

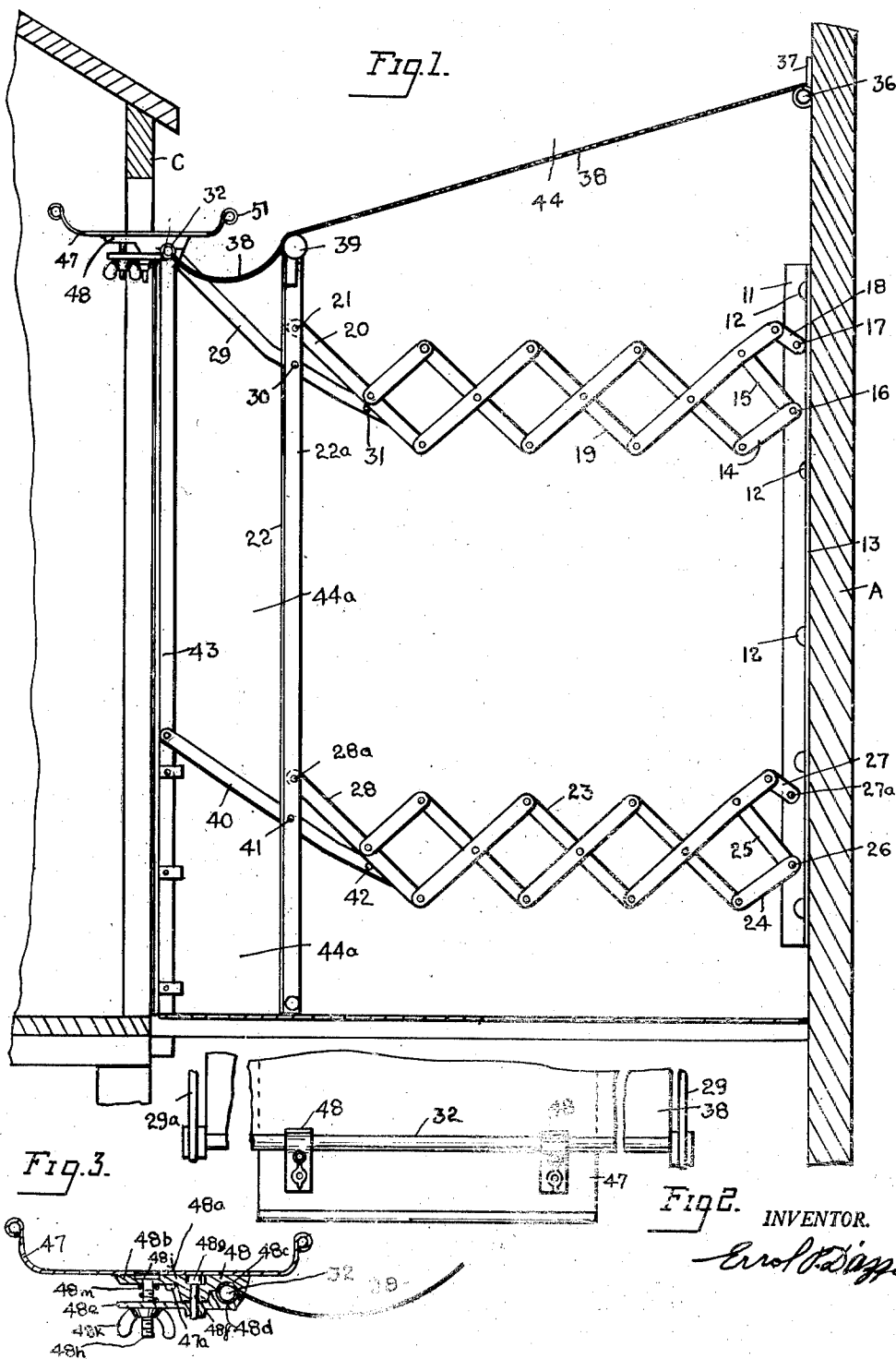
July 9, 1957

E. P. D'AZZO
LOADING DOCK CANOPY

2,798,502

Filed Aug. 27, 1953

