Feb. 24, 1959 D. L. JANOFF 2,874,990

BEAM TONGS

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Fig. 1.

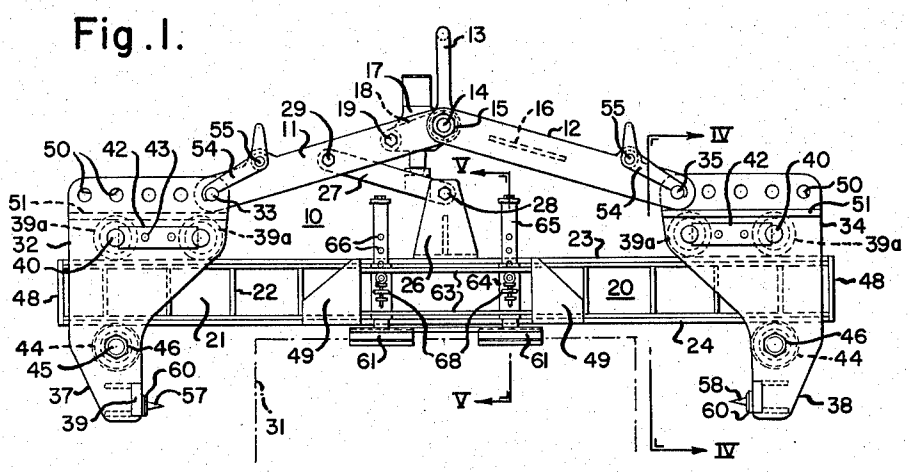
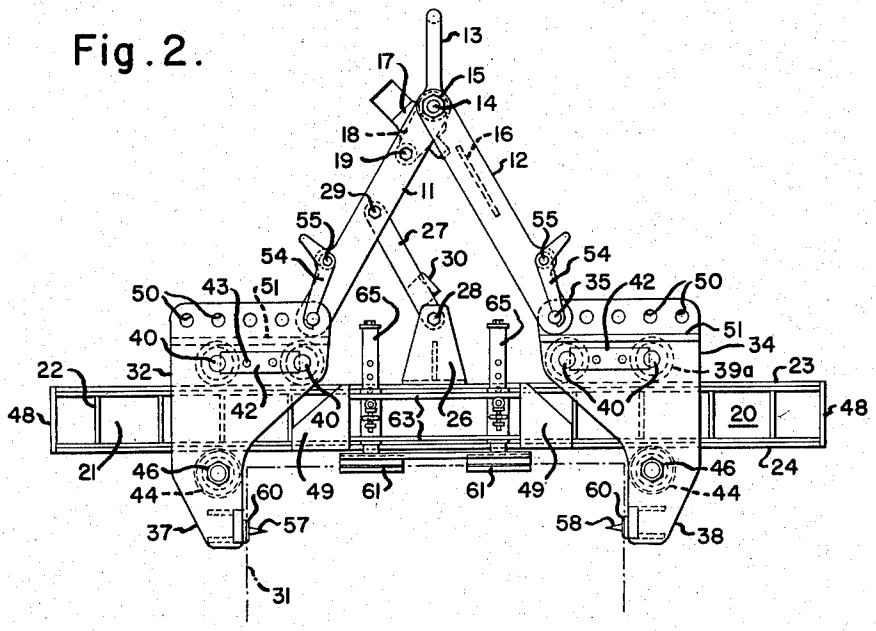


Fig. 2.



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Fig. 5.

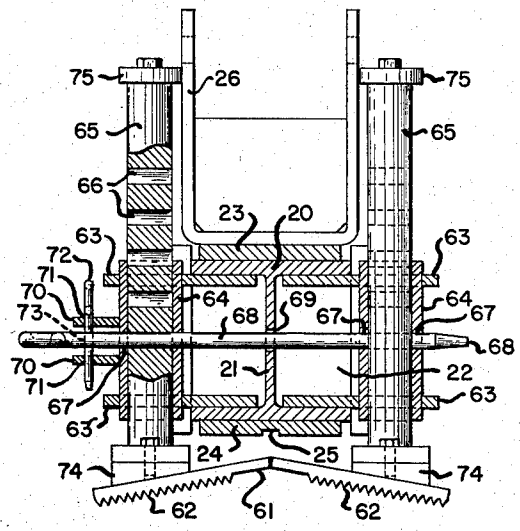


Fig. 4.

