

Oct. 28, 1952

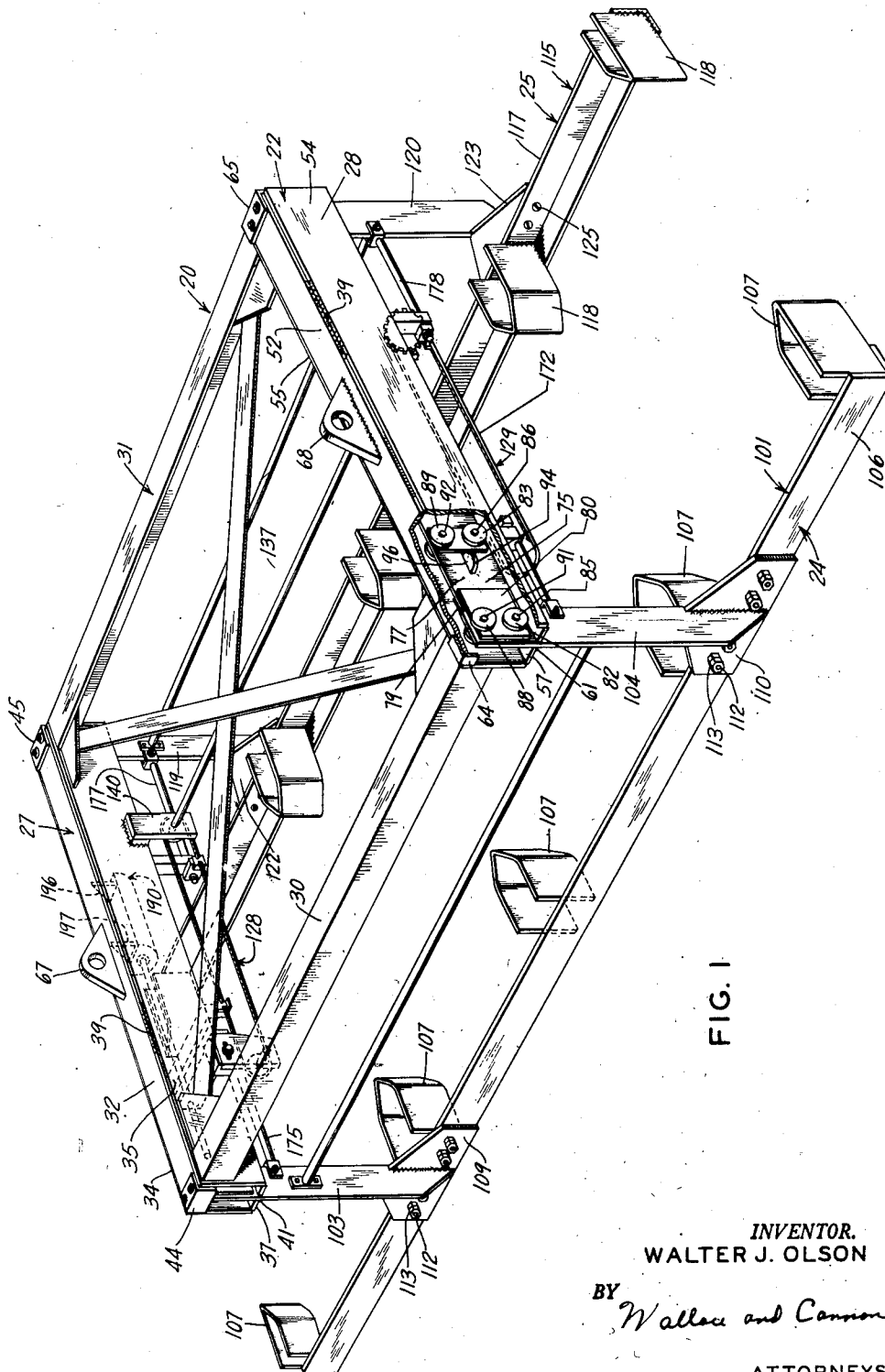
W. J. OLSON

2,615,747

GRAB

Filed Jan. 26, 1949

4 Sheets-Sheet 1



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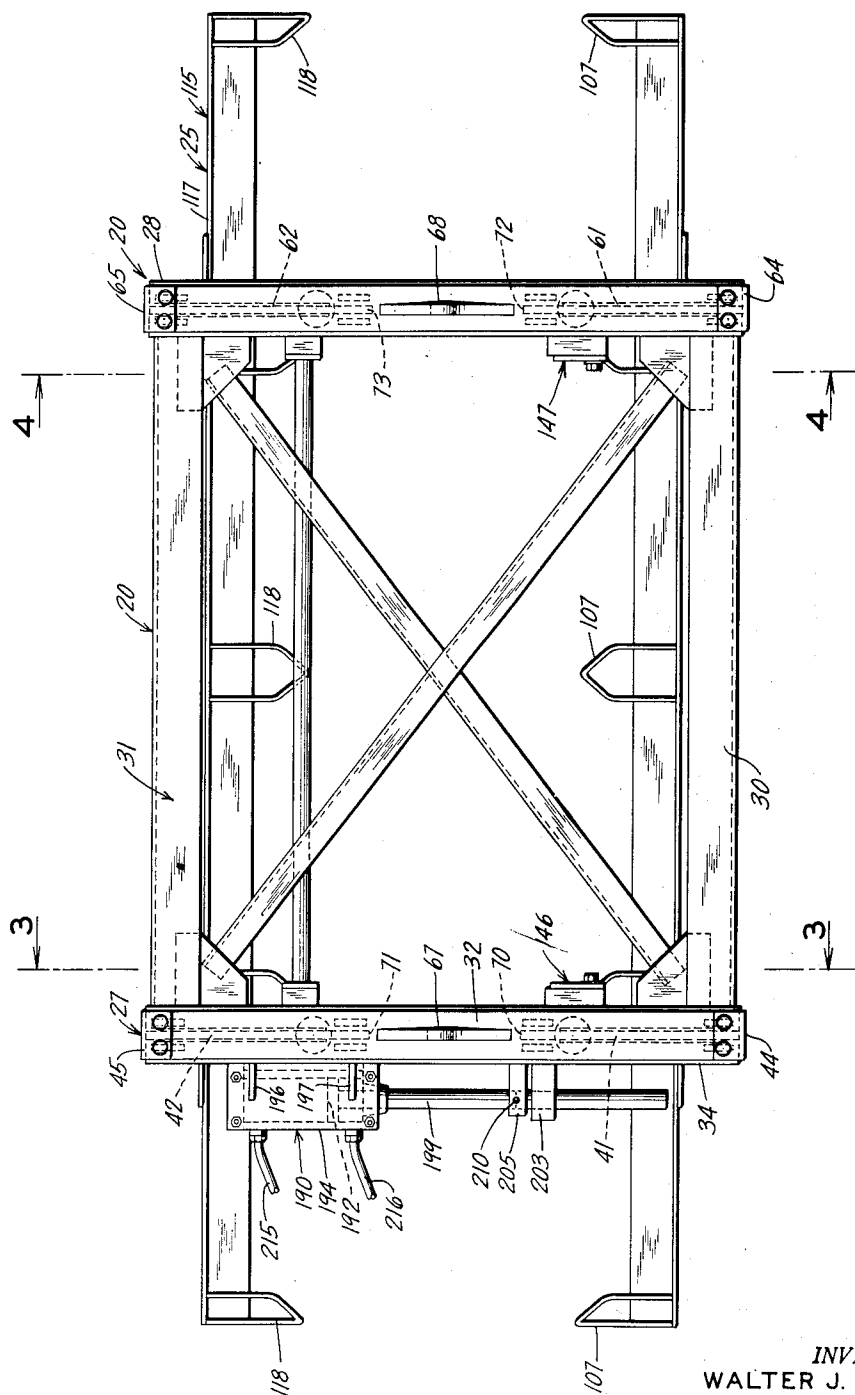
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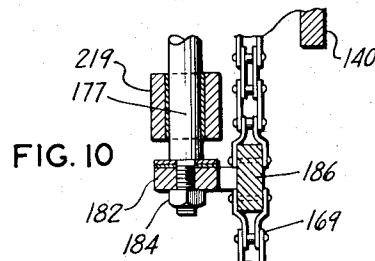
