

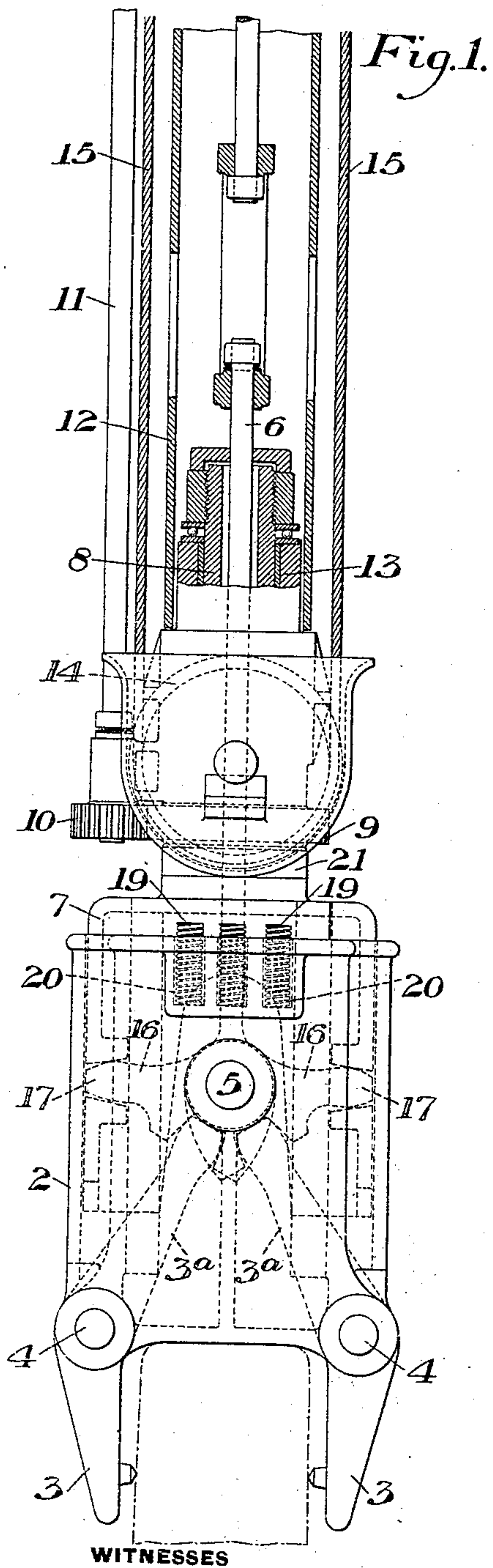
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PATENTED JAN. 15, 1907.

H. W. ISRAEL & R. S. KIRK.
TONGS.

APPLICATION FILED OCT. 16, 1906.

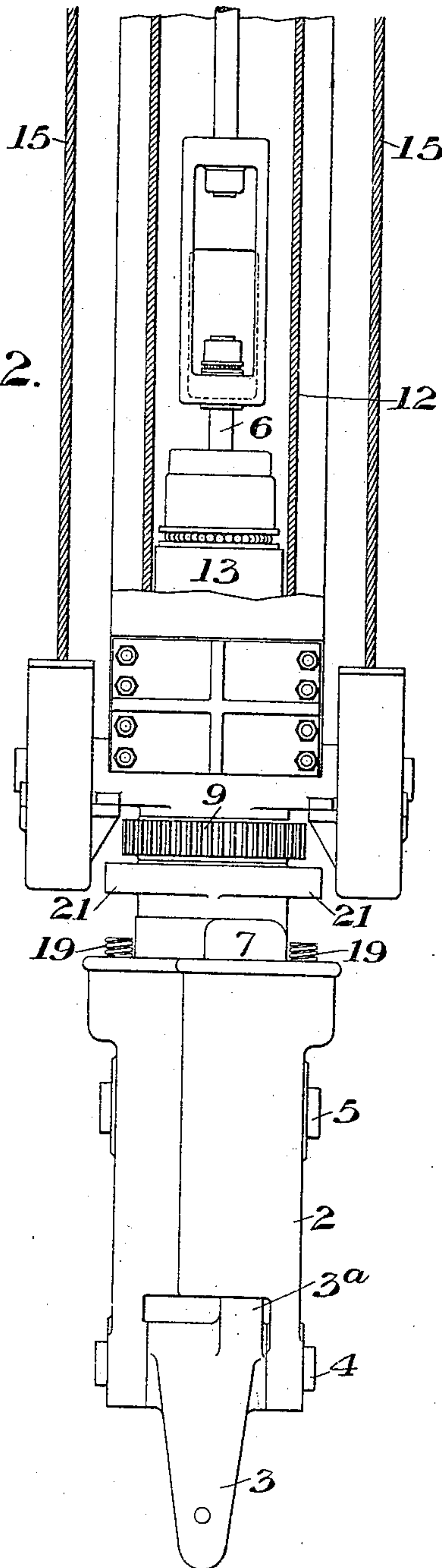
3 SHEETS—SHEET 1.



