April 6, 1937. I. VON K. HOTT 2,076,027

LIFTING MECHANISM

Original Filed April 22, 1935

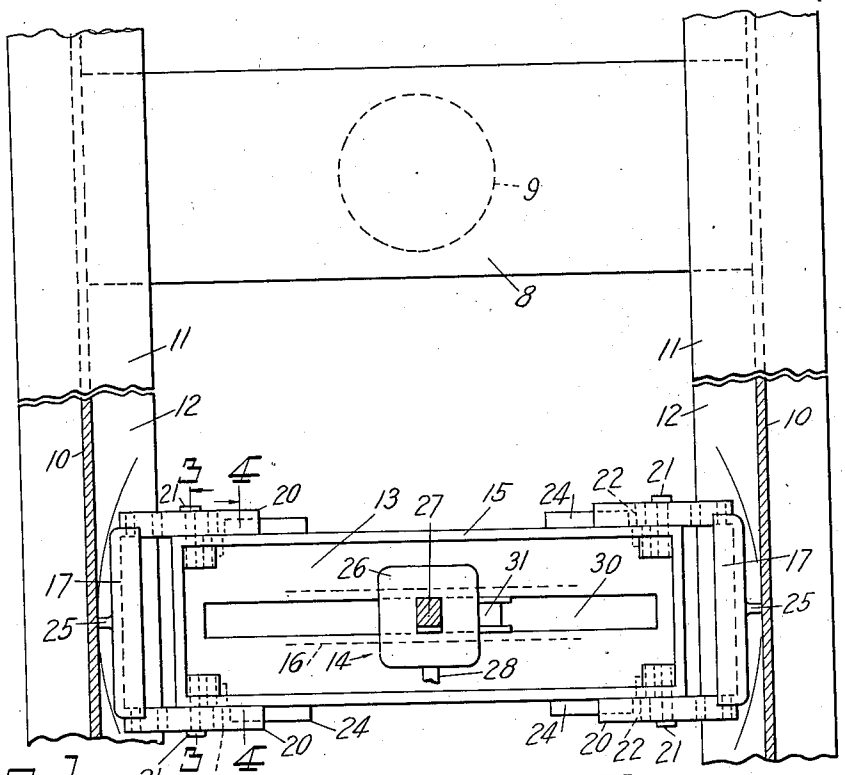


Fig. 1.

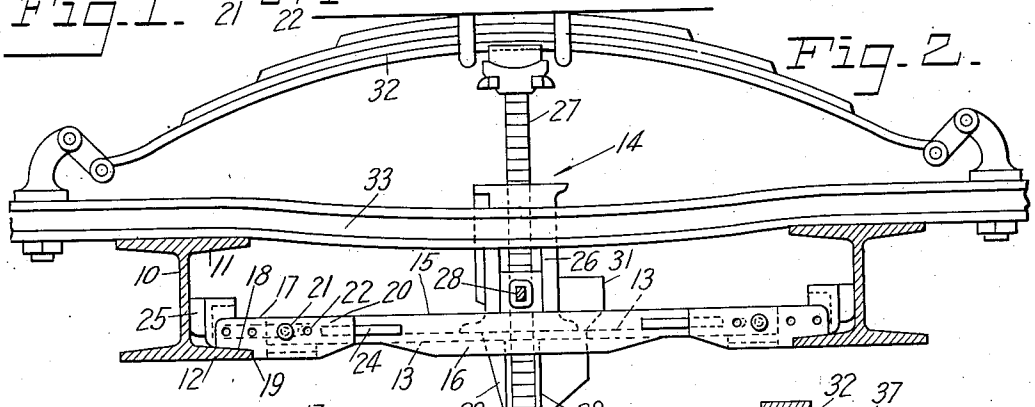


Fig. 2.

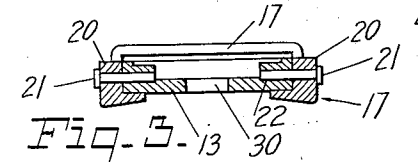


Fig. 3.

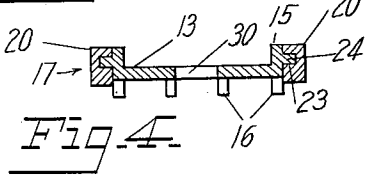


Fig. 4.

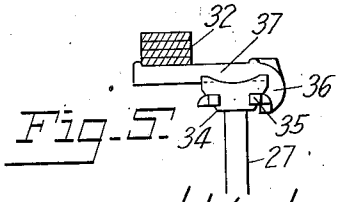


Fig. 5.

