

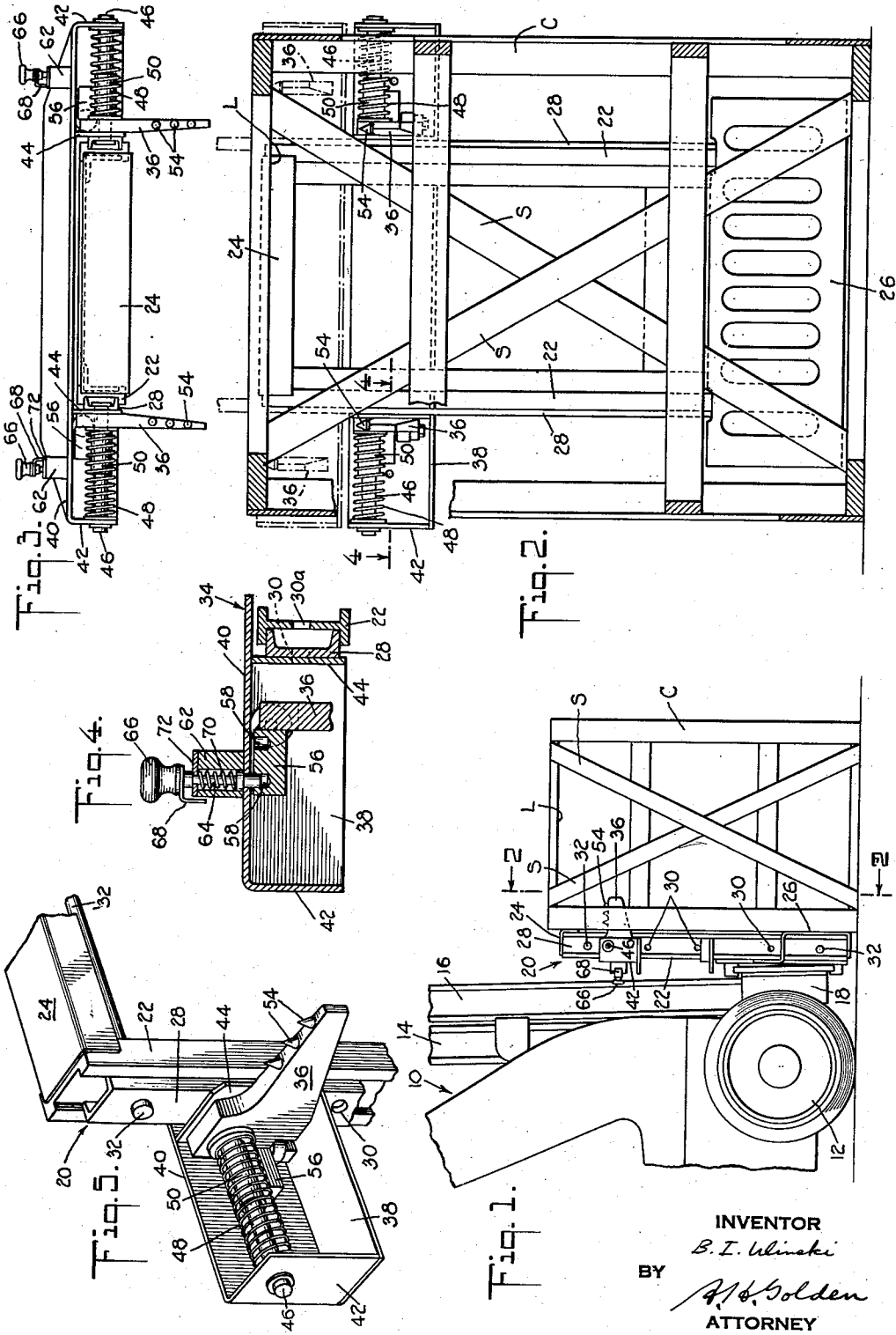
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B. I. ULINSKI

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CRATE HANDLING ATTACHMENT FOR LIFT TRUCKS

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CRATE HANDLING ATTACHMENT FOR
LIFT TRUCKSBronislaus I. Ulinski, Chicago, Ill., assignor to
The Yale & Towne Manufacturing Company,
Stamford, Conn., a corporation of Connecticut

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1

This invention relates to a crate handling attachment for use on electric trucks. More particularly, my invention relates to means carried by a truck adapted for ready adjustment relatively to a crate whereby to lift that crate automatically upon lifting movement of the usual lifting carriage of a truck of the class described.

