

April 3, 1934.

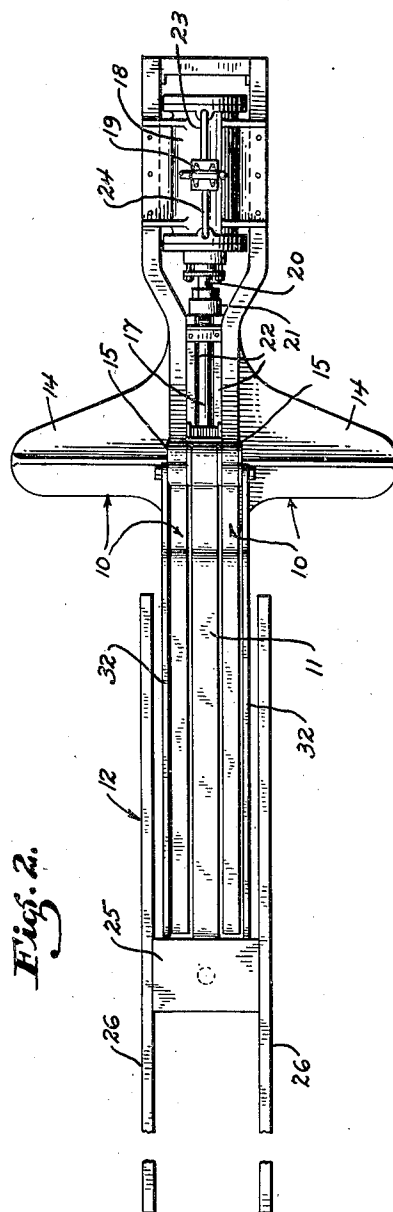
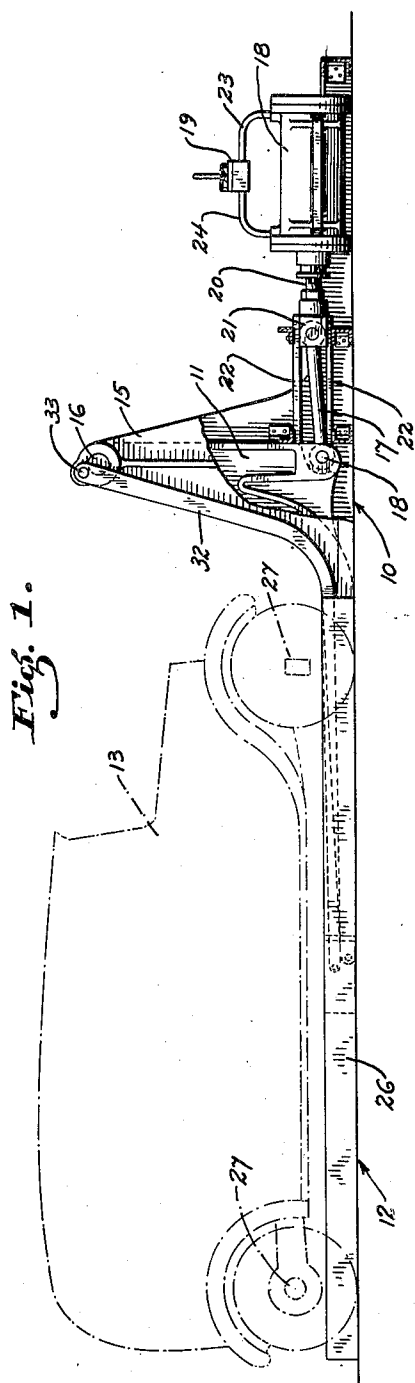
J. D. COCHIN

