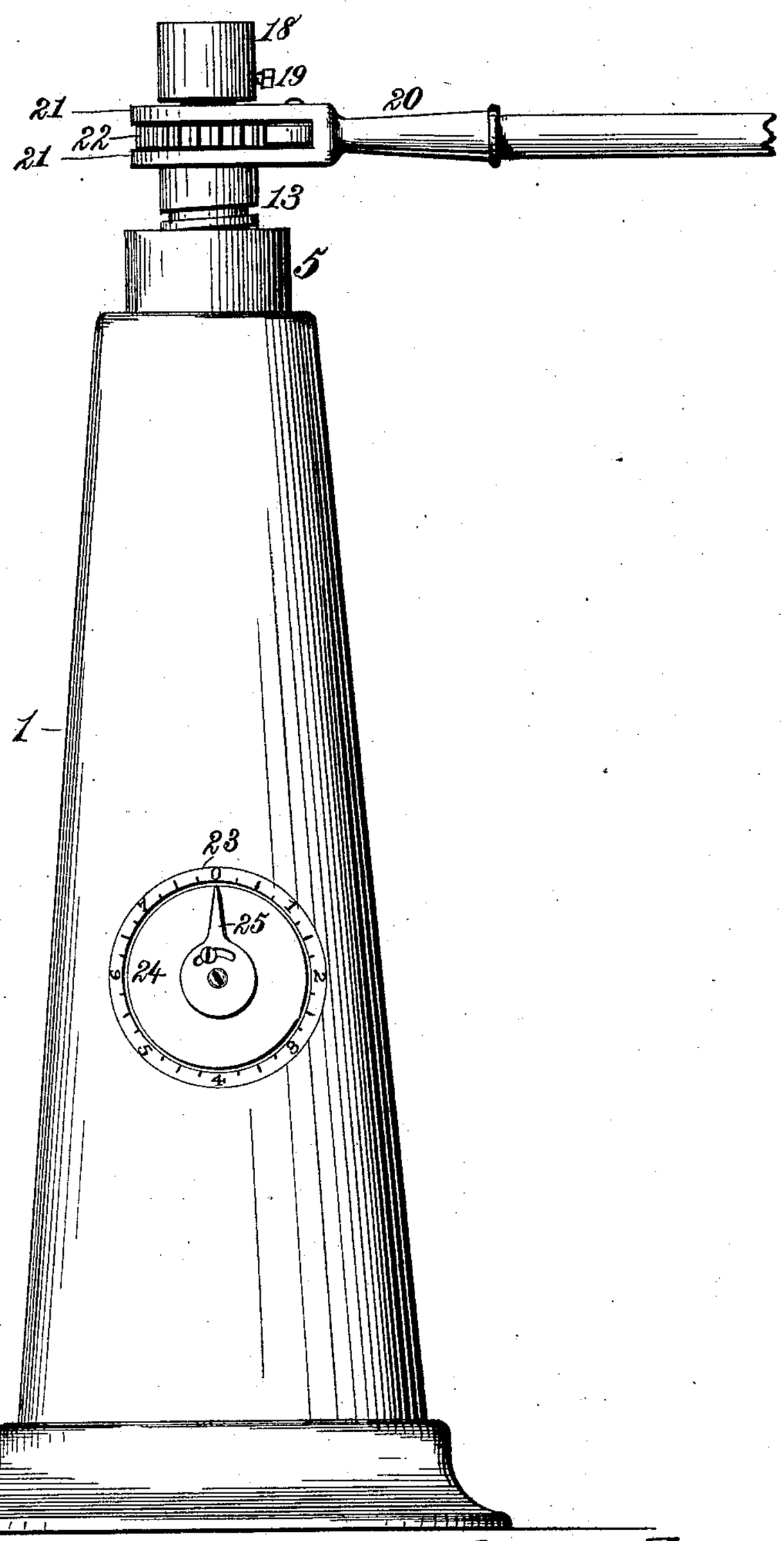
(No Model.) 2 Sheets—Sheet 1.

J. CHASE.

LIFTING JACK.

No. 306,582. Patented Oct. 14, 1884.

Fig. 1.



Witnesses.
Robt Everett.
Jo L. Coombs

Inventor.
James Chase.
By James L. Norris.
Atty.

(No Model.) 2 Sheets—Sheet 2.

