

Jan. 13, 1925.

F. H. MEYER ET AL

1,522,967

LIFT

Filed Jan. 22, 1923

3 Sheets-Sheet 1

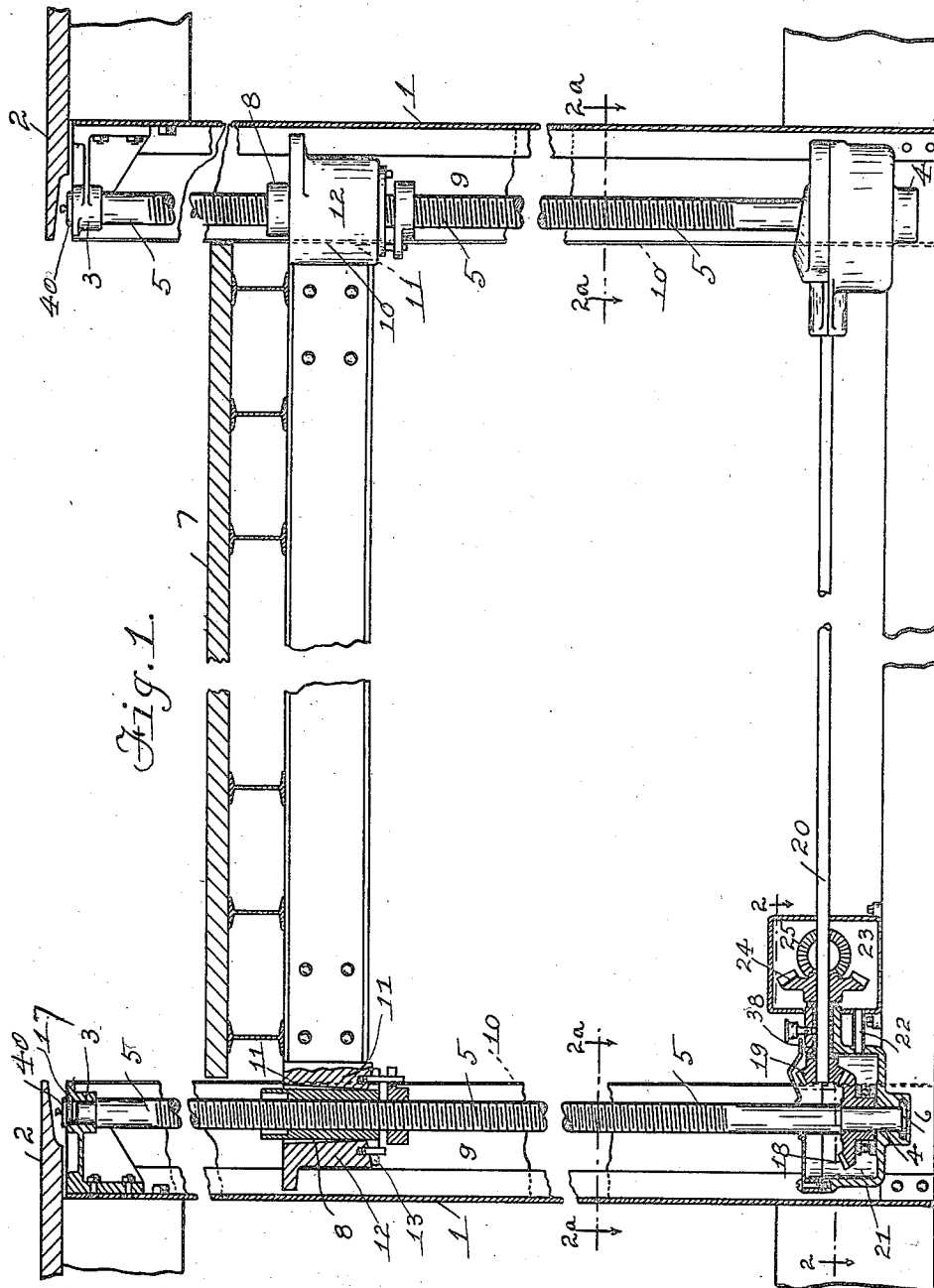


Fig. 1.

Witness:

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Jan. 13, 1925.

