

Jan. 6, 1925.

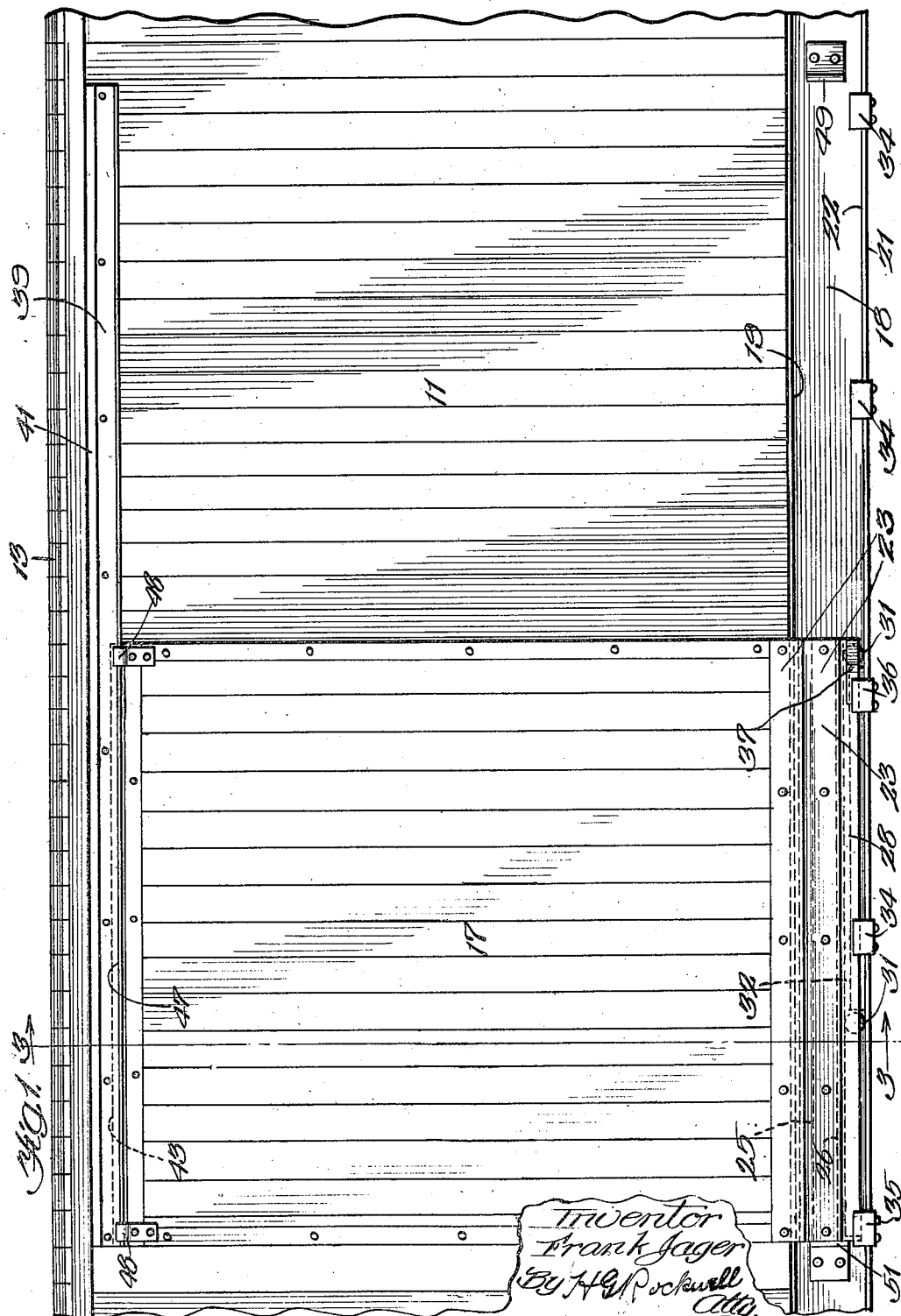
1,521,816

F. JAGER

CAR DOOR

Filed March 18, 1920

2 Sheets-Sheet 1



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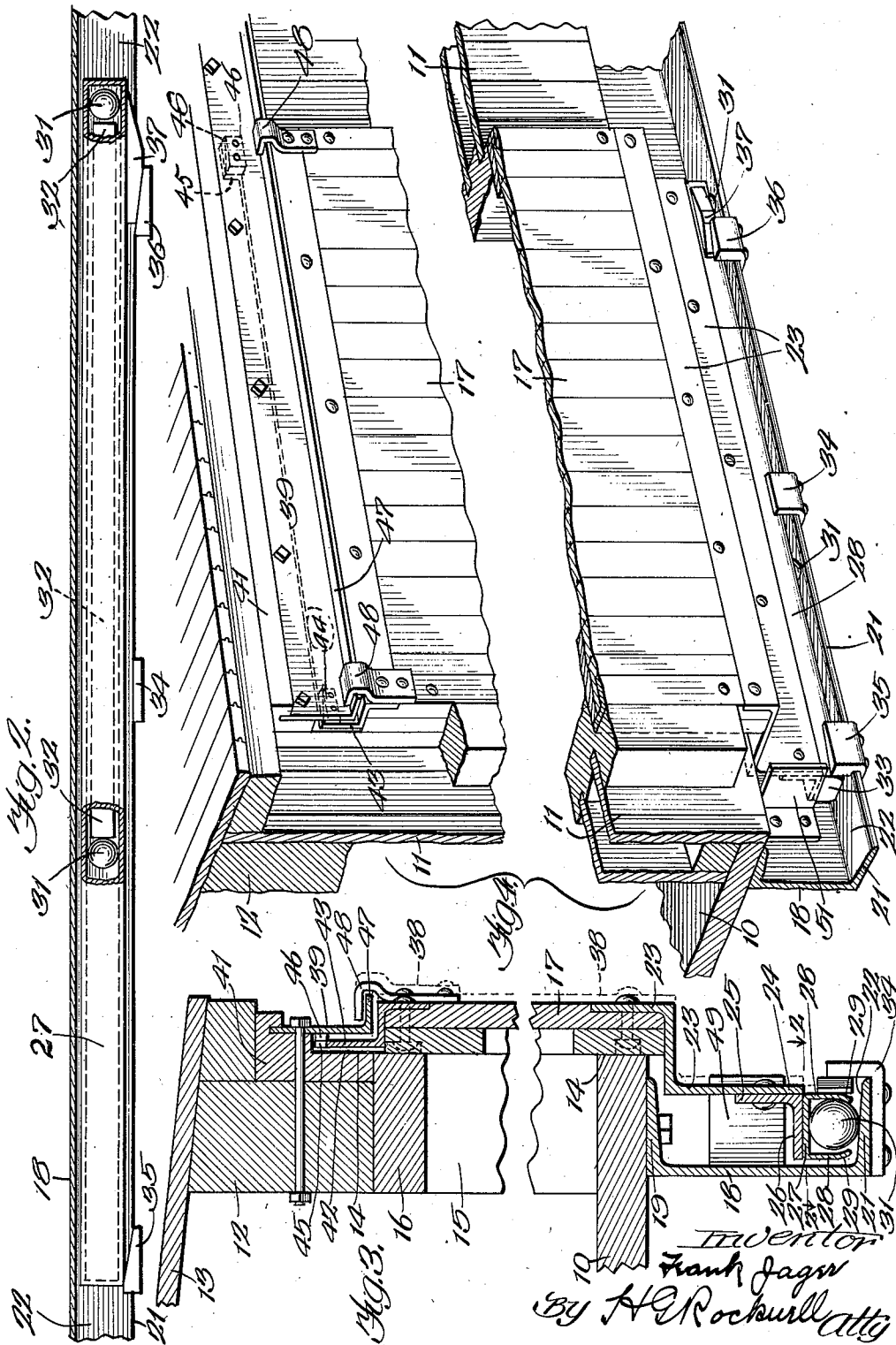
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Patented Jan. 6, 1925.

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UNITED STATES PATENT OFFICE.

FRANK JAGER, OF CHICAGO, ILLINOIS.

CAR DOOR.

Application filed March 18, 1920. Serial No. 366,778.

To all whom it may concern:

Be it known that I, FRANK JAGER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car Doors, of which the following is a specification.

