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HOPPER CAR DOOR FRAME

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5 Claims. (Cl. 105—249)

My invention relates to an improved hopper car door frame and is by way of an improvement on the T-shaped frame disclosed in the A. Campbell United States Patent No. 1,912,620 of June 6, 1933.

My invention resides in an improvement on the T-shaped rolled section employed for the sides and bottom members of a hopper like structure used to form three sides of a four sided frame. It is a particular object of my invention to provide a special T frame section which will be reinforced adjacent the outer marginal edge of the frame and be of a form suitable for bending into a properly formed and well aligned frame member.

A specific object of my invention is to provide an improved T-shaped rolled section which will have a reinforcement in the form of a relatively heavy concentration of metal adjacent the marginal edge of the flange and which will be of such shape as to provide a pocket between the said reinforcement and the stem of the T for the reception of a forming die.

A more specific object of my invention is to provide a frame having a bulge formation presenting a wedge shaped wall extending around the sides and bottom of the frame.

For further comprehension of my invention, reference may be had to the accompanying drawings, wherein:

Fig. 1 is a longitudinal elevational view of a part of the side of a hopper car showing as much of the car as necessary to show a frame and its associated door.

Fig. 2 is an elevational frontal view of the door and frame shown in Fig. 1 as viewed from right to left.

Fig. 3 is a sectional plan view taken through the frame and door and on a line corresponding substantially to a line 3—3 of Fig. 1.

Fig. 4 is a sectional view on an enlarged scale taken through the lower portion of the frame and door as taken on a line 4—4 of Fig. 2.

Fig. 5 is a sectional view taken through the T-frame section and showing the manner in which the recessed portion of the section receives a die block to govern the alignment of the frame during the bending operation.

Fig. 6 is a frontal elevational view of a frame embodying my improved T-frame section.

Fig. 7 is a side elevational view of the frame shown in Fig. 6 as viewed from right to left.

In said drawings my improved frame is shown as applied to a W type of hopper car including a longitudinally sloping floor 18 and inner and outer side walls at 11 and 12 respectively, the latter sloping inwardly downwardly, and an upper sloping floor 13, said respective walls 10, 11, 12 and 13 having their edge portions defining the margins of an opening.

Positioned in the opening to overlie the side walls and the bottom floor and underlie the upper sloping floor is the frame A and hinged thereto is the door B.

The frame A includes a top member 14 preferably formed of an angle bent to shape and having hinge butts 15—15 welded or otherwise secured thereto, whereby the door B is mounted by means of pivots 16.

The lower part of the frame is of hopper like form bent to shape to conform to the shape of the hopper and includes inner and outer legs welded to the top member 14.

The stiirrup forms three sides of the opening with inner and outer legs as at 17 and 18 and a bottom section 19, extending between said legs 17 and 18.

The T-shaped member which is preferably formed of a rolled section includes a wide flange section 20 and a centrally disposed outstanding stem 21. Adjacent the outer margin of the frame my improved frame is formed with a bulb portion 22 which is preferably of triangular shape with surfaces 23 and 24 inclined relatively to each other to present a wedge shaped protuberance with the outer surface 25 inclined steeply relatively to the main body of the flange section 20.

The surface 23 of the bulb in combination with surfaces 25 of flange 20 and 26 of the stem 21 form the contour of a pocket 27 for the reception of a forming die block as indicated at 28.

The door B is of the usual pan shape with flat body portion 29 and upturned flanges 30, 31, 32 and 33, the latter being inclined outwardly to be substantially parallel to the outer surface 24 of the bulb. The inner surfaces of side flanges 31 and 32 of the door by reason of the wedge shaped formation of the T frame are permitted to lie in close proximity to the apex of the bulb as formed by surfaces 23 and 24, when the door is in closed position. It will be understood that the tapering construction of the frame flanges act as guides to center the door and consequently close fits between the door flanges and frame may be tolerated for the purpose of obtaining a tightly fitting door.

