United States Patent [19]

Hall

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[54] **ARTICLE HANDLING SYSTEM**

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[52] **U.S. Cl.**..... **294/67 BC,** 294/67 R, 294/112

[51] **Int. Cl.**..... **B66c 1/32**

[58] **Field of Search**.... 294/67 BC, 63 R, 67 R, 113, 294/106, 67 B, 81 R, 81 SF, 111, 112, 119; 224/48

[56] **References Cited**

UNITED STATES PATENTS

2,610,890	9/1952	Jaeger	294/67 BC
1,781,943	11/1930	Bartholomew	294/63 R
435,839	9/1890	Hunter	294/112 X

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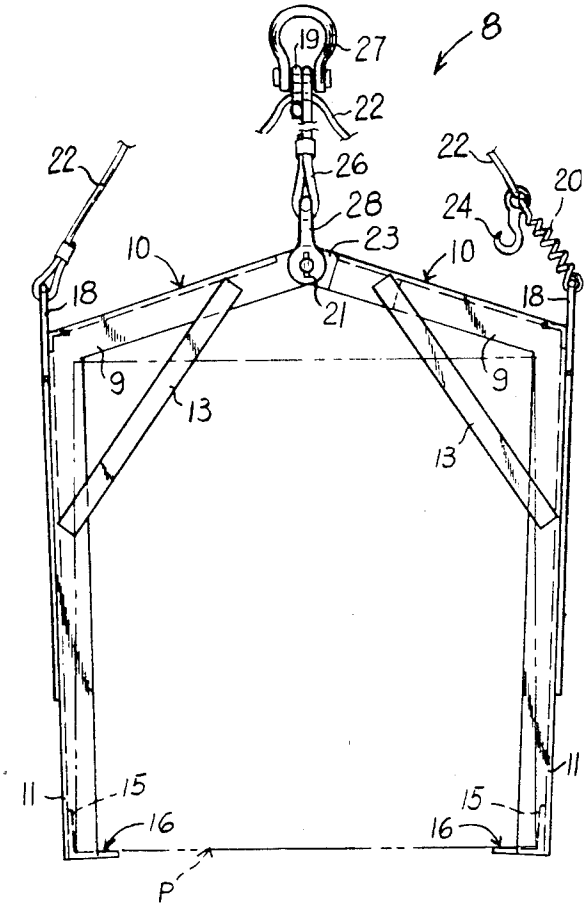
[57] **ABSTRACT**

In an article handling system having article handling means for carrying a stack of articles comprising a pair of lift arms, a rigid pivot rod pivotally joining said lift arms together, a lift cable and an opening cable operatively arranged such that: the lift arms are arranged to swing inwardly toward each other to engage and carry the stack of articles upon application of an external lifting force to the lift cable, and the opening cable is constructed to have a lifting force applied thereto to swing the lift arms apart so that they clear the stack of articles, improvement in the article handling means comprising each lift arm pivotally connected to the pivot rod at opposite ends thereof, the lift cable joined to the pivot rod at opposite ends thereof, the opening cable joined to the lift arms and disposed at a substantially right angle in respect to the lift cable, one end of the opening cable relatively permanently connected to one lift arm and the other end thereof manually connectable or dis-connectable in respect to the other lift arm, two shackles mutually interlocked and arranged so that one has the external lifting force applied thereto and lifts the other, the lift cable extending through one of the shackles, the opening cable extending through the other of the shackles, whereby when the opening cable is disconnected the lift cable is made taut to lift the article handling means to carry the stack of articles, and whereby when the opening cable is connected it is made taut to lift the empty article handling means to swing and spread the lift arms apart.