3 Sheets-Sheet 1



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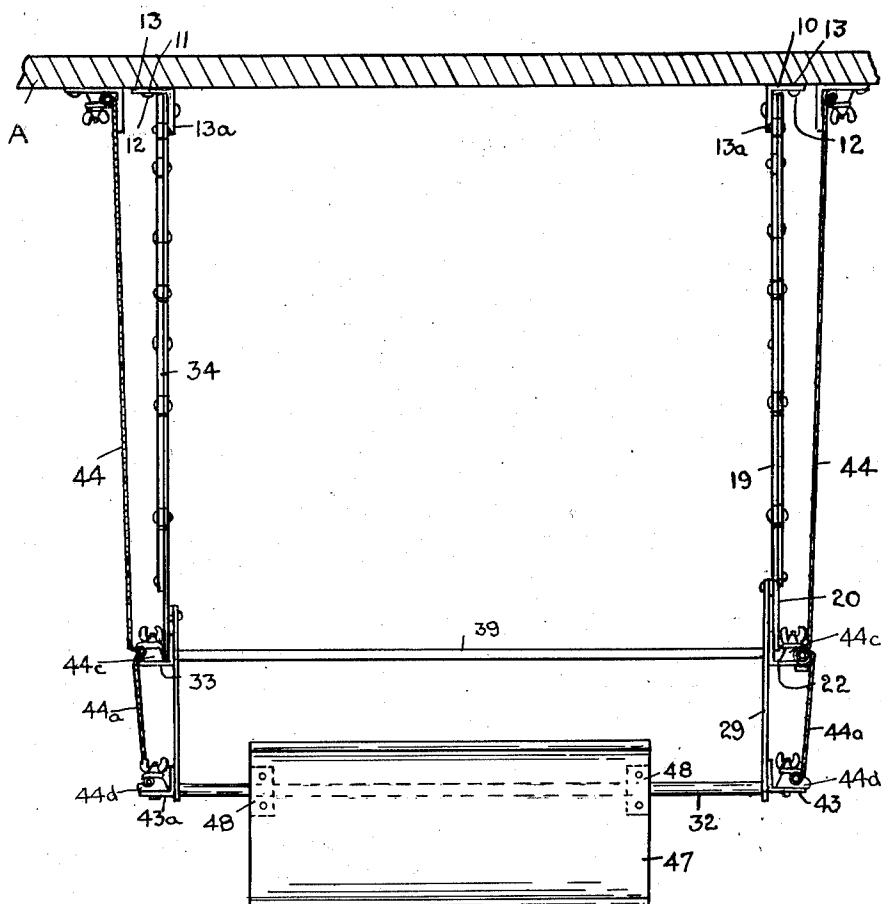


