Dec. 28, 1948. A. W. DALFERES 2,457,646

LIFTING TONGS

Filed May 16, 1946

Fig. 1.

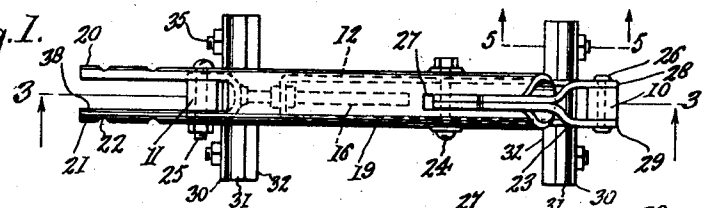


Fig. 2.

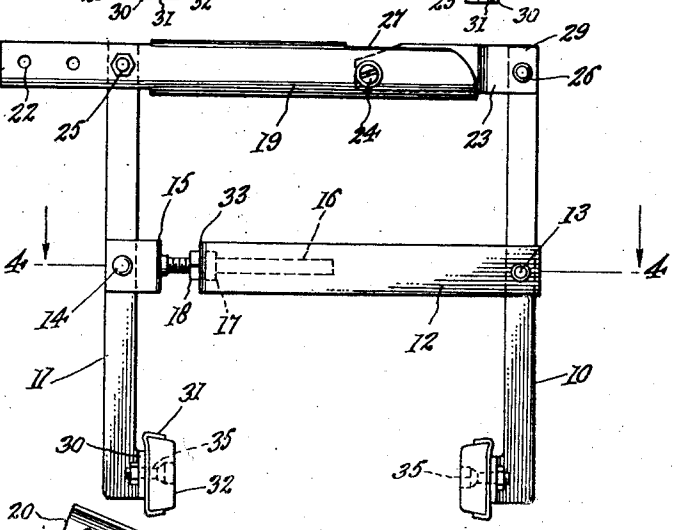


Fig. 3.

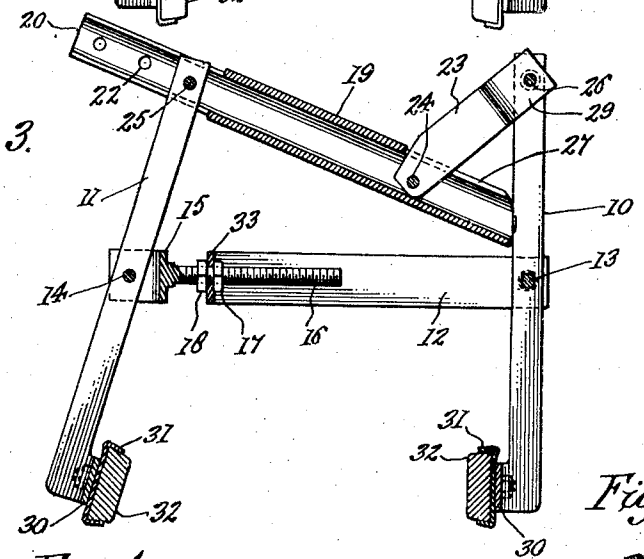


Fig. 4.

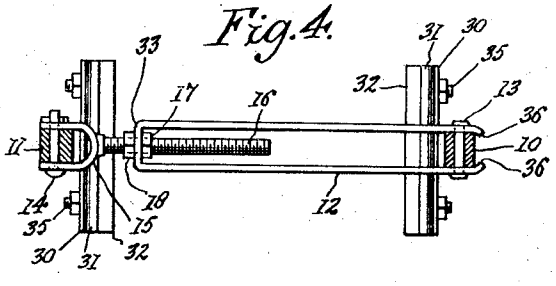
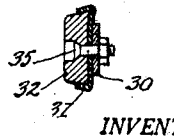


Fig. 5.



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LIFTING TONGS

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2 Claims. (Cl. 294—106)

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The present invention relates to improvements in lifting tongs and more particularly relates to lifting tongs more suitable to the handling of cement blocks of that type having air passages therethrough.

It has been my observation that the greatest drawback to the popular use of cement blocks for building purposes is the difficulty in handling blocks 8'' x 8'' x 16'' and blocks 12'' x 8'' x 16'' weighing thirty-two to fifty pounds. These cement blocks usually have three hollow squares or air passages therethrough which afford convenient channels to admit the jaws of my improved tongs.

An object of the invention is to provide improved lifting tongs constructed and arranged to enable the worker to line up the block as it is being set on the mortar and to do so with ease and convenience.

A further object of the invention is to provide an improved lifting tongs in which provision is made for extending the length of the tongs to accommodate blocks of various sizes and heavier and larger objects.

