

May 26, 1953

L. HAUBERT
PULLING IMPLEMENT

2,639,890

Filed June 2, 1949

4 Sheets-Sheet 1

FIG. 1

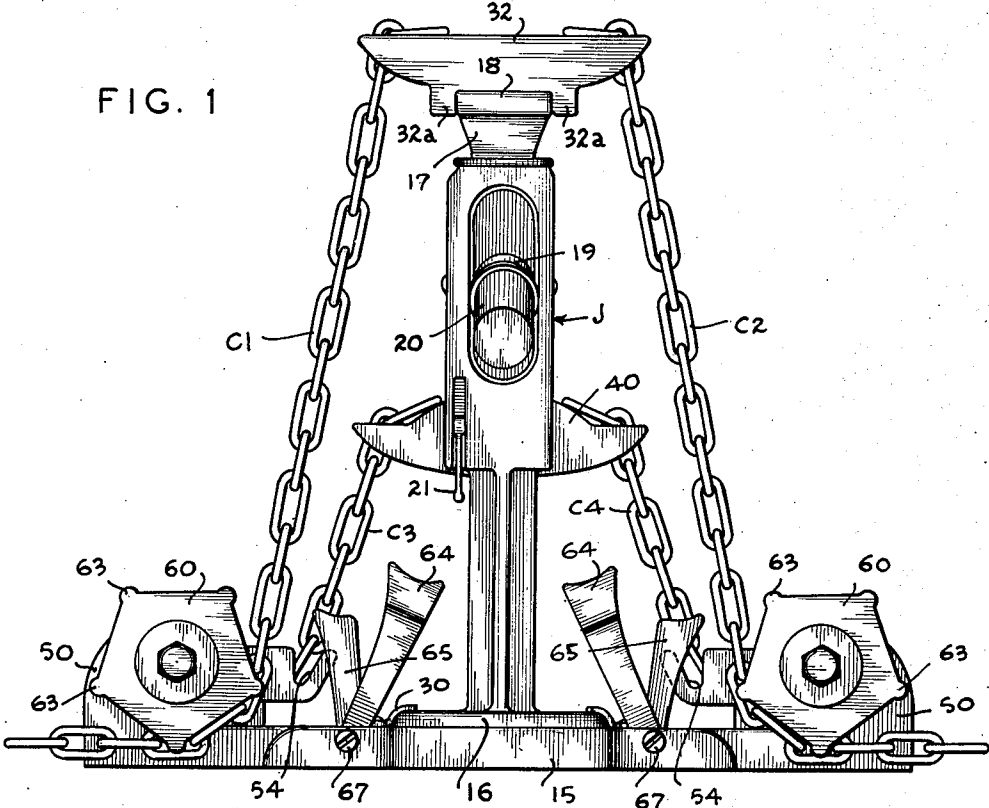
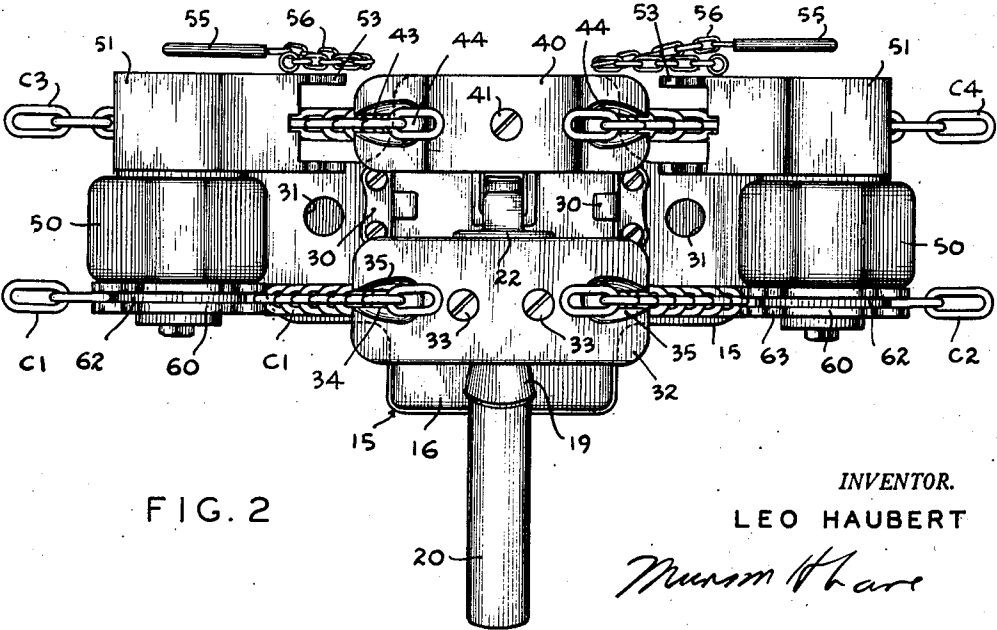


