No. 671,960. Patented Apr. 16, 1901.

A. HEIDEN.

CAR.

(Application filed Apr. 3, 1900.)

(No Model.) 2 Sheets—Sheet 1.

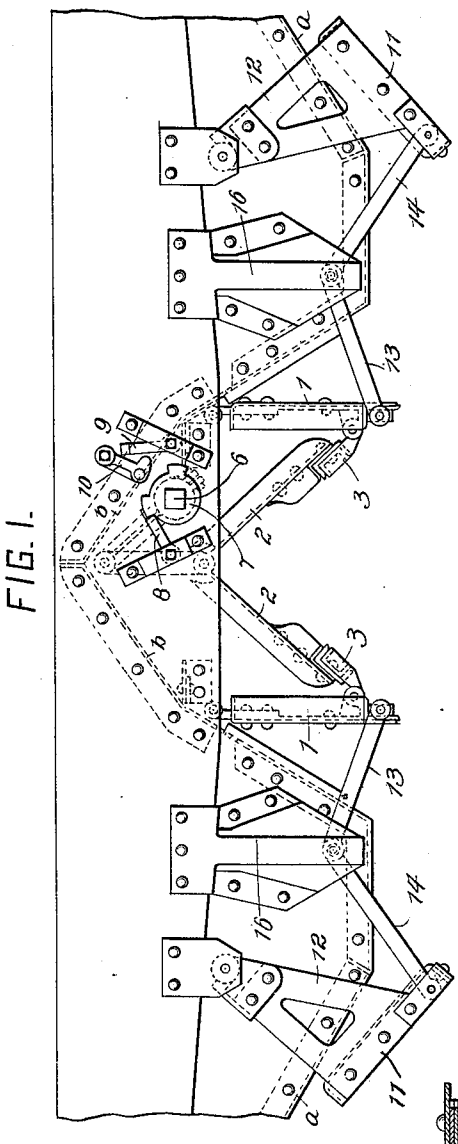


FIG. 1.

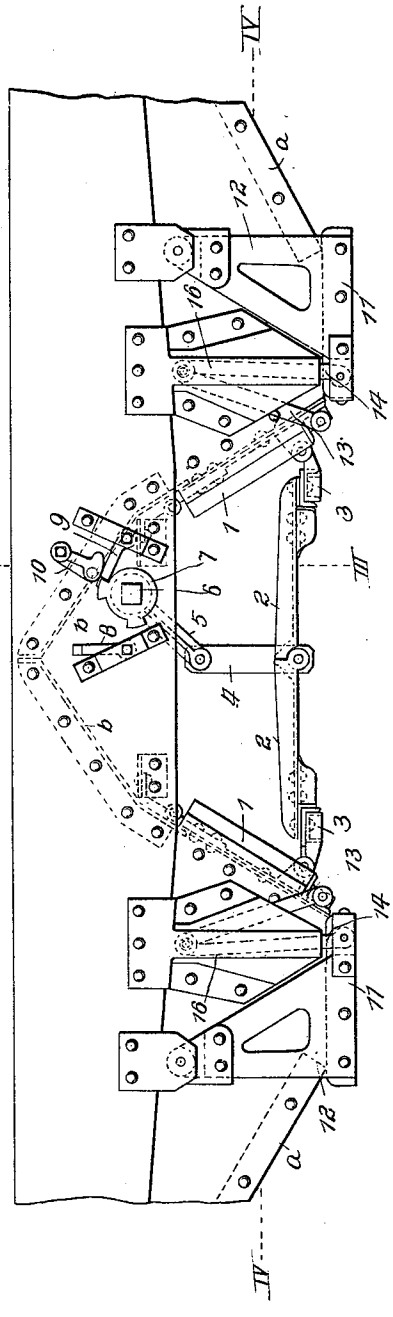


FIG. 2.

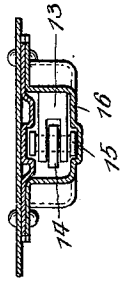


FIG. 5.