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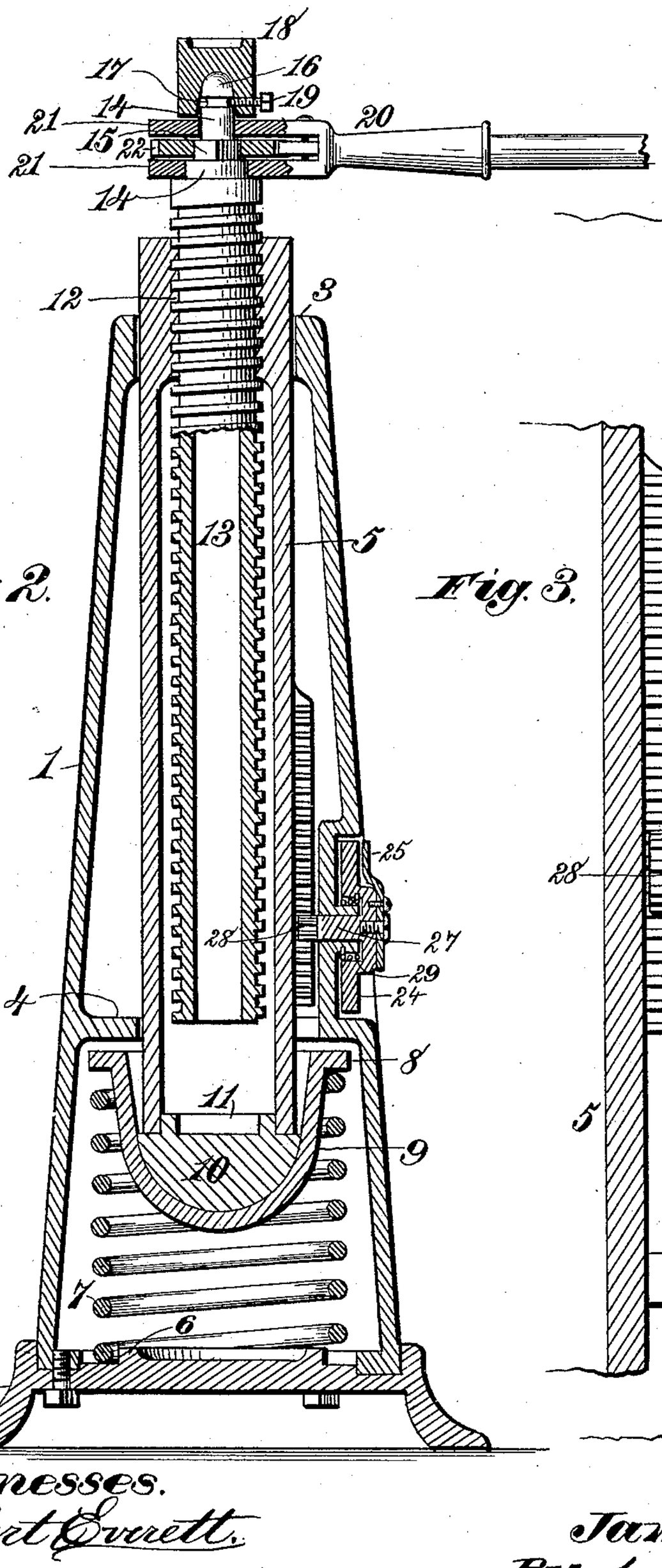

Fig. 2.

