

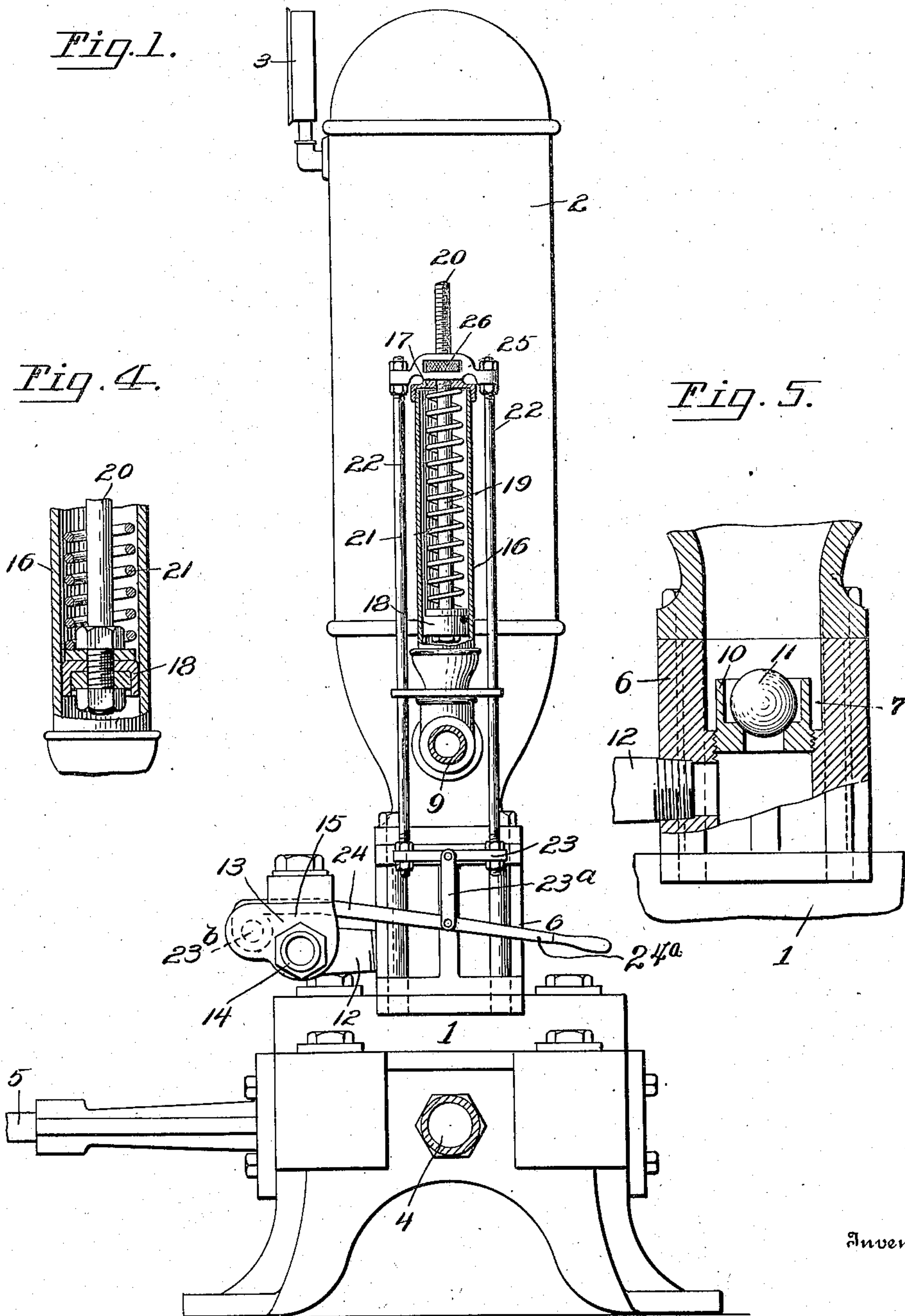
D. W. WADSWORTH.
PORTABLE SPRAYING APPARATUS.
APPLICATION FILED APR. 17, 1907.

