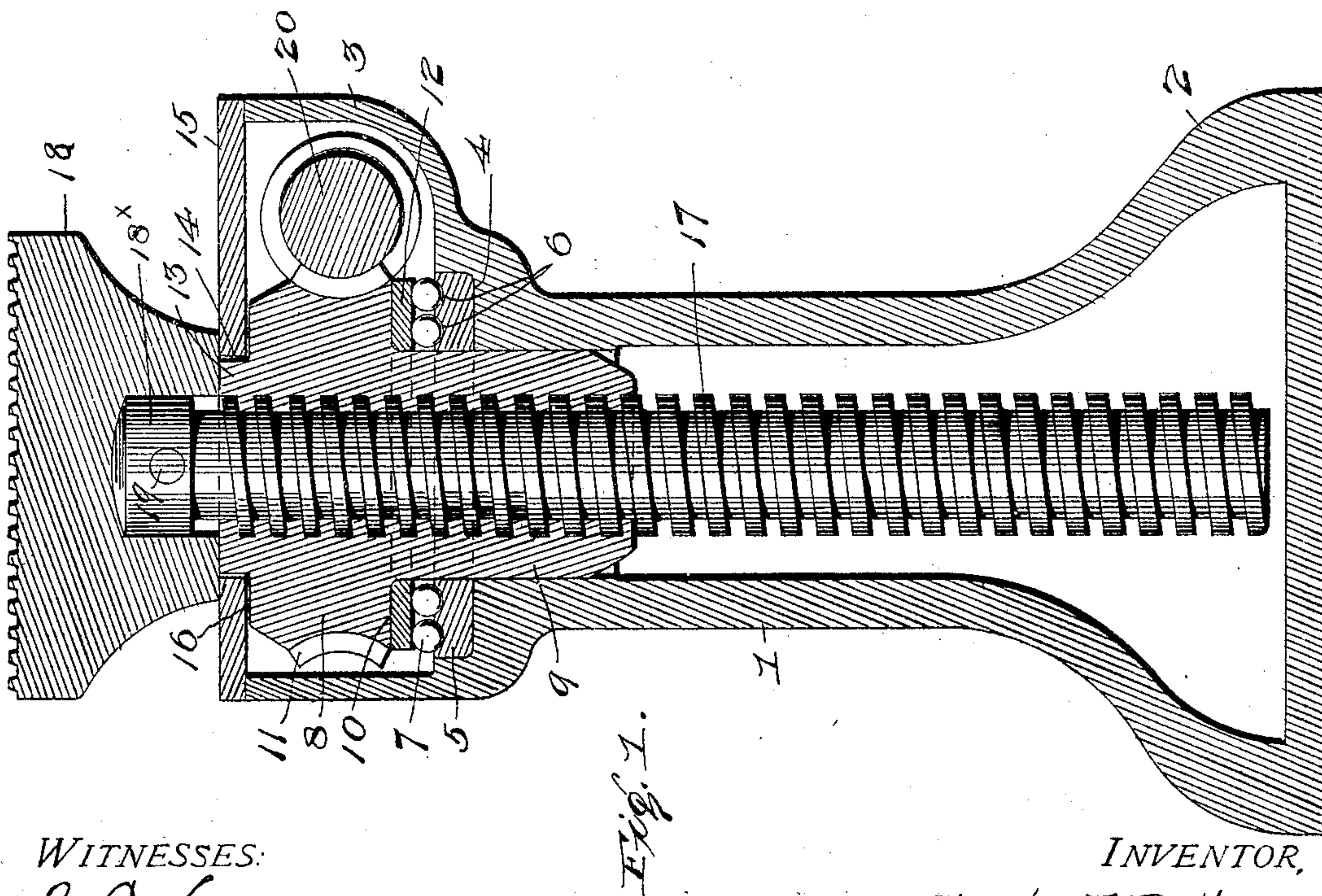
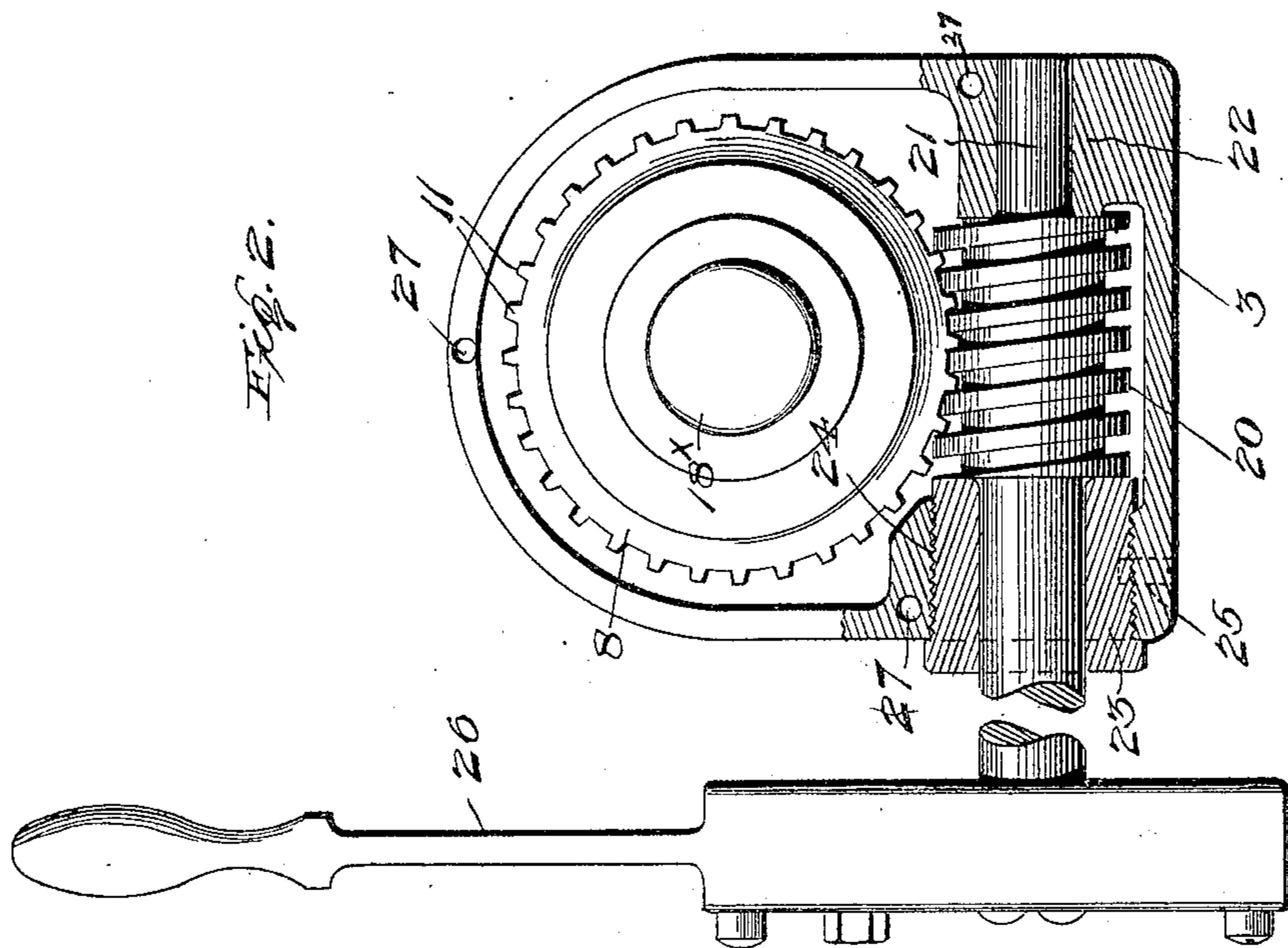