2 Claims, 5 Drawing Figures



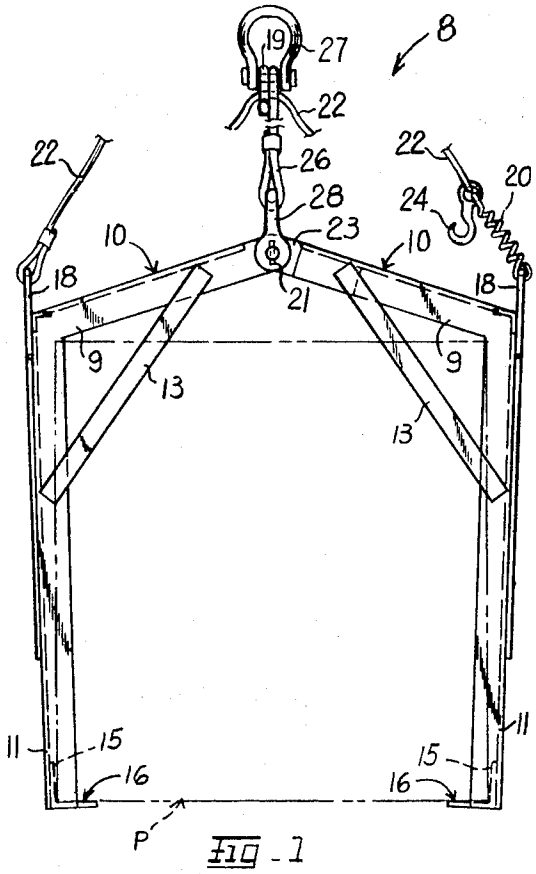


FIG. 1

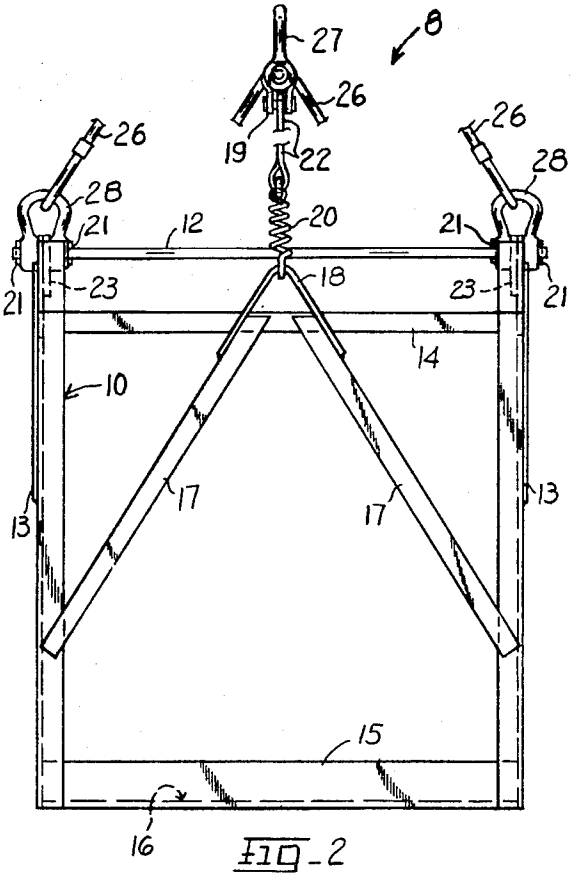


FIG. 2

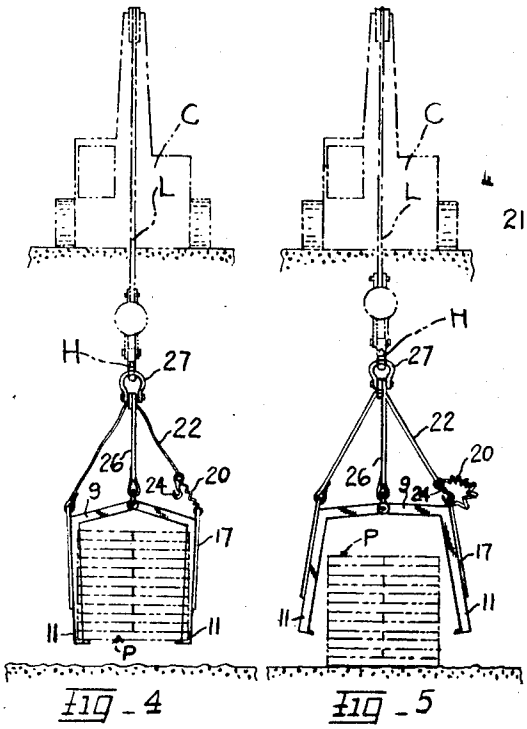


FIG. 4

FIG. 5

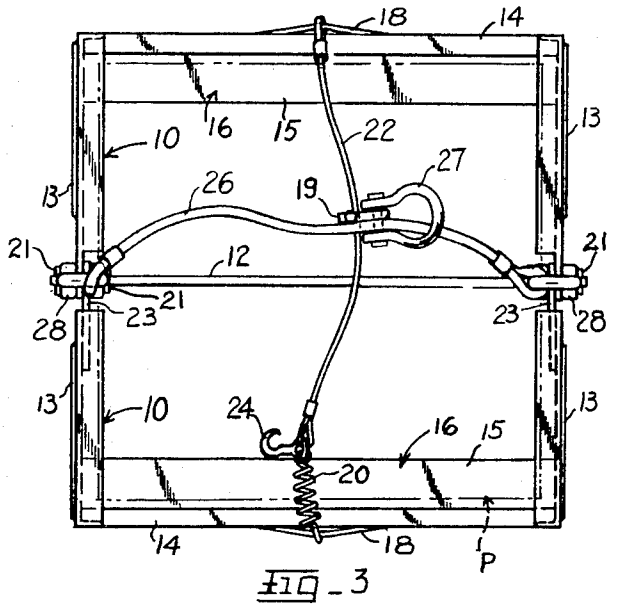


FIG. 3

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ARTICLE HANDLING SYSTEM

My invention relates to article handling, particularly for the construction industry.