FIG. 2

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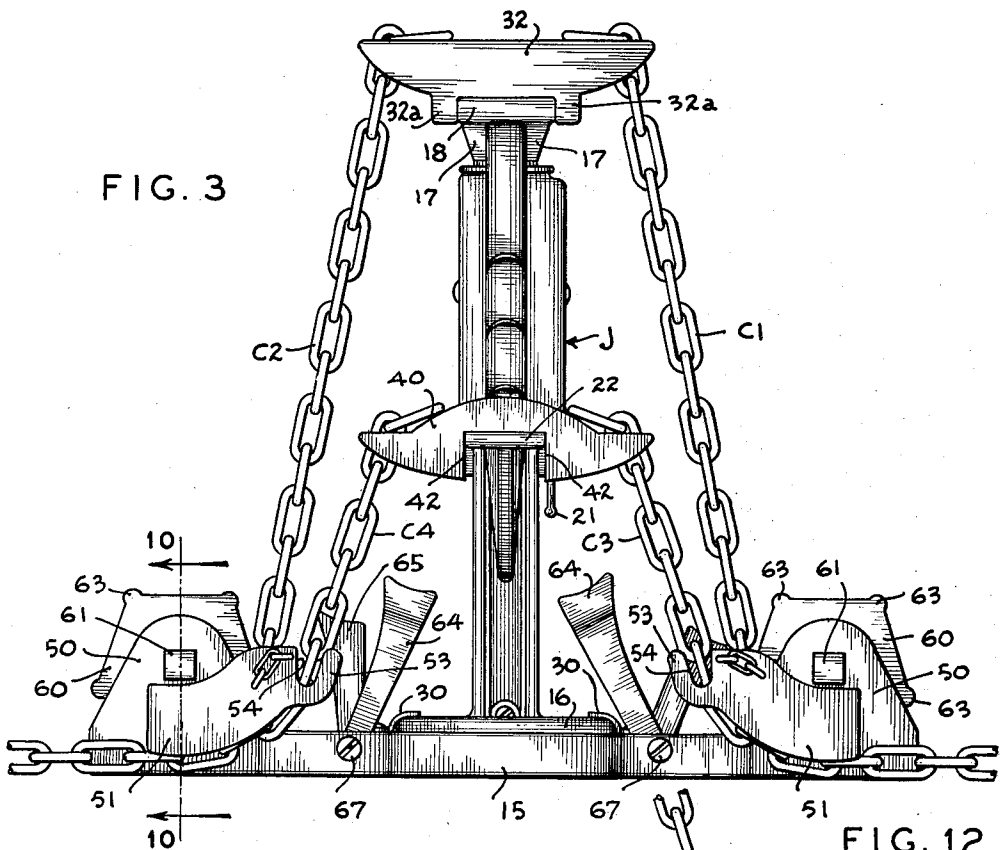


FIG. 4

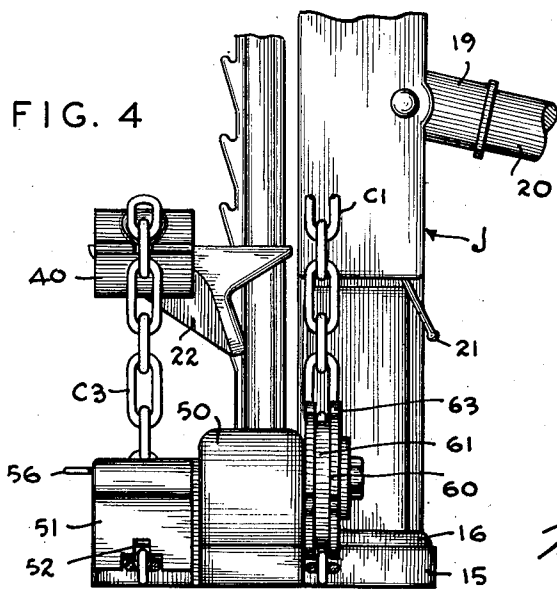
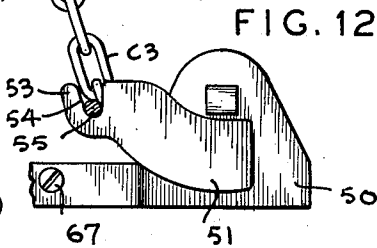
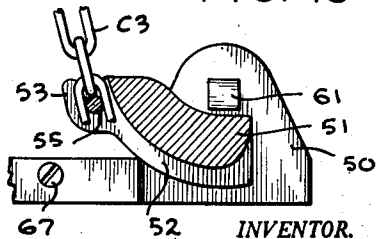


