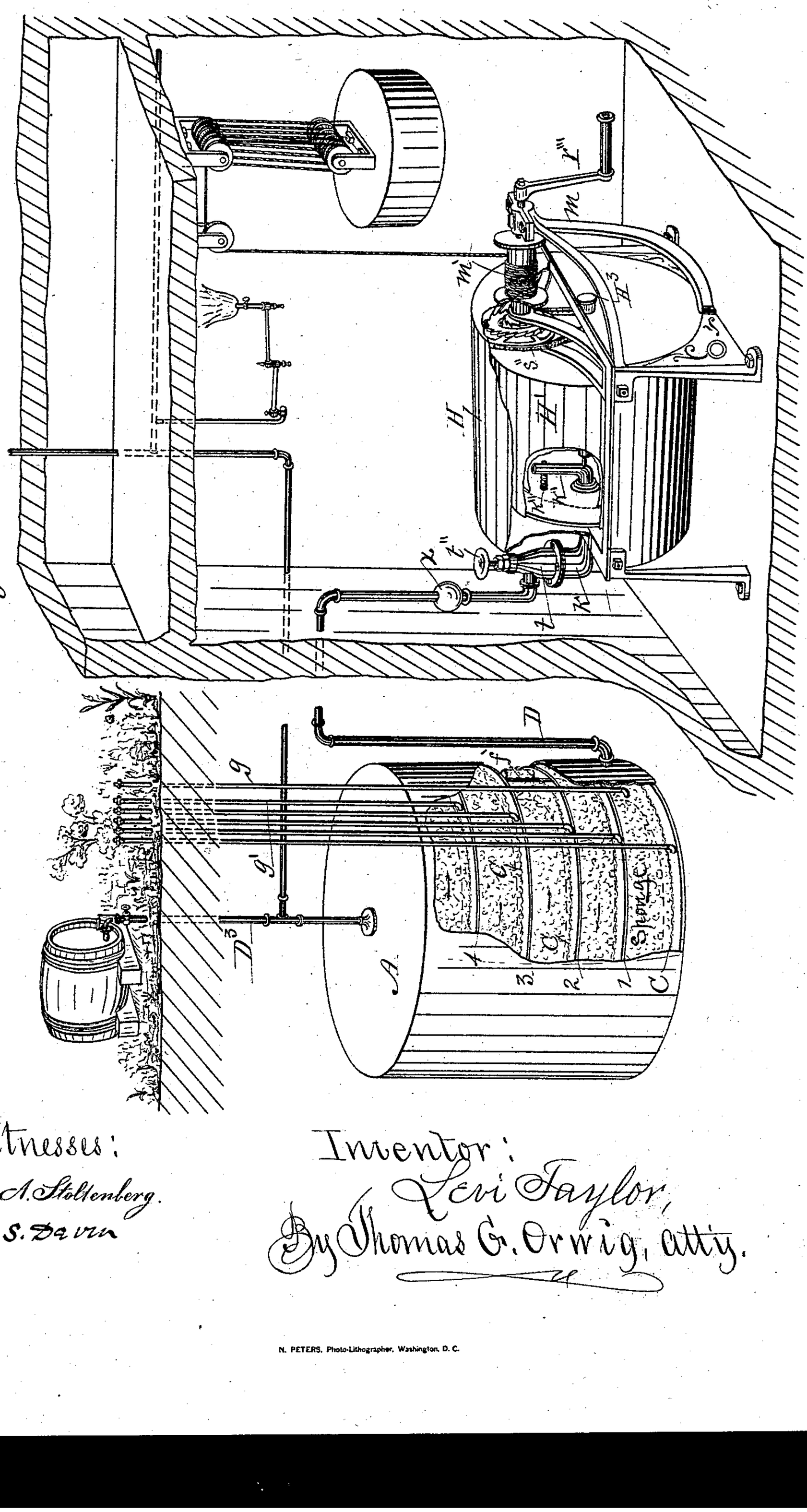
(No Model.) 2 Sheets—Sheet 1.

