

Dec. 19, 1939.

D. R. HILLIS

2,183,679

PORTABLE HYDRAULIC HOIST OR MOVABLE SCAFFOLD

Filed July 12, 1938

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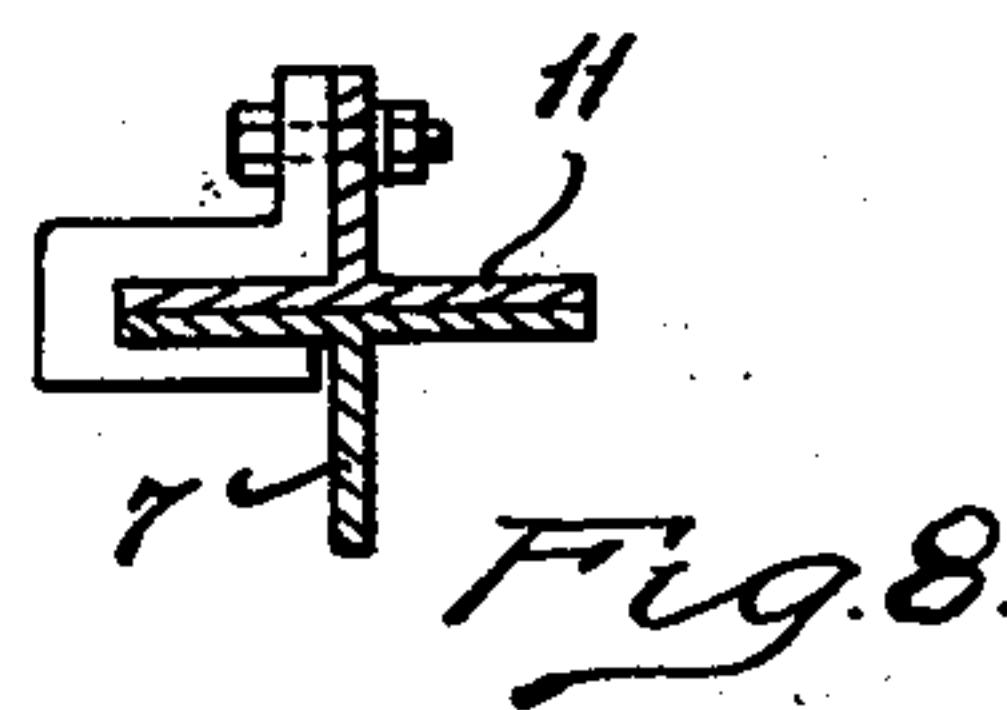
