May 15, 1945. R. A. BROWN 2,375,747

MATERIAL HANDLING CRADLE

Filed June 29, 1944 2 Sheets-Sheet 1

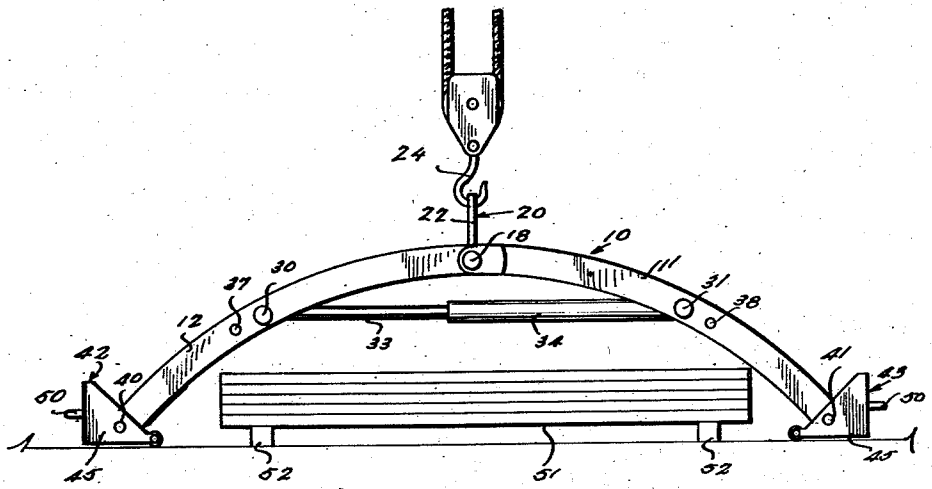


Fig. 1.

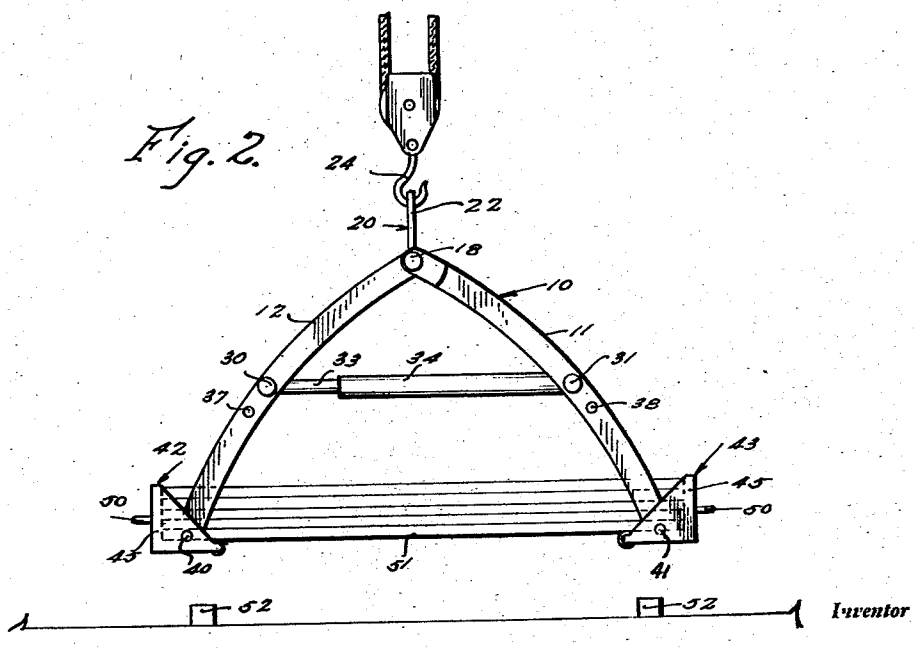


Fig. 2.