L. TAYLOR.

GAS MACHINE.

No. 286,865. Patented Oct. 16, 1883.



Witnesses:
H. A. Stoltenberg.
D. S. Dawn

Inventor:
Levi Taylor,
By Thomas G. Orwig, Atty.

(No Model.)

2 Sheets—Sheet 2.

L. TAYLOR.

GAS MACHINE.

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Fig. 2

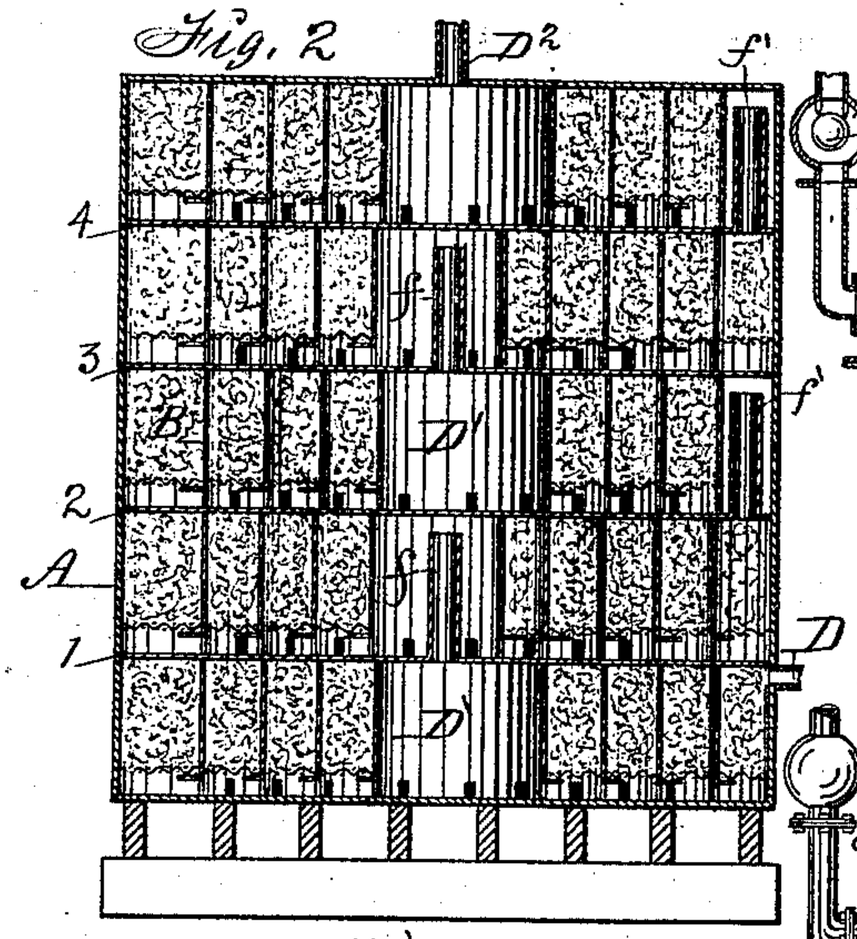


Fig. 3

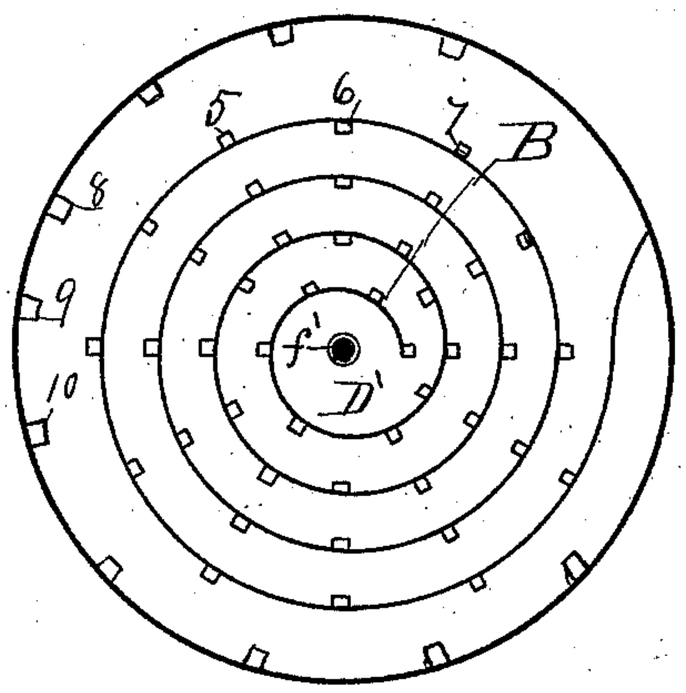