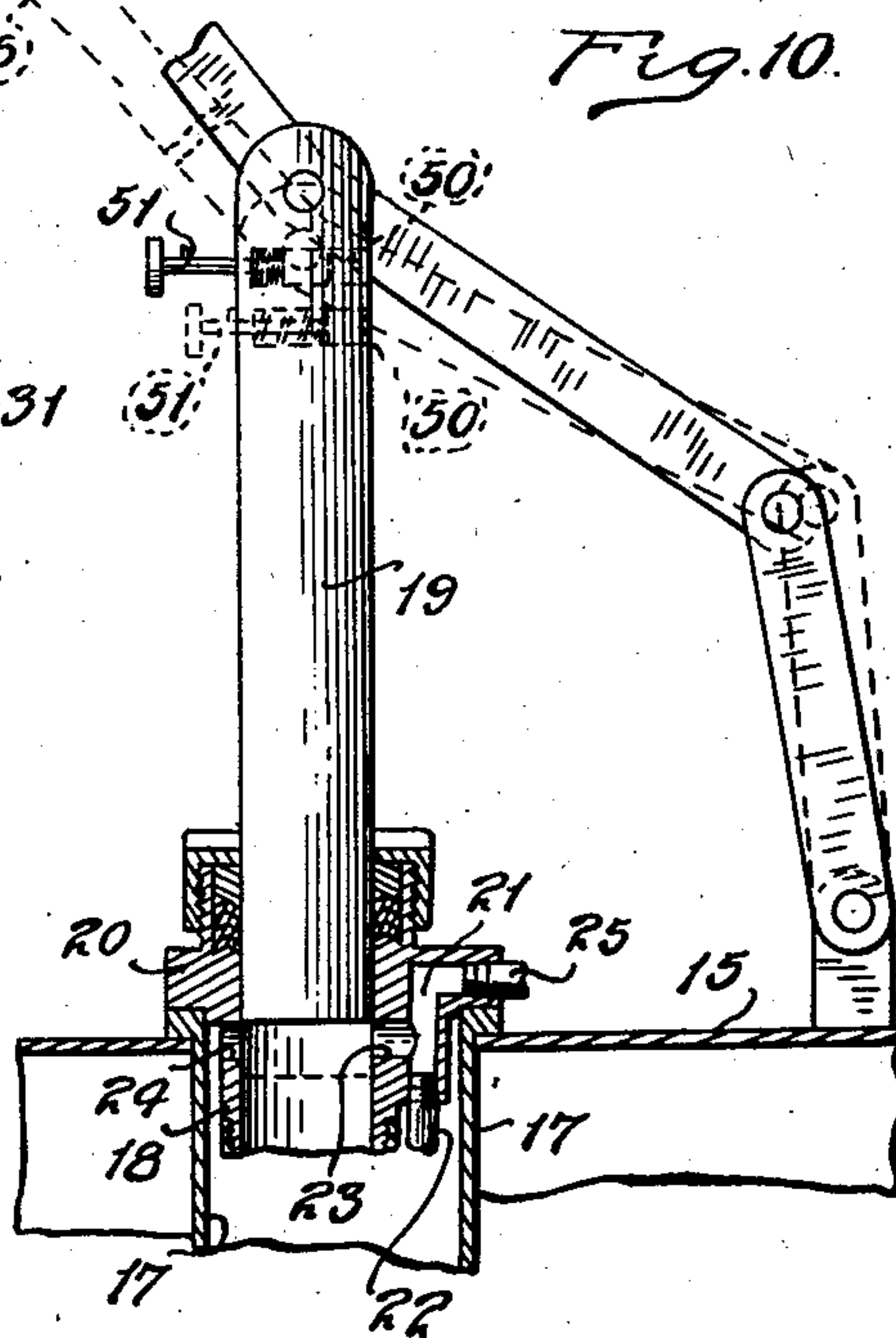
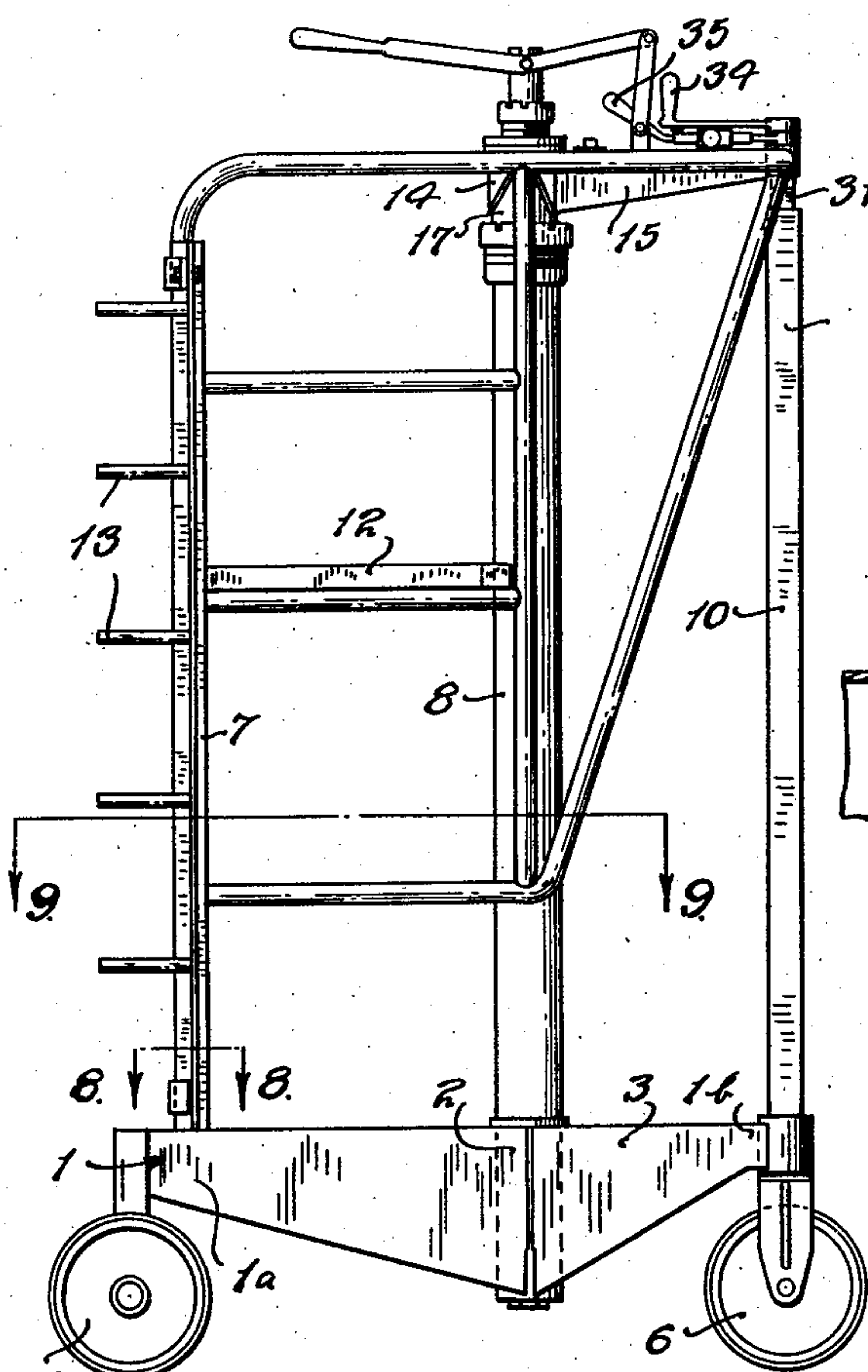
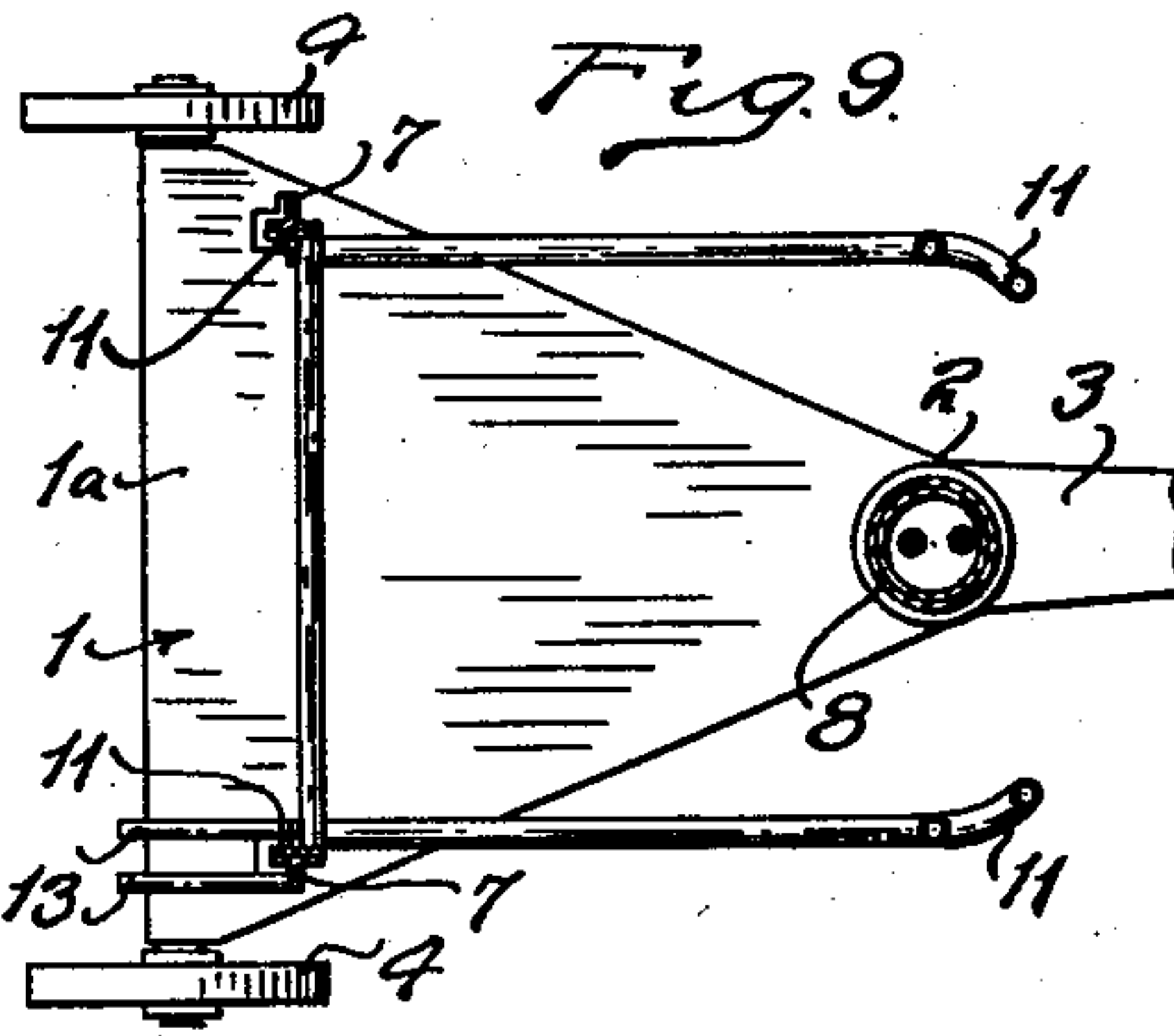
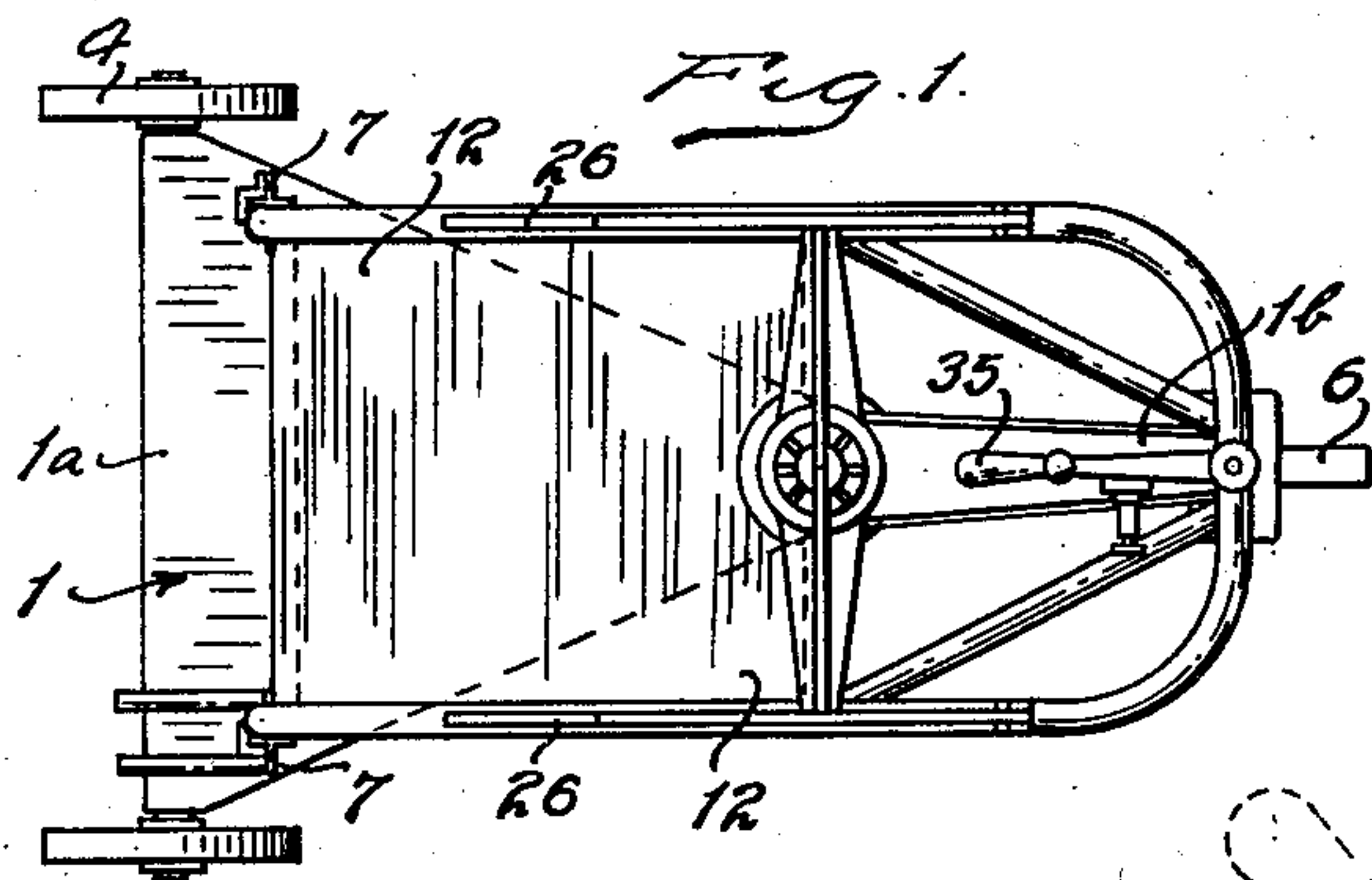


