

(No Model.)

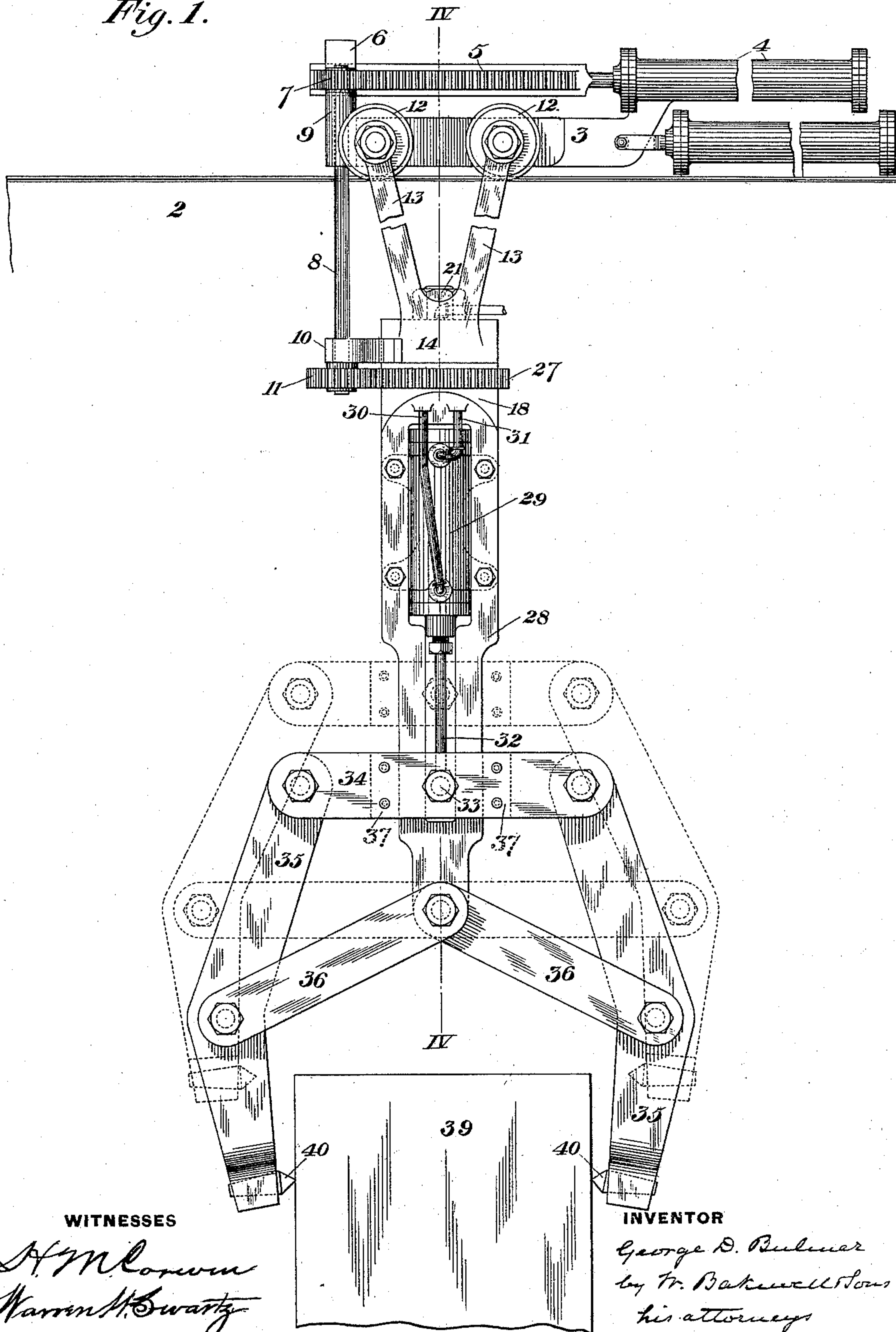
2 Sheets—Sheet 1.

G. D. BULMER.
HYDRAULIC CRANE MECHANISM.

No. 477,621.

Patented June 21, 1892.

Fig. 1.



WITNESSES

A. M. Brown
Harmon H. Swartz

INVENTOR

George D. Bulmer
by Tr. Baker & Sons
his attorneys

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Fig. 2.

