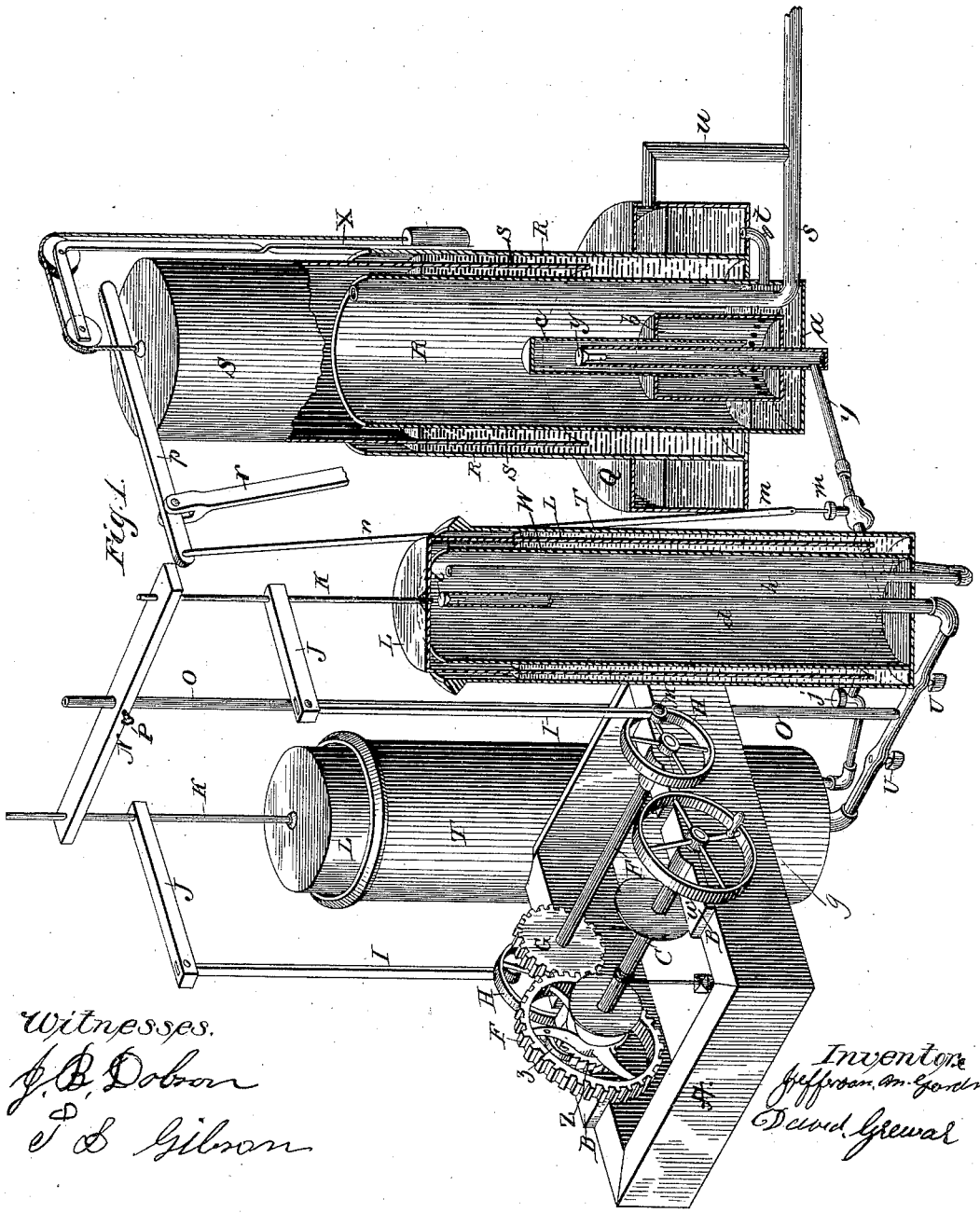
(Model.)

2 Sheets—Sheet 1.

J. M. GARDNER & D. GREWAR.

GAS MACHINE.

No. 306,331. Patented Oct. 7, 1884.



Witnesses.
J. B. Dobson
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(Model.)