Fig. 2.

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Fig. 3.

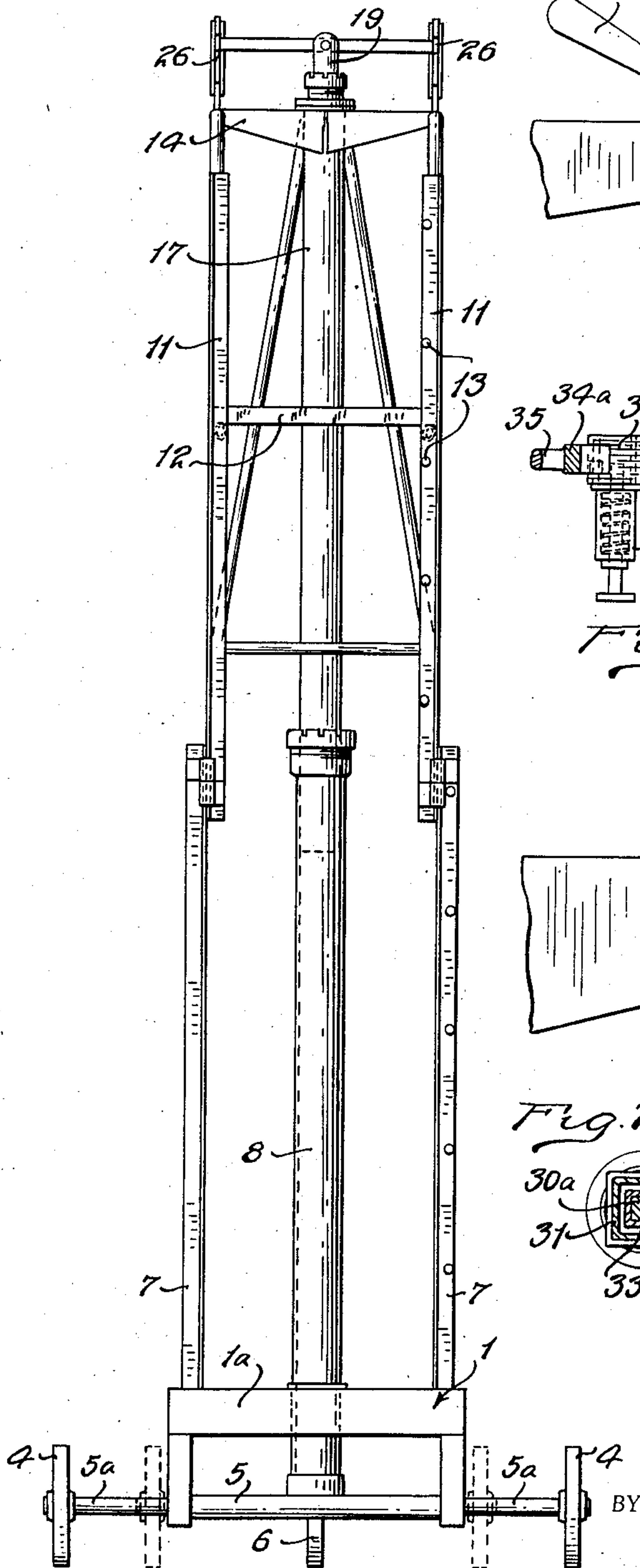


Fig. 5.

