2.

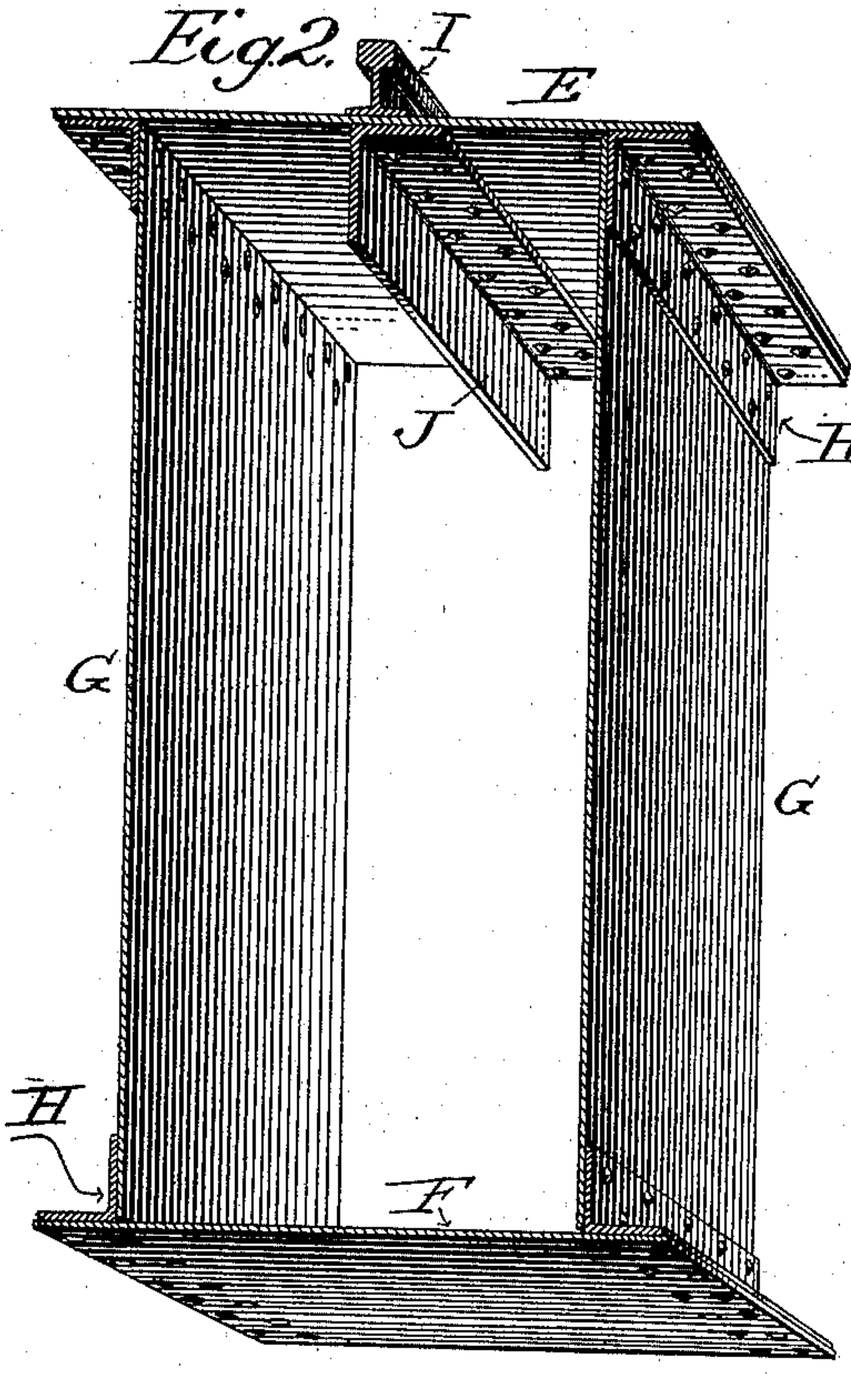