1,953,670

AUTO LIFT

Filed Sept. 30, 1930

3 Sheets-Sheet 1



INVENTOR.
John D. Cochran.
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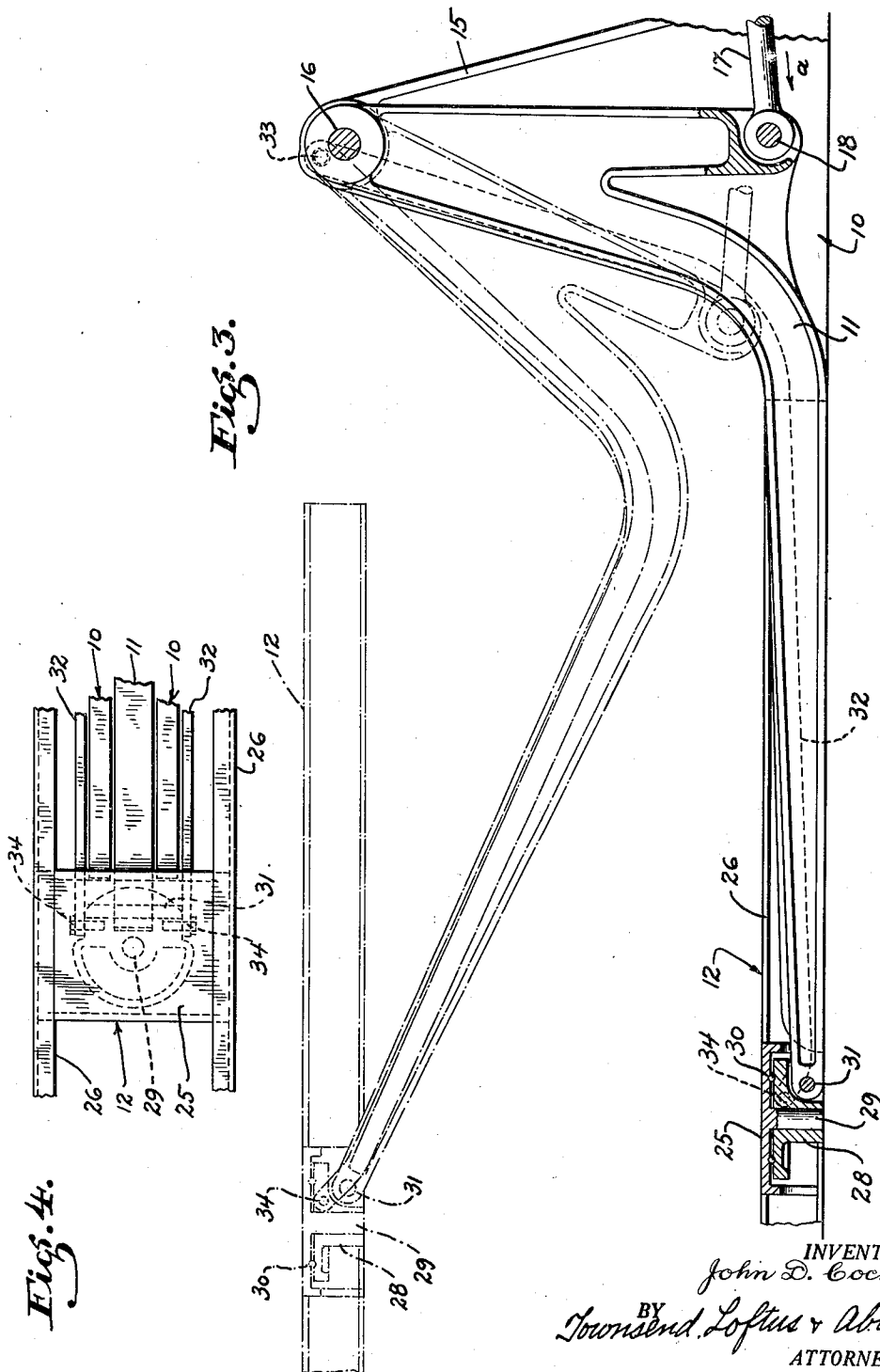
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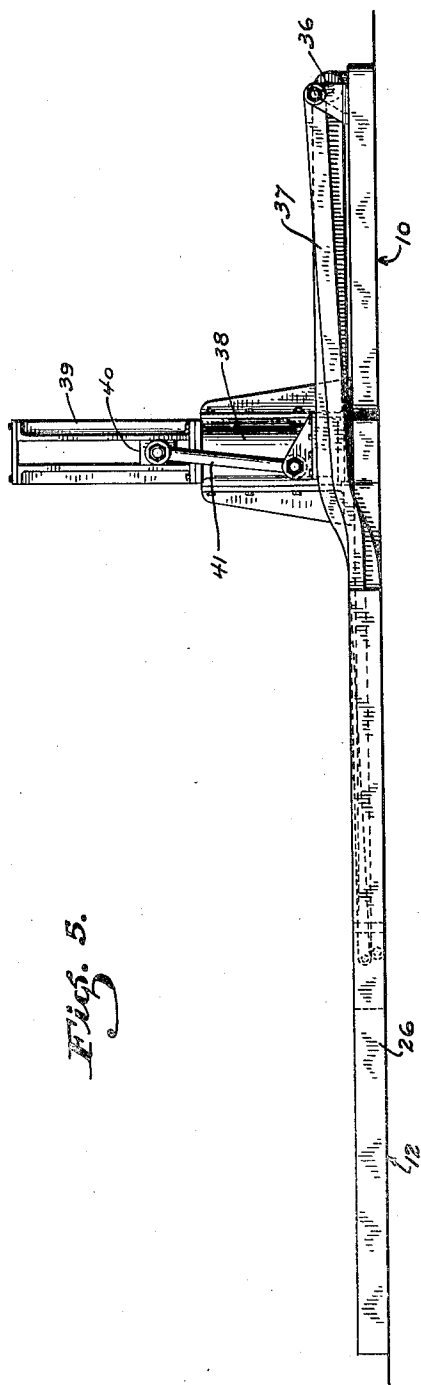


Fig. 5.

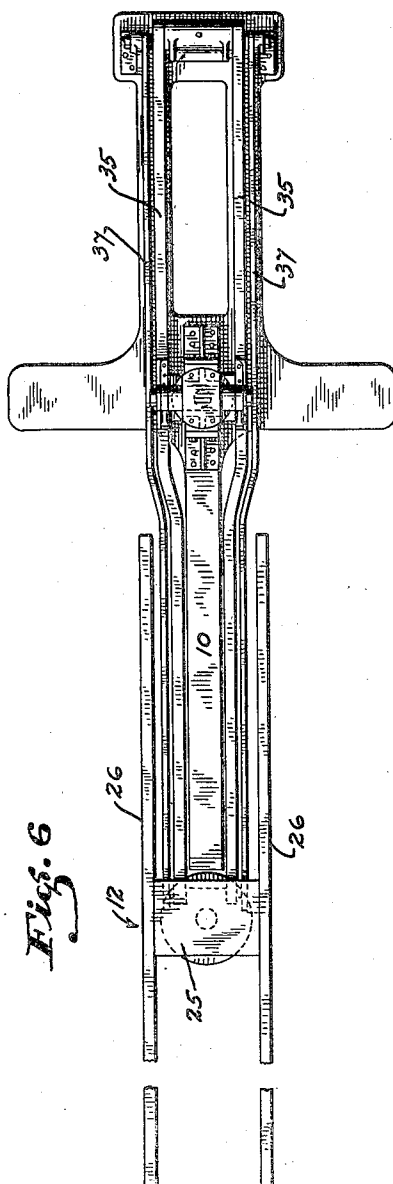


Fig. 6.

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UNITED STATES PATENT OFFICE

1,953,670

AUTO LIFT

John D. Cochran, San Francisco, Calif.

Application September 30, 1930, Serial No. 485,413

6 Claims. (Cl. 254—124)

This invention pertains to auto lifts and more particularly to improvements in devices for elevating motor vehicles and the like to such a position as will render them convenient to grease, service or repair.