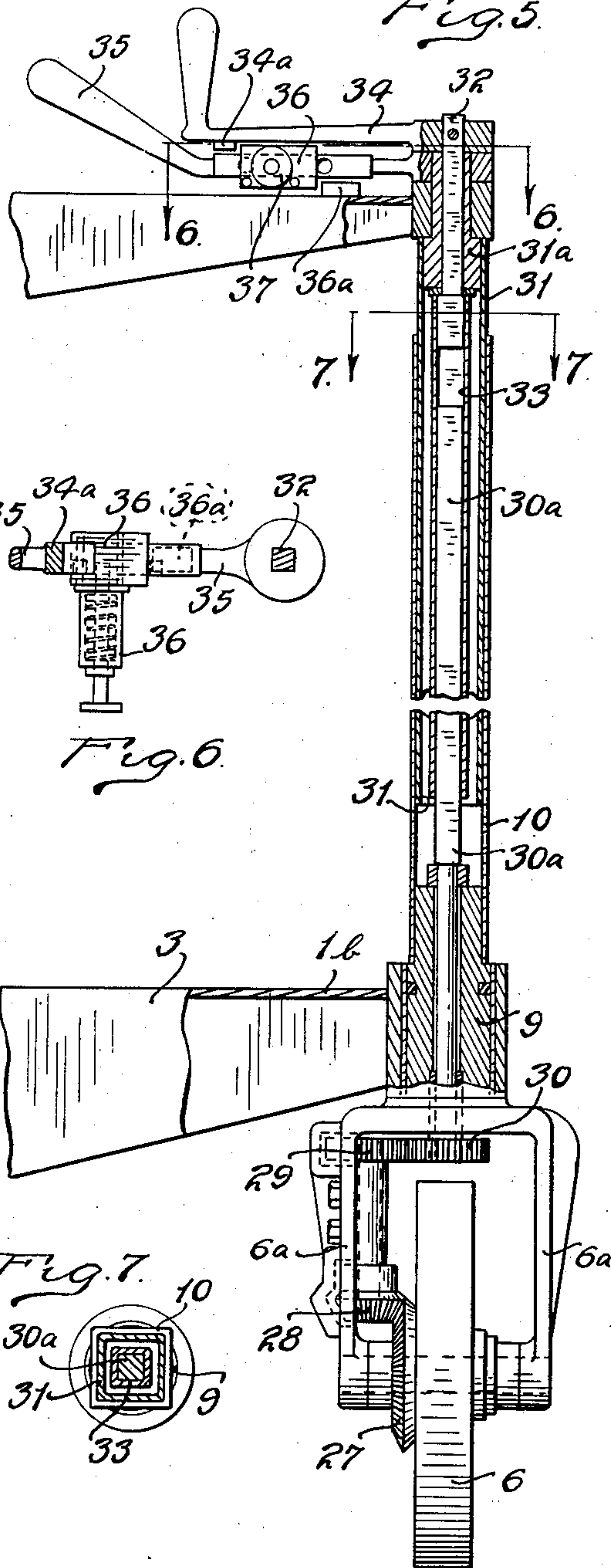


Fig. 6.

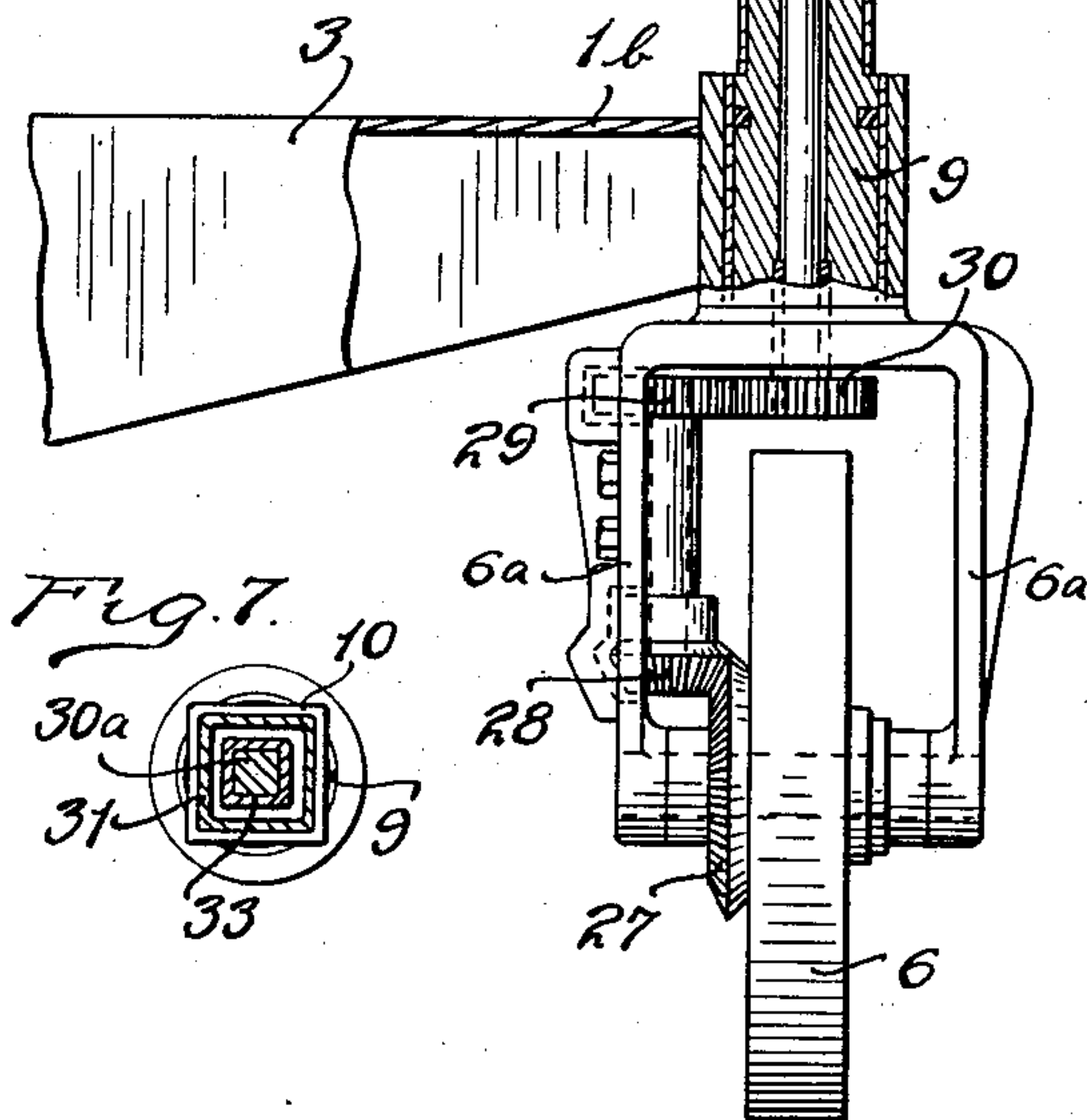
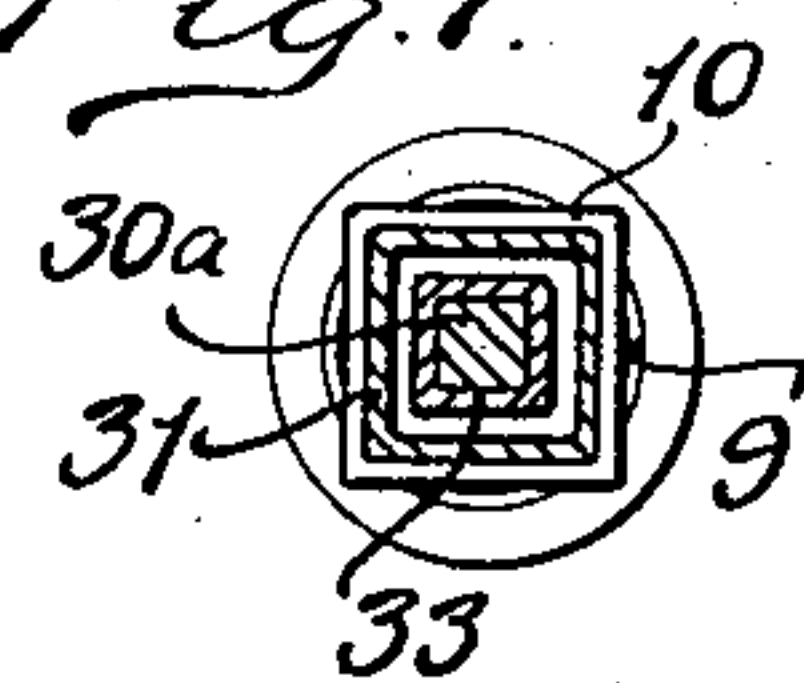


Fig. 7.



