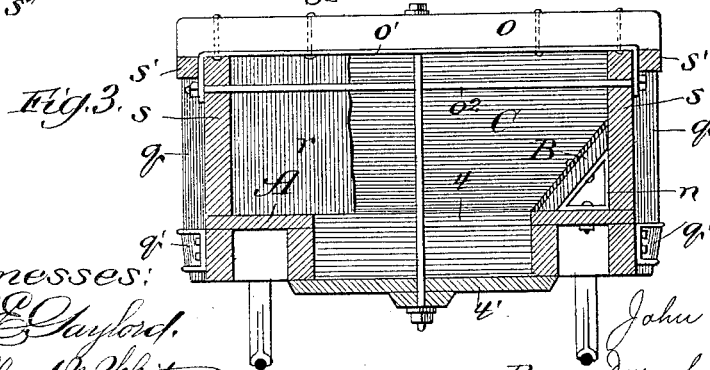
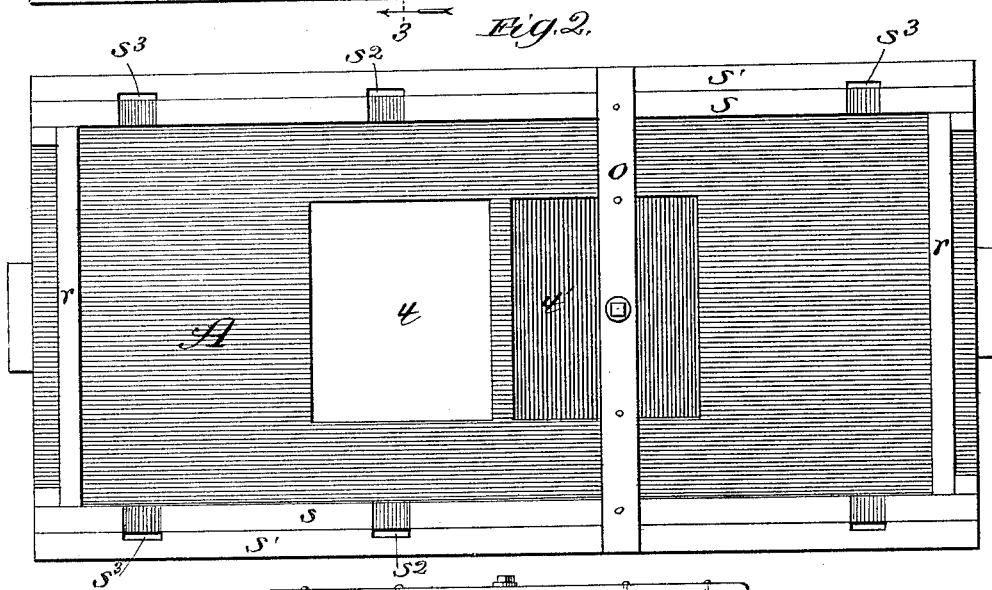
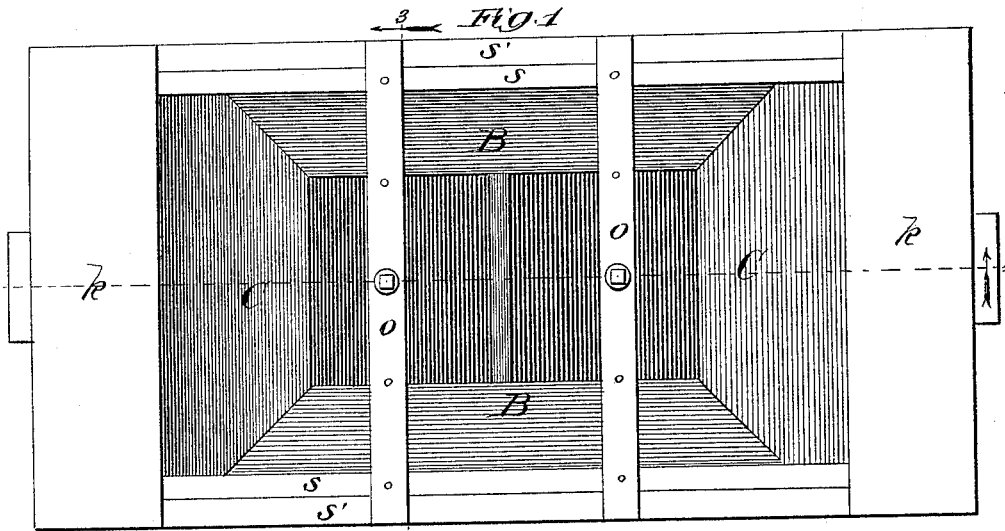


J. V. ERICSON.
ORE CAR.

No. 454,577.