932,520.

Patented Aug. 31, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



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Witnesses

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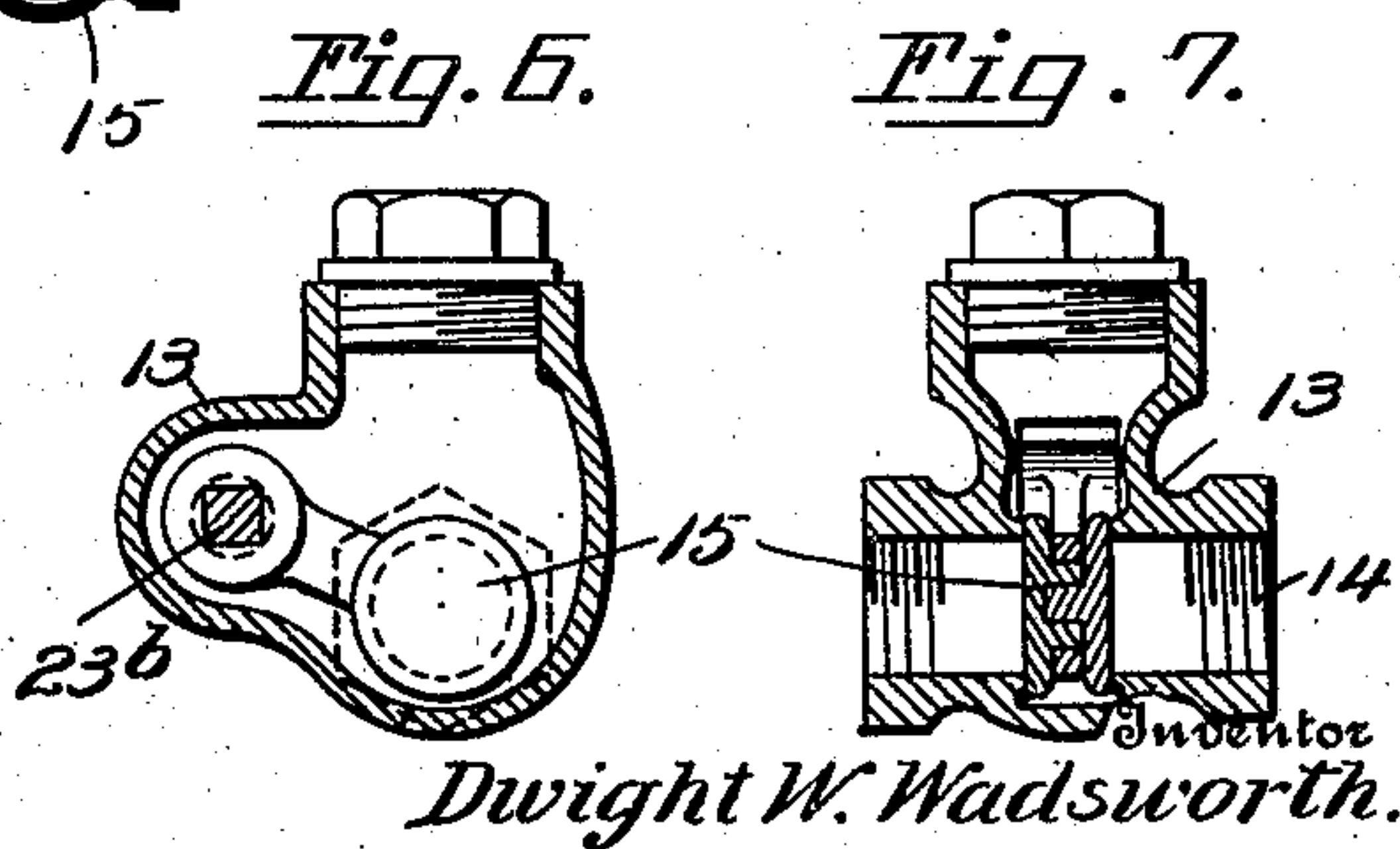