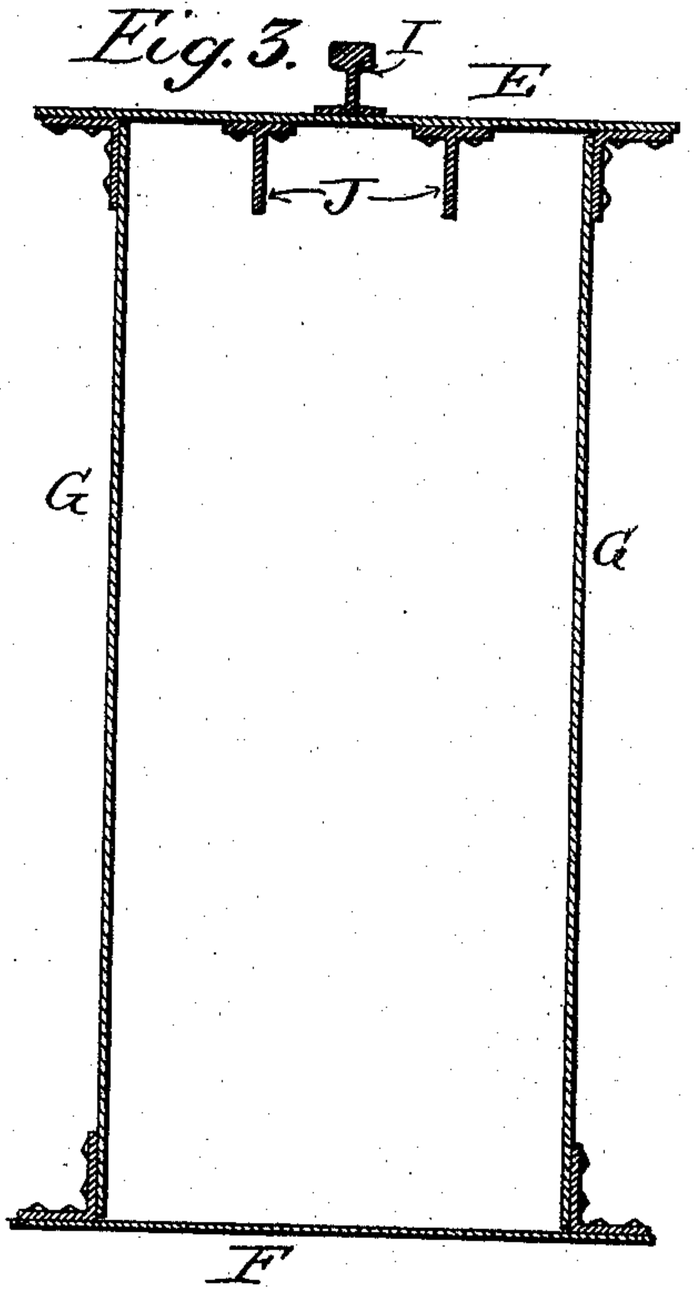