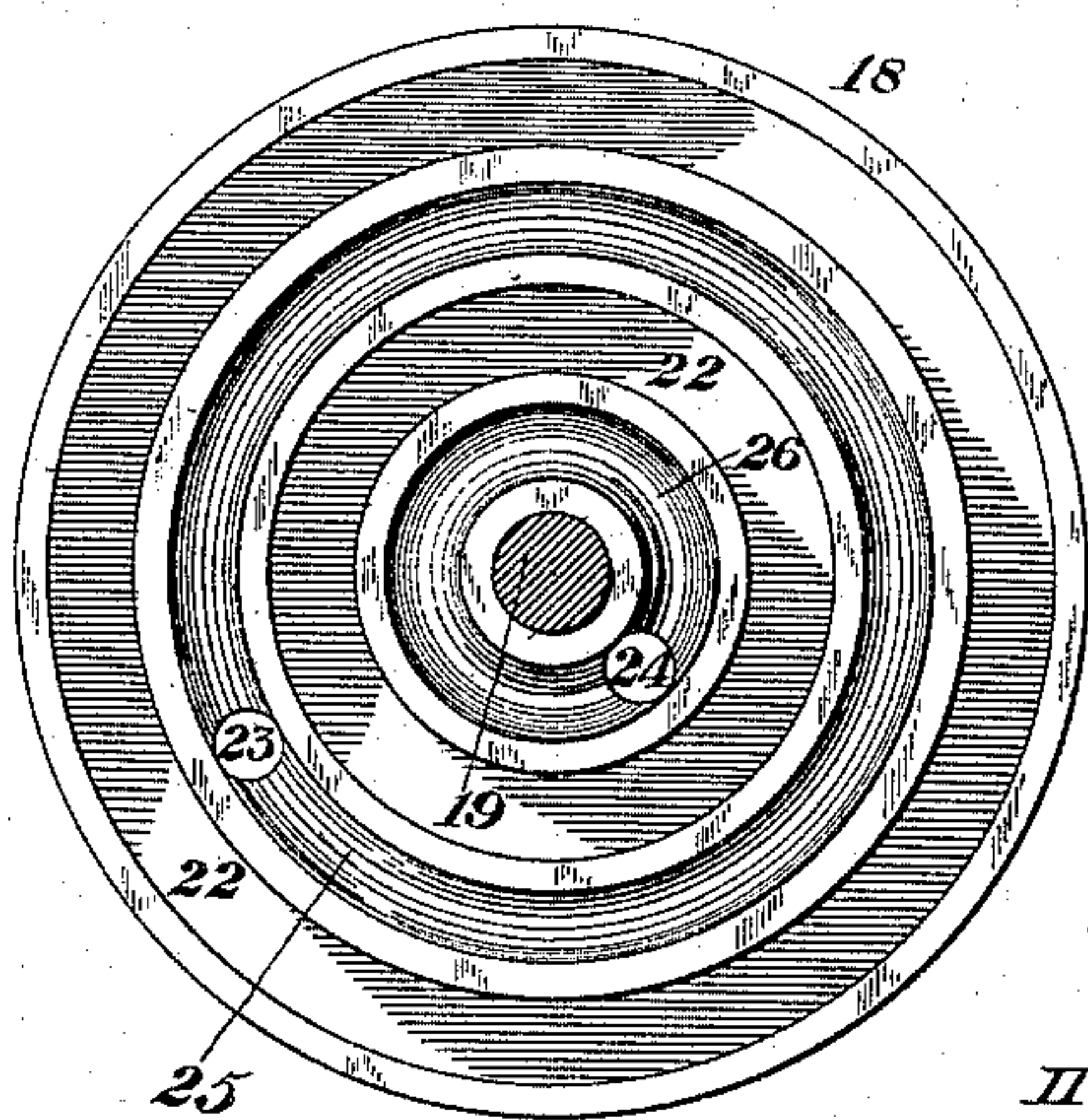


Fig. 4.

