Dec. 21, 1943. J. BRESLAV 2,337,177

LIFTING GRAB

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Fig. 1.

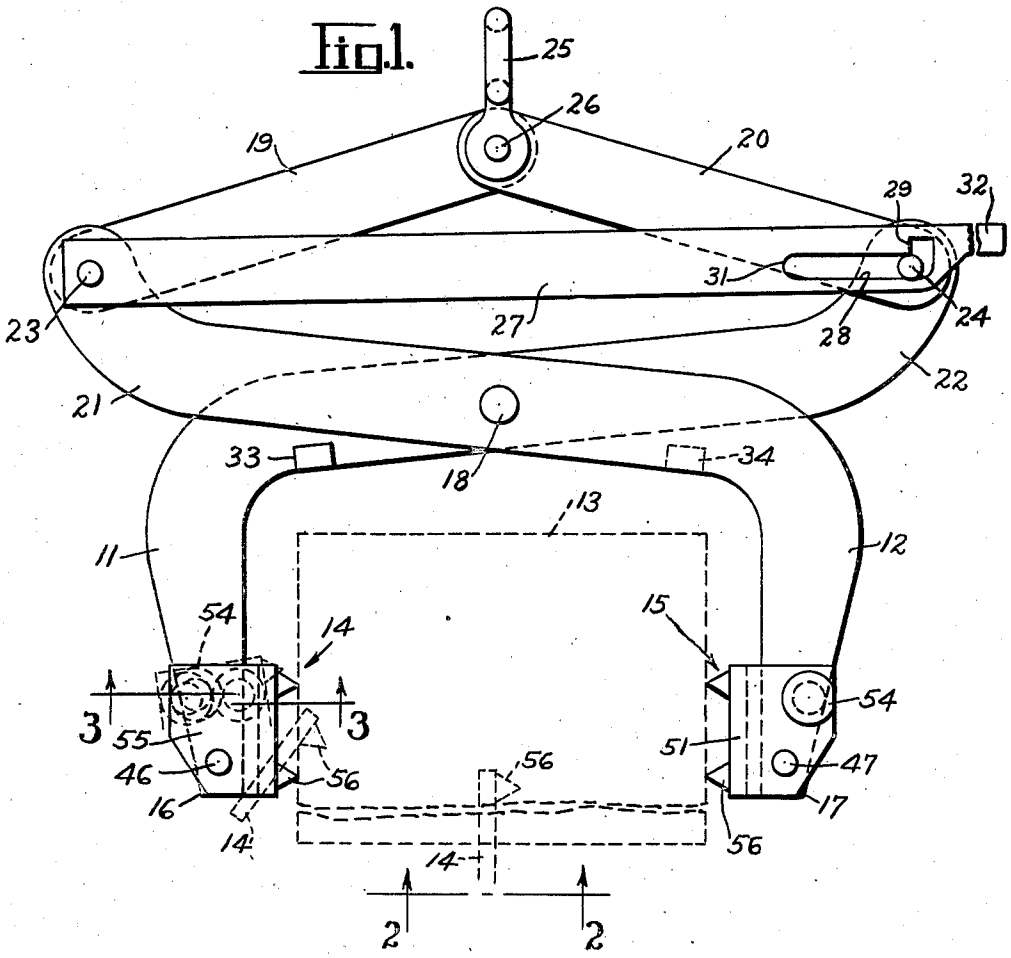
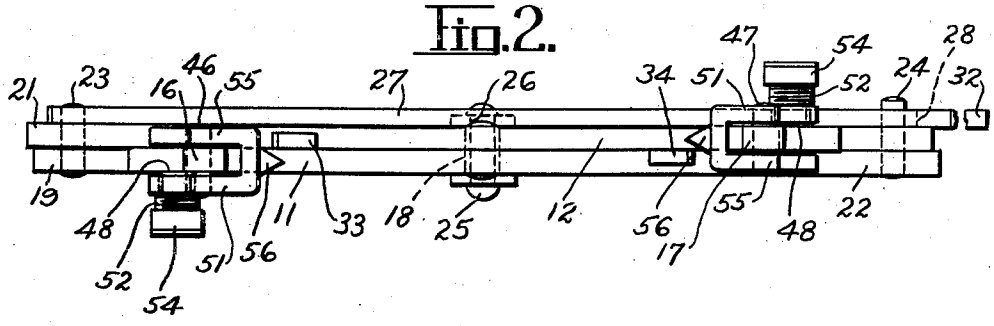


Fig. 2.



