

Dec. 30, 1958

G. E. MCGUIRE ET AL

2,866,660

BLOCK-LIFTING GRAB

Filed Aug. 3, 1955

2 Sheets-Sheet 1

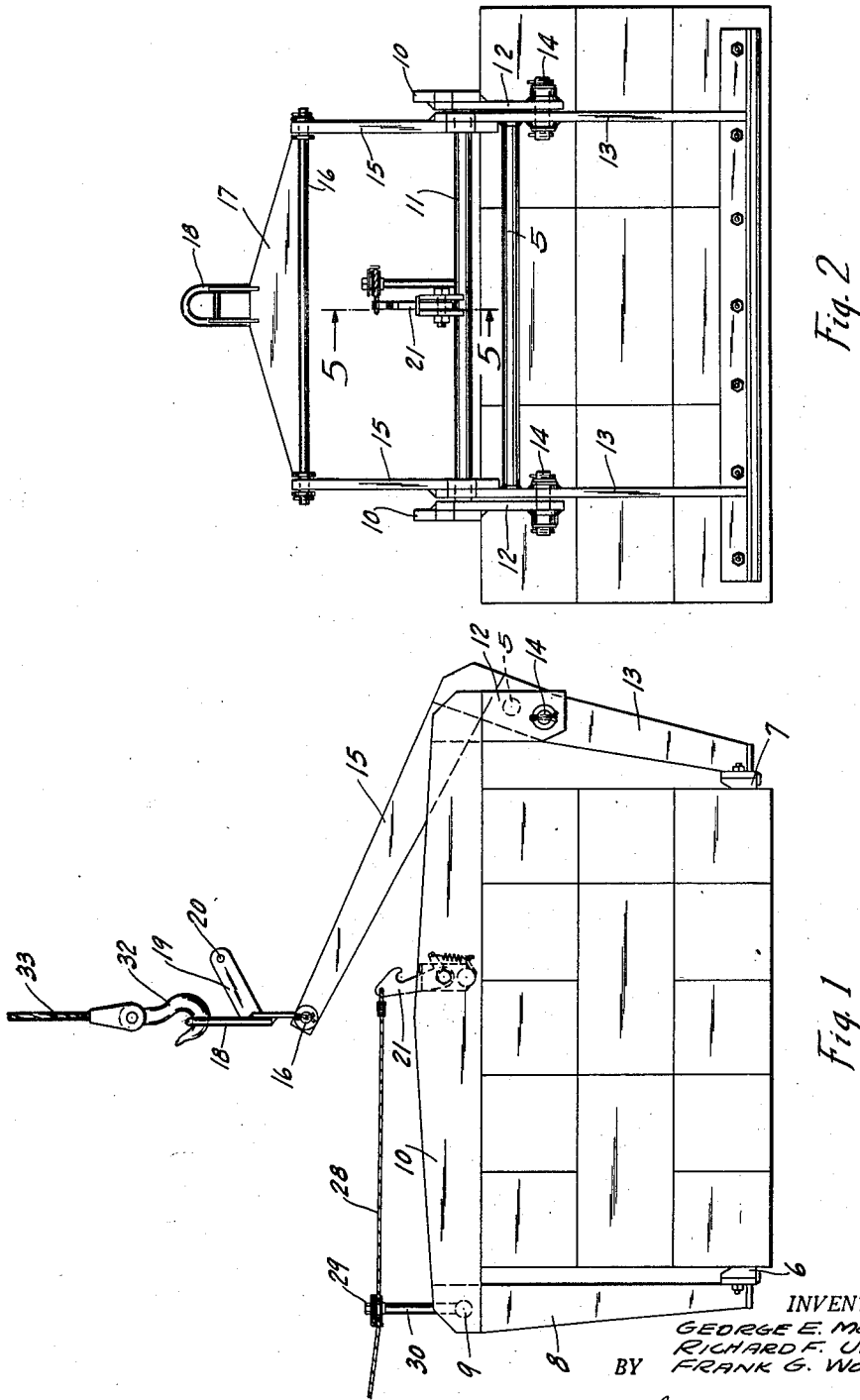


Fig. 2

Fig. 1

INVENTORS
GEORGE E. MCGUIRE
RICHARD F. UREN
BY FRANK G. WOODSIDE

Wheeler, Wheeler & Wheeler
ATTORNEYS

Dec. 30, 1958

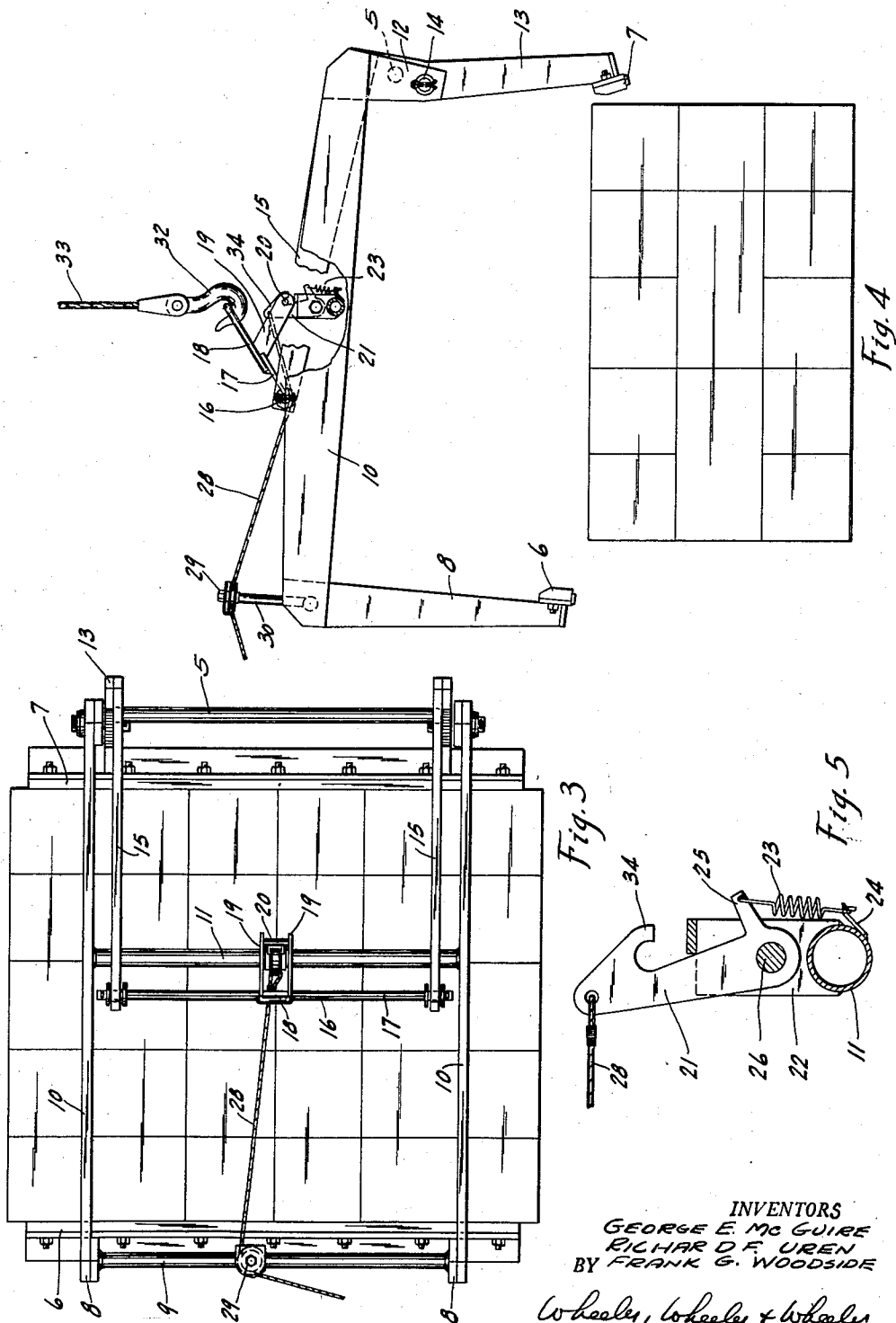
G. E. MCGUIRE ET AL

2,866,660

BLOCK-LIFTING GRAB

Filed Aug. 3, 1955

2 Sheets-Sheet 2



INVENTORS
 GEORGE E. MCGUIRE
 RICHARD F. UREN
 BY FRANK G. WOODSIDE
 Wheeler, Wheeler & Wheeler
 ATTORNEYS

1

2,866,660

BLOCK-LIFTING GRAB

George E. McGuire, Richard F. Uren, and Frank G. Woodside, Milwaukee, Wis., assignors, by direct and mesne assignments, to L. A. Spring & Wire Corporation, Detroit, Mich., a corporation of Michigan

Application August 3, 1955, Serial No. 526,178

3 Claims. (Cl. 294-63)

This invention relates to a block-lifting grab with open jaw lock.