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FIG 3

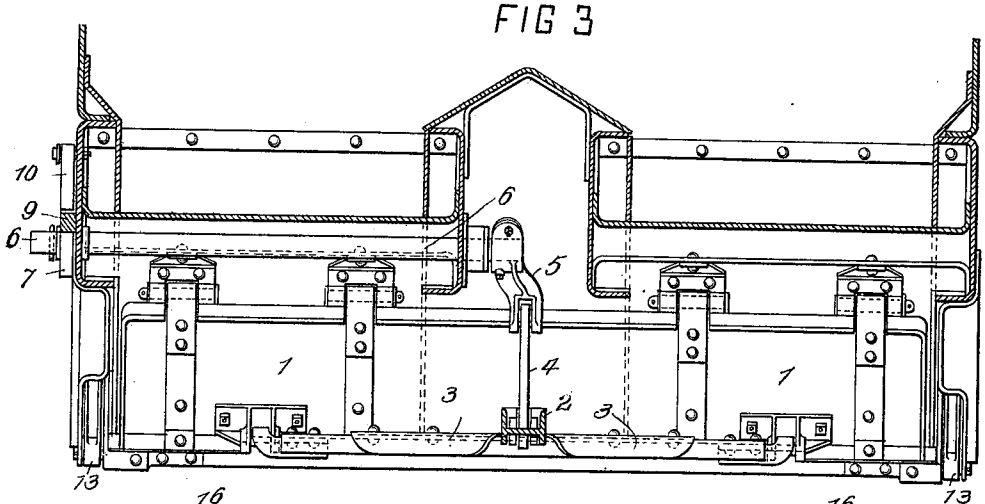
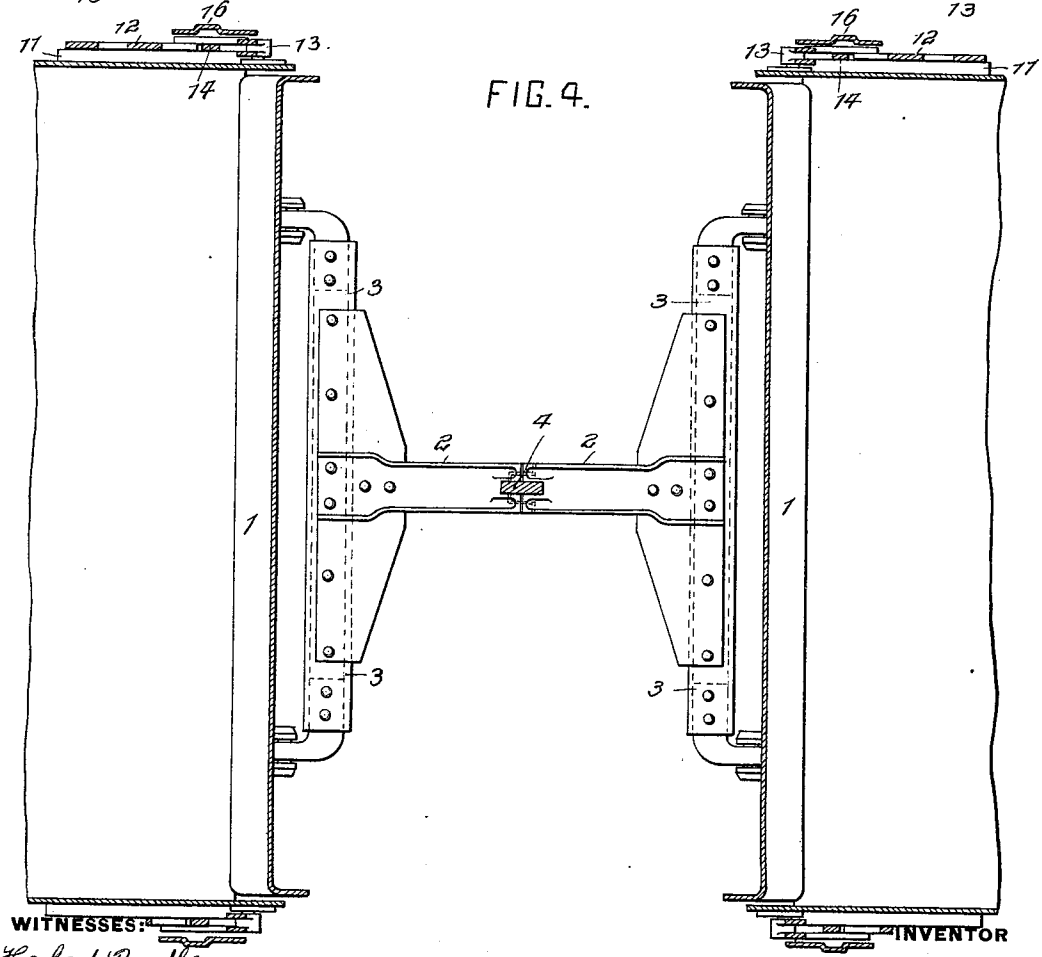