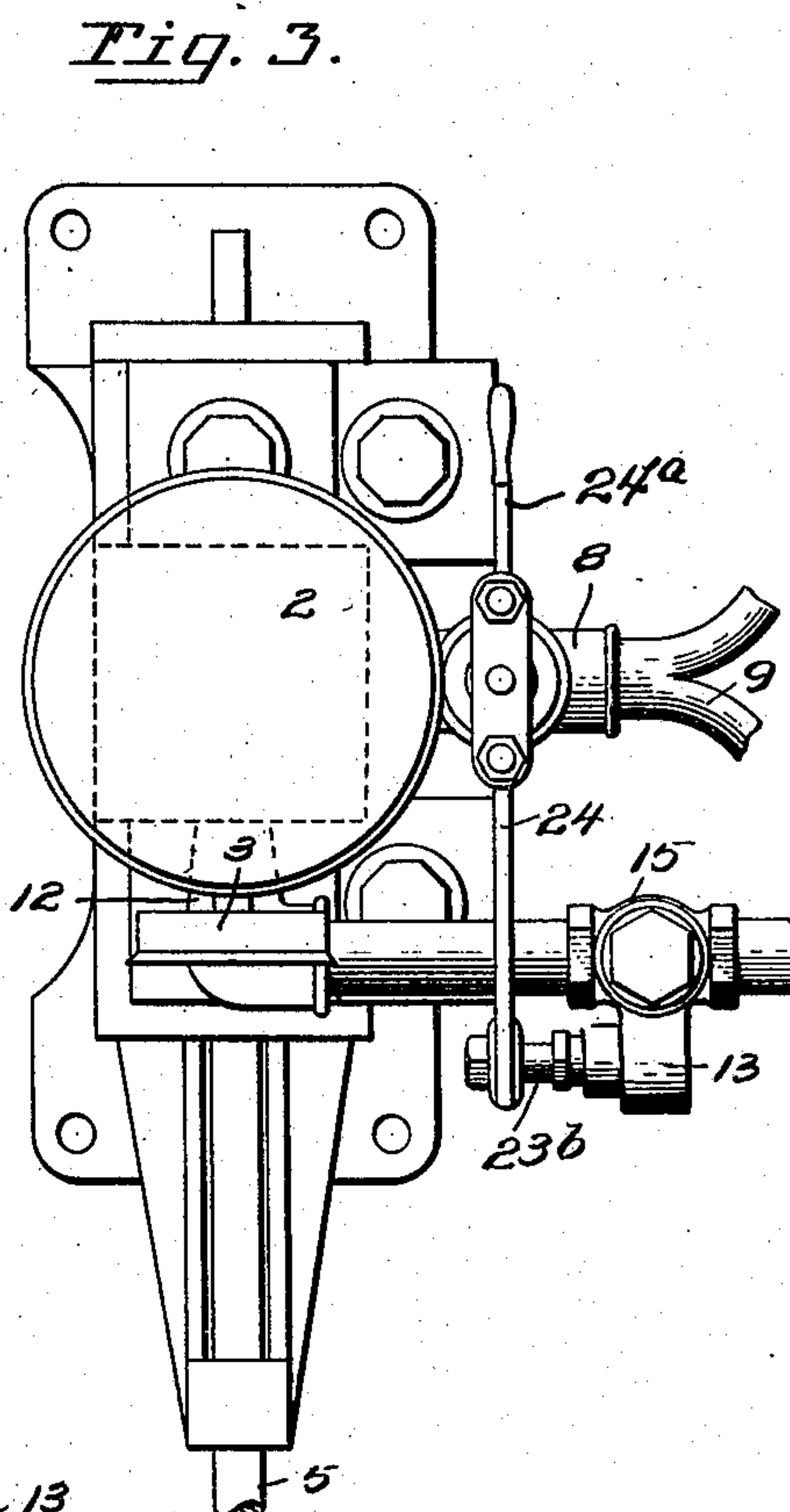
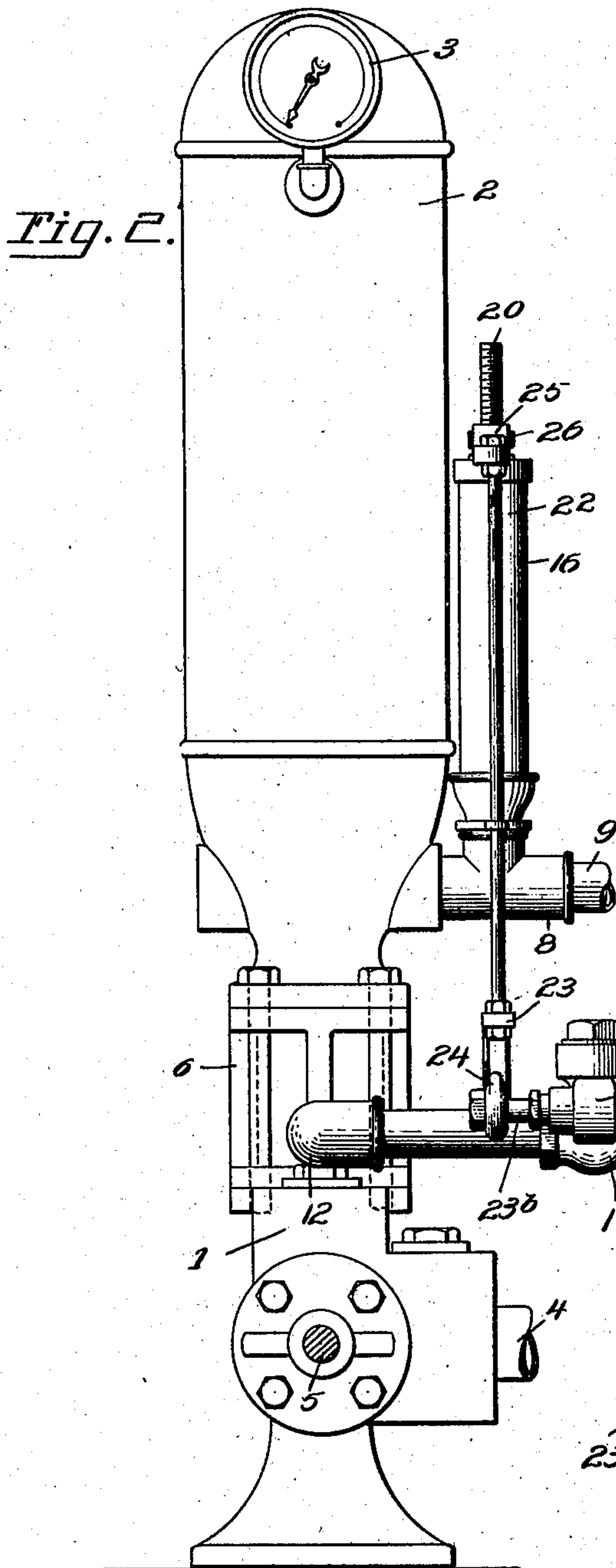
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