Fig. 4

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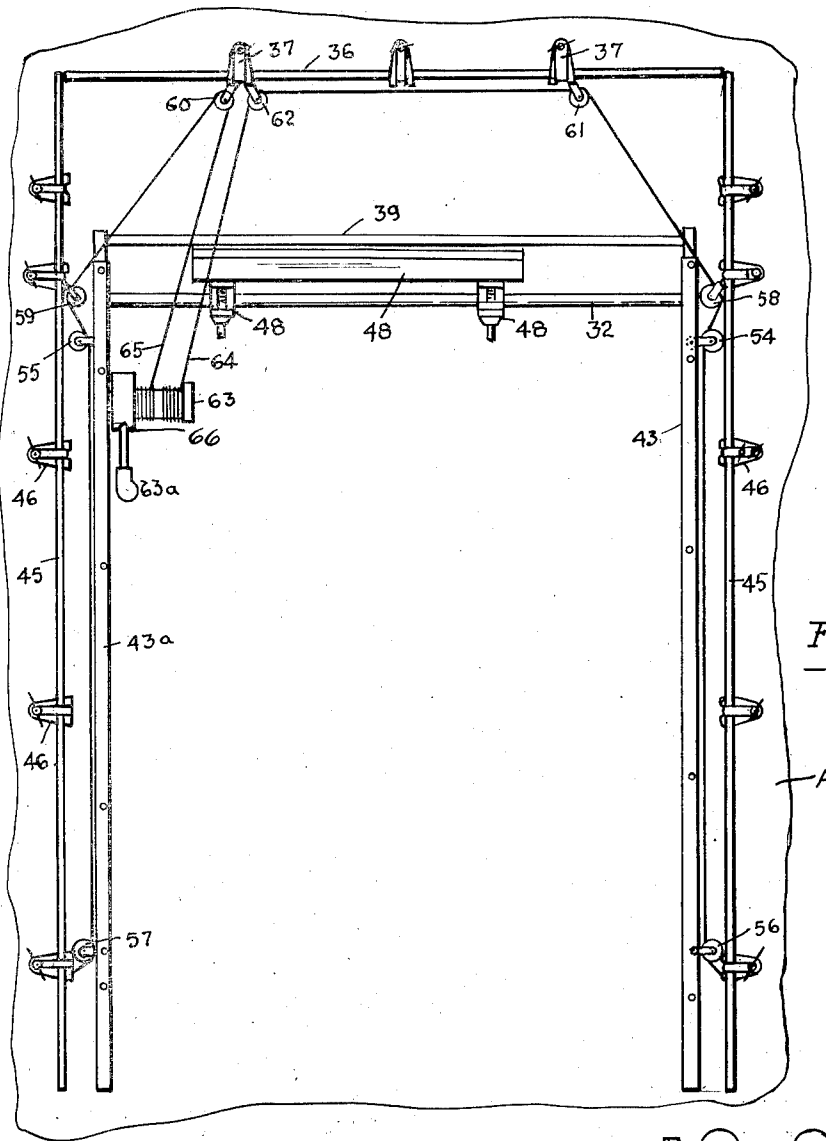


Fig. 5.

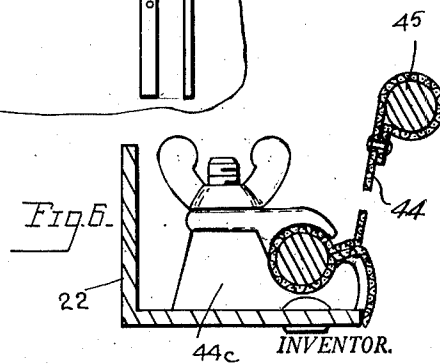


Fig. 6.

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LOADING DOCK CANOPY

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7 Claims. (Cl. 135—5)

This invention relates to an improved loading dock canopy construction, and embraces means for protecting the gap or open space between the outer end of the canopy frame and its covering and the side of the freight car, which has been located opposite the loading door opening, which is protected by the canopy, so that rain or drip water or both can be deflected to the side of the canopy.

Another feature of the invention is the provision in a canopy frame and flexible rain protecting cover, with a drip deflecting pan, which is horizontally shiftable on the frame of the canopy, so that it can always be fitted in the doorway of the freight car, to bridge the open space between the outer end of the canopy frame and the side of the freight car adjacent thereto.

A still further feature of the invention is the provision of a main collapsible canopy frame with an auxiliary frame, which is constructed to drop by gravity action to an open position, in such manner that it establishes pressure engagement with the side of the freight car.

A still further feature of the invention is the provision of a main canopy frame with vertical rear angle bars, and vertical movable outer angle bars connected to the rear angle bars by means of link-lever expansion and contraction jointed members, together with stiffening bars and clamps for securing the vertical rear edge of the side canopy cover to the building wall, and similar clamps and a pair of stiffening bars for securing the forward edge of the side canopy cover or curtain to the forward or movable angle bars, and thereby dispensing with the present expensive lacing practice.

A still further object of the invention is the construction of a collapsible canopy for loading docks or platforms, which will give maximum rain and wind protection, which can be opened and closed with minimum effort, and which will give prolonged service against all weather conditions.