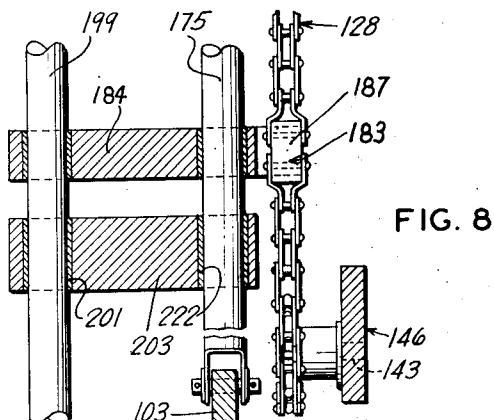
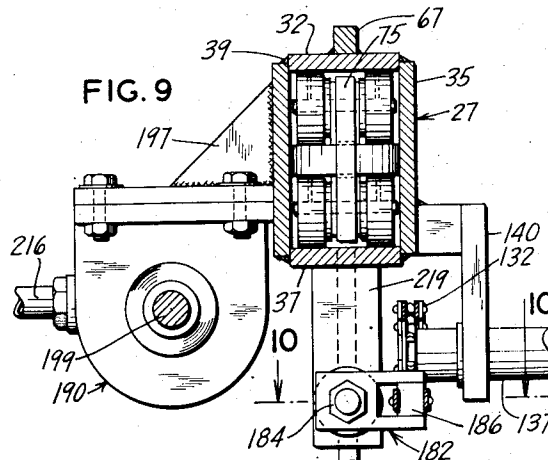
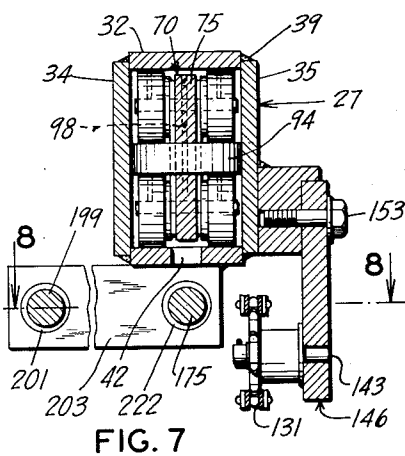
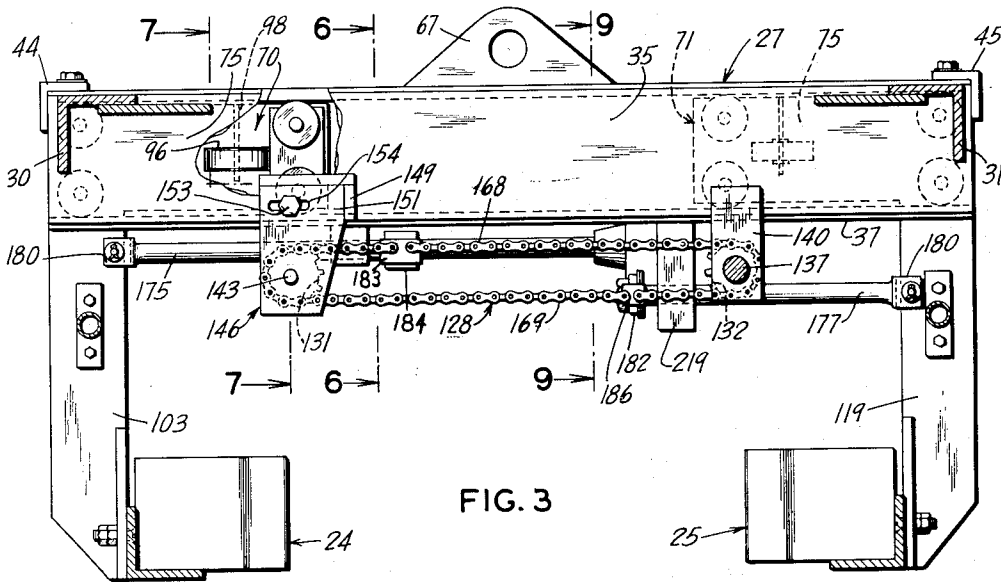
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4 Sheets-Sheet 3