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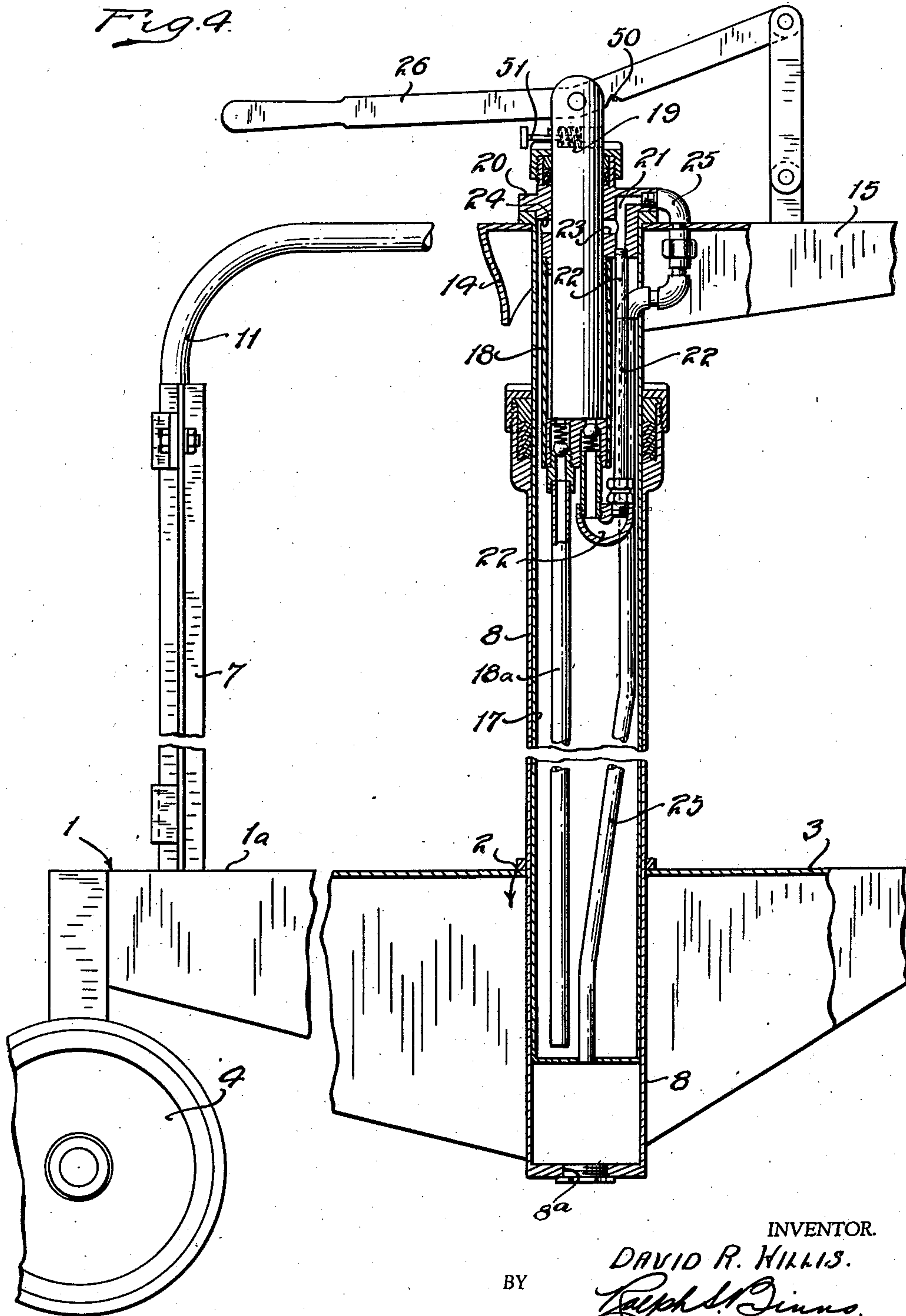
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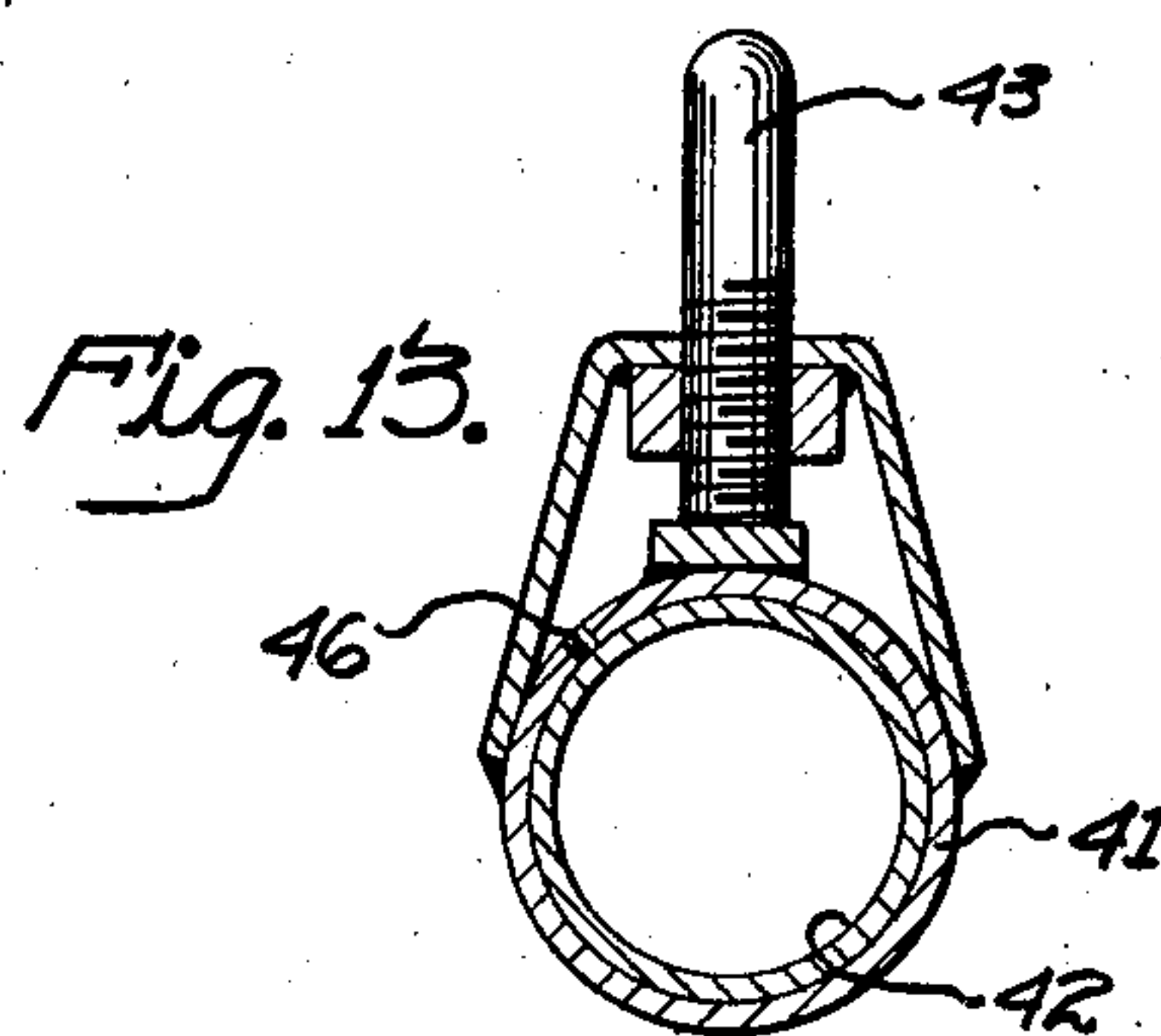