A further object is provision of a canopy with main side curtains and forwardly extending auxiliary side curtains, the position of extension of the auxiliary side curtains being adjustable independently of the extension of the main curtains, the auxiliary side curtains being caused to collapse automatically when the main side curtains are retracted.

With the above and other objects in view the invention comprises certain new and useful constructions, combinations and arrangements of parts, clearly described in the following specification, and fully illustrated in the drawings, in which:

Fig. 1 is a side view showing the improved canopy in its open position, with one side curtain removed for illustrative effect.

Fig. 2 is a fragmentary plan view showing the adjustable drip pan in tilted inoperative position.

Fig. 3 is an enlarged detail sectional view thereof, showing the clamping means for holding the drip pan on the folding canopy frame, for longitudinal and radial adjustment.

Fig. 4 is a horizontal sectional view, showing the drip pan in horizontal service position.

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Fig. 5 is a vertical sectional view, showing the rear clamping bars.

Fig. 6 is a detail enlarged sectional view of one of the movable outer or forward angle bars, showing the means for clamping the side curtain thereto.

Referring to the accompanying drawings, which illustrate the practical embodiment of my invention, 10 designates one vertical rear angle bar and 11 the companion rear angle bar, which is mounted in parallel relation to the angle bar 10, bolts 12 being used for securing the rear flanges 13 of the angle bars, in such manner that the outer supporting flanges 13a will be located inwardly of said rear or base flanges 13.

On the supporting flange 13a of the angle bar 11, the rear supporting links 14 and 15 of the lazy-tong mechanism or extension and collapsible arm 19 are pivotally secured by means of the bolt or rivet 16, and above this bolt or rivet another bolt or rivet 17 is secured to the supporting flange 13a, and on this bolt or rivet the short supporting link 18 is pivoted.

The outer supporting link 20 of the mechanism or arm 19 is pivoted by the bolt or rivet 21 to the supporting flange 22a of the movable outer angle bar 22.

A similar and lower lazy-tong mechanism or collapsing supporting arm 23 is supported by its rear links 24 and 25 on the pivot bolt 26, on the supporting flange 13a, and by the short link 27 and pivot bolt 27a on the same supporting flange. The outer link 28 of this arm 23 is pivoted on the bolt or rivet 28a of the supporting flange 22a of the movable angle bar 22.

Adjacent to the outer supporting link 20 of the arm 19, a lever bar 29 is pivoted by the bolt or pin 30 to the supporting flange 22a of the angle bar 22. The inner end of this lever bar 29 is provided with a lateral pin or bolt 31, which engages the lower portion of the outer supporting link 20, well inwardly of the angle bar 22, when the arm 19 is in open position.

The forward end or portion of the lever bar 29 is connected to one end of the horizontal rod or bar 32, and in open position the lever bar 29 projects upwardly in angular relation to the movable outer angle bar 22. The other end of the horizontal bar or rod 32 is secured to a similar lever bar 29a which is pivoted on the companion outer angle bar 33. The movable angle bar or post 33 is similarly connected to the rear angle bar 10, by means of the use of an upper lazy-tong or extension arm 34, and a similar lower lazy-tong or extension arm.

Above the rear supporting angle bars 10 and 11, a canopy clamping bar 36 is secured in place by means of the manual clamps 37, attached to the building wall A. The canopy roof fabric 38 is formed with a tubular hem which receives this rod, and is clamped in place against the building wall A by means of the rod or bar 36 and the clamps 37. This fabric is extended over the cross bar or rod 39, secured to the upper ends of the movable angle bars 22 and 33, and is then formed with another tubular hem through which the horizontal bar 32 extends.

The movable outer angle bar 22 is provided with a lever 40, pivoted by the bolt 41 thereto, and the rear end of this lever is provided with a lateral stop pin 42, which engages the supporting link 28, and the forward end of this lever is pivotally connected with the upper end of a short vertical pendant bar 43.

On each side of the canopy frame a side fabric curtain 44 is secured along its rear vertical end by the stiffening bar 45 and the clamps 46 to the building wall A, outwardly of the rear angle bar 11 on one side and the angle bar 10 on the other side, by a similar stiffening bar and clamp set. The upper edges of these curtains are secured by stitching or otherwise to the roof fabric or cover 38.