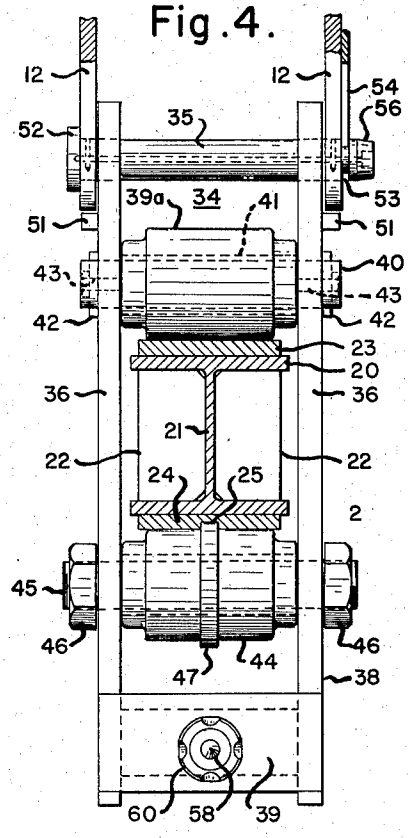
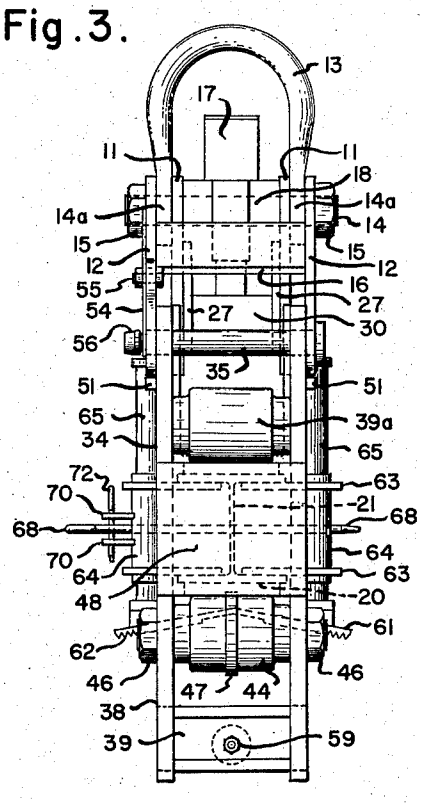


Fig. 3.



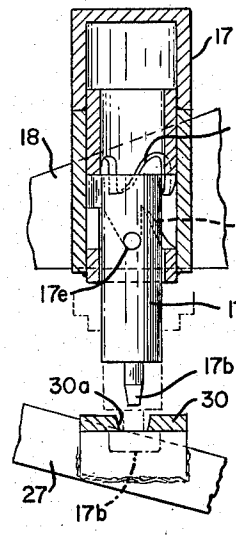


Fig. 6.

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2,874,990

BEAM TONGS

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Application August 18, 1955, Serial No. 529,271

5 Claims. (Cl. 294—86)

This invention relates to a new beam tongs. More particularly, it relates to such a tongs in which travelers are provided on a rigid beam in connected relation to load supporting links for firm reliable engagement and disengagement with a load.

In the present invention, a new beam tongs has been provided. A rigid beam is engaged on each side of the center thereof by travelers which are caused to approach each other to close the tongs and to move away from each other to open the tongs. Load supporting links pivotally connected about a central axis extend downwardly and outwardly for preferably adjustable pivotal connection with such travelers to operate them. Preferably also, means are provided for adjusting the opening between the travelers and, if desired, automatic latching and unlatching mechanism may be included. A cooperating rest member may be provided in the new beam tongs particularly for use where somewhat irregularly shaped loads, such as logs, are to be handled by the new tongs. New devices made in accordance with my invention are relatively free from structural complexity, are positive and firm in operation, and, if desired, are adjustable for different services or loads which they may be called upon to take care of.