FIG. 13



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FIG. 5

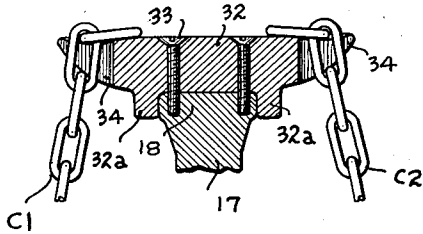


FIG. 6

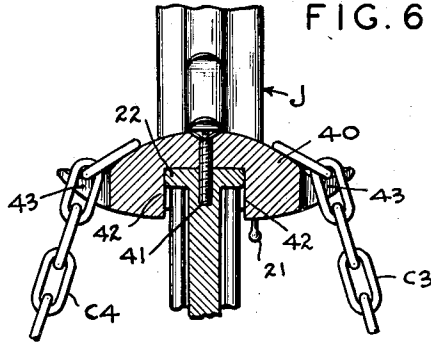


FIG. 7

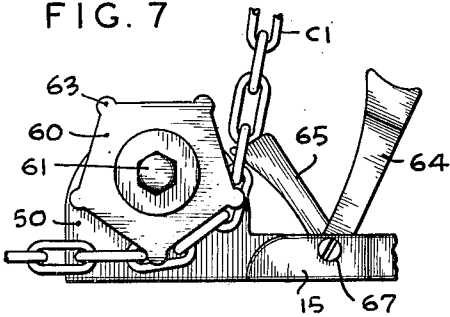


FIG. 8

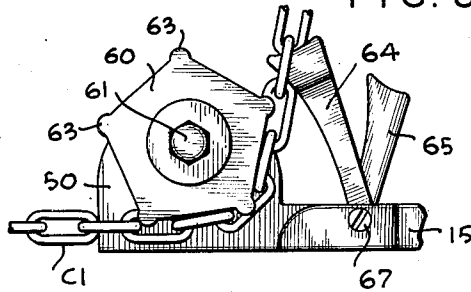


FIG. 9

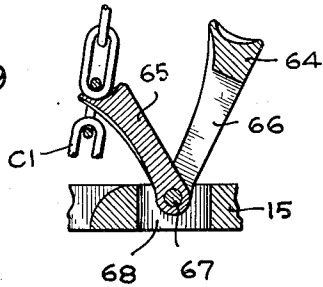


FIG. 10

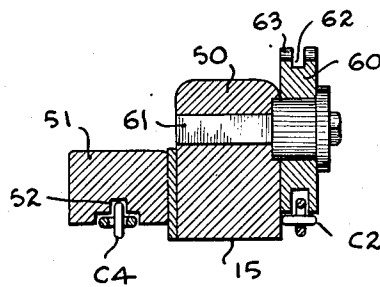
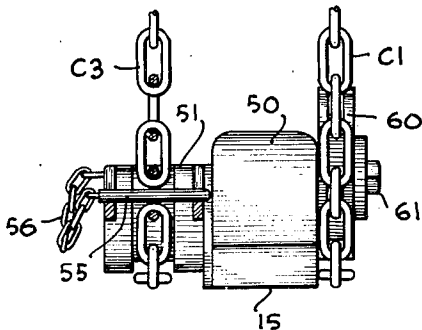


