May 29, 1923. 1,457,009

A. E. STARIK

LIFTING APPARATUS

Filed Dec. 15, 1921

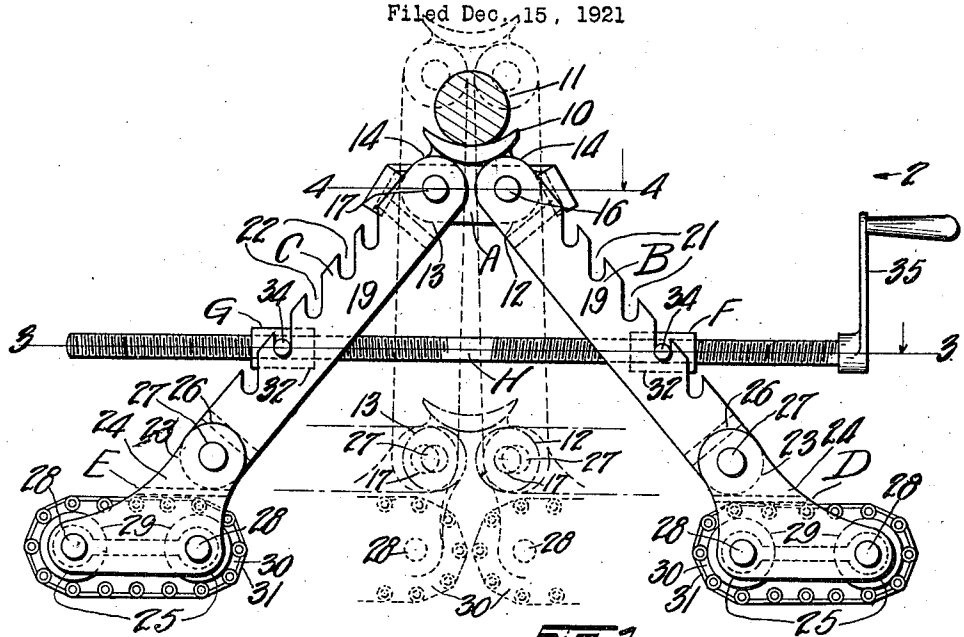

FIG. 1

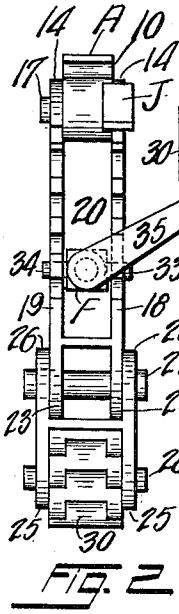

FIG. 2

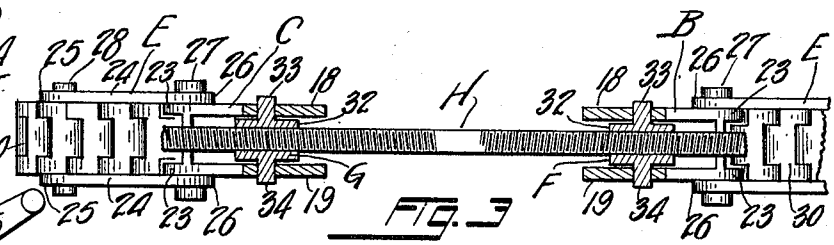

FIG. 3

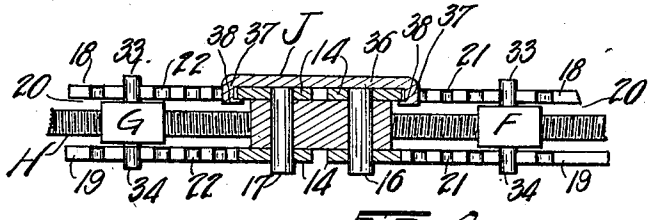

FIG. 4

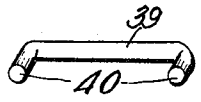

FIG. 5

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UNITED STATES PATENT OFFICE.

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LIFTING APPARATUS.

Application filed December 15, 1921. Serial No. 522,489.

To all whom it may concern:

Be it known that I, ADOLPH E. STARIK, a citizen of the United States, and resident of Lakewood, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Lifting Apparatus, of which the following is a specification.

My invention relates to lifting mechanisms generally and to toggle-joint lifting mechanisms particularly.