Inventor

Ruben A. Brown

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

May 15, 1945. R. A. BROWN 2,375,747

MATERIAL HANDLING CRADLE

Filed June 29, 1944 2 Sheets-Sheet 2

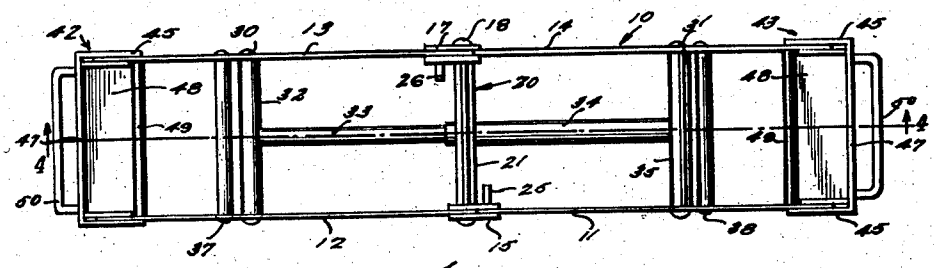


Fig. 3.

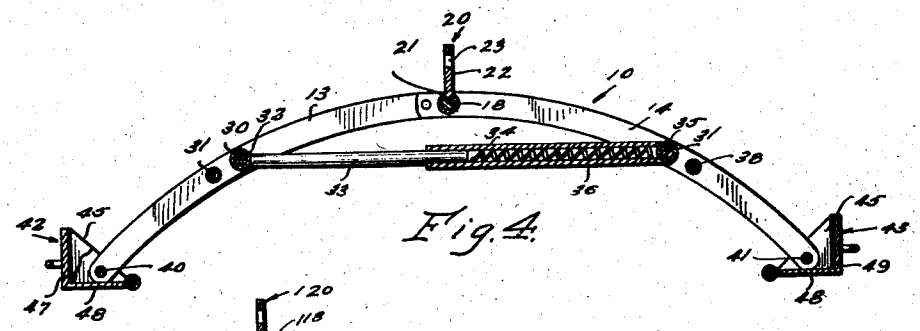


Fig. 4.

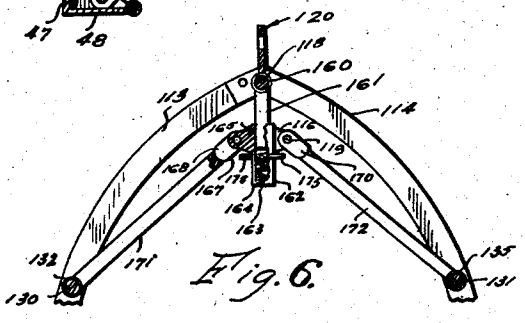


Fig. 6.

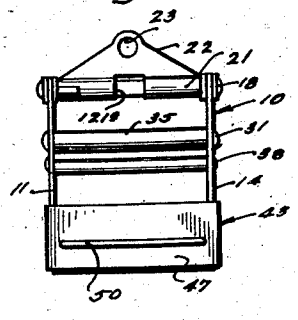


Fig. 5.

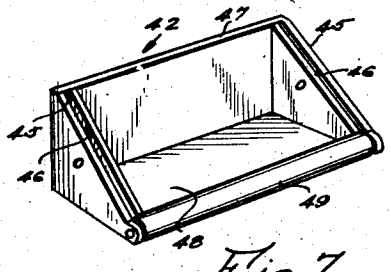


Fig. 7.

Inventor

Ruben A. Brown

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

Patented May 15, 1945

2,375,747

UNITED STATES PATENT OFFICE

2,375,747

MATERIAL HANDLING CRADLE

Ruben A. Brown, Massena, N. Y., assignor to Elgie Anne Brown, Massena, N. Y.

Application June 29, 1944, Serial No. 542,650

6 Claims. (Cl. 294—67)

This invention relates to a material handling cradle and more particularly to such a cradle adapted for the handling of sheet or bar stock or analogous material.

A primary object of this invention is the provision of a material handling cradle adapted to pick up, transport, and release material, when associated with a crane or other lifting device, in an efficient, reliable, and relatively simple manner.