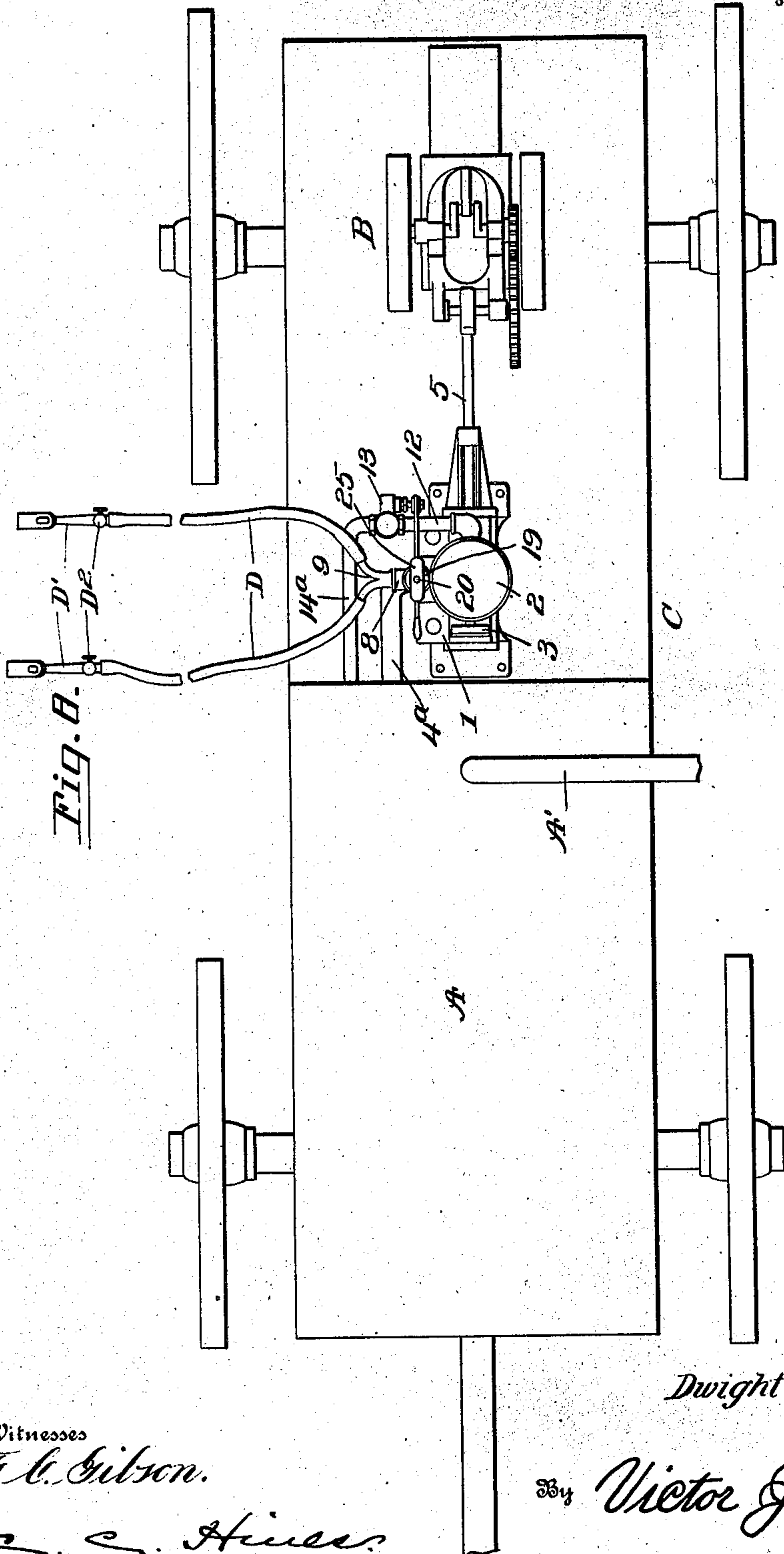


Fig. B.

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UNITED STATES PATENT OFFICE.

DWIGHT W. WADSWORTH, OF BANGOR, MICHIGAN.

PORTABLE SPRAYING APPARATUS.

932,520.

Specification of Letters Patent.

Patented Aug. 31, 1909.

Application filed April 17, 1907. Serial No. 368,719.

To all whom it may concern:

Be it known that I, DWIGHT W. WADSWORTH, a citizen of the United States, residing at Bangor, in the county of Van Buren and State of Michigan, have invented new and useful Improvements in Portable Spraying Apparatus, of which the following is a specification.

This invention relates to improvements in portable sprayers of that type for spraying trees, etc., with a liquid insecticide and employing a pump having an air chamber and designed to be operated by a gasoline or other similar motor.

