March 3, 1942. A. R. CARR 2,275,074

LIFTING DEVICE

Filed July 14, 1941 3 Sheets-Sheet 1

FIG. 1.

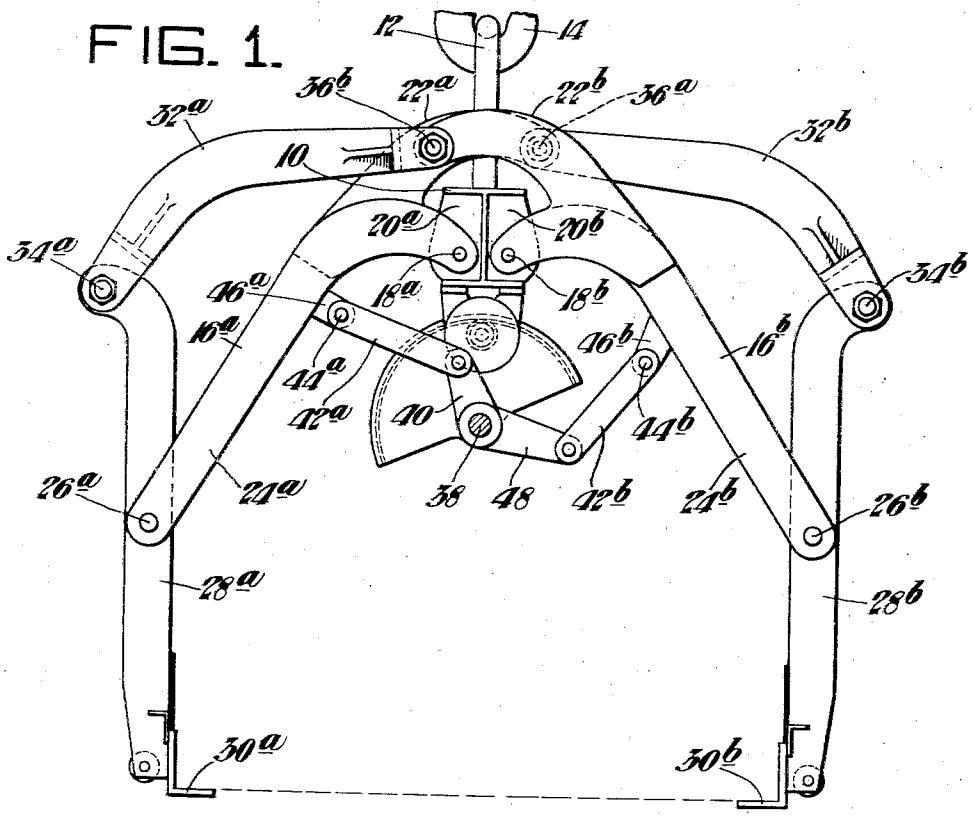
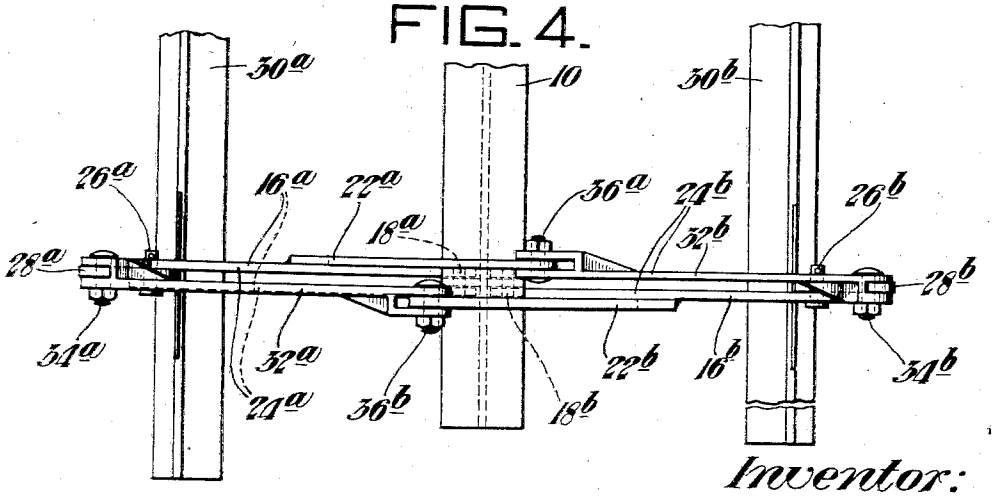


FIG. 4.