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The forward end of one side curtain is secured to the end of the horizontal bar or rod 32, and the forward end of the other side curtain is secured to the other end of the same rod 32. In this way pendant auxiliary curtains 44a are provided forwardly of the movable front angle bars 22 and 33. These auxiliary side curtains are formed with hems, and are adjustable in position independently of the main side curtains 44, because of the free pivotal action of the supporting levers 29 and 40. The auxiliary side curtains collapse automatically when main side curtains 44 are retracted. The action results because links 20, 28 pivot as the multiple link arms are retracted. Links 20, 28 bear on stop elements 31, 42 to pivot levers 29, 40 and cause the spacing between bars 22, 33 and 43, 43a to close. The pendant bars 43, 43a there being one on each side of the canopy frame, serve to stretch the fabric of the side curtains 44a, which is subject to the gravity effect of its own weight and that of the lever arms to swing automatically to an extended open position.

The distance between the movable front angle bars 22 and 33 is made greater than the width of the maximum freight car doorway. In practice a freight car is switched to a side track, laid close to a building wall having a loading door opening. It seldom happens that the vertical center line of the freight car doorway is lined up close to the center line of the building doorway, so that it is necessary to allow for considerable misalignment of the freight car doorway with the building doorway.

It is also difficult to provide a canopy frame and covering which can be made standard in production, and which will have a tailored fit between the building wall of a warehouse and a freight car on an adjacent side track. In any case a small gap is usually left between the outer end of the canopy frame, and rain falls directly into this gap and drains into this gap from the railroad car, to fall on the workers and goods moving to and from the freight car to the building through the loading dock or platform. This may result in extensive damage to the goods transferred in either direction.

For the solution of this problem, I provide a metal or rigid drip pan 47, preferably of aluminum or other non-corrosive material, which is supported on the fabric covered bar 32, by means of the clamps 48, which includes the clamp jaw 48a, having the laterally extended integral base 48b, which is attached to the bottom of the pan 47 by means of one or more rivets 47a. The jaw 48a is in the form of a block having an arcuate or concave seat 48c, to engage one side of the fabric covered rod 32. The opposite side of the fabric rod or bar 32 is engaged by the concave jaw 48d, formed on the end of the movable jaw member or bar 48e. A dowel pin or post 48f is secured by its head 48g to the jaw member 48a and has a free sliding fit with the bar 48e. The jaw bar 48e is clamped against the fabric covered rod or bar 32 by means of the bolt 48h, secured in place by its head 48j to the base 48b, which is engaged by the wing nut 48k. A coil spring 48m is mounted on the bolt 48h and exerts spring tension to separate the movable jaw member from the jaw member fixed to the drip pan. By loosening the wing nut the drip pan may be shifted longitudinally on the fabric covered bar, and radially on this bar. The roof fabric extends between the two jaws, as shown in Fig. 3. Two or more sets of bolts, clamps and wing nuts are used.

In its service drainage position, the drip pan is supported horizontally on and above the fabric covered bar or rod 32, and in its non-service and non-drainage position, the drip pan is allowed to swing by gravity under the fabric covered bar or rod 32. In its service position the rear longitudinal edge of the drip pan overlies the forward and flexible portion of the roof fabric, at 51, which thus forms a transverse drainage trough for the roof covering. The opposite and forward side of the drip pan is then adapted, in its service position, to extend into the freight car, and thereby bridge the gap between

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the freight car and the outer end of the canopy frame, or the auxiliary frame thereof. The drip pan is longitudinally adjustable on the fabric covered bar or rod 32, so that it may be properly aligned with the door opening of the freight car, when the freight car has been stopped in a position out of alignment with the loading dock platform and door opening. Since the canopy frame is made considerably wider than the average or maximum width of a freight car doorway, compensation is thus provided for irregular stopping of the freight car. The longitudinal sliding of the drip pan, within the canopy frame and covering, insures that protective drainage of water entering the gap between the canopy frame and the freight car will be diverted to the side of the working pathway thus established between the freight car doorway and the loading dock doorway, with maximum protection for workers and goods handled by them.