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2,076,027

LIFTING MECHANISM

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Original application April 22, 1935, Serial No. 17,667. Divided and this application August 29, 1935, Serial No. 38,434

8 Claims. (Cl. 254—89)

This invention relates to lifting mechanism, such as an automobile lift, and more particularly to a supplemental device adapted to be mounted on a lifting mechanism to elevate a portion of the load with relation to the lifting mechanism; and is a division of the application filed by me April 22, 1935, Serial No. 17,667.

One object of the invention is to provide a supplemental lift which can be easily mounted on or removed from the lifting mechanism of the type known as a "free wheel" lift.

A further object of the invention is to provide such a supplemental lift which can be mounted on a lifting mechanism of the free wheel type without the use of fastening devices or other movable connections.

A further object of the invention is to provide a supplemental lift which can be quickly and easily mounted between the channeled rails of a lifting mechanism in any location between the ends thereof.

A further object of the invention is to provide a supplemental lift which will be of a simple and durable construction and which may be easily adjusted with relation to the load on the main lift.

Other objects of the invention may appear as the apparatus is described in detail.

In the accompanying drawing Fig. 1 is a plan view of a supplemental lift embodying my invention, showing the same partly in section and as mounted on the rails of the free wheel automobile lift; Fig. 2 is a front elevation of a supplemental lift, and shows a portion of an automobile supported on the main lift; Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1; Fig. 4 is a transverse section taken on the line 4—4 of Fig. 1; and Fig. 5 is a detail view of the adjustable load engaging member and lifting jack.

In the drawing I have illustrated one embodiment of my invention and have shown the same as applied to an automobile lift of the free wheel type, that is, a lift of the type in which spaced parallel rails engage the axles of the automobile, either directly or through the medium of brackets carried by the rails, the rails being supported on a lifting element, such as the ram of a hydraulic lift. When an automobile has been elevated on such a lift it is sometimes desirable to elevate a portion of the automobile with relation to the rails to facilitate the servicing of the same, as for example, the flexing of a spring to separate the leaves thereof and permit lubricant to enter between the same. For this purpose a supporting structure, herein called a cradle, is mounted on the rails and a lifting jack is supported on the cradle. The cradle is adjustable with relation to the rails and the lifting jack is adjustable with relation to the cradle to enable the lifting element of the jack to be located beneath that part of the automobile which it is desired to elevate with relation to the rails.

The rails of such a lift are usually provided with inwardly extending flanges and, in the construction illustrated, these rails comprise H-beams having their webs 10 arranged vertically and having inwardly extending flanges 11 and 12 at the upper and lower edges thereof. These rails are rigidly mounted on a transverse member 8 carried by a vertically movable lifting element, such as the ram 9 of a hydraulic lift. Inasmuch as it is often desirable to locate the jack close to an axle of the automobile it is desirable that the jack supporting structure or cradle should be located beneath the tops, or load supporting surfaces, of the rails and, in the present arrangement, the cradle is carried by the lower flanges 12 of the two rails. The cradle is of an overall length approximately equal to but slightly less than the distance between the vertical webs 10 of the two rails and is of such a character that it may be inserted between the rails in a position lengthwise thereof and between the upper and lower flanges of the rails and then turned about a vertical axis to a position transverse to and preferably at right angles to the rails. In this position the end portions of the cradle will overhang the lower flanges 12 of the rails and these end portions are provided with lower surfaces adapted to have supporting engagement with the flanges. The cradle is also provided near each end with parts adapted to engage the respective rails and hold the cradle against turning movement while it is supported on the flanges, thus preventing any turning movement of the cradle while it is under load.

In the particular construction here illustrated the cradle comprises a base 13 which is preferably in the form of a plate adapted to support a lifting jack 14 and having at its lateral edges upwardly extending flanges 15 and downwardly extending flanges 16 to strengthen the same. This base plate is elongated in form and of a length somewhat less than the distance between the vertical webs 10 of the two rails. Secured to each end of the base is a hanger 17 adapted to engage the flange of the adjacent rail when the cradle is properly positioned with relation to the rail. The outer end portion of each hanger projects beyond the base and is provided in its lower portion with a recess adapted to receive the inner portion of the flange of one of the rails, the upper

surface 18 of this recess having supporting engagement with the flange and the inner wall 19 of the recess being arranged close to or in engagement with the inner edge of the flange to hold the cradle against turning movement. The hangers may be secured to the base in any suitable manner but, in the present instance, they are shown as substantially U-shaped and each hanger has its arms 20 arranged on the opposite sides of the base plate and rigidly secured thereto, as by means of a pin 21 adapted to extend through a hole 22 into the base. Preferably each arm is provided with a series of holes 22 so that the hanger may be adjusted longitudinally with relation to the base to accommodate the same to lifts in which the rails are spaced different distances apart. If desired, the connection between the hanger and the base may be reinforced by providing the arms 20, on their inner sides, with longitudinal grooves 23 adapted to receive ribs 24 rigidly secured to the adjacent sides of the base, these ribs being here shown as arranged inwardly beyond the innermost holes 22.