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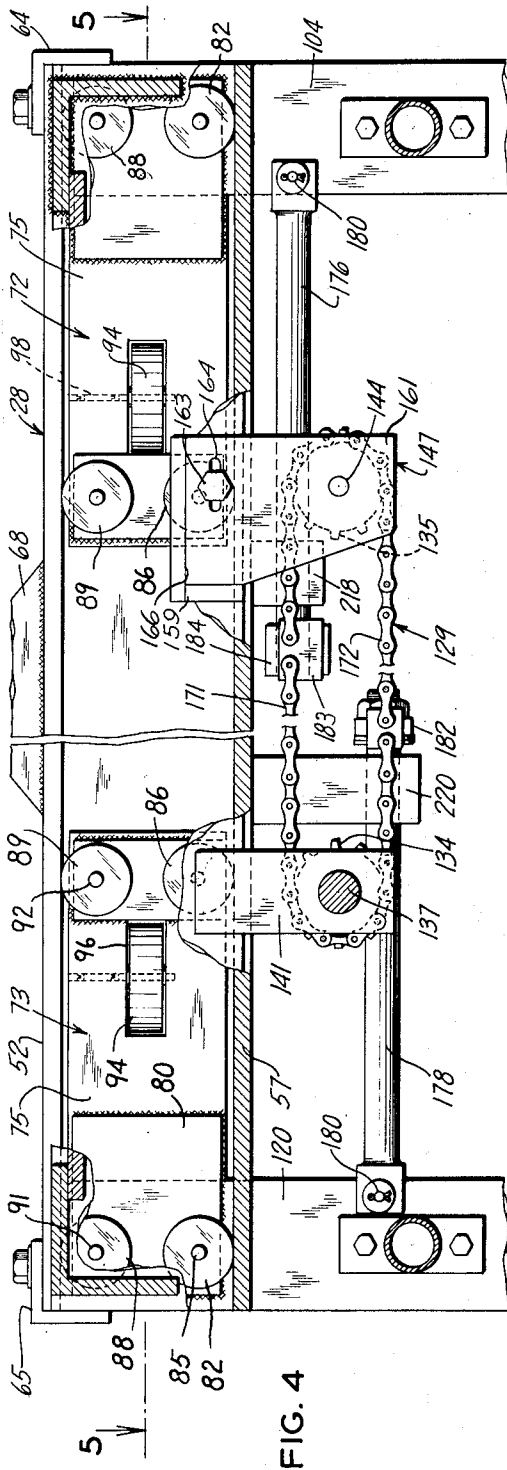