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Fig. 3.

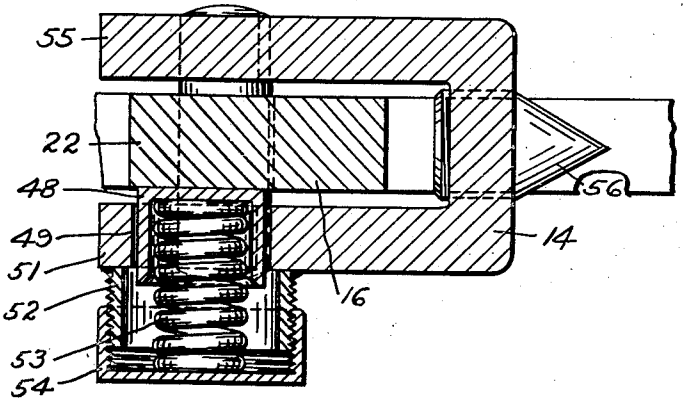
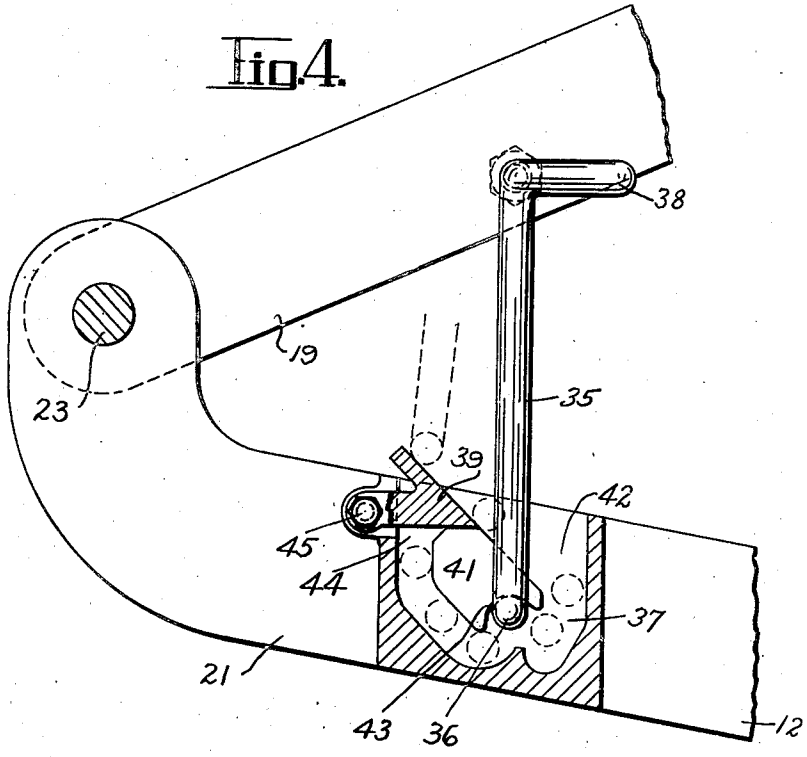


Fig. 4.



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LIFTING GRAB

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Application October 8, 1942, Serial No. 461,343

7 Claims. (Cl. 294—118)

This invention relates to lifting grabs and more particularly to improvements in grabs having arms on which stock gripping jaws are pivoted and which are movable toward and away from each other.

In grabs of this nature there is generally provided means to releasably lock the arms in open position and this means may be semi-automatic in operation, being manually operable to release, or be fully automatic by being released by proper actuation of the grab. The stock gripping jaws are usually pivoted to the lower ends of the arms and when released from the stock are apt to swing inwardly toward the same and jam against it whereby the stock may be mutilated or the jaws may dig into the stock and be jammed thereagainst thus preventing the proper release thereof from the stock. In other instances the pivoted jaws may swing downwardly when open to such an extent that, upon being lowered to again grip stock, they will improperly engage the stock and cause damage thereto and danger of accidental injury to the operator.