FIG. 4.



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UNITED STATES PATENT OFFICE.

AXEL HEIDEN, OF ALLEGHENY, PENNSYLVANIA.

CAR.

SPECIFICATION forming part of Letters Patent No. 671,960, dated April 16, 1901.

Application filed April 3, 1900. Serial No. 11,375. (No model.)

To all whom it may concern:

Be it known that I, AXEL HEIDEN, a citizen of Norway, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Cars, of which the following is a specification.

In the construction of hopper-cars it is desirable that the load-supporting surfaces should be inclined toward one or more discharge-openings, so that the entire load will discharge automatically when the doors of such openings are unlocked, so that they can be swung out. This automatic discharge is a feature common to many forms or constructions of cars, but is obtained by a material decrease in capacity.

The object of the invention is to so arrange the discharge-openings of the car and the doors closing the same that portions of the supporting-surfaces may be made more flat, and therefore lower in the car, thereby materially increasing its carrying capacity without any increase in the height or width of the body of the car.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of a portion of a car, showing the doors open. Fig. 2 is a similar view showing the doors closed. Fig. 3 is a sectional view, the plane of section being indicated by the line III III, Fig. 2. Fig. 4 is a sectional detail view showing the manner of connecting the spreader to the side or inner doors, the plane of section being indicated by the line IV IV, Fig. 2; and Fig. 5 is a detail view of the guide-boxes.

As is usual, the floors *a* of the car are inclined downwardly from the ends of the car toward the middle, the angle of inclination being greater than the angle of rest of the material carried by the car. A ridge (indicated by the dotted lines *b* in Fig. 5) is formed across the car, so as to direct the middle portion of the load toward the discharge-openings. The discharge-openings are formed through the floors or inclines *b*, and the doors for such openings form when closed continuations of these surfaces. It has been found necessary in order to prevent the material from forming an arch over the discharge-openings to make the sides of the ridge comparatively high and steep, as shown, thereby decreasing the capacity of the car.

In the practice of my invention I provide two doors for each opening, one of said doors forming when closed a continuation of the bottom *a* and the other a continuation of the ridge-wall *b*.

As shown in Figs. 1, 2, and 3, the inner or ridge doors 1 are hinged along their upper edges to the inclined plates forming the upper portion of the ridge, so that they will swing toward each other into the space under the ridge.

Arms 2, having their inner ends pivotally connected together, have their outer ends pivotally connected to the doors 1, preferably through the medium of braces 3, which are secured midway of their length to the arms 2 and have their ends pivotally connected to the doors. These arms are made of such a length that when in alinement with each other they will hold the doors in closed position, as shown in Fig. 2. It is preferred that the pivotal connection of the arms to each other should be so constructed in accordance with rules known in the art that outward pressure against the doors will tend to move the pivotal connection of the arms down rather than up. A link 4 has its lower end connected to the arms 2 at or near the junction with each other and its upper end connected to an arm 5 on the shaft 6, which is mounted in suitable bearings under the ridge of the car. The outer end of the shaft is made square or otherwise suitably shaped for the reception of an operating-handle and has a ratchet-wheel 7 secured thereon. The doors are held in open and closed positions by pawls 8 and 9, engaging the ratchet-wheel. The pawl 9, which holds the doors in closed position, is locked in engagement with the ratchet-wheel by a dog 10, pivotally mounted on the car, as shown in Figs. 1 and 2.