FIG. 11

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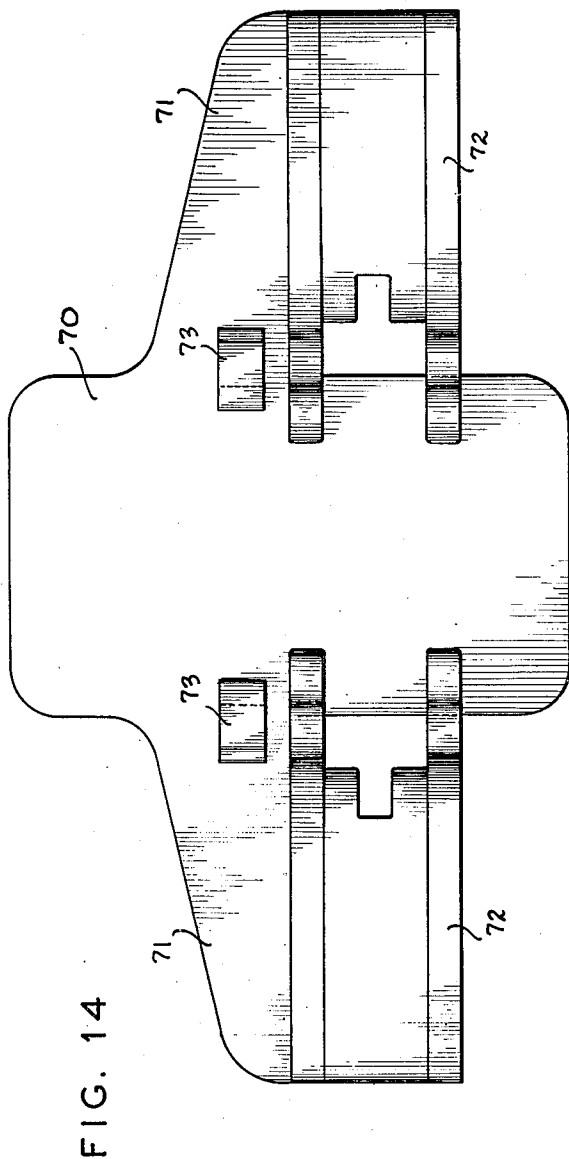
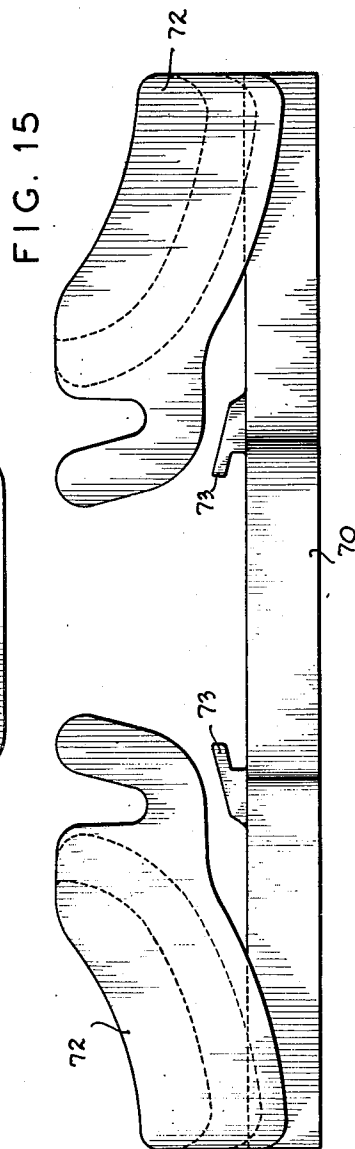
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PULLING IMPLEMENT

Leo Haubert, Tulsa, Okla.

Application June 2, 1949, Serial No. 96,691

21 Claims. (Cl. 254-133)

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This invention relates to pulling implements, and has the following general and specific objects, among others:

(1) To provide a mechanism making it possible to convert any ordinary lifting jack (of which there are millions in use) into a pulling implement of improved construction and capabilities;

(2) To provide an attachment for any ordinary lifting jack which will convert practically all the power (available energy) of the jack into pulling energy;

(3) To provide an attachment of the character described above which permits removal of the jack without change in the pulling energy (tension) exerted on the part or parts being pulled, so that one jack may operate any desired number of attachments, one after the other, at the place of operation;

(4) To provide an attachment which makes it possible for one lift jack to pull two, three, four or more chains simultaneously, with the chains arranged either on one side or on opposite sides of the attachment, also to pull a single chain on either side of the attachment;

(5) To provide an attachment which can be hooked onto a single continuous chain, or onto two continuous chains, at any desired point without change in the chain or chains, and which may then exert pulls on the chain or chains simultaneously in opposite directions, that is, will pull the two ends of one chain in, or the ends of the two chains in, simultaneously;

(6) To make it possible for a lift jack to lift or push, and simultaneously to pull on one or more chains in directions more or less at right angles to the direction of the lift or push;

(7) To provide a device which will exert pulls on one to four chains simultaneously, yet will permit release of any one or more of the chains at any time without necessarily lessening the tension of the chains not released;

(8) To provide a pulling device which may be hooked onto one or more chains, then will exert a powerful pull on the chain or chains through a limited distance, then by adjustment and manipulation of the parts may be released and rehooked onto the chain or chains to exert the same pull as before, this process being continued indefinitely or until the entire chain lengths are taken up, if desired;

(9) In general, to provide a pulling implement of great versatility or adaptability;

(10) In general, to provide a powerful pulling device of simple and rugged construction and a minimum number of parts.

The invention has other objects, uses and ad-

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vantages which may appear from the following description of the preferred embodiment and of a slightly modified form of the invention.

