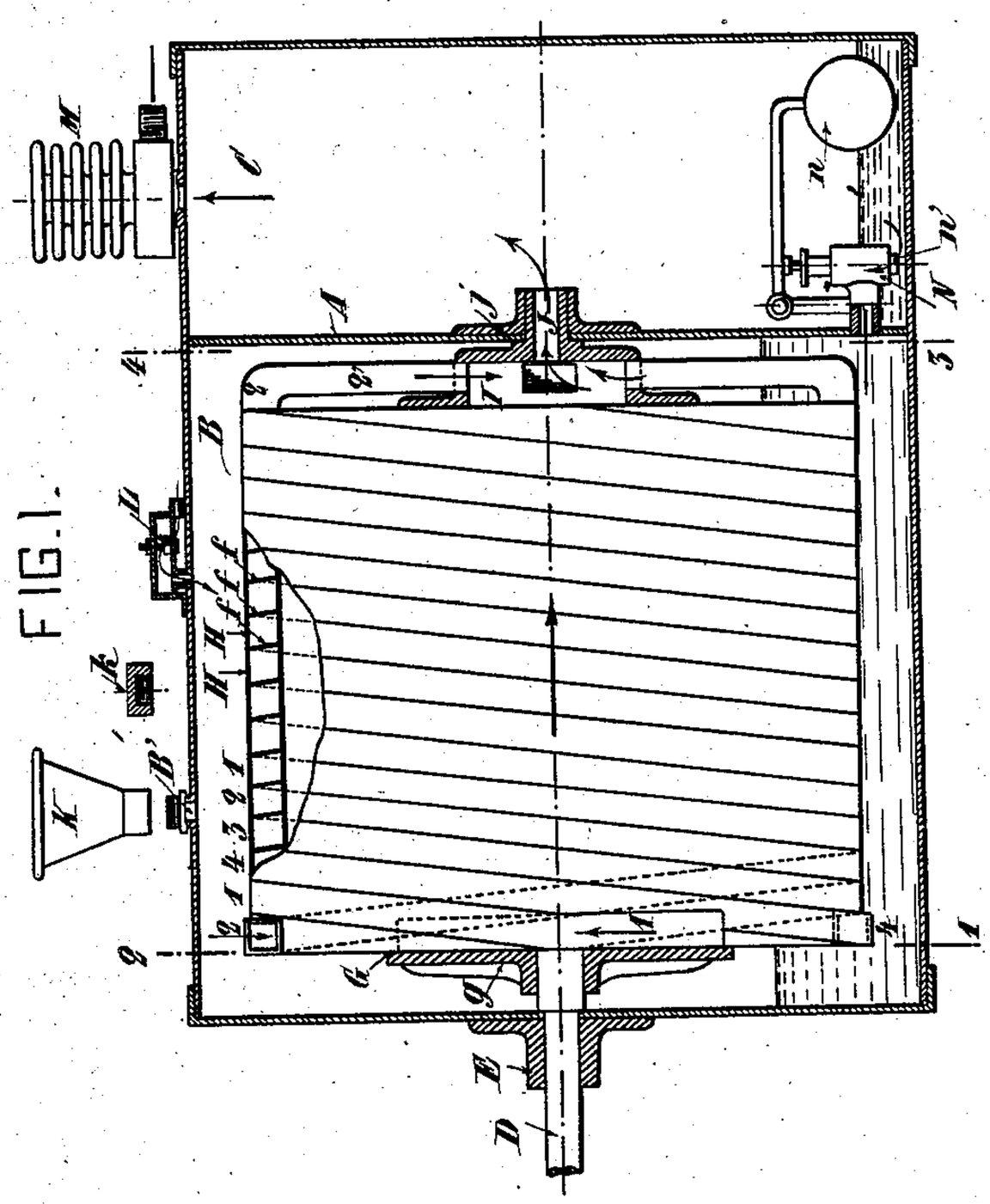
(No Model.) 2 Sheets—Sheet 1.

A. I. VAN VRIESLAND.

CARBURETER.

No. 604,948. Patented May 31, 1898.

FIG. 1.



WITNESSES:

Geo. Gaekel

May Hunziker

INVENTOR

Adolphe Isidore van Vriesland

BY Fitzgerald & Gregory

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

A. I. VAN VRIESLAND.

CARBURETER.

