

R. WHITAKER.

GAS PUMP.

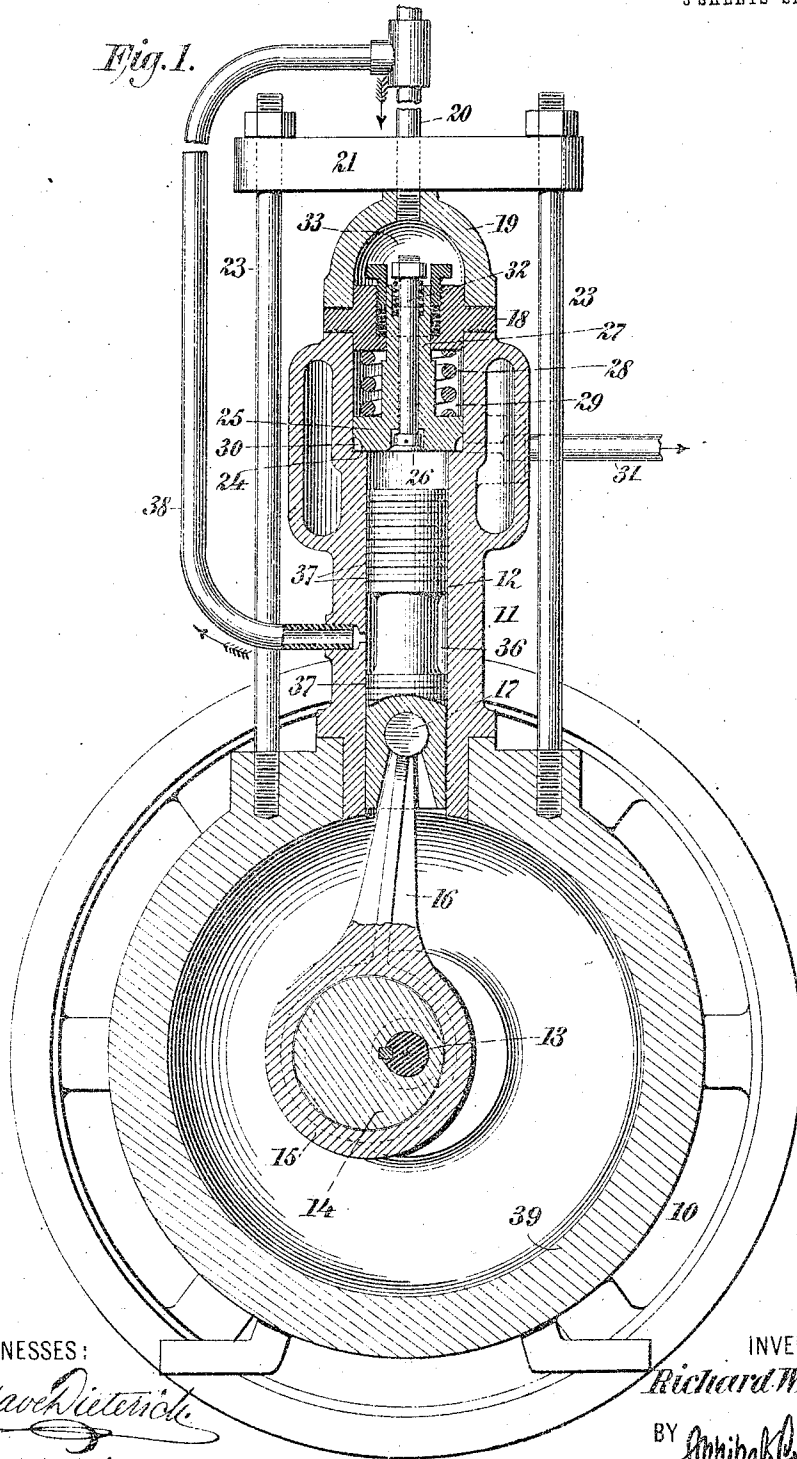
APPLICATION FILED JULY 1, 1907.

Patented Jan. 2, 1912.

