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E. H. SCHULTZ ET AL
SERVICE JACKS

3,120,945

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2 Sheets-Sheet 1

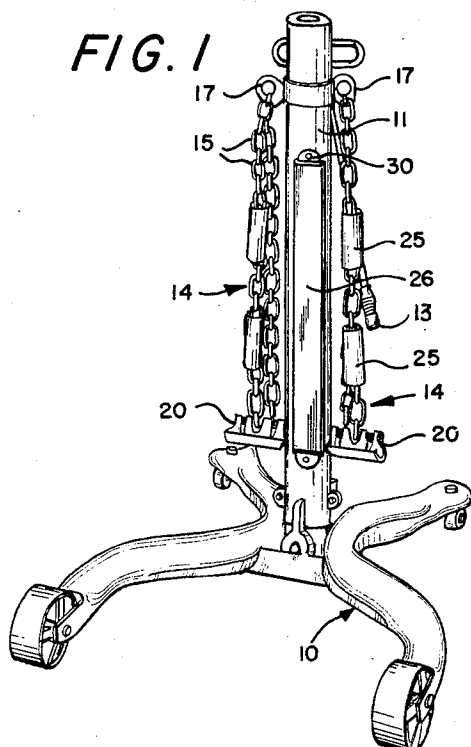
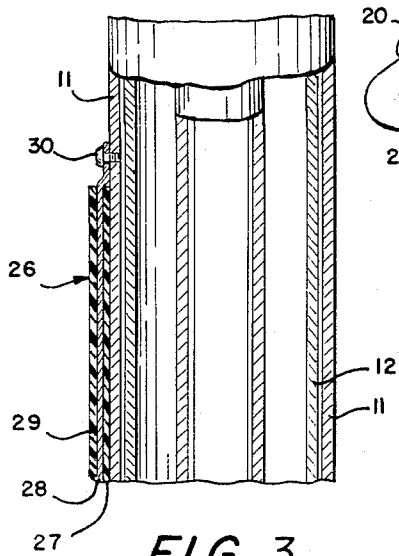
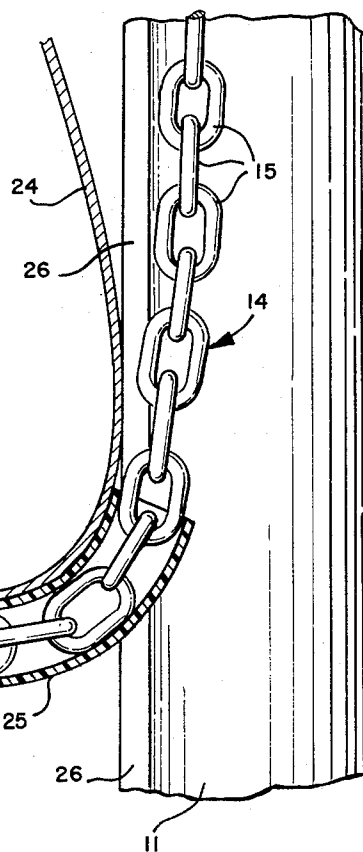