Fig. 4

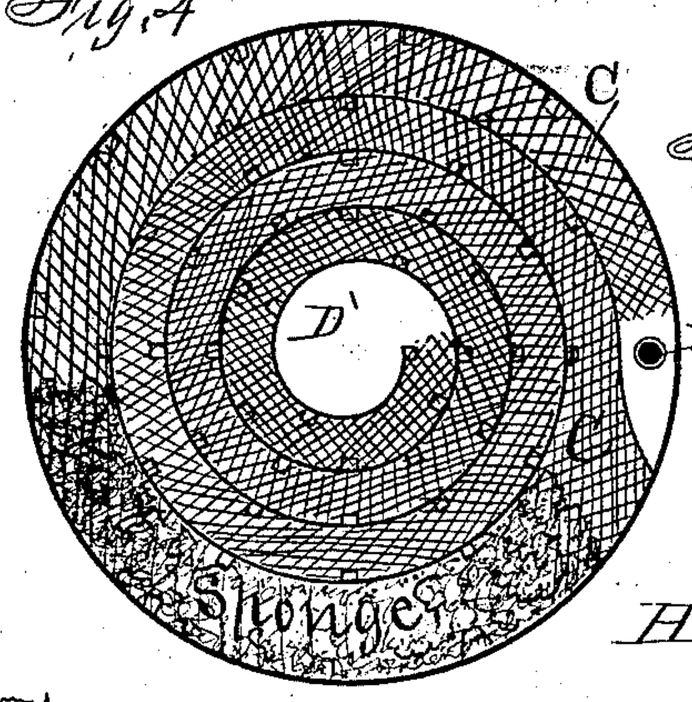


Fig. 5

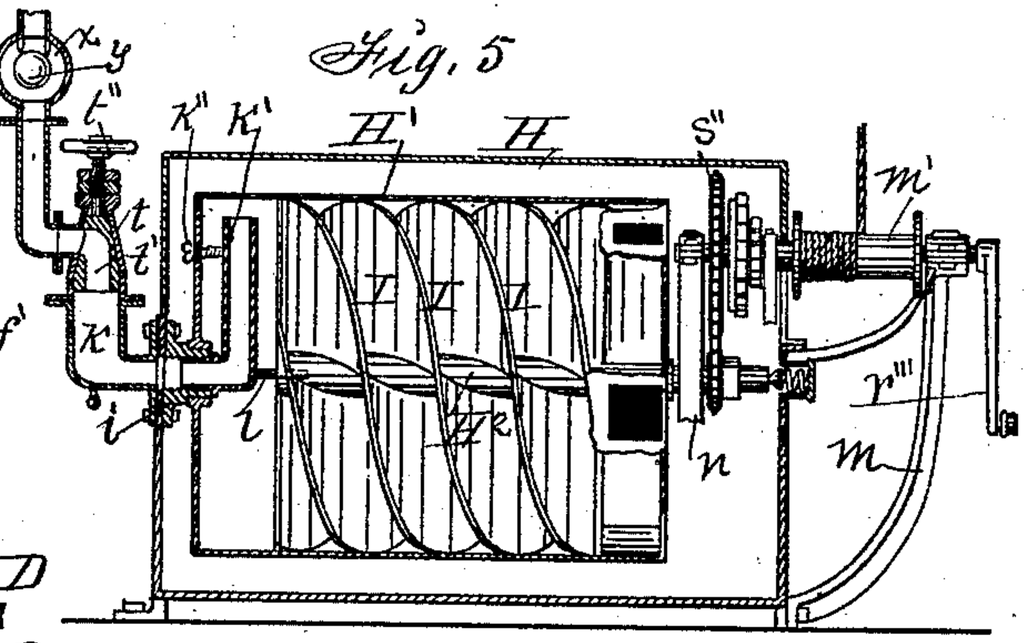


Fig. 6

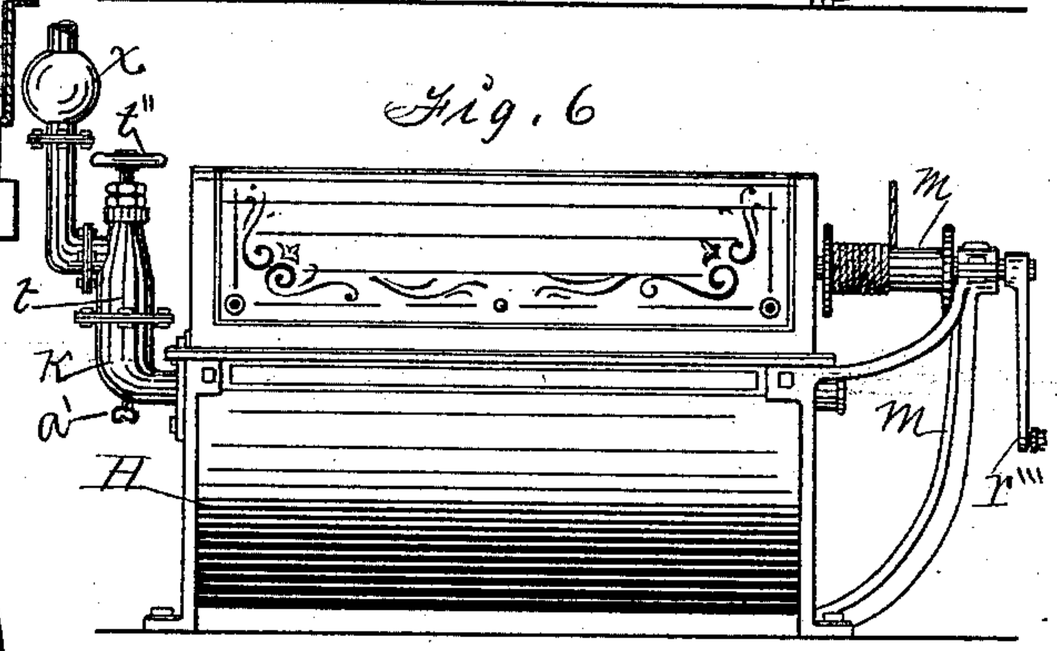


Fig. 7

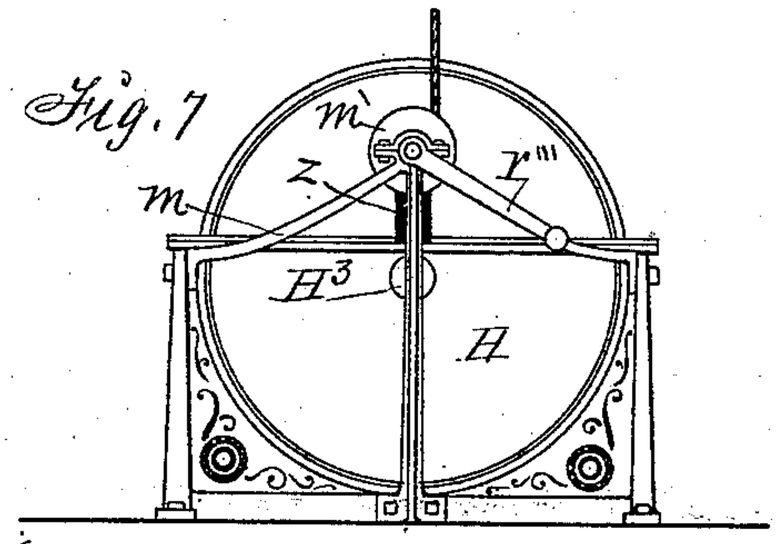


Fig. 8

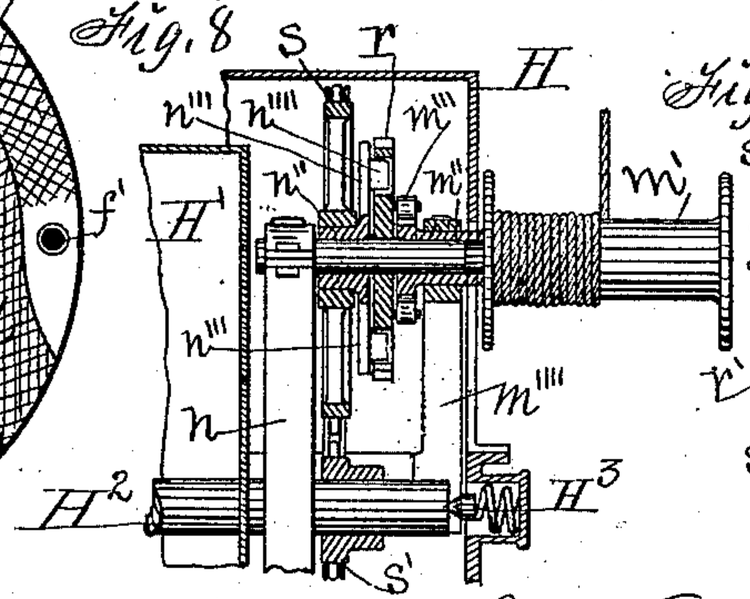
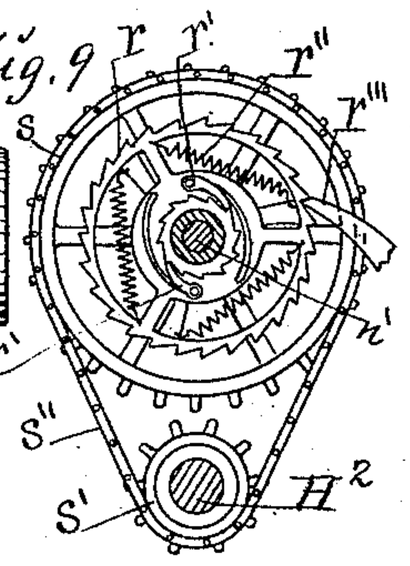


Fig. 9



Witnesses:
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Inventor: Levi Taylor,
By Thomas G. Orrig, Attorney.

UNITED STATES PATENT OFFICE.

LEVI TAYLOR, OF OSCEOLA, IOWA.

GAS-MACHINE.

SPECIFICATION forming part of Letters Patent No. 286,865, dated October 16, 1883.

Application filed May 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, LEVI TAYLOR, of Osceola, in the county of Clarke and State of Iowa, have invented an Improved Gas-Machine, of which the following is a specification.

My invention relates to that class of machines in which gasoline and other carbonaceous liquids are placed in a carburetor and evaporated by means of compressed air to produce illuminating-gas, and to distribute the same through service-pipes to burners in buildings.

