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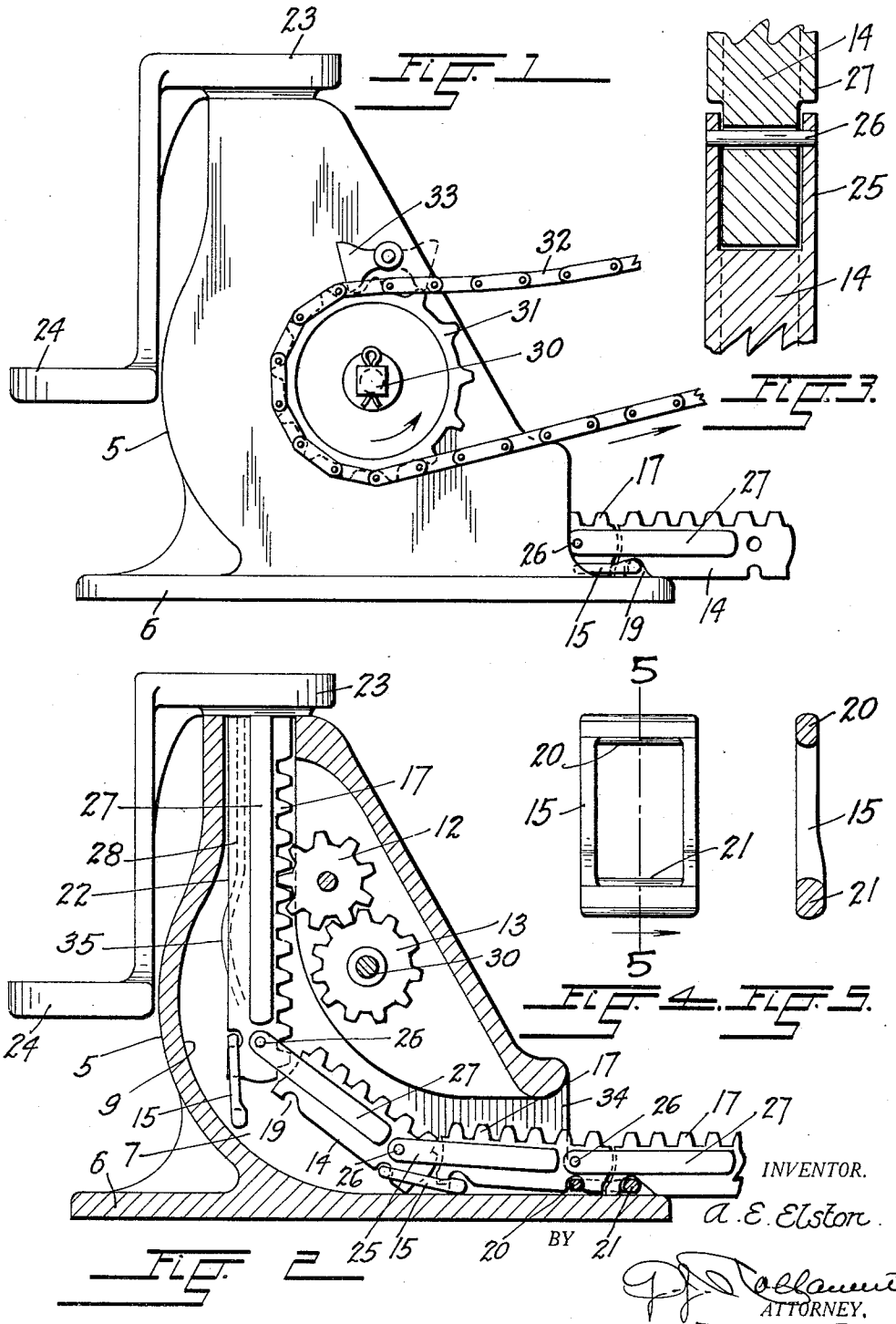
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LIFTING JACK