Other objects and advantages of this invention will be apparent from the following description and from the accompanying drawings, which are illustrative only, in which,

Figure 1 is a front view in elevation of one embodiment of my invention, with the new tongs in opened position;

Figure 2 is a front view in elevation of the embodiment shown in Figure 1 with the tongs closed and in engagement with a load;

Figure 3 is an end view of such tongs in the position shown in Figure 1;

Figure 4 is a view taken along line IV—IV of Figure 1;

Figure 5 is a view taken along line V—V of Figure 1; and

Figure 6 is a detail view in section of a latch mechanism suitable for use with the embodiment illustrated in the foregoing figures.

Referring to the drawings, in one embodiment **10** of my new beam tongs, I provide downwardly and outwardly extending load supporting pairs of links **11** and **12**, the spacing in each such pair being from front to back and with the pair **11** being inwardly, as shown in the end view in Figure 3, of the other pair **12**. Such terms as "front," "back," "side," "horizontal," "vertical" and other directional terms which may be used herein are relative, as will be understood, rather than absolute.

A shackle or clevis **13** having lower ends **14***a* may be provided as a member by which to hang the new tongs **10** from a crane hook or other more primary piece of materials-handling equipment. A stud **14** extends through registering openings at the upper ends of the pairs of links **11** and **12** and through registering openings in the lower ends **14***a* of clevis **13**, nuts **15** being utilized with lock washers or other devices to provide

a pivotal connection about the axis of stud **14** for the respective pairs of links **11** and **12** and the clevis **13**. If desired, a connector plate **16** may be welded to both of the facing inner sides of links **12**. Further, if desired, a latch portion **17** of a latching mechanism may be secured to a bracket **18** extending from stud **14** between the inner sides of the links **11**, the lower end of the bracket **18** being connected thereto by a bolt **19**.

A rigid horizontal unitary beam **20** extends to each side of a vertical median plane through the axis of stud **14**, the new tongs being generally balanced about that plane and also about a transverse median plane coinciding with the web **21** of beam **20**. Beam **20** may be an I-beam between the flanges of which rigidifying posts **22** may be welded and on which an upper track plate **23** may also be welded. A lower track plate **24** may be welded to the underside of beam **20**. Preferably, lower track plate **24** is provided with a groove **25** extending along the length thereof to insure constant registry and firm operation of respective parts of my new beam tongs in operation.

At the center of beam **20**, a U-shaped bracket **26** may be welded. A link frame **27** fitting between the sides of bracket **26** is pivotally connected thereto by bolt **28**, the other end of link frame **27** being pivotally connected to the pair of load supporting links **11** by a bolt **29**. It will be seen that the new construction of this tongs is such as to provide against infirmity or wobbliness in operation, which in prior practices was sometimes a cause of tongs trouble or failure.

A latch catch or keeper **30** may be affixed to frame **27** to cooperate with latch mechanism portion **17**. As an example, the members **17** and **30** may comprise an automatic alternative latching and unlatching mechanism, should it be desired to incorporate a latching mechanism in my new beam tongs, which may be of a kind such as that disclosed in U. S. Letters Patent No. 2,776,857 issued January 8, 1957. In such a latch mechanism, a latch bolt **17***a* is provided with a head **17***b* to be rotated by opposed angularly offset cam surfaces **17***c* and **17***d* through respective engagement thereof by a pin **17***e* and thereby rotate head **17***b* on the under side of keeper **30** which has a slot **30***a* through which head **17***b* may pass when it is in the full line position shown in Figure 6 so as to latch following a 90 degree rotation therefrom to the chain line position shown in that figure and then to open following a further such 90 degree rotation away from that chain line position. Thus, the deposit of a load after being carried by my new tongs **10** would engage the latch **17** and keeper **30** as clevis **13** was lowered to open the tongs so that when clevis **13** was next lifted the tongs would remain open, with the latch mechanism engaged as shown by the chain line position of portions thereof in Figure 6, ready for placement on a new load to be carried. As the tongs would be brought to rest on that new load, the latch **17** would move to a disengagement position relative to the catch **30**, so that the very next lifting of the clevis **13** would permit latch **17** and keeper **30** to separate bringing my new tongs **10** to the position shown in Figure 2 with the load engaged and either ready to be carried away or being carried as the case may be. Such a load **31** for my illustrated embodiment may, for example, be a log which is a load generally of a somewhat irregularly shaped character. Nevertheless it may safely be handled by tongs made in accordance with my invention.