The predominating objects of my invention are: large lifting range, ease of lifting a load, variation of speed and power for lifting, ease of adhesion and adaptability of the shoes to the floor or ground, large bearing area upon the floor or ground, ease of movement of the shoes on the floor or ground, compactness of the apparatus when not in use, adaptability to hold the apparatus in adjusted position without the screw, mitigation of slippage of the lifted object, efficiency of operation, and durability of the apparatus. Other objects and advantages will become apparent during the perusal of the specification.

I attain these objects by the mechanism shown in the accompanying drawings which show my invention, as one embodiment, in a vehicle lifting jack, and in which drawings, Fig. 1 is a general side view of a lifting jack and indicating in dotted lines the highest and lowest positions of the head; Fig. 2 is a side end view of Fig. 1; Fig. 3 is a section on line 3—3 of Fig. 1; Fig. 4 is a section on line 4—4 of Fig. 1; and Fig. 5 is a perspective view of a modified lock bar.

Similar reference characters refer to similar parts throughout the views.

The vehicle lifting jack, selected to illustrate the present invention and shown in the drawings, consists principally of the head A, the legs B and C, the shoes D and E, the swivel nuts F and G, the screw H, and the lock bar J.

The head A may be of any suitable material and, in the present instance, is formed with the flanged portion 10 adapted to engage the vehicle axle 11, and with two ears 12 and 13 which are provided with holes the purpose of which will appear hereinafter.

The legs B and C are duplicates and may be made of any suitable material. Each of these legs is formed, at the top, with a pair of ears 14 which straddle the ears 12 and 13 and which have holes through which the pivot pins 16 and 17 pass. These pins also pass through the aforesaid holes in the ears 12 and 13, so that this portion of the structure forms a pivot joint for the legs on the head.

Along the middle portion, each leg has the side members 18 and 19, and the aperture 20, and the notches 21 and 22 in the side members 18 and 19.

At the bottom, each leg is provided with a pair of ears 23 which have holes for the purpose hereinafter set forth.

The shoes D and E are duplicates and may be made of any suitable material. The body 24 of each shoe has the downwardly projecting ears 25 and the upwardly projecting ears 26, all of which ears are provided with holes for the purpose hereinafter appearing.

The pivot pins 27 pass through the holes in the ears 23 and 26 and thereby form a pivot joint for the shoes on the bottom of the legs.

The pins 28 pass through the ears 25 and carry the rollers 29 which may or may not have sprocket teeth.

The chain 30, either ordinary sprocket link chain preferably with solid central web 31, or of a design similar to a track-laying tractor chain, or other chain which, preferably, provides a large bearing surface of the floor or ground, is disposed over the rollers 29.

The swivel nuts F and G are duplicates except that one has a right hand and the other a left hand thread and may be made of any suitable material. The body 32 of these nuts has a threaded opening for the screw H and is adapted to enter the aperture 20, and has the trunnions 33 and 34 which are adapted to journal in the notches 21 and 22.

The screw H, made of suitable material, has a right and left hand thread, preferably square threads, and also has the crank 35 wherewith the screw is rotated.

It is noted here that the screw H and the nuts F and G form one unit which may readily be detached from the apparatus by lifting the same out of the notches.

The lock bar J, made of suitable material, has the body 36, the bent down portions 37, and the hooks 38. The portions 37 and 38 being adapted to engage the legs B and C on the outside where they can find lodging or holding place on the walls of the notches

and where they can slide up and down as the legs are manipulated.

When preferred, or when it is desired to provide a more positive lock for the legs, the bar J may be made as shown in Fig. 5 where the body 39 has the round and inclined bent down ends 40 which fit into the notches 21 and 22.

The operation of the apparatus shown and described is as follows:

When it is desired to fold this apparatus, lift the screw with the nuts out of the notches in the legs, then close the legs and let the lock bar slide down on the legs or insert the round ends 40 in the lower notches whereby the apparatus is locked in compact form for storage which is a desirable feature particularly in connection with vehicles which carry lifting jacks.

When it is desired to raise an object with this apparatus, place the apparatus without the screw under the object, then manually close the legs until the head touches the object at which point the lock bar has slidden down on the legs and holds them in this particular position (if the round end bar is used, the round ends are inserted into the nearest notches which need not necessarily be in notches exactly opposite each other since the lock bar may be placed in an inclined position) then adjust the nuts on the screw so that they will enter the lowermost notches which permit the crank on the screw to rotate without striking the ground, then rotate the screw by means of the crank, whereupon the head will move upward and raise the object.

