2 Sheets—Sheet 1.

J. E. RICHARD.

GAS APPARATUS.

No. 108,937. Patented Nov. 1, 1870.

Fig. 1

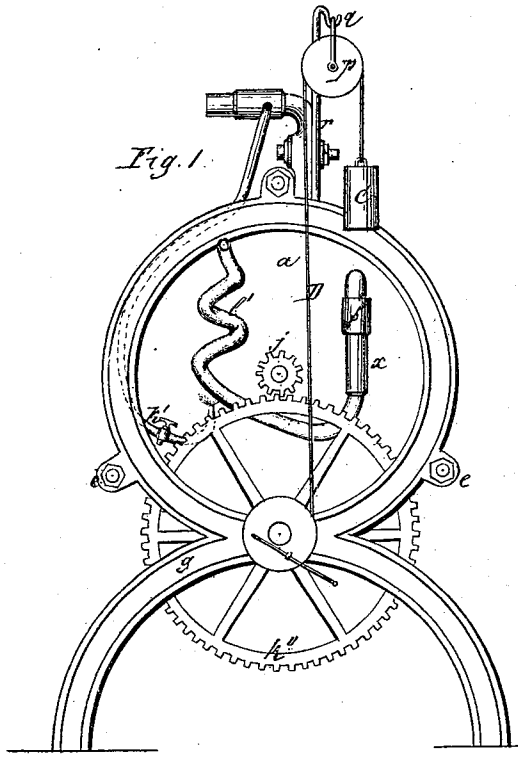


Fig. 2

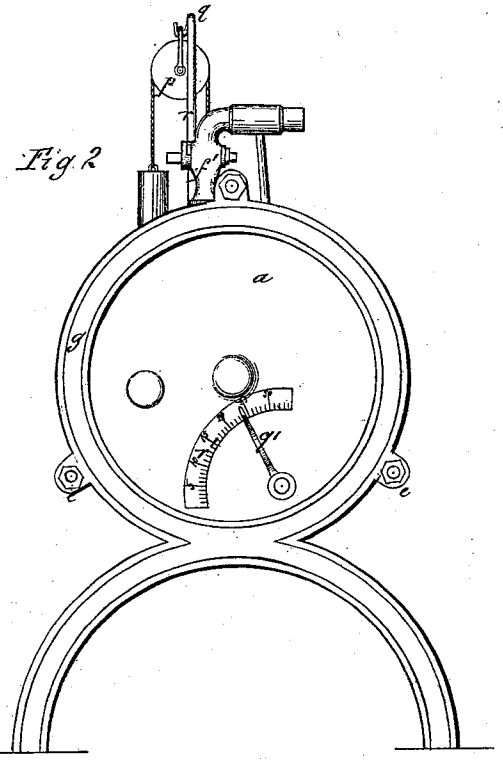


Fig. 3

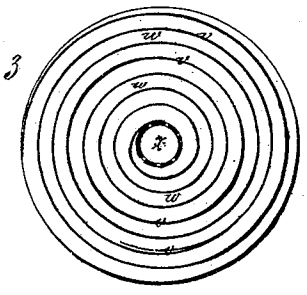
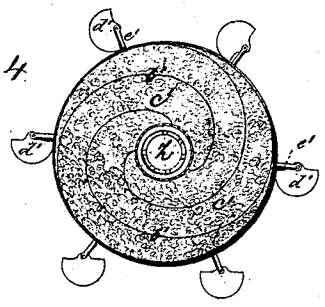


Fig. 4



Witnesses.

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2 Sheets—Sheet 2.