A further object is the provision of such a cradle which serves as a safety device in that it balances the load for carrying automatically the first time the load is lifted, thus obviating the necessity for subsequent shifting of the cradle.

A still further object is the provision of such a cradle so designed as to preclude the possibility of slippage of the load carried thereby.

A still further object is the provision of such a device so designed as to preclude the possibility of damage to the material being handled.

A still further object is the provision of a material handling cradle which will be efficient and reliable in operation and sturdy and durable in construction.

Additional objects reside in the combinations of elements, arrangement of parts and features of construction, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawings wherein there are shown two preferred embodiments of this inventive concept.

In the drawings:

Figure 1 is a side elevational view of one form device embodying this invention, shown in position adjacent a quantity of material to be lifted.

Figure 2 is a view similar to Figure 1 showing the parts in a different position of adjustment, with the material to be handled secured therein and shown in lifted position.

Figure 3 is a top elevational view of the structure shown in Figures 1 and 2.

Figure 4 is a sectional view taken substantially along the line 4—4 of Figure 3.

Figure 5 is an end elevational view of the device as shown in Figure 3.

Figure 6 is a fragmentary view, partially in section and partially in elevation, disclosing a modified form of this inventive concept, and

Figure 7 is an enlarged perspective view of certain additional details of construction.

Having particular reference now to the drawings, the material handling cradle, generally indicated at 10, embodies four arcuate arms 11, 12, 13 and 14. Each of arms 11 and 13 is provided with a bifurcated portion 15 and 17, respectively, (see Figure 3) adjacent an extremity thereof, which portions are adapted to embrace the ends of members 12 and 14, respectively. Suitable registering apertures are passed through the adjacent ends of the members, the arrangement being such that members 11 and 12 and members 13 and 14 form two parallel pairs of members, the component parts of each pair being pivotally mounted with respect to each other as on a pivot pin 18. A self-aligning hook engaging member generally indicated at 20, is comprised of a sleeve 21 mounted about pin 18, portion 21 thus serving as a spacer sleeve retaining the side members in desired spaced relation, and an extending portion 22, having an aperture 23 therethrough, adapted for engagement with the hook 24 of a traveling crane (not shown) or similar lifting device. Pins 25 and 26 secured to bifurcated end portions 15 and 17, respectively, serve to limit the rotative movement of member 20 about pin 18.

Spacer bars 30 and 31 are positioned, at intermediate points between arms 12 and 13 and 11 and 14, respectively. Bar 30 has mounted thereon a cylindrical sleeve 32 which has secured to a mid-point thereof a cylindrical rod 33, adapted slidably to fit within a sleeve 34 secured to an intermediate point of a cylindrical member 35 mounted on bar 31. As best shown in Figure 4, sleeve 34 has positioned therein a relatively weak coil spring 36 abutting the end of rod 33 to force the same outwardly to sleeve 34, thus biasing, normally, the pivoted arms to open position, as shown in Figures 1 and 4. Additional spacer bars 37 and 38 are positioned adjacent bars 30 and 31, respectively, and journaled for rotation in the side walls of arms 12 and 13, and arms 11 and 14, respectively. The lower ends of parallel members 12 and 13, and members 11 and 14, respectively, have pivotally secured thereto, as by pivot pins, 40 and 41, a pair of oppositely disposed, material engaging jaws generally indicated at 42 and 43, respectively. Jaws 42 and 43 are identical in configuration and are comprised of double triangular end walls 45, the double walls being so spaced as to leave a slotted recess 46 therebetween into which the ends of the adjacent arms are adapted to fit. Suitable aligned apertures are provided in walls 45 and the ends of their associated arms through which the pivot pins are adapted to pass to retain the parts in pivotal relation. Jaws 42 and 43 also include a back surface 47 and a base 48, for retaining the material to be handled, in position. Rollers 49 are journaled in the outer side walls 45 adjacent the front edge of base 48 to facilitate the insertion of the ends of material

into the jaws, and handles 50 are secured to back walls 47 to facilitate the manual positioning of the jaws with respect to the material to be handled when desired, the use of handles precluding the possibility of the crushing of the operator's hands between the material and the material handling jaws.