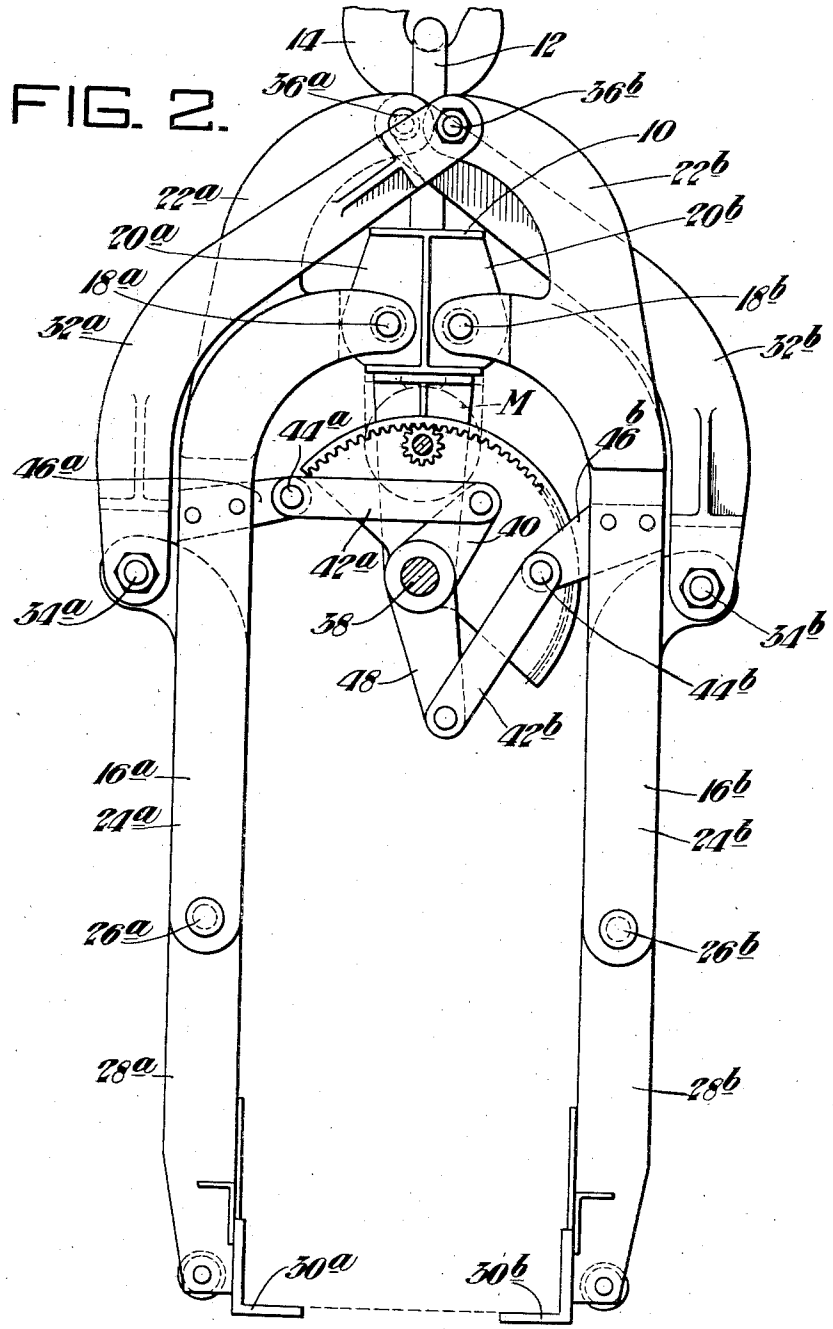
Inventor:
ARTHUR ROBERT CARR,
by: John E. Jackson
his Attorney.