FIG. 4

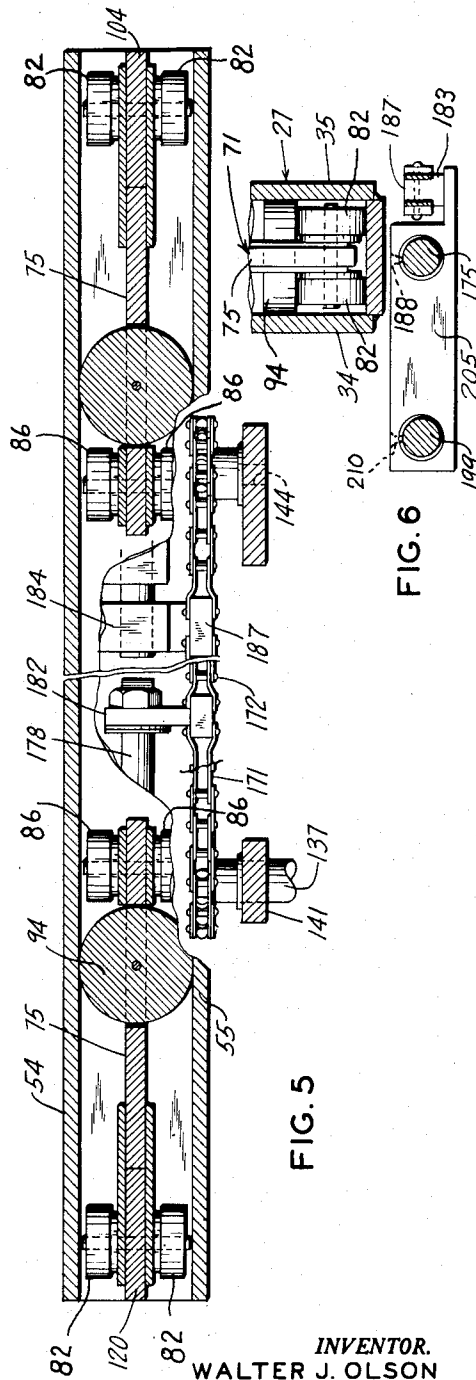


FIG. 5

FIG. 6

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UNITED STATES PATENT OFFICE

2,615,747

GRAB

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5 Claims. (Cl. 294—67)

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This invention relates to grabs and more particularly to grabs of the type especially well adapted to be used with power hoists in factories, foundries, and similar places for picking up and transporting heavy articles such as molds, flasks, heavy stacks of sheet metal, and the like.

Grabs and grapples of the general nature to which this invention relates have long been employed in lifting and transporting heavy articles such as molds, flasks, stacks of material such as sheet metal, and the like. When grabs and grapples are employed for such purposes, they are commonly used in conjunction with power hoists, gantrys, trolleys, or other power lifting machines, the grabs or grapples being used to grip the work to be lifted and transported, and the power lifting machinery being connected to the grab and being effective to raise and transport the grab and the work engaged thereby.

Various types of grabs have been heretofore known and used in the art. However, such grabs have had several inherent disadvantages such as, for example, being costly and difficult to manufacture; being difficult to operate, and the like.

A primary object of my invention is to overcome these disadvantages and to afford a novel grab which may be economically manufactured and is efficient in operation.

One of the primary disadvantages of grabs heretofore known in the art has been that the various parts have been so constituted and arranged that excessive binding of various movable parts thereof occurred during operation of the grabs, and especially when the grab was being operated under load.

One of the principal objects of my invention is to afford a novel grab wherein the various parts thereof are constituted and arranged in a novel and expeditious manner whereby the various parts thereof operate efficiently and freely when the grab is being operated either with or without a load.

An object ancillary to the foregoing is to afford a grab having grappling arms for engaging the work-load, wherein the grappling arms are supported on rollers in a novel and expeditious manner whereby the arms may be relatively easily moved into and out of work-engaging position.

Another object of my invention is to afford a grab of the aforementioned type wherein the grappling arms are guided and supported by rollers in both a horizontal and vertical direction, and in a novel and expeditious manner.

A further object is to enable a grab of the fore-

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mentioned type to be constructed in a manner whereby the grappling arms are supported by the carriages, and the load is supported by the grappling arms, in a novel manner whereby the forces exerted on the grappling arms in supporting the load are substantially vertical.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration show a preferred embodiment and the principles thereof and what I now consider to be the best mode in which I have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is a perspective view of a grab illustrating a preferred embodiment of my invention;

Fig. 2 is a top plan view of the grab shown in Fig. 1;

Fig. 3 is a sectional view taken substantially along the line 3—3 in Fig. 2;

Fig. 4 is a sectional view taken substantially along the line 4—4 in Fig. 2;

Fig. 5 is a sectional view taken substantially along the line 5—5 in Fig. 4;

Fig. 6 is a detail sectional view taken substantially along the line 6—6 in Fig. 3;

Fig. 7 is a detail sectional view taken substantially along the line 7—7 in Fig. 3;

Fig. 8 is a detail sectional view taken substantially along the line 8—8 in Fig. 7;

Fig. 9 is a detail sectional view taken substantially along the line 9—9 in Fig. 2; and

Fig. 10 is a detail sectional view taken substantially along the line 10—10 in Fig. 9.

The grab 20 shown in Figs. 1 to 10, inclusive, to illustrate a preferred embodiment of my invention, comprises, in general, a frame 22 on which are movably mounted two grappling arms 24 and 25, the grappling arms 24 and 25 being adapted to be moved on the frame toward and away from each other as will be discussed in greater detail presently.

The frame 22 comprises two elongated boxes or guide-housings 27 and 28 which are disposed in parallel spaced relation to each other and are connected at their ends by two side bars 30 and 31.

The box 27, Fig. 1, comprises a top wall 32, two side walls 34 and 35 and a bottom wall 37,

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the walls being formed of any suitable material such as sheet metal and being connected together by suitable means such as welding 39. The bottom wall 37 has a slot 41 and 42, Figs. 1 and 2, formed in the opposite end portions thereof. End guards 44 and 45 are mounted on opposite end portions of the top wall 32 and extend down over the upper end portion of the ends of the box 27 for a purpose which will be discussed in greater detail presently.