It is preferable for many reasons to have the pump and motor operate continuously, but such an operation is inexpedient with present constructions, as no means are afforded to relieve the air chamber from an excess pressure which would be produced by the continual action of the pump when the discharge of the liquid through the sprayer pipe or pipes is cut off, as during the transportation of the apparatus from tree to tree.

The object of the present invention is to provide a means for permitting the liquid in the pump to pass back to the supply tank or reservoir when it is not being sprayed and allowing the motor and pump to operate continuously.

With the above and other objects in view, the invention consists of the novel construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a front elevation of a spraying apparatus embodying the invention. Fig. 2 is a side elevation thereof. Fig. 3 is a top plan view. Fig. 4 is a section through the lower portion of the pressure device for operating the relief valve. Fig. 5 is a vertical section through the flow connection between the pump and air chamber. Figs. 6 and 7 are views of the relief valve. Fig. 8 is a plan view of the complete transportable apparatus.

Referring to the drawings, the numeral 1 designates a liquid suction and discharge pump, above which is arranged an air pressure chamber 2, provided with a pressure gage 3. The pump 1 is preferably one of a type especially adapted for use in a spray-

ing apparatus, such as a Deming double-acting spray pump. This pump is provided with the usual intake and outlet check valves and with an inlet 4 designed to be suitably connected as by a pipe 4^a with the tank or reservoir A containing the solution to be sprayed.

5 designates the piston rod of the pump which is driven in practice from a suitable motor, preferably a gasoline or other hydrocarbon motor B. The parts of the apparatus are mounted upon a vehicle or wheeled support C for ready movement across a field in the operation of spraying the trees. It is desirable in practice to have the pump operate continuously in order to avoid the wear, tear and labor caused by the necessity of frequently starting and stopping the motor in the transportation of the apparatus from tree to tree. As usual in such appliances, the discharge port of the pump is connected with the lower end or inlet of the air chamber 2 by a connection 6 providing a port or passage 7 communicating with the lower inlet end of the air chamber, from which inlet end of said chamber extends an outlet 8 to which the spray pipe or pipes D of the apparatus are coupled, such pipe or pipes being provided with spraying nozzles D' and controlling valves D². In the present instance a Y-coupling 9 is shown connected with the outlet 8 for the application of a pair of discharge pipes or tubes D of the character described. A portion of the wall of the passage 7 is interiorly threaded to receive a cup-shaped valve seat or cage 10 having a port therein controlled by a check valve 11, preferably of the ball type, said valve serving to admit liquid to the chamber 2 and maintain a determined pressure therein. A' is a pipe for filling the tank A.

It will be understood that when the discharge of the liquid is cut off by closing the valves in the discharge pipes or nozzles, the pump can not be continued in action for any considerable period of time in the ordinary type of apparatus without liability of danger or the increase of pressure to such an extent that the pump could not operate. In order to overcome this objection, the present invention provides means whereby after the discharge of liquid is cut off and the pressure increases to a predetermined extent the liq-