FIG. 2



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FIG. 4

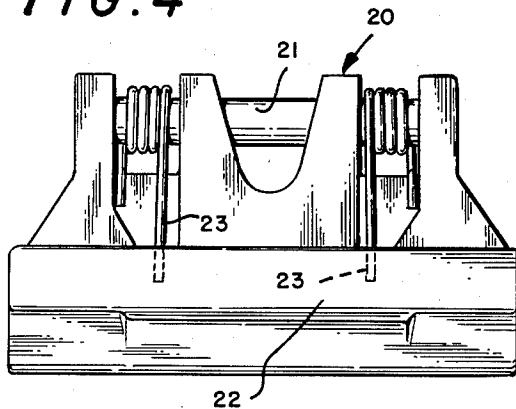


FIG. 5

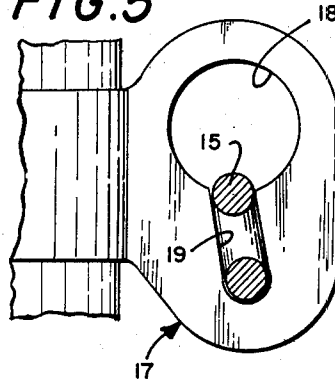


FIG. 6

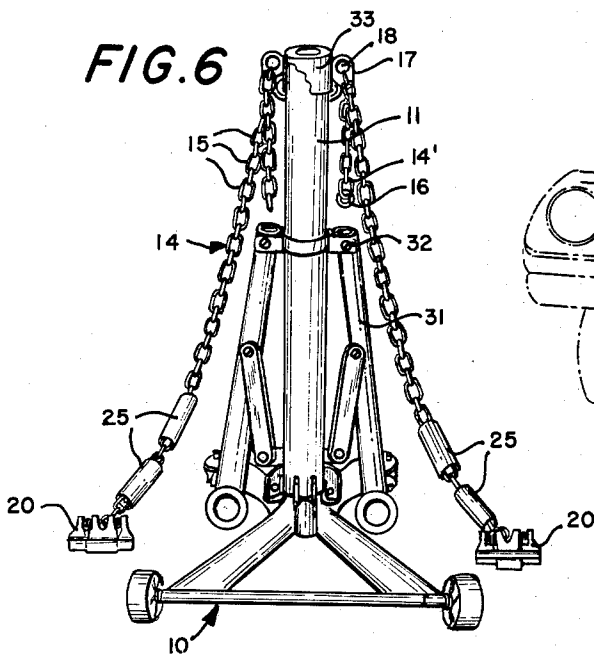
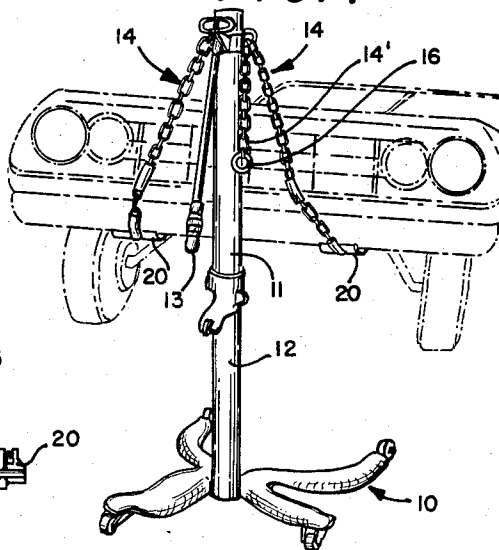


FIG. 7



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3,120,945

SERVICE JACKS

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3 Claims. (Cl. 254-2)

This invention relates to improvements in service jacks, and more particularly to an improved jack of the type used in garages, filling stations and similar establishments.

The general object of the present invention is to provide an improved jack which can be advantageously employed for numerous lifting operations, but which jack is particularly well adapted for engaging and lifting the bumper of an automobile or other vehicle.

A more specific object of the present invention is to provide a jack having a pair of lifting members formed of flexible chains, the flexible nature of which members permits the same to conform to the shape of the vehicle bumper being raised, thus ensuring firm, safe engagement with bumpers of a variety of cross-sectional shapes or contours.

A further object of the invention is to provide a jack having novel, chain-type lifting members, as described, which lifting members are relatively inexpensive as compared to the rigid lifting arms employed on conventional jacks, thus substantially reducing manufacturing costs.

A further object of the present invention is to provide a novel jack having lifting members formed of a pair of chains, as described, the lengths of which chains may be easily manually adjusted and set to eliminate any slack therein prior to lifting, thereby ensuring immediate elevation of the vehicle upon commencement of the pumping operation, and providing maximum elevating range and efficiency.

A further object is to provide a service jack having novel bumper-engaging hook elements on the lifting chains which are provided with integral means for holding said hooks on a bumper while said chains are being adjusted lengthwise, thus freeing the workman's hands for the latter operation.

A further object of the present invention is to provide an improved service jack utilizing flexible lifting chains, as described, which jack is provided with means for stabilizing the automobile or other vehicle against lateral movement while the same is in an elevated condition.

Still further objects of the present invention are to provide a novel service jack which is rugged and durable in construction, which is simple to use, and which improved jack is otherwise especially well adapted for its intended purposes.

With the above and other objects in view, the invention consists of the improved service jack, and all of its parts and combinations, as set forth in the claims, and all equivalents thereof.