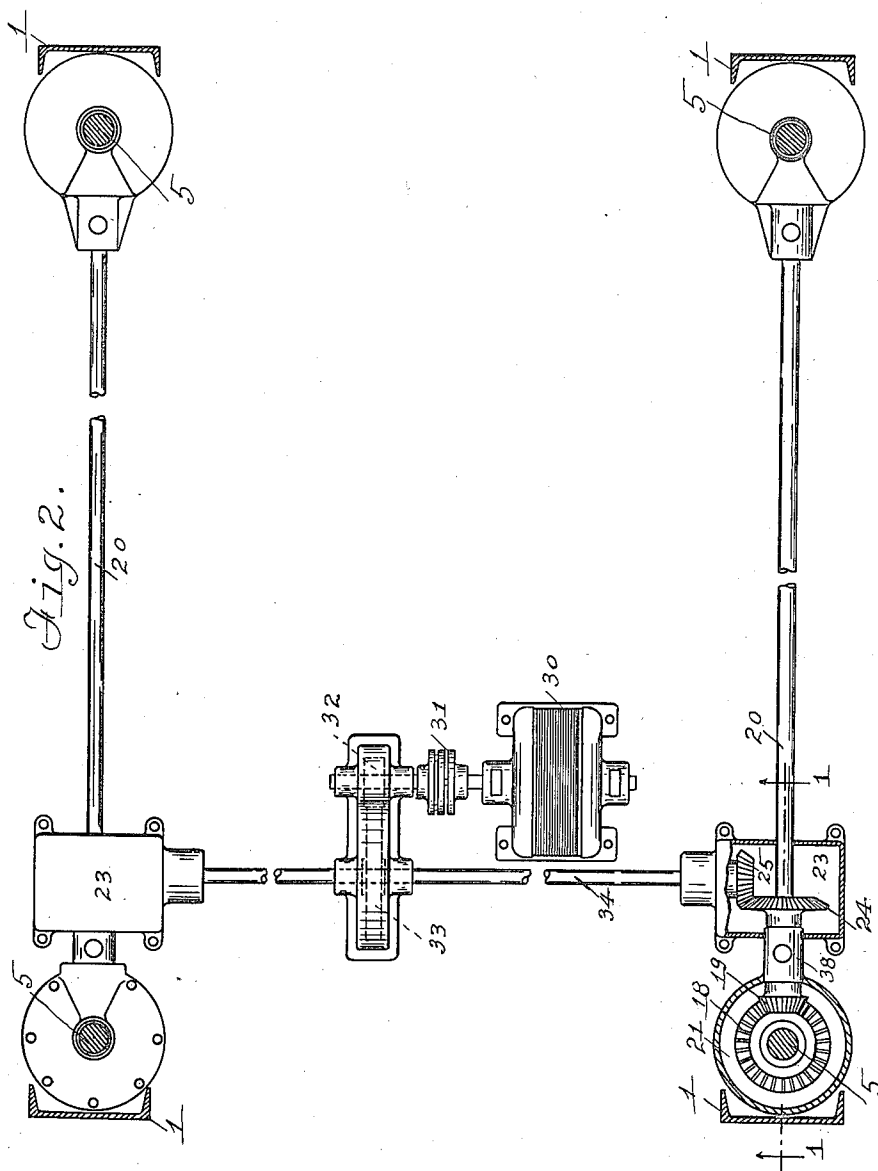
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