In order to obviate the above and other disadvantages it is proposed as one object of this invention to provide in a grab of the above type improved means to control the swinging movement of the pivoted jaws.

Another object of this invention is to provide in a grab of the above type and which has releasable means to hold the arms thereof in open position, means to movably maintain the pivoted jaws in the last position of stock gripping while the arms are held in open position, so that the jaws will not interfere with the operation of positioning them to grip stock of different dimension.

Still another object of this invention is to provide in a grab having arms movable toward and away from each other and which carry stock gripping jaws pivoted thereto, means carried by the jaws and spring biased into engagement with the arms to frictionally retain the jaws in the position, assumed thereby in gripping stock, when they are opened to release the stock, and while being held open by the means to hold the jaws in open position.

A further object of this invention is to provide an improved stock lifting grab which will be relatively simple in construction, inexpensive to manufacture, readily manipulated, compact, and very efficient and durable in use.

With these and other objects in view, which will appear as the description proceeds, there have been illustrated in the accompanying drawings forms of grabs in which the features and principles of this invention may be conveniently embodied in practice, it being understood that various changes may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the drawings:

Figure 1 is a side view of an improved form of stock lifting grab having releasable means to hold the jaws in open position and embodying the features of this invention;

Figure 2 is a bottom view of the grab and looking in the direction of arrows 2—2 in Figure 1;

Figure 3 is an enlarged sectional view taken on the line 3—3 of Figure 1; and

Figure 4 is a broken partial side view of a grab having a fully automatic form of means to releasably hold the jaws in open position.

Referring now to the drawings, wherein like reference numerals designate like parts throughout the several views, the numerals 11 and 12 denote depending opposing arms which are adapted to be moved toward and away from each other to grip stock 13, indicated by dotted lines in Figure 1, between jaws 14 and 15, respectively, which are carried and pivotally secured to the lower ends 16 and 17 of the arms 11 and 12 respectively. The grab, illustrated in Figure 1, is of the so-called ice-tong type wherein the arms 11 and 12 are crossed and pivoted together at the point of crossing by a pin 18. Link bars 19 and 20 are pivoted to the upper extended ends 21 and 22 of the arms 11 and 12 by pins 23 and 24, respectively, and are brought together and pivoted to a lift ring 25 by a pin 26. The stock 13, gripped by the jaws 14 and 15, is lifted by a hoist (not shown) but which is adapted to be attached to the lift ring 25 in any desired manner. Upward pull upon the lift ring 25 will rock the arms 11 and 12 about the common pivot pin 18 to cause these arms to move toward each other and the jaws 14 and 15 to securely grip the stock 13, whereby it may be lifted and transferred to another location.

The means shown in Figures 1 and 2, which is provided to lock the arms 11 and 12 and with them the jaws 14 and 15 in open position, comprises a bar 27 pivoted at one end upon the pivot pin 23 and being provided at its other end with an elongated slot 28 in which an extended end of the pivot pin 24 is adapted to ride. One end of the slot 28 is enlarged to form a stop shoulder 29 which when the arms are in open position drops in front of the pin 24 to retain the pins

23 and 24 in their farthest spread apart position and the arms 11 and 12 in open position. The shoulder 31 formed by the other end of the slot 28 limits the closed position of the arms 11 and 12 to prevent the jaws 14 and 15 engaging, resulting in possible damage thereto. The bar 27 is preferably extended beyond the slot 28 to form a convenient handle 32 by which an operator may raise the bar 27 to release the shoulder 29 from the pin 24 to permit the jaws 14 and 15 to swing toward each other to grip work 13 disposed therebetween.

Upon lowering the work 13 upon a support, continuing the lowering of the grab, to cause the undersurface of the arms 11 and 12, directly below the pivot pin 18, to engage the work 13, will sufficiently spread the pivot pins 23 and 24 whereby the stop shoulder 29 will drop in front of the pin 24. If desired, stop lugs 33 and 34 may be provided on the arms 11 and 12 in position to be engaged by the adjacent arm to limit the spread of the arms and to prevent them being lowered beyond the desired amount. Requiring as it does the manual release of the catch shoulder 29 from the pin 24 the arrangement shown in Figures 1 and 2 is semi-automatic.

