June 26, 1951 D. I. WILLIAMS ET AL 2,558,114

GRAPPLE

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Fig. 1.

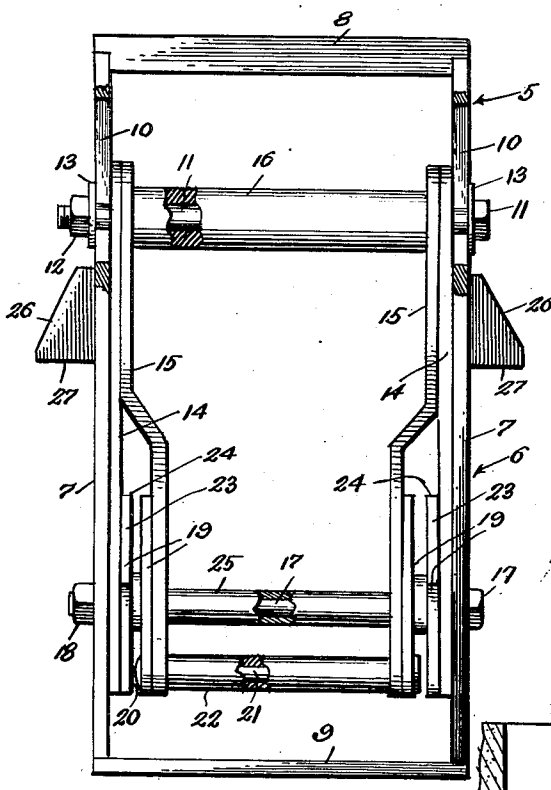


Fig. 2.

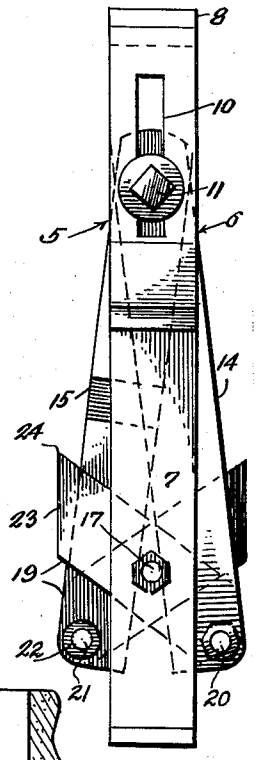


Fig. 3.

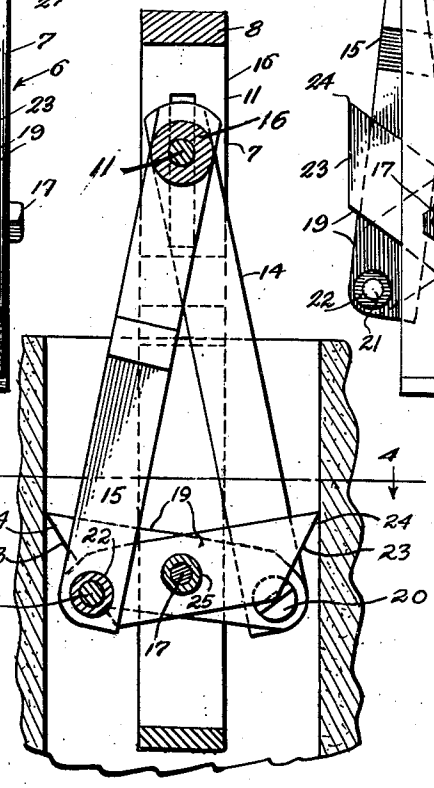
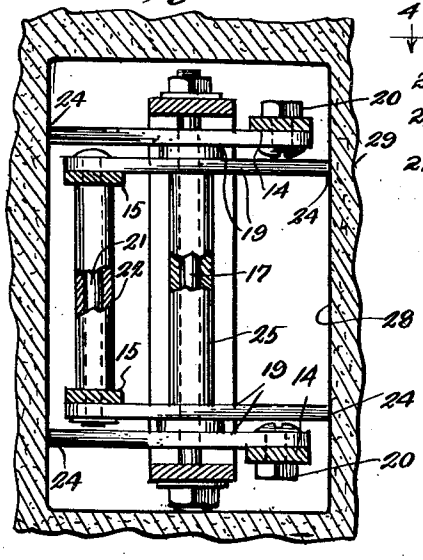


Fig. 4.



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GRAPPLE

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4 Claims. (Cl. 294—97)

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This invention relates to a novel construction of grapple adapted to be used by workmen to facilitate the manual lifting and conveying of blocks of concrete, cinder blocks, tile or other materials provided with openings or recesses.