It consists, first, in the construction and combination of a series of oil-reservoirs to produce an independent trap for residuum in each reservoir, and a continuous and sinuous circumvolving conduit and air-passage, in which sponge is placed to lift and distribute the volatile hydrocarbon, and thereby facilitate the carbureting process, and to increase the quantity and improve the quality of the gas produced in a given time from a given quantity of oil or gasoline; second, in the construction and combination of an air-pump with the carburetor in such a manner as to facilitate adjusting and repairing, to increase the volume of air and pressure without an increase of power, and also in such a manner that the pressure in the carburetor, service-pipes, and burners can be easily regulated, as required, to maintain a regular flow of gas and a steady light at all times, all as hereinafter fully set forth.

Figure 1 of my accompanying drawings is a perspective view, showing the carburetor and pump mechanism placed in position relative to each other and a building as required for practical use. Fig. 2 is a transverse sectional view of the carburetor. Fig. 3 is a top view of one of my oil-reservoirs, having a convolute conduit adapted for supporting a perforated sheet-metal or woven-wire bottom. Fig. 4 is a similar view, showing a wire bottom in the conduit, as required to support sponge, and to produce a trap for residuum in the bottom of the conduit and reservoir. Fig. 5 is a longitudinal section of the air-pump and operative mechanism. Fig. 6 is a side view, and Fig. 7 an end view, of the same. Figs. 8 and 9 are enlarged detail views of the pump-operating mechanism. Jointly considered, these figures clearly illustrate the construction and operation of my complete invention.

A represents a cylindrical case, preferably made of galvanized iron, within which I form my series of oil-reservoirs and air-conduits.

Nos. 1 2 3 4 are the bottoms of the reservoirs, made of sheet-metal circular plates, fixed to the inside surface of the case, at proper distances apart, by soldering or in any suitable way to produce air-tight joints.

B represents a continuous strip of sheet-metal plate, bent into convolute form, and fixed at its top edge to the under side of each one of the plates 1 2 3 4 in such a manner as to produce air-tight joints.

5 6 7 represent a series of projections extending in opposite directions from near the lower edge of each of the reservoir-bottoms. They are formed by simply cutting incisions inward from the lower edge, and then bending the portions between the incisions into right-angled positions relative to the plate, so as to extend horizontally for the purpose of supporting a bottom, C, made of perforated plate or woven wire. Corresponding projections, 8 9 10, are fixed to the inside of the case, as clearly shown in Fig. 3. On top of these auxiliary bottoms C, I place sponge to fill the convolute conduits in each reservoir. By bending the sections 5 6 7 at right angles to the strips B, openings are produced to connect the space and residuum-trap that is produced between the air-tight bottom B and the perforated bottom C.

D is an induction-tube, that connects the air-pump with the carburetor, and enters the lower reservoir, No. 1, and the outside of its volute conduit in such a manner that the air will be forced through the conduit from the circumference of the carburetor to the chamber D′ at its center, and from thence to a corresponding chamber in No. 2 reservoir, through a vertical open-ended tube, *f*, fixed in its bottom; and from the center of No. 2 reservoir the air will pass through the volute conduit to the circumference, and from thence up through a tube, *f′*, into the No. 3 reservoir. Any number of oil-reservoirs having traps in their bottoms may be thus connected, so as to cause air to be passed through them and into an eduction-tube, D^2, at the top of the case A.

D^3 is an induction-tube connected with the

tube D^2 in such a manner that oil can be poured through it into the upper reservoir, and when nearly full, it will overflow the tube *f* and pass down through the tube into the next reservoir. All the reservoirs can be thus successively filled with oil through the medium of the tubes D^2, D^3, *f*, and *f'*.

g is a tube connected with the top portion of the lower reservoir, and extends to the surface of the ground or cover of the vault within which the carburetor is placed, to serve as a vent for the air that will be displaced from the reservoirs by the ingress of the oil.

g' are induction-tubes connected with the independent traps in the bottoms of the reservoirs. By attaching a suction-pump to each one successively, all the residuum gathered in the traps can be readily extracted, and the carburetor-conduits and sponge therein kept clean by means of the traps.