Figure 4 illustrates a full automatic form of means for releasably locking the arms 11 and 12 in open position. In this form a swingable catch member 35 having a rearwardly extending hooked end 36 is pivotally secured to the link 19 with its hooked end 36 adapted to enter and ride in a cam way 37 provided on the end 21 of the arms 12. The member 35 is provided with an offset portion 38 the weight of which acts on the member 35 to normally maintain it in an angular position in respect to the vertical, as indicated in dotted lines in Figure 4, whereby the hooked end 36 of the member 35 will engage and ride down an inclined surface of a catch 39 and a block 41 into the entrance 42 of the cam way 37, when the pins 23 and 24 are spread apart by the lowering of the grab as above described, which action moves the link 19 toward the arm end 21.

Upon attempting to again raise the grab the hooked end 36 swings under the block 41 and is caught in a groove 43 whereby the arms 11 and 12 will be held in open position. When lowering the grab to pick up another stock 13, the hooked end 36 is moved downwardly and swings out of the groove 43 into position to ride out of the cam way 37 through its exit 44. Upon leaving the cam way 37 the hooked end 36 raises the catch member 39 which is pivoted at 45 to the arm end 21, and drops back into place after the hooked end 36 leaves the cam way 37. The various positions of the hooked end 36 in its travel into and out of the cam way 37 are indicated in dotted lines in Figure 4.

In gripping various sizes of stock 13, the jaws 14 and 15 swing upon respective pivot pins 46 and 47 by which they are secured to the arm end 16 and 17, and below the center of gravity of the jaws 14 and 15, will automatically adjust themselves to properly engage the stock to be gripped. In order that the jaws 14 and 15 will not swing toward each other, when the grab is lowered to release them from the stock 13, and again grip the stock when the grab is again raised in arm opened position, the means constituting one feature of this invention, is provided to maintain the jaws in the last position which they assumed in gripping the stock last acted upon by the grab.

The means herein shown for accomplishing the result of so maintaining the jaws in such position includes, see Figure 3, a cup-shaped button 48 which is loosely disposed in an opening 49 provided in a side flange 51, extending from each jaw 14 and 15 into position to overlie a side surface of the arm end 11 and 12, and which button 48 is located above the respective pivot pins 46 and 47, which pins also pass through the flanges 51. A threaded sleeve 52 secured to the flange 51, preferably by welding, extends outwardly from the same and encloses a compression spring 53 which reacts between the cup-shaped button 48 and a cover member 54, which is screw-threaded onto the sleeve 52, to press the button 48 against the respective arm end. By varying the position of the cover 54 on the sleeve 52, the tension of the spring 53 may be adjusted. The jaws 14 and 15 are so positioned on the respective arm ends 21 and 22 as to be limited in their swinging movement in respect thereto by being adapted to have their ends engage the respective arm end. The arrangement is such that the button 48 will be prevented from riding off the arm end at either side thereof, and therefore this jaw movement limiting stop means serves two useful purposes.

In this instance the jaws 14 and 15 are U-shaped in cross-section and have the other flange 55 of this form extended over the other side of the arm end from that engaged by the button 48. Stock penetrating points 56 are also shown as being provided and extend from the jaws 14 and 15 to assist in gripping the stock 13. These points 56 are preferably of hardened steel and are screw-threaded into the respective jaw.

By the provision of the above described improved means to releasably retain the jaws in open position and the means to maintain the jaws in the last position assumed thereby when gripping the last stock acted upon, an improved grab structure is provided which is particularly efficient in use. Such an improved grab is also much safer to use, can be readily manipulated, and is compact and relatively inexpensive to manufacture.

While there has been described above preferred forms in which the features and principles of this invention are embodied it will be understood that the same may be embodied in other specific forms without departing from the spirit and essential attributes thereof, and it is therefore desired that the present embodiments be considered in all respects as illustrative and not restrictive, reference being had to the claims rather than to the foregoing description to indicate the scope of the present invention.