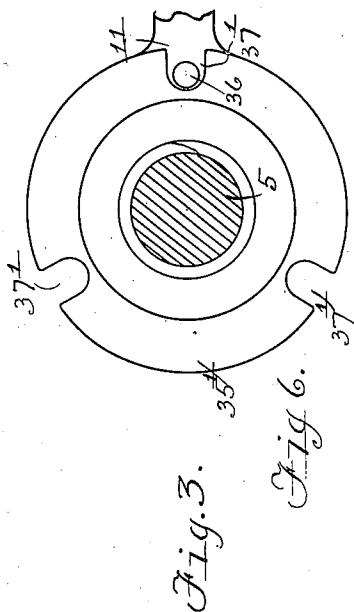
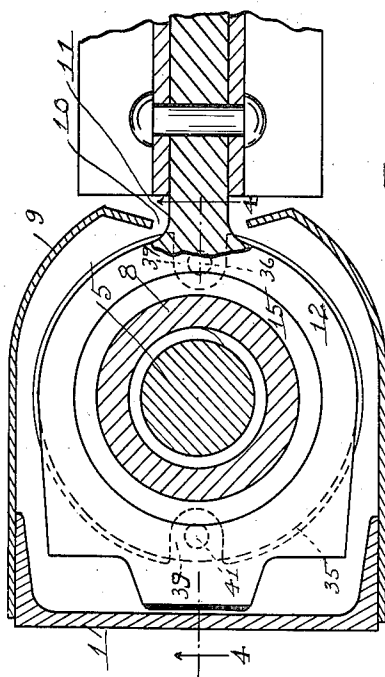
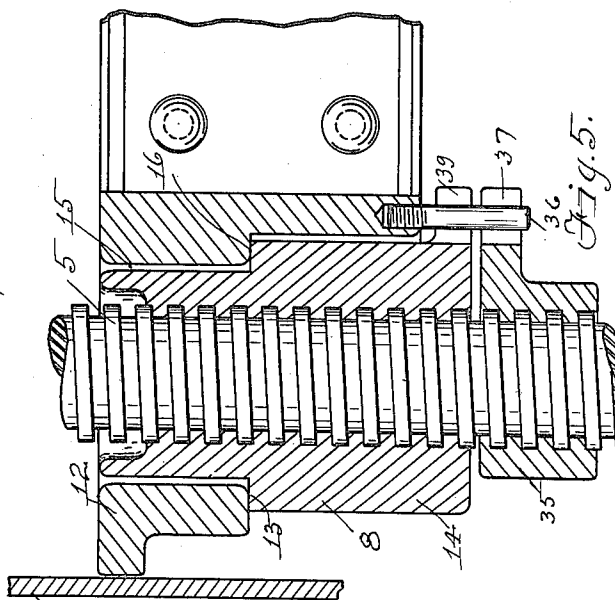
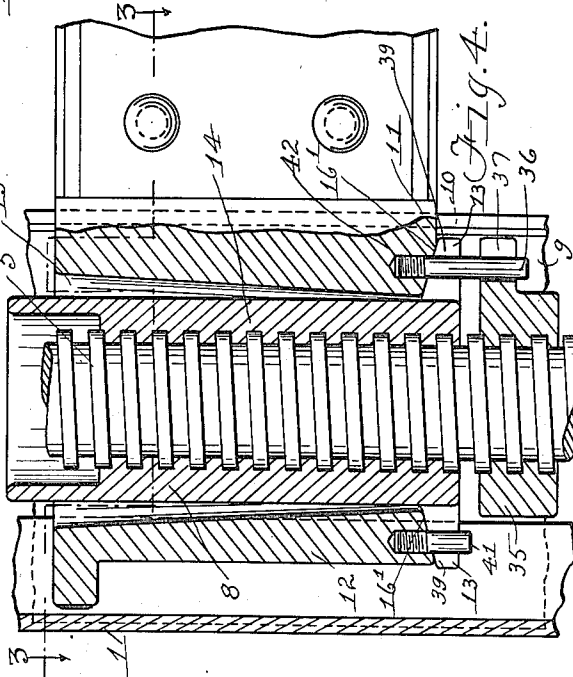


Fig. 6.



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UNITED STATES PATENT OFFICE.

FREDERICK H. MEYER AND FREDERICK J. ZYLMAN, OF GRAND RAPIDS, MICHIGAN,
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LIFT.

Application filed January 22, 1923. Serial No. 614,136.

To all whom it may concern:

Be it known that we, FREDERICK H. MEYER and FREDERICK J. ZYLMAN, citizens of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Lifts, of which the following is a specification.

The present invention relates to lifts, particularly such as are employed for raising and lowering trucks for lumber and the like; and an object thereof is, generally, to provide an improved lift of this character; a further object is to provide in a lift, having a platform raised and lowered by vertical screws, improved means for lubricating such screws and their nuts; a further object is to provide casings for such screws and nuts; a further object is to provide means whereby the platform may be limitedly moved horizontally relatively to such nuts and screws; and a further object is to provide improved secondary or safety nuts on such screws.

