Sept. 24, 1935. R. H. CARTER 2,015,548

SPOOL RACK

Filed Aug. 18, 1932 5 Sheets-Sheet 1

Fig. 1.

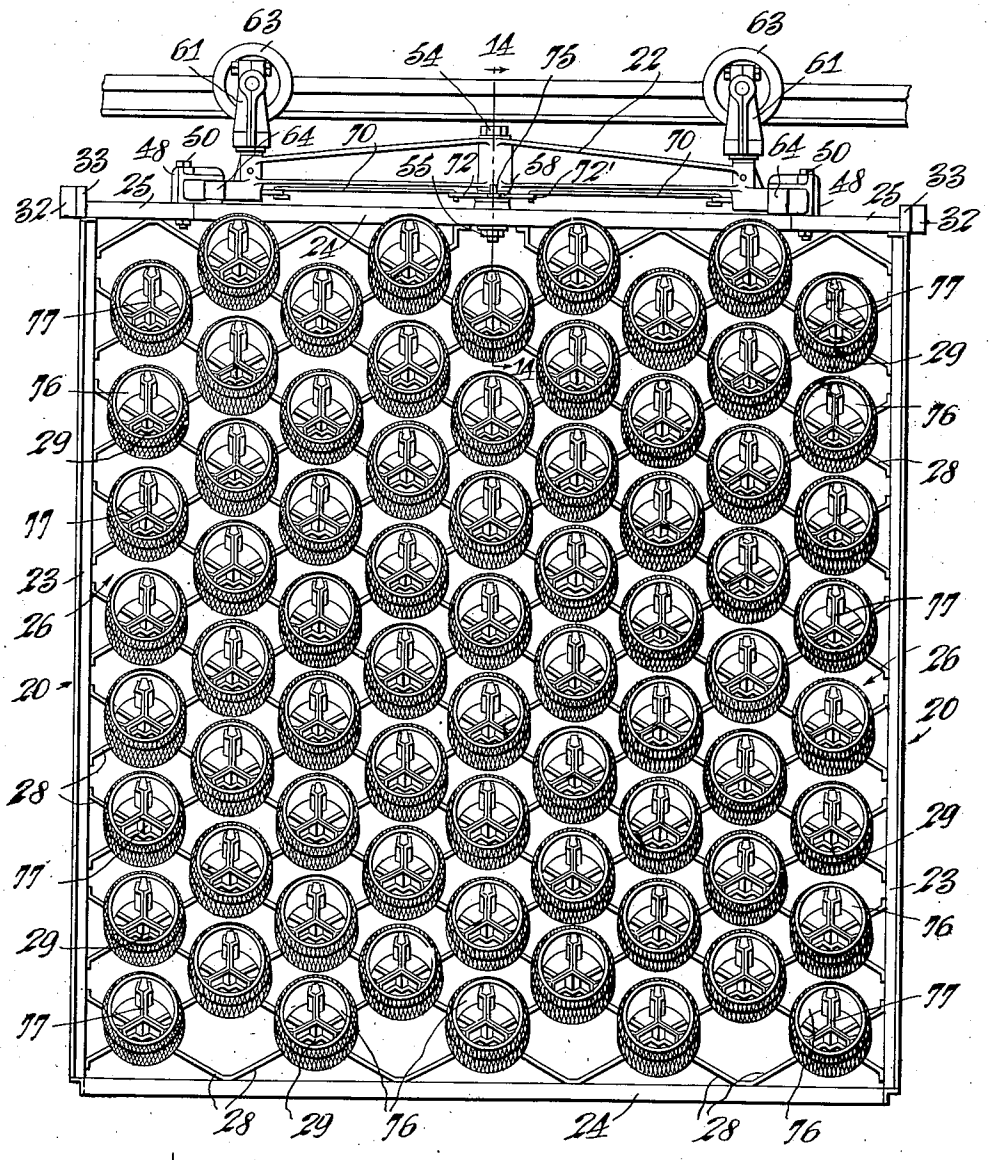
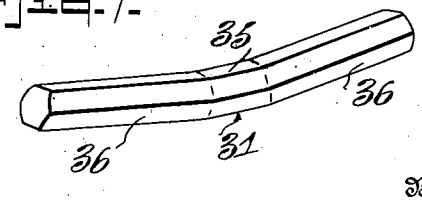


Fig. 7.