3 SHEETS-SHEET 1.

1,013,348.

Fig. 1.



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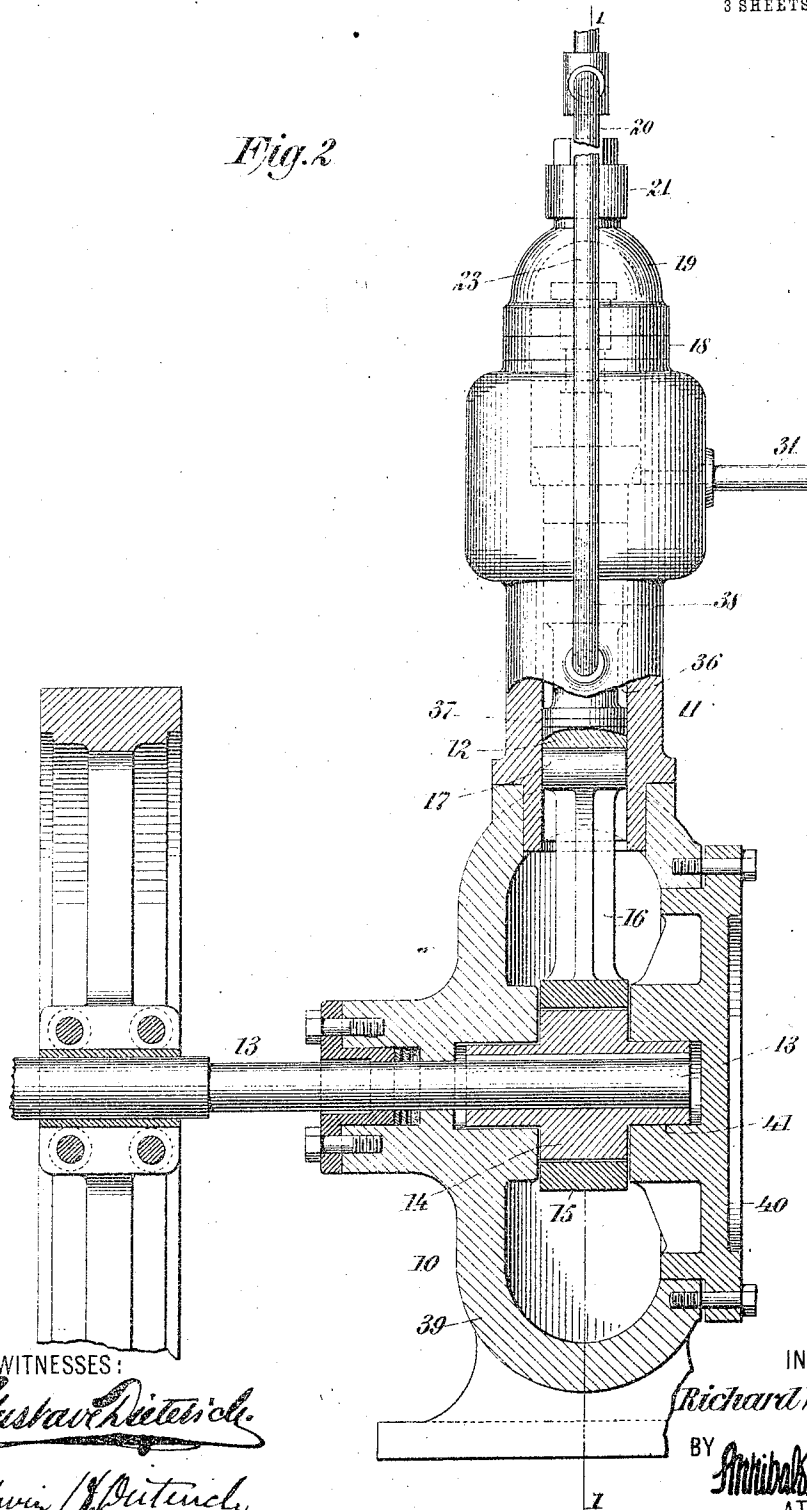
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3 SHEETS-SHEET 2.