These and any other objects hereinafter appearing are attained by, and the invention finds preferable embodiment in, the structure hereinafter particularly described in the body of this specification and illustrated by the accompanying drawings, in which:—

Figure 1 is a side view of a lift, one corner portion of which is shown in section taken on a vertical plane corresponding to line 1—1 of Fig. 2, the power means for operating the lift being omitted from this view;

Figure 2 is a plan view of the lower part of the same, the left-hand lower corner portion of the lift in this view being shown in section taken on horizontal planes corresponding to line 2—2 of Figure 1 and the threaded shafts, etc. adjacent other corners of the lift being shown in section on line 2^a—2^a of Figure 1;

Figure 3 is a transverse sectional view of one of the threaded shafts and the nut traveling thereon and a portion of the platform's supporting framework, taken on horizontal planes corresponding to line 3—3 of Figure 4;

Figure 4 is a central longitudinal sectional view of the same parts taken on a

vertical plane corresponding to line 4—4 of Figure 3;

Figure 5 is a view similar to Figure 4 but showing a modified construction of the same parts; and

Figure 6 is a bottom plan view of a secondary or safety nut.

In the embodiment of the invention chosen for illustration by the drawings and for detailed description in the body of this specification, the building housing the lift contains a suitable frame comprising upright posts 1, preferably of channelled metal construction as shown, and floors, only one of which, however, appears in the drawings. Each of the four posts 1 of this frame carries pairs of journal bearings, the members 3, 4 of each pair being vertically spaced apart. Threaded shafts 5 are journaled adjacent their upper ends in the bearings 3 and adjacent their lower ends in the bearings 4, the lower bearings having cup portions 6 extending below the lower ends of the shafts and adapted to hold oil. A platform 7 on which lumber-trucks may be wheeled, is supported adjacent its four corners by the nuts 8 threaded and traveling on the shafts. Vertically extending casings 9 surround the shafts respectively and the nuts thereon and have vertical slits 10 through which extend and freely move vertically the extensions or connections 12 between the body of the platform and its supporting nuts, such connections being reduced in horizontal thickness, at 11, where they pass through the slits. These nuts have body portions 14 threaded on the shafts and flanges 13 on which the platform's said connections 12 rest. These connections have vertically extending openings 15 loosely surrounding and containing the body portions 14 of the nuts, whereby the platform may have a limited horizontal sliding movement on these flanges relatively to the nuts and to the shafts, so that the impact of a wheeled truck moved onto the platform may cause the connections 12 to slip or slide somewhat on the flanges 13 and thus prevent undue stressing, bending or straining such shafts.

The posts 1 provide stops or means independent of the body portions of the nuts

for limiting the horizontal movement of the platform, thus stopping such movement before the shafts are in any case unduly strained by such movement. In Figure 5 the upper surface 16 of the flange or platform-supporting portion 13 of the nut is shown flat, but in Figures 1 and 4 such surface 16¹ is shown conical or inclined, so that the platform tends to return by its weight to its normal position wherein the shafts and nuts are co-axial with the openings 15. This provision of a sliding contact between the platform's connections 12 and their supporting nuts also obviates difficulties arising from slight inaccuracies in vertically positioning bearings of the shafts and slight non-parallelism of the shafts.

The upper bearings 3 for the shafts 5 have oiling orifices 17 which may be closed by covers 40. The oil supplied to these orifices descends along the threaded shafts and thus lubricates the nuts thereon and also the lower bearings 4 of the shafts. In this manner the gears 18 keyed on the shafts and their intermeshing gears 19 keyed on the horizontal shaft 20 and contained in a vessel 21 may also be lubricated; while a channel 22, extending from the vessel 21 into the vessel 23 containing the gear 24 on the shaft 20 and also the driving gear 25 meshing with the gear 24, supplies oil for lubricating these last-mentioned gears. It will be seen that the casings 9 not only protect operatives and others from injury by coming into contact with the threaded shafts and their nuts, but also keeps these parts from dirt and dust to a great degree.

The four threaded shafts 5 are rotated simultaneously to raise or lower the platform by suitable mechanism, as the motor indicated at 30 whose shaft has the clutch indicated at 31 and the gear indicated at 32 meshing with the indicated gear 33 on the shaft 34 on which are keyed gears 25. Secondary nuts 35 spaced a short distance below the nuts 8 and traveling along the shafts therewith as by the pins 36 carried by the platform and engaging in slots 37 in the secondary nuts serve to prevent the platform from falling in case the nuts 8 break or become unduly worn. These pins 36 or pins 41 carried by the platform and engaging in slots 39 in the nuts 8 prevent these nuts from turning with the shafts. A bearing 38 between the gears 19 and 24 is provided for the shaft 20.

