Nov. 8, 1927. 1,648,188

S. MOLTRUP

JACK

Filed April 9, 1923 2 Sheets-Sheet 1

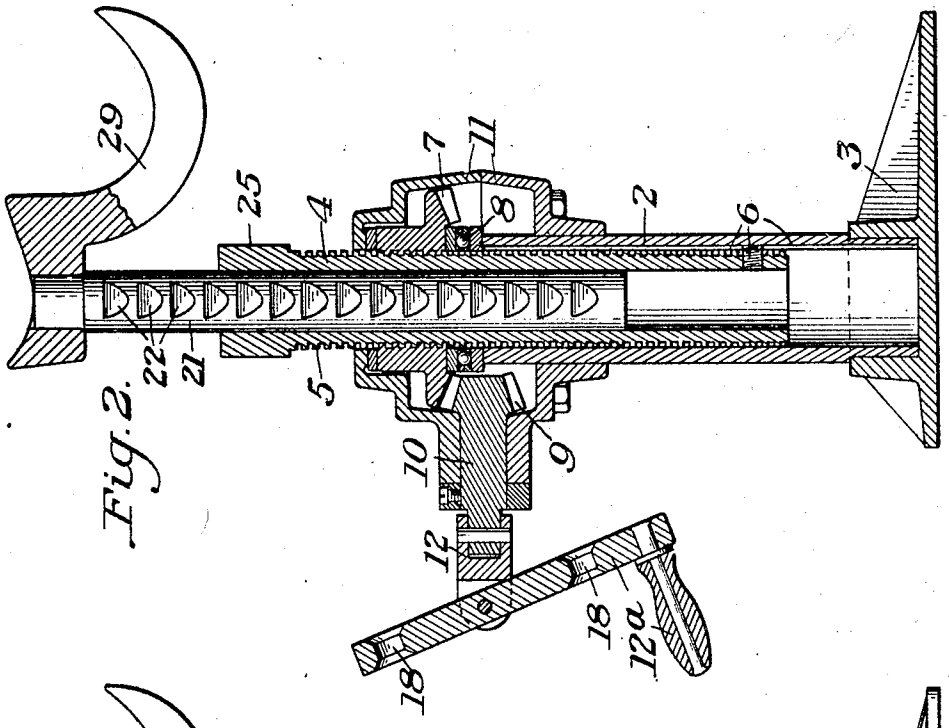


Fig. 2.

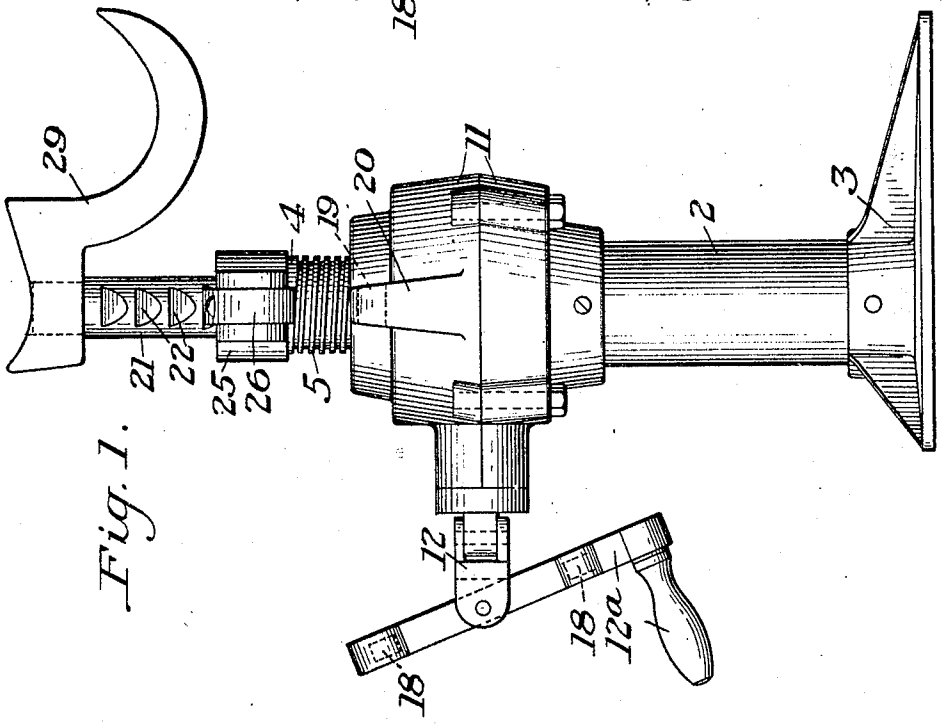


Fig. 1.