Patented June 23, 1891.



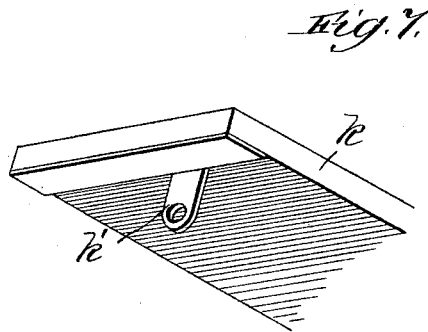
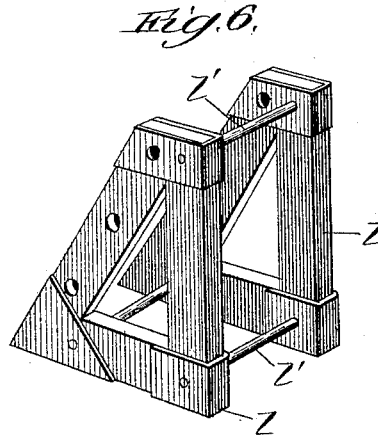
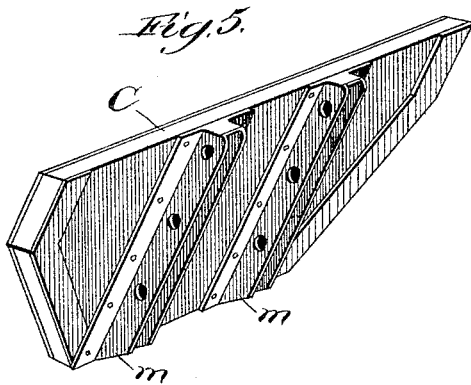
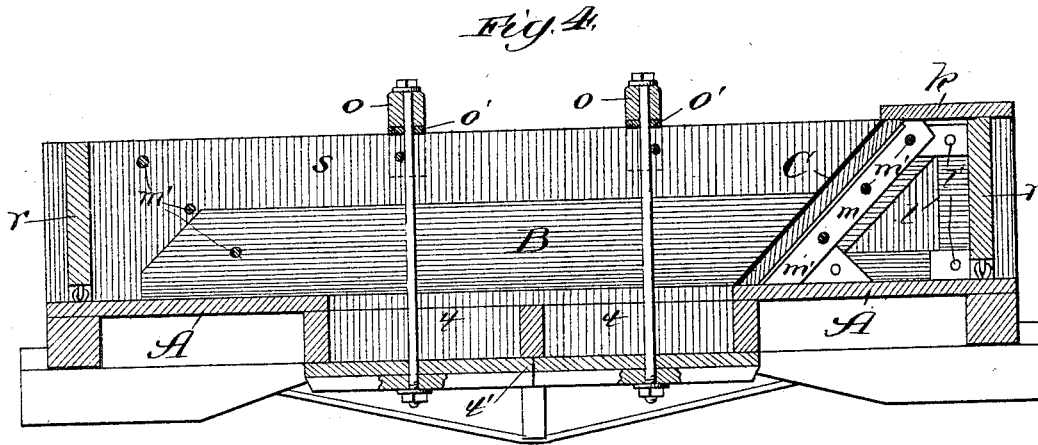
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Fig. 8.

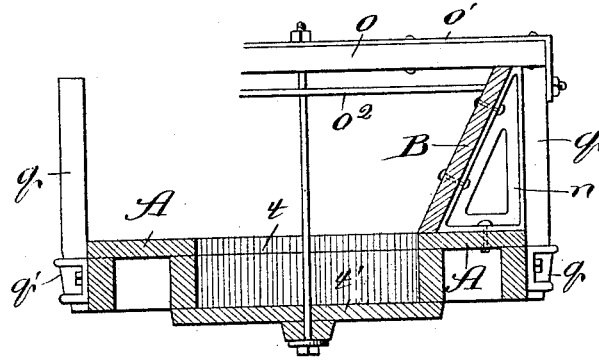


Fig. 9.

