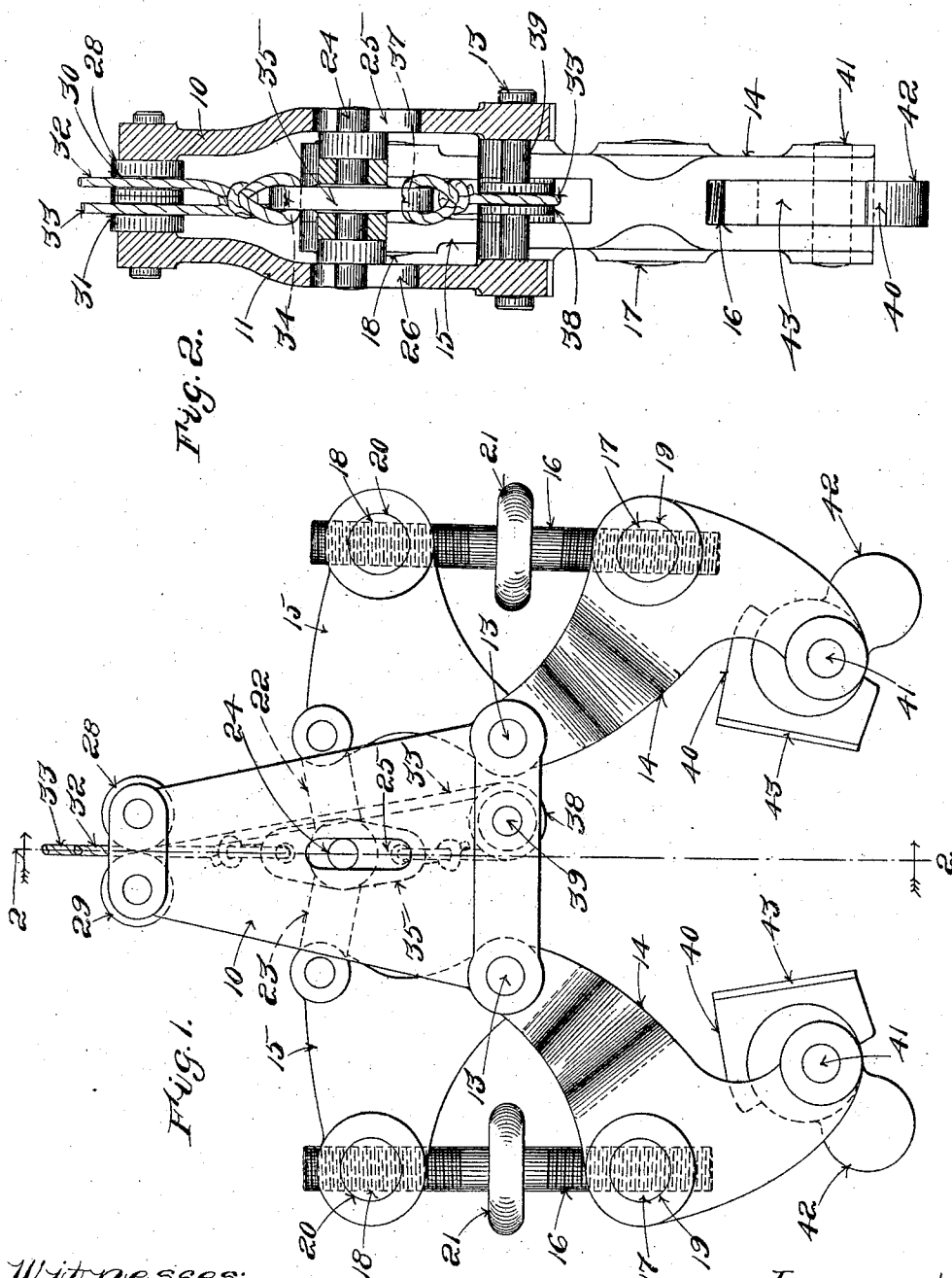


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J. L. SEWALL.
GRAPPLING TONGS.
APPLICATION FILED SEPT. 20, 1906.