In the accompanying drawings, illustrating the principal form of the invention and a modification thereof, and wherein the same reference numerals designate the same parts in all of the views:

FIG. 1 is a perspective view of a complete jack incorporating the novel features of the present invention;

FIG. 2 is an enlarged fragmentary side elevational view of the jack in engagement with a typical automobile bumper shown in section;

FIG. 3 is a fragmentary longitudinal sectional view showing the jack interior, and showing the bumper stabilizing strip employed in the invention;

FIG. 4 is a front elevational view of one of the bumper-engaging hook elements;

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FIG. 5 is a front elevational view of one of the chain supporting brackets employed in the invention, a chain link being shown in locked position therein;

FIG. 6 is a perspective view of a modified form of the invention; and

FIG. 7 is a perspective view showing the jack in lifting engagement with an automobile, the latter being shown in dot and dash lines.

The present invention is intended primarily as an improvement on hydraulic service jacks of the type disclosed in Patent No. 2,926,888, issued to Edward H. Schultz, one of the inventors herein but it is to be understood that the novel features comprising the invention can also be used to advantage on mechanical or pneumatic jacks, or other types of lifting devices, and the invention is by no means to be limited in this respect. In a hydraulic service jack of the type illustrated, the complete unit includes a wheeled base 10 on which there is carried an upright cylinder 11 telescopically mounted on an inner, fixed tube or cylinder 12 (FIG. 3), there being suitable hydraulic pump and reservoir means therein, and an external pump handle 13. Secured to said outer cylinder 11 are bumper-engaging and lifting means 14, the particular form of which is one of the novel features of the present invention, as will be hereinafter described.

In the operation of a hydraulic jack of this type, the unit is wheeled into position adjacent the front or rear bumper of an automobile or other vehicle and the members 14 are engaged beneath said bumper. The pump handle 13 is then manually operated to hydraulically raise the movable outer cylinder 11 together with the lifting members 14 secured thereto, thus raising the vehicle off the ground. When it is desired to lower the jack, the hydraulic fluid return valve or valves are opened to permit the fluid to return to the reservoir, and the weight of the vehicle causes the same to descend, all of which is well known in the art and is described in considerable detail in the aforementioned Patent No. 2,926,888.

With more particular reference now to the novel lifting members 14 employed in the present invention, it will be seen that said members consist of conventional chains formed of interlocked, universally-movable links 15, there being a pair of said chains depending from the upper portion of the cylinder 11. As appears in FIG. 1, said chains 14 are suspended from brackets 17 on said cylinder 11 which ear-like brackets project outwardly from opposite sides of said cylinder, there normally being a substantial length 14' of chain hanging downwardly from the other side of the bracket. As is shown in FIG. 5, each of said brackets 17 is provided with an aperture 18 which is of a size to permit said chain links 15 to pass therethrough, and communicating with said aperture is a downwardly angled cutout or keyhole slot 19 which is of a width and length to permit one of said chain links to be inserted edgewise and held therein as illustrated.

In the use of the present jack, said lifting chains 14 are usually adjusted lengthwise prior to the pumping operation to take up any slack, thus making it unnecessary to hydraulically raise the jack to the point where the chain slack is taken up before the raising of the vehicle commences. As a result, not only is the work of the operator minimized, but the maximum range of the hydraulic mechanism may be utilized for raising the load. Moreover, of course, the entire operation is speeded.

To adjust the length of said chains 14 in the present invention, it is merely necessary to manually pull the links 15 through the bracket apertures 18, and when the proper chain length has been obtained the uppermost link 15 of each chain is inserted edgewise into the bracket keyhole

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slot 19 (FIG. 5). In the latter position, the weight of the chain pulls downwardly on said link to maintain the same firmly within said slot 19, and the adjacent links (not shown), which are transversely interlocked with said upper link, abut the margins of said slot and prevent lateral displacement of said uppermost link. The more weight that is applied to the chains 14 the more securely they become locked in their brackets. Thus there is provided a simple but effective mounting arrangement whereby the lifting chains are securely locked in position when in use, but whereby said chains can be quickly and easily released and adjusted lengthwise when desired.

In the preferred form of the invention, the rearwardly overhanging portion 14' of each of the lifting chains is provided with an enlarged link or ring 16 (FIGS. 6 and 7) on its lower end which is too large to pass through the bracket aperture 13. The purpose of said enlarged end members 16 is to prevent the lifting chains from being completely withdrawn through their mounting brackets, and eliminates the possibility of said chains being removed and inadvertently misplaced or lost.