Fig. 2



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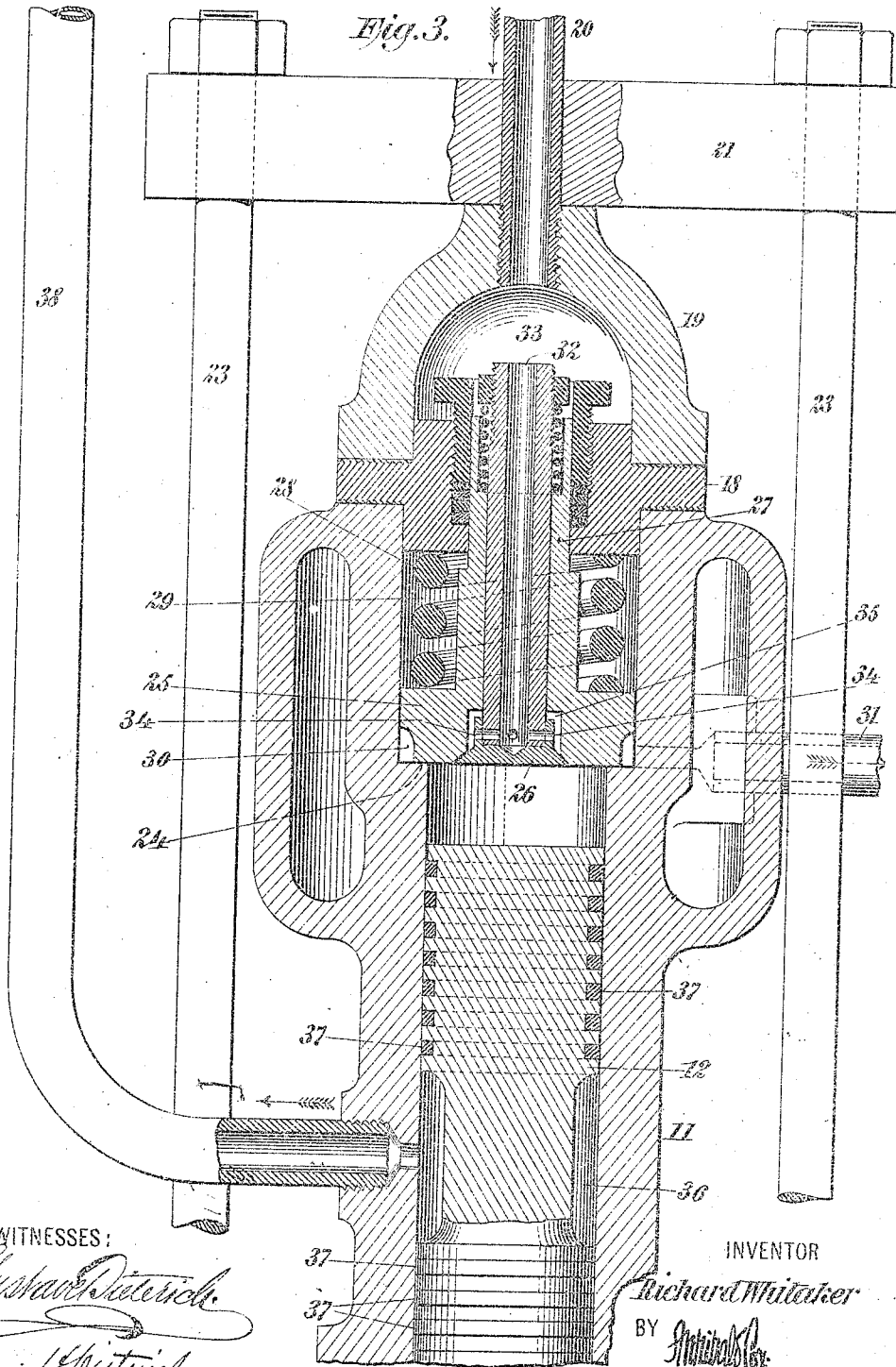
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3 SHEETS-SHEET 3.