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SPOOL RACK

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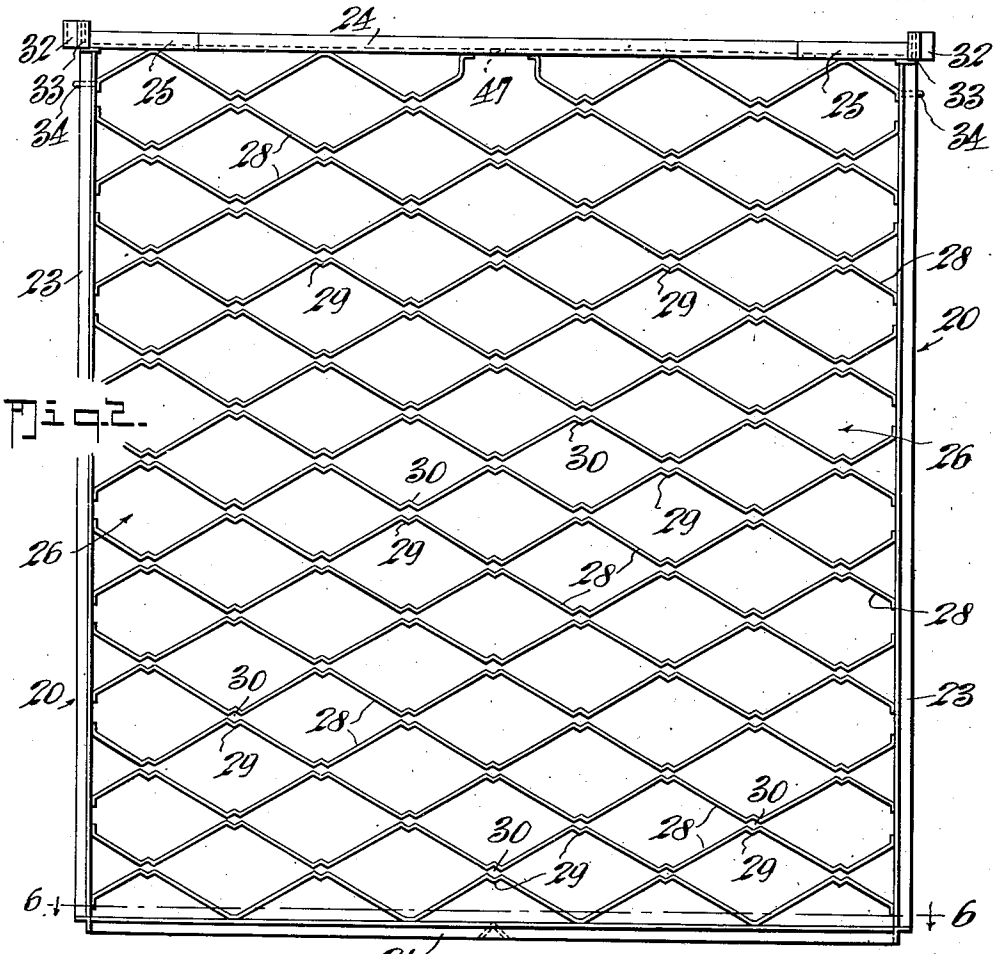


Fig. 2.

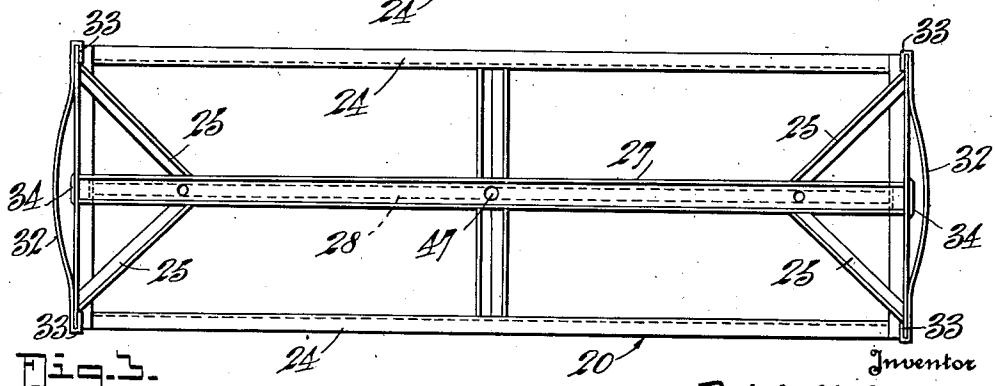


Fig. 3.

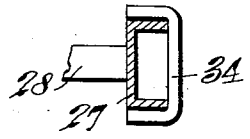


Fig. 4.

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SPOOL RACK

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Fig. 5.