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Fig. 2.



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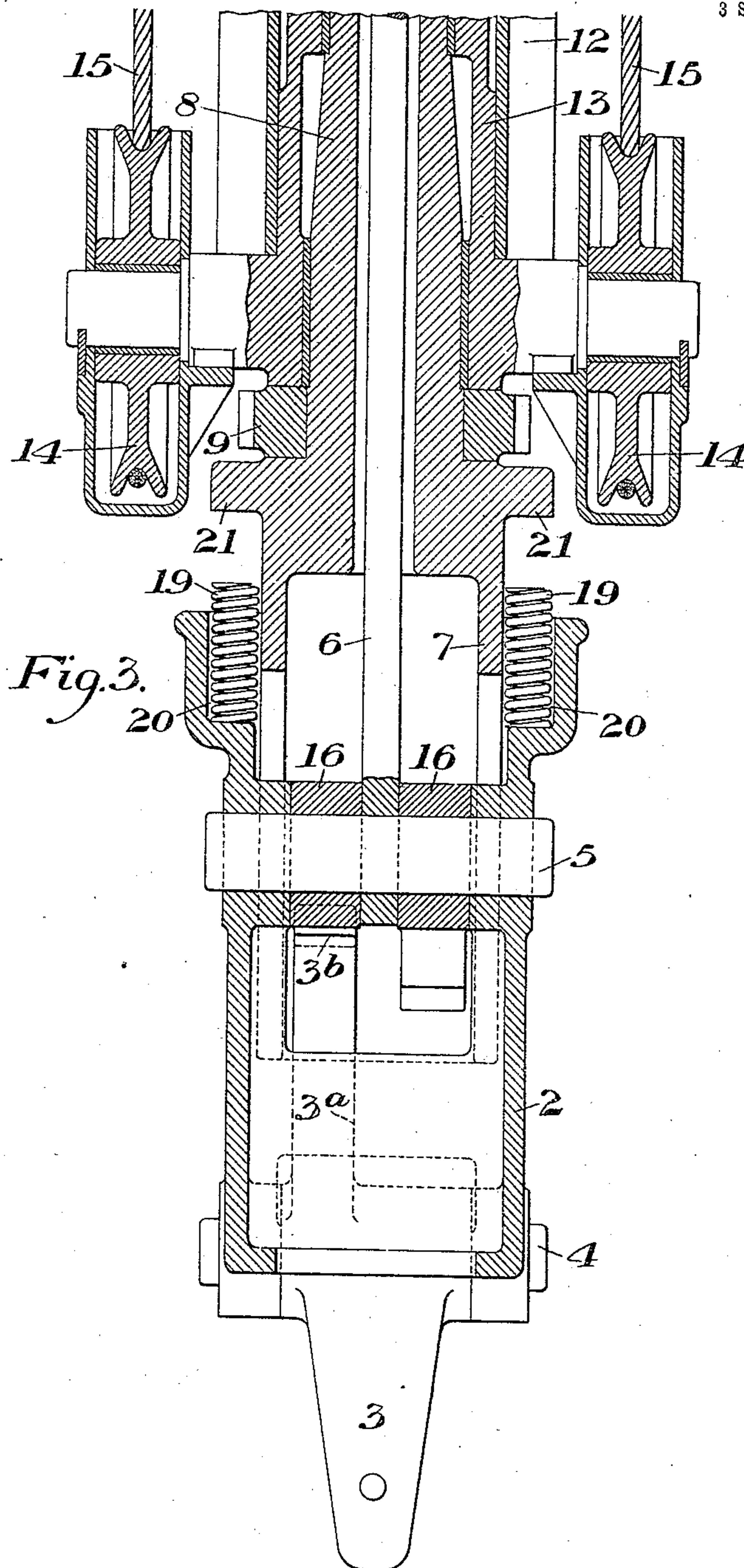
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3 SHEETS—SHEET 2.