Filed Oct. 29, 1928

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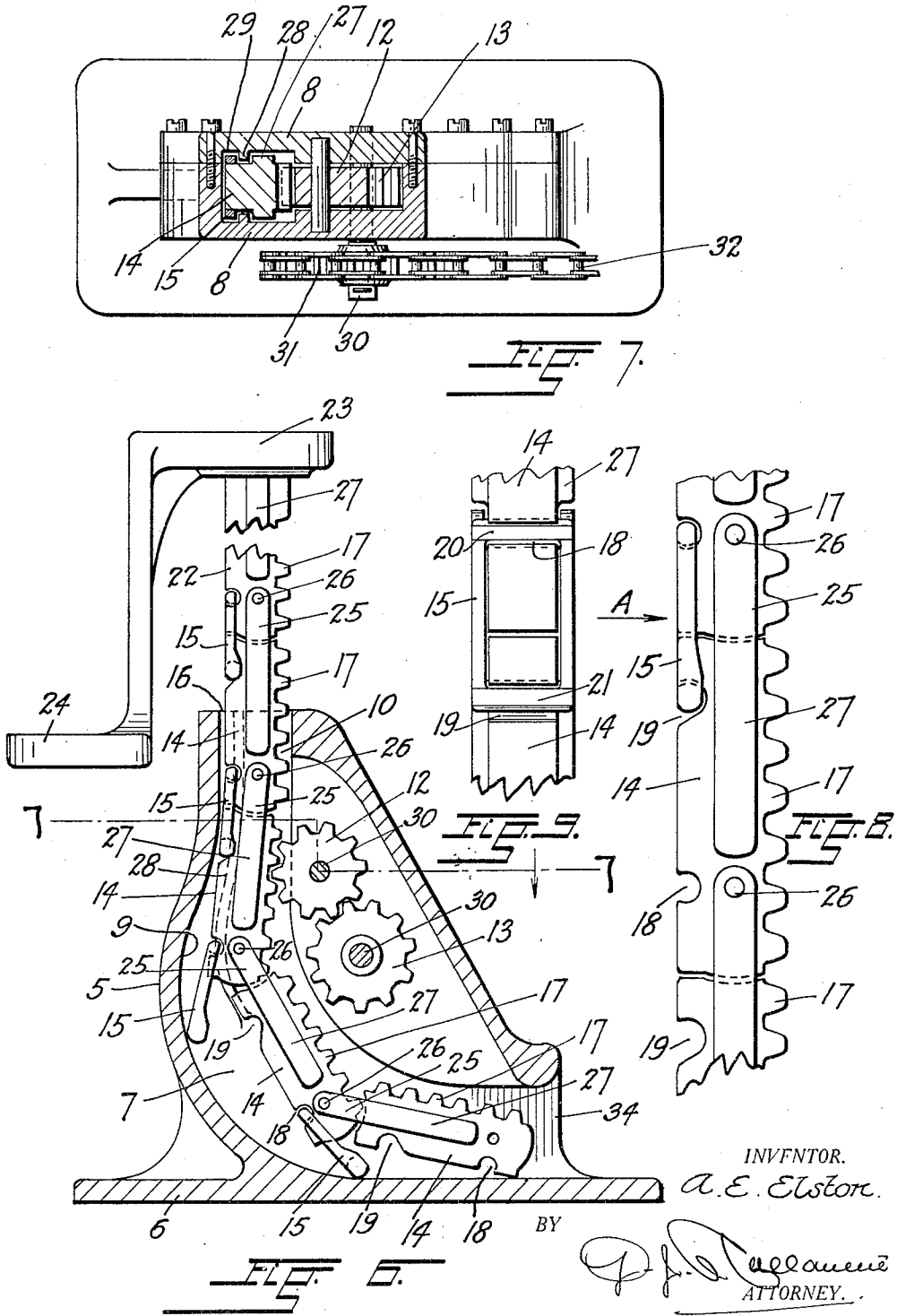
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# UNITED STATES PATENT OFFICE

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## LIFTING JACK

Application filed October 29, 1928. Serial No. 315,792.

This invention relates to lifting jacks and its principal object is to provide a jack of simple and compact construction, having a lifting column or standard that may be extended to an unlimited height.