A further object of the invention resides in providing an improved lifting tongs in which a single lifting movement pressure is exerted on the grips or jaws, it being only necessary to release the gripping handle to disengage the tongs; whereupon the tongs can be removed from the work by grasping a crossbar through which the jaws are not disturbed but may remain in their open position.

A still further object of the invention is to provide an improved lifting tongs useful not only in connection with cement blocks but also for lifting bullions, metal blocks, ingots or the like.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a top plan view of an improved lifting tongs constructed in accordance with the present invention;

Figure 2 is a side elevation of the improved tongs;

Figure 3 is a vertical longitudinal section taken through the tongs on the line 3—3 in Figure 1 and showing the same in open position;

Figure 4 is a horizontal section taken on the line 4—4 in Figure 2, and

Figure 5 is a vertical section of a detail of

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gripping jaw taken on the line 5—5 in Figure 1.

Referring more particularly to the drawings 10 designates a fixed leg and 11 a movable leg which is in effect a lever of the first class inasmuch as the same is pivoted centrally by a bolt or fulcrum pin 14 to an adjustable clip within a U-shaped bearing 15 which is adjustably carried by a cross bar 12.

The immovable leg 10 is secured to the cross bar 12 as by a bolt or other appropriate fastening 13. This bolt 13 may have a square or other straight line shank, as indicated in Figure 3 to fit a complementally shaped hole in the fixed leg 10 in order to prevent relative rotation of the fixed leg 10 upon the cross bar 12; or the free ends of the cross bar 12, as shown in Figure 4 may be bent or toed in or clinched upon the outer side of the fixed leg 10 to bind the two members 10 and 12 into a non-rotary relationship. This clinched condition is shown at 36 in Figure 4.

As shown to best advantage in Figure 4, the cross bar 12 is preferably made from strap metal returned upon itself to provide the two spaced parallel arms, the free ends of which flank the fixed leg 10 and receive the bolt 13 while the yoke 33 of the cross bar 12 is perforated to receive the threaded shank 16 which projects from and supports the fulcrum bearing 15. Lock nuts 17 and 18 run upon the screw 16 at opposite sides of the yoke 33 serve to bind the same in adjusted position.

The upper ends of the legs 10 and 11 are coupled together by a toggle lever consisting of a main member 19 which is preferably of tubular form in order to afford a convenient hand grip, this member extending substantially the entire length of the distance between the upper ends of the legs 10 and 11 and being pivoted at 25 to the upper end of the movable leg 11 and at 24 to the inferior toggle member 23. This latter member is pivoted at 26 to the upper end of the fixed leg 10 and operates in a slot 27 which is formed only through the top wall of the tubular member 19. It will be observed that the center fulcrum 24 of the toggle lever is considerably closer to the fixed leg 10 than to the lever leg 11.

As shown more particularly in Figure 1 the inferior toggle member 23 may be formed of strap metal bent upon itself with two side branches in substantial contact through the majority of its length where it is received through the slot 27 of the handle member 19, but such branches diverge at their free ends in order to encompass the upper end of the fixed leg 10 to

receive the bolt 26 by which this inferior toggle member 23 is pivoted to said leg 10.

The base 37 of the slot 27 encounters the lower edge of the toggle inferior member 23 in the raised position of the handle 19 as shown in Figure 2 to constitute a stop.

The left end of the handle member 19 is formed with a slot 38 which unlike the slot 27, passes completely through the tubular member 19 in a vertical direction whereby to provide two end extensions 20 and 21 adapted to slidably engage opposite sides of the lever leg 11. These extensions 20 and 21 are provided with horizontally registering series of perforations 22 adapted to be brought into alignment with the pivot bolt 25 for the purpose of selectively shortening or elongating the toggle lever.

The lower ends of the legs 10 and 11 carry the grippers or jaws which preferably comprise rubber or other resilient blocks 32 held in retaining frames 31 which are bolted to cross bars 30 carried by the legs 10 and 11. The bolts are shown at 35 and their heads are preferably countersunk in the material of the rubber blocks 32 so as not to scratch or mar the surfaces of the blocks or other work to be gripped and lifted.

It will be apparent from the drawings that these rubber blocks 32 are deeper than the frames 31 in which they are mounted, or in other words substantial masses of the bodies of these blocks 32 project inwardly beyond the flanges of the frames 31, which allows of considerable compression of the rubber blocks 32 in the act of gripping the blocks or other work.