2 Sheets—Sheet 2.

J. M. GARDNER & D. GREWAR.

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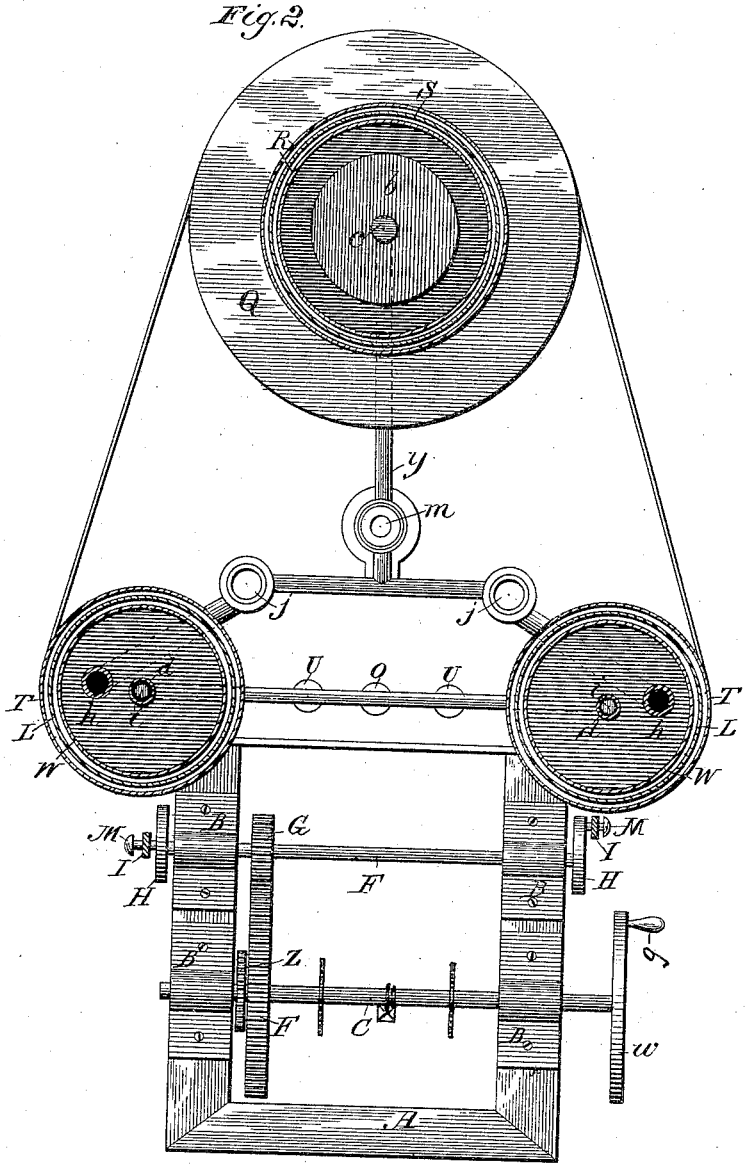
Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

JEFFERSON M. GARDNER AND DAVID GREWAR, OF NASHVILLE, TENN.

GAS-MACHINE.

SPECIFICATION forming part of Letters Patent No. 306,331, dated October 7, 1884.

Application filed June 22, 1882. (Model.)

To all whom it may concern:

Be it known that we, JEFFERSON M. GARDNER and DAVID GREWAR, of Nashville, in the county of Davidson and State of Tennessee, have invented a new and valuable Improvement in Gas-Machines; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 is a perspective view, partly in section. Fig. 2 is a sectional view of the gasometer and air-pump combined.

Similar letters refer to similar parts throughout the several views.

The nature of our invention consists in the construction and arrangement of a gas-machine, as will be hereinafter more fully set forth in the annexed drawings.