H represents the cylindrical case of my air-pump, attached to a frame and the frame fixed to the floor. It is formed in two flanged sections, so that the top section can be taken off.

H' is a revolving cylinder within the concentric case H. It has a shaft, H^2, to which are fixed four spiral flanges, I, to extend along the inside surface of the cylinder from its front end rearward to a point near the rear, and in such a manner as to produce four open-ended spiral conduits.

H^3 is a pivoted bearing fixed to a spring, and connected with the case H in such a manner that it will engage a concave in the face of the front end of the shaft H^2, to support the revolving shaft, and to press it toward the opposite end of the case, and a boss or short flanged tube, *i*, (shown in Fig. 5,) that is bolted against the inside and center of the end of the case H, and a tubular elbow, *k*, having a corresponding annular flange to engage the outside of the case. The tube *i* has an annular shoulder, against which the annular edge of an opening in the center of the end or head of the cylinder fits, and against which it is constantly pressed by the force of the spring connected with the pivoted bearing H^3 at the opposite end of the cylinder-shaft H^2 and case H.

k' is a tubular elbow-shaped tube screwed into the fixed tube *i*, to extend vertically, and to remain stationary within the vacant rear end of the revolving case H'.

l is a pin fixed to the elbow *k*, to extend into a corresponding bore formed in the end of the shaft H^2, to prevent the tube *k'* from dropping when it is detached from the boss or tube *i*. To detach the tube *k'* a screw, *k''*, carried in the end of the case H', is forced inward to engage the tube and lock it to the cylinder to be revolved therewith. By combining the screw *k''* with the case H', the elbow-shaped tube can be loosened without being touched with the hands and without the use of tools, and the work of separating and repairing a machine greatly facilitated.

m represents a frame fixed to the front end of the case H, to support a drum, *m'*, that is connected with a suspended weight by means of a rope, as clearly shown in Fig. 1.

m'' is a tubular extension on the inner end of the shaft, and *m'''* a ratchet-wheel on the end of the tubular extension.

m'''' is a shaft-bearer fixed within the case H, upon which the tubular extension *m''* of the drum-shaft rests and revolves.

n is a bearer in parallel position with the bearer *m''''*.

n' is a solid shaft, that extends into the tubular end *m''* of the drum-shaft at one end, and rests on the bearer *n* at its other end.

n'' is a hub fixed to the shaft *n'*. This hub has radial arms *n'''*, and cams *n''''* extend laterally from the arms to engage a ratchet-wheel, *r*, that is placed loosely upon the shaft *n'*. Pawls *r'*, pivoted to the face of the ratchet-wheel *r*, engage the ratchet-wheel *m'''* on the drum-shaft in such a manner that when the drum is revolved the loose ratchet-wheel *r* will be revolved therewith, and its arms will engage the cams *n''''* on the arms *n'''*, that extend from the hub *n''*, and thereby revolve the hub and solid shaft *n'*, to which the hub is fixed. *r''* (shown in Fig. 9) are springs fixed to the loose ratchet-wheel *r* and to the arms *n'''* of the hub *n''* in such a manner that the springs will in their normal condition hold the cams *n''''* on the arms *n'''* away from the arms of the loose ratchet-wheel in such a manner that force imparted from the drum-shaft will stretch the springs and store power by so doing before the hub *n''* and shaft *n* are revolved. When the drum *m'* is revolved by means of a crank-handle, *r'''*, on its end, as required to elevate the weight and motor power, the force thus stored by means of the springs *r''* will be exerted to continue the motion of the hub *n''* and shaft *n'*, and the motion and action of the complete machine will not be interrupted by the reverse motion of the drum, and the light will not be extinguished when the weight is down, but only diminished, to thereby give notice that the weight should be elevated again. A pawl, *r'''*, (shown in Fig. 9,) prevents any backward movement of the loose ratchet-wheel *r*, to which the springs *r''* are attached and stretched by its forward movement.

s is a chain-wheel fixed to the hub *n''*.

s' is a chain-wheel fixed to the shaft H^2.

s'' is an endless chain, that connects the two wheels and transmits power from the weight and drum to the air-pump as required to rotate the cylinder H'.