The grab is designed to lift, as a unit, a number of rows and tiers of concrete blocks or other rectangular objects such as bricks, boxes, ingots, etc. The grab is of the type in which elongated jaws can be closed into engagement with the rows of work pieces in the bottom tier of those to be lifted. When the tension of the lifting hoist is applied, the jaws are engaged so tightly with the work pieces of the bottom tier that these and the tiers superimposed thereon can be lifted unitarily for any purpose. The loading or unloading of the work pieces to or from a truck bed is an example of the use of the device.

One feature of the invention is the organization of the jaws in such a way as to increase the mechanical advantage of the lever arm to which the hoist is connected as compared with a relatively much shorter arm which carries the jaw, thereby assuring great clamping pressure upon the work pieces.

Another feature of the invention is the provision of a releasable latch which locks the jaws open to facilitate manipulation of the grab into engagement with the pile of work pieces to be lifted. In this connection, the latch includes means whereby the center of gravity of the grab is changed according to whether it is being hoisted with the jaws open or with the jaws closed upon work pieces to be lifted. This is done by connecting the hoisting link to the latch mechanism in such fashion that when the latch mechanism is operative, the link is held at an angle so as to displace the hoisting hook toward one end of the grab. Release of the latch mechanism permits the link to straighten out, whereby the hook is centered over the load. In this connection, the relationship between the hoisting link and the arm engaged by the detent of the latch mechanism is such as to facilitate reengagement of such arm with the detent when it is desired to lock the jaws open.

In the drawings:

Fig. 1 is a view in side elevation of the grab in hoisting engagement with a stack of blocks.

Fig. 2 is a view of the grab and blocks in end elevation.

Fig. 3 is a view of the grab and blocks in plan.

Fig. 4 is a view of the grab with its jaws open in position above the blocks.

Fig. 5 is an enlarged detail view taken in section on the line 5-5 of Fig. 2.

The grab comprises a pair of elongated work engaging jaws 6 and 7 of such horizontal length as to be attached and engaged with all of the blocks in the lowermost tier of a stack of work pieces to be lifted. The relatively stationary jaw 6 is mounted at the lower end of a pair of arms 8 cross connected by a bar 9 and rigidly welded at the upper ends to the horizontal frame members 10. Frame members 10 are interconnected at an intermediate point by bar 11. At the other end of the grab, members

2

10 have short depending arms 12. The organization thus far described constitutes a rigid frame.

Pivoted to the rigid frame, which includes jaw 6, is a sub-frame carrying jaw 7 and comprising arms 13 which are pivoted at 14 to the short depending arms 12 of the frame structure above described. The arms 13 are cross connected with each other by a bar 5. Welded to the upper ends of arms 13 are levers 15, the free ends of which are disposed centrally of the grab and cross connected by bar 16. The web 17 welded to bar 16 carries the hoisting link 18 and an obliquely disposed pair of latch levers 19 connected at their free ends by a rod 20, which serves as a keeper for the latch hook or detent 21, pivotally mounted on ears 22, welded centrally to bar 11. A tension spring 23 having an anchorage 24 welded to bar 11 is connected to an ear 25 on detent 21, whereby to bias the detent clockwise about its pintle 26 is viewed in Fig. 5. A trip cord 28 is connected to the free outer end of the detent hook 21 and extends to a remote point for manipulation by the operator. It may be trained through a guide 29 at the upper end of a standard 30 welded to rod 9.

It will be observed that the hoisting link 18 is attached to receive the conventional hook 32 at the end of the hoist cable 33 of any suitable hoist. In the position of the parts shown in Fig. 4, the jaws 6 and 7 are locked open, the levers 15 being oscillated about pintles 14 in a counterclockwise direction as viewed in Fig. 4, and being anchored in this position by engagement of the keeper 20 in the hook 34 of detent 21.