uid will be forced through an automatically opened auxiliary outlet back to the tank, thus allowing the pump to continually operate, the construction being such as to automatically close said outlet for the supply of the liquid to the discharge pipe when the valves in the latter are again opened and the pressure decreased to the normal point. To this end an outlet pipe 12 is provided and communicates with the passage 7 of the connection 6 below the check valve 11, and this pipe communicates with a valve chamber 13 having an outlet 14 for a suitable return connection, as a pipe 14^a, to the tank, the flow of the fluid through said valve chamber being controlled by a valve 15. A pressure-controlled or regulated device is provided to control the valve 15 and comprises a tube or cylinder 16 communicating at its lower end with the outlet 8 and closed at its upper end by a head or cap 17. In said tube or cylinder is arranged a piston or diaphragm 18 connected to the lower end of a stem 19 projecting loosely at its upper end through an opening in the cap 17, the said upper end of the stem being provided for a suitable distance with screw threads 20. The piston is subjected to the pressure of the air entering the lower end of the tube 16 from the chamber 2, and its upward movement under such pressure is resisted by the action of a spring 21, inclosing the stem between the piston and head 17. When the pressure in the tube 16 rises to a determined degree above the normal pumping pressure, the piston is forced upwardly in said tube against the resistance of the spring. A connecting rod is employed to transmit motion from the piston to the valve 15, and is herein shown in the form of a yoke 21 composed of parallel arms 22 arranged on opposite sides of the tube and outlet 8 and connected at their lower ends by a cross-piece 23, pivotally attached by a link 23^a to a lever 24 connected with a crank arm 23^b attached to the valve 15, whereby the up and down movements of said connecting rod or yoke will raise and lower the lever and consequently, by a rocking motion, open and close the valve. The upper ends of the arms 22 are connected by a cross piece or head 25 having a vertical opening through which the stem 19 extends, and formed with a slot receiving a nut 26 engaging the threaded portion of the stem by which the latter may be adjusted to regulate the stroke or extent of movement of the rod and consequently the degree of opening movement of the valve under different pressures. Preferably the lever 24 has its free end extending beyond the link and formed to provide a handle 24^a whereby said lever may be manually operated to open the relief valve when it is desired, at any time and without regard to the pressure in the air chamber, to have the pumped liquid pass back to the tank.

The apparatus operates in the usual manner when the valves in the discharge pipes are open, the valve 15 being closed and the liquid discharging through the outlet 8. When the valves in the discharge pipes are closed, however, and the pressure increases above the normal from the continued operation of the pump, the piston 18 will be elevated to a proportionate extent, according to the increased pressure, and will open the valve 15, thus allowing the liquid being pumped to pass through the outlet 14 back to the tank. Upon the opening of the valve 15, it will be understood that the decrease of pressure on the underside of the valve 11 will cause said valve to automatically close, thus retaining the normal air pressure within the chamber 2. This operation will continue as long as the valves in the discharge pipes are closed and the pressure exceeds the normal pumping pressure, allowing the liquid pumped from the tank to be returned thereto. The closing of the valve 11 during these conditions also causes the load to be taken off the motor, because it does not pump against any air pressure when the valve 15 is open and said valve 11 closed. When the valves in the discharge pipes are again opened for the spraying of the solution, the pressure in the bottom of the tube 16 decreases and the spring 21 restores the piston to normal position, thus moving the yoke downward and closing the valve 15, the resulting increase of pressure causing the check valve 11 to open for the operation of the pump against the air pressure in the chamber 2.

It will accordingly be seen that by the use of the novel features of the invention, the pump may operate continuously, thus materially increasing the efficiency of spraying apparatus of this type.

Having thus described the invention, what is claimed as new, is:—

1. A relief mechanism for spray pumping apparatus comprising a pivoted relief valve, a pressure cylinder adapted to be connected at its lower end with the air chamber of the pump, a spring retracted piston arranged therein, a yoke connected at its upper end to the piston rod, a lever connected with the controlling valve, and a pivotal connection between said lever and the lower end of the yoke.

2. A relief mechanism for spray pumping apparatus comprising a pivoted relief valve, a pressure cylinder adapted to be connected at its lower end with the air chamber of the pump, a spring retracted piston operating in said cylinder, a lever operatively connected with said relief valve, and a rod adjustably connected at its upper end with the piston stem and pivotally connected at its lower end with the lever.

3. A relief mechanism for spray pumping

apparatus comprising a pivoted relief valve,
a pressure cylinder adapted to be connected
at its lower end with the air chamber of the
pump, a spring retracted piston movable in
5 said cylinder and having an upwardly ex-
tending threaded stem, a lever connected
with the relief valve, a yoke, means adjust-
ably connecting the yoke with the piston

stem, and a link connecting the lower end
of the yoke with the valve lever.

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

DWIGHT W. WADSWORTH.

Witnesses:

C. M. Doon,
L. J. Lewis.