J. E. RICHARD.

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Fig 5

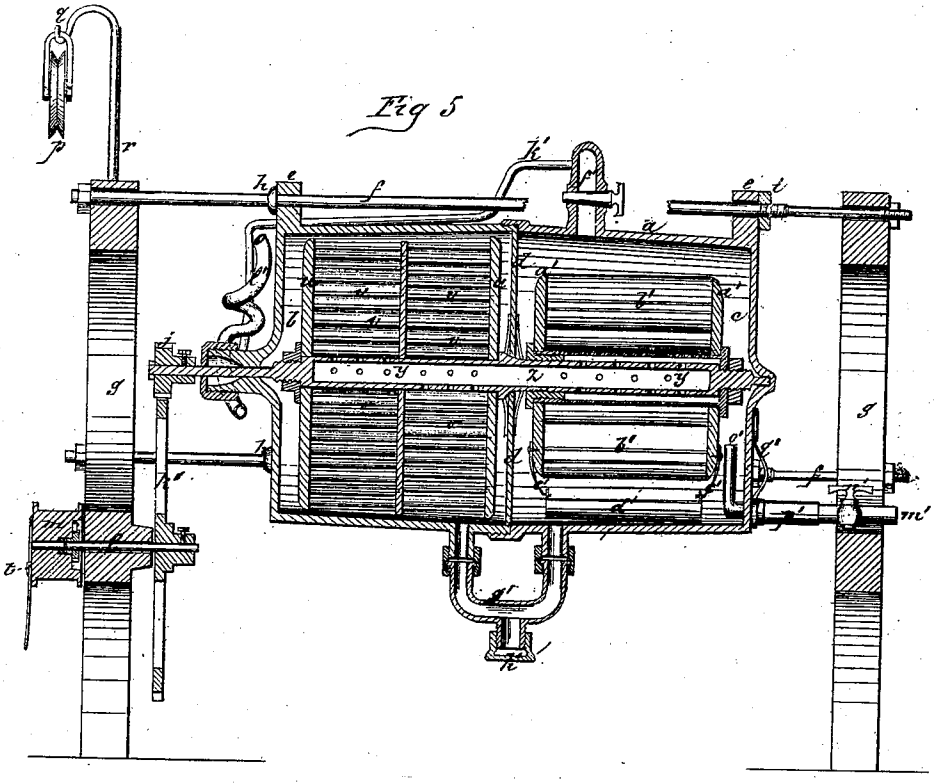

Fig 6.

Fig 7.

Witnesses.

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United States Patent Office.

JEAN ELIE RICHARD, OF COLUMBIA, SOUTH CARORINA, ASSIGNOR TO HIMSELF AND EUGENE C. PLUMER, OF SAME PLACE.

Letters Patent No. 108,937, dated November 1, 1870.

IMPROVEMENT IN GAS-APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JEAN ELIE RICHARD, of Columbia, in the county of Richland and State of South Carolina, have invented a new and improved Gas-Generator; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figures 1 and 2 are elevations of opposite ends of the machine;

Figure 3 is a transverse vertical section of the spiral condenser;

Figure 4 is a transverse vertical section of the spiral carbureter;

Figure 5 is a sectional elevation of the whole machine;

Figure 6 is an elevation of the perforated hollow shaft B; and

Figure 7 is a side elevation of the pulley and its ratchet.

The invention has for its object the impregnation of atmospheric air with molecules of gasoline or other hydrocarbon fluid, for the purpose of producing an illuminating-gas. The manner in which this object is sought to be attained is fully described hereinafter.

In the drawing—

a is a hollow cylinder, of any required dimensions, made in two equal parts, and divided into two chambers *b* and *c* by a diaphragm, *d*, placed across the cylinder at the point of junction of its two parts.

The cylinder is provided with external ears, *e*, at each end, through which pass rods *f*, by which the cylinder is secured in standards *g*, said rods being furnished with flanges *h*, against which the cylinder may be pressed, and its two parts forced together by nuts *i*, seated in screw-threads on the rods.

The cylinder is intended to hold the gasoline, the same being distributed equally between the two chambers *b* and *c*.

A hollow perforated shaft, B, is mounted lengthwise centrally of the cylinder *a*, one of its journals entering a box made in one end of the cylinder, and the other journal passing through a stuffing-box in the other end of the cylinder, and bearing at the extremity, outside the cylinder, a pinion, *j*, which gears with a toothed wheel, *k*, that is fixed on the end of a horizontal shaft, *l*, which is mounted in one of the standards *g*, and bears on the opposite side of said standard a windlass, *m*, that is furnished with a pawl, *n*, which takes in the teeth of an annular ratchet, *o*, fixed on the shaft *l*.

If the windlass *m* be turned forward, the pawl and ratchet effect the rotation of the shaft *l*, wheel *k*, and shaft B. If the windlass *m* be turned backward, the pawl slips over the ratchet and the shaft *l* does not rotate.

The rotation of the shaft is effected by a weight, C, hung at the end of a cord, D, that is wound around the windlass *m*, and passed over a sheave, *p*, which is suspended from a hook, *q*, at the upper end of a rod, *r*, that extends upward from the standard *g*.

The windlass is only rotated backward when the cord is to be wound upon it. Such backward rotation of the windlass is effected by a crank, *s*, which is pivoted in the end of the pulley at a point outside the center of the same, and bears against a hook, *t*, also in the end of the windlass, but immediately comes out of the hook, and ceases to rotate the windlass when turned in the direction opposite to that necessary for winding up the cord.