With the grab unloaded, the weight of its right hand end, as viewed in Figs. 3 and 4, exceeds the weight of its left hand end due to the lever structure which is movable with respect to frame 10 and supports jaw 7. Consequently, if the open grab were suspended from the same center point as is used to suspend the loaded grab, the end of the grab at which jaw 7 is located would hang so low with respect to jaw 6 as to make it difficult to manipulate the grab in position. By reason of the lateral projection of the arms 19, which carry the keeper rod 20, the link 18 is constrained in the position of the parts shown in Fig. 4 to a position in which the hoisting force exerted by cable 33 in its support of the grab is offset to the right from the center of the grab, thereby equalizing, in part, the weight distributed in the grab itself. It is desirable not to equalize this weight distribution completely, as it is found that the grab is more easily engaged with the work when one of the jaws hangs slightly lower than the other, so that it can be engaged with the blocks at one side of the pile before the other jaw is manipulated into engagement with the blocks at the other side of pile.

When the grab is lowered over the pile substantially to the position of Fig. 1, the operator tensions the cord 28 to release the detent 21 from hooked engagement with the keeper bar 20. Thereupon, the upward pull of the hoist cable 33 on the hoist link 18 straightens the link between the hook 32 and the axis of bar 16 and pivots the levers 15 upon pintles 14 to oscillate arms 13 and thereby to bring the jaw 7 into forcible contact with the blocks in the end row of the lowest tier of the pile to be lifted. This draws the jaw 6 into contact with the blocks of the other end row of the lowest tier. Continuing upward, tension on the hoisting cable will now exert a powerful clamping pressure sufficient to maintain all the blocks of the lowest tier in alignment and to enable the entire stack to be lifted as shown in Fig. 1.

When it is desired to redeposit the blocks and to release the cable, the hoisting cable is lowered until the blocks rest on the desired point of support. Continued lowering of the hoisting cable will result in the move-

3

ment of the levers 15 and arms 13 of the sub-frame pivotally in a counterclockwise direction as viewed in Fig. 1. As the hoisting cable falls slack, the hoisting link 18 and its laterally projecting arms 19 will fall toward the position of Fig. 4, thereby automatically engaging themselves in the hook 34 of the detent 21. Renewed tension on the hoisting cable will lift the grab with its jaws open in readiness to receive another load.

What is claimed is:

1. A work-hoisting grab comprising a generally horizontal frame, a first arm connected with one end of the frame and extending downwardly, a first clamping jaw on the first arm below the frame, a second arm pivoted to the frame near its other end and extending downwardly from the frame, a second clamping jaw opposed to the first clamping jaw and mounted on said second arm, a lever connected with the second arm and extending along the frame toward said one end thereof, said lever somewhat unbalancing the frame by imposing greater weight on its second end than on its first end, a suspension line coupling connected with the lever intermediate the ends of the frame and adapted under load to effect oscillation of said lever and second arm pivotally in a direction to actuate said second jaw toward the first jaw to engage work therebetween, the connection of the said coupling to the lever being substantially centered over work so engaged, and means for releasably fastening said coupling to the frame in a position offset toward said other end thereof, whereby to sustain at least some of the lever weight while also securing said lever to said

4

frame, whereby to prevent said suspension line coupling from actuating the second jaw toward the first jaw.

2. The device of claim 1 in which said releasable fastening means comprises a link pivotally connected between the lever and the suspension line coupling, and a hook in pivotal connection with the frame and offset from the normal position of said link toward the second end of the frame, said hook being releasably engageable with the link to hold said link in a position in which it is implanted toward the second end of the frame.

3. The device of claim 1 in which said frame comprises laterally spaced members and means cross connecting said members, the first arm comprising laterally spaced arm parts to the lower ends of which the ends of the first clamping jaw are connected, the second arm comprising laterally spaced arm parts to the lower ends of which the second clamping jaw is connected, said lever including laterally spaced lever parts respectively fixed to the arm parts of the second arm.

References Cited in the file of this patent

UNITED STATES PATENTS

1,411,316	Vestal	Apr. 4, 1922
1,733,236	Pearce	Oct. 29, 1929
1,830,264	Edwards	Nov. 3, 1931
2,076,494	Camerota et al.	Apr. 6, 1937
2,148,911	Morgan	Feb. 28, 1939
2,369,727	Falkner	Feb. 20, 1945

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,866,660

December 30, 1958

George E. McGuire et al

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 10, for "implanted" read -- implaned ---.

Signed and sealed this 29th day of March 1960.

(SEAL)

Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents