June 12, 1934. H. C. KETTELSON 1,963,022

APPARATUS FOR LIFTING AND SUPPORTING AUTOMOBILES

Filed Dec. 21, 1931 2 Sheets-Sheet 1

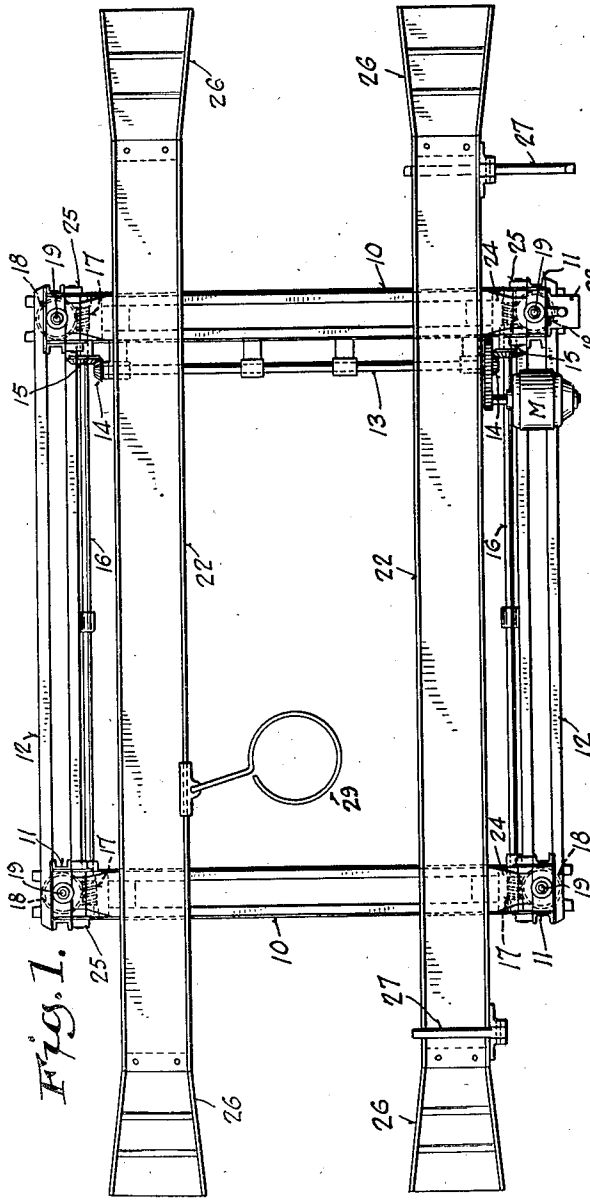


Fig. 1.

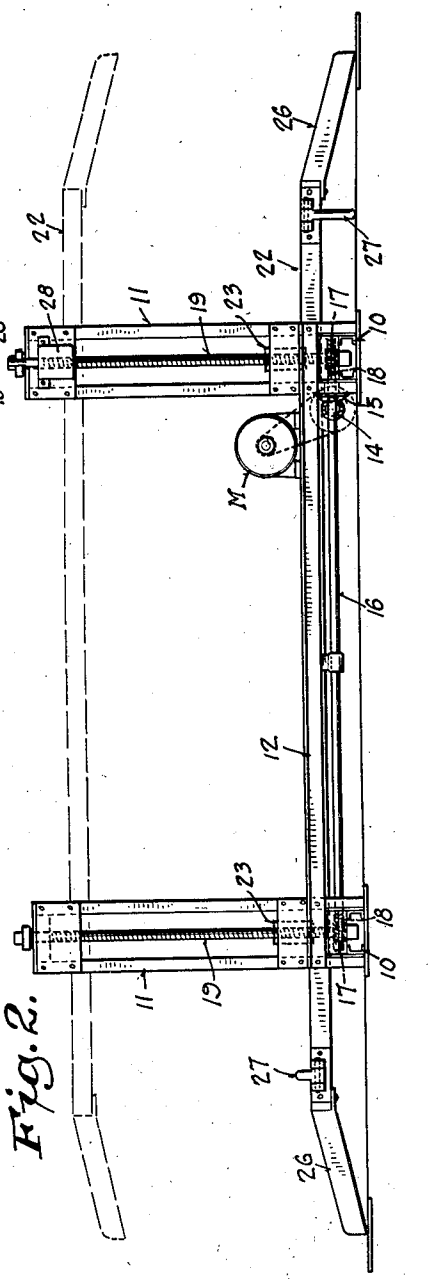


Fig. 2.

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Fig. 3.

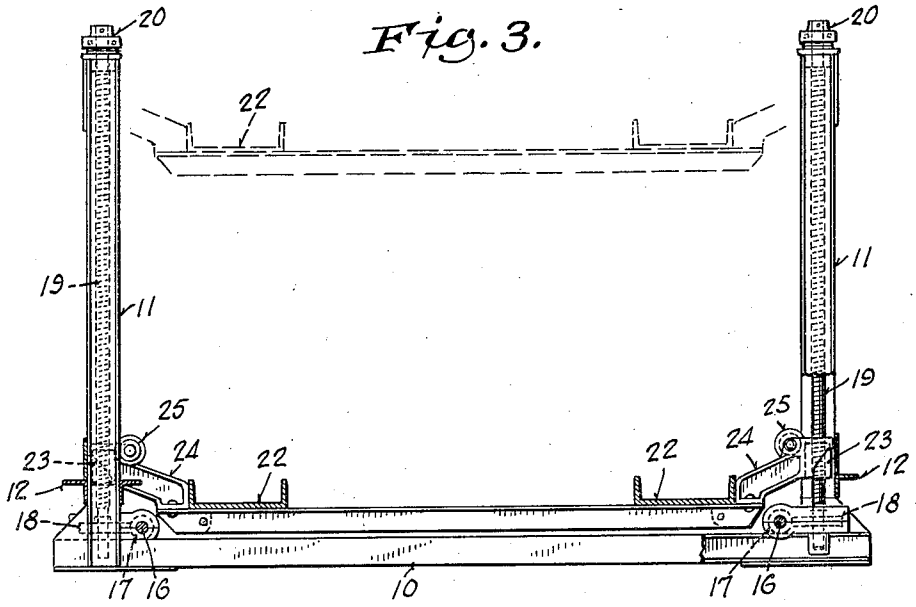


Fig. 4.

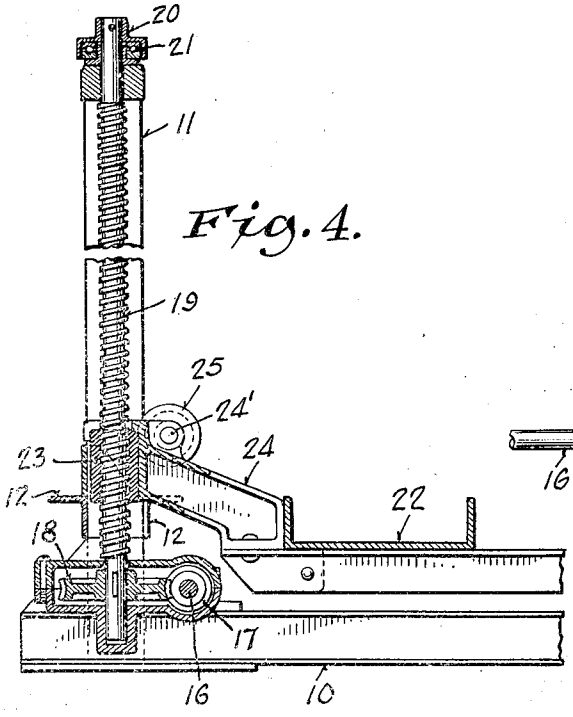
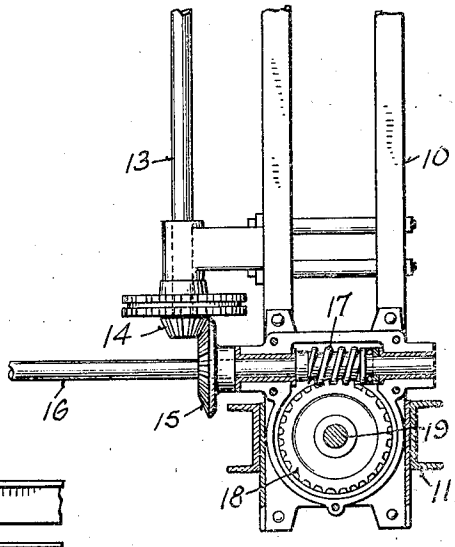


Fig. 5.



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UNITED STATES PATENT OFFICE

1,963,022

APPARATUS FOR LIFTING AND SUPPORTING AUTOMOBILES

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Application December 21, 1931, Serial No. 582,215

2 Claims. (Cl. 254—92)

My invention relates to garage equipment in the form of an apparatus constructed as an improvement in lifting tables or platforms, such as are designed for the elevation and support of an automobile at a distance above the floor, sufficient to enable easy access to be had to the parts at its underside, and which, ordinarily, are reached with some difficulty and considerable inconvenience. By elevating and sustaining an automobile in such position, or at any desired intermediate stage in the range of the hoist, the automobile may be approached from any point, for adjustment, repair, greasing, or for any other purpose.

Usually, the mechanic desiring to make repairs, must crawl under the automobile, and perform his work in a very restricted space, which limits his free movements, and imposes a severe handicap upon his work. Or, if the garage be modernized to the extent that a pit below the floor level is part of its equipment, some of the difficulties usually encountered by the mechanic are lessened, but still he is obliged to climb into and out of the pit. Very often the latter is in such unkempt condition as to interfere with the work he is called upon to perform. Bad working conditions contribute unconsciously to lack of thoroughness in work.

A later development in apparatus of this type, involves a hoisting table or platform which finds a permanent location in the garage, and is not portable. In connection with such, four small wells are required to be provided below the floor for the accommodation of the four lengthy, normal-standing screws which elevate and sustain the hoisting table or platform, and which, in the operation of the device, travel through fixed nuts and in and out of the said wells. This arrangement involves a considerable expense in constructing such wells in the first instance, and forbids any changes in the location of the hoisting apparatus, when dictated by convenience, except by providing four other screw accommodating wells at a further considerable expense.

The present invention resides in a freely portable apparatus, no part of which extends below the floor level. The apparatus may be moved from place to place in the garage, and its location changed when desired, by simply shifting it from one position to another. No special preparation for its accommodation in its new location is necessary.

In the present invention, the operating screws for lifting the platform or table occupy a relatively fixed position in the frame of the apparatus, and have only a movement of rotation. The fixed bearings at the opposite ends of the screws, restrain the axial movements of the latter. The platform or table of the lifter is provided with four nuts of special construction, one for each of the screws. These nuts are attached to the platform or table, and travel synchronously, so that as the screws are rotated, the platform or table is moved up or down. However, the plane of the platform or table does not depart from a true horizontal.

Another feature of the present invention, resides in the arrangement of the platform or table only slightly above the level of the floor, so that an automobile may be run onto the same in a very easy manner. This eliminates the use of long, inclined runways which lead to the usual somewhat elevated platform or table of other apparatus.

Other features residing in the invention, in addition to those above mentioned, will be described in the matter which follows, and the novel features of the whole will be pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a plan view of an apparatus constructed in accordance with my invention.

Fig. 2 is a view in elevation of the apparatus shown in Fig. 1.

Fig. 3 is a vertical transverse sectional view of the apparatus shown in Figs. 1 and 2, looking toward the left.

Fig. 4 is an enlarged view in elevation showing more clearly the arrangement of some of the parts shown at the left in Fig. 3.

Fig. 5 is a horizontal sectional view showing more clearly the arrangement of some of the parts shown at the lower right in Fig. 1.

In all of the views, some of the parts are shown in section.

The primary purpose of the present invention is to produce an apparatus of the character described, in which the table or platform on which the automobile is supported, shall be brought close to the floor level, and thus eliminate the usual inclined, long ramps heretofore necessary to pass an automobile onto the table or platform of a hoisting apparatus, in which the said table or platform is of considerable elevation in its lowest position.

To enable me to carry out this idea, I have designed and built the metal structure shown in the drawings. In the construction shown, the numerals 10 indicate two sills, spaced apart a distance approximately equal to that between the

front running gear and rear running gear of an automobile. Rising from the ends of each sill, are two standards, indicated 11, which are permanently united at their lower ends to the sills. A longitudinally arranged tying bar 12 is attached at its ends to two of the uprights at one side of the apparatus, and a like tying bar is similarly arranged and connected at the other side of the apparatus. The tying bars 12 serve to maintain the spaced relation of the sills 10. The sills 10, the standards 11 and the tying bars 12 may be made up of any suitable channels, angles and bars or plates; and gussets, may be used wherever desired, to reinforce the connection between the parts. The structure thus described constitutes the frame of the apparatus, and is of such sturdy construction as to support without yielding, any load, which may be imposed upon the apparatus at the time that the same is used in the performance of its functions.