In mounting the cradle upon the rails it is inserted between the rails, from either above or below the same, and is located lengthwise of the rails and between the upper and lower flanges 12 thereof. While supported in this position the cradle is moved about a vertical axis to a position transverse to and preferably at substantially right angles to the rails, the overall length of the cradle being such as to permit of this movement. When the cradle has been moved to this transverse position the hangers will be located above but spaced from the respective flanges 12 and by then lowering the cradle the supporting surfaces 18 of the hangers are brought into engagement with the respective flanges and the inner walls of the recesses, or shoulders, 19, are arranged in line with and adjacent to the inner edges of the flanges, thereby supporting the cradle on the flanges and holding the same against turning movement so long as the hangers are in engagement with the flanges. In the present construction each hanger is provided with a lug 25 which extends outwardly from the transverse portion thereof approximately midway between the lateral edges of the hanger. These lugs are of such length that when the cradle is in its transverse position they will lie close to or in engagement with the vertical webs of the respective rails but they are of such narrow width that they will not interfere with the turning movement of the cradle. They serve both to center the cradle as it is turned to its transverse position and to positively hold the same against lengthwise movement while it is supported on the flanges of the rails.

Mounted on the cradle is a lifting jack which may be of any suitable character, that here shown being of the pawl and ratchet type and comprising a standard 26, a vertically movable element 27 and a lever 28 for actuating the lifting element. The lower end of the standard is supported upon the base plate 13 and is provided with downwardly extending projections 29 which are slidably mounted in a slot 30 in the base plate so as to retain the jack on the base but to permit of its free adjustment throughout the length of the slot. The height of the jack is such that, even with the lifting element in its lowered position, it will extend into the path of an automobile which is being driven onto the main lift. The jack is therefore so mounted on the base that it may be tilted about an axis transverse to the base to cause it to occupy a position on and lengthwise of the base, this being in the present instance, accomplished by tilting the standard 26 about one of its lower edges. In order to retain the jack in its folded position on the base it is provided with a projection 31 which normally extends lengthwise of the base above the latter but which, when the jack is moved to its folded position, will enter the slot 30 and hold the jack against lateral displacement with relation to the base.

It is sometimes desirable to engage the jack with a part which is so located that the lifting element 27 can not be moved to a position directly beneath the same. For example in the arrangement shown in Fig. 2 the spring 32 is arranged directly above the axle 33 and the jack must be arranged either in front of or to the rear of that axle and therefore it is not possible to place the lifting element 27 directly beneath the spring. I have therefore provided the lifting element of the jack with a laterally offset load engaging part, as shown in Fig. 5. The lifting element comprises a head 34 which normally engages the load and this head is provided with lugs 35 adapted to be engaged by hook-shaped portions 36 of the supplemental head or load engaging element 37, which element is of such a length that when mounted on the head it will extend some distance beyond one side thereof to enable the same to engage a part of the automobile which is out of line with the lifting element 27. Such an offset lifting element is fully described in the above mentioned application and need not be here described in further detail.

The construction and operation of the supplemental lift will be readily understood from the foregoing description and it will be apparent that I have provided a very simple but very durable structure which can be quickly and easily mounted on a free wheel lift at any location between the ends of the latter and when so mounted may be easily adjusted lengthwise of the rails to move the same to the desired position with relation to the automobile on the lift and, further, that the jack 14 may be moved transversely to the rails to properly locate it with relation to the automobile.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a lifting mechanism comprising parallel rails each having a vertical web and a flange extending inwardly from the lower portion of said web, a cradle having means to support a load engaging device and having at its ends parts of substantial width adapted to have supporting engagement with the flanges of the respective rails, said cradle being of such length with relation to the width of said parts that it may be inserted between the webs of said rails in a position lengthwise thereof and then moved about a vertical axis to cause said end parts to overhang the flanges of the respective rails, said cradle also having parts arranged to engage said rails and hold said cradle against movement about said vertical axis while said end parts are in engagement with said flanges.