My invention relates to car doors and has for its primary object the provision of an improved construction and arrangement of parts, whereby the liability of damage to the door supporting track and associated parts is minimized; whereby friction between the door and the car siding is eliminated during the opening and closing movements of the door; and whereby the size and hence the serviceability of the elements supporting the door is in no way limited to the thickness of the door nor by liability of their too great projection outwardly from the side of the car.

Other objects and advantages of the invention will appear from the following description, taken in conjunction with the accompanying drawings which form a part of this specification and illustrate the preferred embodiment of the invention.

In the drawings:

Fig. 1 is a fragmentary side elevation of a box car embodying the present invention.

Fig. 2 is a plan view of the portion of the door on a line below 2—2 of Fig. 3, portions being broken away to show the ball bearings.

Fig. 3 is a section on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary perspective view of the box car shown in the preceding figures, portions being sectioned and others broken away to clearly detail the invention.

Reference numeral 10 indicates the floor of a box car, 11 the siding thereof, 12 the upper side beam and 13 the roof. The line 14 in Fig. 3 indicates the plane of the outer surface of the siding of the car, the edge of floor 10 being flush with this surface within the doorway. 15 is the ordinary door opening in the side wall of the car, and 16 the lintel thereof. Numeral 17 indicates generally the door for opening 15, the same being of the sliding type and positioned exteriorly of the siding 11.

In the drawings I have illustrated a wooden door, but the principles of the present invention are readily applicable to steel box car doors.

At 18 is indicated the lower side beam

of a well-known type of box car, said beam consisting of a steel channel with its concavity out-turned, its upper flange 19 supporting the floor 10 and its lower flange 21 being spaced below the floor and positioned interiorly of the outer surface 14 of the side wall of the car. The upper surface 22 of flange 21 forms the bearing surface of the door supporting track of the present invention. It is a characteristic of channel shapes such as that indicated at 18 that the inner surfaces of their edge flanges taper toward the free end of the flange in each instance. Thus the surface 22 slants downwardly and outwardly with respect to the body of the box car.

In applying the present invention to those box cars the underframing of which is differently constructed from that shown in the drawings, I bolt the channel iron 18 in the position shown in Figs. 3 and 4. Obviously variations in the present shape of the element 18 may be made without departing from the spirit of the invention, provided the element includes a track-forming flange 21 spaced below the floor of the car and interiorly of the side thereof.

Secured to the bottom edge portion of door 17 is a door supporting bracket 23 preferably comprising an ordinary commercial Z-bar extending the full width of the door, and having riveted to its lower edge 24 an angle bar 25 one web 26 of which is turned toward the center of the car and positioned directly above the flange 21. Suitably secured against its lower surface, the web 26 carries a shoe 27 spaced above and directly opposed to the surface 22 of the track flange 21. The shoe 27 comprises a piece of channel iron having side flanges 28 the lower edges of which are in-turned as at 29 to retain a set of anti-friction balls 31 interposed between track surface 22 and the opposed shoe 27.

Preferably I employ two of the balls 31 held in suitably spaced relation by means of a sliding spacer block 32. The opposite ends of the shoe 27 are down-turned as at 33 (see Fig. 4) to prevent loss of the balls 31. To retain the lower edge of the car door and the movable door supporting parts 23 to 31 inclusive upon the surface 22, the usual form of retaining brackets 34 are employed, these being applied to the flange 21 and being positioned wholly on the inner side of the plane of the outer surface of the

car siding. In the closed position of the car door as illustrated in the drawings, it is desirable to have the door firmly held against the side of the car. This function is accomplished, as concerns the lower portion of the door, by means of a forward wedge shaped bracket 35, and a rear bracket 36, the latter co-operating with a wedge 37 projecting outwardly from outer flange 28 of the ball retainer. The bracket 35 at the front of the door, and the bracket 36 and wedge 37 at the rear of the door force the lower portion of the door tightly against the car siding. These elements, however, are inoperative except as guiding elements during the actual movement of the door. The track surface 22 being wider than shoe 27 and its flange 28, the door is thrown out of frictional contact with the car siding during its opening and closing movements: this position of the door is illustrated by the dotted line 38 in Fig. 3. It will be noted that a vertical plane passing through the centers of the balls 31 is positioned interiorly of the siding 11, while the door 17 is positioned exteriorly thereof. The door is thus given a strong tendency to move away from frictional contact with siding 11 into the dotted line position 38. This tendency is enhanced by the outward and upward slant of the track surface 22 though the main objects of the present invention may be readily attained with an utterly horizontal track surface.