Those skilled in the art will recognize the fact that the usual crate is formed of a series of timbers placed horizontally, vertically and angularly to form a protective barrier for a machine or other piece of equipment that is to be shipped. The usual crate, as indicated, is equipped with angular members that I prefer to call struts, and these struts are generally positioned to run from the extreme upper surface of the crate to the extreme lower surface of the crate for bracing the crate.

As a feature of my invention, I employ a pair of automatically adjustable arms adapted to be moved through contact with the angular struts of a crate of the class described, so as to be adjusted readily for application to lifting surfaces. Thus, I employ a pair of lifting arms that are maintained yieldingly in a particular position. When these arms are applied against the crate, and more particularly applied to the angular struts, those angular struts will move the arms in one direction as the arms are moved by the truck vertically toward the lifting surfaces of the crate. The struts will act, therefore, to cam the arms so as to place them in proper relation to lifting surfaces of varying dimensions of crates.

I have thus outlined rather broadly the more important features of my invention in order that the detailed description thereof that follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of my invention. It is important, therefore, that the claims to be granted me shall be of sufficient breadth to prevent the appropriation of my invention by those skilled in the art.

Referring now to the drawings, Fig. 1 is a side elevation of one end of an industrial truck showing my crate handling attachment applied thereto. Fig. 2 is a section taken along lines 2—2 of Fig. 1. Fig. 3 is a top plan view of the attachment

2

of my invention. Fig. 4 is a section taken along lines 4—4 of Fig. 2. Fig. 5 is an enlarged perspective view of a part of the crate handling attachment.

Referring now more particularly to the drawings, and especially Fig. 1, I show the front end of a truck indicated generally by numeral 10, and supported by wheels, one of which is designated by the numeral 12. Carried by the truck are primary uprights 14 and secondary uprights 16, and movable vertically on the secondary uprights is a load carriage 18. This load carriage will, of course, be moved relatively to the secondary uprights and the secondary uprights will move relatively to the primary uprights, all as is conventional in this art.

An auxiliary frame, indicated generally by the numeral 20, is carried by the load carriage 18 and moves integrally therewith. Auxiliary frame 20, as can best be seen from Figs. 1, 2 and 4, is formed of opposed vertical I beams 22 connected at their upper ends by a cross member 24 and at their lower ends by a crate support plate 26. Slidably mounted on each I beam 22 of the auxiliary frame 20 is a vertical bearing member 28. Each vertical bearing member 28 is formed with a series of holes 30 adapted for alignment with any one of a series of holes or bores 30a formed in the I beam members 22. By placing a cross shaft 32 into alignment with bores 30, 30a, the bearing members 28 may be fixed in any desired adjusted position relatively to the I beams 22 of the auxiliary frame. Through this structure, it is possible to obtain a vertical adjustment of the lifting arms relative to the auxiliary frame and the load carriage 18, all as will appear presently.

The two bearing members 28 have secured thereto an arm carrying frame designated generally by reference numeral 34. This frame is symmetrical in form, and for the purposes of my invention only one-half thereof will be described, reference being had particularly to Figs. 3, 4 and 5 for this purpose. Each half of the frame 34 is formed with a back plate 40, a bottom plate 38 and an end plate 42. Cooperable with the end plate 42 of each side of the frame 34 is a plate 44. Bearing in the plates 42, 44 is a shaft 46 and slidably mounted on the shaft 46 is an arm 36. A spring 48 surrounds the shaft 46 and presses against the arm 36, urging it towards the center of the truck and against the plate 44. In order to present a better bearing for the arm 36 on the shaft 46, a sleeve 50 is formed as a part of the arm 36 and slides on shaft 46. Each arm 36 is equipped with suitable barbs 54 so as to

permit the ready locking of the arms against slippage when the arms contact the wood of a crate to be lifted thereby.