Having thus fully disclosed the invention, what is claimed as new and for which it is desired to secure Letters Patent is:

1. In a stock lifting grab, opposed arms adapted to move toward and away from each other, a stock engaging jaw pivoted to each arm to normally swing downwardly when released from the stock by movement of the arms away from each other, and means carried by each jaw and frictionally engaging the respective arm to resist swinging movement of the jaw in respect to the arm, and means to adjust the friction of said arm swinging resisting means.

2. In a stock lifting grab, opposed arms adapted to move toward and away from each other, a stock engaging jaw pivoted to each arm to normally swing downwardly when released from the

stock by movement of the arms away from each other, a spring pressed button carried by each jaw in position to frictionally engage the respective arm to resist swinging movement of the jaw in respect to the arm, and means to adjust the frictional tension of the button on the arm.

3. In a stock lifting grab, opposed arms adapted to move toward and away from each other, a stock engaging jaw pivoted to each arm to normally swing downwardly when released from the stock by movement of the arms away from each other, a button slidable in and carried by each jaw in position to engage the respective arm, a spring adapted to press each button toward the respective arm, and means to adjust the tension of each spring.

4. A grab for lifting stock comprising crossed arms pivoted together at their crossing point, each of the ends of said arms at one side of their crossing point having stock engaging jaws pivoted thereto, each of the ends of said arms at the other side of their crossing point having an end of a link pivoted thereto by pivot pins, the other ends of said links being pivotally secured together, a bar pivoted at one end to one end of the arm and link ends by the pin thereat and having a slot embracing the pivot pin at the pivoted ends of the other arm and link, a stop shoulder formed in the bar end having the slot to engage the respective pivot pin in the slot to retain the jaws in spread apart position and another shoulder engageable by the pivot pin to limit the movement of the jaws toward each other.

5. A grab for lifting stock comprising crossed arms pivoted together at their crossing point, each of the ends of said arms at one side of their crossing point having stock engaging jaws pivoted thereto, each of the ends of said arms at the other side of their crossing point having an end of a link pivoted thereto by pivot pins, the other ends of said links being pivotally secured together, a bar pivoted at one end to one of the arm and link ends by the pin thereat and having a slot embracing the pivot pin at the pivoted ends of the other arm and link, a stop shoulder formed in the bar end having the slot to engage the respective pivot pin in the slot to retain the jaws in spread apart position and another shoulder engageable by the pivot pin to limit the movement of the jaws toward each other, and means to resist swinging movement of each jaw on the respective arm.

6. A grab for lifting stock comprising crossed arms pivoted together at their crossing point, each of the ends of said arms at one side of their crossing point having stock engaging jaws pivoted thereto, each of the ends of said arms at the other side of their crossing point having an end of a link pivoted thereto by pivot pins, the other ends of said link being pivotally secured together, a bar pivoted at one end to one of the arm and link ends by the pin thereat and having a slot embracing the pivot pin at the pivoted ends of the other arm and link, a stop shoulder formed in the bar end having the slot to engage the respective pivot pin in the slot to retain the jaws in spread apart position and another shoulder engageable by the pivot pin to limit the movement of the jaws toward each other, each of said jaws being pivoted to the respective arm to normally swing downwardly when released from the stock by movement of the arms away from each other, and means carried by each jaw and frictionally engaging each arm to resist swinging movement of the jaw in respect to the arm.

7. A grab for lifting stock comprising crossed arms pivoted together at their crossing point, each of the ends of said arms at one side of their crossing point having stock engaging jaws pivoted thereto, each of the ends of said arms at the other side of their crossing point having an end of a link pivoted thereto by pivot pins, the other ends of said links being pivotally secured together, a bar pivoted at one end to one of the arm and link ends by the pin thereat and having a slot embracing the pivot pin at the pivoted ends of the other arm and link, a stop shoulder formed in the bar end having the slot to engage the respective pivot pin in the slot to retain the jaws in spread apart position and another shoulder engageable by the pivot pin to limit the movement of the jaws toward each other, each of said jaws being pivoted to the respective arm to normally swing downwardly when released from the stock by movement of the arms away from each other, and means carried by each jaw and frictionally engaging each arm to resist swinging movement of the jaw in respect to the arm, and means to adjust the friction of said arm swinging resisting means.

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