The type of auto lift now most generally used consists of a vehicle engaging frame supported by and adapted to be raised and lowered by a pneumatically or hydrically controlled ram. The direction of movement of the ram is vertical and in order that the vehicle may be picked up from the floor level and raised to the desired height, it is necessary that the greatest portion of the ram be mounted beneath the floor level. On ground floors this necessitates the excavation of a pit into which the ram is placed, and where a lift is employed upon elevated floors the building of a very substantial foundation is required for the support of the downwardly extending ram. Such a lift, aside from the expense of installation, becomes a permanent fixture and often in the remodelling, or even the rearrangement of a garage, becomes the cause of great inconvenience.

It is with a view to overcoming the above and other disadvantages accompanying auto lifts of ordinary construction that I have evolved the present invention.

It is, therefore, the object of my invention to provide an auto lift of simple and durable construction that may be installed in any desired location with a minimum of labor and expense, and that may be conveniently transported from place to place at will.

Further objects and advantages of my invention will be made clear through an understanding of the accompanying drawings and following specification having reference thereto.

In the drawings—

Fig. 1 is a side elevation with parts broken away of an auto lift embodying my invention,

Fig. 2 is a plan view of the same,

Fig. 3 is an enlarged view of a part of the mechanism shown in Fig. 1,

Fig. 4 is an enlarged view of a swivel connection between the lifting arm and the vehicle supporting frame of the lift,

Fig. 5 is a side elevation of a modified form of my invention, and

Fig. 6 is a plan view of the device shown in Fig. 5.

Referring more particularly to the drawings and especially to Figs. 1 and 2, I show an auto lift comprising a base member 10, a lifting lever 11, and a vehicle supporting frame 12. The position occupied by the vehicle to be lifted is indicated by broken lines at 13 in Fig. 1. The base member 10, preferably formed of cast steel or other heavy material, is provided with a pair of side extensions 14 to lend it lateral support.

A pair of upwardly extending bearing arms 15 carried by the base member support a bearing pin 16 upon which is journaled one end of the angular shaped lifting lever 11. The lifting lever extends downwardly from this end and then outwardly to a position centrally of the vehicle supporting frame 12 to which it is connected at its other end.

The manner in which the lifting lever is operated is best shown in Fig. 3. In this figure, a connecting rod 17 is shown as pivotally connected to the lifting lever at 18. It is obvious that movement of the connecting rod 17 in the direction of the arrow —a— will force the lower end of the lifting lever in the same direction and cause it to pivot upon the bearing pin 16, whereby its opposite end will raise to the position shown in broken lines in this figure. The means for actuating the connecting rod 17 is shown in Fig. 1 as being a hydraulic cylinder 18, containing a reciprocable plunger, not shown, controlled by a valve 19 of any suitable construction and operating a piston rod 20 which is connected to a crosshead 21 carrying the connecting rod 17 and adapted to reciprocate between crosshead guides 22.

When it is desired to operate the lifting lever in an upward direction, the valve 19 is operated to direct a flow of fluid under pressure through a pipe 23 into one end of the cylinder 18, forcing the plunger to the opposite end and thereby causing movement through the piston rod, the crosshead and the connecting rod to the lifting lever. Lowering movement of the lifting lever is accomplished through manipulation of the valve 19 to direct a flow of fluid through a pipe 24 into the opposite end of the cylinder 18.

While I have shown hydraulic means for operating the lifting lever, it should be understood that I do not intend to limit myself to the same, as it is foreseen that pneumatic or electrical means may be used to good advantage.

The vehicle supporting frame 12 consists of a central plate 25 which supports a pair of side arms 26, as shown. The side arms 26 are so spaced as to enable them to engage the axles 27 of the car 13 when it straddles the vehicle supporting frame. The connection between the plate 25 and the lifting lever 11 is best seen in Figs. 3 and 4 in which the plate 25 is shown as adapted to rotate upon a bearing member 28 by means of a trunnion 29 and a ball race 30.