Hereinafter, I will indicate just how the arms 36 adjust themselves relatively to the shaft 46 for application to a crate. I shall now describe means for locking the arms against this movement of adjustment when it is desirable to do so. For the particular purpose, each arm 36 is formed with an extension 55 equipped with detent bores 58. A bearing block 62 is welded to the back plate 40 and carries a locking detent pin 64 normally urged by a spring 70 to the position illustrated in Fig. 4. The detent pin is equipped with a knob 66 carrying a finger 68. It is the function of the finger 68 to co-act with the part 72 so as to hold the detent pin against the pressure of the spring away from the bores 58. However, when the knob 66 is rotated to bring the finger 68 into the position of Fig. 4, the spring will function to press the detent pin into either one of the detent bores 58 of the arm 36. Actually, each detent pin will thus function to lock its particular arm 36 in either one of two adjusted positions.

I shall now describe the operation of my invention, it being understood that the arms 36 are to be considered as pressed to the position illustrated in Figs. 3 and 5, with the detent mechanism of Fig. 4 just described inoperative, so that the arms slide readily on their bearing shafts 46 against the pressure of the springs 48. Reference will also be had to a typical crate C with which my invention co-acts, shown in Figs. 1 and 2, and having a pair of angular struts S, as earlier described generally.

The truck 10 is first so manipulated that the two arms 36 are placed in the solid line position illustrated in Fig. 2 relatively to crate C. The arms 36 are now inwardly of the crate, with the sides of the arms adapted to contact the struts S as the said arms move with the load carriage 18 of the truck upwardly toward the lifting surface L of the crate. It will be readily appreciated that as the arms move upwardly, as shown in Fig. 2, from their full line position to their dotted line position, the struts S will force the arms 36 outwardly and laterally of the crate and the truck, and the arms will be cammed gradually until the barbs 54 thereof engage the surface L, whereupon the arms will lift the crate upon further lifting movement thereof by the carriage 18.

It will now be readily appreciated by those skilled in the art that the arms 36 are readily adapted to contact the lifting surfaces of practically any crate, and that the arms can be so positioned on the frame 34 on which they are mounted, as to be cammed into proper operating and lifting relation to almost any type of crate. In other words, the lifting carriage of my truck may readily be manipulated first to move the arms 36 into a particular position relatively to a crate. Then, upon lifting movement of the arms, parts of the crate contacted thereby will cam the arms into full lifting co-action with the crate so that the arms can manipulate and lift the crate thereafter.

As was already indicated, the crate lifting arms may be locked in any lateral position on their mounting means, and the mounting means themselves can also be fixed in any one of a series of vertical positions relative to the lifting carriage with which they move relatively to the truck.

I claim:

1. In an industrial truck adapted for lifting a crate or the like having angularly inclined reinforcing struts extending upwardly to lifting surfaces, a load carriage mounted for vertical lifting movement on said industrial truck, a pair of load-lifting arms, means mounting said arms on said lifting carriage for movement in a lateral direction relatively to said lifting carriage bodily toward and away from one another, yielding means urging said arms toward one another on their mounting means, said arms when moving upwardly contacting the angularly inclined struts on said load and moving relatively to the truck through said contact until engaged with said lifting surfaces, and said yielding means holding said arms at said lifting surfaces and against said struts to lift said load upon lifting movement of said carriage.

2. In an industrial truck adapted for lifting a crate or the like having angularly inclined reinforcing struts extending upwardly to lifting surfaces, a load carriage mounted for vertical lifting movement, a pair of load-lifting arms, means mounting said arms on said lifting carriage for movement in a lateral direction relatively to said lifting carriage bodily toward and away from one another, yielding means urging said arms to extreme opposed positions on their mounting means, said arms when moving upwardly on said lifting carriage contacting said angularly inclined struts on said crate and moving through contact with said struts relatively to the truck against the pressure of said yielding means until engaged with said lifting surfaces, and said yielding means holding said arms at said lifting surfaces and against said struts to lift said crate upon lifting movement of said carriage.

3. In an industrial truck adapted for lifting a crate or the like having angularly inclined structural members extending upwardly to lifting surfaces, a load carriage mounted for vertical lifting movement, a pair of load-lifting arms, means mounting said arms on said lifting carriage for movement in a lateral direction relatively to said lifting carriage bodily toward and away from one another, yielding means urging said arms toward one another on their mounting means, said lifting carriage when moving upwardly moving said arms into contact with said angular structural members and then moving said arms relatively to the truck through said contact until said arms engage said lifting surfaces, and said yielding means holding said arms at said lifting surfaces and against said structural members to lift said crate upon further lifting movement of said carriage.

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