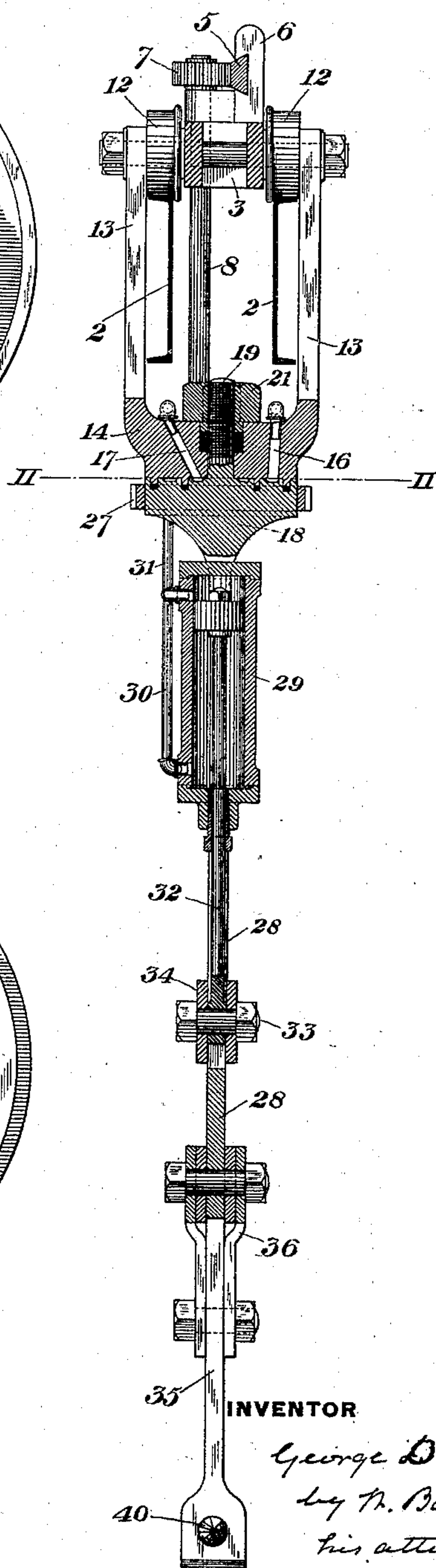
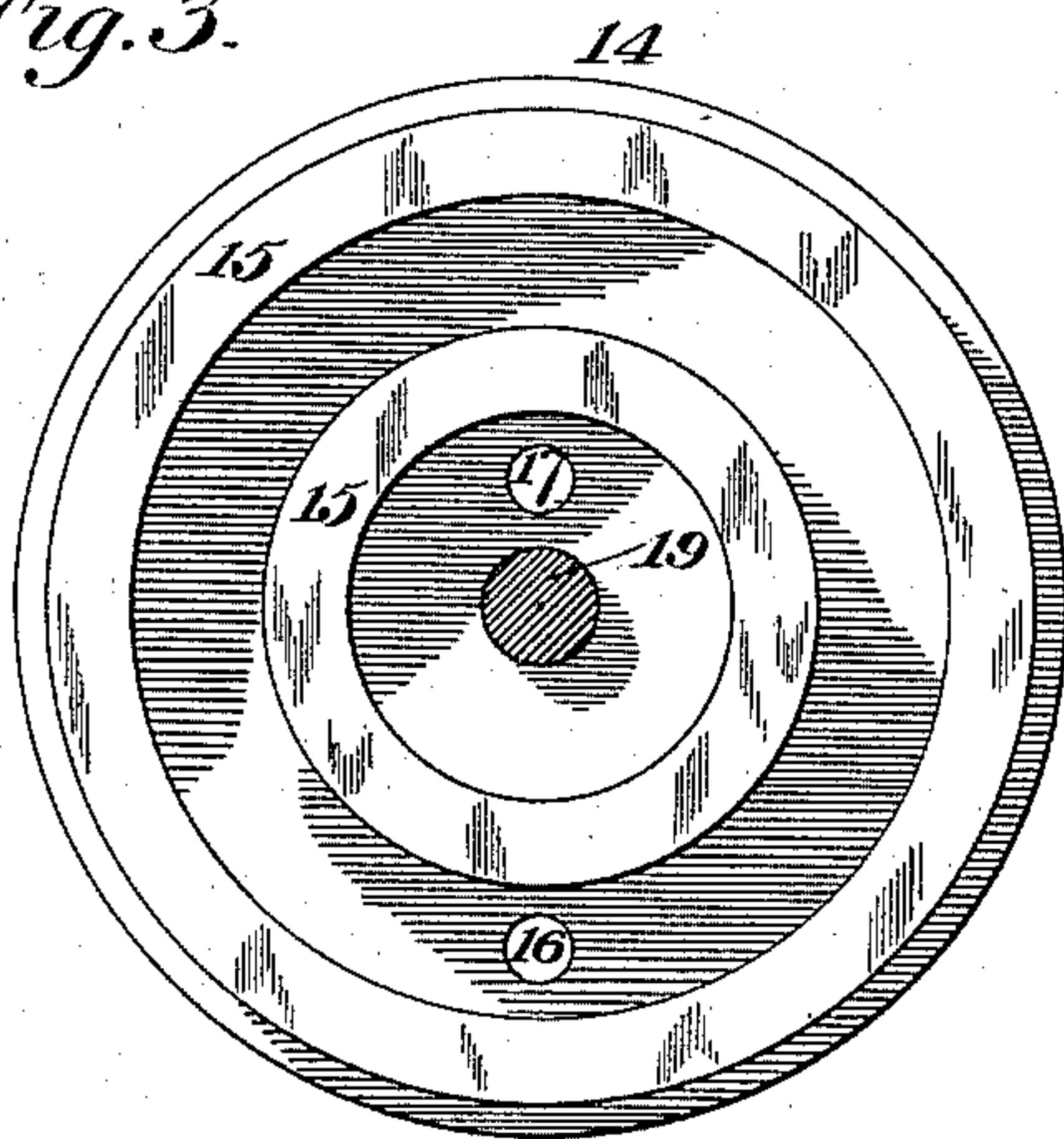