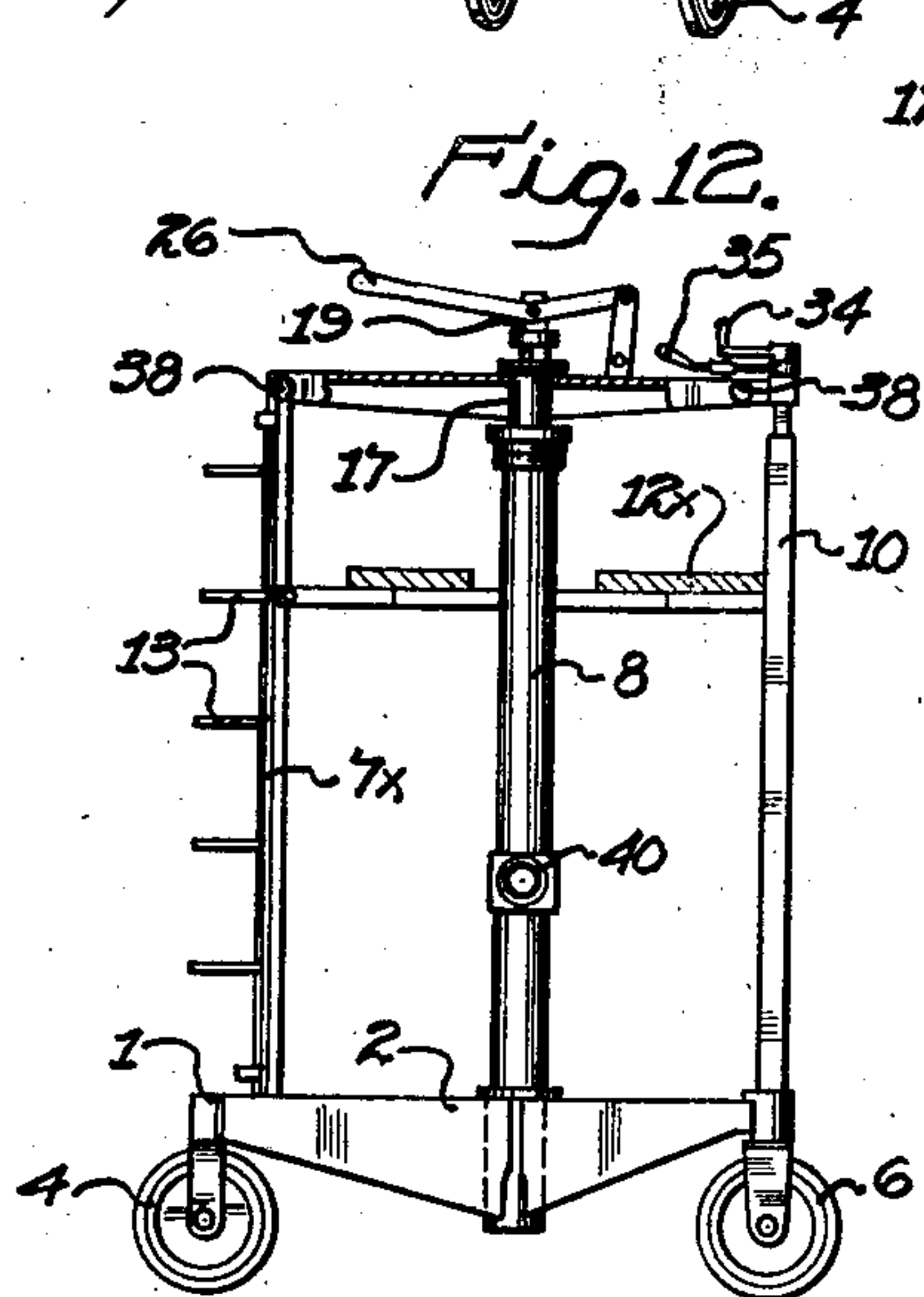
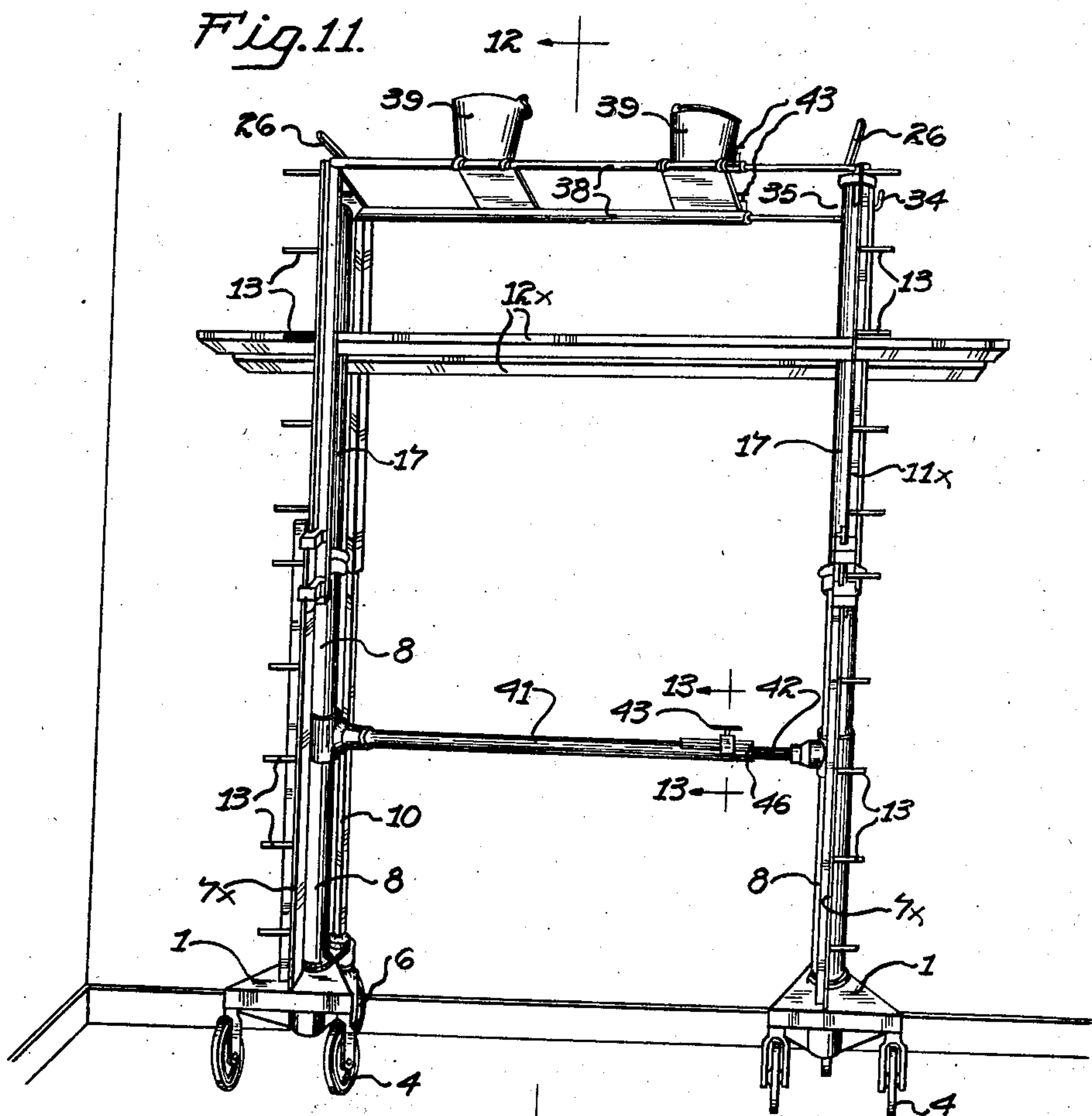
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PORTABLE HYDRAULIC HOIST OR MOVABLE SCAFFOLD

