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L. C. MONTGOMERY
DOUBLE-LIFT JACK

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2 Sheets-Sheet 2

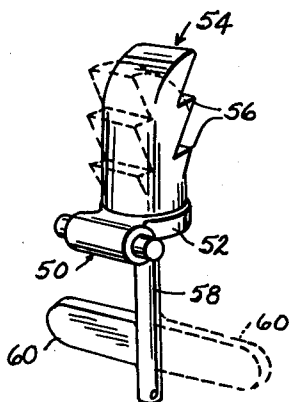


FIG. 5

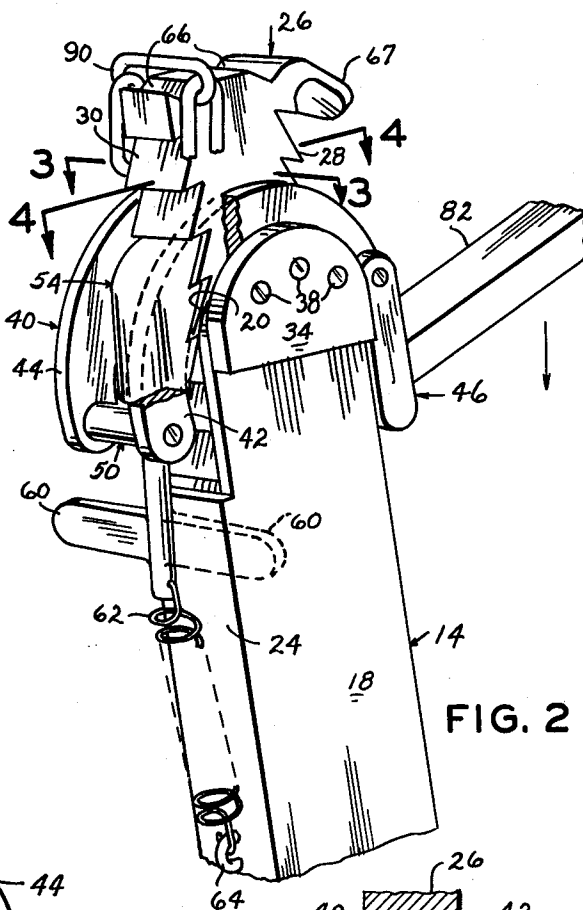


FIG. 2

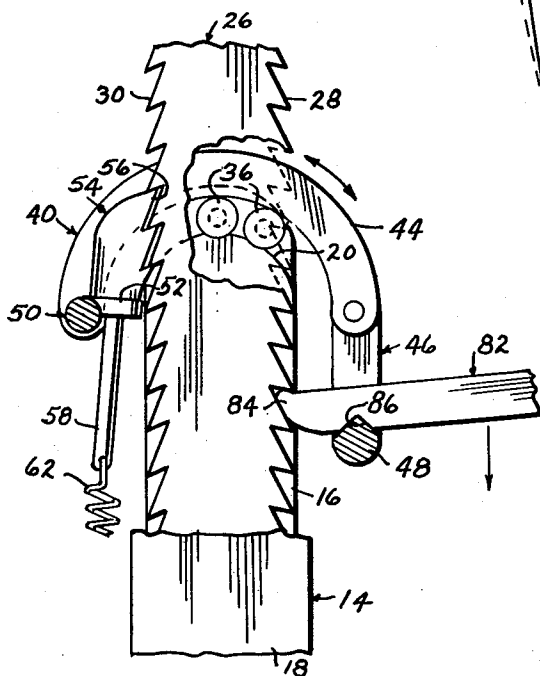


FIG. 4

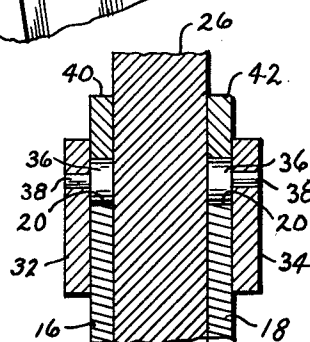


FIG. 3

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DOUBLE-LIFT JACK

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The present invention relates to jacks and more particularly to a double-lift type ratchet jack.

The principal object of the instant invention is to provide a ratchet type jack wherein a lifting force is simultaneously applied to opposite surfaces of the extendable or lifting member.

Another object is to provide a double-lift jack of this class wherein bearings support the weight opposing the lifting action thereby reducing the frictional resistance of the moving parts during the lifting action.

Another object is to provide a jack wherein, when the lifting member is fully extended, the jack may be released to a collapsible position by the release of a single locking member.

Still another object is to provide a jack which is relatively simple and yet sturdily constructed for lifting relatively heavy objects.

Yet another object is to provide a jack which may be connected with a chain or suitably connected hooks for engagement with and lifting objects positioned parallel with the base portion of the jack.

The present invention accomplishes these and other objects by providing an upright housing which telescopically receives a lift member having a series of coextensive ratchet teeth positioned on opposite surfaces thereof. A saddle and stirrup cooperate with lever and pawl means engaged with the ratchet teeth for extending the jack while a ratcheting locking means releasably holds the lift member in an elevated position.