It is a primary object of the invention to provide a grapple of extremely simple construction capable of being quickly applied to or removed from an opening or recess of an article and which, through a simple gripping operation will be actuated for causing the grapple to grip the article so that it may be readily lifted and conveyed.

Still a further object of the invention is to provide a grapple wherein the article gripping means thereof are actuated by a portion of the grapple handle so that the extent of the gripping operation will vary in proportion to the weight of the article to insure a secure grasping of any article capable of being manually lifted and conveyed.

Another object of the invention is to provide a grapple capable of being readily released from engagement with an article thereby enabling the device to be efficiently utilized without any waste of time of the user.

Still another object of the invention is to provide a grapple of extremely simple construction which is capable of being economically manufactured and which will be durable.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, which illustrates a preferred embodiment thereof, and wherein:

Figure 1 is a side elevational view, partly in section, showing the improved grapple;

Figure 2 is an edge view in elevation thereof;

Figure 3 is a longitudinal transverse sectional view showing the grapple in an operative position and in engagement with a portion of a recess or apertured article to be lifted and conveyed and

Figure 4 is a cross-sectional view of the grapple taken substantially along a plane as indicated by the line 4—4 of Figure 3.

Referring more specifically to the drawing, the grapple in its entirety is designated generally 5 and includes an elongated rectangular frame 6 comprising corresponding side members 7, an upper end member 8 and a lower end member 9. The parts 7, 8 and 9, constituting the frame 6 may be formed integral or rigidly connected together in any suitable manner.

The side members 7, adjacent to the end portion 8, are provided with corresponding longitudinally elongated openings 10 for slidably receiving portions of the shank of a bolt 11 which extends transversely through the frame 6. The bolt 11 is provided with a head at one end and a removable nut 12 on its opposite end. The bolt head and

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nut are disposed on the outer sides of the two side members 7 and the bolt shank preferably carries washers 13, which are located between the bolt head and nut and the side members 7.

A pair of corresponding links 14 are pivotally mounted on the shank of the bolt 11 within the frame 6. The links 14 are disposed one adjacent each of the side members 7 and are pivotally connected to the bolt 11 adjacent corresponding ends thereof. A second pair of links 15 are pivotally mounted, adjacent corresponding ends thereof, on the bolt 11 and are disposed between the links 14 and with one of the links 15 adjacent each of said links 14. The opposite, lower ends of the links 15 are offset inwardly with respect to the first mentioned, upper ends thereof which pivotally engage the bolt 11, as best seen in Figure 1. A spacing sleeve 16 is mounted on the shank of the bolt 11 between the links 15 for holding the links 14 and 15 in correct relationship, as illustrated.

A bolt 17 extends transversely through the side members 7 and transversely of the frame 6, adjacent the lower end member 9, and is provided with a head at one end thereof and a nut 18 at its opposite end, which parts are disposed on the outer sides of the side members 7. A pair of corresponding levers or fingers 19 are pivotally mounted intermediate of their ends on the shank of the bolt 17 and adjacent each side of the frame 6. One of said pairs of fingers or levers 19 is disposed between the lower ends of the links 14 and 15, which are located adjacent each side of the frame 6, as clearly illustrated in Figure 1. The links 14 and 15 are pivotally connected at their lower ends to corresponding ends of the levers 19; the links 14 being connected to the fingers 19 preferably by nut and bolt fastenings 20 and the links 15 being connected to the levers 19 by a single nut and bolt fastening 21 the shank of which extends loosely through the lower ends of the two links 15 and through the ends of the levers 19, which are pivotally connected thereto. The shank of the fastening 21 preferably carries a spacing sleeve 22 which is disposed between the links 15.

The opposite, free ends of the levers or fingers 19 are cut on an oblique, as seen at 23 to form points 24 at the upper edges of said free ends and for a purpose which will hereinafter become apparent. A spacing sleeve 25 is preferably mounted on the shank of the bolt 17 between the pairs of levers 19. A stop member 26 projects through the outer side of each of the side members 7. The stops 26 are located beneath and adjacent the lower ends of the openings 10 and are provided with downwardly facing shoulders 27 which are disposed substantially perpendicular to the sides 7, for a purpose which will hereinafter be described. From the foregoing it will