Fig. 3.



WITNESSES

W. M. Conover
Warren H. Swartz

INVENTOR

George D. Bulmer
by Th. Bakerwell
his attorneys

UNITED STATES PATENT OFFICE.

GEORGE D. BULMER, OF DUQUESNE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO FREDERICK NORRIS, OF SAME PLACE.

HYDRAULIC CRANE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 477,621, dated June 21, 1892.

Application filed March 11, 1892. Serial No. 424,520. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. BULMER, of Duquesne, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Hydraulic Crane Mechanism, 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 side elevation of a pair of ingot-tongs provided with my improved water connections. Fig. 2 is a plan view of the lower half of the water connection, looking downwardly on the line II II of Fig. 1. Fig. 3 is a bottom plan view of the upper half of the same connection; and Fig. 4 is a vertical sectional view of the apparatus, taken on the line IV IV of Fig. 1.

My invention relates to the operation of the mechanism depending from the trolley of a crane and more especially to the operating of ingot-tongs; and it consists in an improved water connection for use therein, though the device is capable of general use in crane mechanism and may be employed at the top or bottom steadiment of the crane or wherever water is supplied from a stationary to a rotatory portion.

It also consists in the combination of parts, as hereinafter more fully described, and set forth in the claims.

In the drawings, 2 indicates the jib of a crane, on which reciprocates the trolley 3, carrying on its upper part the hydraulic cylinder 4 and rack 5, which forms a continuation of the piston-rod of said cylinder. This rack is supported at its outer end in a suitable bearing 6 and engages a pinion 7, carried at the upper end of a shaft 8, which passes through vertical bearings 9 and 10 and bears at its lower end the pinions 11. Depending from the outer protruding ends of the shafts carrying the trolley-wheels 12 are the arms 13, which are four in number and are rigidly connected with the upper half 14 of the bearing and water connection. The upper half-bearing, as shown in Fig. 3, consists of a circular plate having two downwardly-projecting rings 15 and two ports 16 and 17, passing through the plate, the one leading into the

space between the two concentric rings and the other into the space inclosed by the inner ring. The lower portion 18 of the bearing, which is held in engagement with the upper part 14 by the pivot-pin 19, which passes up through a central perforation in the upper half and is provided with a nut 21, is provided with annular recesses 22, into which take the rings 15, and with ports 23 and 24, located similarly to those of the upper half, as shown in Fig. 2.

Between the recesses 22 is an annular groove 25, and inside the inner recess is a similar groove 26, these grooves communicating with the ports 23 and 24, so that said ports have a constant communication with the ports 16 and 17 no matter into what position the lower half is turned. A circular rack or gear-wheel 27 is provided on the exterior of the lower half-bearing, with which meshes the pinion 11, so that any movement of the rack causes a circular motion of the device suspended from the bearing, in this case an ingot-tongs. These tongs are suspended from a frame 28, which is secured to a downward extension of the bearing and carries the hydraulic cylinder 29, connecting with the ports of the lower half-bearing by the pipes 30 and 31. The piston-rod 32 of the cylinder moves in a vertical slot in the lower part of the frame, and at its lower end is provided with a collar, which takes about the pivot-pin 33. This pivot-pin passes through the cross-bar 34, to the ends of which are pivoted the tong-levers 35. To the lower end of the frame are pivoted the toggle-links 36, which at their outer ends are pivotally connected with the tong-levers. The cross-bar consists of two plates held apart by the separating-blocks 37, which form guides for the movement of the bar, these plates inclosing the frame 28. 39 represents the ingot, and the gripping-pins in the ends of the tong-levers. Suitable telescoping or flexible pipes lead to the upper ends of ports 16 and 17, and to the cylinder 4 upon the trolley lead other flexible pipes to convey motive fluid to and lead the waste from the cylinders.