In the accompanying drawings forming a part of this specification—

Fig. 1 is a side elevation of an ordinary lift jack shown with an attachment embodying the invention;

Fig. 2 is a top plan view of the same;

Fig. 3 is a side elevation of the same parts, viewed from the opposite side;

Fig. 4 is a fragmentary end elevation from the left end of Fig. 1;

Fig. 5 is a fragmentary vertical section through the upper end or lift bar of the jack with an attachment which secures the ends of two chains to the jack;

Fig. 6 is a fragmentary vertical section through the toe lift of the jack, showing an attachment securing the ends of two chains to the jack;

Figs. 7 and 8 are details, in side elevation, showing how two pawls of different lengths may engage a chain to hold the same in tension;

Fig. 9 is a detail in vertical section showing the engagement of the shorter pawl with the chain, as in Fig. 7;

Fig. 10 is a section on line 10-10 of Fig. 3;

Fig. 11 is a detail in elevation showing the same parts illustrated in Fig. 10 but also showing a locking pin engaged with one of the chains and showing more links of the chains than appear in Fig. 10;

Figs. 12 and 13 are details showing how the locking pin of Fig. 11 holds two different links of the chain;

Fig. 14 is a top plan view of a slight modification of the attachment base;

Fig. 15 is a side elevation of the modification of Fig. 14.

Before proceeding with the detailed description required by the patent statutes, it may be stated that the attachment shown comprises a base, chain-guiding means mounted on the base, chain locking or securing means associated with the chain-guiding means, and means removably secured to both the lift bar and toe bar of the lift jack to make it possible to hook from one to four chains onto the lift jack, so that normal operation of the lift jack is converted into pulls on all chains attached to the jack. Thus the implement in its broadest aspect is a device for converting the vertical lift of a jack into more or less horizontal pulls on chains or the like, a result which is not new broadly, as it is inherent in the load binder of the Sabourin Patent No. 371,792, dated October 18, 1887. However, my invention

offers many advantageous features not found in the Sabourin load binder, as this specification makes clear, or as will be apparent to those skilled in the art.

Referring particularly to the drawings, the implement includes a base 15 which may be of any convenient size and shape but should have a flat under surface to rest on the ground or other support, and on its upper face should also have a flat area for the base 16 of the jack J to stand on. The jack selected for illustration is the well known type having a housing, a lift or rack bar 17 vertically movable in the housing, a rack bar head 18 at the upper end of the rack bar, a pivoted lever socket 19, a lever 20 insertible in socket 19 to swing the socket up and down to work the jack, a trip latch 21, and an adjustable rack bar toe lift 22. The construction and operation of jacks of this type are too well known to require description. In lieu of the jack shown, other types of lift jacks, such as those employing a worm and an operating endless chain, or a rotating crank handle, or a hydraulic mechanism, may be used. Whatever the type of jack used, it is to be mounted on the base 15 and usually it will be readily removable, that is, not secured by screws or bolts to the base but only by a pair of opposed lugs 30 integral with or attached to the base 15, the base 16 of the jack being slipped or slid under the two lugs. If preferred, the lugs may be secured by studs (not shown) to base 15, so as to be removable and replaceable by other lugs properly shaped to accommodate the bases of other types or models of jacks, and a series of tapped bores in base 15 may make it possible to vary the spacing of the lugs according to the width of the jack base. This type of adjustment is so well known that it need not be illustrated. A pair of perforations 31 in base 15 are also provided to facilitate anchoring the attachment by means of studs or the like to any suitable fixed object. The jack base 16 may also be secured to the attachment base 15 by studs.

The attachment of the invention includes chain-connecting means 32 removably secured by studs 33 to the top of the rack bar head 18. Means 32 is preferably a block-like member, flat on the top, having two depending lugs 32a adapted to fit snugly on either side of the rack bar head 18 to obviate any turning of the chain-connecting means on said head, and also having two aligned slots 34 in its opposite ends and grooves 35 merging with said slots. The slots 34 are adapted to receive a chain link flatwise, while grooves 35 are adapted to receive the lower end of the next adjacent link of the chain, which of course is at right angles to the link in the slot. Thus two chains C¹ and C² may be securely engaged with the opposite ends of the chain-connecting means 32, yet may be manually disengaged and removed when the tension has been relieved. While two chains are shown, chains C¹, C² may be a single chain engaged in two places to secure it to the chain-connecting means 32 and hence the lift jack. The described means 32 permits the attachment of one chain to one of its ends or two chains (as illustrated) to two ends, or a single chain at two points; and these two points of attachment may be close together on the chain or many feet apart.