Cooperating with the pair of links **11** is a traveler subassembly **32** which is pivotally connected thereto about the axis of a bolt **33**. A similar opposed traveler subassembly **34** cooperates with the pair of load supporting links **12** to which traveler **34** is connected about the axis of a bolt **35**. Each traveler comprises spaced

plates 36 outwardly of beam 20, the lower ends of such plates forming depending arms 37 and 38 respectively. The sides of each such arm may be connected by a plate 39 welded thereto.

Each traveler is provided with a spaced pair of upper rollers 39*a* adapted to roll on upper track 23. Each roller 39*a* extends between the plates 36 in each traveler and is supported on a bearing bolt 40, a bushing 41 being positioned between such bolts and the rollers. Locking bars 42 fastened at 43 to the respective plates 36 keep the rollers in place yet permit the removal and replacement thereof whenever maintenance or wear warrants such action. Each traveler moreover is provided with a lower roller 44 journalled on a bolt 45 which is locked in place by nuts 46. The respective lower rollers 44 may be provided with an annular rib 47 to run in groove 25 while the remainder of the roller engages the lower track 24 to each side of the center of my new tongs 10 when the respective travelers 32 and 34 approach each other or are being separated from each other in unison due to the action of the links 11 and 12.

End plates 48 may be welded to the respective ends of beam 20 to serve as outer stops, if no other parts are provided which so act such as the optional latch mechanism illustrated in the embodiment shown in the figures. Thereby, the axis of stud 14 preferably remains at all times above a horizontal plane passing through axes of bolts 33 and 35. Similarly, inner stops 49 may be welded to the sides of beam 20 so that if the new tongs 10 is carried without a load and with the travelers in "closed" position, the angle between the links 11 and 12 may be kept from becoming less than a predetermined minimum.

The upper ends of the pairs of plates 36 in each of the travelers are drilled in registry to provide adjustment holes 50 across the top of each of the travelers. A support bar 51 is welded to each of the plates 36 immediately below the end of the load supporting link connected to that plate. Since the pair of links 12 is outwardly of the pair 11, the bars 51 on traveler 34 are on the outer sides of the plates 36 of that traveler 34. Conversely, the bars 51 on the traveler 32 are on the inner sides of the plates 36 in that traveler. The bolts 33 and 35 are each provided with a head 52 and a grooved or necked portion 53 at the other end thereof. The reduced portion 53 is engaged by a retainer 54 pivotally connected at 55 to sides of the respective pairs of links 11 and 12. Various means to keep the retainer levers 54 in locking position to secure the bolts 33 and 35 in place may be used. In the adjustment position shown in Figures 1 and 2, relative vertical movement of clevis 13 toward beam 20 opens the tongs and separates arms 37 and 38 to provide their maximum opening. Relative vertical movement of clevis 13 away from beam 20 will close the tongs and bring the arms 37 and 38 to their maximum opening relation in "closed" tongs position unless such inward movement is arrested by engagement of a load 31 as shown in Figure 2.

In the embodiment shown, I provide for extensive adjustment of those openings achievable between the travelers 32 and 34. Thus, if the retainers 54 are lifted out of the grooves 53 in the bolts 33 and 35, the bolts can readily be withdrawn to enable the lower ends of the respective pairs of links 11 and 12 to be moved into registry with another set of adjustment holes 50 on the respective travelers 32 and 34. The lower ends of the links 11 may readily be slid along the bars 51, after bolt 33 is removed, to their new adjustment position. Similarly, in traveler 34 after bolt 35 is removed, the lower ends of the links 12 may be permitted to drop a little to rest on the bars 51 for ready shifting to their new adjustment position corresponding to the new position selected on traveler 32. The tapered ends 56 of the bolts 33 and 35 enable such bolts to be readily reinserted in the respective new adjustment positions whereupon the retainers 54 are brought back into locking position in the grooves 53 to secure the new construction. The plurality of adjustment positions provided enables extensive variation to be obtained in respect of the selected opening achievable between the respective travelers for the accommodation of different sizes of loads and/or services to which my new tongs may be put. Moreover, as the links 11 and 12 are connected to travelers 32 and 34 respectively towards the outer ends of those travelers, the headroom taken up by my new tongs is correspondingly decreased.