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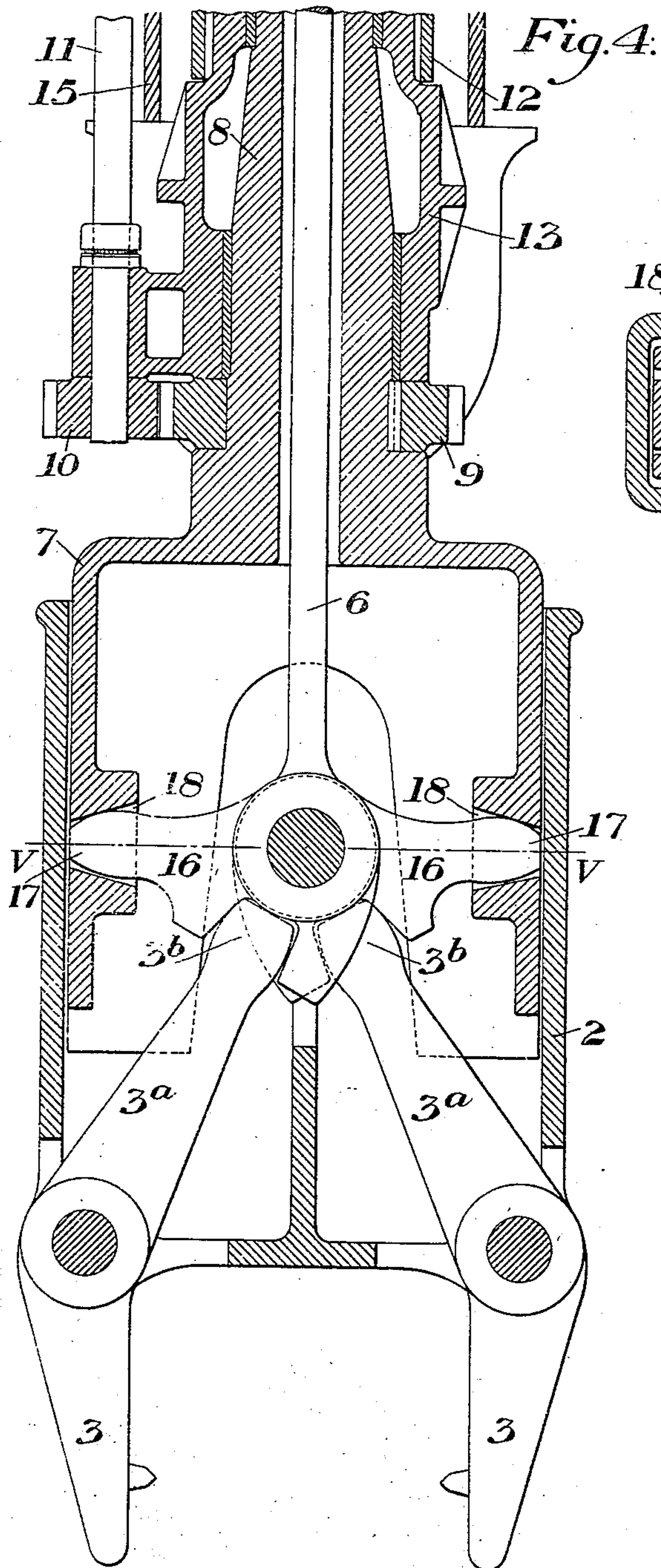
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3 SHEETS—SHEET 3.