With particular reference now to FIGS. 2 and 4, the novel bumper-engaging fitting or hook member 20 carried by each of the lifting chains in the present structure includes a straight back portion defining spaced legs between which is carried a rod 21 which projects through the lowermost link of the lifting chain and pivotally secures said hook thereto. The lower portion of said member 20 is bent transversely, and the forward edge 22 thereof is flanged upwardly to provide a relatively wide, hook-like device as illustrated, the laterally widened nature of said hook providing maximum gripping action. Mounted on said rod 21 are a pair of spring arms 23 which are positioned to pressurably bear against the flanged forward edge of said hook member.

While the present jack is not limited to bumper lifting, the flexible nature of the chains 14 enables said lifting members to conform to the curvature of an automobile bumper 24, and permits the hooks 20 to be securely engaged with the lower, inwardly-flanged edge of said bumper regardless of its contour (FIG. 2). This is particularly important with late model automobiles, wherein the cross-sectional bumper shapes vary substantially. Moreover, due to the flexible and readily adjustable nature of the present bumper-supporting members 14, said members can be easily shifted laterally on the bumper to avoid bumper guards or other obstructions, and it is unnecessary to tediously adjust the width of the entire jack unit, as is required on many conventional jacks. Said lifting chains 14 are provided with movable tubular rubber protectors 25 which encircle the same and which can be positioned thereon to cover the chain bumper-contacting portions, thereby preventing said chains from scratching or otherwise marring the plated and polished surface of the bumper.

As mentioned, in the use of the present jack it is desirable to adjust the length of the lifting chains 14 prior to the lifting operation, in order to eliminate slack and to obtain maximum lifting efficiency, and it is in this connection that the aforementioned spring arms 23 on the bumper-engaging hooks 20 are important. As described, said spring arms 23 are designed to bear against the inner surfaces of the flanged, hook portions 22, and when said bumper-engaging members are mounted on a bumper (FIG. 2) said spring arms firmly clampingly engage the bumper and prevent said hooks from falling off. Thus, when it is desired to initially adjust and set the lifting chains 14 to eliminate slack, the hook members 20 can be mounted on the bumper and they will remain thereon, freeing the operator's hands and permitting him to manually adjust and tighten said lifting chains. This is an important feature of the invention as it permits the easy manipulation and use of the jack by one man.

Another feature of the present invention is the means incorporated therein for stabilizing the automobile or

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other vehicle while the same is in an elevated condition. In this respect, attention is directed to FIGS. 1, 2 and 3 of the drawing. It will be noted that mounted on the outer cylinder 11 is a longitudinal strip 26 which is so positioned that the vehicle bumper 24 will bear against the same (FIG. 2) when the vehicle is raised. Said strip is formed of an elastic tube, preferably of neoprene or similar material having strong friction properties, which is stretched over a flattened, elongated metal member 28, said flattened tube surrounding said metal member and forming an inner layer 27, and an outer layer 29 against which the bumper engages. Said metal member 28 not only increases the rigidity of said friction strip, but it also functions as the mounting means, being provided with end extensions through which screws 30 are projected to secure the unit on the jack.

When the present jack is initially engaged with the bumper of an automobile the upright cylindrical portion of the jack is normally spaced several inches from the bumper, and as the automobile is raised the wheeled jack is drawn toward the same until said cylindrical portion abuts the vehicle, said bumper engaging against the strip 26. Due to the frictional properties of the strip outer surface 29, the bumper is held stationary thereagainst, and lateral swinging movement of the vehicle is prevented. This is particularly essential when a workman is removing a wheel or exerting transverse force which would otherwise cause the vehicle to swing laterally on the flexible chains 14.

With reference now to FIG. 6 of the drawing, illustrated therein is a modification which permits the use of the novel, flexible lifting members 14 characterizing the present invention with a jack having rigid lifting arms 31 thereon, thereby greatly increasing the utility of the jack. In many instances said rigid lifting arms are unsatisfactory, as for example when the automobile to be lifted has an irregular bumper contour which does not permit secure engagement by said rigid arms, as hereinabove described, and in such cases flexible lifting members will be preferred. With this in mind, the modified form of the present invention comprises a cap 33 which is designed to removably fit over the upper end of a conventional jack cylinder, said cap having chain-supporting ears or brackets 17 and flexible lifting chains 14 as in the principal form of the invention.