To secure two additional chains C³, C⁴ to the jack, the rack bar toe lift 22 supports a removable chain-connecting means 40 in the form of a block secured by a stud 41 and having a pair

of opposed vertical walls 42 engaging the toe lift on either side to obviate turning. Block 40 has aligned slots 43 in either end to receive links of chains C³, C⁴, and also has grooves 44 on its upper face merging with the slots and adapted to receive the lower ends of the next adjacent links of the chains. Thus the construction of block 40 is similar to that of block 32, the differences being those required to fit over the rack bar toe lift 22 instead of the rack bar head 18. Instead of two chains, a single chain may be secured to either end of block 40; or a single chain may be secured at two points close together on the chain or many feet apart, as will be clear. Both chain-connecting blocks 32, 40 will be shaped to fit the particular jack for which the attachment is designed, and hence there will be numerous departures from the forms illustrated. It should also be understood that the device of the invention will be useful if only one block (either 32 or 40) is used: there are many situations requiring the pulling of only a single chain in one direction, or pulling two chains simultaneously in opposite directions, and in either case a single block is all that is needed.

Secured to upright supports 50, which are integral with the base 15 and lie on opposite sides of the jack when attached to the base, are the hold-down chain guides 51 which are spaced above the base 15 so as to give clearance for movement of the vertical links of the chains C³, C⁴. The chain guides have curved grooves 52 (Figs. 4 and 13) on their bottoms and on the ends adjacent the jack to receive said vertical links, thus guiding the chains, the total arc of the curved grooves 52, being less than 90°. The function of the chain guides 51 is to change the direction of chains C³, C⁴ so that said chains may be pulled by the rack bar toe lift as it moves upwardly although the principal lengths of said chains extend horizontally, also to hold the chains against lateral movement, and prevent disengagement with the hook-like ends of the block 40. Without the chain guides the chains C³, C⁴ would slip out of the slots 43 and grooves 44 as soon as any tension was imposed on them. To secure the chains independently of the hooks on the block 40, each chain guide has a pair of nearly upright, parallel fingers 53 separated from the main body of the chain guide by slots 54. These slots are each defined by a vertical wall on the side where the main body of the chain guide lies, and a slanting wall which is one wall of the finger. As appears from Figs. 11, 12 and 13, pins 55 (which may be secured by small chains 56 to the chain guides) are adapted to be inserted crosswise, that is, in the two slots 54, to lock the chains, the construction permitting the locking of each chain by any selected one of its links. To hold the edgewise chain links the pins 55 are thrust through the links, and upon release of the chains from the block 40 the tension on the chains will pull the pins 55 hard against the ends of the chain guides 51. To hold the flatwise chain links the pins are each placed in the two slots 54 outside a flatwise link and upon release of the chain the edgewise link immediately above will engage the pin to press it against the bottoms and vertical walls of the slots. If the slots 54 were otherwise formed, the described locking of each (any) link by the pins 55 would not be possible.

Co-operating with chains C¹, C² are a pair of chain guides 60 in the form of sheaves rotatable about horizontal axes on pins 61 which are secured in supports 50. As shown the sheaves 60

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are pentagonal, with a circular groove 62 cut in each of their peripheries. At each of the five corners of the pentagons the sheaves have teeth 63 extending outwardly, said teeth holding the chain against lateral movement. The edge-wise links are received in the circular groove 62 and are held between the pairs of teeth 63, while the flatwise links lie flat against the straight sides of the two pentagons, the distance between any two adjacent teeth of one of the pentagons being equal to the length of a chain link. The sheaves thus hold the chains against lateral movement and guide the chains toward their connections with the hooks on block 32 so that said connections will not release. To make possible the locking of chains C¹, C² to hold them in tension even after release from the block 32, locking means are provided for each chain in the form of two pawls 64 and 65, the pawls 64 being longer than pawls 65 and each being slotted as indicated at 66 (Fig. 9) to receive the shorter pawl. The pawls of each pair are pivoted on a pin 67 secured horizontally crosswise of a slot 68 in the base 15, the arrangement permitting each pawl to swing independently of the other. The lengths of the pawls are such that one or the other will engage any selected link of the chain C¹ or C² which is to be made fast. See Figs. 7 and 8. No pawl springs are used (although they could be employed) because it is desired to have the construction as simple and rugged as possible.

Operation

It is impossible to describe all the different uses of the device, but the following may illustrate one use. Assuming that there are four chains C¹, C², C³, C⁴ to be pulled, or two chains whose two ends are to be pulled (the middle portions of the two chains passing around a sheave or pulley), then the jack J is placed on base 15 with the lugs engaging over the jack base 16 to prevent tipping or turning, and the rack bar and toe lift are moved as far down as possible. Then the four chains (or two chains) are engaged with the hooks on blocks 32 and 40 in the manner made clear in the drawings, the chains being pulled until they are under slight tension such as may be imposed by manual force. Then the jack is operated in the usual manner, the chains being immediately tightened. When the jack has reached its upper limit of motion, the chain-locking members 55 and 64 (or 65) will be engaged with the chains. Now the jack may be adjusted to lower the rack bar and toe lift, and after such lowering has taken place the chains will either fall off the jack or may be readily disengaged. The jack may be taken to another place and operated with another attachment or it may be re-engaged with the same chains at points farther along the chain lengths, and after removal of locking pins 55 or pawls 64, 65 the chains will again be pulled in if the jack is adjusted to lift. This process may be repeated as often as desired: each time the jack will pull one to four chains in toward itself a distance equal to the vertical lift of the toe bar or rack bar. When the pulling is done on both sides of the device the chains will travel twice the distance of the lift. The chains may be inserted by a lateral movement, hence may be engaged at any point along their lengths.