The plates 39 on the respective depending arms 37 and 38 may be pierced for the respective passage of pronged members 57 and 58, the rear ends of which are respectively threaded for engagement by locking nuts 59 at the back of the plates 39. If desired, an edged gripping cup 60 may be secured either to the respective plates 39 or to the pronged members 57 and 58 for use in the handling of loads like logs where after gripping no revolving of the load about the axis common to the prongs 57 and 58 is desired.

For the handling of somewhat irregularly shaped loads such as logs, my new beam tongs may be provided, as shown in the illustrated embodiment, with an adjustable rest member, one form of which may take the shape of a saddle 61 having a gable profile in end view with serrations 62 for gripping of the exterior of a load carried by the device 10. Brackets 63 welded to beam 20 may carry vertical sleeves 64 on each side of beam 20 through which posts 65 may slide. The lower ends of the posts 65 may be flanged and bolted to bosses 74 to connect the saddle portion 61 to the bottom of the four respective posts 65. Stop washers 75 may be bolted to the upper ends of the respective posts 65, if desired, so that even if in the course of adjustment of the rest member subassembly, a workman should lose his hold, the subassembly would not fall out of sleeves 64.

The four respective posts 65 are provided with a series of fore and aft holes 66 at the same elevations. Saddle 61 may be adjusted to a desired height by bringing one set of the holes 66 on each side of the center of beam 20 into registry with openings 67 in the four respective sleeves 64. Each pair of sleeves 64 on each side of the center of beam 20 may have an adjusting pin 68 adapted to extend through the holes 67 and 66 and through a registering opening 69 in web 21, as shown in Figure 5, to maintain saddle 61 at such desired adjusted level. The front sleeves 64 may be provided with auxiliary brackets 70 having registering holes 71 therein for a cotter or other locking pin 72 adapted to go through a vertical opening 73 in the shank of the respective pins 68. It is evident that by removing pin 72 each pin 68 can be withdrawn and the entire saddle 61 brought down to a new desired level before the pins are respectively reinserted to lock the rest member in the new adjusted position.

The rest member 61 effects a cooperation with other elements of my new beam tongs construction. Thus, when a somewhat irregularly shaped log or other load is to be carried by the new device 10, that device will rest on saddle 61 without slipping off while the depending arms 37 and 38 are being closed by the elevation of clevis 13 to cause the prongs 57 and 58 to respectively bite into the ends of such a log. In addition, the prongs 57 and 58 can engage the ends of the load 31 in an eccentric manner without concern about rotation of the load 31 about the axis of the prongs due at least in part to the rest member 61 which is in engagement with the periphery of the load, thereby inhibiting likelihood of relative movement between load and tongs which might otherwise be the cause of detrimental imbalance or even damage or hazard to persons or property. Further, the rest member 61 cooperates with any latching mechanism, such as mechanism 17 and 30, that may be utilized with my tongs.

Various modifications may be made in details of my invention without departing from the spirit thereof or the scope of the appended claims.