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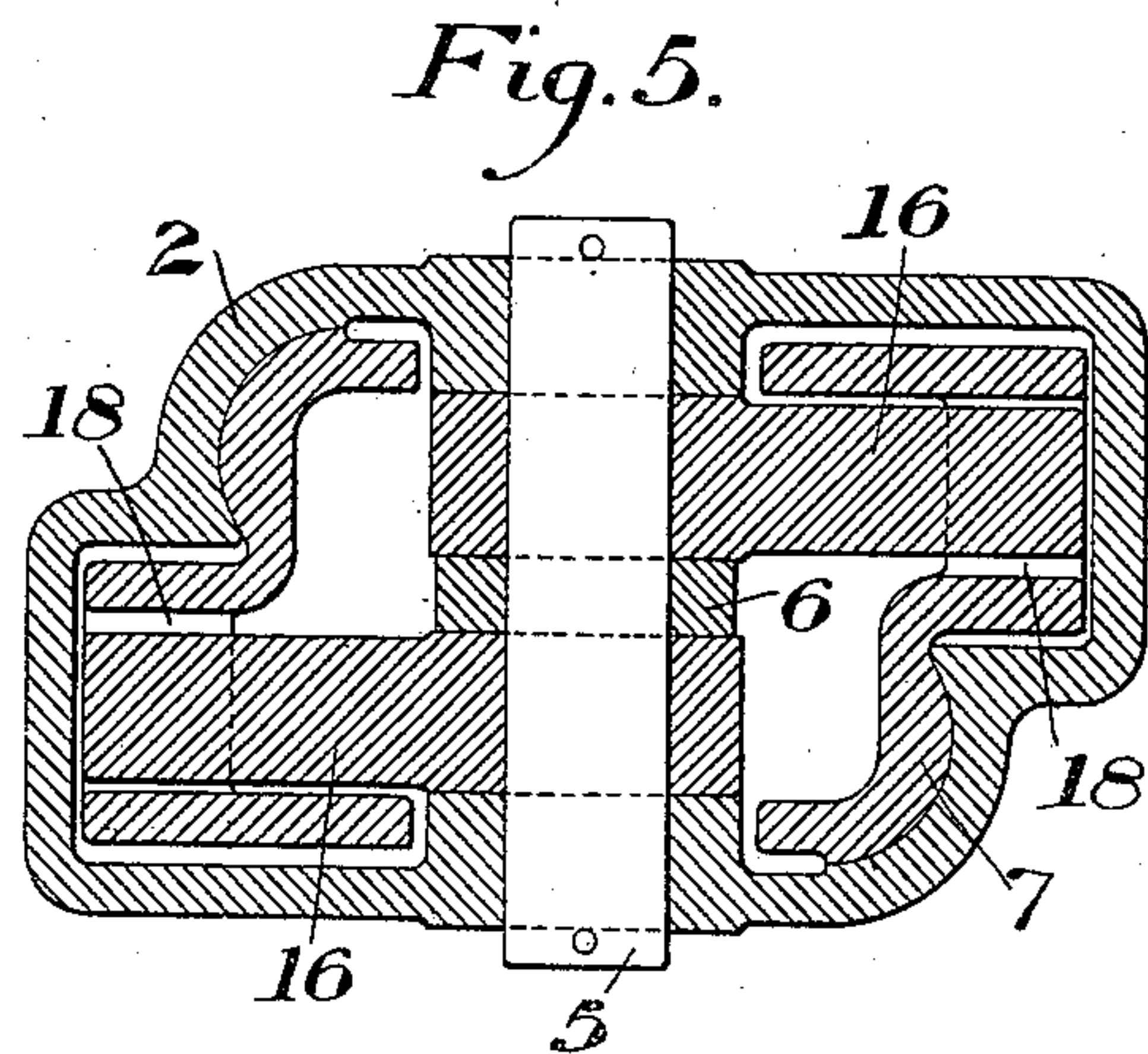
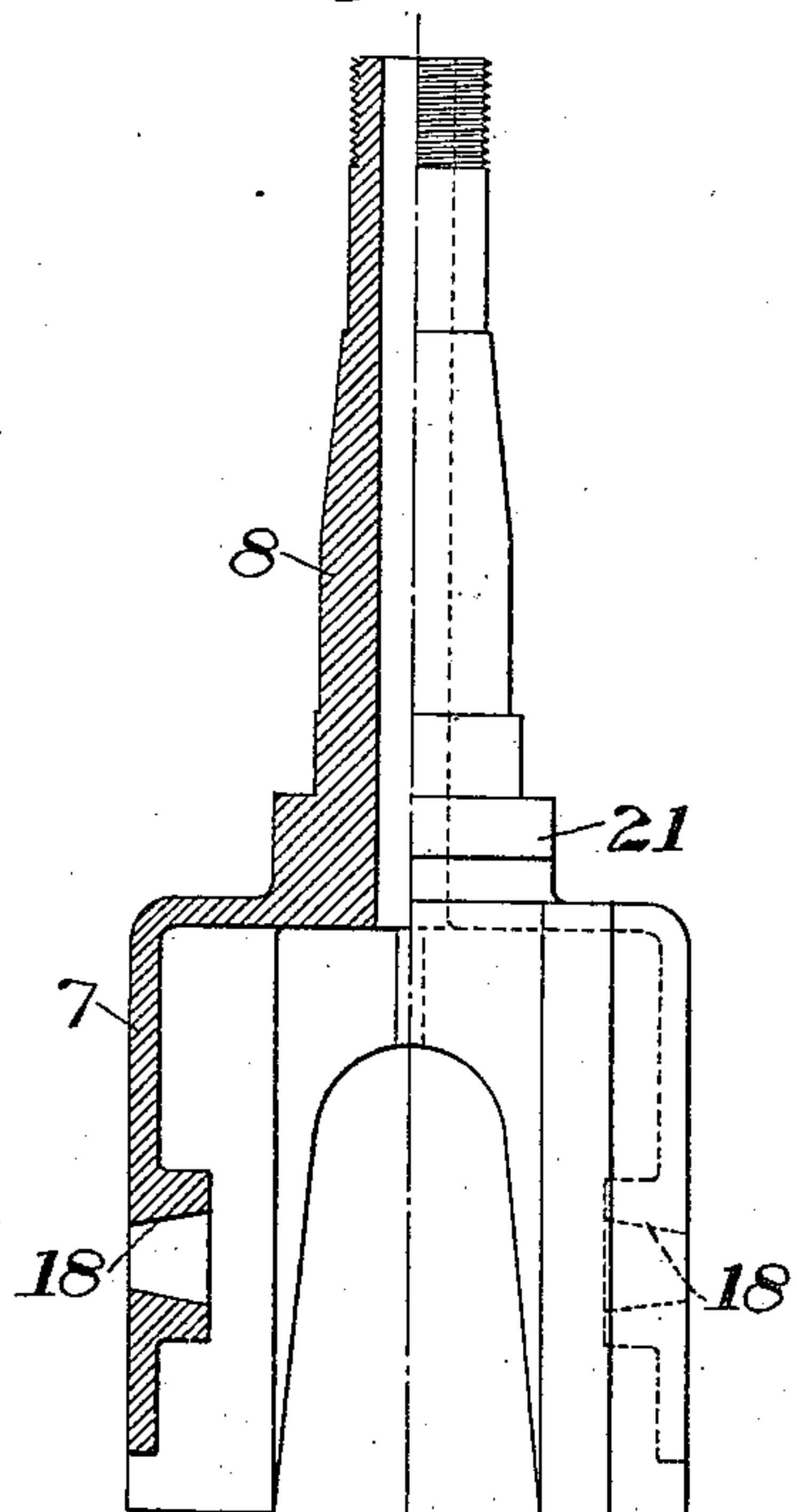