The guide-housing 28 is substantially the same as the guide-housing 27, having a top wall 52, side walls 54 and 55 and a bottom wall 57, connected together by suitable means such as welding, and having slots 61 and 62 formed in the bottom wall 57. Two guards 64 and 65 are mounted on the opposite end portions of the guide-housing 28 in a manner similar to that in which the guards 44 and 45 are mounted on the housing 27.

Two lugs 67 and 68 extend upwardly from the top walls 32 and 52, respectively, of the guide-housings 27 and 28, and are adapted to be engaged by the usual hook, not shown, on a hoist or crane, whereby the grab may be lifted and transported by the hoist or crane.

Four carriages 70, 71, 72 and 73, Fig. 2, are mounted in the housings 27 and 28, with two carriages 70 and 71 disposed in the housing 27, and two carriages 72 and 73 disposed in the housing 28. Each of the carriages 70, 71, 72, and 73 comprises an elongated body member 75 comprising a central member 77 having two ears 79 and 80 mounted on opposite faces of one end thereof in spaced relation to each other and attached thereto by any suitable means such as welding. Two pairs of rollers 82 and 83 are rotatably mounted on shafts 85 and 86 extending through the lower portion of the body member 75, each of the rollers 82 and 83 in each of the pairs being disposed on the side of the body member 75 opposite to that on which the other roller in the same pair is disposed, and each of the rollers 82 and 83 projecting downwardly below the lower edge of the body member 75 to thereby afford a peripheral edge portion which may rest on the bottom wall of the guide-housing within which the carriage is disposed. Two other pairs of rollers 88 and 89 are rotatably mounted on shafts 91 and 92 which extend through the upper portion of the body member 75 in substantially vertical alignment with the shafts 85 and 86, the rollers 88 and 89, projecting above the member 75 to thereby afford a peripheral edge portion engageable with the top wall of the guide-housing within which the respective carriage is mounted to thereby retain the lower rollers 82 and 83 in engagement with the bottom wall of the housing.

In addition to the vertically disposed rollers 82, 83, 88, and 89, a roller 94 is horizontally disposed in a slot 96 formed in the body member 75 of each of the carriages 70, 71, 72, and 73 and is rotatably mounted on a pin 98 extending in a vertical direction through the slot 96, each roller 94 projecting horizontally outwardly from the sides of the body member 75 past the rollers 82, 83, 88, and 89, and being adapted to engage both side walls of the housing within which it is disposed to thereby afford guide means for guiding the carriage on which the roller is mounted between the side walls of the housing during movement of the carriage longitudinally of the housing.

Hence, it will be seen that the carriages 70-73 are well supported and guided for relatively fric-

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tionless movement longitudinally of the housings 27 and 28, the rollers 82, 83, 88, 89, and 94 affording rolling contacts between the carriages and the walls of the housings.

The grappling arm 24 comprises a horizontally disposed jaw member 101 to which are connected two drop legs 103 and 104. The jaw member 101 comprises an elongated bar 106 formed of suitable material such as an angle iron and to which a plurality of spacers 107 are connected by any suitable means such as welding. Gusset plates 109 and 110 are welded to the lower end portions of the drop legs 103 and 104, respectively, and the drop legs 103 and 104 are connected to the jaw member 101 by bolts 112 and nuts 113, the bolts 112 extending through the plates 109 and 110.

The grappling arm 25 is similar to the grappling arm 24, including a jaw member 115 having a bar 117 to which are connected a plurality of spacers 118. Two drop legs 119 and 120, having gusset plates 122 and 123 attached to the lower end portions thereof, respectively, are connected to the bar 115 by bolts 125 which extend through the plates 122 and 123.

The spacers 107 and 118 are preferably disposed on the respective grappling arms 24 and 25 in such a manner that each spacer 107 is disposed in position opposite to the corresponding one of the spacers 118, Fig. 2. As will be appreciated by those skilled in the art, work to be picked up by the grab 20 may be supported on top of the spacers 107 and 118, or may be gripped between the spacers 107 and 118 or the bars 106 and 117, depending on the size and contour of the work to be engaged.

The drop legs 103 and 104 on the grappling arm 24 extend upwardly through the slots 41 and 61 in the bottom walls of the guide-housings 27 and 28, respectively, and the upper end portions of the drop legs 103 and 104 are disposed between the ears 79 and 80 on the body members 75 of the carriages 70 and 72, respectively, and are connected thereto by any suitable means such as welding. As is best seen in Figs. 1 and 2, the shafts 85 and 91, which extend through the ears 79 and 80 of the carriages 70 and 72, respectively, also extend through the drop legs 103 and 104 so that the drop legs 103 and 104 are supported substantially vertically below the pair of rollers 82, and the jaw 101 is so disposed on the drop legs 103 and 104 that it is suspended in substantially vertical alignment with the central portions of the body members 75 of the carriages 70 and 72 between the two pairs of rollers 82 and 88, and 83 and 89, mounted on the opposite end portions, respectively, of the body members 75.

The grappling arm 25 is similarly connected to the carriages 71 and 73, the drop legs 119 and 120 of this latter grappling arm extending upwardly between the ears 79 and 80 on the carriages 71 and 73 and being connected thereto by any suitable means such as welding.