The canopy frame may be collapsed by manually retracting movable bars 22, and 33, whereupon the multiple link arms will be withdrawn and the main side curtains 44 will collapse up to wall A. At the same time the auxiliary side curtains 44a will collapse automatically by the action of links 20, 28 on pins 31, 42 of levers 29, 40 as explained above. As an alternative means of collapsing the canopy frame from its fully open position there are provided a pair of pulleys 54, 56 mounted on bar 43, a pair of pulleys 55, 57 mounted on bar 43a, pulleys 60, 61 and 62 secured to brackets 37 on wall A, and pulleys 58, 59 secured to rods 45 at wall A. A windlass or winding mechanism 63 is mounted on bar 43a. The pulley cords 64 and 65 are wound in separate coils on the spool of the winding mechanism. Cord 65 passes over pulleys 60, 59, 55 and 57 and its end is tied to a bracket on rod 45. Cord 64 passes over pulleys 62, 61, 58, 54 and 56, and is tied to a bracket on the other rod 45. When the cords are wound up on the spool they pull simultaneously on bars 43, 43a to retract the canopy frame. The windlass spool or drum is actuated by means of a conventional worm gear disposed in gear box 66 operated by handle bar 63a. The canopy frame is held by this worm gear from accidentally opening. To open the canopy frame the handle 63a is turned manually in a reverse direction while the bars 22, 33 are pushed forward manually. Normally the weight of the bars 22, 33 and the supported fabric side walls will be sufficient to cause the multiple link arms to extend forwardly with a minimum exertion of manual effort as the cords 64 and 65 are unwound.

By means of the auxiliary frame, an automatic take-up is provided between the main canopy frame and the freight car, which compensates for differences between narrow freight cars and wider freight cars, and at the same time the roof fabric covering for the main canopy frame is maintained tight and in best drainage condition, as a result of the fact that the main frame of the canopy can be extended to maximum at all times, instead of being adjusted to meet the conditions caused by the presence of a wider freight car, or a narrower freight car.

Due to the fact the main canopy frame is fully extended in any and all service conditions, and is always used with the roof fabric cover in maximum taut condition, no folding of the roof fabric to provide pockets for rainwater to collect, results. The roof fabric between the main canopy frame and the forward end of the auxiliary pressure frame is allowed to form a variable drainage trough, regardless of the amount of its opening, and the allowance made for this opening movement is such as to meet all variations in the widths of the freight cars handled.

The opening movement of the main canopy frame moves the auxiliary forward frame into position where it drops by gravity against the side of the freight car, and no calculation of this opening need be made, as the opening movement of the auxiliary frame takes place by a gravity action and ends when pressure contact is made by the auxiliary frame with the side of the freight car.

When this takes place the main canopy frame is under

maximum tightness and a flexible fabric trough is provided at the lower end of the roof covering.

Having described my invention I claim as patentable:

1. A folding canopy having a pair of opposing multiple-link supporting arms, said arms being spaced apart and disposed parallel to each other, rear supports for the multiple-link arms, forward vertical bars having pivotal connection with the multiple-link arms, a cross bar connecting the upper ends of the forward vertical bars to each other, a lever pivoted on each of said forward vertical bars, a horizontal bar connecting the forward ends of the levers to each other, each of said levers having a stop on its rear end to engage one of said multiple-link arms, a drip pan positioned on and movable with the horizontal bar, and means for securing the drip pan on the said horizontal bar in a horizontal plane for longitudinal adjustment thereon.

2. A canopy frame having supporting side arms, rear supports for said side arms, forward supports for said side arms, a roof fabric secured over the side arms at its rear end and extending forwardly, a cross bar connecting the upper parts of the forward supports to each other, said cross bar being connected to the forward supports at a lower level than the rear end of the roof fabric and providing a support for said roof fabric, a second cross bar movably supported on the forward supports forwardly of the first-named cross bar, said second cross bar being connected to the forward end of the roof fabric to maintain a transverse drainage trough between the two cross bars, and a drip pan longitudinally adjustable on the second-named cross bar and securable thereto so that said drip pan may be held in a horizontal plane and centered within the doorway of a freight car.