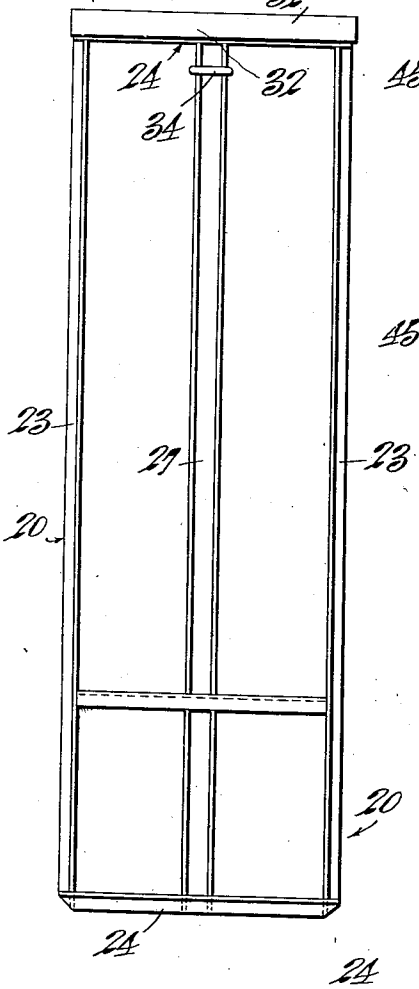


Fig. 8.

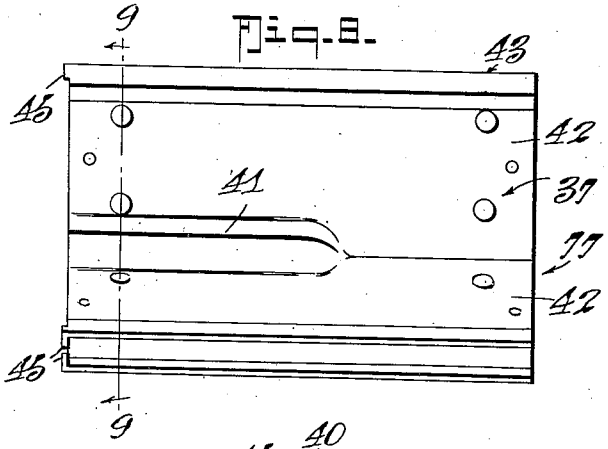


Fig. 9.

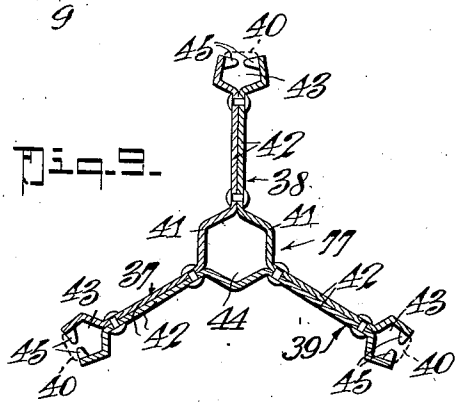
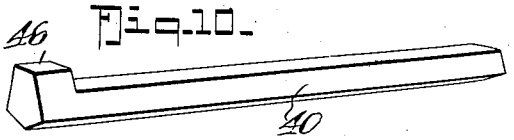


Fig. 10.



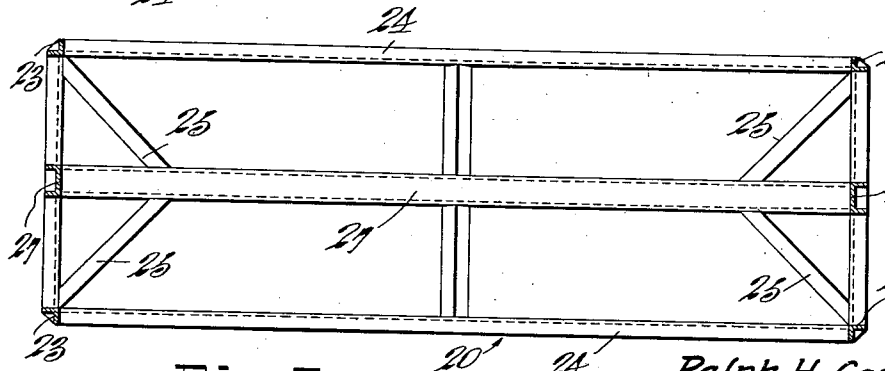


Fig. 6.