Hence, it will be seen that the grappling arms 24 and 25 are mounted on and suspended from the pairs of carriages 70 and 72, and 71 and 73, respectively, and are movable therewith longitudinally of the housings 27 and 28 between the outer positions wherein the carriages 70-73 engage the guards 44, 45, 64, and 65, respectively, and the inner positions wherein the drop legs 103, 119, 104, and 120 engage the inner ends of the slots 41, 42, 61, and 62, respectively.

Also, it will be seen that, in my novel grab the grappling arms 24 and 25 and the carriages 70, 71, 72, and 73 are so constituted and arranged

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that the jaws 101 and 115, by which the work to be lifted by the grab is engaged, are, in all positions of adjustment, disposed in substantially vertical alignment with the central portion of the body member 75 from which they are suspended so that the load carried by each carriage is substantially equally distributed between the rollers 82 and 83 mounted on opposite end portions of the carriage, and comprises a substantially vertically applied load thereon.

To afford means for moving the grappling arms 24 and 25 toward and away from each other I provide two endless chains 128 and 129, Figs. 1, 3 and 4, which are trained over two pairs of sprocket wheels 131 and 132, and 134 and 135, respectively. The sprocket wheels 132 and 134 are mounted on, and rotatable with, the opposite end portions of a shaft 137, which extends substantially the length of the frame 22 and is rotatably mounted in brackets 140 and 141 mounted on the outer faces of the side walls 35 and 55 of the housings 27 and 28, respectively. The sprocket wheels 131 and 135 are mounted on, and rotatable with stub shafts 143 and 144, which are journaled in brackets 146 and 147 mounted on the side walls 35 and 55, respectively.

To afford means for adjusting the tension on the chain 128, the bracket 146, Fig. 3, comprises a block 149 welded to the outer face of the side wall 35 of the housing 27, and a plate 151 which is adjustably mounted on the block 149 by a bolt 153 extending through an elongated slot 154 formed in the plate 151, and overhanging lip 156 on the block 149 engaging the upper edge of the plate 151 and preventing the latter from turning on the bolt 153. Similarly, to afford means for adjusting the tension on the chain 129, the bracket 147 comprises a block 159 welded to the side wall 55 of the box 28, and a plate 161 which is mounted on the block 159 by a bolt 163 extending through an elongated slot 164 in the plate 161, an overhanging lip 166 on the block 159 preventing the plate 161 from turning on the bolt 163. Thus it will be seen that the positions of plates 151 and 161 may be adjusted on the blocks 149 and 159 to thereby properly tension the chains 128 and 129 on their respective pulleys.

As is best seen in Figs. 3 and 4, the chain 128 is disposed on the pulleys 131 and 132, below the housing 27, in such a position that vertically spaced upper and lower runs or passes 168 and 169, respectively, are afforded thereon; and the chain 129 is so disposed on the pulleys 134 and 135, below the housing 28, that vertically spaced upper and lower passes or runs 171 and 172 are afforded. As will be described in greater detail presently, the chains 128 and 129 are connected to the legs 103, 104, 119, and 120 of the grappling arms 24 and 25 in such a manner that upon rotation of the chains 128 and 129 in one direction the grappling arms 24 and 25 are moved along the guide-housings 27 and 28 toward each other, and, when the chains are rotated in the other direction, the grappling arms 24 and 25 are moved along the housings 27 and 28 away from each other.

Interconnection of the drop legs 103, 104, 119, and 120 with the chains 128 and 129 is effected by elongated links or rods 175, 176, 177, and 178, respectively, Figs. 3 and 4, the rods 175, 176, 177 and 178 being connected at one end to the drop legs 103, 104, 119 and 120 by suitable means such as pins 180, and being connected at the other end to the chains 128 and 129 by brackets 182 and 183. Each of the brackets 182 is mounted on the last

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mentioned end of a respective one of the rods 177 and 178 and is held thereon by a nut 185, Figs. 9 and 10, and includes a crossbar 186, Fig. 9, which extends through a link of one of the chains 128 and 129 to thereby attach the rod to that chain. Each of the brackets 183 comprises one end of an elongated block 184 mounted on a respective one of the rods 175 and 176, Figs. 3 and 4, and connected thereto by suitable means such as a set screw 188, Figs. 6 and 8. The bracket 183 on each of the blocks 184 is connected to the upper pass of a respective one of the chains 128 and 129 by a cross bar 187 extending through a link of the chain, Figs. 6 and 8.

As is best seen in Figs. 3 and 4, the legs 103 and 104 of the grab 20 shown in the drawings are connected to the upper runs 168 and 171 of the chains 128 and 129 by the rods 175 and 176, respectively, and the legs 119 and 120 are connected to the lower runs 169 and 172 by the rods 177 and 178. Thus it will be seen that upon rotation of the chains 128 and 129 in a clockwise direction, as viewed in Fig. 3, the grappling arms 24 and 25 will be moved along the guide-housings 27 and 28 toward each other, whereas, when the chains are rotated in a counter-clockwise direction the grappling arms will be moved away from each other.

To afford means for so rotating, or oscillating, the chains 128 and 129, I provide an air cylinder 190 having a piston 192 reciprocally mounted in a housing 194, Fig. 2. The air cylinder 190 is connected to the guide-housing 27 by two brackets 196 and 197, Figs. 2 and 9, which are welded to the outer face of the side wall 34 of the housing 27 in such position that the cylinder 190 is suspended in position with the longitudinal axis of the housing 194 thereof disposed in substantially horizontally spaced parallel relation to the upper run 168 of the chain 128, Fig. 9.