The operation of the device is obvious. The trolley being moved along the jib to the proper place, motive fluid, being admitted to the cylinder 4, turns the tongs into the proper po-

sition, while by means of the cylinder 29 the tongs are actuated to grip the ingot. The jib carrying the trolley and tongs is then lifted, raising the ingot from its support, and the jib
5 is then turned and the trolley moved along the same to bring the ingot to the place desired, when the tongs are actuated to release the ingot.

The advantages of the device are obvious.
10 A simple and effective means for supplying water to the tong-actuating cylinder is obtained, which means is also applicable to any portion of the crane mechanism, the ordinary ball-and-socket joint being dispensed with,
15 and I desire to claim the same broadly. The tong mechanism also may be used without the particular trolley and water connection shown, the frame 28 being hung from a suitable swivel, as ordinarily, and flexible or tele-
20 scoping pipes employed to lead the fluid to and from the cylinder 29.

Many changes may be made in the form and arrangement of the parts without variance from my invention, since

25 What I claim is—

1. A water connection for cranes, consisting of two bearing-plates, registering ports in the plates, annular passages communicating with the ports, independent supply and exhaust
30 pipes leading to the ports of one plate, and similar pipes leading from the ports of the other plate to a motive cylinder upon the crane, substantially as and for the purposes described.

35 2. A water connection for cranes, consisting of two bearing-plates, one having projecting concentric rings working in suitable annular recesses in the other plate, registering ports in the plates, annular concentric grooves com-
40 municating with the ports, independent supply and exhaust pipes leading to the ports of one plate, and similar pipes leading from the ports of the other plate to a motive cylinder upon the crane, substantially as and for the
45 purposes described.

3. A water connection for cranes, consisting of two bearing-plates, one having projecting concentric rings working in suitable annular recesses in the other plate, registering ports
50 in the plates, one set between the rings and the other within the inner ring, annular concentric grooves communicating with the ports, independent supply and exhaust pipes lead-
55 ing to the ports of one plate, and similar pipes leading from the ports of the other plate to a motive cylinder upon the crane, substan-
tially as and for the purposes described.

4. In crane mechanism, a trolley having supported beneath the same a plate provided

with ports, a second rotatory plate bearing 60 against the first-named plate and having registering ports, and annular grooves communicating with said ports, means for rotating the latter plate, independent supply and exhaust
65 pipes leading to the ports of one plate, and similar pipes leading from the ports of the other plate to a motive cylinder upon the crane, substantially as and for the purposes described.

5. In crane mechanism, a trolley having 70 supported beneath the same a plate provided with ports, a second rotatory plate bearing against the first-named plate and having registering ports and annular grooves communi-
75 cating with said ports, a tong mechanism suspended from the rotatory plate, and a cylinder for actuating the same, having passages lead-
ing to the ports in the rotatory plate, means for rotating said plate, and independent supply
80 and exhaust pipes leading to the ports in the stationary plate, substantially as and for the purposes described.

6. In crane mechanism, a trolley carrying 85 beneath the same a frame, a hydraulic cylinder carried on the frame, a cross-head actuated thereby, tong-levers pivoted to the ends of the cross-head, and toggle-arms pivoted to the lower end of the frame and to the tong-
90 levers, substantially as and for the purposes described.

7. The combination, with a crane, of a tong 95 mechanism carried thereby and comprising a frame supporting a motive cylinder, a cross-head connected to the piston of said cylinder, tong-levers pivoted to said cross-head, and
toggle-links connecting the lower end of the frame and the tong-levers, substantially as and for the purposes described.

8. In crane mechanism, a trolley having 100 supported beneath the same a plate provided with ports, a second rotatory plate bearing against the first-named plate and having registering ports and annular grooves communi-
105 cating with said ports, a pair of tongs arranged to be actuated by a hydraulic cylinder carried by the lower plate, a rack upon the trolley engaging a pinion upon a shaft
which carries a second pinion engaging a circular rack upon the lower bearing-plate, and
110 means for reciprocating said rack, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 16th day of February, A. D. 1892.

GEORGE D. BULMER.

Witnesses:

C. BYRNES,
W. B. CORWIN.