From the foregoing the operation of the device should now be readily understandable. Hooks 24 are engaged in recess 23 of self-aligning hook engaging portion 20, which, it may here be pointed out, is caused by gravity to assume a horizontal position and held in such position by its abutment with either pin 25 or pin 26, and cradle 10 moved to a position adjacent and straddling a pile of material 51 to be handled, preferably mounted on supporting blocks 52 (see Figures 1 and 2). As hook 24 is raised jaws 42 and 43 are manually moved inwardly toward the edges of the material 51 until the ends of the material abut the back 47 of the jaws, whereupon further lifting of the hook lifts the material, the dead weight of the material and the friction between the material and the base 48 of the jaws being sufficient to overcome the tendency of the spring 36 to bias the jaws outwardly. It should be noted that the positioning of the ends of the material outwardly with respect to the pivots 40 and 42 overcomes any tendency of the jaws to pivot about these points when the cradle is handling a load. The material may then be safely lifted and moved to any desired location and deposited on suitable additional supports 52. Further lowering relieves the weight and hence the friction on the jaws and permits them to be disengaged from the edges of the material, spring 36 serving to force the jaws outwardly with respect thereto, and the device may now be lifted clear of the material and reutilized for the transfer of other material as desired.

It will be seen that the structure previously discussed may be utilized with any desired length of material within certain limits, it being noted that the inward travel of the jaws is restricted by the length of rod 33 and sleeve 36. Under certain conditions it may be desirable to use the cradle to move shorter material. Under such conditions a modified form of structure as shown in Figure 6 is employed. The device of Figure 6 is comprised of arms 113 and 114, identical to arms 13 and 14 and additional arms identical to arms 11 and 12, (not shown), a pivot pin 118 and a hook engaging member 120. Spacer bars 130 and 131 are positioned between opposite arms as in the modification previously discussed. The ends of the arms terminate in material handling jaws identical in assembly and construction to the jaws 42 and 43 of the previous modification. In this construction, however, the sleeve 121 of hook-engaging portion 120 has a central section thereof cut out as at 121a (note Figure 5). Fitted in the recess thus formed is a sleeve 160 from which a rod 161 projects downwardly into a sleeve 162 having a compression spring 163 positioned therein adjacent a closed end 164 of the sleeve. Sleeve 162 is provided with a pair of oppositely disposed lugs 165 and 166 to which are pivotally secured as by pivot pins 167 and 168, respectively, to the bifurcated ends 169 and 170 of a pair of rods 171 and 172. The opposite ends of rods 171 and 172 terminate in sleeve-like portions 132 and 135, respectively, positioned at right angles thereto and surrounding spacer bars 130 and 131 for rotative movement thereabout.

The mode of use and operation of this modification are substantially similar to those described in connection with the foregoing modification. However, the pivoting of arms 171 and 172 at their ends permits the jaws to move materially closer to each other and thus permit the handling of shorter lengths of material. Stop members 175 are secured to sleeve 162 to limit the inward movement of the jaws toward each other.

From the foregoing it will now be seen that there are herein provided two forms of material handling cradle achieving all the objects of this invention and many others including advantages of great practical utility and commercial importance. It will also be seen that the constructions herein described provide for material handling cradles which are safe and reliable in operation and sturdy and durable in construction.

As many embodiments may be made of this inventive concept and as many modifications may be made in the embodiments hereinbefore described and shown in the accompanying drawings, it is to be understood that all matter herein is to be interpreted merely as illustrative and not in a limiting sense.