To provide for the proper positioning and movement of the upper portion of the door I bolt a guide rail 39 against the fascia plate 41 and form a recess 42 in the fascia plate back of the guide rail 39. A guide plate 43 fixedly projects upwardly from the top edge of the door into the recess 42, this guide plate bearing against the inner surface of rail 39 during the movement of the door. To cause the upper portion of the door to bear tightly against the car siding during its closed position, I provide at the front end of guide rail 39 an inwardly extending wedge 44 which forces the forward end of the guide plate 43 toward the car siding and holds the door itself tightly against the siding. At the rear end of guide plate 43 I provide an upstanding stud 45 which, in the closed position of the door is forced inwardly toward the car siding by means of a wedge 46 projecting inwardly from guide rail 39. Wedge 46 lies in the path of movement of the upstanding stud 45 but is positioned above the upper edge of the guide plate 43. The latter plate is of less thickness than the recess 42 thereby permitting the door during its opening and closing movements to move out of frictional contact with the car siding into the dotted line position indicated at 38. Preferably I provide the lower edge of guide rail 39

with an out-turned flange 47, the upper portion of the door being provided with a number of hooks 48 overlying this flange.

The opening movement of the door is limited by means of a steel stop 49 riveted to the track element 18 and positioned entirely beneath the floor of the car and interiorly of the outer side plane 14 of the car. A similar stop 51 limits the closing movement of the door; stops 49 and 51 lying in the path of movement of the door supporting bracket 23.

In the operation of the invention a very slight rearward movement of the door from the closed position shown in the drawings permits the door to move out of frictional contact with the car siding 11 and the anti-friction balls 31 make the further movement of the door extremely easy. When the door slides from open to closed position its movement is very free until the forward edge is forced inward by wedges 35 and 44 and the rearward vertical edge by wedges 37 and 46. The door is, however, readily given sufficient impetus while free from the wedges to cause its inertia alone to accomplish the full operation of the wedges in forcing the inner side of the door tightly against the car siding.

Particular attention is directed to the following advantages arising from the present invention. It is not uncommon for a loaded automobile truck, weighing with its cargo as high as eight or ten tons, to be backed with great force against the side of a car. The very frequent result of this action is the mutilation or breakage of the supporting and guiding elements associated with the lower edge of the door. It will be noted that in my invention these elements are positioned beneath the floor of the car and interiorly of the edge of the floor so that they are entirely removed from damage by trucks and wagons. Even the retaining brackets 34 and wedging brackets 35 and 36 are removed from damage by this source. Heretofore, regardless of whether a door was supported from its upper or its lower edge, these lower door retaining brackets have projected outwardly of the car siding a greater distance than the thickness of the door, thus rendering them liable to breakage due to the backing of trucks and wagons against the side of the car. The arrangement of the door supporting bracket and shoe and the retaining brackets just mentioned eliminates also the danger of breakage of these parts from the sideswiping of cars in switching.

Another advantage of my novel construction and arrangement lies in the reduction of clearances made possible by the removal of all parts associated with the lower portion of the door and heretofore commonly projecting outwardly from the door. A

still further advantage lies in the fact that the track surface 22 is partially sheltered from the weather by the floor of the car, and again, the front and rear door stops 49 and 51 do not, as in many types of outside doors, project outwardly of the outer surface of the door, but are also sheltered by the overhanging heavy floor of the car; thus they are protected from sideswiping and from damage by trucks. Many railroads consider it preferable to support the box car door from its lower edge rather than to suspend it by its upper edge. In doors supported by their lower edges, the diameter of the supporting anti-friction balls has been limited to something less than the thickness of the door. By the use of the present invention, however, the thickness of the door in no way limits the diameter of the anti-friction balls. Larger, hence more serviceable, balls may therefore be used in the present arrangement. A further feature of utility lies in the fact that, where the element 18 is not the lower side beam of the car but is a track-forming element added to the box car a lighter form of track may be substituted than has heretofore been common. Hitherto it has been necessary to provide very strong metal for the tracks carrying the lower edge of a door, due to the fact that these tracks projected beyond the side of the car and, if not made very strong, were mutilated or broken by sideswiping and the action of vehicles backing against them. A track element 18 may thus be employed which is much lighter than the type commonly in use heretofore, though of ample strength to support the weight of the door. It will also be noted that the present invention is commercially adaptable because of the fact that it may be constructed, as illustrated, from steel shapes commonly purchasable on the open market and not from special shapes or castings.