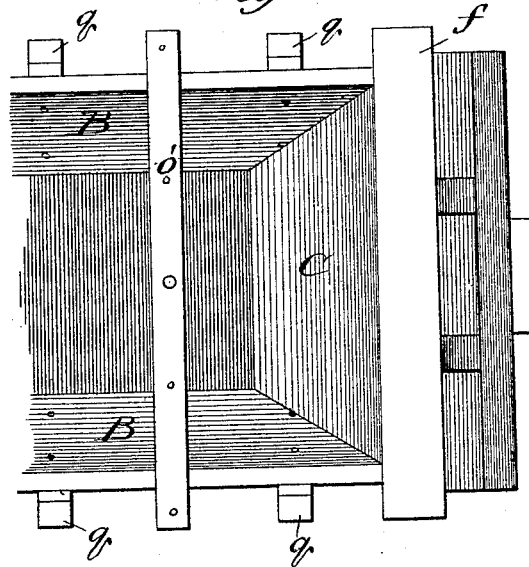


Fig. 10.

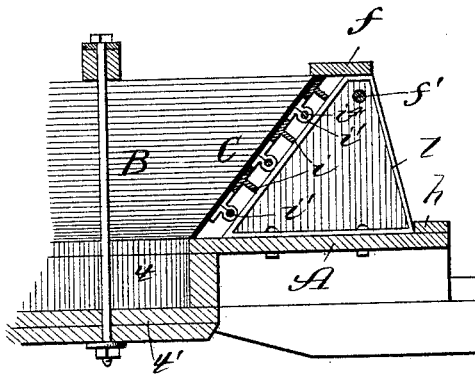


Fig. 11.

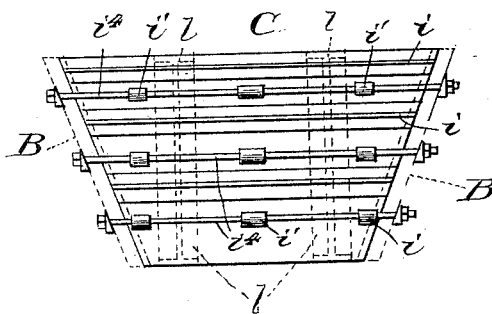
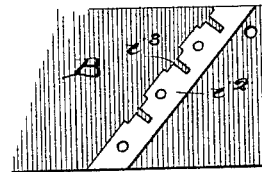


Fig. 12.



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UNITED STATES PATENT OFFICE.

JOHN V. ERICSON, OF ESCANABA, ASSIGNOR OF ONE-HALF TO D. M. PHILBIN,
OF MARQUETTE, MICHIGAN.

ORE-CAR.

SPECIFICATION forming part of Letters Patent No. 454,577, dated June 23, 1891.

Application filed March 3, 1891. Serial No. 383,580. (No model.)

To all whom it may concern:

Be it known that I, JOHN V. ERICSON, a citizen of the United States, residing at Escanaba, in the county of Delta and State of Michigan, have invented a new and useful Improvement in Ore-Cars, of which the following is a specification.

My invention relates to improvements in railroad-cars of the class particularly adapted for carrying ores and provided with one or more hoppers having drop-doors to facilitate their unloading.

My object is to provide an ore-car of an improved construction which will render it particularly strong and durable, comparatively economical to manufacture, and safe and convenient for the operators while loading and unloading. My object is, further, to provide an ore-car of a construction which will render it readily convertible into a gondola-car or a flat car.

Ore from certain of the large mining districts, notably those of the Upper Lake Region, is shipped from the mines by railroad and afterward transferred to boats, which take the ore to the market. As a consequence comparatively little ore is conveyed by the railroads during the winter season while navigation is closed, and the ore-cars as hitherto constructed, being unadapted for other freight, are obliged for the most part to stand idle during several months of the year. In the winter months the largest shipments of the year of logs and lumber are made, which necessitates a greater number of flat and gondola cars than is required at other seasons. By providing a car which may be readily converted back and forth, as required, from a flat or a gondola car to an ore-car, a very material reduction over what has hitherto been considered necessary (of the rolling-stock of certain railroads in particular) may be made to fulfill all the requirements of transportation with proportionate economy.