The bottom doors 11 are supported by arms 12, which have their upper ends pivotally connected to the side of the car. The pivotal supports of these doors are located approximately in the vertical plane passing through the rear edges of the doors when in closed position, so that the doors will tend of their own weight

to swing open toward the ends of the car. Links 13 and 14 have their lower ends pivotally connected to the doors 1 and 11, respectively, at or near the meeting edges of the same, while their upper ends are connected by pins 15. The ends of these pins project into grooves in the inner walls of the guide-boxes 16, which are secured to the sides of the car, as shown. It is preferred to place antifriction-rollers on the projecting ends of the pins to prevent wear of the pins or walls of the grooves.

By reference to Figs. 1 and 2 it will be seen that when the doors 1 are pushed outwardly to closed position by depressing the spreader-arms 2 the pins 15 will be pushed up in their guide-boxes by the links 13, and thereby pulling on the links 14 cause the doors 11 to swing into closed positions. By locking the doors 1 in closed or open position the doors 11 will be locked in corresponding position. As the doors 1 are made sufficiently wide to extend above the point at which arching of the material would occur or where the greatest compacting of the material in the car is effected the opening of the doors would permit of such a spreading or loosening of the material as would destroy any arch which might have been formed. As a lateral as well as a vertical discharge of the material is thus provided for, the portions of the ridge above the doors 1 need not be made of a height greater than that necessary to obtain a discharge inclination or angle.

It is characteristic of my construction that the ridge-doors when closed form continuations of the sides of the ridge, and when moving to open position the free edges of the doors do not approach materially nearer the rails. Hence in constructing the car in accordance with my improvement the hopper portions can be extended down nearer to the rails, retaining the size of doors heretofore used, than is possible in a construction requiring the ridge-door to assume a horizontal or nearly-horizontal position when closed.

I claim herein as my invention—

1. A hopper-car having in combination floors inclined toward the middle of the car, doors hung to the inclined floors, a transverse ridge having oppositely-inclined sides and other swinging doors hinged to said sides in such relation to their lower ends that the doors when closed will be in or approximately in the planes of said sides and form continuations thereof, substantially as set forth.

2. A hopper-car having in combination floors inclined toward the middle of the car, swinging doors forming when closed continuations of said floors, a transverse ridge having oppositely-inclined sides, swinging doors forming when closed continuations of said sides, means for closing the ridge-doors, connections from the ridge-doors to the bottom doors, whereby the latter are shifted to and from closed position by the ridge-doors, substantially as set forth.

3. In a hopper-car, the combination of two doors mounted to move in opposite directions to and from closed position, arms having their inner ends pivotally connected together and their outer ends pivotally connected to said doors, means for shifting the arms into and out of alinement with each other, doors mounted to move to and from closed position in opposition to the other doors, and connections between said sets of doors, whereby the latter doors are shifted by the other doors, substantially as set forth.

4. A hopper-car provided with a discharge-opening, two oppositely-moving doors for closing said opening, means for closing one of said doors and connections from one door to the other whereby the closing or opening of one door will effect a corresponding movement of the other door, substantially as set forth.

5. A hopper-car provided with two discharge-openings, two doors arranged to partially close said openings, means for simultaneously moving both of said doors to and from closed position, two doors arranged to act in conjunction with the other doors to close the discharge-opening, slides mounted in suitable guides on the car, and links connecting the doors of each pair to said slides, whereby said doors are caused to move simultaneously, substantially as set forth.

In testimony whereof I have hereunto set my hand.

AXEL HEIDEN.

Witnesses:
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F. E. GAITHER.