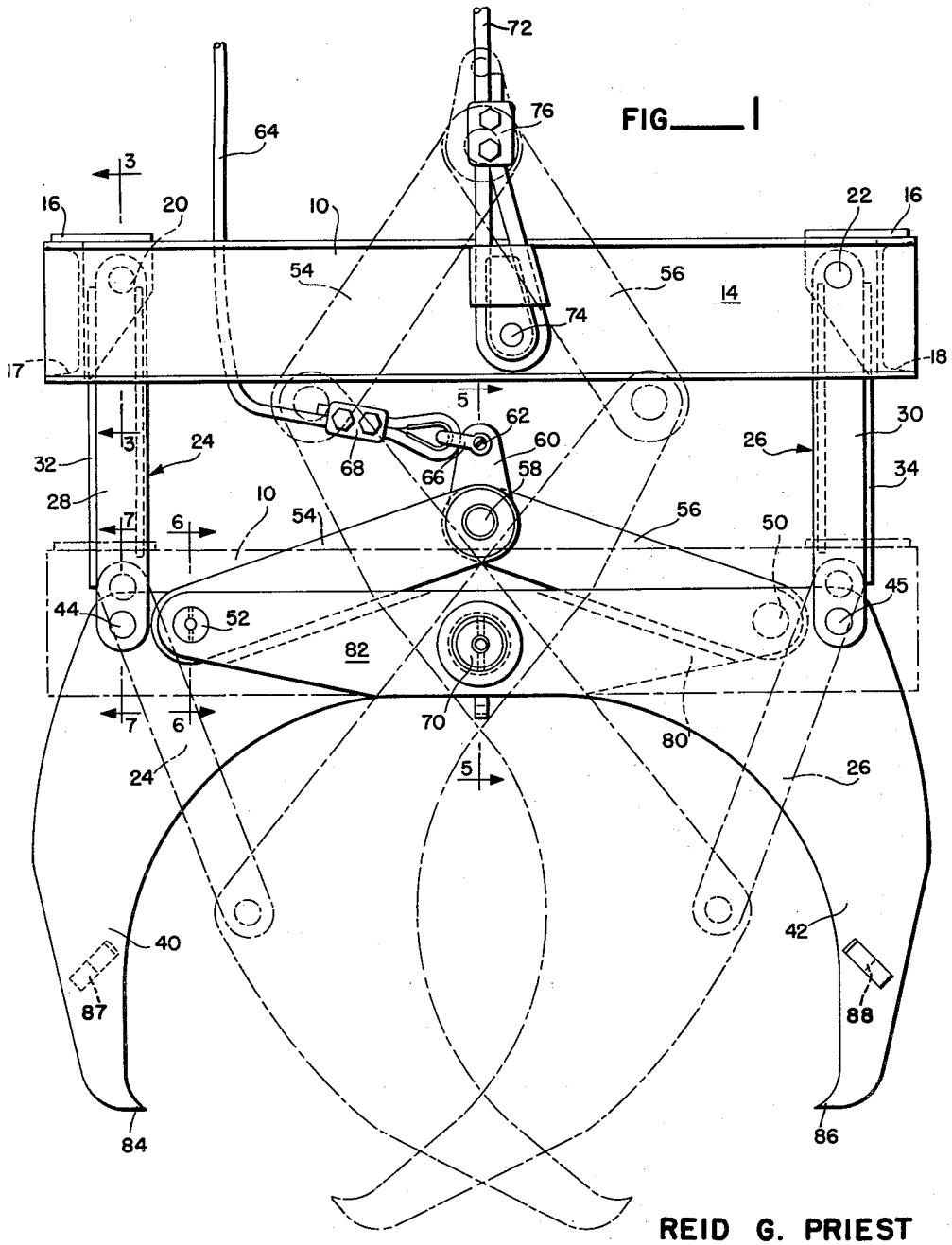
July 10, 1962 R. G. PRIEST 3,043,620

LOG HANDLING TONGS

Filed Jan. 6, 1961 3 Sheets-Sheet 1

FIG. 1