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,183,679

PORTABLE HYDRAULIC HOIST OR MOVABLE
SCAFFOLD

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Application July 12, 1938, Serial No. 218,888

7 Claims. (Cl. 304—9)

My invention relates to a movable scaffold and includes a platform adjustable in position vertically and horizontally by an operator on said platform, and by apparatus located at a lower level. The vertical adjustment is by hydraulic power.

In the accompanying drawings:

Fig. 1 is a plan view of an apparatus embodying my invention;

Fig. 2 is a side elevation looking from below Fig. 1, the platform being in its lower position;

Fig. 3 is an elevation looking from the left of Figs. 1 and 2, the platform being raised;

Fig. 4 is a sectional elevation to an enlarged scale, broken away intermediate its upper and lower ends and at the right hand side to economize room;

Fig. 5 is a sectional elevation of the part of the construction broken away at the right in Fig. 4;

Fig. 6 is a detail section on the line 6—6 Fig. 5;

Fig. 7 is a detail section on the line 7—7 Fig. 5;

Fig. 8 (sheet 1) is a detail section on the line 8—8 Fig. 2;

Fig. 9 is a section on the line 9—9 Fig. 2;

Fig. 10 is a sectional elevation to an enlarged scale of the pumping apparatus;

Fig. 11 (sheet 4) is a perspective view of a modified structure where duplicate positioning apparatus are used, shown in a portion of a room;

Fig. 12 is an elevation looking from the right of Fig. 11, to a reduced scale; and

Fig. 13 is a detail section on the line 13—13 Fig. 11, to an enlarged scale.

1 is a supporting platform, or supporting base, of sufficient breadth at its end 1a, its sides converging toward an intermediate point 2 and extending in a girder-like arm 3 to the other end, 1b.

4—4 are supporting wheels at opposite sides of the platform. At the end 1a thereof (Fig. 3) is a tube 5 extending across the platform 1 beneath its end 1a. 5a—5a are stub axles for the wheels 4—4 which extend into the ends of the tube 5 and slide out and into said tube to adjust the wheels 4—4 to different distances apart, to pass through a doorway, or to prevent the tipping of the scaffold when in raised position. They may be secured in adjusted position in any suitable manner. 6 is a wheel supporting the end 1b of the platform 1. The wheel 6 is adapted to turn about a vertical axis as hereinafter described.

7—7 are standards extending upward from the platform 1 at points adjacent to its corners at its end 1a. 8 is a tube extending vertically upward from the platform 1 at the point 2 to which

its sides converge. The wheel 6 (Fig. 5) has its axis bearing in the lower ends of the branches of a fork 6a which fork has a hub, or arbor, 9 fixed in the outer end of the arm 3 so as to turn about a vertical axis.

10 is a tube, square in cross-section as shown in Fig. 7, having its lower end fixed to the upper end of the hub 9 and extending upward to a point a little below that of the operating mechanism of the apparatus.

11 is a framework adapted to slide vertically on the uprights 7—7, and carrying the platform 12 upon which the workman stands.

13 indicates rods extending horizontally from a standard 7 and the corresponding part of the frame 11, serving as rounds of a ladder by which a workman may mount to the platform 12.

14 is a transverse girder extending between the side pieces of the frame 11, at the top thereof and 15 is a cantilever arm extending from the center of the girder 14 to a point just above the tube 10.

The tube 8 extends upward from the point 2 of the platform 1, to a point just below the center of the girder 14 where the arm 15 joins it, when the platform is in its lowest position. The tube 8, at that time, passes through an arcuate opening in the platform 1 and is provided with a drainage opening 8a at its lower end, as shown in Fig. 4. 17 is a tube fixed at its upper end to the girder 14, extending downward therefrom and fitting and adapted to slide in the tube 8. The lower end of the tube 17 is closed.

18 is a pump in the upper end of the tube 17, having a plunger 19 extending above the girder 14. 18a is the suction, or intake, pipe of the pump 18 open at the lower end in the tube 17. 20 is a casting closing the upper end of the tube 17 and forming the head of the pump 18. There is a cavity 21 formed in the head 20. 22 is the discharge pipe of the pump 18 leading to and opening into the cavity 21 in the pump head 20. The cavity 21 opens through a passage 23 to the interior of the cylinder of the pump 18 and through said cylinder and a passage 24 to the interior of the tube 17. 25 is a pipe leading from the cavity 21, mainly within the tube 17 and opening into the tube 8 through the bottom of the tube 17, (Fig. 4). 26—26 are handles by which the plunger 19 may be reciprocated.

50 is a notch in the lower edge of the pump handle 26, and 51 is a spring pressed pin adapted to engage said notch to prevent an accidental raising of said handle to release position.

The frame 11 is raised and lowered as follows:

The tubes 8 and 17 and pump 18 being full of

oil, the plunger 19 is reciprocated by one or both of the handles 26, drawing the oil from the tube 17 through the pipe 18a, and forcing it through the pipe 22 into the cavity 21 and from this
5 through the pipe 25 into the tube 8 below the lower closed end of the tube 17 thus forcing the tube 17 upward which carries with it the frame 11 and platform 12.