A plunger 199, Fig. 2, is connected to the piston 192 and projects from one end of the housing 194 of the air cylinder 190 in axial alignment therewith. The free end portion of the plunger 199 is slidably mounted in an opening 201 formed in a supporting block 203, Figs. 2 and 7, connected to the bottom wall 37 of the housing 27 by suitable means such as welding, and is mounted in the bracket 183 connected to the rod 175, the latter bracket 183 being connected to the plunger 199 by suitable means such as a set screw 210.

Thus, it will be seen that the air cylinder 190, upon reciprocation of the plunger 199, is effective to oscillate the chain 128 upon the sprocket wheels 131 and 132 and, therefore, through the interconnection of the chains 128 and 129 by the shaft 137, is likewise effective to oscillate the chain 129 on the sprocket wheels 134 and 135. Such reciprocation of the plunger 199 and piston 192, as is well known to those skilled in the art, may be effected by alternately feeding suitable working fluid such as, for example, compressed air, into one end and then the other of the housing 194. For this purpose, two feed pipes 215 and 216 are connected to the opposite end portions of the housing 194, Fig. 2, and are operable to alternately serve as conduits for the feeding of compressed air into the housing 194 and for exhausting air therefrom during a reciprocation of the piston 192.

To insure that the rods 175, 176, 177 and 178 will be reciprocated by the chains 128 and 129 in substantially a straight line, I prefer to slidably mount the rods 175-178 in suitable supporting means in a manner similar to that in

which the plunger 199 of the air cylinder 190 is slidably mounted in the supporting block 203, as previously discussed. Thus it will be seen that I have provided supporting blocks 218, 219 and 220 in which are slidably mounted the rods 176, 177, and 178, respectively, the supporting blocks 218-220 being welded to the lower end portion of the respective guide-housing beneath which the individual rod 176, 177 or 178 is mounted. As is best seen in Figs. 2, 3, 7 and 8, the rod 175 is slidably mounted in an opening 222 formed in the supporting block 203 within which the plunger 199 is mounted, as previously mentioned.

Operation

In the operation of the device shown in Figs. 1 to 10, inclusive, the grab 20 may be supported from a suitable hoist, trolley, or the like, by hooks, not shown, engaged in the openings in the lugs 67 and 68 mounted on the upper walls of the guide-housings 27 and 28.

In preparation for lowering the grab 20 over the article or articles to be lifted and transported thereby, the grappling arms 24 and 25 may be moved away from each other by feeding working fluid through the feed line 215 into the housing 194 and exhausting working fluid from the housing 194 through the feed line 216, thus causing the plunger 199 to be moved toward the left, as viewed in Fig. 3, to thereby cause counter-clockwise rotation of the chains 128 and 129, as viewed in Fig. 3. The grab 20 may then be lowered over the article or articles to be lifted and transported thereby, and operation of the air cylinder 190 may be reversed, as will be readily understood by those skilled in the art, by feeding working fluid into the housing 194 through the feed line 216 and exhausting working fluid from the housing 194 through the feed line 215, thus causing the chains 128 and 129 to be rotated in a clockwise direction, as viewed in Fig. 3, to thereby move the grappling arms 24 and 25 toward each other into engagement with the work to be lifted by the grab.

Obviously the grab 20 may be maintained in either an open or closed position by maintaining a positive pressure in the housing 194 on the proper side of the piston 192 and maintaining a reduced pressure on the other side of the piston. Thus, for example, it will be seen that during a lifting and transporting operation of the grab 20 the grappling arms 24 and 25 may be positively held in engagement with the work to be so lifted and transported by maintaining a positive pressure on the left side of the piston 192, as viewed in Fig. 3, and maintaining a reduced pressure on the right side thereof.

As previously mentioned, the work to be lifted by the grab 20 may either be gripped between the grappling arms 24 and 25, or may be disposed on top of the spacers 107 and 118, the particular manner of supporting the work by the grab 20 being determined primarily by the size and contour of the work. However, it will be seen that whichever way the work is engaged by the grappling arms 24 and 25, the parts of my novel grab are so constituted and arranged that the forces applied to the carriages 70-73 are efficiently distributed, and the carriages are so mounted in the housings 27 and 28 that they may be moved relatively freely when desired and are operable to effectively support the grappling arms 27 and 28, and the load carried thereby, in a novel and expeditious manner.

It will be understood that although I have

shown an air cylinder as the power unit for effecting oscillation of the chains 128 and 129 in the preferred embodiment of my invention, shown in Figs. 1 to 10, this is by way of illustrating the preferred embodiment of my invention and not by way of limitation, and other means for moving the chains 128 and 129 may be used by those skilled in the art without departing from the purview of my invention.

From the foregoing it will be seen that I have afforded a novel and practical grab wherein the grappling arms of the grab are supported in a novel and expeditious manner whereby they may be moved relatively freely in either an unloaded or loaded condition during an operation of my device.

Furthermore, it will be seen that I have provided a novel grab wherein the parts thereof are constituted and arranged in a novel and expeditious manner to afford novel mechanism for the operation of the grab.

In addition, it will be seen that I have afforded a novel grab which is sturdy in construction, practical and efficient in operation, and which may be economically produced commercially.

