J. W. GOFF.

Iron Tenders and Car-Frames.

No. 137,436. Patented April 1, 1873.

Fig. 1.

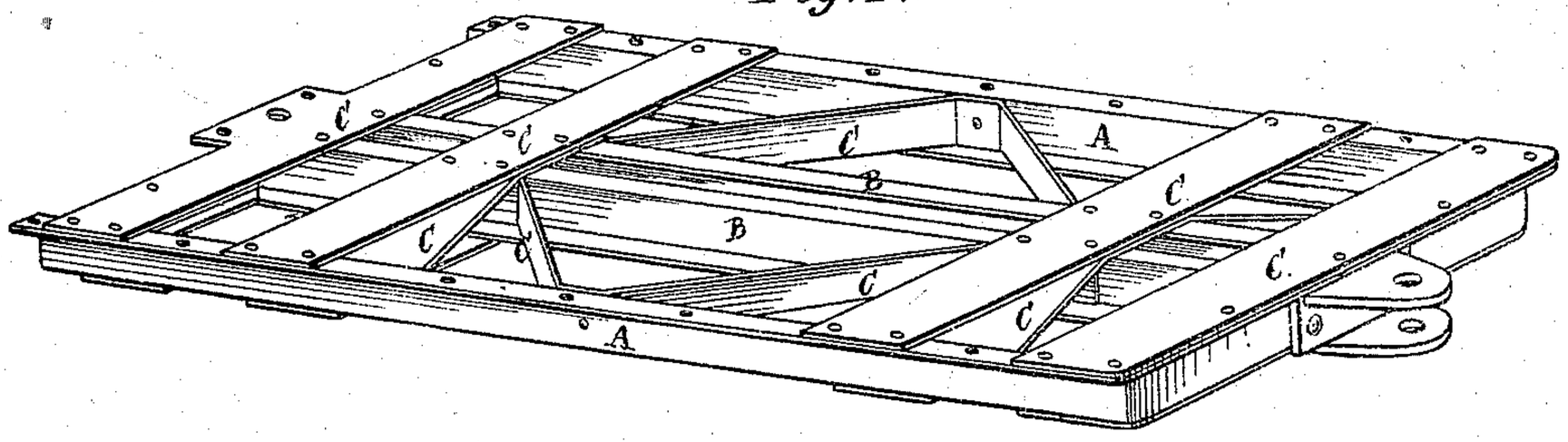


Fig. 2.

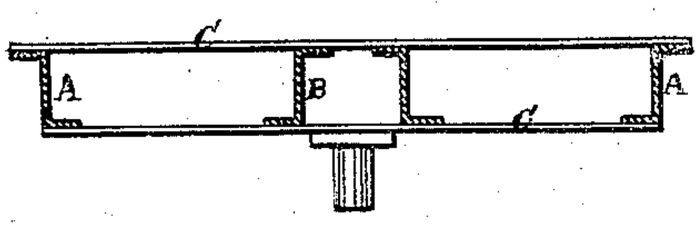


Fig. 3.

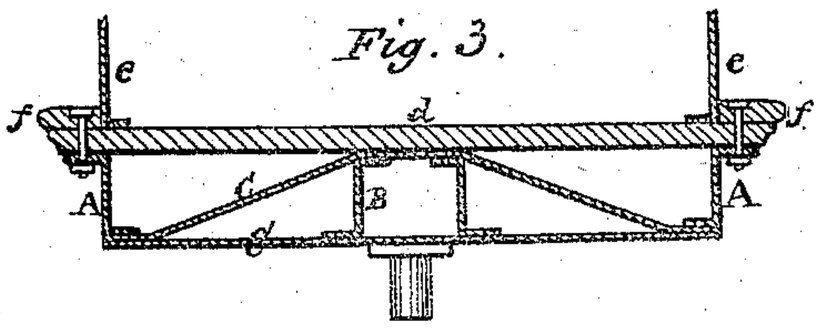


Fig. 4.

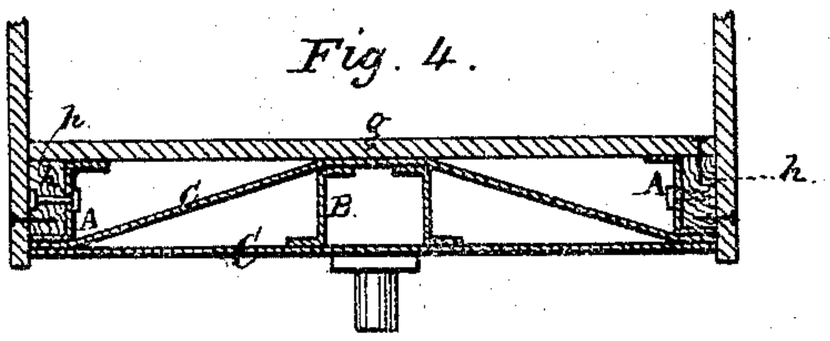


Fig. 5.