In Figure 6, the secondary nut 35¹ is shown provided with a plurality of radially extending openings or slots 37¹ angularly spaced apart. By this provision the secondary nut may be turned on the threaded shaft a part turn to adjust it at a desired distance from the main nut 8, whereupon the pin 36 may be inserted into that slot which is in registration with the pin's

threaded socket 42 and thereupon screwed into said socket. It will be seen that by reason of this plurality of slots 37¹ the secondary nut may be positioned on the shaft 5 at distances from the main nut less than can be accomplished by turning the secondary nut a complete turn on the threaded shaft 5.

The invention being intended to be pointed out in the claims, is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings or hereinbefore described or shown.

We claim:

1. In a lift: a frame carrying a pair of journal bearings vertically spaced apart; a threaded vertical shaft journaled in said bearings; a gear keyed to the lower end of said shaft; a horizontal rotatable shaft; a gear keyed thereon meshing with the first-mentioned gear; another gear keyed on the horizontal shaft; a bearing for the horizontal shaft between the gears thereon; a driving gear meshing with the third-mentioned gear; vessels containing the respective pairs of intermeshing gears and adapted to hold oil, and having an oil channel extending between them; a platform having a nut threaded on the vertical shaft.

2. In a lift: a frame carrying a pair of journal bearings vertically spaced apart; a threaded vertical shaft journaled in said bearings; a gear keyed to the lower end of said shaft; a horizontal rotatable shaft; a gear keyed thereon meshing with the first-mentioned gear; another gear keyed on the horizontal shaft; a driving gear meshing with the third-mentioned gear; vessels containing the respective pairs of intermeshing gears and adapted to hold oil, and having an oil channel extending between them; a platform having a nut threaded on the vertical shaft.

3. In a lift: a frame carrying pairs of journal bearings, the members of each pair being vertically spaced apart; threaded shafts journaled in said bearings; a platform having supporting nuts threaded on the shafts and horizontally-reduced connections between the platform and the nuts respectively; vertically extending casings surrounding the shafts respectively and their nuts and having vertical slits through which said connections are adapted to freely pass vertically; means for rotating the shafts simultaneously.

4. In a lift; a frame carrying pairs of journal bearings, the members of each pair being vertically spaced apart; threaded shafts journaled in said bearings; nuts having body portions threaded on the shafts and platform-supporting portions; a horizontal platform supported on said supporting portions of the nuts and having verti-

cally extending openings loosely containing the body portions of the nuts, whereby the platform has a limited horizontal movement relatively to the nuts and shafts; means for
5 rotating the shafts simultaneously.

5. In a lift; a frame carrying pairs of journal bearings, the members of each pair being vertically spaced apart; threaded shafts journaled in said bearings; nuts
10 having body portions threaded on the shafts and platform-supporting portions; a horizontal platform supported on said supporting portions of the nuts and having vertically extending openings loosely containing
15 the body portions of the nuts, whereby the platform has a limited horizontal movement relatively to the nuts and shafts; independent means for limiting said horizontal movement of the platform; means for rotat-
20 ing the shafts simultaneously.

6. In a lift; a frame carrying pairs of journal bearings, the members of each pair being vertically spaced apart; threaded shafts journaled in said bearings; nuts

having body portions threaded on the shafts 25 and platform-supporting portions having inclined upper surfaces; a horizontal platform supported on said upper surfaces and having vertically extending openings loosely containing the body portions of the nuts 30 whereby the platform has a horizontal movement relatively to the nuts and shafts; means for rotating the shafts simultaneously.

7. In combination: a vertically disposed 35 screw; a nut threaded thereon; a secondary nut threaded on the screw below the first-mentioned nut and having a plurality of angularly spaced openings; a pin adapted to engage in any of said openings and detach- 40 ably carried in non-rotatable relation to the first-mentioned nut.

In testimony whereof we have hereunto set our hands at Grand Rapids, Michigan, this 28th day of December, 1922.

FREDERICK H. MEYER.
FREDERICK J. ZYLMAN.