When it is desired to change the speed or the power required while raising this object, the screw and nuts may be changed from one pair of notches to another during the operation since the lock bar holds the legs in any position and the screw can be removed without disturbing the legs and placed in another pair of notches, either upward or downward, whereby the speed and the power required will be changed.

When it is desired to lower an object which has been raised with this apparatus, place the screw in a convenient pair of notches, then rotate the screw sufficiently so that it will temporarily hold the legs in position, then slide the lock bar upward (or remove the round ended one) to release the lock, then rotate the screw to lower the head and consequently the object.

It is noted that the chain on the shoes provides not only a large bearing surface for the ground, but also mitigates friction between the shoe and the ground when the apparatus is in operation, thereby conserving power in raising or lowering an object as well as preventing the shoes from digging into the ground which is a very desirable feature particularly in vehicles.

It is further noted that this apparatus has two shoes, spaced apart, whereby the object, particularly a vehicle, is prevented from moving longitudinally after it is raised, unlike the one shoe jack which does not prevent, but rather increases, the possibility of such longitudinal movement. If, for any reason, the vehicle did have a tendency to so move, a peg or nail or other object may be inserted between the chain links and abutting on the edge of the legs or elsewhere whereby the movement of the chain is prevented.

The apparatus shown and described carries out the objects herein set forth and is susceptible to modifications as to structure and application. Therefore, without limiting myself to the precise construction shown and described,

I claim:—

1. An apparatus of the character described, comprising a head, a pair of legs pivoted on said head, a shoe pivoted on the lower end of each of said legs and provided with movable ground engaging means, and means for moving said legs on said pivot.

2. An apparatus of the character described, comprising a head, a pair of legs pivoted on said head, a shoe pivoted on the lower end of each of said legs and each shoe provided with a track laying chain, and means for moving said legs on said pivot.

3. An apparatus of the character described, comprising a head, a pair of legs pivoted on said head and each leg provided with a series of notches, a ground engaging means on the lower end of each of said legs, a swivel nut mounted in each of said legs and each nut adapted to journal in said notches, and a screw adapted to engage said nuts to move said legs about said pivot.

4. An apparatus of the character described, comprising a head, a pair of legs pivoted on said head and each leg provided with a series of notches, a ground engaging means on the lower end of each of said legs, and a screw provided with a pair of nuts each of which is adapted to journal in said notches.

5. An apparatus of the character described composed of two units, one of said units comprising a head, a pair of legs pivoted on said head and each leg provided with a series of notches, a ground engaging means on the lower end of each of said legs, and the other of said units comprising a screw provided with a pair of nuts each of which is adapted to journal in said notches and said pair of nuts adapted to engage any set of said notches.

6. An apparatus of the character described, comprising a head, a pair of legs pivoted on said head, a shoe pivoted on the lower end of each of said legs and each shoe provided with a tracklaying chain, means

for moving said legs on their said pivots, and a lock bar adapted to hold said legs in adjusted position.

7. An apparatus of the character described, comprising a head, a pair of legs pivoted on said head, a shoe pivoted on the lower end of each of said legs and each shoe provided with a track laying chain, a swivel nut mounted in each of said legs, a screw adapted to engage said nuts and move said legs on their said pivots, and a lock bar adapted to hold said legs in adjusted position.

8. An apparatus of the character described, comprising a head, a pair of legs pivoted on said head, a shoe pivoted on the lower end of each of said legs and each shoe provided with a track laying chain, a removable screw and nut means adapted to engage said legs and move the same on their said pivots, and a lock bar adapted to hold said legs in adjusted position.

9. An apparatus of the character described, comprising a head, a pair of legs pivoted on said head, a shoe pivoted on the lower end of each of said legs and each shoe provided with a tracklaying chain, a removable and locally adjustable screw and nut means for moving said legs on their said pivots, and a lock bar adapted to hold said legs in adjusted position.

10. An apparatus of the character described, comprising a head, a pair of legs pivoted on said head and provided with notches, a shoe pivoted on the lower end of each of said legs and each shoe provided with a tracklaying chain, a pair of swivel nuts and each nut adapted to journal in any of said notches, a screw through said nuts, and a lock bar adapted to engage said legs at different locations to hold the same in adjusted position.

ADOLPH E. STARIK.