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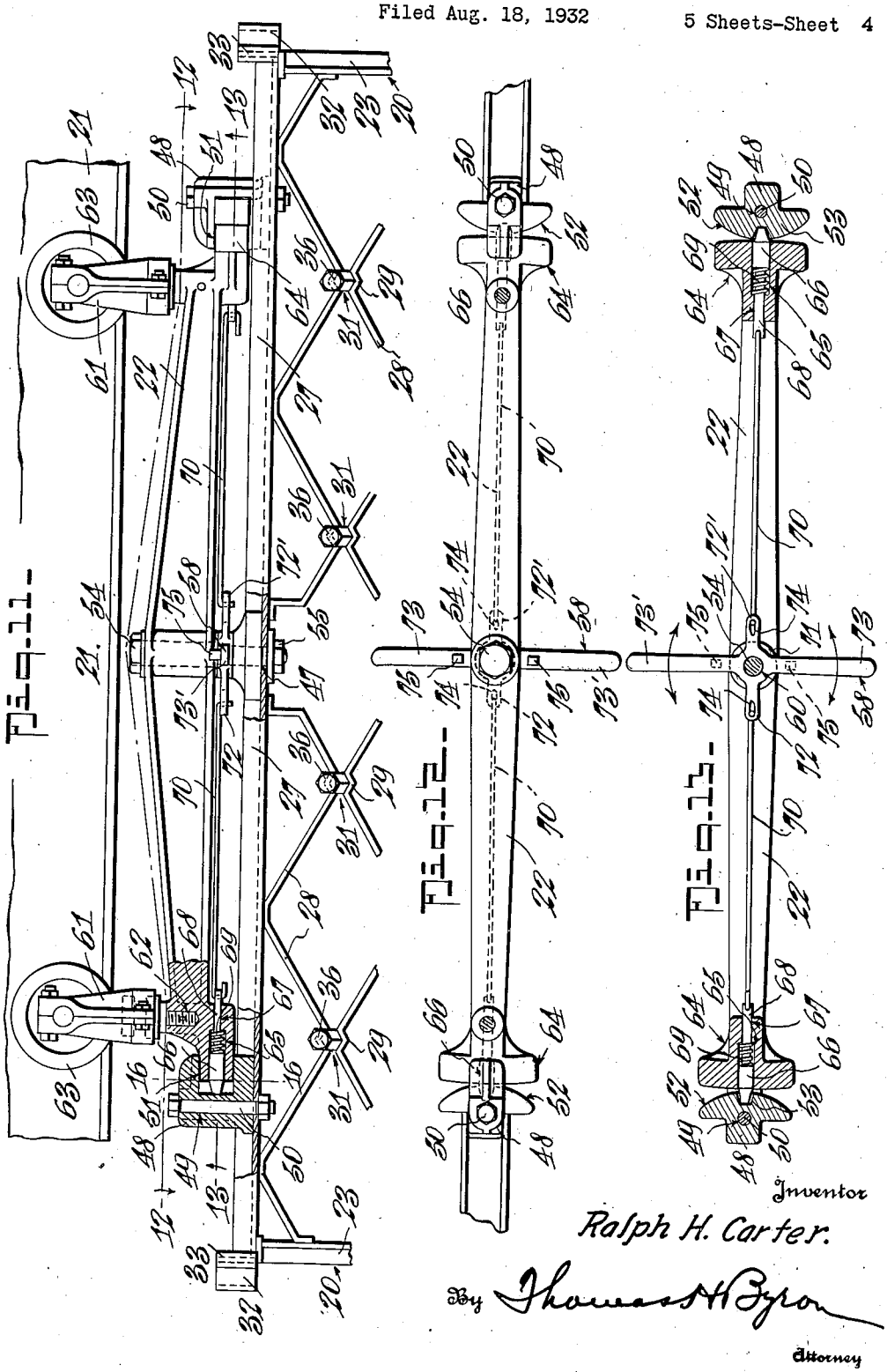


Fig. 11.

Fig. 12.

Fig. 13.

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SPOOL RACK

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Fig. 14.