The door when in closed position is arranged to abut the edges of the frame and it is therefore essential that a smooth and level surface be obtained on the frame throughout its bearing contact with the door.
The aim of my improvement is to obtain even bearing throughout the length of contact with the door. It will be noted, that owing to the sloping nature of the hopper outer side walls, there is an undesirable twist in the outer leg of the stirrup as indicated at 34 and in the absence of the construction embodied in my improvement for retaining the outer edge of the frame in fixed relation to the die there is a tendency for the heavy stem construction of the T bar to control the direction of draw of the material, which has the effect of distorting the flanges of the frame, resulting in a warped and uneven bearing surface where contact with the door is made.

The tendency of the frame to distortion is further enhanced by the fact that in most constructions the body of the door is not at right angles to the sloping bottom floor and there is therefore an angle bend between the bottom and sides of the frame as indicated at 35.

With my improved construction I am able to control the alignment of the outer edge by reason of the die block engaging with the guiding surface 24 and such deformation as normally takes place due to departure from right angle bends is then confined to the stem and the inner flange of the T bar.

What I claim is:

1. As a new article of manufacture an improved T-shaped rolled section of the character described for incorporation as the stirrup member of a hopper car door frame, said T-shape having a relatively thin flange and an outstanding centrally disposed stem and a marginal reinforcement at the outer edge of the flange, said stirrup member being of U-shape with spaced apart depending legs and a connecting lower beam portion and adapted to be bent to shape in a forming die, said reinforcement being in the form of a concentration of metal providing for increased wall thickness adjacent the front marginal edge of the stirrup, said increased wall thickness being of wedge shape and separated from the outstanding stem by a comparatively thin flange section to provide a recess intermediate the stem and marginal reinforcement for receiving the forming die.

2. In a railway car hopper door frame arranged for application to a hopper having a bottom and side walls, said frame having a stirrup portion of T shape disposed with the flange extending flatwise around the bottom and side walls and the stem outstanding from said flange, said stirrup being adapted to be bent to shape in a forming die; and an upper beam member meeting with and united to the stirrup portion, said beam member having hinge butts; a door pivotally mounted on the hinge butts, said door being formed of pan shape with upstanding flanges arranged to embrace the stirrup portion of the T adjacent the door with a marginal reinforcement in the form of a relatively heavy concentration of metal of greater thickness than the flange overlying the hopper wall plates, said concentration of metal being of triangular formation to provide a wedge shaped flange presenting a wall surface coating at a keen angle to the hopper walls and disposed adjacent the upstanding flanges of the door, said wedge shaped flange having a recess formed therein adjacent the outstanding flange to receive and hold the forming die.

4. A closure for a hopper opening of a railway car comprising, in combination, a frame for surrounding said opening including a stirrup member for overlying the bottom and sides of the opening and a top member joining said sides, said stirrup member having a T-shaped cross section with the stem outstanding and the outer margin of the flange being thickened, said thickened margin having a surface inclined toward said hopper opening and providing an outflared guiding surface along the bottom and sides of said frame, and a pan shaped door hinged to said top member and arranged to be guided into tight fitting engagement with the juxtaposed edges of said frame by the guiding action performed by said inclined guiding surface of said thickened margin in cooperation with the side and bottom flanges of said pan shaped door.

5. A closure for a hopper opening of a railway car comprising, in combination, a frame for surrounding said opening including a stirrup member for overlying the bottom and sides of the opening and a top member joining said sides, said stirrup member having a flange portion defining the bottom and sides of said opening and an outstanding stem portion spaced from the outer margin thereof, said outer margin being thickened and having an outflared wedge shaped wall extending around said bottom and sides, and a pan shaped door hinged to said top member and arranged to be guided into tight fitting engagement with the juxtaposed edges of said frame by the guiding action performed by said wedge shaped wall in cooperation with the side and bottom flanges of said pan shaped door.

GEORGE B. DOREY.

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