In the drawings, Figure 1 is a top plan view of an ore-car of my improved construction and convertible into a gondola-car; Fig. 2, a similar view of the car with the hopper and one of the drop-door beams removed; Fig. 3, a section taken on line 3 3 of Fig. 1 and

viewed in the direction of the arrows; Fig. 4, a section taken on line 4 of Fig. 1 and viewed as indicated by the arrow, but with one of the ends of the hopper removed for purposes of the illustration; Figs. 5 and 6, perspective views, and Fig. 7 a broken perspective view, respectively, of details of the car shown in the above-named figures; Fig. 8, a broken cross-sectional view of an ore-car involving my improvements and convertible into a flat car; Fig. 9, a broken top plan view of one end of the car illustrated in Fig. 8; Fig. 10, a broken longitudinal section of the same; Fig. 11, a view in elevation of a modified construction of the removable end floor, and Fig. 12 a broken view in elevation of the end portion of a removable side floor.

A represents the floor or platform of the car, which is provided with one or more openings *t*, to which are fitted drop-doors *t'*. The gondola-car has the usual side planks *s* and end planks *r*, the side planks being held in place by stakes *q*, inserted into stake-pockets *q'*. The flat car differs from the gondola-car only in the absence therefrom of the side and end planks. On the outer sides of the side planks *s* at the upper edges of the latter are strips *s'*, which thus widen the tops of the sides to render them more safe and convenient for operators to stand upon while loading or unloading the car. The drop-door beams *o* on the gondola-car are provided along their under sides with straps *o'*, which flange downward at their end portions to pass through sockets *s²* in the strips *s'*, whereby they may extend for a limited distance down the outer sides of the planks *s*. The beams *o* are secured in place by tie-rods *o²*, fastened by nuts which extend across the car underneath the beams and at opposite ends through bolt-holes in the strap-flanges and side planks. The tie-rods thus operate to strengthen the car by tying the side planks together between their ends. The hopper, which when in place converts the car into an ore-car, is formed of two removable side floors B and two removable end floors C.

In the gondola-car the side floors B of the hopper need extend from the edges of the opening *t* only part way up the side planks *s*. They are provided at intervals upon their

under side with triangular metal braces *n*, which fit into the angles afforded by the floor A and side planks *s*. The braces *n* have flanged edges, through which they may be secured by nut-bolts to the side floors and to the floor A, as shown. The end floors C extend from the edges of the opening *t* to the top of the side planks *s* and are of the shape shown in Fig. 5 to fit at their edges closely over the side floors and against the side planks. Upon the backs of the end floors and extending from top to bottom of the latter are socket-pieces *m*, closed at their upper ends and provided with flanges, at which they are secured in place upon the end floors. The end floors are braced by braces *l*, which rest upon the floor A and against the end planks *r* and fit along their inclined edges into the socket-pieces *m*. At opposite ends of the car are top planks *k*, which rest upon the upper edges of the side and end planks and the upper ends of the braces *l*. The planks *k* are provided on their under sides near opposite ends with downward-projecting ears *k'*, which extend through sockets *s*³ in the strips *s'* a short distance down the outer sides of the planks *s*. The end floors C are secured in place by tie-rods *m'*, fastened by bolts, the lower rods extending across the car through bolt-holes in the same line in the side planks, side floors, socket-pieces, and braces *l*, and the top rods extending through bolt-holes in the ears *k'*, side planks, socket-pieces, and braces *l*. Thus two or three tie-rods at each end of the car operate to hold all the parts named firmly in place. I prefer to construct the hopper end and side floors of planks faced with metal plates, and the braces *l* may be of wood strengthened at the corners with metal straps and held in fixed relation by tie-rods *l'*, as shown in Fig. 6.