No. 804,052.

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C. E. ROTH.
LIFTING JACK.

APPLICATION FILED NOV. 23, 1903. RENEWED AUG. 4, 1905.



WITNESSES:

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CHARLES E. ROTH, OF NEW YORK, N. Y.

LIFTING-JACK.

No. 804,052.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES E. ROTH, a citizen of the United States, residing at New York city, State of New York, have invented new and useful Improvements in Lifting-Jacks, of which the following is a specification.

My invention relates to lifting-jacks of that type in which a lifting-screw is operated by means of a gear-wheel and worm.

One of the principal objects of the invention is to provide a device of this character which shall be simple in construction and of few parts, which will not readily get out of order, and which may be quickly taken apart for repairs or to replace worn or defective parts, and which may be readily reassembled without special tools.

Another object is to provide a strong and durable device of the character referred to and one in which the lifting-screw shall be firmly mounted in a true vertical position to avoid torsional strains on the various parts of the structure.

A further object is to provide simple and efficient means for covering or housing the operative parts of the jack in order that dirt, grit, or any foreign substance may not find ready entrance to the working parts to interfere with the smooth and easy operation of the mechanism. I have also provided a cover or housing for the operative mechanism which can be readily removed in order that access may be had to said mechanism for the purpose of replacing worn or broken parts and for lubricating the bearings when found necessary.

The objects referred to are attained by means of the construction illustrated in the accompanying drawings, in which—

Figure 1 is a view in vertical section of a lifting-jack made in accordance with my invention. Fig. 2 is a top plan view and partial section of the same with the cap or cover of the housing removed to better illustrate the interior mechanism.

In order that the parts subjected to the greatest strains in use may have the required strength, I have given such relative proportions to the different parts as will secure practical uniformity when constructed of the materials and of the relative dimensions set forth and hereinafter disclosed.

Referring to the accompanying drawings for a more particular description of my invention, the numeral 1 designates the body

or standard of the jack. This body or standard is preferably made of cast-iron, the lower portion or base 2 being enlarged to provide a firm support for the jack and the body portion of the standard being hollow, as shown. The upper portion of the body is enlarged, as at 3, to provide a housing for the gear-wheel and worm.