The lifting lever 11 is pivotally connected as

at 31 to the bearing member 28 and the bearing member is held in a level position during movement of the lifting lever 11 by means of a pair of guide links 32. These guide links 32 are bent at an angle which is substantially the same as that of the lifting lever 11 and are pivotally connected as at 33 to the bearing arms 15 at one end and pivotally connected as at 34 at their other end to the bearing member 28.

The distance between the axes of the pivotal connections 33 and 16 is the same as the distance between the axes of the pivotal connections 34 and 31. Hence, a parallel motion is effected, and assuming that the vehicle supporting frame is in a level position when it lies upon the ground, it will remain level throughout the upward or lifting motion of the lifting lever 11.

The operation of the device as described thus far is as follows:

A vehicle is driven over the vehicle supporting frame 15 to the position shown in Fig. 1. Fluid is then introduced into the cylinder 18 in the manner described, causing the connecting rod 17 to force the lifting lever upwardly. The vehicle supporting frame carried by the lifting lever in its upward motion then engages the axles 27 of the vehicle and elevates it. When the vehicle is elevated to the position shown by broken lines in Fig. 3 the vehicle supporting frame may be revolved upon the trunnion 29 and ball race 30 to suit the convenience of the operator.

In Figs. 5 and 6 I show a modification of my device in which the hydraulic cylinder may be vertically disposed and in which the principles of leverage are slightly different. In these figures, the lifting lever consists of a pair of bars 35 pivoted at 36. The guide links are shown at 37 and a hydraulic cylinder 38 is disposed intermediate the ends of the lifting lever in a vertical position.

In these views cross head guides 39 are disposed above the cylinder and carry a cross head 40 to which is connected a pair of connecting rods 41 engaging and adapted to lift the lifting lever 35. The further construction and operation of the device shown in these figures is substantially the same as that described in connection with Figs. 1 and 2.

While I have shown the preferred form of my invention, it should be understood that various changes may be resorted to in the construction and arrangement of its several parts without departing from the spirit and scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A vehicle lift, comprising a base member, a lever including a substantially horizontal arm

and a substantially vertical arm extending upwardly therefrom, vehicle engaging means carried by the horizontal arm, a pivotal connection between the upper end of the vertical arm and said base member, and means to swing the lever about said pivotal connection to raise said vehicle engaging means.

2. A vehicle lift, comprising a base member, a lever including a substantially horizontal arm and a substantially vertical arm extending upwardly therefrom, vehicle engaging means carried by the horizontal arm, a pivotal connection between the upper end of the vertical arm and said base member, and means to exert pressure adjacent the lower end of the vertical arm, whereby the lever will swing about said pivotal connection and raise said vehicle engaging means.

3. A device of the character described, comprising a lever including a pair of connected arms disposed at an angle to each other, vehicle engaging means carried by one of said arms, a pivotal support for the other arm, and power means engageable with the lever adjacent the connected end of said arms to pivot the lever on said support and raise the vehicle engaging means.

4. A vehicle lift, comprising a base member, a lever pivotally connected to the base member, said lever extending downwardly from its pivotal connection and having a substantially horizontal arm adjacent its lower end, vehicle engaging means pivotally secured to the outer end of said arm, and power means engageable with the lower end of the lever to swing it about its pivotal support and raise said arm and vehicle engaging means.

5. A vehicle lift, comprising a base member, a lever pivotally connected to the base member, said lever extending downwardly from its pivotal connection and having a substantially horizontal arm adjacent its lower end, vehicle engaging means pivotally secured to the outer end of said arm, power means engageable with the lower end of the lever to swing it about its pivotal support and raise said arm and vehicle engaging means, and a link pivotally connected to the base member and vehicle engaging means to maintain the latter in a horizontal position while it is raised.

6. A vehicle lift comprising a base member, a lifting lever pivoted at one end relative to the base member, and power means intermediate the ends of the lever for swinging it upwardly about its pivoted end, the portion of said lever between said power means and its opposite end normally lying adjacent the base member and having its top surface substantially in the same plane as the top surface of the base member.

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