Other objects will be apparent from the following description when taken in conjunction with the accompanying two sheets of drawings, wherein:

FIGURE 1 is a fragmentary perspective view of the jack;

FIGURE 2 is a fragmentary perspective view of the upper end portion of the jack showing the opposite face thereof;

FIGURES 3 and 4 are vertical cross-sectional views taken substantially along the respective lines 3-3 and 4-4 of FIG. 2; and,

FIGURE 5 is a perspective view of the ratchet teeth engaging pawl, per se.

Like characters of reference designate like parts in those figures of the drawings in which they occur.

In the drawings:

The reference numeral 10 indicates the device, as a whole, comprising a base 12 and a housing 14. The housing 14 is rectangular in cross section and extends upwardly from the base on an incline with respect to a line normal to the upper surface of the base. The upper ends of opposing sides 16 and 18 of the housing are arcuately curved, as at 20 (FIG. 4), while the other sides 22 and 24 terminate in downwardly spaced relation with respect to the upper end portion of the sides 16 and 18. A substantially rectangular lift member 26 is slidably received by the interior of the housing in telescoping relation. Opposing sides of the lift member 26 are each provided with a coextensive series of ratchet teeth 28 and 30, respectively, which face toward the inner surfaces of the respective housing sides 22 and 24. A pair of lugs 32 and 34 are secured to the outer surface of the uppermost end portions of the housing sides 16 and 18 and project slightly above the respective arcuate end surface 20. Roller bearings 36 are mounted for rolling contact with the

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respective end surfaces 20 by pins 38 extending through the lugs 32 and 34.

A saddle 40, comprising a pair of parallel substantially semi-circular bar members 42 and 44, is positioned on opposing sides of the lift member 26 with the interior arcuate surface of the bar members contacting the respective rollers 36.

A stirrup 46, substantially U-shaped in configuration, is pivotally connected by the end portion of its legs to one end of the saddle 40. The bight portion 48 of the stirrup is substantially inverted V-shaped in cross section for the purposes which will presently be apparent.

A cross pin 50 is transversely journaled by the end of the saddle opposite the stirrup. The pin 50 is provided with a centrally bored extension 52 extending inwardly of the saddle toward the ratchet teeth 30. A pawl 54, having a series of ratchet engaging teeth 56, is journaled by the extension 52 for rotation about a vertical axis defined by its shaft 58 projecting downwardly through the extension 52. A wing 60, connected to the depending end of the shaft 58, permits manual rotation of the pawl 54 for engagement and disengagement of its teeth 56 with the ratchet teeth 30. A spring 62 is connected at one end to the depending end of the shaft 58 and is connected at its other end to the housing, as at 64, for normally pulling the saddle 40 and pawl 54 downwardly of the housing opposite the stirrup 46.

The upper end of the lift member 26 is provided with transverse notches 66 for engagement with an object to be lifted such as the rim of an automobile wheel indicated by the dotted lines 68. An outstanding ear 67 permits the lift member 26 to be manually raised for engaging the latter with the work prior to the jacking action as more fully explained hereinbelow.

The housing 14 is further provided with a locking means 70 comprising a pair of arms or bars 72 connected, respectively, to the housing sides 16 and 18 intermediate the ends thereof and spaced downwardly of the lowermost limit of the stirrup 46. A lever 74 is pivotally mounted between cooperating laterally projecting ends of the arms 72. One end portion 76 of the lever projects inwardly of the housing through a suitable aperture 78 formed in the housing wall 22 for cooperative engagement with the ratchet teeth 28. A spring 80, interposed between the outer surface of the housing wall 22 and the handle 74, normally urges the handle engaging end portion 76 toward the ratchet teeth 28.

Operation

In operation the device 10 is positioned adjacent the object to be lifted with one of the notches 66 engaged with the work. The inclined relation of the housing 14 with respect to the base 12 permits the lift member 26 to engage the work with the base 12 positioned in spaced relation with respect to the lower portion of the work when supported by a common supporting surface. An elongated lift handle or lever 82, having a tapered end portion 84 adapted to engage with the teeth 28 and having a transverse inverted V-shaped notch 86 adjacent its end 84, is positioned within the stirrup 46 with the notch 86 positioned over the bight portion 48 of the stirrup. The free end of the handle 82 is manually raised to engage the end 84 with a selected one of the teeth 28. The outer end of the handle is manually forced downwardly using the bight portion 48 as a fulcrum while the pawl teeth 56 engages the teeth 30 on the opposite side of the lift member 26. Downward movement of the handle pulls the saddle 40 across the rollers 36 and simultaneously applies a lifting force to opposite sides of the lift member 26 and step raises or elevates the latter with respect to the housing 14. The locking means 70 engages one of the teeth 28 to maintain the lifting member 26 in its upper position. Pressure on the handle 82 is

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released permitting the spring 62 to reposition the saddle and pawl 54 downwardly for engagement with lower ones of the series of ratchet teeth 30 by the sliding movement of the saddle across the bearings 36. The inward end of the handle 84 is then engaged with a selected lower one of the series of ratchet teeth 28. This completes one cycle of the lifting operation.