March 3, 1942. A. R. CARR 2,275,074

LIFTING DEVICE

Filed July 14, 1941 3 Sheets-Sheet 2

FIG. 2.



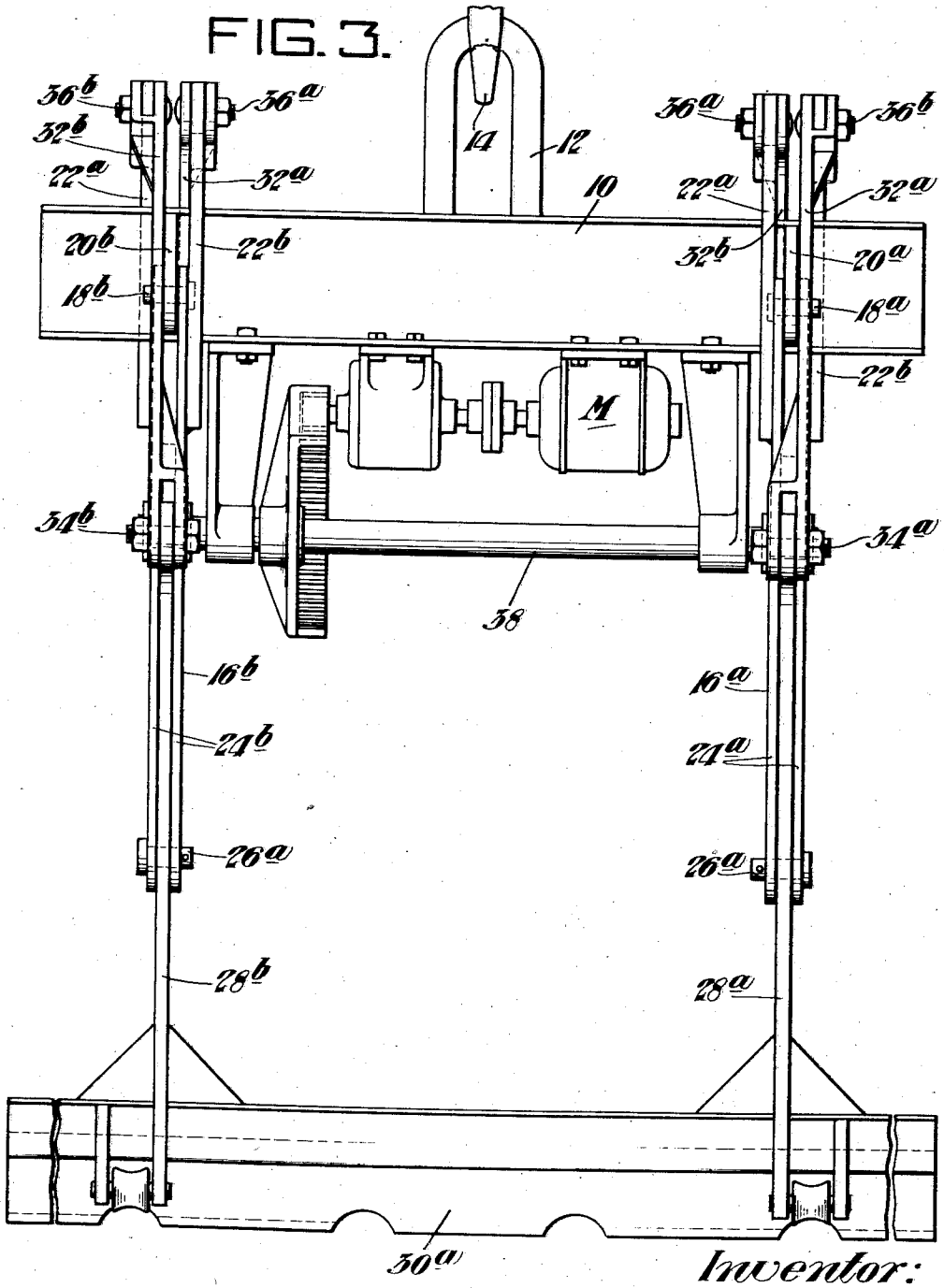
Inventor:
ARTHUR ROBERT CARR,
by: John E. Jackson
his Attorney.