I claim:

1. In a beam tongs, in combination, a unitary horizontal beam, a pair of parallel links extending downwardly and outwardly toward one side of said beam, a second pair of parallel links extending downwardly and outwardly toward the other side of said beam, the spacing of said links in each of said pairs being approximately equal to the width of said beam, said respective pairs of links being pivotally connected at the upper ends thereof, a traveler surrounding each side of said beam, said travelers having side plates adjacent the respective sides of said beam, a pair of rollers extending between said side plates in each of said travelers, said pair of rollers being adapted to roll along the top of said beam to each side thereof, a bottom roller extending between said side plates in each of said travelers, each of said bottom rollers being adapted to roll along a grooved track on the underside of said beam to each side thereof, the lower ends of each of said pairs of links being above said beam and respectively adjacent the pair of side plates in the respective travelers, means for adjustably connecting the lower ends of said pairs of links to the respective travelers across the tops of said respective travelers to vary the opening between said travelers, opposed load clamping means mounted on said travelers beneath said beam, a load engaging rest positioned beneath said beam between said travelers, vertical post members slidably mounted relative to said beam, means for adjusting the height of said rest beneath said beam, a link frame extending between one of said pairs of links and said beam to maintain said pairs of links in laterally balanced positional relation, and parts of a latching mechanism respectively mounted on said last-mentioned pair of links and said link frame for alternative latching and unlatching operation of said tongs.

2. In a beam tongs, in combination, downwardly and outwardly extending load-supporting links, said links being respectively pivotally connected adjacent the upper ends thereof, a clevis pivotally connected to said links about the axis of said first-named pivotal connection, a horizontal beam extending generally in the direction of the path of movement of the lower ends of said links, a member pivotally connected between said links and beam to maintain said links in laterally balanced positional relation, opposed travelers engaging the respective sides of said beam, said travelers being constrained to move along said beam, the top portions of said travelers each having a support for the lower ends of said links and further being pivotally connected to said links adjacent the lower ends thereof, depending arms on said travelers, prong members on said respective arms in opposed relation to engage a load when said clevis is lifted bringing said links and thereby said travelers toward one another along said beam, rest means mounted on said beam centrally thereof and having a portion extending beneath said beam to rest on a load to be engaged or disengaged by said tongs, means for adjusting the distance which said portion extends beneath said beam, means for adjusting the maximum opening distance between said travelers by respectively shifting the lower ends of said links along said supports to change said pivotal connections between said top portions of said travelers and said links, and means for latching and unlatching said tongs.

3. In a beam tongs, in combination, downwardly and outwardly extending connecting links, said connecting links being respectively pivotally connected adjacent the upper ends thereof, a clevis pivotally connected to said links about an axis coincident with the axis of said first-named pivotal connection, a unitary horizontal beam extending generally in the direction of the plane of said links, opposed travelers engaging the respective sides of said beam, said travelers being constrained to move along said beam, said travelers further being pivotally connected to said links adjacent the lower ends of said links and the upper parts of said travelers above said beam, rigid frame means pivotally connected between said beam and said links to maintain said links in laterally balanced positional relation, load engaging members on said respective travelers in opposed relation to engage a load when said clevis is lifted bringing said travelers toward one another along said beam, stop means on said beam for limiting the extreme extent of movement between said travelers, and means for adjusting the maximum opening distance between said travelers by respectively shifting said pivotal connections between said travelers and said links.

4. In a beam tongs, in combination, pivotally connected links extending away from one another, means for carrying said tongs and for moving said pivotal connection, a rigid unitary beam extending to each side of said pivotal connection, opposed travelers to run on the top and bottom of each side of said beam, means pivotally and removably connecting said links to said travelers above said beam, said travelers being moved toward and away from each other by said links, said last-mentioned means including a plurality of laterally-spaced alternatively useable pivotal connection means and a support member positioned adjacent such pivotal connection means, and load engaging members on said respective travelers in opposed relation to engage a load when said first-named means is lifted away relative to said beam.

5. In a beam tongs, in combination, a beam, at least one link extending downwardly and outwardly toward one side of said beam, at least one second link extending downwardly and outwardly toward the other side of said beam, said links being pivotally connected together adjacent the upper ends thereof respectively, a roller traveler engaging each side of said beam and adapted to travel therealong in correspondence with the movement of said respective links, the lower ends of said links being respectively pivotally connected to said travelers adjacent the upper part of said travelers and said beam, a frame member pivotally connecting said links and said beam respectively to maintain said links in laterally balanced positional relation, and opposed load clamping means carried by said travelers below said beam.

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