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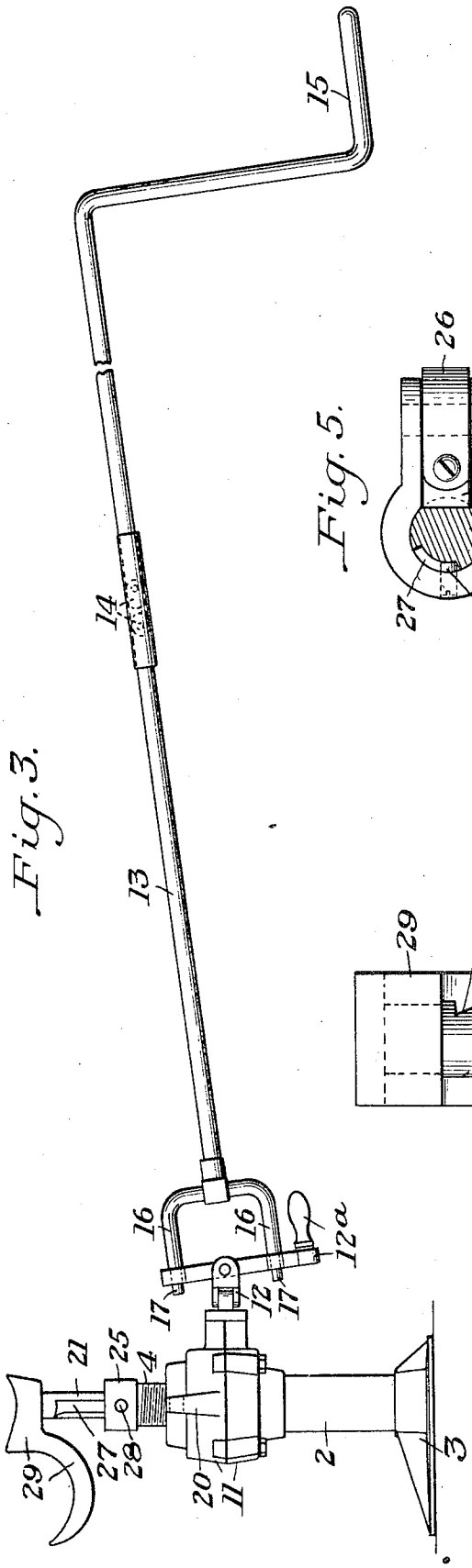


Fig. 3.

Fig. 5.

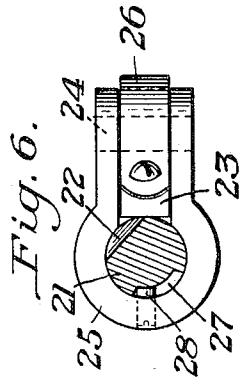


Fig. 6.

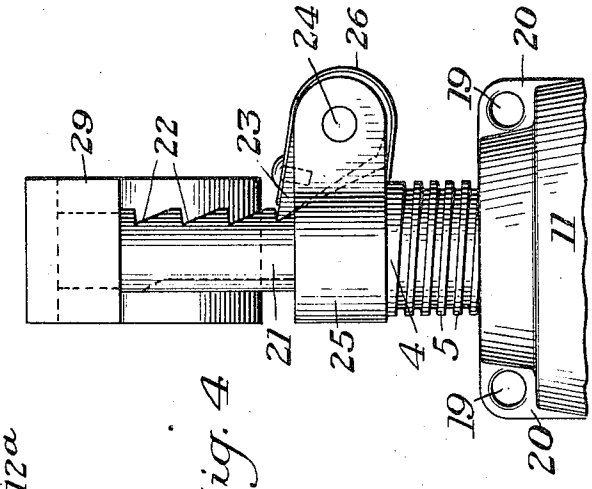


Fig. 4

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UNITED STATES PATENT OFFICE.