When it is desired to use flexible lifting chains on a conventional jack the cap 33 is merely placed on the upper end of the movable cylinder 11, and the pivotal lifting arms 31 are set in their lowered position adjacent the cylinder, as illustrated. The chains 14 carried by the cap are then secured to the bumper and the elevating apparatus is actuated in the usual manner to raise the cylinder 11 together with said cap and attached chains. In the event it should subsequently be desired to utilize the rigid arms 31 for a lifting job the chains 14 can be disregarded. Moreover, in the event a top lift jack is desired for a particular lifting operation the entire adapter unit can be easily removed. Thus a conventional jack can be readily modified by the use of the structure shown in FIG. 6 to greatly increase its versatility.

From the foregoing detailed description it will be seen that the present invention provides a novel service jack which is more convenient and safer than conventional jacks, is less expensive to manufacture, and is otherwise particularly well adapted for its intended purposes. It is to be understood, of course, that various changes and modifications may be made in the structure hereinabove described without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the following claims.

What we claim is:

1. In a service jack adapted to engage the bumper of a vehicle, said jack having a movable base, an upright, vertically-reciprocal member mounted on said base, and having means for reciprocating said upright member, a bumper-engaging and lifting structure comprising: a pair

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of brackets on and projecting from said reciprocal upright member, each of said brackets having an aperture therethrough and a downwardly extending keyhole slot communicating with said aperture; an elongated lifting chain longitudinally-adjustably carried by each of said brackets, said chains being formed of universally-movably interlocked links of a size to pass through said bracket apertures to permit longitudinal adjustment of said chains, and said links being of a size to fit edgewise in said keyhole slots to lock said chains in a desired position of adjustment; a bumper-engaging hook member attached to each of said lifting chains, said hook members having flanged portions adapted to engage the lower longitudinal edge of a vehicle bumper; and means on said hook members adapted to releasably retain said members on a vehicle bumper.

2. In a service jack adapted to engage the bumper of a vehicle, said jack having a movable base, an upright, vertically-reciprocal member mounted on said base, and having means for reciprocating said upright member, a bumper-engaging and lifting structure comprising: a pair of brackets on and projecting from said reciprocal upright member, each of said brackets having an aperture therethrough and a downwardly extending keyhole slot communicating with said aperture; an elongated lifting chain longitudinally-adjustably carried by each of said brackets, said chains being formed of universally-movably interlocked links of a size to pass through said bracket apertures to permit longitudinal adjustment of said chains, and said links being of a size to fit edgewise in said keyhole slots to lock said chains in a desired position of adjustment; a bumper-engaging hook member attached to an end of each of said lifting chains, said hook members having flanged portions adapted to engage the lower longitudinal edge of a vehicle bumper; and spring arms carried by said hook members and positioned to pressurably bear against said flanged portions, said spring

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arms being adapted to clampingly engage against a vehicle bumper to retain said hook members thereon.

3. In a service jack adapted to engage the bumper of a vehicle, said jack having a movable base, an upright, vertically-reciprocal member mounted on said base, and having means for reciprocating said upright member, a bumper-engaging and lifting structure comprising: a pair of brackets on and projecting from said reciprocal upright member, each of said brackets having an aperture therethrough and a downwardly extending keyhole slot communicating with said aperture; an elongated lifting chain longitudinally-adjustably carried by each of said brackets, said chains being formed of universally-movably interlocked links of a size to pass through said bracket apertures to permit longitudinal adjustment of said chains, and said links being of a size to fit edgewise in said keyhole slots to lock said chains in a desired position of adjustment; an enlarged link on one end of each of said chains, said enlarged links being too large to pass through said bracket apertures; a bumper-engaging hook member pivotally attached to the opposite end of each of said lifting chains, said hook members having upwardly flanged lower edge portions adapted to engage the lower longitudinal edge of a vehicle bumper; and spring arms carried by said hook members and positioned to pressurably bear against said upwardly flanged portions, said spring arms being adapted to clampingly engage against a vehicle bumper to retain said hook members thereon.

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