I claim:

1. The combination with a car having a door opening, of a door therefor positioned outside the plane of the car side wall, a channel member providing a door supporting track positioned beneath the car floor and inside the vertical plane of the car side, means extending downwardly below and inwardly of the door whereby said door is supported on and carried by said track, and means for guiding the upper edge of said door.

2. The combination with a car provided with a door opening, of a door for closing said opening disposed outside the vertical plane of the car side wall, a channel member, the lower flange of which provides a track beneath the car floor and inside the plane of the car side wall, and means including an angle shaped bracket extending downwardly and inwardly from said door and ball bear-

ings whereby said door is supported on said track.

3. The combination with a car provided with a door opening, of a door slidable outside said opening and adapted to close the same, a channel member extending on edge longitudinally beneath the floor of the car and inside the vertical plane of the car side wall, said channel opening outwardly, and door supporting means including an angle shaped bracket extending into said channel and adapted to travel on the lower flange of said member whereby the door is supported.

4. The combination with a car having a door opening, of a door for the opening positioned exteriorly of the wall of the car, a door supporting track spaced beneath the car floor and having its upper surface pitched downwardly and outwardly, a door supporting bracket, a shoe associated with said bracket and spaced above said surface, and anti-friction balls interposed between the shoe and track.

5. The combination with a car having a door opening, of a sliding door for the opening positioned exteriorly of the wall of the car, means associated with said car and door whereby the latter, except when in closed position, is free to move out of frictional contact with the car wall, a door supporting track spaced beneath the car floor, and a door supporting bracket associated with said track along a line spaced interiorly of the car with respect to the center of gravity of the door.

6. The combination with that type of car having as an essential part of its frame a longitudinal floor supporting beam provided with an out-turned flange spaced below the car floor and inside the vertical plane of the edge of the latter, of a sliding door for closing an opening located in the car wall above said beam, a door supporting bracket fixed to the door and operatively associated with said flange, and spaced front and back stops for limiting the sliding movement of the door, said stops being fixed to said beam in the path of movement of said bracket and lying wholly below the floor of the car and interiorly of the side thereof.

7. The combination with a car having a door opening above its floor, and a sliding door for said opening positioned exteriorly of the wall of the car, of a door supporting track positioned beneath the car floor and inside the vertical plane of the edge thereof, a door supporting bracket secured to the lower portion of the door and extending inwardly to a point above said track, anti-friction balls of greater diameter than the thickness of the door positioned between said bracket and track, and elements for retaining said balls in this position.

8. The combination with a box car having

a door opening, and a sliding door for said opening movable exteriorly of the outer surface of the car wall, of devices for supporting said door by its lower edge, said devices including a track, a shoe spaced above said track, and anti-friction elements interposed between said track and shoe, said track, shoe and anti-friction elements being all positioned beneath the floor of the car and inside the vertical plane of the outer surface of the wall thereof.

9. The combination with a car provided with a door opening above the floor thereof, of a door therefor, a track mounted beneath the floor, door supporting means extending below and inwardly from the door and adapted to travel upon said track, and means for guiding the top of the door.

10. The combination with a car provided with a door opening above the floor thereof,

of a door therefor, a door supporting bracket secured to and extending below and inwardly of the door, a track mounted beneath and inside the vertical plane of the lateral edge of the floor, and means for slidably supporting said bracket upon said track.

11. The combination with a car provided with a door opening above the floor thereof, of a door therefor, and means downwardly and inwardly offset from the door and extending beneath the floor of the car and inside the vertical plane of the car side, whereby said door is slidably supported.

12. A car comprising a floor, a side wall having a door opening, a door therefor, and means positioned below the door beneath the floor and inwardly with respect to the vertical plane of said side wall, whereby said door is slidably supported.

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