No. 604,948. Patented May 31, 1898.

FIG. 2. 1.2.

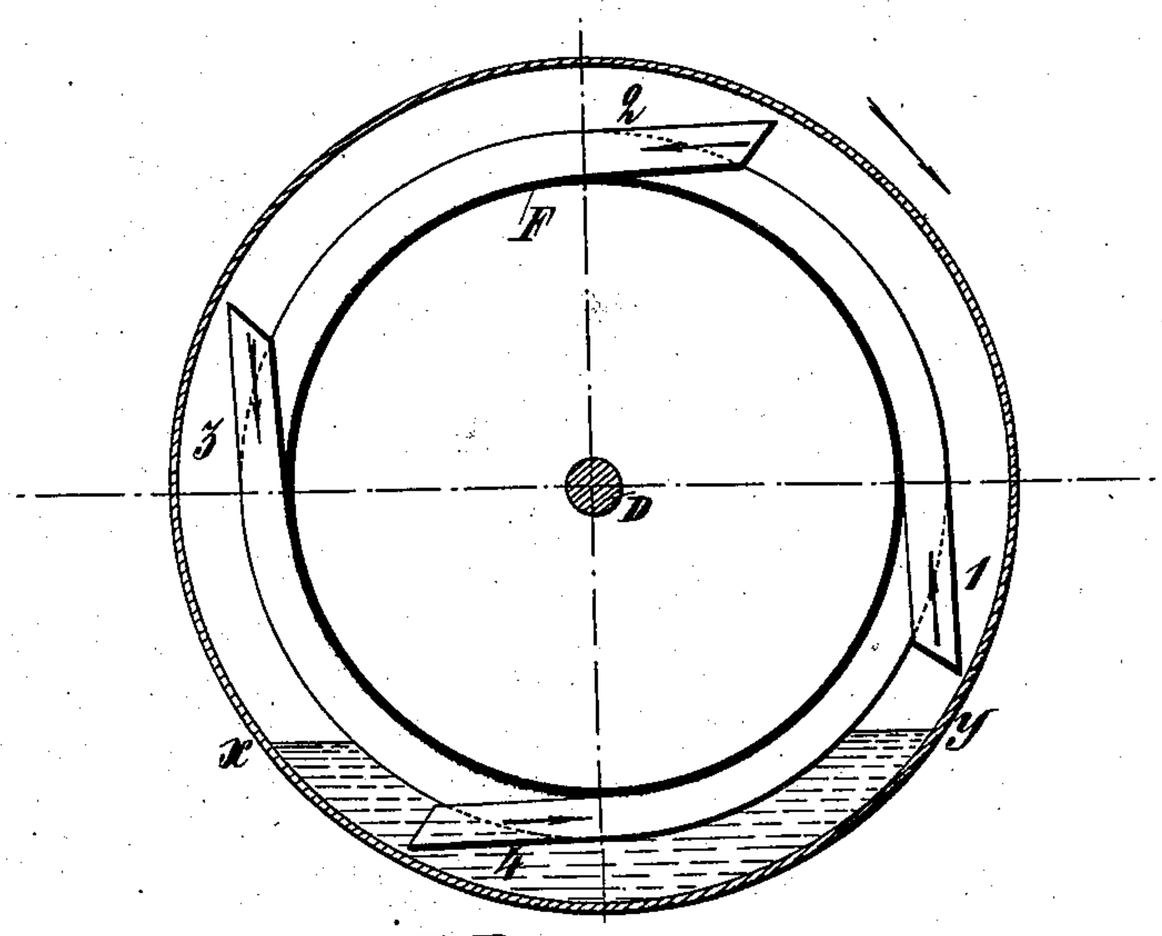
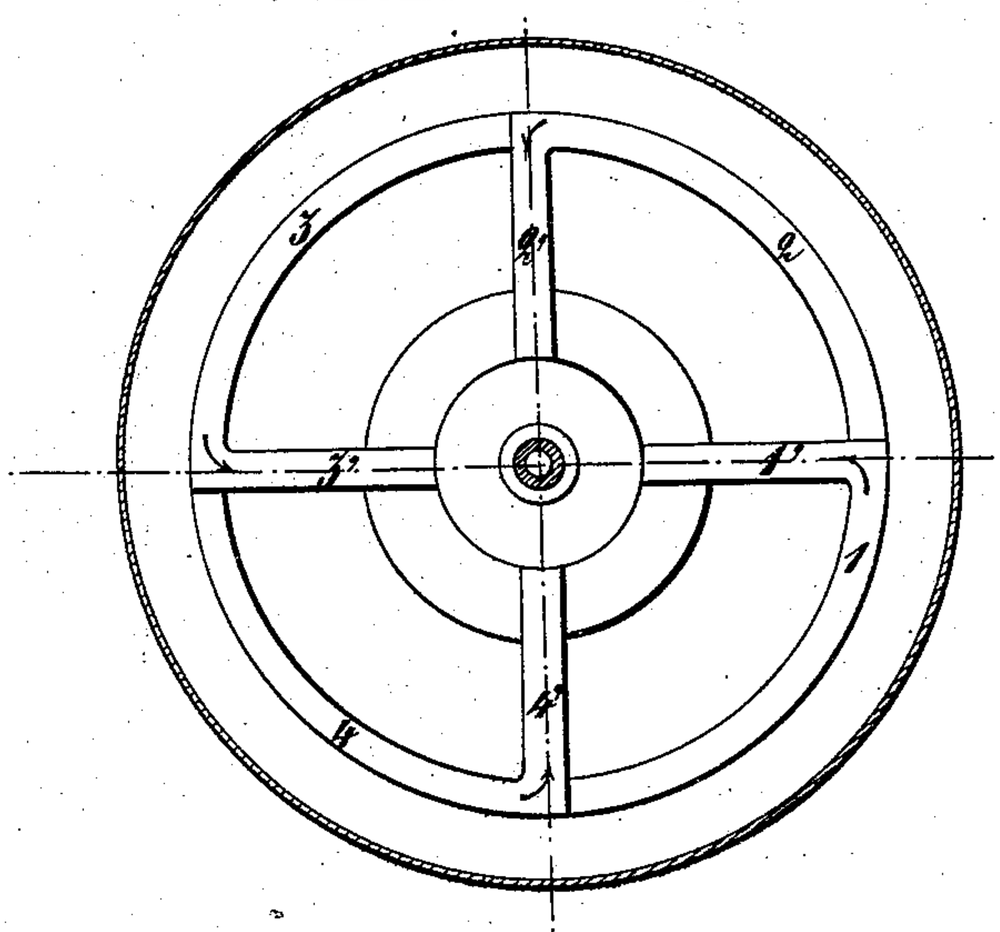