March 3, 1942. A. R. CARR 2,275,074

LIFTING DEVICE

Filed July 14, 1941 3 Sheets-Sheet 3

FIG. 3.



Inventor:
ARTHUR ROBERT CARR,
by: John E. Jackson
his Attorney.

Patented Mar. 3, 1942

2,275,074

UNITED STATES PATENT OFFICE

2,275,074

LIFTING DEVICE

Arthur Robert Carr, Gary, Ind.

Application July 14, 1941, Serial No. 402,347

3 Claims. (Cl. 294—113)

This invention relates to an improved form of device peculiarly well suited for engaging and lifting stacks of sheets of different sizes and maintaining the multiplicity of sheets of the stack in substantial alignment during the lifting operation.

An important object of the invention is to provide means whereby the sheet engaging lugs of the device will at all times be maintained in substantially horizontal position and also to provide means whereby the suspension members of the device will at all times be maintained in substantially vertical position, these conditions to be brought about automatically as the device is adjusted to various positions for engagement with different sizes of sheet stacks.

The above and more detailed features of the invention will be fully apparent from the following detailed disclosure when read in connection with the accompanying drawings and the features of patentable novelty will be defined with particularity in accordance with the requirements of the patent statutes in the appended claims.

In the drawings:

Figure 1 is an end view of the lifting device of the present invention with the parts adjusted to engage a relatively wide stack of sheets;

Figure 2 is a similar view but with the parts adjusted for engagement with a relatively narrower stack of sheets;

Figure 3 is an end elevation of Figure 2; and

Figure 4 is a partial top plan of Figure 1.

Referring in detail to the drawings, the numeral 10 represents a frame member which in the embodiment of the invention illustrated is a stock structural H-section. This frame member has secured thereto a bale 12 which is adapted to be suspended from a crane hook 14 or similar hoist. The frame 10 supports the cooperating component parts of the improved device, which combination constitutes the present invention.

Hangers 16^a and 16^b are supported on pivots 18^a and 18^b carried by respective bracket plates 20^a and 20^b secured between the upper and lower flanges of the frame member 10.

The hangers 16^a and 16^b include respective upper arms 22^a and 22^b and lower arms 24^a and 24^b. At their lower extremities the arms 24^a and 24^b carry pivot pins 26^a and 26^b which serve to pivotally support respective suspension members 28^a and 28^b. At their lower extremities these suspension members carry respective horizontally disposed sheet supports 30^a and 30^b, which may conveniently be in the form of angle bars, as shown.

It is a particular feature of the present invention to provide means whereby in all positions of adjustment the suspension members 28^a and 28^b are maintained in substantially vertical position and whereby the inner flanges of the angle bars constituting sheet engaging supports 30^a and 30^b are maintained in substantially a horizontal position. That this result is secured will be apparent by comparing the positions of these parts as they are shown in the different positions in Figures 1 and 2. In Figure 1 the parts are adjusted for engaging a stack made up of a plurality of superposed relatively wide sheets, while in Figure 2 the parts are adjusted for engagement for a stack made up of a plurality of superposed relatively narrow sheets. Because the sheet engaging lugs 30^a and 30^b are maintained substantially horizontal, it will be understood that the bottom of the stack of sheets will rest flat and evenly on said supports and it will also be apparent that because the suspension members 28^a and 28^b are maintained substantially vertical, alignment of the side edges of the sheets will be facilitated. Obviously the sheet supports 30^a and 30^b are perpendicular to the parallel inside edges of the vertical suspension members. In order to maintain this parallelism of the suspension members and therefore to maintain the sheet engaging supports in horizontal position in all positions of adjustment, I have devised the specific coacting members illustrated.

An important feature to the attainment of this result is the provision of links 32^a and 32^b as shown. These links are connected by pins 34^a and 34^b with the upper portions of the suspension members as shown. The link 32^a extends upwarly in a substantially vertical direction for a short distance and then extends laterally over the top of the frame 10 where it is connected by a pin 36^b with the upper arm 22^b of the hanger 16^b on the opposite side of the frame. In similar manner, the link 32^b extends upwardly from its connection 34^b with the suspension member and then extends laterally over the top of the frame 10 and is connected by means of a pin 36^a with the upper arm 22^a of the hanger 16^a.