Another feature of the invention is the release of the jack from a workload lifted position wherein the jack is released or collapsed by removing the handle 82, rotating the pawl 54 out of engagement with the teeth 30 by means of the wing 60, and then forcing the free end of the locking handle 74 downwardly and toward the housing wall 22 which releases the handle end 76 from engagement with the ratchet teeth 28.

The jack may be used for lifting objects supported by the same surface as the base 12 by means of a chain 90, or the like, engaged within one of the recesses 66 and having suitable hooks or links, not shown, secured to its depending ends which are engaged with the work to be lifted.

Obviously the invention is susceptible to some change or alteration without defeating its practicability, and I therefore do not wish to be confined to the preferred embodiment shown in the drawings and described herein, further than I am limited by the scope of the appended claims.

I claim:

1. A double-lift jack, comprising: a base; a housing secured to said base; a lift member telescopically received by said housing, said lift member having a series of ratchet teeth on opposing surfaces; bearings supported by opposing sides of the upper end portion of said housing; a saddle supported by said bearings; a stirrup connected to one end of said saddle; a pawl supported by the other end of said saddle and engaged with the adjacent series of said ratchet teeth; a handle having one end engaging the ratchet teeth on that side of the lift member adjacent said stirrup and fulcrumed by the stirrup to pull said saddle across said bearings and simultaneously apply a lifting force to the ratchet teeth on opposing sides of said lift member and elevate the latter with respect to said housing as the free end of said handle is moved downwardly; and locking means connected with said housing and engaged with one series of said ratchet teeth for holding said lift member in elevated position.

2. A double-lift ratchet jack, comprising: a horizontally disposed base; a hollow elongated housing secured to said base and projecting angularly upward therefrom with respect to a line normal to said base; a lift member telescopically received by said housing, said lift member having a series of coextensive ratchet teeth on opposing surfaces; bearings supported by opposing sides of the upper end portion of said housing; a substantially semi-circular saddle slidably supported by said bearings; a stirrup pivotally connected to one end of said saddle in depending relation; a ratchet teeth engaging pawl pivotally supported by the other end of said saddle; a handle having one end engaging the ratchet teeth on that side of the lift member adjacent said stirrup and fulcrumed by the stirrup to pull said saddle across said bearings and simultaneously apply a lifting force to the ratchet teeth on opposing sides of said lift member and elevate the latter with respect to said housing as the free end of said

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handle is moved downwardly; and locking means connected with said housing and engaged with one series of said ratchet teeth for holding said lift member in elevated position.

3. A ratchet jack, comprising: a horizontal base; an elongated hollow upright housing mounted on said base; a lift member telescopically received by said housing, said lift member having a series of coextensive ratchet teeth formed on opposite surfaces; lugs secured to the upper end portion of opposing walls of said housing and spaced 90° with respect to the series of ratchet teeth; bearings supported by said lugs adjacent opposing sides of said lift member; a saddle supported by said bearings, said saddle comprising a pair of parallel substantially semi-circular bar members; a U-shaped stirrup pivotally connected to one end of said saddle; a pawl supported by the other end of said saddle, said pawl having teeth releasably engageable with the adjacent series of said ratchet teeth on said lift member; a handle having a tapered end engaging the ratchet teeth on that side of the lift member adjacent said stirrup and fulcrumed by the bight portion of the stirrup to pull said saddle across said bearings and simultaneously apply a lifting force to the ratchet teeth on opposing sides of said lift member and elevate the latter with respect to said housing as the free end of said handle is moved downwardly; and locking means connected with said housing and engaged with one series of said ratchet teeth for holding said lift member in elevated position.

4. A ratchet jack, comprising: a horizontal base; an elongated hollow upright housing mounted on said base; a lift member telescopically received by said housing, said lift member having a series of coextensive ratchet teeth formed on opposite surfaces; lugs secured to the upper end portion of opposing walls of said housing and spaced 90° with respect to the series of ratchet teeth; bearings supported by said upper end portion of opposing walls and by said lugs adjacent opposing sides of said lift member; a saddle supported by said bearings, said saddle comprising a pair of parallel vertically edgewise disposed substantially semi-circular bar members; a U-shaped stirrup pivotally connected to one end of said saddle, said stirrup having an inverted V-shaped bight portion; a pawl supported by the other end of said saddle, said pawl having teeth releasably engageable with the adjacent series of said ratchet teeth on said lift member; a handle having a tapered end engaging the ratchet teeth on that side of the lift member adjacent said stirrup and having a transverse inverted V-shaped recess fulcrumed by the bight portion of the stirrup to pull said saddle across said bearings and simultaneously apply a lifting force to the ratchet teeth on opposing sides of said lift member and elevate the latter with respect to said housing as the free end of said handle is moved downwardly; a spring normally urging said pawl downwardly; and locking means, said locking means comprising a spring urged handle connected with said housing and engaged with one series of said ratchet teeth for holding said lift member in elevated position.

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