In the use of the device, Figure 3 shows the open position of the jaws in which the movable lever leg 11 has been rocked out of its vertical position by the downward collapse or breaking of the toggle lever 19, 23. In this position the jaws 32 are open and in readiness to be inserted into the passages of a block or upon the sides of any other article. In lowering the device to a block or other object the same will be supported by the cross bar 12. After the jaws 32 have arrived at a proper position for gripping the internal walls of the cement block or the side walls of any article, the hand of the operator is transferred from the cross bar 12 to the tubular handle 19, by which act alone the jaws 32 are automatically closed upon the object by a shift of weight. In other words when the weight of the device is transferred from the cross bar 12 to the handle 19 the weight of the device will tend to cause the tongs as a whole to fall while the handle 19 remains stationary in the hand of the operator; the net effect of which is to tend to straighten the handle from the condition of Figure 3 to that of Figure 2, accompanied by the approach of the lower end of the lever leg 11 to the lower end of the fixed lever leg 10. The weight of the device descends until the stop 37 encounters the lower edge of the inferior toggle member 23 at which point the jaws are completely closed and the toggle lever is held in a toggle lock position with the pivots 24, 25 and 26 in substantial horizontal alignment. The toggle lock can therefore not be broken by any force tending to spread apart the jaws 32. Just before the toggle lock finally closes the inner portions of the rubber blocks 32 begin to be compressed and the final upward closing movement of the toggle lever 19, 23 is to compress these rubber blocks 32 upon the object. The reaction due to the inherent elasticity of the blocks which tends to force the lower ends of the legs 10 and 11 apart encounters the toggle lock across the aligned pivots 24, 25 and 26. This serves to bind the toggle lock tighter in that it cannot jog loose and fall down to the position of Figure 3 casually or accidentally or in other words until it is directly and positively pushed down by the conscious act of the operator when he desires to withdraw the tongs from the block or other work. It will be noted from Figure 5 that the heads of the blocks 35 are enbedded in the rubber blocks 32 in substantial spaced relation from the inner walls of the rubber jaws 32 which grip the object in order to allow for adequate compression of the inner portions of these rubber blocks 32 without bringing the bolt heads 35 into contact with the surface of the work.

By loosening the lock nuts 17 and 18, the screw 16 may be pushed in or out with respect to the yoke 33 of the cross bar 12 and thus shift the fulcrum support 15 toward or from the fixed leg 10. After adjustment the lock nuts 17 and 18 are retightened against the yoke 33. By such adjustment the movable leg jaw may be shifted toward or from its companion jaw carried by the fixed leg 10 and thus the span of the device may be increased or diminished to compensate for different distances between the walls of the article to be gripped. This adjustment is also efficacious in determining the amount of compression to which the rubber blocks are to be subjected.

The series of apertures 22 also provide for the adjustment of the toggle lever in its connection with the upper end of the lever leg 11. This permits the handle or toggle lever as to its distance between the pivots 25 and 26 to be lengthened or shortened. This latter adjustment may accompany if desired any adjustment effected in the fulcrum support 15 by means of the screw 16 and the lock nuts 17 and 18. Either adjustment may be made independently to suit various conditions. Both adjustments will probably be found desirable where attempt is made to preserve the parallel relationship between the inner faces of the two rubber blocks 32 when the same are in the closed position of Figure 2.

Although both legs 10 and 11 might be made pivoted, it is preferred that the leg 10 be stationary with respect to the other elements of the device, particularly where its use in connection with cement blocks is concerned inasmuch as the straight leg 10 is always more easily inserted downwardly through the vertical air passage in the hollow cement block while a diagonally disposed pivoted leg 11 (see its position in Figure 3) is more difficult to insert into such air passage of the cement block. Thus by having one straight leg 10 and only one diagonal leg it is much easier to assemble the tongs to the cement block than if both the legs were diagonally disposed into open position of the tongs.

In handling the ordinary cement block on the outer edge very frequently the fingers are mashed against the block already set. To avoid this the block is usually lowered to the mortar about 1" or 1½" to the set block and is then pushed against the block that is set. Quite a bit of mortar is thereby pushed into the openings in the block below, and necessarily the block is lowered from ⅛ to ¼" because of the loss of mortar on the underside of the block being laid. With these tongs that grip in the middle, the block can be laid within ½" of the other block and need not be moved at all.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the folowing claims.

I claim:

1. A lifting tongs comprising a pair of legs having jaws at one end, a bar connecting intermediate portions of the legs, a fulcrum on the bar on which one leg is pivoted, and a toggle lever comprising a tubular handle member having a slot at one end of its upper portion and a stop below the slot, said tubular member pivoted to one leg, and an inferior toggle member pivoted to the other leg and to the tubular member within said slot and adapted to encounter said stop in the locked position of the toggle lever.

2. A lifting tongs comprising a pair of legs having jaws at one end, a bar connecting intermediate portions of the leg, a fulcrum on the bar on which one leg is pivoted, and a toggle lever comprising a tubular member having perforated extension pieces adjustably straddling one leg and pivoted thereto, and a second member pivoted to the tubular member and to the other leg.

ANTHONY WILMOT DALFERES.

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