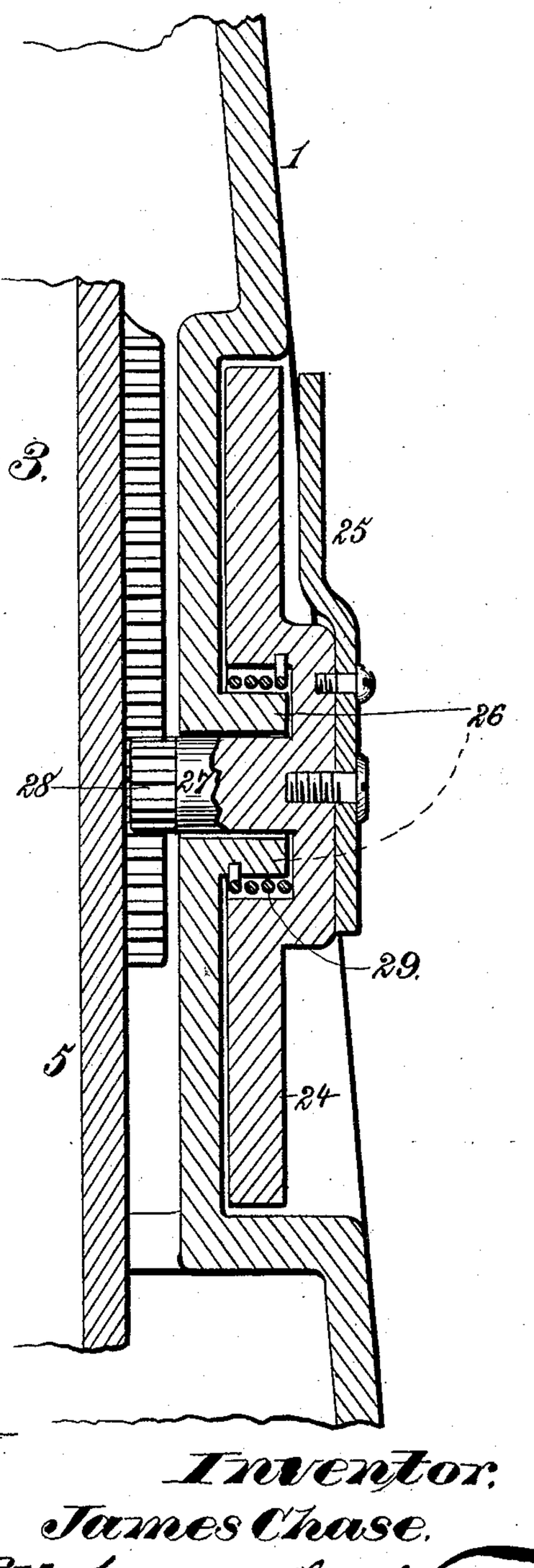

Fig. 3.

Witnesses.
Robert Everett.
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By James L. Norris.
Atty.

UNITED STATES PATENT OFFICE.

JAMES CHASE, OF ROCHESTER, NEW YORK.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 306,582, dated October 14, 1884.

Application filed July 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES CHASE, a citizen of the United States, residing at Rochester, New York, have invented new and useful Improvements in Lifting-Jacks, of which the following is a specification.

This invention relates to improvements in the lifting-jack forming the subject-matter of my application for Letters Patent filed May 6, 1884, Serial No. 130,546, wherein a lifting-bar and tube are sustained in a tubular stand through the medium of a spring, a scale and index being used to indicate the weight of a load raised by the lifting-bar.

The objects of my present invention are to improve the construction of the supporting stand or frame, whereby less drilling or boring is required to provide accurate bearings and guides for the vertically-sliding tube; to simplify the construction of the parts by making the screw-nut for the lifting-bar a part of the sliding tube; to provide novel means for supporting the sliding tube and preventing it from cramping when under the weight of a load; to provide means for maintaining the sliding tube and the spring in line; to improve the construction of the parts, whereby the weight of the structure is greatly diminished, while less metal is required, and the requisite strength is preserved and increased; to provide novel means for sustaining a load on the lifting-bar, and actuating the latter to lift the load, and to provide novel means for indicating the weight of the load, and rendering the indicating devices very sensitive, whereby the least weight is accurately registered. These objects I accomplish in the manner and by the mechanism hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a lifting-jack embodying my invention; Fig. 2, a vertical central sectional view of the same, and Fig. 3 an enlarged broken sectional view through the registering devices.

In order to enable others skilled in the art to make and use my invention, I will now describe the same in detail, reference being made to the drawings, where the number 1 indicates the tubular stand or frame, and 2 the supporting-base therefor, the stand being formed of a steel casting cored out to create upper and lower upwardly-projecting flanges 3 and 4, which are drilled or bored to form bearings and guides for the sliding tube 5. The stand and its base are socketed together and secured in any suitable manner, as by bolts or screws, and the base-plate is provided on its upper face with an annular rib or flange, 6, resting closely against the interior lower end of the coiled spring 7, while within the upper end of the spring is suspended by a lateral flange, 8, a cup-shaped support, 9, having a hemispherical seat on the interior for receiving and supporting a hemispherical block, 10, having an annular rib or flange, 11, which closely fits within the lower end of the tube 5, the ribs or flanges on the base-plate and block coacting to maintain the sliding tube and the spring properly in line at all times, while the block and cup constitute a ball-and-socket joint, which yields to any uneven pressure of the spring that may arise in such manner as to prevent the sliding tube from cramping or binding in the stand or frame. The upper end of the sliding tube is thickened interiorly, as at 12, and such portion is tapped with a female screw-thread engaging the male screw-thread on the lifting-bar 13, by which construction the sliding tube constitutes in itself a screw-nut for the lifting-bar, which simplifies the structure very materially.

The lifting-bar is composed of a steel casting cored out longitudinally to constitute a tubular screw lifting-bar, which reduces the quantity of metal necessary to construct ordinary lifting-bars, and also diminishes the weight of the structure, while preserving the requisite strength. The upper end portion of the lifting-bar is constructed with circular bearings 14, intermediate of which is an angular hub, 15, and the extreme upper end of the bar is hemispherical, as at 16, and provided with an annular groove, 17, the hemispherical end receiving the loosely-mounted cap-plate 18, which is held from vertical displacement by a set-screw or a pin, 19, passing through it into the annular groove. A lever, 20, is provided with two apertured arms, 21, loosely mounted on the circular bearings 14,

and to the angular hub 15, between the lever-arms, is rigidly attached a ratchet-wheel, 22, with which engage pawls pivoted on the lever, so that by swinging the lever in the proper direction the lifting-rod is rotated and caused to move upward or downward, as required.