With the connections as thus shown and described, it is apparent that regardless of the position of lateral adjustment of the suspension members 28^a and 28^b, their inner edges will be maintained substantially truly vertical and the supporting flanges 30^a and 30^b being perpendicular thereto will in all positions be maintained

substantially horizontal. These positions will be automatically secured upon any swinging movement of the hangers 16ª and 16ᵇ. The swinging of the hangers is accomplished by movement of a shaft 38 mounted in suitable bearings supported by the lower flange of the frame member 10. This shaft may be powered by a suitable motor M as diagrammatically shown acting through conventional reduction gearing, the motor also being supported from the frame member in a manner well known to those skilled in the art. The shaft 38 carries an upwardly extending arm 40 which is connected by a link 42ª to a pin 44ª secured to a lug 46ª extended inwardly from the hanger 16ª.

Depending downwardly from the shaft 38 there is an arm 48 which is connected by a link 42ᵇ with a pin 44ᵇ which engages a lug 46ᵇ extending inwardly from the hanger 16ᵇ. Thus it is apparent that when the shaft 38 is turned counterclockwise, the arms 40 and 48 acting through links 42ª and 42ᵇ will serve to move the parts of the device from the position shown in Figure 2 to the position shown in Figure 1. Similarly, when the shaft 38 is turned clockwise the parts can be adjusted from the position of Figure 1 to the position of Figure 2, and at various intermediate positions it will be understood that the suspension members 28ª and 28ᵇ will be maintained substantially vertical and the sheet engaging supports or flanges 30ª and 30ᵇ will be maintained in a horizontal position. Thus the superposed sheets constituting the stacks of different sizes can be expeditiously handled in an orderly manner.

While I haye described quite precisely certain specific details of the embodiment of the invention illustrated, it is to be understood that various modifications and substitutions of equivalents may be made by those skilled in the art without departure from the invention as defined in the appended claims.

I claim:

1. A sheet lifting device of the character described comprising a vertically movable frame, hangers pivoted thereon having respective arms disposed above and below the pivots thereof, means carried by the frame effective to swing the hangers toward or from one another, respective suspension members pivotally secured to the lower arms of the hangers, sheet supports secured to the lower portions of the suspension members, and means operatively connecting suspension members on one side of the frame with hangers on the opposite side of the frame designedly intended to maintain the suspension members in substantially vertical position and to maintain the sheet supports in substantially horizontal position regardless of the position to which the suspension members are moved in normal operation for engagement with stacks of sheets of different widths.

2. A sheet lifting device of the character described comprising a vertically movable frame, hangers pivoted thereon and having respective upper and lower arms, means carried by the frame having connections for simultaneously swinging the hangers on their pivots, respective suspension members pivoted on the lower arms of said hangers, horizontally disposed sheet supports secured to said suspension members, and respective links pivotally connecting each suspension member on one side of the frame with the upper arm of a respective hanger on the opposite side of the frame, the parts thus being so constructed and arranged that upon movement of the suspension members to different lateral positions for lifting stacks of sheets of different sizes the said supports will be maintained in substantially true horizontal position and said suspension members will be maintained in substantially true vertical position.

3. A sheet lifting device of the character described comprising a vertically movable frame element, respective hangers pivoted on opposite sides thereof, each hanger having one arm extended upwardly from the pivot thereof and another arm extending downwardly from said pivot, respective vertically disposed suspension members pivoted to the lower extremities of the lower hanger arms, respective horizontal sheet sustaining flanges secured to the lower portions of the suspension members, means carried by the frame for swinging the hangers simultaneously toward and from one another, and respective links connecting the upper ends of the suspension members on one side of the frame with the said upper arms of the hangers on the opposite side of the frame whereby upon actuation of said moving means the said suspension members are moved automatically in a manner to maintain them in substantially true vertical alignment and to also maintain said supporting flanges in a substantially true horizontal plane to thus effectively engage stacks of sheets of different sizes and maintain the stacks horizontal with the edges of the sheets thereof in vertical alignment.

ARTHUR ROBERT CARR.