A motor M is mounted on the framework at some convenient point between the standards 11 at one side of the apparatus, as shown in Figs. 1 and 2. A transversely extending shaft 13 is journalled in bearings carried by the sill 10 at the right in Figs. 1 and 2, which shaft is connected to the shaft of the motor, so as to be driven therefrom. At each end, the shaft 13 is provided with a bevel pinion 14, in mesh with a bevel gear 15 on and near the adjacent end of the parallel shafts 16, journalled in suitable bearings on the sills.

Each shaft 16 carries at its ends a worm 17, and this in turn is engaged with a worm gear 18, keyed or otherwise made fast upon the lower end of a vertical screw shaft 19, of which there are four, one disposed at each corner of the apparatus. The screw shaft 19 is a floating shaft, and is provided at its upper end with a head 20, resting upon a ball-bearing 21 supported upon the upper end of the standard 11, so as to maintain the shaft in a state of suspension, as shown in Fig. 4.

The bearing for each end of the longitudinal shafts 16 is enlarged so as to enclose the worm 17 and worm gear 18, and provide an oil chamber in which the said worm and gear may be operated under constant lubrication. It follows from the construction described, and of the arrangement of the several shafts, pinions and gears, that the screw shafts 19 will operate in synchronism at all times.

Two parallel runway channels 22 are disposed longitudinally of the apparatus, adjacent the inner sides of the standards 11, which channels are spaced so that their center lines correspond with the recognized standard gauge of the wheels of an automobile. The length of the runway channels exceeds somewhat the length of the framework of the apparatus, in order to accommodate automobiles of extreme length.

Cooperating with each vertically disposed screw shaft 19, is a special nut 23, formed at one side with a hanger 24, which takes under the adjacent runway channel to which it is positioned, and supports the same. The hangers may be connected by cross members. To prevent impact of the nuts 23 with the screw shafts 19, when an automobile is being positioned upon the runway, I provide the hangers with shock absorbers in the form of a stub shaft 24' having mounted for rotation upon each end, a roller 25, the flange of which bears against the spaced members constituting the standard 11. The faces of the rollers 25 bear against the said spaced members, in the raising and lowering of the runway channels, which latter constitute the table or platform hereinbefore referred to.

At each end of each runway channel 22, I attach an approach 26, of short length, and widened or flared at its outer end, so as to better guide the wheels of an automobile when the latter is run upon the table or platform. The free ends of the approaches 26 rest upon the floor, and their upward inclination is very slight, being no more than is necessary to reach the plane of the bottom of the runway channels. The provision of the low-lying table or platform enables an automobile to be run thereupon without difficulty.

In order to retain the automobile upon the table or platform, I provide at each end of one of the runway channels, a locking member 27, pivoted to the channel member, and adapted to be turned over into the same, so as to block the automobile, and preventing it running off the table or platform.

A suitable current control 28 may be conveniently installed at the upper end of one of the standards 11, and properly connected to the motor.

In operation, the automobile is positioned with its wheels in the runway channels 22, of the table or platform, held therein by the locking members 27, and the motor M will be thrown in circuit. The screw shafts 19 quickly raise the table or platform to the desired elevation, where it will come to a position of rest by breaking the circuit. In such elevated position, the mechanic will have free access to the parts to be adjusted or repaired, without being subjected to the inconveniences and restrictions of the older practices. By reversing the motor, the automobile will be lowered, and may then be run off from the table or platform.

A laterally swinging support 29 for a receptacle for parts and tools, may be carried by one of the runways, so as to be supported in a position of convenient accessibility.

The apparatus described may be used for purposes other than those described, such for instance, as an unloading platform for freight cars, or for lifting engines and machinery of various kinds.

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

1. An automobile lift comprising a rectangular base frame, four hollow standards rising from the corners of said frame, an automobile receiving rack between said standards, vertical screws within said standards for supporting said rack, an end-thrust bearing at the upper end of each screw to support the same, a gear at the lower end of each screw to drive the same, and means on said base frame for simultaneously rotating said gears.

2. An automobile lift comprising a rectangular base frame, four hollow standards rising from the corners of said frame, a vertical screw within each standard, an automobile rack having supporting arms extending into said standards and guided thereby, replaceable nuts seated in said arms, each of said nuts being threaded on one of said screws, an end-thrust bearing at the upper end of each screw for supporting the same, and means on said frame engaged with the lower ends of said screws for simultaneously rotating the same to thereby raise or lower said rack.

HARRY C. KETTELSON.