Thus, while I have illustrated and described the preferred embodiment of my invention, it is to be understood that this is capable of variation and modification and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a grab, a frame including two elongated boxes each having walls and each having elongated slots formed in, and extending longitudinally of, one of the walls thereof, two pairs of carriages mounted in said boxes and movable longitudinally thereof, each of said carriages comprising a body member, and two pairs of rollers rotatably mounted on said body member with one of said pairs of rollers disposed outwardly of the other of said pairs of rollers longitudinally of one of said boxes, each of said carriages of each of said pairs being mounted in a respective one of said boxes with said rollers on said carriages in engagement with said box for supporting said body member therein, a pair of grappling members, each of said grappling members comprising a jaw member and two drop legs mounted thereon, each of said grappling members being supported by a corresponding one of said pairs of carriages with each of said legs extending vertically through a predetermined one of said slots and mounted on a respective one carriage of said corresponding one pair of carriages between said one pair of said rollers on said carriage, and means for moving said carriages longitudinally of said boxes to thereby move said grappling members toward and away from each other.

2. In a grab, a frame including two elongated boxes including bottom walls having elongated slots formed therein and extending longitudinally thereof, two pairs of carriages mounted in said boxes and movable longitudinally thereof, each of said carriages comprising an elongated body member disposed longitudinally in said box, and a plurality of rollers rotatably mounted on said body member with predetermined ones of said rollers disposed at one end portion of said body member and others of said rollers disposed at the other end portion of said body member, each of said carriages of each of said pairs being mounted

in a respective one of said boxes with said rollers on said carriage in engagement with said box for supporting said body member therein, a pair of grappling members, each of said grappling members comprising a horizontally disposed bar and two drop legs mounted thereon and projecting upwardly therefrom, each of said grappling members being supported by a corresponding one of said pairs of carriages with each of said legs extending vertically through a predetermined one of said slots and mounted on a respective one of said pairs of carriages in a manner such that said horizontal bar of said grappling member extends transversely below said pair of carriages in vertical alignment with the portion of said body members in said pair of carriages disposed between said rollers mounted on opposite end portions of said body members, and means for reciprocating said carriages and grappling members in said boxes.

3. In a grab, a frame including two elongated guide-housings disposed in parallel relation to each other, carriages mounted in said housings for movement longitudinally thereof, two grappling members connected to said carriages for movement therewith, and means for reciprocating said carriages relative to each other in said housings to thereby move said grappling members toward and away from each other, said means comprising a pair of sprocket wheels rotatably mounted on one of said housings, an endless chain trained over said sprocket wheels to afford two spaced runs between said wheels, a link member connecting one of said runs to one of said grappling arms, a second link member connecting the other of said runs to the other of said grappling arms, an elongated member slidably mounted on said one housing in parallel relation to one of said runs and connected to said run, and means for reciprocating said elongated member along a path parallel to said last mentioned one run to thereby oscillate said chain about said wheels and move said grappling arms toward and away from each other.

4. In a grab, a frame including two elongated guide-housings disposed in parallel relation to each other, carriages mounted in said housings for movement longitudinally thereof, two grappling members mounted in said housings and projecting downwardly therefrom, said grappling members being connected to said carriages for movement with the latter, and means for reciprocating said carriages relative to each other in said housings to thereby move said grappling members toward and away from each other, said means comprising a pair of sprocket wheels rotatably mounted below one of said housings in spaced relation to each other, an endless chain trained over said sprocket wheels to afford two spaced runs between said wheels, two elongated rods slidably mounted on said one housing in parallel relation thereto below said housing, one of said rods having one end connected to one of said runs and the other end connected to one of said grappling arms, the other of said rods having one end connected to the other of said runs and the other end connected to the

other of said grappling arms, and means connected to said chain for oscillating the latter to thereby cause said rods to be reciprocated relative to said one housing and effect movement of said grappling members toward and away from each other.

5. In a grab, an elongated frame comprising two elongated parallelly disposed side members, and two elongated parallelly disposed guide-housings mounted on opposite ends of said side members, each of said guide-housings comprising a top wall, a bottom wall, and two side walls interconnecting said top and bottom walls, each of said bottom walls having a longitudinally extending slot formed in each end portion thereof, two pairs of elongated carriages mounted in said guide-housings, said two pairs of carriages being disposed in opposite end portions of said guide-housings with each of said carriages of each of said pairs being disposed in a respective end of one of said housings, each of said carriages comprising an elongated body member disposed in longitudinal alignment with the guide-housing within which said carriage is disposed, a plurality of rollers rotatably mounted in pairs on said body member, predetermined pairs of said rollers being engaged with the bottom wall of the housing within which said carriage is disposed to movably support said body member of said carriage thereon, and other pairs of said rollers being engaged with the top wall of the housing within which said carriage is disposed to retain said predetermined pair of rollers in engagement with said bottom wall of said housing, and other rollers rotatably mounted on said body members and engageable with the side walls of said housing within which said carriage is disposed to guide said carriage therein, grappling arms supported by said carriages for movement toward and away from each other, each of said grappling members being supported by a corresponding pair of said carriages and comprising a jaw member and two drop legs mounted on said jaw member, each of said drop legs extending through a corresponding one of said slots in the bottom of one of said housings and being mounted on said body member of one of said carriages between the rollers in one of said predetermined pairs disposed on said body member, and means for moving said carriages back and forth in said housings to thereby move said grappling arms toward and away from each other.

WALTER J. OLSON.

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