On the shaft B, within the chamber *b*, is a condenser, figs. 3 and 5, which is composed of disks *u* fixed on the shaft B concentrically, and spiral blades *v* placed between the disks parallel with the shaft, and forming parallel curved passages *w* leading from the outer ends of the blades to the shaft B.

The lower part of the condenser is, of course, immersed in gasoline. Into the chamber *b*, above the gasoline, air is admitted through the pipe *x*.

The condenser partakes of the rotary motion of the shaft B, and, as it revolves, air flows through the curved passages *w* from above and gasoline from below, and both meet at the shaft, into which they flow through the perforations *y*.

The chamber *z* inside the shaft conducts the mingled current of air and gasoline through the central partition of the cylinder into the opposite chamber *c*. Within this chamber, fixed on the shaft B, is a carbureter, figs. 4 and 5, constructed similarly to the condenser, with disks *a'* and spiral blades *b'*, which are placed at greater intervals apart than the blades *v* of the condenser, and form curved passages *c'*, which are loosely packed with wool or hair, a covering of flannel cloth being drawn over the carbureter to keep the packing in place. Into this packing the gasoline flows from the chamber *z* of the shaft, saturating the same, and dripping from the outer ends of the blades *b'* into vessels *d'*, which are hung on radial pins *e'* that project from the disks *a'*, and pour their contents over the outer covering of cloth, as they are carried round by the rotating carbureter, as shown in fig. 4, in order to increase the saturation of the same. The air also flows through the passage *c'*, and becomes thoroughly permeated therein with molecules of gasoline.

On emerging from the carbureter the air thus charged with illuminating material rises into the upper part of the chamber *c*, and is drawn off thence for use through a pipe *f'*.

The gasoline sinks to the bottom of the chamber *c*, and a portion sufficient to supply the place of that drawn off from the chamber *b* through the shaft B

flows back into said chamber through the pipe *g'* at the bottom of the cylinder *a*, which connected the two chambers *b* and *c*.

The pipe *g'* is furnished with a cock, *h'*, by which all the gasoline in the cylinder may be drawn off at pleasure.

A small tube, *k'*, opening at one end into the gas-pipe *f*, runs thence to a point immediately beneath the coil *l'* of the air-pipe *x*, as shown in fig. 1.

On opening the valve of the tube *k'* and lighting the gas-jet that thereupon issues from its open end, the flame that follows burns directly against the coil *l'*, and, consequently, heats the air within the same. By this means the cylinder may be supplied with heated air, and the gasoline thus warmed and rendered tractable in cold weather.

In fig. 5—

m' is a pipe opening into the outer end of the chamber *c*, and provided with a cock *n'*. Inside the chamber *c* the pipe *m'* is bent into an elbow *o'*.

The pipe *m'* passes through a stuffing-box, *p'*, within which the pipe may be rotated on its longitudinal axis. When it is thus rotated, if the open end of the elbow *o'* is submerged below the surface of the gasoline in the chamber *c*, and the cock *n'* is open, the liquid will flow through the pipe *m'*.

When the open end of the elbow *o'* is above the surface of the gasoline no liquid will flow through the pipe *m'*. The pipes *m'* and *o'* consequently afford a means of ascertaining the quantity of gasoline in the chamber *c*.

The pipe *m'* is furnished with a finger, *q'*, and on the end of the cylinder is inscribed a graduated register, *r'*, on which the finger *q'* marks the quantity.

The air-pipe *x* is furnished with a valve, *s'*, which prevents any gas that may find its way into the chamber *b* from escaping. The condenser and carbureter are confined by nuts, pressing them against suitable shoulders on the shaft B.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The cylinder *a*, when divided into the chambers *b* and *c*, which are connected by the pipe *g*, and combined with the perforated hollow shaft B and the spiral carbureter *a' b'*, substantially as described.
2. The carbureter *a' b'*, pins *c'*, and suspended rocking-vessels *d'*, arranged as specified.
3. The hollow perforated shaft B, spiral condenser *u v*, and carbureter *a' b'*, arranged as set forth.
4. The cylinder *a*, gas-pipe *f'*, air-pipe *x*, coil *l'*, and tube *k'*, all arranged as explained.
5. The cylinder *a*, elbow *m' o'*, stuffing-box *p'*, finger *q'*, and register *r'*, all arranged as described.

JEAN ELIE RICHARD.

Witnesses:

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W. T. PURSE.