FIG. 3. 3.4.



WITNESSES:

Geo. W. Jaekel

Max Kurtzer

INVENTOR

Adolphe Isidore van Vriesland

BY Howard & Howard

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ADOLPHE ISIDORE VAN VRIESLAND, OF PARIS, FRANCE.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 604,948, dated May 31, 1898.

Application filed August 13, 1897. Serial No. 648,155. (No model.) Patented in France July 8, 1897, No. 268,556; in Belgium July 16, 1897, No. 129,503; in Switzerland July 16, 1897, No. 14,710; in England July 17, 1897, No. 16,907; in Luxemburg July 17, 1897, No. 2,904; in Hungary August 5, 1897, No. 10,445; in Italy August 28, 1897, No. 45,386, and September 30, 1897, No. 33; in Spain September 10, 1897, No. 21,282, and in Austria November 4, 1897, No. 47/4,553.

To all whom it may concern:

Be it known that I, ADOLPHE ISIDORE VAN VRIESLAND, a citizen of Holland, residing at Paris, France, have invented certain new and useful Improvements in Carbureter-Compressors, (for which I have obtained Letters Patent in France, No. 268,556, dated July 8, 1897; in England, No. 16,907, dated July 17, 1897; in Austria, No. 47/4,553, dated November 4, 1897; in Hungary, No. 10,445, dated August 5, 1897; in Belgium, No. 129,503, dated July 16, 1897; in Italy, No. 33, dated September 30, 1897, and No. 45,386, dated August 28, 1897; in Spain, No. 21,282, dated September 10, 1897; in Switzerland, No. 14,710, dated July 16, 1897, and in Luxemburg, No. 2,904, dated July 17, 1897,) of which the following is a specification.

By charging air with hydrocarbons a gaseous mixture is obtained which can be utilized as fuel to obtain either heat or light.