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BY

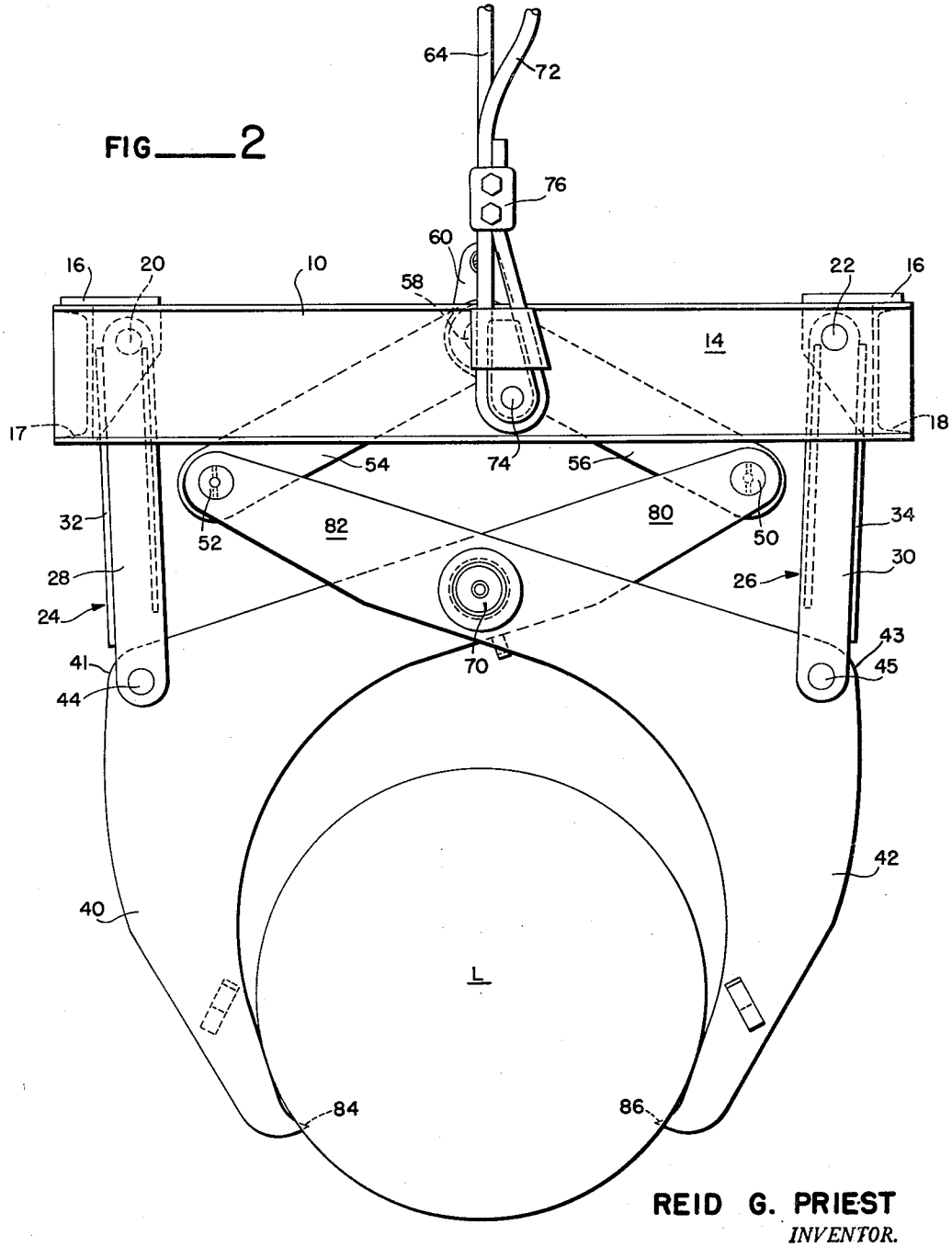
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LOG HANDLING TONGS