The hoppers I provide for flat cars have side floors B, which extend from the openings *t* to the tops of the stakes *q*. The braces *n* extend higher than those of the gondola-car and may be secured by bolts to the side floors and floor A. The braces *n* are placed only at the stakes against which they bear at their outer sides. The straps *o'* of the drop-door beams *o* may extend along the upper sides of the latter and are flanged at their end portions to extend a short distance down the outer surfaces of the stakes, each beam being held in place by a tie-rod *o*³, which extends across the car through holes in the side floors, braces, stakes, and strap-flanges, as shown in Fig. 8. There being no end planks to flat cars, I prefer to employ hopper end floors and braces therefor of the construction shown in Figs. 10 and 11. The end floor shown in Fig. 11 comprises a single plate of metal re-enforced along the under side by horizontally-extending iron strips *i*, and provided between and below the re-enforcing-strips *i* with small stanchions or eye-pieces *i'*. On the side floors B are inclined plates *i*², against which the end floors rest at their lateral edges and which

are provided with recesses *i*³, as shown in Fig. 12, to receive the ends of the re-enforcing strips *i*. The side and end floors are held firmly in place by tie-rods *i*⁴, fastened by nuts, which extend across the hopper through the stanchions *i'*, plates *i*², and side floors. The end floors also rest against braces *l*, which may be bolted to the floor A and further held in place by strips *h*, extending across the ends of the floor A. The strips *h* are usually provided upon flat cars, especially when used for shipping logs, to facilitate the loading and unloading of the logs, which thus rest upon the strips *h'* instead of the car-platform. The top planks *f* at opposite ends of the car are provided with downward-extending ears, (not shown,) which, like the flanges of the straps *o'*, extend a short distance down the outer sides of the stakes. Tie-rods *f'* extend across the car through the ears on the planks *f*, stakes, side floors, and braces *h*. The side floors of the hopper upon the flat car, being less inclined than those provided on the gondola-car, will not be subject to the same wear and there is not the same necessity for their being metal-plated.

Constructed as described the parts of the hoppers when in place are secured and braced in a manner to render them particularly strong, as required by the rough service to which they are subjected in use. To disengage the hopper-floors from each other and the cars, it is only necessary to remove the nuts from the tie-rods and withdraw the latter and remove the nuts from the bolts which fasten the braces to the floors A, when the hopper-floors may be taken separately from the cars and stored until again required. The disposition of the tie-rods causes them to be out of the way, whereby they will not interfere with the loading and unloading of the car or be bent or broken by impact against them of the ore in the operation of loading.

While the cars shown in the drawings are short cars provided each with a single hopper, long cars may be provided with two removable hoppers of substantially the same construction as those described.

The top planks at the ends of the cars are a desirable feature, for the reason that they afford comparatively wide platforms for the operators to stand upon, whereby they may work with greater ease and less danger of accident.

What I claim as new, and desire to secure by Letters Patent, is—

1. A convertible car provided in its floor with a discharge-opening and door and a hopper removable from and replaceable upon the car, surrounding the said opening, substantially as described.

2. A convertible car provided in its floor with a discharge-opening and door, and a hopper surrounding the said opening formed in detachable sections which are removable from and replaceable upon the car, substantially as described.

3. In an ore-car, the combination, with the car - platform provided with an opening through it and a drop-door at the opening, of a removable and replaceable hopper upon the car about the said opening formed with removable and replaceable side floors and end floors, and detachable securing means for holding the parts of the hopper together upon the car, substantially as described.

4. In an ore-car, the combination, with the car - platform provided with an opening through it and a drop-door at the opening, of a removable and replaceable hopper upon the car about the said opening formed with removable and replaceable side floors and end floors, removable and replaceable braces interposed between the hopper-floors and platform, and detachable securing means for holding the braces in place and the parts of the hopper together upon the car, substantially as described.

5. In an ore-car, the combination, with the car - platform provided with an opening through it and a drop-door at the opening, of a removable and replaceable hopper upon the car about the said opening formed with removable and replaceable side floors and end floors, removable and replaceable top planks

extending across the end portions of the car and having downward-projecting ears, and detachable tie-rods extending across the ends of the hoppers and securing the side floors, end floors, and top planks together upon the car, substantially as described.

6. In an ore-car, the combination, with the car - platform provided with an opening through it and a drop-door at the opening, of removable and replaceable hopper side floors B, triangular braces *n* for the side floors, held in place by bolts, removable and replaceable hopper end floors C, provided on their under sides with projections having holes through them for the passage of tie-rods, removable and replaceable braces for the end floors, and securing means for holding the end-floor braces against independent movement when in position, and removable tie-rods extending across the ends of the hopper through the side floors and the projections on the under sides of the end floors, substantially as and for the purpose set forth.

JOHN V. ERICSON.

In presence of—

WALTER KITCHEN,
W. L. BROWN.