Other objects reside in the provision of specific means for carrying the first mentioned object into effect and in details of construction and a novel arrangement of parts as will be fully disclosed in the course of the following description.

In the accompanying drawings,

Figure 1 represents a side elevation of the improved lifting jack, showing the lifting column in its lowered position,

Figure 2, a vertical sectional elevation of the device as shown in Figure 1,

Figure 3, a fragmentary section through two of the sections of which the lifting column is composed,

Figure 4, a detail view of one of the links by which the sections of the lifting bar are locked in alinement,

Figure 5, a section on the line 5—5, Figure 4,

Figure 6, a section similar to Figure 2, showing the lifting column in an extended position and partially broken,

Figure 7, a section taken on the line 7—7, Figure 6,

Figure 8, an enlarged view of a portion of the lifting column, and

Figure 9, a fragmentary face-view of the column, looking in the direction of the arrow A in Figure 8.

Similar numerals designate corresponding parts throughout the views.

The jack, as shown, comprises a housing 5 having a base or foot 6 for its support upon a surface beneath the object to be lifted.

The housing has a curved guideway 7 for the sectional lifting column hereinafter to be described formed between parallel side walls 8 and open at the top of the housing and at a point adjacent the base or foot of the same.

Distinctive features of the guideway are a curved slide face 9 for the links included in the construction of the lifting column, and a restricted throat 10 which causes the links to

lock adjoining sections of the lifting bar in vertically alined relation to each other.

At one side of the guideway is a recess for two gear wheels 12 and 13 forming part of the operating mechanism of the jack.

The lifting column, hereinbefore repeatedly referred to, is composed of sections 14 hinged together to permit of flexing the column in a collapsed condition, and links 15 by which the sections of the column are locked in alinement when the column is extended through the opening 16 of the guideway at the top of the housing, when the jack is in operation.

Each section consists of an oblong block having a series of rack-teeth 17 in its front-face, for engagement with one of the meshing gear wheels, and having in its opposite side, and adjacent its ends, notches 18 and 19 to receive the cross bars 20 and 21 of the links by means of which the sections are locked together.

The notches 18 are narrowed at the surface of the section, to prevent the links from falling out when the lifting column is collapsed, and the notches 19 are widened at one side to facilitate the entrance of the links when the column is extended through the opening at the upper end of the guideway.

The section 22 at the upper end of the column carries a cap-member 23 to engage the object to be lifted and the cap-member may have a downwardly extending foot 24 to engage objects at an elevation below the top of the housing.

The hingedly connected sections of the column in the operative condition thereof, are vertically alined and securely locked in their alined relation by the links 15, the cross bars of which occupy the notches of each two links at their adjoining ends.

The sections are hinged together by means of arms 25 fastened or formed upon opposite sides thereof, and projecting beyond an end of each section to embrace the next adjoining section.

Pivot pins 26 extend through alined openings in the ends of the arms and the sections with which the arms are pivotally connected. The arms not only serve for the

pivotal connection of the sections but they form ribs 27 at the sides of the sections, which aid in guiding the column when it is projected from the housing through the opening at the upper end of the guideway.

The guideway, with this object in view, has in its upper portion, ledges 28 that define grooves 29 in which the ribs fit slidingly.

The section 22, at the upper end of the column, is preferably made longer than the other sections and the ribs 27 at its sides are not extended into arms for its pivotal connection with an adjoining section but terminate below the cap-member.

When the sections are locked together in vertical alinement, they form a solid column that may be raised to any desired extent and the series of teeth at the front-faces of the sections form a continuous rack engaged by the teeth of the gear-wheel 12.

This gear-wheel is of smaller diameter than the one with which it meshes and its shaft 30 projecting outside the housing carries a sprocket wheel 31. A chain 32 engaging the sprocket wheel is the medium by which the jack is operated, and a pawl 33 at the side of the housing functions to lock the lifting column and the load supported thereon, at any point in the operation of the jack.

It is to be understood that the operating mechanism, as shown and described, is not an essential part of the invention and that any other mechanism of different construction and design may be employed within the scope of the invention, as defined in the hereunto appended claims.