Filed Jan. 6, 1961 3 Sheets-Sheet 2

FIG. 2



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LOG HANDLING TONGS

Filed Jan. 6, 1961 3 Sheets-Sheet 3

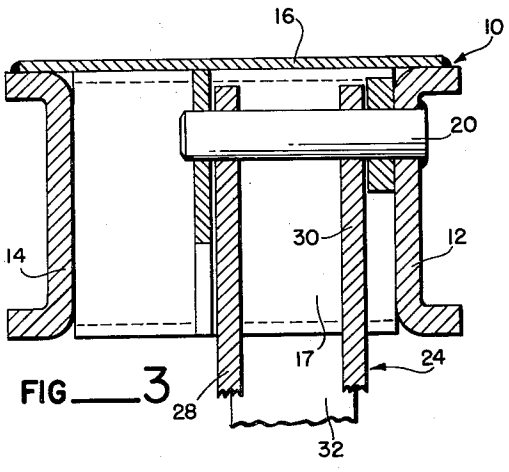


FIG. 3

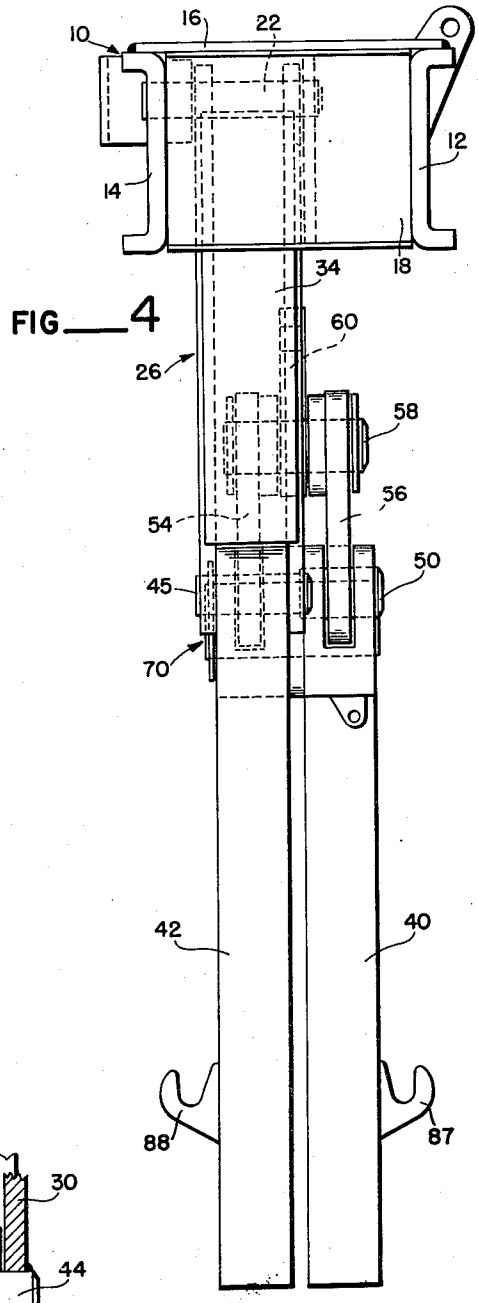


FIG. 4

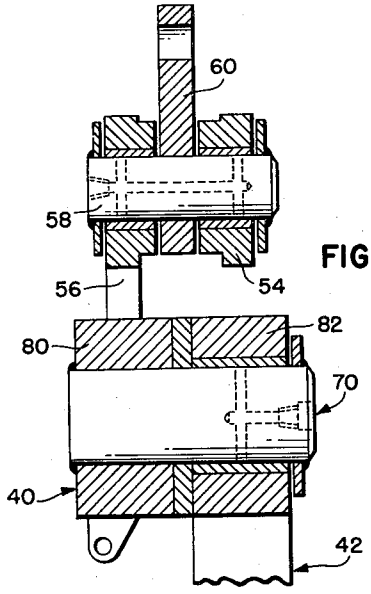


FIG. 5

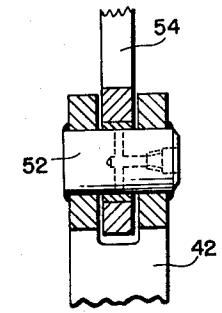


FIG. 6

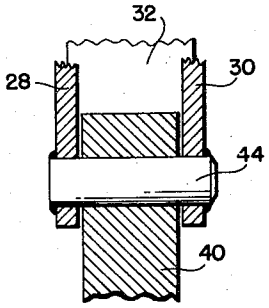


FIG. 7

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3,043,620

LOG HANDLING TONGS

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Filed Jan. 6, 1961, Ser. No. 81,021
5 Claims. (Cl. 294—118)

This invention relates to the general art of material handling tongs and more particularly to tongs that are especially built to handle logs and which, because of the relatively heavy loads they handle, are intended for power tripping.

In present day logging operations, particularly in the western part of the United States and Canada, it is often necessary to handle very large logs which must be picked up and lifted over and then lowered upon the truck that is to transport them. During the handling operation means must be provided that will keep the log under control at all times; as the weight of the log would easily severely damage any wheeled equipment upon which it might be accidentally dropped even from relatively short distances and might also be very hazardous to the operational personnel. It is therefore very important that a log tong be made and proportioned so that it will have a very high factor of safety during the handling of a log. Because of the tremendous weights involved, the release of the tongs after the log is deposited in place must be by power means. This requires that the tongs be operated by two cables, a lifting cable and a tripping cable.

The principal object of this present invention, therefore is to provide a log handling tongs of rugged construction and one which provides and insures adequate stability so that the two log gripping members will be adequately guided so that they will operate as a coacting pair.