Fig. 6.



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TONGS.

No. 841,528.

Specification of Letters Patent.

Patented Jan. 15, 1907.

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To all whom it may concern:

Be it known that we, HOMER W. ISRAEL and RAPHAEL S. KIRK, of Alliance, Stark county, Ohio, have invented a new and useful Improvement in Tongs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view, partly in front or side elevation and partly in vertical section, of ingot-tongs embodying our invention. Fig. 2 is an edge view of the same, also partly in section. Fig. 3 is a central vertical section. Fig. 4 is an enlarged sectional view showing the tongs proper and the manner in which they are actuated. Fig. 5 is a section on the line V V of Fig. 4; and Fig. 6 is a detail view, partly in elevation and partly in section, of the tongs-operating frame.

Our invention has relation to tongs for overhead cranes and the like and is designed to provide means of simple, effective, and novel character for opening and closing the tongs.

With this object in view our invention consists in the novel construction, arrangement, and combination of parts all substantially as hereinafter described, and pointed out in the appended claims.

In the drawings, the numeral 2 designates the tongs-carrying frame to which the tongs 3 are pivoted at the points 4.

5 is a transverse pin or shaft which is seated in the frame 2 and which is engaged by the lower end of a rod 6, which is arranged to be moved up and down by means of a motor or other device, (not shown,) and which, through the pin 5, forms the support for the tongs-carrying frame 2.

7 designates the tongs-operating frame, which is arranged to slide freely within the tongs-carrying frame 2 and which is of slotted or yoke form to enable it to straddle the pin or shaft 5, as best shown in Figs. 4 and 6. This frame has an upwardly-extending hollow shank 8, through which the rod 6 loosely passes. Fixed to said shank is a spur gear-wheel 9, which is rotated by means of a pinion 10 on a vertical shaft 11, whereby the said frame, together with the frame 2, may be rotated in order to bring the tongs into any desired position. Any suitable

well-known means may be provided for rotating the shaft 11.

12 is a vertical column which surrounds the rod 6 and the shank 8 and to which is rigidly secured a frame-casing 13, at opposite sides of which are journaled sheaves 14, around which pass ropes 15 for the purpose of raising and lowering the frame 7, said ropes being operated by means of hoisting drums, gears, and motor on the usual overhead trolley. (Not shown.)

Each of the tongs 3 is formed with an upwardly and inwardly extending arm 3^a, whose upper end is shaped to form a tooth 3^b. Journaled on the pin or shaft 5 are two levers 16, each of which is formed with a tooth 17 at its outer end, which is arranged to engage a seat or socket 18 on the interior of the tongs-operating frame 7, as best shown in Fig. 4. The inner end portion of each lever 16 is formed with a space to receive the tooth 3^b of one of the tong-arms 3^a.

19 designates buffer-springs which are seated in pockets 20 of the frame 2 and which are adapted for contact with lugs 21 on the tongs-operating frame 7 for the purpose of relieving the shock when said frame is at the bottom of its stroke and the tongs-carrying frame 2 is resting upon the ingot.