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UNITED STATES PATENT OFFICE.

JOHN L. SEWALL, OF RANDOLPH, MASSACHUSETTS.

GRAPPLING-TONGS.

No. 868,945.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN L. SEWALL, a citizen of the United States, residing at Randolph, county of Norfolk, Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Grappling-Tongs, of which the following is a specification, reference being had therein to the accompanying drawings.

It is frequently desirable that grappling tongs be provided for lifting heavy weights, and especially for use in connection with blocks of stone. In grappling tongs of this kind, it is desirable that the structure of the tongs be such that the points of the tongs which engage the sides of the articles to be lifted be pressed against the sides of the article with sufficient force, so that the weight may be lifted without the necessity for holes or notches being cut in the sides of the article. Such tongs may also be employed to take the place of a "Lewis", such as is frequently employed in lifting blocks of stone and which is inserted in a "Lewis" hole cut in the top of the block. It is also desirable that the tongs be arranged for use on as wide a range of sizes of the articles to be lifted as possible, so that different sizes of tongs will not be required. The tongs should also be constructed so that they may be readily applied to the load and the load be instantly released when desired.

My invention has for its object to produce lifting tongs which shall fulfil these requirements and at the same time be simple in construction and easy and secure in operation.

The construction of my improved grappling tongs is such that the heavier the load the greater the pressure exerted by the grappling tongs at the points of contact, thereby lessening the danger of accidents. Provision is also made for lifting polished articles without injury to the polished surfaces.

The invention will be fully understood from the following description taken in connection with the accompanying drawings, and the novel features thereof are pointed out and clearly defined in the claims at the close of the specification.

Referring to the drawings,—Figure 1 is a side elevation of a pair of grappling tongs embodying my invention. Fig. 2 is a section on line 2—2 Fig. 1, looking in the direction of the arrows.

My improved grappling tongs are constructed preferably with a central frame composed of two plates 10 and 11, to which are pivoted at 13 the grappling members, by means of which the load is lifted. The grappling members are preferably made in two parts 14 and 15 which are adjustable with relation to each other for the purpose of varying the space between the jaws of the members 14. This adjustment between the two members 14 and 15 is conveniently obtained by means of a right and left threaded screw 16 engaging two correspondingly threaded swing nuts 17 and 18

pivoted at 19 and 20 to the said members 14 and 15. The screw 16 is also provided with a hand wheel 21, by which it may be turned when adjustment is desired. It will thus be seen that the two members 14 and 15 may be rigidly disposed in any desired position with regard to each other, and that each acts, when adjusted as described, as a lever of the first class. It will be understood, of course, that the two members 14 and 15 may be made in a single piece, if preferred. To each of the members 15 is pivoted one end of a toggle joint composed of the two links 22 and 23 which are themselves pivotally connected at their centers, as shown at 24. The ends of the pivot 24 are adapted to extend sidewise into slots 25 and 26 in the plates 10 and 11, and these slots serve to guide the movement of the pivot 24, so that an equal amount of motion is imparted to the points of contact of the grappling members by the movement of the toggle joint.

At the upper end of the plates 10 and 11 are pivoted a pair of sheaves 28 and 29, each provided with two grooves, as shown at 30 and 31 in Fig. 2. Between these two sheaves pass the two ropes or suspensions 32 and 33, by one of which the grappling tongs and the load are supported and by the other of which the load is released and the tongs carried with the grappling members extended when not in use. Thus the rope 32 is attached to a suitable hole 34 in the upper end of the shackle 35, while the rope 33 is attached to a corresponding hole 37 in the lower end of said shackle 35. The said rope 33 passes downward from the said shackle 35 about a sheave 38 supported on the axle 39 between the two plates 10 and 11. After passing about the sheave 38, the rope 33 passes between the two sheaves 28 and 29, as previously described.