be readily apparent that the grapple 5 may be grasped in one hand by the end 8 and the sleeves 16 which forms the handle thereof. For this purpose, the upper edges of the member 8 are preferably rounded. In applying the grapple 5, the parts 8 and 16 are held loosely so as not to move the sleeve 16 toward the end 8. While thus held, the lower portion of the grapple may be readily inserted into a recess or opening 28 of a block 29, shown fragmentarily in Figures 3 and 4. The block 29 may be made of any material including cement, cinder block and tile. The grapple 5 is preferably inserted until the downwardly facing shoulders 27 abut against the upper surface of the block 29 after which by gripping the portions 8 and 16 the bolt 11 will be moved in the openings 10 toward the end 8 to thereby draw the links 14 and 15 upwardly for rocking the levers or fingers 19 on their pivots 17 from their retracted, inoperative positions of Figure 2 to their operative, extended positions of Figures 3 and 4. This will cause the tapered ends 24 of the levers 19 to engage forceably against opposite walls of the recess or opening 28 so that the block 29 can be lifted with the grapple 5. It will be readily apparent that if the weight of the grapple and the block is supported by the operator primarily through engagement with the sleeve 16 that the greater the weight of the block, the greater will be the force exerted through the links 14 and 15 for urging the levers 19 into engagement with said walls of the opening or recess 28. To remove the grapple from the block 29, it is only necessary to place the block in its desired location and press downwardly upon the sleeve 16 for retracting the levers 29. If the shoulders 27 are raised slightly out of engagement with the block before it is grasped by the grapple 5, the release of the grapple can be facilitated by a downward pressure on the end 8 which will tend to move the levers 19 toward retracted positions. Further, in applying the grapple 5, should the levers 19 not be in fully retracted positions the inclined faces 23 thereof will engage the upper edges of the opening or recess 28 for swinging the levers to fully retracted positions.

The grapple 5 may be formed of any suitable material having sufficient strength for the purposes for which the device is intended. Likewise, it is to be understood that other articles than building blocks, such as vessels or containers having recesses or openings therein may be handled by the grapple 5.

It will also be apparent that the grapple may be made in various sizes depending upon the particular work for which it is primarily intended.

Various other modifications and changes are contemplated and may obviously be resorted to without departing from the spirit and scope of the invention as hereinafter defined by the appended claims.

We claim as our invention:

1. A grapple for moving recessed or apertured articles, comprising a body portion, a handle mounted for lengthwise sliding movement thereon, levers pivotally mounted in crossed relationship on the body portion, links pivotally connected to the handle and to complementary ends of the levers and which are disposed remote to the handle when the levers are in retracted inoperative positions, and the opposite article engaging ends of the levers being swingable away from the handle and outwardly of the body portion toward projected, operative positions, when the handle is moved in a direction away from the levers.

2. A lifting device comprising a frame, a handle member mounted for longitudinal sliding movement in said frame, at least two lever members pivotally mounted in the frame intermediate of their ends and in crossed relationship to one another and in longitudinally spaced relationship to the handle member, each of said lever members having an article engaging end and a link engaging end, said link engaging ends being disposed more remote to the handle than the article engaging ends of the lever members when the lever members are in retracted, inoperative positions, and link means pivotally connected to the handle member and to the link engaging ends of the lever members for swinging the article engaging ends of the lever members outwardly of the frame when the handle member is moved in a direction away from the lever members.

3. A lifting device comprising a frame, a handle member mounted for longitudinal sliding movement in said frame, levers pivotally mounted intermediate of their ends in the frame and in longitudinally spaced relationship to the handle member for swinging movement laterally of the frame, each of said levers including an article engaging end and a link engaging end, said link engaging ends being disposed more remote to the handle member than the article engaging ends when said lever members are in retracted positions, and link means pivotally connected to the handle member and to the link engaging ends of the levers for swinging the article engaging ends of the levers outwardly of the frame and in a direction away from the handle member when the handle member is displaced away from the pivot of the levers, said article engaging ends of the levers having beveled free end portions adapted to engage a surface of an article to be lifted by the device.

4. A lifting device comprising a frame, a handle mounted for longitudinal sliding movement in said frame, a plurality of levers pivotally mounted intermediate of their ends in the frame and in longitudinally spaced relationship to the handle, each of said levers including an article engaging end and a link engaging end, the complementary ends of said levers being disposed on opposite sides of the frame, said article engaging ends being disposed adjacent the handle when in retracted inoperative positions, link means pivotally connected to the handle and to the link engaging ends of the levers for swinging the levers on their pivots for displacing the article engaging ends thereof outwardly of opposite sides of the frame and away from the handle when said handle is moved in a direction away from the intermediate portions of the levers, the article engaging end of each lever being beveled on the side thereof remote to the handle.

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