In Fig. 1, A represents the frame, which is attached to the two pumps T T, as shown in the drawings, on the top side of which are secured four boxes, B B B B, for carrying the axles C and E. Axle C carries a spur-wheel, F, which engages with pinion G. On shaft C is a spool or cam for the winding up of a cord to which is attached a weight sufficient to propel the pumps T T. On one end of the shaft C, next to the spur-wheel F, is a ratchet-wheel, Z, which engages with a pawl, *z*, attached to the spur-wheel F. On the other end of spur-wheel F is a crank, *g*, for winding up the weights. Pinion G turns shaft E. On each end of shaft E is a crank, H H, which gives a vertical movement to the two pitmen, I I. The upper ends of these pitmen are connected to the bars J J, which are secured to the guide-rods K K, the lower ends of which are securely fastened to the plungers or pistons L L of the pumps T T. The cranks H H are set on the axle E, as shown in drawings, one being up or going up as the other is coming down, giving a uniform movement at all times to the pistons, obviating or preventing jerks when in use. Cross-head N is slipped on pipe O and secured by thumb-screw P, a guide hole or box being formed in each end of cross-head N for the purpose of guiding the guide-rods K K, for giving a perpendicular movement to the pistons or plungers L L. Q is a tank or reservoir for holding gasoline. Vertically passing through the center of tank or reservoir Q is a double tube or cylinder, R R, the outside tube being soldered to the edge of the upper head, the lower end being soldered on the inside of the bottom head of the tank, the inside tube passing through the lower head of the tank far enough to allow the utilizing of all the gasoline contained in the tank, the inside tube or cylinder being enough smaller than the outside tube to admit of the free movement of the gasometer S up and down. The space between the tubes R R is to be partially filled with water or some other suitable liquid to form a seal to prevent the escape of gas, the inside tube R having a bottom head. *a* is a small tube passing up through the center of the bottom head of the inside tube R, as shown in the annexed drawings, having a check-valve, *y*, in the upper end for the purpose of retaining the air when forced into the gasometer, and also to prevent condensation in the tube *a*, to convey air from the pumps T T into the float *b*. Float *b* is a cylinder having a tube, *c*, passing through the center of the upper head and within a short distance of the lower end of the float, which is perforated or has small tubes in the lower end. The head of the float is securely soldered to the tube *c*. Tube *c* passes down over tube *a* until the lower end of the float *b* is submerged below the perforations or small tubes in the gasoline, thereby distributing the air through the perforations or small tubes, forcing the same up through the gasoline and vaporizing the gasoline.

In Fig. 2, T T are the tube-cylinders, of any suitable diameter and not less than twenty inches in length, having a bottom head. On the inside of these tubes or cylinders are smaller tubes or cylinders W W, soldered to the bottom of the tubes or cylinders T T, the inside tube or cylinder being enough smaller than the outside ones to allow a free movement of the plungers or pistons L L, the space being partially filled with water or some other suitable liquid to form a seal. O is a pipe to supply the pumps with air. U U are

regulating-valves to decrease or increase the current of air to equalize the suction of the pumps with the discharge of the air to the gasometer. *d d* are two pipes connected to the pipe O at the bottom of the pumps, as shown in Figs. 1 and 2, having check-valves *i i* in the upper end, for retaining the air when sucked in by the plungers or pistons. *h h* are pipes for conveying air from the pump to the float *b*.

In Fig. 2, *j j* are check-valves to prevent the return of air to the pumps when forced out, and to prevent an unequal pressure in the gasometer. *m* is a regulating or stop valve, which is connected to lever *p* by means of a rod, *n*. Lever *p* has a bearing on a fulcrum, *r*. When the gasometer is forced to a proper height, it raises the lever *p*, forcing down valve *m*, which cuts off the air from the float *b*, and thereby stops the action of the pumps.

In Fig. 1, *s* is a pipe to convey the gas from the gasometer to its destination. The consumption of the gas from the gasometer will cause the latter to recede, and thereby lower the lever *p*, which raises the valve *m* and sets the pumps in motion. Pipe *t* connects the tank Q with the small tube or cylinder R, supplying the same with gasoline from the tank Q. The small pipe *u* connects pipe *s* and tank Q, for the purpose of equalizing the pressure in the tank with that in the gasometer.

The device X, shown in Fig. 1 is a standard fastened to the outside of cylinder R, having a projection at the upper end, with two sheaves or pulleys for a cord attached to the upper end of the gasometer S, the cord passing over the sheaves and attached to a sufficient weight to equalize the proper pressure on the gas-burners.

What we claim, and desire to secure by Letters Patent, is—

1. The combination of the pipes O and *d d*, provided with cocks U U, pipes *h h*, valves *j j*, and pipe *y*, provided with cut-off valve *m*, the cylinders R, and rods *p* and *n*, operated by drum S, substantially as and for the purpose set forth and described.

2. The combination of the pipe O, provided with cocks U U, pipes *d d*, valves *i i*, cylinders T W, drum L, operated as shown, pipes *h h*, valves *j j*, pipe *y*, provided with cut-off valve *m*, operated as described, pipes *a* and *c*, float *b*, cylinders R R, drum S, pipe *s*, having branch *u*, connected with reservoir Q, and connecting-pipe *t*, substantially as and for the purpose set forth and described.

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Witnesses:
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