The operation is as follows: When it is desired to pick up an ingot-mold, the column 12 is lowered until the lower end of the frame 2 rests on the top of the ingot, said column and the tongs-operating frame 7, however, still continuing to descend until the lugs 21 come in contact with the springs 20. This additional movement of the tongs-operating frame 2 moves the toothed ends of the tong-arms 3^a and operates to open the tongs 3. The column 12 and tongs-operating frame 7 are then raised in a vertical direction by the hoisting-motor, the upward movement of the frame 7 actuating the lever 16 to thereby actuate the tong-arms 3^a, and thereby closing the tongs upon the ingot. The rod 6 is lowered at the same time by means of its operating-motor in order to permit the tongs to grasp the ingot. It will be seen that the pressure with which the ingot is grasped by the tongs is in proportion to the lengths of the toothed ends of the levers 16 and the toothed faces which receive the teeth 3^b and the weight of the ingot.

The advantages of our invention consist in the simple and positive manner in which the tongs are opened and closed and in the simplicity and strength of the construction
5 as a whole.

Various changes may be made in the details of construction and operation without departing from the spirit and scope of our invention, since

10 What we claim is—

1. The combination of a tongs-carrying member or frame, a tongs-operating member or frame, tongs pivoted to the carrying member or frame and having lever-arms,
15 and a pair of lever-arms fulcrumed on a common center carried by the tongs-carrying member or frame and engaging the lever-arms on the tongs and also engaging the tongs-operating frame; substantially as described.
20

2. The combination of a tongs-carrying frame, tongs pivoted thereto, and having upwardly-extending lever-arms, a vertically-movable tongs-operating frame, and levers
25 carried by the tongs-carrying frame and having a toothed engagement with the tongs-operating frame, and also having an engagement with the lever-arms of the tongs; substantially as described.

30 3. The combination of a vertically-movable tongs-carrying frame, tongs pivoted thereto, and having lever-arms, a tongs-operating frame having an independent vertical movement, and levers carried by the tongs-
35 carrying frame, and operated by the tongs-actuating frame to move the lever-arms of the tongs; substantially as described.

4. Tongs of the character described, having lever-arms formed with gear-teeth at
40 their ends, tongs-actuating levers engaged by the said teeth, and a tongs-operating member also having a toothed engagement with the levers; substantially as described.

5. Tongs of the character described having
45 a tongs-carrying frame, tongs pivoted thereto, and having lever-arms formed with a gear-tooth at the end, levers carried by said frame and having each a space to receive the tooth of one of the lever-arms, and also having a
50 tooth at the end and an independently-mov-

able operating member engaging the end teeth of the said levers; substantially as described.

6. The combination of a tongs-carrying frame, tongs pivoted thereto, and having
55 lever-arms, a pin or shaft carried by said frame, a vertical movable rod connected to said pin or shaft, a pair of toothed levers fulcrumed on said pin, and a vertically-movable operating member engaging teeth of the
60 levers; substantially as described.

7. The combination of a hollow tongs-carrying frame, tongs pivoted thereto, and having lever-arms extending within the frame, a
65 pin or shaft carried by said frame, toothed levers fulcrumed on said pin or shaft and engaged with the lever-arms of the tongs, means whereby said frame may be raised and lowered, and an operating frame or member
70 vertically movable within the hollow frame and engaging said levers; substantially as described.

8. The combination of a tongs-carrying member, tongs pivoted thereto and having lever-arms, a pair of levers fulcrumed on the
75 said member intermediately of the tongs-pivots, and extending in opposite directions from their fulcrum, and having a toothed engagement with the lever-arms of the tongs, and a vertically-movable tongs-operating
80 member having an operating engagement with the lever; substantially as described.

9. The combination of a tongs-carrying frame, tongs pivoted thereto and having lever-arms extending within said frame, a pair
85 of toothed levers fulcrumed on the frame intermediately of the tongs-pivots and engaged with the lever-arms of the tongs, and an operating frame or member vertically movable within the tongs-carrying frame and
90 engaging the free end portions of the said lever; substantially as described.

In testimony whereof we have hereunto set our hands.

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RAPHAEL S. KIRK.

Witnesses:

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EDWIN W. DIEHL.