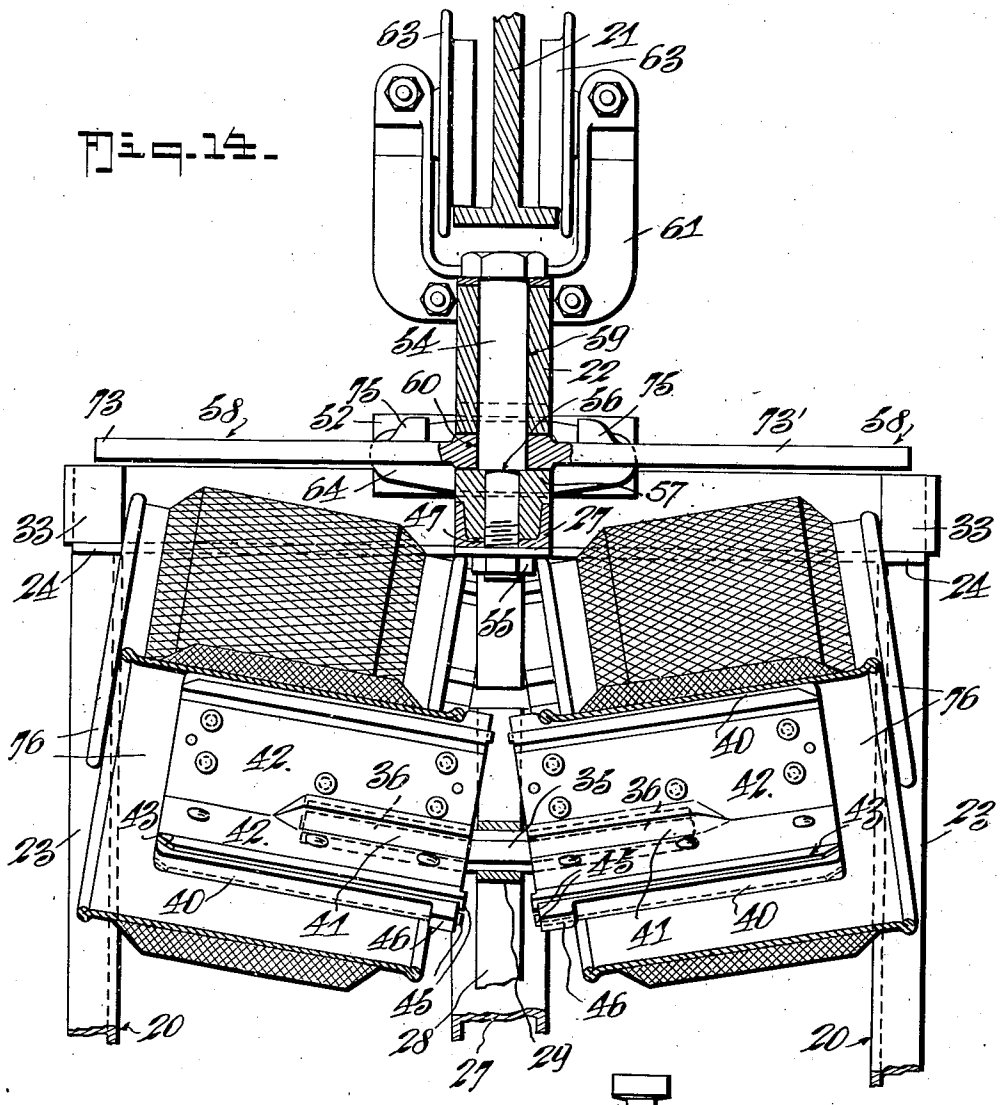


Fig. 15.

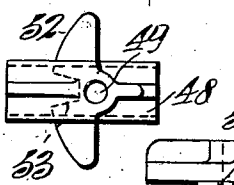


Fig. 17.

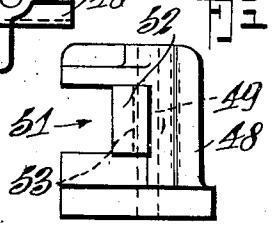
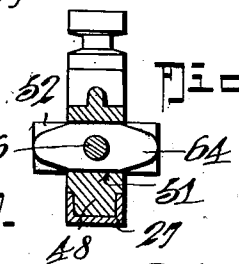


Fig. 16.



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UNITED STATES PATENT OFFICE

2,015,548

SPOOL RACK

Ralph H. Carter, Johnson City, Tenn., assignor to North American Rayon Corporation, New York, N. Y., a corporation of Delaware

Application August 18, 1932, Serial No. 629,376

13 Claims. (Cl. 242—130)

My present invention relates to improvements in transportation systems, and more particularly to an improved means for handling and transporting spools of artificial silk and like products.

In the manufacture of artificial silk and the like by the "spool spinning" process, wherein the freshly spun thread is wound on spools and then subjected to those treatments necessary to produce the finished thread, it is necessary to provide a suitable system for transporting the thread throughout the manufacturing processes. The material handling devices to be used in such transportation systems must be so constructed as to be as light as possible and at the same time be durable enough to withstand the heavy usage to which they will be subjected.

It is, accordingly, one object of my present invention to provide a rack or car of improved construction and design for the handling and transportation of spools of artificial silk and the like and which is sufficiently durable to withstand the heavy service in which it is to be used.

Another object of my present invention is to provide a spool carrying rack or car adapted primarily for use in the production of artificial silk which is provided with a plurality of spool holding means secured to a central grille whereby the spools may be carried on both sides of said grille. By the use of a grille-like partition the spools of artificial silk may be dried quickly and effectively when placed in the drier, the central partition affording little obstruction to the air currents in the drier.

A further object of my present invention is to provide an improved form of spool holder, adapted to be secured to the carrier or rack, so constructed as to prevent a metal to metal contact between said holder or spool, and/or between the spool and rack.