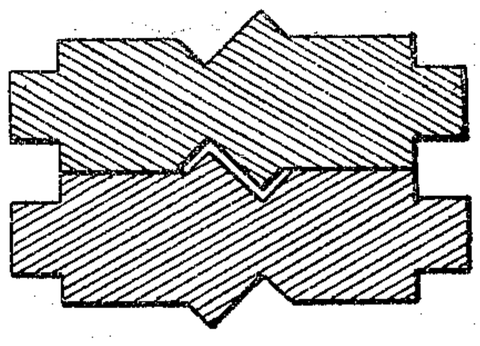


Fig. 6.

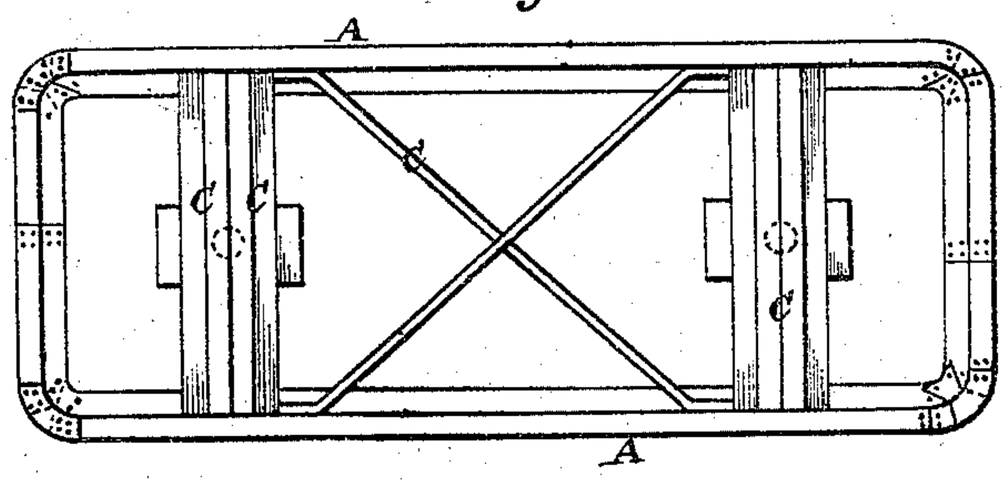


Fig. 7

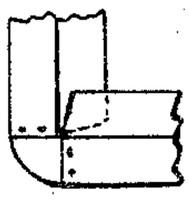
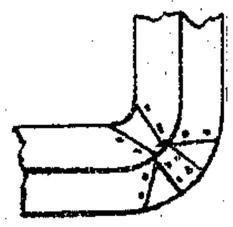


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOSEPH W. GOFF, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN IRON TENDER AND CAR FRAMES.

Specification forming part of Letters Patent No. **137,436**, dated April 1, 1873; application filed February 12, 1873.

To all whom it may concern:

Be it known that I, JOSEPH W. GOFF, of the city and county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Iron Tender and Car Frames; and I do hereby declare that the following specification, taken in connection with the drawing furnished and forming a part of the same, is a full, clear, and exact description thereof, reference being had to the drawing.

Figure 1 is a perspective view of one of my improved car-frames. Fig. 2 represents the same in cross-section at the point where the frame is mounted on the truck. Fig. 3 represents in cross-section a partial view of a locomotive-tender frame with the floor and side walls of the tank. Fig. 4 represents in cross-section a partial view of a car-frame with the floor and the outer walls of the car. Fig. 5 represents in section certain rolls adapted to making the iron used by me in my car-frames. Fig. 6 represents a plan or top view of one of my improved car-frames with rounded and re-enforced corners, and especially adapted to rolling-stock for "narrow-gage" railroads. Figs. 7 and 8 represent rounded corners with re-enforcement at the "angles."

Prior to my invention car and tender frames have been composed in the main either of beams made up of strips of boiler-iron of uniform width, secured together by means of bolts and intermediate thimbles of "double-channel" or "H" iron, or of the single-channel or U iron. The strips and bolts are expensive and heavy. The use of the H or the U iron results in appreciable economy when compared with the plates, and the iron so rolled is very strong; but from its form it cannot be rolled without having at the corners where the sides and top meet more metal than is necessary for the requisite strength. The rolls for making the U or H iron, in order to have a proper "clearance," must be so tapered or rounded at the interior corners of the recess as to leave at that point usually, say, about twice as much metal as at any other point.