2. In a lifting mechanism comprising parallel rails each having a vertical web and a flange extending inwardly from the lower portion of said web, a cradle having means to support a load engaging device and having at its ends parts of sub-

stantial width adapted to have supporting engagement with the flanges of the respective rails, said cradle being of such length with relation to the width of said parts that it may be inserted between the webs of said rails in a position lengthwise thereof and then moved about a vertical axis to cause said end parts to overhang the flanges of the respective rails, said cradle also having parts extending below said supporting parts and arranged to engage the edges of said flanges to hold said cradle against movement about a vertical axis, said cradle being of such length with relation to the width of said supporting parts that it may be inserted between the webs of said rails in a position lengthwise thereof, moved about a vertical axis to locate said supporting parts above the respective flanges and then moved downwardly to bring said supporting parts into engagement with said flanges and to locate said holding parts adjacent the edges of said flanges.

3. In a lifting mechanism comprising parallel rails each having a vertical web and a flange extending inwardly from the lower portion of said web, a cradle having means to support a load engaging device and having at its ends parts of substantial width adapted to have supporting engagement with the flanges of the respective rails, said cradle being of such length with relation to the width of said parts that it may be inserted between the webs of said rails in a position lengthwise thereof and then moved about a vertical axis to cause said end parts to overhang the flanges of the respective rails, said cradle also having parts extending below said supporting parts and arranged to engage the edges of said flanges to hold said cradle against movement about a vertical axis, said cradle being of such length with relation to the width of said supporting parts that it may be inserted between the webs of said rails in a position lengthwise thereof, moved about a vertical axis to locate said supporting parts above the respective flanges and then moved downwardly to bring said supporting parts into engagement with said flanges and to locate said holding parts adjacent the edges of said flanges, said cradle also having relatively narrow parts projecting outwardly beyond said supporting parts near the centers thereof to engage said webs as said cradle is moved about said vertical axis and center said cradle with relation to said rails.

4. A cradle adapted to be mounted on the lower flanges of the rails of an automobile lift and comprising a base having means for supporting a load engaging device and having at its respective ends hangers provided with parts of substantial width to have supporting engagement with said flanges, said hangers being also provided with parts to engage the edges of said flanges to hold said cradle against movement about a vertical axis while said hangers are in engagement with said flanges, the combined length of said base and said flanges being such that said cradle may be inserted between said rails above said lower flanges, moved to a position at substantially right angles to said rails and then lowered to bring said hangers into operative relation to said flanges.

5. A cradle adapted to be mounted on the lower flanges of the rails of an automobile lift and comprising a substantially flat elongate base having means for supporting a load engaging device, and hangers formed separately from and secured to the respective ends of said base, said hangers having parts arranged to have supporting engagement with said flanges adjacent the lateral edges of said base and also having parts to engage the edges of said flanges adjacent the lateral edges of said base to hold said cradle against movement about a vertical axis while said hangers are supported on said flanges, the combined length of said base and said flanges being such that said cradle may be inserted between said rails above said lower flanges, moved to a position at substantially right angles to said rails and then lowered to bring said hangers into operative relation to said flanges.

6. A cradle adapted to be mounted on the lower flanges of an automobile lift and comprising a base of a length less than the distance between said flanges and having means to support a load engaging device, hangers detachably secured to and projecting beyond the respective ends of said base and adapted to have supporting engagement with the respective flanges when said base is at right angles to said rails, said hangers having downwardly extending parts to engage the edges of said flanges and hold said cradle against movement about a vertical axis while said hangers are in supporting engagement with said flanges, the combined length of said base and said flanges being such that said cradle may be inserted between said rails above said lower flanges, moved to a position at substantially right angles to said rails and then lowered to bring said hangers into operative relation to said flanges.

7. In an automobile lift including parallel rails each having a vertical web and upper and lower flanges extending inwardly from said web, a cradle comprising an elongate base plate adapted to support a lifting jack and hangers secured and projecting outwardly beyond the respective ends of said base plate and each having in its lower side a recess to receive a portion of the lower flange of one of said rails, the total length of said cradle being less than the distance between the webs of said rails and greater than the distance between said flanges to permit said cradle to be rotated in a horizontal plane intersecting said walls to a position at right angles to said rails.

8. In an automobile lift including parallel rails each having upper and lower flanges extending inwardy from the vertical web, a cradle comprising an elongate base plate adapted to support a lifting jack and having a longitudinal slot to receive a portion of said jack, hangers secured to the respective ends of said base plate and each having a recess to receive the flange of one of said rails, said cradle being of a length less than the distance between the webs of said rails to enable it to be inserted between said rails, turned to a position transverse to said rails with said hangers between said flanges and then lowered to cause the recessed portions of said hangers to engage said lower flanges, and a lifting jack slidably mounted on said base plate and having a part extending into said slot, said jack being tiltable to a position substantially parallel with said base and having a part arranged to enter said slot and retain said jack on said base.

ION VON KERT HOTT.