In the operation of the jack, the lifting column is normally collapsed within the housing, as shown in Figure 2. The end section 22 of the standard occupies the upper portion of the guideway and the ribs 27 at opposite sides of said section extend into the slide-grooves 29 defined by the ledges 28. The other sections of the standard extend at an angle to each other through the guideway and project partially beyond the opening 34 at the lower end thereof, it being understood that other sections are readily attached at any time, in any desired quantity to increase the length of the standard to any necessary height. When by rotation of the gear wheels of the operating mechanism the end section of the column is raised, the other sections necessarily follow its movement, and are guided in their movement by the ribs on their sides in the slide-grooves.

The links which, within the housing hang from the sections and are disconnected from the next adjoining sections, are gradually moved inwardly as the sections approach the position in which they are alined with the preceding sections.

The inward movement of the links is effected by their engagement with the curved

face 9 of the guideway and when the sections move upwardly through the restricted throat of the guideway the links are forced into the notches of the sections from which they were previously separated and the sections are thereby locked rigidly in alinement.

In the return movement of the column, the sections are compelled to assume a position at an angle to the following sections by curved extensions 35 of the ledges 28 and further by the engagement of the preceding section with the curved face of the guideway leading to the opening at the lower end thereof. It will thus be apparent that the column is automatically extended or collapsed, that in its extended condition it provides a rigid and solid lifting bar and that it may be lengthened to any desired extent to engage its load at any elevation above the surface on which the jack is supported.

What I claim and desire to secure by Letters Patent is:

1. A lifting jack comprising a housing providing a guideway, a lifting column in the guideway composed of sections hinged together, links for locking the sections in alined relation, pivotally connected with the sections and loosely interlocked with adjoining sections, and mechanism for moving the column in the guideway.

2. A lifting jack comprising a housing providing a guideway, a lifting column in the guideway composed of notched sections hinged together, links pivoted in notches of the sections and loosely inserted in notches of adjoining sections, and mechanism for moving the columns in the guideway.

3. A lifting jack comprising a housing providing a guideway having inwardly projecting ledges, a lifting column in the guideway composed of sections hinged together by projecting arms terminating in ribs at the sides of the sections, said ribs cooperating with the ledges, and means to automatically lock the sections in alined relation by their movement through the guideway.

4. A lifting jack comprising a housing providing a guideway, a lifting column in the guideway composed of notched sections, links for locking the sections in alined relation, having cross bars in notches at adjoining ends of the sections, the cross bar at one end of each link being pivoted in the respective notch, and the cross bar at the other end of each link, being disposed in the respective notch to move laterally into and from the same, and mechanism to move the column through the guideway.

5. A lifting jack comprising a housing providing a guideway, a lifting column in the guideway composed of notched sections, links for locking the sections in alined relation, having cross bars in notches at adjoining ends of the sections, the cross bar at one end of each link being pivoted in the

respective notch of one section and the cross bar at the other end of each link being disposed in the respective notch of the adjacent section to move laterally into and from the same, and mechanism to move the column through the guideway.

5 6. A lifting jack comprising a housing providing a guideway, a lifting column in the guideway composed of toothed sections  
10 hinged together, pivoted links for automatically locking the sections in alinement by their movement through the guideway, the sections and the links having cooperating means for interlocking engagement, gearing  
15 in the housing, meshing with the sections, and means outside the housing for the operation of the gearing.

7. A lifting jack comprising a housing having a guide-surface, a movable column in the  
20 housing, composed of hinged sections, and links pivoted on alternate sections and adapted for interlocking engagement with other sections, the latter having means to effect said engagement and the guide-surface being  
25 formed and disposed to engage the links and to move them to their interlocking position in the movement of the column.

8. A lifting jack comprising a housing having a guide-surface, a movable column in  
30 the housing, composed of hinged sections, and links pivoted on alternate sections and adapted for interlocking engagement with other sections, the latter having notches to admit the links and the guide-surface being  
35 formed and disposed to engage the links and to move them to their interlocking position in the movement of the column.

In testimony whereof I have affixed my signature.

40                   ARTHUR E. ELSTON.

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