Heretofore coiled springs have been placed upon rotating shafts to continue the motion of a revolving cylinder and air-pump while the weight was being elevated; but my manner of combining a series of springs with the radial arms and levers of a hub on a shaft is novel and advantageous.

t is a valve-chamber detachably connected with the tubular elbow *k*, at the rear end of the case H, by means of flanges and bolts.

t' is a cone-shaped valve fitted in the chamber *t* in such a manner that it can be operated

by means of a hand-wheel, t'', at the top end of its stem, to regulate the passage of air through the chamber t on its way from the pump to the carburetor or shut it off entirely at pleasure.

x is a valve-chamber connected with the tube D, within which is an automatic check-valve, y, that will allow air to pass from the pump to the carburetor, but prevent it from passing backward.

z (shown in Fig. 7) is an opening in the end of the top portion of the case H, that allows the cover or detachable case-section to slip over the drum-shaft, and also allows air to enter the case and pump.

In the practical operation of my machine the revolving case or pump-cylinder H is half filled with water, so that the air that enters the open ends of the spiral conduits from the outside will be pressed through those conduits by the water which enters as their open ends are successively submerged in the water, and the air will be discharged into the rear end of the cylinder by the water, which performs the function of a piston, and from thence through the tubes k', k, and D into the carburetor. The volatile oil in the reservoirs of the carburetor will be lifted by the capillary action of the sponge packed in the convolute conduits, and the air forced through will therefore more readily vaporize the hydrocarbon and increase the quantity of gas and its richness or quality before it passes from the carburetor to be distributed through service-pipes to burners.

a' (shown in Fig. 6) represents a stop-cock, for drawing off any condensed vapors that may gather in the tube k.

I claim as my invention—

1. In a carburetor, the combination of a case, A, a series of reservoir-bottoms, 1 2 3 4, a series of convolute plates, B, and auxiliary perforated or wire bottoms C, the central chambers, D', and open-ended tubes f and f', the eduction-tube g, and series of tubes g', substantially as shown and described, to operate in the manner set forth, for the purposes specified.

2. A convolute metal plate, B, having sections 5 6 7, bent in opposite directions, in combination with a fixed horizontal partition or reservoir-bottom in a carburetor, and a perforated or wire bottom, C, substantially as shown and described, for the purposes specified.

3. The pump-case H, the fixed boss i, having an annular shoulder, the revolving pump-cylinder H', and the pivoted bearing H^3, fixed to a spring, arranged and combined substantially as shown and described, to operate in the manner set forth.

4. The elbow-shaped tube k', having a pin, l, in combination with the boss i and the revolving cylinder H', carrying a screw, k'', substantially as shown and described, for the purposes set forth.

5. The combination of the auxiliary frame m, the drum m', having a tubular extension, m'', and ratchet-wheel m''', the shaft-bearer m'''', fixed within the case H, the shaft n', the hub n'', having radial arms n''' and cams or projections n'''', the ratchet-wheel r, the springs r'', and a suspended weight, to operate in the manner set forth, for the purposes specified.

6. The improved mechanism for keeping the air-pump of a gas-machine in continuous and regular operation, composed of the drum m', connected with a weight, the tubular drum-shaft extension m'', and ratchet-wheel m''', the shaft n', hub n'', having radial arms n''' and cams or projections n'''', the loose ratchet-wheel r, having pawls r', the springs r'', the chain-wheels s and s', and the drive-chain s'', substantially as shown and described.

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