These and other objects of my present invention will become more apparent from a study of the following description and by reference to the attached drawings in which:

Figure 1 is a side elevational view of a preferred form of my invention showing the spool rack or carrier attached to a mono-rail by the swivel connection;

Figure 2 is a side elevational view of the spool rack or carrier;

Figure 3 is a top plan view thereof;

Figure 4 is a detailed view of the manner in which the link, to which suitable conveying means may be attached, is secured to the rack;

Figure 5 is an end elevational view of the carrier or rack;

Figure 6 is a horizontal sectional view taken along the lines 6—6 of Figure 2 looking in the direction of the arrows;

Figure 7 is a detail view of the construction of the bar or rod to which the spool holders are attached;

Figure 8 is a side elevational view of the spool holder;

Figure 9 is a sectional view thereof taken along the lines 9—9 of Figure 8;

Figure 10 is a detail view of the insert used with the spool holder;

Figure 11 is an enlarged side elevational view, parts being shown in section, of the mono-rail and the swivel construction;

Figure 12 is an enlarged detail view of the swivel construction taken along the lines 12—12 of Figure 11;

Figure 13 is an enlarged horizontal sectional view of the swivel construction taken along the lines 13—13 of Figure 11;

Figure 14 is an enlarged sectional view of the spool holder and swivel taken along the lines 14—14 of Figure 1;

Figure 15 is a top plan view of the latching block;

Figure 16 is a sectional view of one end of the load bar taken along the lines 16—16 of Figure 11; and

Figure 17 is a side elevational view of the latching block.

Referring now to the several drawings in which like numerals indicate like parts, and more particularly to Figure 1, I have shown my improved spool carrier or rack 20 secured to a mono-rail 21 of a standard construction by means of my improved swivel connecting device. It may be here stated that the specific construction of my improved carrier or rack is such that its use does not depend on its being associated with a mono-rail transportation system since it is obvious in other transportation systems. For example, wheels or rollers may be secured thereto and it may then be hauled or pushed by any suitable motive power.

Referring now to Figures 1–7 inclusive which show the construction of the spool carrier or rack it will be seen that the said carrier or rack consists essentially of an open box-like frame-work made up of vertically disposed side members 23 connected to the horizontally disposed top and bottom members 24 in anv suitable manner such as by bolts, rivets, or the like, or by welding. The top and bottom members are provided with reinforcing braces 25. Extending centrally of the frame work and vertically thereof is a central

grille 26. This grille (Figure 2) comprises a frame 27 made of channel iron or other suitable material to which is secured at spaced intervals metal strips 28 running in a horizontal direction. Each strip is zig-zag in form and the point of each bend is V-shaped as shown at 29, so that openings 30 between adjacent bends of the strips are provided to receive the hexagonal shaped bars or rods 31 to which the spool holders 77 are secured. Although hexagonal bars are used, round, square or other types of bars may be used if desired. To insure a rigid network the bars 31 are welded or otherwise rigidly secured to the metal strips 28.

To prevent damage to the spool carriers or racks if two or more of these should collide, as is quite often the case, I have provided bumpers 32 made of spring steel which are secured adjacent the upper ends of the side members by having their ends 33 bent around the uprights of the side members thereof. I have also provided means whereby a chain or other hauling means may be secured to the rack comprising a U-shaped member or link 34 welded or otherwise secured to one or both of the channel irons forming the vertical sides of the grille section of the carrier or rack.

Referring now to Figure 14, I have shown the manner in which the bars or rods 31, here shown as hexagonal, are inserted in and secured to the grille to prevent the shaking of the spools from the spool holders due to vibration. Each bar (Figure 7) is provided with a central horizontally extending section 35 which is welded or otherwise secured to the metal strips as hereinbefore stated. The end 36 of the bar is inclined upwardly and outwardly from the central section 35 so as to keep the spool, which are on the holders carried by said bar, in proper relation to the grille. This acts to counteract any vibration when the rack is in motion and prevents the spools from being shaken off the holders.

In Figures 8–10 inclusive, I have shown a preferred form of my new spool holder adapted primarily for use with the above described spool holder or rack. The spool holder 77 is made up of three plates 37, 38 and 39 riveted or otherwise secured together. As is shown in Figure 9, the ends of each plate are bent to form a side support for the non-metallic insert 40 to be more particularly described hereinafter. Each plate is also provided with a V-shaped portion 41 forming two sides of the hexagonal opening for the bar or rod 31, and two leg portions 42. The holder, when the plates are secured together, constitutes a tripod or three armed holder provided with three insert holding slots 43 and an opening 44 for the bar 31 which extends about half way along the median axis of the holder. The size of this opening is such as to form a press fit between said opening and the bar. The plates 37, 38 and 39 are so formed as to provide tabs or lugs 45 which limit the movement of the inserts 40 in the slots 43.