1,013,348.



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UNITED STATES PATENT OFFICE.

RICHARD WHITAKER, OF NEW BRUNSWICK, NEW JERSEY, ASSIGNOR TO THE BRUNSWICK REFRIGERATING COMPANY, OF NEW BRUNSWICK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

GAS-PUMP.

1,013,348.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed July 1, 1907. Serial No. 381,639.

To all whom it may concern:

Be it known that I, RICHARD WHITAKER, a citizen of the United States, and a resident of New Brunswick, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Gas-Pumps, of which the following is a specification.

The invention relates to improvements in gas-compressing pumps, and pertains more particularly to improvements in pumps of the character shown and described in the following Letters-Patent heretofore granted to me, to-wit: No. 795,014 dated July 18, 1905, No. 795,015 dated July 18, 1905, No. 821,563 dated May 22, 1906, and No. 848,277 dated March 26, 1907.

In the constructions shown in the patents above referred to, the ammonia-gas which may leak by the packing-rings of the piston enters the oil-chamber at the base of the pump and thence passes into an adjacent auxiliary chamber (which also contains oil) from which the gas may be drawn off by means of a pipe entering said chamber and returned to the gas-tank and again compressed. The oil in the oil chamber is kept in a state of constant agitation by the piston-operating mechanism.

The object of the present invention is to simplify and increase the efficiency of the pump and the system in which the pump may be connected, and to this end I entirely dispense with the auxiliary or condensing chamber in the base-portion of the pump-casing and provide a novel piston having an annular chamber intermediate its upper and lower sets of packing rings, into which chamber the gas which may leak along the sides of the piston may collect and from which it may pass through a relief pipe communicating with said chamber and be returned to the gas-tank or gas-inlet and again compressed, the gas which leaks by the piston being thus to the maximum degree returned in a condition fitting it for efficient further use and prevented from commingling with the oil in the oil-chamber formed in the base of the pump-casing.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Figure 1 is a central vertical transverse

section, on the dotted line 1—1 of Fig. 2, of a pump constructed in accordance with and embodying my invention; Fig. 2 an edge elevation, partly in central vertical longitudinal section, of the same, and Fig. 3 an enlarged central vertical transverse section of the upper portion of the pump.

In the drawings, 10 designates the lower or base-portion of the pump-casing, 11 a vertical cylinder mounted thereon, 12 an elongated piston within said cylinder, 13 the actuating shaft, 14 an eccentric keyed on said shaft, 15 an eccentric strap on said eccentric, 16 a connecting-rod preferably integral with said strap and having on its upper end a cylindrical head 17 set within a cylindrical bearing in the lower end of said piston, 18 a valve-guide upon the upper end of said cylinder, 19 a hollow cap or crown upon said valve-guide, 20 an inlet pipe for gas leading into the chamber formed within said cap or crown, 21 a horizontal bar engaging at its center the top of said cap or crown, and 23 tie-bolts engaging the ends of said bar and the base portion of the general casing and securing said cap or crown, valve support and guide, cylinder and base-portion together.

The parts hereinbefore identified by reference numerals are with the exception of certain features of the casing 10 and piston 12, fully shown and described in the aforesaid Letters-Patent No. 848,277 dated March 26, 1907, and hence with the exceptions noted said parts require no detailed explanation herein.

Within the upper end of the cylinder 11 is formed an annular valve seat 24, above which is located a pressure-valve 25 adapted to said seat and having within it a gas-inlet valve 26, the two valves constituting a duplex valve substantially the same in construction and operation as the duplex valve shown and described in detail in the aforesaid Letters Patent No. 848,277. The hollow stem 27 of the valve 25 passes within the valve-guide 18 and the body of said valve is normally held against the seat 24 by a coiled spring 28 confined within the chamber 29. Around the lower peripheral edge of the valve 25 is formed a chamber 30 for compressed gas, and this chamber is in communication with the outlet pipe 31 for said gas, as usual. The inlet-valve 26 seats against the valve 25 and has a hollow