One method of charging air with hydrocarbons consists in bringing atmospheric air into contact with liquid hydrocarbons. After a certain period of time and by repeating this operation several times the air becomes sufficiently impregnated with hydrocarbons.

My invention has for its object to provide an improved apparatus for carbureting air which also imparts to the gaseous mixture considerable pressure, allowing of its utilization for light-producing purposes.

The apparatus which forms the subject of the present invention is thus a carbureting and compressing apparatus. It is capable of being applied, as above stated, for producing a gaseous mixture subsequently utilized in gas-mains, and it may be also used for producing a gaseous mixture which is conveyed as it issues from such apparatus to suitable heating-burners. The pressure will vary, as hereinafter more fully set forth, according to the dimensions of the apparatus and to its rotary speed.

The invention consists of a carbureting and compressing apparatus substantially as hereinafter described, and defined in the claims.

Referring to the drawings, Figure 1 represents a longitudinal central section of my improved carbureting and compressing apparatus, showing the rotating drum partly in elevation. Fig. 2 is a section on the line 1 2 of Fig. 1. Fig. 3 is a section on the line 3 4 of Fig. 1.

Similar letters and figures of reference indicate corresponding parts.

Referring to the drawings, B represents a cylinder closed at its two extremities and divided by a partition A into two chambers, one of which, C, is longer than the other, C'. The cylinder comprising these two chambers is hermetically closed apart from the openings, hereinafter indicated, which are used for the admission of hydrocarbon and air and for the outflow of the gaseous mixture.

In the center of the longer chamber C is arranged a shaft D, projecting from the left of the apparatus through a stuffing-box E. This shaft is provided outside the apparatus either with a crank-handle or with a driving-pulley (not shown) for imparting a rotary motion thereto. Upon this shaft and within the chamber is mounted a hollow drum G, which is closed on the left-hand side by a tray or disk *g*, fixed upon the shaft D. Strengthening-ribs impart sufficient rigidity to the disk and prevent the same from warping. At its right end the hollow drum G is likewise closed, so as not to communicate with the chamber C. Upon the drum thus mounted on the shaft are formed four helical conduits, which are parallel one to the other and are indicated on the drawings by the numbers 1 2 3 4. These conduits are coiled around the drum. They may consist of tubes fixed by any suitable means upon the drums or of small partitions *f f*, fixed upon the outer periphery of the drum. The conduits formed by these partitions are subsequently closed by a shell or lamella H, fixed upon them in any suitable manner. The first conduit starts from the right-hand side, extends along the horizontal diameter of the drum, and ascends, while being coiled upon the said drum, in order to pass behind the second conduit, which commences at the top of the drum and extends along the vertical diameter thereof. These two conduits are coiled parallel one to the other and pass afterward behind the third conduit, starting along

the horizontal diameter of the drum toward the left side. The three parallel conduits continue to be coiled and pass behind the starting-point of the first conduit, and so on. The conduits, instead of starting flush with the drum, have each a slightly-projecting end, so that they debouch into the chamber outside the drum. The four conduits above mentioned are thus coiled parallel one to the other all over the drum and have inclined convolutions, the inclination or dip of which may vary for each apparatus. As they reach the end of the drum each conduit communicates, through another conduit extending along one of the radial axes of the drum, with a box or chamber I arranged in the center of the right end of the drum. The second conduit, for instance, is extended to the center by a radial conduit, and the third, fourth, and, lastly, the first conduits are similarly each prolonged by a radial conduit 1′, 2′, 3′, and 4′. These four radial conduits debouch at right angles to one another in a central box or chamber I, which communicates through the hollow part J of the shaft with the smaller chamber C′ of the cylinder. A stuffing-box *j* prevents the larger and smaller chambers from communicating directly one with the other. The larger chamber is provided with an opening or neck B′, upon which is screwed either a funnel K for feeding the liquid hydrocarbons or a cap or stopper *k* to close the opening. Moreover, this chamber communicates with a valve L, which allows the atmospheric air to enter it. The valve may be regulated so as to only open when the depression in the chamber has reached a given limit. Obviously this valve is arranged so as to prevent the escape of the air or gas contained in the chamber. It can only admit air in the apparatus. The second or smaller chamber C′ communicates with an expansion valve M or apparatus of any suitable construction, which is connected to the pipe supplying the carbureted air to the apparatus where it is to be utilized. At the lower part of this chamber is arranged a valve N, enabling the smaller chamber to communicate with the longer chamber and connected to a ball *n*, so that it can only be opened when the level of the liquid in the smaller chamber has reached a certain height. The arrangement of the ball is such that the valve is closed before the level of the liquid has fallen below the communicating opening.