A further object of this invention is to provide a plurality of coacting tong members which are so proportioned that the parts which are pivoted together have a very favorable angular relationship with the lifting cable during the lifting operation and are of a structure and proportioning so that the trip line will have adequate mechanical advantage to insure a smooth functioning of their operation when it is desired to trip the load.

A further object is to provide power operated tripping means for unloading the tongs.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

In the drawings:

FIGURE 1 is a face view of my log handling tongs, and for clearer understanding the raising position in an extreme form is shown in dot and dash lines whereas the position of the tongs releasing the log is shown in full lines.

FIGURE 2 is a view taken in the same sense as FIGURE 1, showing a face view and showing the device transversely disposed upon a log and with the jaw members engaged in holding a log.

FIGURE 3 is a fragmentary vertical cross-sectional view taken along the line 3—3 of FIGURE 1.

FIGURE 4 is a side elevation view of the tongs.

FIGURE 5 is a fragmentary vertical cross-sectional view taken along the line 5—5 of FIGURE 1.

FIGURE 6 is a fragmentary vertical cross-sectional view taken along the line 6—6 of FIGURE 1.

FIGURE 7 is a fragmentary vertical cross-sectional view taken along the line 7—7 of FIGURE 1.

Referring to the drawings, throughout which like reference characters indicate like parts, the numeral **10** designates the tripping and positioning horizontally disposed frame.

This frame is preferably built up from welded together steel structural members which are adequately reinforced so as to give the frame appreciably greater strength than it will ever require, in order to safely handle its normal loading.

FIGURE 3 shows a sectional view through one of the upper link pins and shows also the two substantial channel side frame beam members **12** and **14**. These beam members are spaced apart and tied together by top plate members **16**, there being one such at each end of the beam. The center portion of the beam of necessity should preferably be kept open so that the pivoted members making up the moving members of the tongs will be able to pass between plates or beams **12** and **14**. Each end of frame **10** is preferably strengthened by inset channel spacing and stop members indicated at **17** and **18**. These members preferably are all welded in place to make a rugged frame structure.

Pivotably supported from frame **10** by pivot pins **20** and **22** are the positioning links **24** and **26**. These links must be stiff and also capable of exerting considerable force and are each preferably formed of two coacting side bar link members **28** and **30** which are spaced apart and secured together as a unit by a web-plate, as **32** and **34** respectively. Links **24** and **26** engage and are pivoted to jaw members **40** and **42**, each being bell-crank shaped. This arrangement is shown generally in FIGURES 1 and 2 and more specifically in FIGURE 7, where it will be noted that substantial pivot pins **44** and **45** pass through the jaw members **40** and **42** respectively at their mid or apex portions **41** and **43** and pass through both of the link side bar members **28** and **30**. The pin **44** as well as pin **45** are preferably welded to these side bar members.

At their upper ends the jaw members **40** and **42** are provided with lifting link pins **50** and **52** respectively. Pivotably engaging pins **50** and **52** are lifting links **54** and **56** which in turn are pivotably secured together by the central pivot pin **58**. Also secured to pivot pin **58** is the lifting strap **60**, which is provided with a through opening **62** to which the main line or lifting cable **64** may be secured by suitable means, such as a shackle at **66** and a cable clamp **68**. The two jaw members **40** and **42** are pivotably secured together in a scissor arrangement by a very substantial pivot member **70**. The proportioning of the various parts, and particularly those associated with the various pivot pins are shown in FIGURES 3, 5, 6 and 7, which are fragmentary sectional views in elevation.

The tripping cable **72** is suitably secured to a lifting pin **74**. Pin **74** is encircled by the lifting cable which is bent back on itself and secured as by cable clamp **76**. During the raising of the log, only cable **64** is under strain, and this is the means for the lifting of the log. As cable **64** is tightened it moves pivot **58** upwardly and this through the action of links **54** and **56**, operating through pivots **50** and **52**, closes the jaw members **40** and **42**, the closed position being that shown in FIGURE 1, in the dashed line position, which normally would only be used on very small timber, pipe and other elongated materials. During this lifting of pivot **58** and the closing of jaw members **40** and **42**, the lifting frame **10** is positioned by means of links **24** and **26**.