It will be seen that when the rope 32 is raised or shortened, the toggle joint composed of the links 22 and 23 will be straightened, thus causing the lower ends of the grappling members to engage the sides of the stone or other load to be lifted and also that the heavier the load the greater will be the pressure exerted on the sides thereof. When the rope 33 is tightened and the load borne by the rope 32 is taken by the rope 33, the toggle joint will be bent and the load released. This arrangement makes my improved grappling tongs especially valuable for use with winches, traveling cranes and similar hoisting devices, because it enables the crane man or engine man to release the load, no attendance on the grapple being required, once the load is raised. This contrivance adapts my improved grappling tongs for convenient use in the construction of breakwaters and similar marine use, where the load is to be released over a point which is inaccessible to a workman.

To insure a firmer grip on the load to be lifted and also for the purpose of causing the grappling tongs to seize more readily upon the load, I provide the lower

end of each of the grappling members 14 with what I term "eccentric grippers." Each of these eccentric grippers consists essentially of a circular or somewhat circular piece 40 of steel or other suitable metal, pivoted eccentrically as at 41 to the lower end of the grappling members. The action of these eccentric grippers is substantially that of a second toggle joint, the links of which are pivoted at 41, 41, the load, against the sides of which the grippers bear, taking the place of the other pivot of the toggle. These eccentric grippers are each provided with a counterweight 42, by means of which they are constantly maintained in position for engagement with the load to be lifted. When the grappling tongs are lifted, the said eccentric grippers 40 are turned down slightly and engage the sides of the load. Thereafter, the weight of the load tends to cause the said members to turn down still further and to grip the sides of the load still more firmly. As the grappling members 14 are made sufficiently heavy so as to be rigid under the loads intended to be supported by the tongs, I find that when once the eccentric gripping members 40 have caught the load, they take an absolutely secure grip on it, but at the same time, the load may be instantly released by bending the toggle joint, as previously described.

For use upon articles having a smooth or polished surface which it is desired not to mar, I provide a shoe 43 which goes over the eccentric gripper and is interposed between it and the load, being provided with a suitable surface for engagement with the load. This shoe may also be made, if desired, with a contour corresponding to the contour of the load when said contour is of peculiar shape.

What I claim is:

1. The improved grappling tongs comprising a frame, grappling members, a toggle between the upper ends of the grappling members, a suspension attached to the said toggle by means of which the grappling tongs and their load are supported, and a second toggle comprising members pivoted to the lower ends of the grappling members, the inner surfaces of said second toggle members bearing against the load.

2. The improved grappling tongs comprising a frame, grappling members, a toggle between the upper ends of the grappling members, a suspension attached to the said toggle by means of which the grappling tongs and their load are supported, and a second toggle comprising members eccentrically pivoted to the lower ends of the grappling members, the inner surfaces of said second toggle members bearing against the load.

3. The improved grappling tongs comprising a frame, grappling members, a toggle between the upper ends of the grappling members, a suspension attached to the said toggle by means of which the grappling members and their load are supported, a second toggle comprising members pivoted to the lower ends of the grappling members, the inner surfaces of said second toggle members bearing against the load, and counterweights to maintain the said second toggle members in upright position when not in engagement with the load.

4. The improved grappling tongs comprising a frame, grappling members pivoted thereon, a toggle joint pivotally connected with the said grappling members, a suspension attached to said toggle joint to support the said grappling tongs and the load from the said toggle joint, a second suspension attached to the toggle joint for releasing the load, and a sheave on the frame beneath the toggle joint, about which the second suspension passes to give it a direction of pull opposite to that of the first mentioned suspension.

5. The improved grappling tongs comprising a frame, grappling members, operating means therefor, a suspension attached to the said operating means to support the grappling tongs and their load, a gripping member comprising a piece eccentrically pivoted to one of the grappling members and a counterweight for the said gripping member.

6. The improved grappling tongs comprising a frame, grappling members, operating means therefor, a suspension attached to the said operating means to support the grappling tongs and their load, a gripping member comprising a piece eccentrically pivoted to one of the grappling members, and a shoe between the said gripping member and the load to be lifted.

In testimony whereof I affix my signature, in presence of two witnesses.

JOHN L. SEWALL.

Witnesses:

GEORGE P. DIKE,
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