Modification

The slight modification illustrated in Figs. 14

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and 15 includes a base 70 having a pair of wings or reinforcements 71 to which jack-holding lugs 73 are integrally secured. Chain guides and hold-down means 72 are also shown as integral with the base. This form is very rugged and would be used for heavy duty work.

Many other changes and modifications will occur to those skilled in the art. For instance, the device could be so made as to pull cables or even ropes instead of chains. I do not wish to be limited to the forms shown in the drawings.

Having described the invention in accordance with the requirement of the statute, what I claim as new and desire to secure by Letters Patent is:

1. A pulling implement comprising a base, a flexible pulling element, means for guiding the flexible pulling element, said means being immovably secured upon the base and acting to hold down the flexible pulling element so that the line of pull thereof may be diverted from a substantially horizontal direction to a direction nearly vertical, means on the base to temporarily secure a lift jack thereto, and means adapted to be removably secured to that part of the lift jack which is moved upwardly when the lift jack is operated, the last named means being constructed and arranged to engage and temporarily hold the flexible pulling element, so that the power of the lift jack is transferred to the flexible pulling element.

2. The invention defined in claim 1, wherein the flexible pulling element is a chain and a pawl is pivotally mounted on the base to swing in a vertical plane, said pawl being engageable at its upper end with an operator selected link of the chain to hold the chain when disconnected from the means adapted to be attached to the lift jack.

3. The invention defined in claim 1, wherein the flexible element is a chain and a pair of pawls are pivotally mounted on the base, the pawls being of different lengths and one being engageable with an operator selected link of the chain when the other longer pawl may not be so engaged, the longer pawl being engageable with the second link above the first mentioned link when the chain has moved a distance equal to the length of one link, the two pawls therefore permitting locking the chain effectively at any link along its length.

4. The invention defined in claim 3, wherein the two pawls are both pivotally mounted on a pin fixed to the base of the pulling implement, so that either may swing on said pin independently of the other, the longer pawl being slotted to receive the shorter pawl or let it pass there-through when the shorter pawl is in inactive position.

5. The invention defined in claim 1, wherein the flexible element is a chain and the guiding and hold down means has a pair of parallel up-standing fingers spaced from it by slots, a locking pin being insertible in the two slots and engageable with any selected link of the chain to lock the chain when disconnected from the means which is adapted to be attached to the lift jack.

6. The invention defined in claim 1, wherein the means which is adapted to be attached to the lift jack is secured detachably to the top of the movable part of the lift jack and has chain hooking means at one end, the flexible element being a chain temporarily secured by its tension to the chain hooking means.

7. A pulling implement comprising a base, a

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pair of chains, a pair of chain-guiding sheaves rotatable in vertical planes upon the base, means on the base to temporarily secure a lift jack thereto by means of its base with the lift jack standing upright, a block member adapted to be rigidly but removably secured to some portion of the lift jack which moves upwardly when the lift jack is operated, said block member having chain-engaging means on each end, the chains being thereby temporarily secured to opposite ends of the block member and passing down to and partly around the respective sheaves thence outwardly to the work, and means to lock the chains when under tension from operation of the lift jack to hold the chains even when disengaged from the block member, said last named means being movably mounted on the base.

8. A pulling implement comprising a base, a pair of chains, a pair of chain guides fixed to the base and each adapted to receive a chain and hold it down, means on the base to temporarily secure a lift jack thereto by means of its base with the lift jack standing upright, a chain-engaging element adapted to be secured to one end of each chain and adapted to be fixed to and removed from the part of the lift jack which moves upwardly when the lift jack is operated, and pins engageable with links of the chains and with said chain guides to lock the chains when in tension from operation of the lift jack.

9. A lift jack attachment adapted to pull one or more chains in a plane generally at right angles to the path of movement of the part of the lift jack which moves when the lift jack is operated so as to lift or push, said attachment consisting of a base, means for securing the base of the jack temporarily but rigidly to the base of the attachment, means for securing temporarily at least one chain to the aforesaid part of the lift jack which moves, so that operation of the lift jack to lift or push will pull on said chain or chains, chain-guiding and hold-down means on the attachment base, and chain-locking means associated with said attachment and manually movable to lock the chain or chains after release from the aforesaid part.