STEPHEN MOLTRUP, OF BEAVER FALLS, PENNSYLVANIA; ELLEN MOLTRUP AND J. T. MOLTRUP ADMINISTRATORS OF SAID STEPHEN MOLTRUP, DECEASED.

JACK.

Application filed April 9, 1923. Serial No. 630,683.

The present invention relates broadly to jacks, and more particularly to jacks especially adapted for use with automotive vehicles, although obviously its utility in this respect is not limited.

It has heretofore been proposed to provide jacks movable, under favorable conditions, and operable, from a distance. Such jacks have not been easily manipulated on soft or uneven ground, and frequently it has been necessary for the operator to actually get partly under or very close to the part being engaged by the jack to initially position the same.

By the present invention there is provided a jack which is easily positioned and operated at a distance even under very unfavorable circumstances.

A further object of the invention is to provide a jack having an increased range of operation without materially increasing the size of the jack when collapsed, or its weight.

In the accompanying drawings, there are shown for purposes of illustration only a preferred embodiment of the present invention, it being understood that the drawings do not limit the invention as changes may obviously be made in the construction and operation disclosed without departing from the spirit of the invention or scope of my broader claims.

In the drawings:

Figure 1 is a side elevation of a jack constructed in accordance with the present invention and partly extended;

Figure 2 is a vertical sectional view through the jack illustrated in Figure 1;

Figure 3 is a view similar to Figure 1, but showing the opposite side of the jack with the operating handle in operative position;

Figure 4 is a detail elevational view of the upper portion of the jack at substantially right angles to Figures 1 and 3;

Figure 5 is a transverse sectional view on a line just above the ratchet pawl 26 shown in Fig. 4, and

Figure 6 is a view similar to Figure 5 illustrating the parts in slightly different position.

In jacks as ordinarily constructed at the present time the range of operation of the jack, or in other words, the distance through which the jack may lift a given object at one setting thereof, is substantially equal to, but generally less than, the height of the jack when collapsed. By the present invention, there is provided a jack which may be extended to a height equal to almost three times the normal length of the jack when collapsed. This feature is of special importance when operating on soft ground where the jack tends to sink into the supporting surface a considerable distance before the load is effectively lifted.

A jack constructed in accordance with the present invention may comprise a tubular support 2 secured in any desired manner to a base 3 of suitable construction and dimensions. Adapted to move within, and axially with respect to, the tubular support is a lifting member 4. This lifting member is in the form of a sleeve having its outer surface shaped to provide an operating thread 5 of suitable pitch. Relative rotational movement between the lifting member 4 and the tubular support is prevented by a key and slot connection 6.

For operating the lifting member to raise it relatively to the tubular support, there is provided a bevel gear 7 having its hub interiorly threaded to cooperate with the thread 5. The gear 7 is supported for rotation upon an anti-friction bearing 8 of any well known construction resting directly on the upper end of the support 2 whereby the downward thrust imparted to the bevel gear through the lifting member is taken up directly by the support and the movement of the gear 7 even under heavy loads is rendered comparatively easy. Meshing with the gear 7 is a pinion 9 having its operating shaft 10 extending outwardly at substantially right angles to the support 2 and journaled between the upper and lower halves of a sectional housing 11. It will be understood that the housing may be secured in position with respect to the support in any convenient manner and that it may be filled with a suitable lubricating body to increase the smoothness of operation and length of life of the jack.