The inserts 40 are made of any suitable acid resistant material, preferably hard rubber and are shaped to fit snugly in the slots 43. One end of each insert is provided with an enlargement or boss 46 which limits the inward movements of the spools on the holders. The inserts project slightly above the slots 43, and, together with the bosses 46 prevent a metal to metal contact between the spool and holder, and between the spool and grille.

It will thus be seen that I have provided an improved form of carrier or rack having a central spool supporting grille which is rigid in construction and which stiffens the carrier or rack so that it will withstand the hard usage to which it will be subjected in the manufacturing plant. Moreover, since in the manufacture of artificial silk the thread must be dried at one stage of its manufacture, the grille-like character of the rack will permit the said rack, laden with spools, to be placed in a drying apparatus and the currents of hot air will pass through the grille insuring fast drying of the thread.

Since the carrier is designed to carry spools on both sides of the grille, I have provided an improved form of construction to secure the carrier or rack to a mono-rail which will permit the turning of the carrier approximately 180° so that each side of said grille may be loaded with spools. As is shown in Figure 11 the top of the carrier is provided with a centrally located opening 47 and a pair of spaced latch blocks 48. Each of these blocks, (see Figures 15 and 17), has formed therein a vertical bore 49 for the bolt 50 which secures the same to the carrier. Each block is also provided with a horizontal opening 51 the inner wall 52 of which is provided with a centrally located recess 53 for a purpose to be hereinafter described.

As is shown in Figure 14, the carrier or rack is swiveled on the connecting device or load bar 22, by means of the bolt or pin 54 secured in the opening 47 by the nut 55. This bolt or pin is provided with a shoulder 56 to prevent binding of the sleeve or block 57 against the latch actuating means 58 when the nut 55 is tightened. The bolt or pin fits loosely in the vertical bore 59 formed in the load bar and in the opening 60 formed in the latch actuating means so that the carrier may be swiveled thereon without difficulty. The trolley brackets 61 are secured in the openings 62 formed in the load bar by any suitable means such as by pins or the like and carry the rollers 63 which ride on the mono-rail.

As is shown in Figures 12 and 13, the load bar 22 is provided with enlarged ends 64. Since these ends are identical in construction, only one will be described in detail, it being understood that both ends of the load bar are alike in every respect. A horizontal bore 65, serving as a housing for the latch pin 66, is formed in the end of the load bar and is provided at its inner end with a communicating bore 67 in which is located the shank 68 of said latch pin. A spring 69 is positioned at the head of the latch pin and the inner wall of the housing and serves to hold the latch pin in its normal locking position. A wire or rod 70 connects each latch pin to the latch actuating means 59. The outer end of each latch pin is tapered slightly, in the embodiment shown about 15°, for a purpose to be hereinafter described. The outer surface of the enlarged end of the load bar is convex and the said enlarged end is of such dimension as to fit in the horizontal opening of the latch blocks secured to the carrier.

The latch pins, as hereinbefore stated, are connected to the actuating means 58 by means of the wires or rods 70. This latch actuating means comprises a central portion 71 having four arms 72, 72' and 73, 73' extending outwardly therefrom, the opposed arms 72, 72' of which are provided with elongated slots 74 in which the inner ends of the wires or rods 70 move. This arrangement prevents the distortion of the wires when the latch pins are depressed by the convex

surfaces of the latch blocks. The opposed arms 13, 13' serve as handles to rotate the actuating means in order to retract the latch pins and are provided with bosses 15 which act as stops contacting with the load bar to prevent distortion of the wires 10 when the latch actuating means is turned in either direction.

In operation the spools 16 are loaded on the spool holders on one side of the grille. When it is desired to swivel the rack, the operator disengages the latch pins from the openings in the latch blocks by movements of the handles 13, 13' in either direction permitting the rack to be rotated about the swivel bolt or pin to bring the unloaded side of the rack into filling position. Because of the convex shape of the inner walls of the openings of the latch blocks the latch pins are gradually forced inwardly against the tension of the springs as the rack reaches its new position, and because of the tapered ends of the pins and the correspondingly shaped recesses formed in the inner walls of the openings formed in the latch blocks, the latch pins snap positively into operative position when the rack has been rotated 180°. Moreover because of the curvature of the enlarged ends (Figure 16) the said enlarged ends are guided into horizontal alinement with the openings of the latch blocks. By this construction the latching is done automatically and any tendency of the rack to ride past the desired position is prevented. When fully loaded with spools the rack may then be moved along the mono-rail being supported during its travel therealong at three points, viz.: at each latch block and at the swivel. By such arrangement undue vibration of the rack is prevented and at the same time, the load is well distributed and not concentrated at one point.