10. A device for use with a lift jack and adapted to convert the lift or push of the lift jack into pulling motions, said device consisting of a base so shaped as to support the base of the lift jack with the lift jack standing upright, plural chain-guiding and hold-down means on the base of the device and so disposed that the lift jack may be placed between them, said chain-guiding and hold-down means receiving chains extending in two opposite directions in a generally horizontal plane and guiding said chains so as to extend generally upwardly, means adapted to be attached to and readily detachable from the lift jack and adapted to secure an end of each chain temporarily to some movable part of the lift jack, and chain-locking means operably associated with the device, there being as many chain-locking means as there are chains to be pulled and each such means being manually engageable and disengageable with the links of the several chains to hold the chains secured to the device in full tension even after the lift jack has been removed from the device.

11. The invention as defined in claim 10, wherein the lift jack has a vertically movable rack bar with a head at the upper end, and the means adapted to be attached to and readily detached from the lift jack consists of a member having chain-hooking means on each end, and

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means to secure the member immovably to said head.

12. The invention as defined in claim 10, wherein the lift jack has an adjustable toe lift attached thereto, and the means adapted to be attached to and readily detachable from the lift jack consists of a member having chain-hooking means on each end, and means to secure the member immovably to said toe lift.

13. The invention as defined in claim 10, wherein the jack has a rack bar with a head and a toe lift attached thereto, and the means adapted to be attached and readily detached from the jack consists of two members each having chain-hooking means, one of the members being adapted for attachment to the head of the rack bar and the other being adapted for attachment to the rack bar toe lift.

14. The invention as defined in claim 10, wherein the chain-locking means consists of pins, the chain-guiding and holding means having slots open at the top and extending downwardly from the open ends to receive said pins crosswise of the chains locked by them.

15. The invention as defined in claim 10, wherein the chain-locking means consists of pawls pivoted to the base of the device and directly engageable with links of the chains.

16. A pulling implement comprising a base adapted to rest on the ground or other horizontal support, means adapted to hold a lift jack rigidly on the base so that the lift jack is prevented from tilting thereon responsive to lateral stresses, said means permitting manual removal of the lift jack when desired, the lift jack having a movable part which travels away from said base when the lift jack is operated in the normal manner to lift an object, chain-connecting means adapted to be secured to and removed from said movable part by the operator and being adapted to be manually secured to and released from a chain, and a chain-engaging device on said base which acts as a guide to change the direction of the chain so that upward lifting motion of the lift jack may effect pull of the chain toward the lift jack, said chain-engaging device including means adapted to secure the chain to the base at any point along the length of the chain.

17. The invention defined in claim 16, wherein there are two chain-engaging devices each in the form of a grooved sheave, and means to support the grooved sheaves on the base to rotate in vertical planes on each side of the lift jack when supported on the base, the jack being readily removable from the base.

18. The invention defined in claim 16, wherein there are two chain-engaging devices each in the form of a stationary block fixed to the base on either side of the lift jack when supported on the base, and the lift jack being readily removable from the base, the blocks each having a curved groove on the underside and on the end near the lift jack to receive and guide a chain, the chain-connecting means for the lift jack consisting of an attachment onto which one chain may be hooked at two spaced points or onto which the ends of two different chains may be hooked.

19. As a new article of manufacture, an attachment for lift jacks consisting of a lift jack support, means to secure a chain to a movable part of the lift jack, means fixed on the lift jack support to guide a chain to said chain-securing means, said chain-securing means being removable from the lift jack and the lift jack being

removable from the lift jack support, means being provided to fasten the chain to the lift jack support prior to removal of the lift jack.

20. In combination with a lift jack having a base and a part which is movable away from the base when the lift jack is operated in the normal manner, means to temporarily attach a flexible element to said movable part so that operation of the lift jack may impose tension on the flexible element, direction-changing means for the flexible element, base means supporting the direction-changing means, means to secure the base means to the base of the lift jack, and manually operable locking means to secure the flexible element to the base means prior to releasing it from said movable part.

21. A lift jack attachment adapted to pull one, two, three or four chains simultaneously, said attachment having a base; means on said attach-

ment base for securing the base of a lift jack temporarily but rigidly to the attachment base; means for securing one, two, three or four chains temporarily to a movable part of the lift jack that is secured to the attachment base so that operation of the lift jack to lift or push will pull said chain or chains, said means for securing being part of the attachment and being removable from the lift jack; chain-guiding and hold-down means on the attachment base for each of the chains to be pulled; and chain-locking means for each of the chains, said chain-locking means being associated with the attachment so as to be readily manipulated to secure each of the chains to the attachment while the chain is under tension from operation of the lift jack.

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No references cited.