3. A canopy frame having a pair of extendable multiple-link arms, said arms being spaced apart and disposed parallel to each other, rear vertical supports attached to said arms, forwardly disposed movable vertical bars pivotally connected with said arms, a first cross rod connecting said movable bars to each other at their upper ends, a second cross rod, a plurality of levers pivotally connected to said bars and supporting the second cross rod, and a drip pan carried by and horizontally adjustable on the second cross rod.

4. A canopy comprising a pair of opposing extendable multiple-link arms, said arms being spaced apart and disposed parallel to each other, rear vertical supports attached to said arms, a first pair of forwardly disposed movable vertical bars pivotally connected to said arms, a first cross rod connecting the vertical bars to each other at their upper ends, a second pair of movable vertical bars disposed forwardly beyond the first pair of bars, a second cross rod connecting the second pair of vertical bars, and a plurality of levers, each one of said levers being pivotally connected to one bar of the first pair of bars and to one bar of the second pair of bars, each of said levers having a portion extending rearwardly beyond the first pair of vertical bars, said portion carrying a stop element arranged to engage a forward link of one of said arms, whereby the spacing between the first pair of bars and the second pair of bars may be changed without changing the position of extension of said arms, with the stop elements limiting the maximum spacing between the first and second pair of bars by engagement with the forward links.

5. A canopy comprising a pair of extendable multiple-link arms, said arms being spaced apart and disposed

parallel to each other, rear vertical supports attached to said arms, a first pair of forwardly disposed movable vertical bars pivotally connected to said arms, a first cross rod connecting the vertical bars to each other at their upper ends, a second pair of movable vertical bars disposed forwardly beyond the first pair of bars, a second cross rod connecting the second pair of vertical bars, a plurality of levers, each one of said levers being pivotally connected to one bar of the first pair of bars and to one bar of the second pair of bars, each of said levers having a portion extending rearwardly beyond the first pair of vertical bars, said portion carrying a stop element arranged to engage a link of one of the supporting arms, a first pair of side curtains supported between said first pair of bars and another pair of rear supports, and a pair of auxiliary side curtains supported between said first pair of bars and said second pair of bars, whereby the extension of the auxiliary side curtains may be changed without changing the position of extension of said first pair of side curtains.

6. A canopy comprising a pair of extendable multiple-link arms, said arms being spaced apart and disposed parallel to each other, rear vertical supports attached to said arms, a first pair of forwardly disposed movable vertical bars pivotally connected to said arms, a first cross rod connecting the vertical bars to each other at their upper ends, a second pair of movable vertical bars disposed forwardly beyond the first pair of bars, a second cross rod connecting the second pair of vertical bars, a plurality of levers, each one of said levers being pivotally connected to one bar of the first pair of bars and to one bar of the second pair of bars, each of said levers having a portion extending rearwardly beyond the first pair of vertical bars, said portion carrying a stop element arranged to engage a link of one of the supporting arms to space the second pair of bars a maximum distance from the first pair of bars, whereby the spacing between the first pair of bars and the second pair of bars may be changed without changing the position of extension of said arms with the stop elements limiting the maximum spacing between the first and second pair of bars by engagement with the forward links, and whereby retraction of said arms causes the spacing between the first and second pair of bars to close.

7. A canopy according to claim 6, further comprising a pair of side curtains supported between said first pair of bars and another pair of rear supports, a pair of auxiliary side curtains supported between said first pair of bars and said second pair of bars, and a drip pan carried by and horizontally adjustable on the second cross bar, whereby extension of the auxiliary side curtains may be changed without changing the position of extension of said first pair of side curtains, and whereby retraction of said arms causes the auxiliary side curtains to be collapsed as the spacing between the first and second pair of bars closes.

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