A shouldered recess 4 is formed in the body and supported within this recess is the annular ball-bearing ring or raceway 5, the upper surface of said ring having, preferably, two annular grooves 6, which provide raceways for the steel balls 7. The gear-wheel 8 may be of case-hardened cast-iron and is provided with a depending bushing or boss 9, which fits smoothly within the upper portion of the standard to insure a true vertical alinement of the lifting-screw. A shoulder 10 is formed on the gear-wheel below the cogs or threads 11, and firmly seated against said shoulder is a bearing-ring 12, which preferably has a smooth under face to rest upon the steel balls 7. The bearing-rings 5 and 12 may be secured in place by shrinking or otherwise. The bearing-ring 5 is preferably so constructed and attached within the body portion of the jack as to be readily removable and to be replaced when desired, while the bearing-ring 12 is preferably shrunk or swaged against the laterally-extended shoulder 10 of the gear-wheel. A boss 13 is formed upon the upper end of the gear-wheel, and this boss fits within an opening in the removable cap or cover 15. A shoulder 16 is provided immediately above the threaded portion of the gear-wheel, and the cap or cover 15 rests upon this shoulder.

It will be noted that the bushing 9 and the boss 13 may be of substantially uniform diameter and that the shoulders 10 and 16 are preferably of substantially equal area, the object being to attain the greatest possible strength in line with the lifting-screw by equalizing the bearing area of the gear-wheel by requisite proportions. Further, said shoulder 16 also constitutes an extended bearing-surface whereby the gear-wheel is prevented from moving upward from any cause. The crucible-steel lifting-screw 17 has a comparatively long screw-threaded bearing within the gear-wheel, owing to the extended bushing 9 and the boss 13, and is thus firmly seated in a true vertical line relatively to the body or support. This is a matter of considerable importance in a de-

vice of this character, as any torsional or side-wise strain would have a tendency to injure or crush some of the parts under the great weight being raised. The head 18 rests upon
 5 the upper end 18^x of the lifting-screw 17, a set screw or pin 19 being used to hold the top 18^x in place. The crucible-steel worm 20 has one end 21 of its shaft journaled in a boss or enlargement 22, formed inside the body 1,
 10 and the other bearing for the worm-shaft is formed in a steel bushing 23, and said bushing is fitted into a threaded enlargement 24, formed inside the body 1. A pin or screw 25 holds the bushing 23 in place in its bearing.
 15 A handle 26, which may be of the ratchet type, is secured in any suitable manner to the outer end of the worm-shaft. The top or cover 15 may be held in place by screws which pass through said top or cover and
 20 into the holes 27, formed in the top of the body portion.

It will be noted that when the head 18 is secured in place upon the end 18^x of the lifting-screw 17 the flat lower end of the head 18
 25 extends beyond the shoulder 14 on the gear-wheel 8 and covers the joint between the boss 13 and the opening in the top of the cover-plate 15, and thus serves to keep grit or dirt from gaining access to the working parts of
 30 the jack when not in use.

From the foregoing it will be obvious that my lifting-jack is comparatively simple in construction, is composed of few parts, that the operative mechanism is completely covered and housed in to protect it from injury,
 35 and that access may be readily gained to the parts for repairs, that the lifting-screw is seated in a long bearing to hold it in vertical position to prevent sidewise strains, and that
 40 the relative proportions of the parts are such as to secure substantially uniform strength to the jack in its various parts.

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

1. A lifting-jack comprising a hollow body portion, a gear-wheel having a bushing depending from one end thereof and a boss extending from the opposite end thereof, said
 50 bushing being seated in a bearing in the body

portion, a ball-bearing for the gear-wheel, a threaded lifting-screw passing through the gear-wheel and bushing, and a removable cover-plate for inclosing the operative parts of the jack, said cover-plate having an opening through which the said boss extends, and the upper faces of said boss and plate being flush. 55

2. A lifting-jack comprising a hollow body portion, provided with an interior shouldered recess, a ball-raceway in the form of a ring seated in the recess and provided with ball-grooves, balls in the grooves, a smooth-surfaced bearing-ring resting upon the balls, a gear-wheel resting upon the bearing-ring, a
 60 bushing extending from the gear-wheel and seated in a bearing in the body, a boss extending from the upper end of the bushing, a lifting-screw, a worm for revolving the gear-wheel and lifting the screw, and a removable
 65 cover-plate for inclosing the operative parts of the jack, said cover-plate having an opening through which said boss extends, the upper surfaces of said boss and plate lying in the same plane. 75

3. A lifting-jack comprising a hollow body portion having an interior shouldered recess, a ball-bearing ring seated in said recess and provided with ball-raceways, balls in the raceways, a gear-wheel provided with a depending bushing journaled in the hollow body
 80 portion, a bearing-ring secured to a shoulder on the gear-wheel and resting upon the balls, a worm-shaft journaled at one end in the body portion, a threaded bushing in which
 85 the opposite end of the worm-shaft is journaled, and a removable cover-plate for covering the operative portions of the jack, said cover-plate having an opening which fits over a boss on the upper end of the bushing
 90 and the plate and boss having flush upper surfaces.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES E. ROTH.

Witnesses:

JOS. H. BLACKWOOD,
 E. P. BUNYEA.