The stand or frame is provided with an attached circular dial or scale, 23, and a cavity, in which is arranged a circular rotary disk, 24, carrying an index or finger, 25, which is preferably adjustable by a set-screw or otherwise, so that it can be set at zero after the lifting-bar is adjusted to the position required for use. The wall of the stand or frame centrally in relation to the circular disk 24 is provided with an orifice and laterally-projecting sleeve-bearing 26 for a short shaft, 27, which is rigidly secured at its outer end to the disk and its inner end to a pinion, 28, engaging a vertical rack-bar provided in any suitable manner on the exterior surface of the sliding tube 5. Any longitudinal movement of the tube will impart a rotary movement to the disk carrying the index or finger, which will thus travel about the dial to indicate the weight of the load, and by the means shown the slightest deflection of the sustaining-spring 7 will be indicated. The most minute indications can be made by interposing accurate gearing between the rack-bar and rotary index or finger, or by varying the diameter of the pinion 28 with respect to the diameter of the rotary disk and dial.

In order to compensate for any slack or play between the pinion and the rack, I provide a spring, 29, between the pinion and disk, this spring being preferably a coil around the sleeve-bearing 26, with one end secured to the latter and the other end to the disk. By this rotary indicating mechanism the most minute weights can be indicated, while greater loads can be weighed without considerable longitudinal movement of the sliding tube.

I do not confine myself to the particular rotary weight-indicating mechanism here shown, as modifications can be made without changing the character of the invention.

The index or finger might be stationary and the dial revolved by the gearing; but the construction shown is satisfactory and useful.

I do not confine myself to a screw lifting-bar, nor to the exact arrangement of the spring here shown, as changes in the location might be made without substantially changing the mode of operation.

In practice the spring sustains the lifting-bar under the weight of the load to be lifted, and the spring and bar should be capable of supporting the load. If the spring be sufficiently powerful to sustain ten tons, then the spring must be capable of supporting the same pressure.

Inasmuch as the present invention is practically used as fully explained in my application before alluded to, I do not deem it essential to more elaborately set forth the mode of operation and advantages incident to the employment of a spring-sustained lifting-bar and scale or weighing mechanism.

The invention is applicable to jacks wherein the lifting-bar or ram is actuated by hydraulic pressure, and I also design to use my invention in connection with an ordinary office-chair or chair for other purposes, the spring serving as a cushion, while the seat, which will be secured to the head of the screw, can be adjusted to any desired height by properly turning the screw.

Having thus described my invention, what I claim is—

1. The combination of the tubular frame, cored out to form the inward-projecting bearings, with a lifting-bar and a spring sustaining the bar under the weight of the load to be raised, substantially as described.

2. In a lifting-jack, the combination of the tubular frame, cored out to form the inward-projecting bearings, with the sliding tube, substantially as described.

3. The combination of the frame cored out to form the inward-projecting bearings, the sliding tube, the lifting-bar, and the spring, substantially as described.

4. The combination of a frame, a sliding tube, a jointed support for the tube, a lifting-bar, and a spring, substantially as described.

5. The combination of a frame, a sliding tube, a spring, a cup supported thereby, a block in the cup, supporting the tube, and a lifting-bar, substantially as described.

6. The combination of a frame, a sliding tube, a spring, a flanged cup suspended thereon, a block in the cup, supporting the tube, and the sliding bar, substantially as described.

7. The combination of a frame, a sliding tube formed with a female screw-thread, a screw lifting-bar, and a spring supporting the tube, substantially as described.

8. The combination of a frame, a sliding tube, a tubular lifting-bar, and a spring sustaining the tube, substantially as described.

9. The combination of a frame, a sliding tube formed with a female screw-thread, a tubular screw-threaded lifting-bar, and a spring sustaining the tube, substantially as described.

10. The combination of a frame, a lifting-bar, a spring sustaining the bar, and a rotary indicator for weighing a load lifted by the bar, substantially as described.

11. The combination of a frame, a sliding tube, a lifting-bar in the tube, a spring sustaining the tube, and a rotary indicator operated by the tube, substantially as described.

12. The combination of a frame, a sliding tube having a rack-bar, a lifting-bar, a spring sustaining the tube, and a rotary indicator in gear with the rack-bar on the tube, substantially as described.

13. The combination of a frame, a sliding tube having a rack-bar, a lifting-bar, a spring

sustaining the tube, the rotary indicator having a pinion engaging the rack-bar, and the spring between the pinion and indicator, substantially as described.

14. The combination of the frame, the sliding tube, the spring sustaining the tube, the screw lifting-bar having the ratchet-wheel secured thereto, the lever loosely mounted on the bar and engaging the wheel, and the loose cap-piece, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES CHASE.

Witnesses:

WM. H. FARRAND,

WM. E. CRAIB.