Having now described my invention as provided by the patent statutes, what I desire to claim is:

1. In a spool transporting rack, a frame, a grille secured thereto comprising a plurality of spaced strips extending horizontally thereof, each strip being bent in a series of angles the apex of each bend being provided with a V-shaped portion, the V-shaped portions in one strip lying adjacent the V-shaped portions in another strip, spool holder rods secured in each of said V-shaped portions and connecting the said adjacent V-shaped portions each rod comprising a central horizontal portion secured in said V-shaped portions and having the ends thereof bent upwardly and outwardly, and spool holders secured to said ends.

2. A spool transporting rack comprising a frame, a grille extending vertically of said frame, said grille comprising a plurality of horizontally disposed strips bent in zig-zag form, the bends in one strip lying adjacent the bends in another strip, rods secured at these adjacent bends, the ends of said rods being bent upwardly and outwardly from said grille, and spool receiving means secured to said ends.

3. In a spool transporting rack, a box-like frame, a grille disposed along the vertical median axis thereof comprising a plurality of metallic strips extending horizontally of said frame bent in zig-zag form, adjacent strips having their bends adjacent, rods connecting the adjacent bends, and spool holders secured to the ends of said rods.

4. In a spool transporting rack, a box-like frame, a grille disposed along the vertical median axis thereof comprising a plurality of metallic strips extending horizontally of said frame bent in zig-zag form, adjacent strips having their bends adjacents, rods connecting the adjacent bends, and spool holders secured to the ends of said rods, the ends of said rods extending upwardly at an angle to said grille.

5. In a spool transporting rack, a box-like frame, a grille disposed along the vertical median axis of said frame comprising a plurality of metallic strips extending horizontally thereof bent in zig-zag form, the apex of each bend being substantially V-shaped, the apexes of adjacent strips lying adjacent so that the V-shaped portions define a plurality of recesses, rods fitting in said recesses and having secured to the ends thereof spool holders.

6. In a spool transporting rack, a box-like frame, a grille disposed along the vertical median axis of said frame comprising a plurality of metallic strips extending horizontally thereof bent in zig-zag form, the apex of each bend being substantially V-shaped, the said V-portions of adjacent strips lying adjacent thereby defining a plurality of recesses, rods fitting in said recesses and secured therein and having secured to the ends thereof spool holders.

7. In a spool transporting rack, a frame, a grille secured thereto comprising a plurality of metallic strips extending horizontally thereof bent in zig-zag form, the apex of each bend being substantially V-shaped, the V-portions of adjacent strips lying adjacent whereby the said V-portions form a plurality of recesses, rods fitting in said recesses and having secured to the ends thereof spool holders.

8. In a spool transporting rack, a box-like frame, a grille secured thereto comprising a plurality of metallic strips extending horizontally thereof bent in zig-zag form, the bends in adjacent strips lying adjacent, means connecting the said adjacent bends, and spool holders supported by said connecting means.

9. In a spool transporting rack, a box-like frame, a grille secured thereto along the vertical median axis of said frame comprising a plurality of metallic strips bent in zig-zag form, the bends in adjacent strips lying adjacent, rods connecting the said adjacent bends, and spool holders supported by said connecting rods.

10. In a spool transporting rack, a box-like frame, a grille secured thereto along the vertical median axis of said frame comprising a plurality of metallic strips bent in zig-zag form, the bends of adjacent strips lying adjacent and connected by rods, and spool holders supported by said rods, the ends of said rods being bent upwardly and outwardly.

11. A spool holder comprising a tripod composed of three metallic sheets, each being bent to form a central V-shaped section and two wing portions, the outer ends of said wing portions being V-shaped, each wing portion forming one half of each leg of said tripod, means securing said sheets together whereby the central V-shaped sections form collectively an opening adapted to receive a projecting support, the wing portions forming the legs of the tripod, and the V-shaped ends of adjacent wings defining a groove and a non-metallic insert secured in each of said grooves.

12. A holder for a spool, adapted to be secured to a projecting support comprising a member provided with a plurality of radially extending legs, the outer end of said legs being provided with a substantially dove-tailed groove running longi-

tudinally of said legs, a non-metallic dove-tailed insert positioned in each of said grooves whereby contact between a spool and the holder is prevented, said insert being provided with shoulders to limit the movement of the spool thereon.

13. A holder for a spool, adapted to be secured to a projecting support comprising a member with a central recess in which said projecting support is adapted to fit and provided with a plurality of legs, the end of each leg being provided with a substantially dove-tailed groove running longitudinally of said legs, a non-metallic dove-tailed insert positioned in each of said grooves whereby contact between a spool and the holder is prevented, said inserts being provided with shoulders to limit the movement of a spool thereon.

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