When it is desired to lower the frame 11, the
10 pin 51 is pulled outwardly against its spring pressure, thus preventing the pin from engaging the notch 50, the plunger 19 is raised until its lower end is above the passages 23—24 as shown in Fig. 10. Then the weight of the frame
15 11 will force the tube 17 downward, the oil passing from the lower end of the tube 18 through the pipe 25, cavity 21 and passages 23—24 into the tube 17.

Referring more specifically to Figs. 5, 6 and 7
20 (sheet 2).

27 is a bevel wheel on the shaft of the wheel
6. 28 is a bevel wheel on a vertical shaft bearing in a branch of the fork 6a and meshing with the bevel wheel 27. 29 is a pinion on the upper
25 end of the shaft of the bevel wheel 28. 30 is a gear wheel meshing with the pinion 29 and having a shaft bearing in, and extending upward through, the hub 9 co-axial therewith, and extending above said hub in a squared portion 30a
30 to a point near the upper end of the tube 10. 31 is a tube square in cross-section, extending and fitting into the tube 10 from the upper end of the latter and having a hub 31a, bearing and adapted to turn about a vertical axis, in the
35 outer end of the arm 15.

32 is a shaft extending and bearing in and through the bearing 31a coaxial therewith and adapted to turn about a vertical axis. The lower
40 end of the shaft 32 is square in cross-section. 33 is a tube square in cross-section upon the squared lower end of the shaft 32 and extending over and fitting and adapted to slide upon the square portion 30a of the shaft of the gear wheel 30.

34 is a handle by which the shaft 32 may be rotated and 35 is a handle by which the hub
45 31a and the tube 31 may be turned. 36 is a sliding block on the handle 35 by which said handle may be locked to the stationary lug 36a or to a lug 34a on the handle 34, or, when in an intermediate position, will leave the handle 35 free to
50 be moved independently of the handle 34. 37 is a click to fix the block 36 in its adjusted position.

The above described apparatus is operated to
55 move and direct the horizontal motion of the scaffold in the following manner. The block 36 is first moved outward to connect the handles 34 and 35. Said handles are then manipulated to rotate the tube 31 and consequently the tube
60 10 which latter carries the wheel 6 with it through the hub 9 until the wheel 6 is in the direction it is desired that it shall move. The sliding block 36 is then moved inward until the handle 35 is anchored to the lug 36a. The handle 34
65 is then turned which rotates the shaft 32, tube 33 and therethrough the squared portion 30a of the shaft of the gear wheel 30. This drives the wheel 6 through the pinion 29 and bevel gear wheels 28 and 27 to carry the scaffold
70 in the desired direction.

In the modification, Figs. 11 and 12, two constructions substantially like that above described,
75 are used, the wheels 4 here being pivotally mounted and the tube 8 is centrally mounted in each construction. A platform 12x is extended

between the two constructions. The upper ends of the simplified upper frame-work 11x are united by extensible rods or tubes 38, which may support required receptacles 39 and the single
5 standards 7x are joined by an extensible member 40, consisting of a tube 41 (Fig. 13) split at its end and a tube 42 extending into said split end. The parts of the split end of the tube 41 may be pressed together by a screw 43, bearing
10 in a part extending from one split portion over the other, the end of said screw engaging against said split portion.

Aside from the specific embodiments of the invention herein shown and described, it will be understood that numerous details of the construction may be altered or omitted without departing from the spirit and scope of the invention as disclosed and claimed, and that I do not
15 desire to limit the invention to the exact constructions herein set forth.

I claim:

1. In an apparatus of the kind described, a movable base, a vertically adjustable platform supported on said base, a steering wheel forming part of the support of said base, having a vertical
25 arbor rotatable in a bearing in said base, a hollow member forming an upward extension of said arbor, a member extending downward from said platform into the first mentioned member adapted to slide longitudinally in the same but restrained from turning relative thereto, and means operable from said platform for turning said member extending downward therefrom, means for rotating said wheel to move said
30 base, an extensible means passing axially through said members adapted to actuate said rotating means, and means operable from said platform for actuating said extensible means.

2. In an apparatus of the kind described, a movable base, a vertically adjustable platform
40 supported on said base, a steering wheel forming part of the support of said base, having a vertical arbor rotatable in a bearing in said base, a hollow member forming an upward extension of said arbor, a member extending downward from
45 said platform into the first mentioned member adapted to slide longitudinally in the same but restrained from turning relative thereto, and means operable from said platform for turning said member extending downward therefrom, means for rotating said wheel to move said base, an extensible means passing axially through said
50 members adapted to actuate said rotating means, and means operable from said platform for actuating said extensible means, and means for binding together at will the means for turning said member and the means for actuating said rotating means.

3. In an apparatus of the kind described, a vertically movable platform, a vertically extending tubular member below said platform, a tubular member extending downward from said platform, fitting and adapted to slide in the first
60 named tubular member, the lower ends of both of said tubular members being closed, and a pump at the upper end of the second named tubular member and extending into the same, having its intake communicating with the interior of the second named tubular member and its discharge port communicating with the first
65 named tubular member below the second named tubular member.

4. In an apparatus of the kind described, a vertically movable platform, a vertically extending tubular member below said platform, a tubu-
75

lar member extending downward from said platform, fitting and adapted to slide in the first named tubular member, the lower ends of both of said tubular members being closed, a pump at the upper end of the second named tubular member and extending into the same, having its intake communicating with the interior of the second named tubular member and its discharge port communicating with the first named tubular member below the second named tubular member, and means for putting the interior of said tubular members into connection at will.

5. In an apparatus of the kind described a vertically movable platform, a vertically extending tubular member below said platform, a tubular member extending downward from said platform, fitting and adapted to slide in the first named tubular member, the lower ends of both of said tubular members being closed, a pump having a plunger at the upper end of the second named tubular member and extending into the same, having its intake communicating with the interior of the second named tubular member and its discharge passage communicating with the first named tubular member below the second named tubular member, and a passage between the interior of said second tubular member and the first named tubular member, so located that it shall be closed by said plunger during the normal travel of the same and will be opened by said plunger passing beyond its normal travel.

6. In an apparatus of the kind described a vertically movable platform, a vertically extending tubular member below said platform, a tubular member extending downward from said platform, fitting and adapted to slide in the first named tubular member, the lower ends of

both of said tubular members being closed, a pump having a plunger at the upper end of the second named tubular member and extending into the same, having its intake communicating with the interior of the second named tubular member and its discharge passage communicating with the first named tubular member below the second named tubular member, a passage between the interior of said second tubular member and the first named tubular member, so located that it shall be closed by said plunger during the normal travel of the same and will be opened by said plunger passing beyond its normal travel, and a displaceable means for limiting the normal travel of said plunger.

7. In an apparatus of the kind described a vertically movable platform, a vertically extending tubular member below said platform, a tubular member extending downward from said platform fitting and adapted to slide in the first named tubular member, the lower ends of both of said tubular members being closed, a pump having a cylinder head and plunger reciprocating therethrough at the upper end of the second named tubular member and extending into the same, a passage in said cylinder head opening from the bore in which said plunger reciprocates upon both sides of said plunger, said pump having its intake communicating with the interior of the second named tubular member and its discharge passage communicating with said passage in the cylinder head on one side of said plunger and with the first named tubular member below the second named tubular member, said passage in the cylinder head opening to the interior of said second tubular member on the opposite side of said plunger.

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