The principal object of my invention is to provide an article handling system, particularly for the construction industry, which saves labor in handling articles particularly metal form pans used as forms in pouring concrete walls and the like.

The foregoing object of my invention and the advantages thereof will become apparent during the course of the following description, taken in conjunction with the accompanying drawings, in which FIGS. 1–3 are, respectively, front and side elevational and top plan views of an article handling system embodying my invention; and FIGS. 4 and 5 are front elevational views of said system shown in use.

Referring to the drawings in greater detail, 8 generally designates said embodiment of an article handling system which comprises a pair of lift arms 10 pivotally connected together at their upper ends by a longitudinally extending rod 12. Each lift arm 10 has spaced apart front and back angle plate members 9 and 11 joined fast and disposed at an obtuse included angle in respect to each other and axially extending angle plate cross bars 14 and 15 welded, respectively, to said members 9 and 11 at the junction thereof and to the lower ends of the members 11. Said cross bars 15 form a pair of axially extending inwardly projecting horizontal holding shelves 16 which support the bottom of a stack of metal form pans P. Each lift arm 10 is provided with flat plate braces 13 and 17 joining, respectively, the members 9 and 11 and the members 11 and 14 at the corners thereof. A closed rigid loop member 18 is made fast to each crossbar 14 at the center thereof to one of which loop members 18 is connected one end of a spring 20 and to the other of which is connected one end of an opening cable 22, the other end of which has a hook 24 carried thereon. The other end of the spring 20 is connected to the free end of the opening cable 22 which holds the hook 24. Said embodiment 8 also includes a lift cable 26 connected via eyes on opposite ends thereof to a pair of shackles 28 which are pivotally carried on the rod 12 at opposite ends thereof. In the instance, the upper ends of the front and back members 9 of one of the pair of lift arms 10 are differently constructed than the upper ends of the front and back members 9 of the other lift arm 10 so that the pair of lift arms 10 have the same width axially or front to back of said embodiment 8. Said upper ends of one pair are cut shorter than the other and are provided with flat plates 23 which are welded to the inside vertical webs of said shortened upper ends of said one pair. The plates 23 bear against the vertical webs of said upper ends of the other pair and both said plates 23 and said last-mentioned vertical webs are provided with aligned apertures through which said rod 12 extends. Each shackle 28 straddles one of the plates 23 and the respective last-mentioned vertical web of said other pair. To insure that the rod 12 does not move out of such apertures said rod 12 is pinned, as at 21, at two places at each end thereof on opposite sides of the respective shackle 28. Said upper ends of the other pair have their horizontal webs cut-away to accommodate pivotal movement of the shackles 28 on said rod 12. A shackle 19 through which said opening cable 22 threads is carried on the pin for a shackle 27 through which said lift

cable 26 threads. An external lifting force is applied to said lift cable 26 via said shackle 27. Said lift cable 26 is twice the diameter of and, in the instance, is about 6 inches longer than said opening cable 22 for reasons which will appear.