Operatively secured to the shaft 9 through a universal joint 12 is a small auxiliary operating handle 12a. By means of this handle, the pinion 9 may be quickly rotated to extend or collapse the lifting member 4 with respect to the support for initially positioning the jack. Thereafter, if it is desired to place the jack in a comparatively inaccessi-

ble position, a main operating handle 13 which may have a joint 14 permitting the same to be folded, is brought into use. One end of this handle is formed to provide a suitable operating crank 15 while the opposite end has forked extensions 16. These extensions have reduced portions 17 adapted to enter openings 18 in the handle 12ª for operating the same from a distance. The extensions are also adapted to engage openings 19 in lugs 20 formed on the housing 11 whereby the entire jack may be bodily lifted and easily moved from a distance irrespective of the contour or condition of the supporting surface over which it is being moved.

The lifting member 4 provides a comparatively slow acting means. It is frequently desirable to quickly extend or collapse the jack to expedite the use thereof. With the present invention, this may be accomplished by providing a ratchet lifting member 21 adapted to telescope with respect to the lifting member 4. The ratchet lifting member is formed on one side with a series of ratchet teeth 22 suitably shaped and spaced to cooperate with a spring pressed pawl 23 having a pivotal mounting 24 in the head 25 on the lifting member 5. This pawl is normally urged into position to cooperate with the teeth 22 by means of a spring 26. By reason of this construction, it will be apparent that the ratchet lifting member may be easily moved upwardly or extended with respect to the lifting member 5 and the support 2, and that the pawl 23 will effectively maintain it in the position to which it is extended. In order that the ratchet lifting member may be collapsed with respect to the support or lifting member 5, it is adapted to rotate relatively to the pawl 23 whereby the pawl is disengaged from the ratchet teeth and caused to engage a smooth surface portion adjacent to the teeth. In Figure 5 the ratchet lifting member is illustrated in its normal operative position, while in Figure 6 the parts are illustrated in the position to which they are moved to disengage the pawl and permit lowering of the ratchet lifting member. This relative rotational movement between the parts is preferably limited by providing the ratchet lifting member with a slot 27 into which projects a pin 28 carried by the head 25. This construction permits the ratchet lifting member to be quickly extended or quickly lowered to the exact position required. Thereafter, the pinion 9 may be operated to simultaneously raise the lifting members 5 and 21.

The ratchet lifting member may be provided with a lifting head 29 of any desired shape, particularly adapting it to the use for which it is intended.

In operation, it may be assumed that the jack has been positioned as shown in Figure 3 with the head 29 in engagement with the part to be lifted. The pinion 9 is then rotated and the two lifting members are simultaneously raised. It may be that the complete movement of the lifting member 4 may be required to compact the supporting surface on which the jack is mounted to an extent sufficient to carry the load on the jack. In such case, the pinion 9 will be operated in the reverse direction to lower the lifting members. The head 29 may then be engaged by one of the extensions 16 and quickly lifted into engagement with the part being lifted. Thereafter the pinion 9 may again be rotated to simultaneously raise the two lifting members. At this time the effective length of the jack will have been increased by the amount to which the ratchet lifting member is extended, thereby compensating for the amount to which the jack has sunk into its supporting surface. This makes it unnecessary to provide special blocks under the jack to compensate for its tendency to sink.

The advantages of the present invention arise from the provision of a jack so constructed that the total lifting stroke thereof is materially increased.

Further advantages arise from the provision of a jack having lifting means which may be quickly extended or collapsed to the desired position.

Still further advantages arise from the provision of a jack and cooperating handle of such construction that the jack may be bodily lifted from a distance and moved as desired.

All of the foregoing advantages are inherent in the principle of operation herein disclosed and may obviously be embodied in other mechanical constructions without departing from the invention as defined in the following claim.

I claim:

In a jack, a tubular support, a sleeve axially movable in said support and held against relative rotative movement within the support, a lifting member within said sleeve axially movable relatively thereto, means for simultaneously extending or collapsing the said sleeve and lifting member relatively to said support, a ratchet connection permitting said lifting member to be quickly extended or collapsed relatively to said sleeve, said sleeve and lifting member being relatively rotatable to bring the ratchet into operative or inoperative position at will, and means for limiting such relative rotative movement with the lifting member in any extended or collapsed position within the sleeve.

In testimony whereof I have hereunto set my hand.

STEPHEN MOLTRUP.