stem 32, which guides within the hollow stem 27 of said valve 25 and is in communication with the inlet gas-chamber 33 formed within the cap 19. When the valve 26 is seated against the valve 25 no gas escapes below it to the cylinder 11, but on the suction stroke of the piston 12 said valve 26 descends from its seat and at such time the supply-gas escapes through the lateral openings 34 and chamber 35 and around the valve 26 and enters said cylinder, as fully described in said Letters-Patent No. 848,277, to be compressed on the pressure or up-stroke of said piston against the area presented by the combined faces of said valves 25, 26. The compressed gas, upon the slight ascent of the valves 25, 26 together enters the chamber 30 and passes thence to the pipe 31, as usual.

The piston 12 is of novel construction in that it is formed at a suitable location between its ends with an annular chamber 36 and provided above and below said chamber with packing-rings 37. The chamber 36 is of sufficient length to insure its being at all times in communication with the relief and return pipe 38, whose lower end enters the side of the cylinder 11, as clearly shown in Fig. 3. The chamber 36, with its pipe 38, constitutes one of the main features of the present invention and adds greatly to the efficiency of the pump and the system in which the pump is connected. The rings 37 above and below the chamber 36 render said chamber efficient as a chamber for collecting gas which may leak along the sides of the piston 12, and this gas instead of passing to an oil-chamber at the base of the pump, as heretofore, is drawn off from said chamber 36 by means of the return pipe 38 in fit condition for further efficient use. The chamber 36 intercepts the passage of the leaking-gas to the eccentric-chamber of the pump, and enables me not only to return this gas in better condition to the tank or gas-inlet pipe for future use but to simplify the construction of the lower or base portion of the pump.

The base-portion 10 of the pump differs from the like portion of the pump disclosed in my aforesaid Letters-Patent No. 848,277, in that it entirely omits the features required for the auxiliary or condensing oil-chamber described in said patent and some of the joints necessary in the formation of said chamber. The base-portion 10 is formed of but two parts, one being the main frame 39 and the other a side cap 40 whose outer face is solid and in whose inner face is formed a bearing 41 for one of the stub-

shafts of the eccentric 14, as shown in Fig. 2, the bearing for the other stub-shaft of said eccentric being in the opposing face of the frame 39, the same as shown in said Patent No. 848,277. The outer or peripheral portion of the frame 39 is solid or devoid of joints, since in this instance the cap 40 only occupies the central portion of the side of said frame and does not extend to the outer edges of the same. The base-portion 10 constructed as shown and described is of very durable character and easily prevented from leaking.

The operation of the pump described herein will be fully understood, in view of the patents hereinbefore referred to, without further detailed explanation, the more essential feature of the present invention residing in the provision of the annular gas-collecting chamber 36 intermediate the ends of the piston, with the pipe 38 communicating therewith.

I do not limit the invention to the special duplex-valves 25, 26 shown and described, since other forms of cooperating pressure and inlet valves may be substituted therefor without varying the features constituting the invention.

What I claim as my invention and desire to secure by Letters Patent, is:

In a gas-compression pump, a base-casing, a cylinder thereon, a valve-guide on the upper end of said cylinder, a cap forming a gas-inlet chamber on said guide, and an inlet-pipe leading into said chamber, combined with an elongated piston in said cylinder having a gas-collecting chamber closed from the discharge for compressed gas between its ends and packing at opposite ends of said chamber, a pipe leading from said collecting-chamber, a duplex gas-pressure and inlet-valve partly within said guide and extending across said cylinder and facing said piston, and a driving eccentric and rod in said base-casing, said base-casing comprising a main frame 39 in one integral piece and a closing cap 40 occupying the central portion of one side thereof, said cap having a solid outer face and said frame and cap on their inner facing sides being formed with bearings for the shaft of said eccentric; substantially as set forth.

Signed at New York city, in the county of New York, and State of New York, this 28th day of June A. D. 1907.

RICHARD WHITAKER.

Witnesses:

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