Said embodiment 8 is used for transporting articles, such as a stack of metal form pans P, from one location to another. Preferably the stack of metal form pans P is stacked on boards which hold the bottom of the stack off a supporting surface such as the ground so that the holding shelves 16 can move beneath said stack of metal form pans P. Said embodiment 8 is carried by an external lifting force, such as applied by a crane C or the like, the lifting hook H of which is engaged in the shackle 27. Said embodiment 8 while empty and with the lift arms 10 spread apart is lifted over the metal form pans P to be carried and is then lowered until the embodiment 8 rests upon the ground. The lift arms 10 are spread apart by lifting upon the lift cable 26 while the opening cable 22 is engaged, i.e., the hook 24 is engaged with the respective loop member 18. The opening cable 22 is engaged prior to lifting upon the lift cable 26. After the embodiment 8 rests upon the ground over the stack to be lifted the opening cable 22 is disengaged, i.e., the hook 24 is disengaged from the respective loop member 18. The spring 20 holds the end of the opening cable carrying the hook 24 from falling too far toward the ground. After the opening cable 22 is disengaged the crane C is operated to apply a lifting force to the lift cable 26 via the shackle 27, whereupon the lift arms 10 swing together and the holding shelves 16 move beneath the stack of metal form pans P on opposite sides thereof and said stack is lifted in accordance with the lifting movement of the crane lifting cable L. Said embodiment 8 is constructed so that when it is empty and a lifting force is applied thereto while said opening cable 22 is disengaged the lower ends of the lift arms 10 swing together and are normally disposed apart a distance less than the left to right or transverse width of the stack of metal form pans P. After the crane C has transported the embodiment 8 while full to the new location desired for the stack of metal form pans P said embodiment 8 while full is lowered to the ground with said stack preferably resting upon boards as mentioned. With said stack of metal form pans P resting upon the ground and with said lift cable 26 slackened, said opening cable 22 is engaged by hooking the hook 24 on the respective loop member 18 and thereafter a lifting force is again applied to the lift cable 26, a part of which lifting force is applied via said shackle 19 to said opening cable 22, whereupon the lift arms 10 swing apart and the holding shelves 16 move away from said stack of metal form pans P and said embodiment 8 while empty is then lifted off said stack of metal form pans P in accordance with the lifting movement of the crane lifting cable L. The reason the opening cable 22 is shorter than the lift cable 26 is to insure that the former will spread the lift arms 10 apart sufficiently when a lifting force is applied thereto via the latter.

It will thus be seen that there has been provided by my invention an article handling system in which the object hereinabove set forth, together with many thoroughly practical advantages, has been successfully achieved. For example, since the lift cable 26 does all of the lifting there need by only one heavy duty lift cable for the pair of lift arms 10. Also, during engage-

ment and disengagement of the opening cable **22** the crane lifting cable L does not have to be disengaged from the lift cable **26** but only lowered sufficiently to slack the lift cable **26** such that the opening cable **22** can be readily engaged. The crane lifting cable L never has to be disengaged from the lift cable **26** during use of said embodiment **8.** While a preferred embodiment of my invention has been shown and described, it is to be understood that variations and changes may be resorted to without departing from the spirit of my invention as defined by the appended claims.

What I claim is:

1. In an article handling system having article handling means for carrying a stack of articles comprising a pair of lift arms, a rigid pivot rod pivotally joining said lift arms together, a lift cable and an opening cable operatively arranged such that: the lift arms are arranged to swing inwardly toward each other to engage and carry said stack of articles upon application of an external lifting force to said lift cable, and the opening cable is constructed to have a lifting force applied thereto to swing the lift arms apart so that they clear the stack of articles, improvement in said article handling means comprising each said lift arm pivotally connected to said pivot rod at opposite ends thereof, said lift cable joined to said pivot rod at opposite ends thereof, said opening cable joined to said lift arms and disposed at a substantially right angle in respect to said lift cable, one end of said opening cable relatively permanently connected to one lift arm and the other end thereof manually connectable or dis-connectable in respect to the other lift arm, two shackle means mutually interlocked and arranged so that one has said external lifting force applied thereto and lifts the other, said lift cable extending through one of said shackle means, said opening cable extending through the other of said shackle means, whereby when said opening cable is disconnected said lift cable is made taut to lift said article handling means to carry said stack of articles, and whereby when said opening cable is connected it is made taut to lift the empty article handling means to swing and spread said lift arms apart.

2. In an article handling system having article handling means for carrying flat bottomed pans comprising a pair of lift arms, a rigid pivot rod pivotally joining said arms together, a lift cable and an opening cable operatively arranged such that: the lift arms are arranged to swing inwardly toward each other to engage and carry said pans upon application of an external lifting force to the lift cable, and the opening cable is constructed to have a lifting force applied thereto to swing the lift arms apart so that they clear the stack of articles, improvement in said article handling means comprising each said lift arm pivotally connected to said pivot rod at opposite ends thereof, said lift cable joined to said pivot rod at opposite ends thereof to lift said article handling means to carry said stack of articles, said opening cable operatively connected to said lift arms to lift the empty article handling means to swing and spread said lift arms apart, each said lift arm having one right angled bottom frame member extending axially in the same direction as said pivot rod so that both said lift arms form two shelves which swing together to lift and squeeze upon the bottommost pans of said stack of pans, each said lift arm also having two other right angled frame members axially spaced apart so that both said lift arms form, in horizontal cross-section, four inwardly facing corners which assist in confining the other pans above said bottommost pans within the confines of said lift arms.

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