The operation of my apparatus is as follows: Hydrocarbon is poured into the longer chamber through the funnel K, so that the level of this liquid in such chamber may be sufficiently high to allow the ends of the conduits to dip successively in the hydrocarbon as they are rotating. A rotary motion being now imparted to the shaft D, the end of each of the conduits will dip in turn into the hydrocarbon. For example, the tube 1 dips as it rotates into the hydrocarbon, and a quantity of this liquid enters the conduit. When the end of the tube is withdrawn from the hydrocarbon, it accomplishes one revolution in the air contained in the chamber until it comes back again to dip a second time into the hydrocarbon. As the conduit is arranged in the form of a helical coil, it will successively contain liquid layers separated by layers of air, and owing to the rotary motion these liquid layers thus separated by layers of air will move in the first conduit from the left end of the apparatus to the right end thereof. After a number of turns a given portion of the liquid or gas, having entered the mouth of the first conduit, will pass through the first radial conduit into the central chamber I. From this chamber the air and the hydrocarbon proceed to the smaller or compression chamber C′ of the cylinder, the surplus hydrocarbon sinks to the bottom, and the gas expands in this chamber. Now as the expansion valve or apparatus is regulated to a given pressure the gas, which is highly charged with hydrocarbon in consequence of its contact with the liquid, will not be able to escape until the pressure has reached a given degree, and as, on the other hand, the drum continues to rotate and that hence carbureted air enters the compression-chamber constantly this carbureted air will become compressed, and as soon as the required pressure is reached it will escape through the expansion or pressure valve and enter the main where it is intended to be utilized, and the supply will soon become regular and continuous. It will be readily understood that the pressure attained in the compression-chamber is limited, such limit corresponding to the height of the various liquid convolutions contained in one of the conduits. The surplus hydrocarbon reaching the compression-chamber sinks at the bottom of such chamber, as already stated, and gradually raises a ball or float which opens the valve, and in consequence of the pressure exerted above the level of the hydrocarbon the latter returns into the first chamber until the ball closes the valve. There is thus no other loss of hydrocarbon than that used to enrich the air, the hydrocarbon returning to its starting-point.

It is obvious that with regard to the air in the first chamber as the rotation continues and in consequence of the depression produced by this rotation the valve L is raised and the atmospheric air enters the chamber.

In the above description four parallel conduits are indicated; but it is obvious that a lesser or greater number of such conduits may be used.

Among the advantages of my improved compressor the following are worthy of mention:

First. The heat produced by the compression compensates that which is absorbed by the carburation in such a manner that, contrary to the operation of many carbureters, no lowering of temperature occurs within the apparatus.

Second. The liquid hydrocarbon moves

continuously from the drum-chamber to the smaller chamber.

The carbureter and compressor may be utilized as an air or gas compressor only, if desired, the hydrocarbon being then replaced by water or by any other liquid having no action on gas and water.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a carbureting and compressing apparatus, the combination with a cylinder divided by a partition into two chambers, of a rotary drum mounted in one of said chambers, a series of conduits helically wound adjacent to each other around said drum, a box arranged at the end of the drum, said conduits opening at one end into the drum-chamber and at the other end into said box, a passage between said box and the second chamber, an air-inlet valve and a supply-opening in the drum-chamber, and a gas-outlet valve in the second chamber, and a valved passage connecting the lower part of said chambers for the return of the surplus hydrocarbon, substantially as set forth.

2. In a carbureting and compressing apparatus, the combination with a cylinder divided by a partition into two chambers, of a rotary drum mounted in one of said chambers, a series of conduits helically wound around said drum, a box arranged at the end of the drum, radial conduits leading into said box, said helically-wound conduits communicating at one end with the drum-chamber and at the other end with said radial conduits, a passage between said box and the second chamber, an air-inlet valve and a supply-opening in the drum-chamber and a gas-outlet valve in the second chamber, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ADOLPHE ISIDORE VAN VRIESLAND.

Witnesses:

FRANCOIS FAR,

ANTOINE ROUSSAUNOS, Jr.