The object of my invention is to give to the car-frame the maximum degree of essential strength with the minimum weight of iron, and at the same time to afford a more economical method of connecting the superstructure thereto. It is obvious that in H or U iron the greatest strength would naturally reside at the point where the two right angles practically meet, and that therefore the increased thickness of metal at that point, which necessarily occurs in its manufacture, is in reality non-essential, for if re-enforcement is requisite at all it is not wisdom to apply it at the strongest points, while the weakest points remain weak as before. The beams employed by me may properly be called "double-angle iron." It has a vertical central section and an upper and a lower section, extending at right angles in opposite directions. Such iron, made in such rolls as are exhibited in Fig. 5, will have a uniform thickness throughout. The inner and outer corners will be sharp and well filled.

In Fig. 1 the side bars A extend in a continuous length from one end to the middle of the frame at the other end, at which point they are joined by overlapping, and with rivets or bolts. The central bars B are of the same kind of iron, and extend from end to end of the frame, and are riveted or bolted to the side bars A at the junction therewith. Under ordinary circumstances, the two side bars and the two middle bars will afford ample rigidity to the frame if well tied by the braces or plates C applied in any of the several well-known methods. The corners, when turned, will be re-enforced, as illustrated in Figs. 7 and 8. It will be observed that in Fig. 7 the outwardly-projecting angle is relieved by a single cut, and that a curved-edged plate is riveted thereto, which preserves the continuity of the projecting flange-like portion of the bar. The inwardly-projecting angle is also relieved by a single cut, and the two surfaces overlap and are riveted, so that the corners are rendered much stronger, and are as capable of receiving severe shocks and blows as any other portion of the frame. When a rounded corner of the vertical section is required, as shown in Fig. 8, the inwardly and outwardly projecting flanges or angles are relieved by two or more cuts, as may be necessary. The outwardly-projecting flanges or angles will be re-enforced, as before described, with a corner-plate. The inwardly-projecting angles, how-

ever, when relieved with, say, two cuts at the corner, may be made to overlap, and present, with the triangular central piece, three full thicknesses of metal, which secures unusual strength at that point when properly riveted or bolted. As heretofore constructed, projecting brackets have been employed on tender-frames for receiving the moldings and finish. Such brackets have been bolted to the vertical sides of the double plates or fitted into the recess in the H or the channeled iron. By constructing the side bars of the double-angle iron, as herein described, a neat and desirable finish can be attained without brackets, as illustrated in Fig. 3, in which *d* denotes the floor of the tank, *e* the side walls, and *f* the molding. When employed in car-frames the position of the iron is reversed, and the lower angle projects outward and the upper angle projects inward, as illustrated in Fig. 4. The sub-floor *g* of the car is cut in lengths, which are equal to the full width of the frame. A wooden base, *h*, as thick as the width of the lower projecting section of the side bar, and as wide as the vertical section, is secured to the bar by lateral bolts. The ends of the sub-floor are spiked into this base, and the outer vertical sides of the car with their lower ends are projected sufficiently below to cover the edge or side of the frame, and afford a desirable finish. A narrow-gage car-frame, as illustrated in Fig. 6, can be constructed without the central bars, although they are generally preferable. The two lateral sections of the double-angle bars will always serve to strengthen the vertical section, and, by maintaining it in a vertical position, prevent it from being crippled by any load which in practice would be applied. The lateral sway of the car in passing curves at a high rate of speed subjects the frame to great strains, which cannot fail to be successfully resisted by the two lateral sections, which, although on opposite sides of the main or vertical section, and at its upper and lower edges, fully co-operate to as great a degree, or even greater, than similar lateral sections in the H or the channeled iron.

It will be readily understood that no set proportions for the iron can be stated which will adapt it to all uses. Iron which is one-half inch thick and, say, four or five inches wide at the vertical main section, and two or two and a half inches wide at each of the lateral sections, is well adapted to ordinary tender-frames and ordinary cars; but it can be considerably lighter for narrow-gage or light passenger-cars. These proportions may be increased to meet extraordinary requirements. Frames constructed with this iron can be afforded at comparatively low cost, and will weigh much less than any other iron frame of equal strength with which I am acquainted.

It is to be understood that the auxiliary bracing can be varied to meet the special requirements of each case, and that any particular system of bracing constitutes no portion of my improvement.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A car or tender frame composed mainly of iron bars or beams which are rolled or formed in one main section, with two angular sections projecting therefrom in opposite directions at right angles thereto, and in different planes, substantially as and for the purpose specified.

JOSEPH W. GOFF.

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