The normal and preferred angularity of the jaw members **40** and **42** and their operating upper lever portions **80** and **82** respectively are indicated most clearly in FIGURE 2, in which links **24** and **26** are approaching a right angle juncture with the upper lever portions **80** and **82** of the jaw members. This gives a very favorable mechanical advantage on the jaw members in the releasing operation. The releasing operation is effected by the tripping cable **72**. This cable lifts the lifting frame or beam **10**, taking with it the two links **24** and **26**, and these links in turn raise the outer portions of the jaw members to the position shown in full lines in FIGURE

1 at which time the log L has been released. The proportioning of the various levers and links is very important as tremendous pressure must be used on the jaws as they engage the logs, in order to insure against dropping them during the handling operation. It is to be noted that in the lifting operation the positioning of links **54** and **56** as shown in FIGURE 2 gives resultant forces of a high percentage of the total load raised when pivot point **58** is raised. These applied resultant forces make it possible for the log engaging points **84** and **86** to be pressed very firmly into the log being handled. Attention is invited to the angularity shown in dashed lines in FIGURE 1, in which the included angle of lifting links **54** and **56** becomes an acute angle and under such conditions the force applied to the jaws in the closing operation is greatly reduced.

It has been found desirable that the various pivot pins function smoothly and with a minimum of friction, and to this end indication is made, by dotted lines at **83** in FIGURES 5 and 6, of one form of desirable lubrication means in which drilled channels are provided in the various pins which may then be serviced by any pressure lubricant fitting.

In some instances where the diameter of the load to be raised is too great for the capacity of the jaws **40** and **42**, hooks **87** and **88** are provided on the outer face of said jaw members **40** and **42** respectively so that cable or chain can be looped, in the form of a bridle, around the object to be raised and then its opposite ends secured to hooks **87** and **88**. The tongs are raised as usual and the linkage provided tightens the cables. When the trip cable is employed it opens the jaws **40** and **45** and slacks off on the loop so that it can be removed.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of log handling tongs.

Having thus disclosed my invention, I claim:

1. Material handling tongs of the type used in handling heavy loads, including saw logs, pipe and elongated structural members, comprising: a horizontally disposed frame having spaced apart beam members joined together by spacing and stop members at each end; downwardly extending positioning links pivotably secured, on horizontal pins disposed at right angles to said frame members, at each end of said frame; coacting jaw members of substantially bell-crank shape, having upper lever portions, lower jaw portions and intermediate apex portions, terminating in material engaging points; said jaws disposed in a scissor arrangement on a common pivot pin intermediate their ends; said jaw members being supported by said positioning links to which they are pivotably secured at their said apex portions by pins disposed at right angles to said jaw portions and parallel to said pins securing said position links in place; lifting links pivoted one at each of the upper ends of said lever portions and to each other at their opposite upper ends; means for securing a single lifting cable to the upper end of said links and means for securing a tripping cable to said frame.

2. The combination according to claim 1 wherein said positioning links are formed of two spaced apart side bar link members which are secured together as a unit by a web plate; said web plate disposed to engage said stop members and provide an increased area over the edges of said bar link members, in engagement with said stop members and said bar links members disposed one on each side of said jaw members.

3. The combination according to claim 1 further provided with bridle receiving hooks secured to the outer face of said jaw members and adjacent their pointed ends.

4. Material handling tongs of the type used in handling heavy saw logs and the like, comprising: a horizontally disposed frame having power means secured thereto for unloading said tongs; downwardly extending positioning links pivotably secured at each end of said frame and having horizontal pivot pins at each end disposed at right angles to the longitudinal axis of said frame; coacting jaw members of substantially bell-crank shape, having upper lever portions and lower jaw portions terminating in material engaging points; said jaws pivoted on a common horizontal pivot pin between said lever portion on said jaw portions; said jaw members being supported by said positioning links to which they are pivotably secured substantially at their mid portions; lifting links pivoted one at each of the upper ends of said lever portions and to each other at their opposite upper ends; means for securing a single lifting cable to the upper end of said links and means for securing said power unloading means to said frame.

5. Material handling tongs of the type used in handling heavy loads, comprising: a single horizontally disposed tripping and positioning frame; positioning links pivotably secured at each end of said frame and extending downwardly between said spaced apart beam members; coacting jaw members of substantially bell-crank shape, having upper lever portions, a centrally located apex portion and lower jaw portions terminating in material engaging points; said jaw members pivotably secured together between said upper lever portion and said lower jaw portion; said jaw members being supported by said positioning links to which they are pivotably secured at their apex portions; lifting links pivoted one at each of the upper ends of said lever portions and to each other at their opposite upper ends; pins for pivoting said positioning links, said lifting links and said jaw members all disposed horizontally and at right angles to the general plane of said tongs; a single lifting cable secured to the upper end of said links and a power operated tripping cable operatively secured to said frame.

References Cited in the file of this patent

UNITED STATES PATENTS

1,009,760	Loreman	Nov. 28, 1911
1,770,343	Reichmann	July 8, 1930
2,956,832	Morin	Oct. 18, 1960