I claim:

1. In a device of the character described, in combination, a plurality of pairs of arms the inner ends of each of said pairs of arms being pivotally secured to each other, said pairs of arms being in parallel alignment, spacer bars between said pairs of arms securing the same in said alignment, jaws pivotally secured to the outer ends of related arms of said pairs, and resilient means positioned between said spacer bars normally biasing the component parts of each of said pairs of arms outwardly and hence biasing said jaws away from each other, said resilient means comprising a rod secured to one of said spacer bars coacting with a sleeve secured to an oppositely positioned spacer bar, and spring means in said sleeve abutting the end of said rod.

2. In a device of the character described, in combination, a plurality of pairs of arms the inner ends of each of said pairs of arms being pivotally secured to each other, said pairs of arms being in parallel alignment, spacer bars between said pairs of arms securing the same in said alignment, jaws pivotally secured to the outer ends of related arms of said pairs, and resilient means positioned between said spacer bars normally biasing the component parts of each of said pairs of arms outwardly and hence biasing said jaws away from each other, said last-mentioned means comprising a vertically disposed rod secured to said means pivotally securing the inner ends of said arms, and a sleeve positioned about the lower end of said rod and coacting therewith, and closed at its lower end, a compression spring in said sleeve normally biasing the same downwardly with respect to said rod and a pair of rods, pivotally mounted between said sleeve and on opposite sides thereof, and oppositely disposed spacer bars between said arms.

3. In a device of the character described, in combination, a plurality of pairs of arms the inner ends of each of said pairs of arms being pivotally secured to each other, said pairs of arms being in parallel alignment, spacer bars between said pairs of arms securing the same in said alignment, jaws pivotally secured to the outer ends of related arms of said pairs, and resilient means positioned between said spacer bars

normally biasing the component parts of each of said pairs of arms outwardly and hence biasing said jaws away from each other, said jaws being comprised of a base member and a back member and double end walls of triangular configuration, the outer ends of said arms being adapted to fit between said double end walls, means pivotally securing the ends of said arms between said double end walls, and a roller adacent the inner end of said base portion adapted to facilitate its insertion under material to be handled.

4. In a device of the character described, in combination, a plurality of pairs of arms the inner ends of each of said pairs of arms being pivotally secured to each other, said pairs of arms being in parallel alignment, spacer bars between said pairs of arms securing the same in said alignment, jaws pivotally secured to the outer ends of related arms of said pairs, and resilient means positioned between said spacer bars normally biasing the component parts of each of said pairs of arms outwardly and hence biasing said jaws away from each other, said jaws being comprised of a base member and a back member and double end walls of triangular configuration, the outer ends of said arms being adapted to fit between said double end walls, means pivotally securing the ends of said arms between said double end walls, and a roller adjacent the inner end of said base portion adapted to facilitate its insertion under material to be handled, and handles secured to the back portion of said jaws to facilitate the manual rotation thereof about said pivotal securing means.

5. In a device of the character described, in combination, two pairs of arms forming a frame, a pivot pin securing the inner ends of the arms of said pairs in pivotal relation to each other, a hook engaging member rotatably mounted on said pivot pin, stop pins mounted on said arms limiting the rotating movement of said member, jaws pivotally secured to the outer ends of said pairs of arms, said jaws being comprised of a back wall, a base wall and double end walls of triangular configuration, said outer ends of said arms being adapted to fit between said double end walls, and resilient means biasing said jaws apart.

6. In a device of the character described, in combination, two pairs of arms forming a frame, a pivot pin securing the inner ends of the arms of said pairs in pivotal relation to each other, a hook engaging member rotatably mounted on said pivot pin, stop pins mounted on said arms limiting the rotating movement of said member, jaws pivotally secured to the outer ends of said pairs of arms, said jaws being comprised of a back wall, a base wall and double end walls of triangular configuration, said outer ends of said arms being adapted to fit between said double end walls, and resilient means biasing said jaws apart, said resilient means including a sleeve having a compression spring therein and a rod coacting with said spring and sleeve, the arrangement being such that the action of said spring serves to bias the component members of said pairs of arms outwardly about said pivot pin.

RUBEN A. BROWN.