Fig. 3.



Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HARRY SAWYER, OF MUSKEGON, MICHIGAN.

CRANE.

SPECIFICATION forming part of Letters Patent No. 608,227, dated August 2, 1898.

Application filed April 1, 1897. Renewed February 16, 1898. Serial No. 670,591. (No model.)

To all whom it may concern:

Be it known that I, HARRY SAWYER, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Cranes, of which the following is a specification.

My invention relates to improvements in box-girders designed for use more especially in connection with cranes.

In the accompanying drawings, Figure 1 is an end elevation, partly in section, of so much of a crane as is necessary to a proper understanding of the invention; Fig. 2, a perspective view of a section of a box-girder made in accordance with my invention, and Fig. 3 a cross-sectional view illustrating a modification of the same.

The object of the present invention is so to construct, brace, and strengthen a box-girder that it may properly sustain its load without injury to its component parts or members.

Heretofore it has been customary to place at intervals throughout the entire length of the girder a series of castings to support the top flange-plate and the trolley-rail, the rail being depended upon to carry the wheel-loads to these castings. The use of these castings adds greatly to the dead-load which must be carried and is therefore objectionable. Short cross-stiffeners riveted to the under side of the top plate are also sometimes used, but such construction fails to accomplish properly the result sought. The supporting capacity of these cross-stiffeners is limited by the strength in tension of a very few rivets securing each to the top plate. The heads of rivets under heavy tension are likely to come off, and the cross-stiffeners localize the strains on the rivets connecting the flange angles to the web-plates. My invention seeks to overcome these and other difficulties inherent in the foregoing constructions and to produce a girder so braced or stayed that the strains shall be distributed over the top plate throughout quite an extended area, and consequently received by a great number of rivets connecting said plate with the other component parts.

Referring to Fig. 1, A designates a trolley; B, the bridge; C, one of the trucks for supporting said bridge, and D the runway or track upon which the trucks are mounted. The bridge in this instance is composed of two box-girders built up as shown in Fig. 2. Said girder comprises a top plate E, a bottom plate F, side or web plates G, and angle-pieces H, the parts being assembled and riveted together as shown.

The rail I for supporting the trolley is placed upon the top plate, preferably centrally thereon. Beneath it and in line with said rail upon the under face of said plate is riveted a length of angle iron or steel J or a distributing member of other suitable cross-section. This length of angle iron or steel, as has been found from actual use, distributes the load upon the top plate, and consequently upon the side webs and angle-pieces H to quite a distance upon both sides of the trolley-trucks, thus doing away with any injurious localizing of strains and preventing the rivets from being strained and broken. Another advantage of this construction is that the member used to stiffen the top plate and to distribute the load instead of being a dead-load upon the girder to be carried by other parts is itself a part of the compression member of the girder, and therefore admits of the reduction of the necessary weight of the other parts.

In Fig. 3 a modified form of construction is shown wherein two T-irons are secured to the under face of the top plate upon opposite sides of the centrally-disposed rail.

It will be observed from the foregoing description that the primary purpose and effect of the member J is to distribute the load over the top plate and to the side plates or vertical walls of the girder for a considerable distance, where without such member there would be, as heretofore, a localization of the strain at points each side of the truck or trolley-wheel. To effect this result to advantage without unduly increasing the weight or cost of the girder, it is desirable that the member J be of less depth than the side walls or plates of the girder, and ordinarily I find it unnecessary and undesirable to connect it with the bottom plate, though transverse braces or stays are sometimes employed to prevent lateral buckling or deflection.

While I have shown but two forms—the angle-iron and T-iron—I desire it to be understood that my invention is not restricted thereto, as it will be apparent that any struc-

tural form possessing the requisite strength and stiffness may be employed.

The girder, though primarily designed for use in crane and bridge work, is susceptible of general use or application.

Having thus described my invention, what I claim is—

1. A built-up girder, having a distributing member secured to the under face of its upper plate and extending longitudinally thereof, its lower edge terminating some distance above the bottom plate.

2. A box-girder having a distributing member secured to the under face of its upper plate and extending longitudinally thereof, the attaching-flange of said member being wholly within the space between the vertical side plates of the girder and its lower edge being out of contact with the bottom plate of the girder, substantially as shown.

3. In combination with a built-up or box girder, a rail secured to the upper face of its top plate and extending lengthwise thereof, and a longitudinal structural member secured to the lower face of said top plate, but terminating above and out of contact with the bottom plate, to distribute the wheel-pressure brought upon the rail, substantially as described and shown.

4. The herein-described girder, comprising wrought-metal plates E, F, and G, G; angle-plates H riveted to and connecting the main plates; and distributing member J secured to the lower face of plate E, substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand in the presence of two witnesses.

HARRY SAWYER.

Witnesses:
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