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CARBURETER.

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Fig. 1

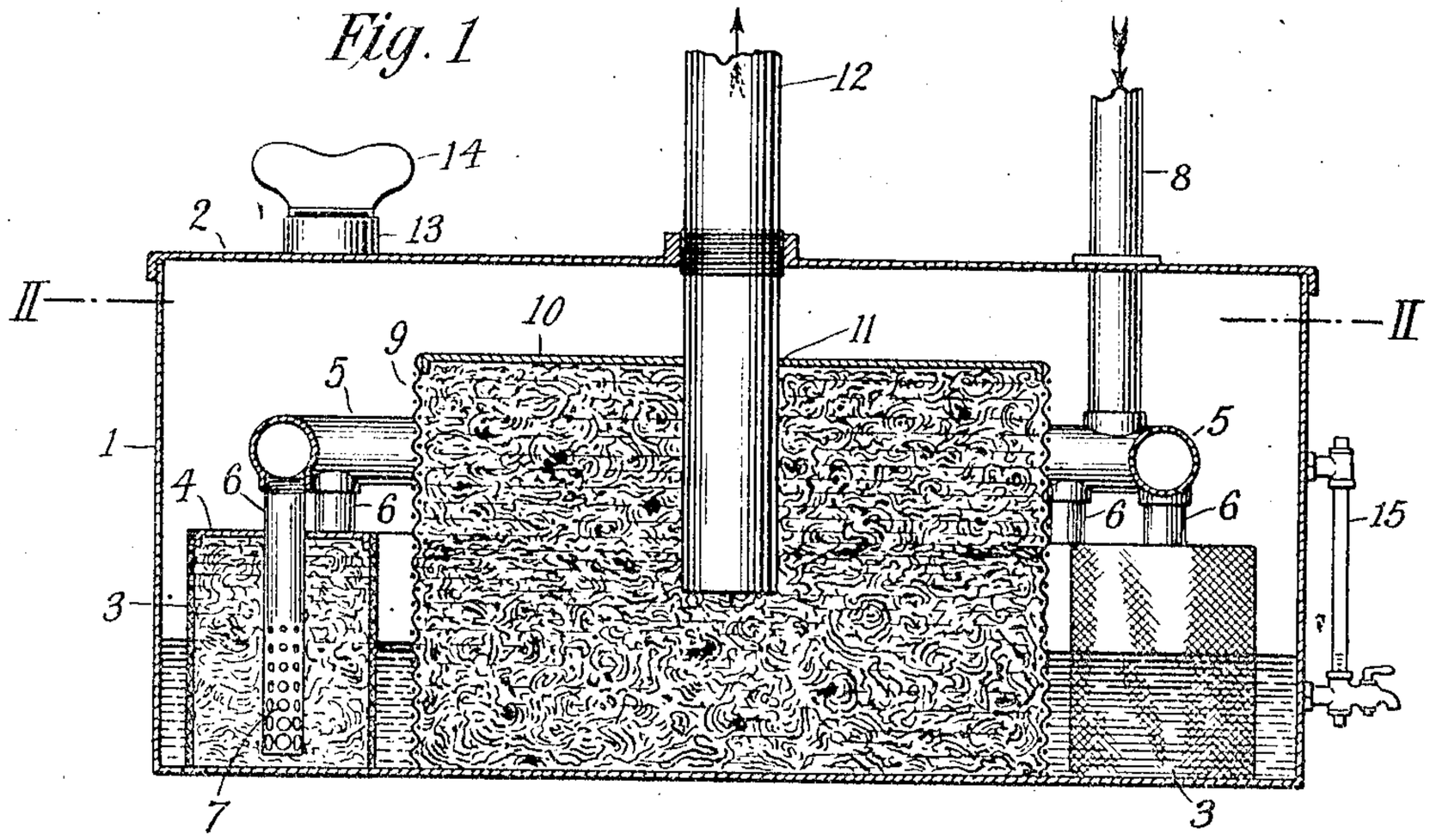
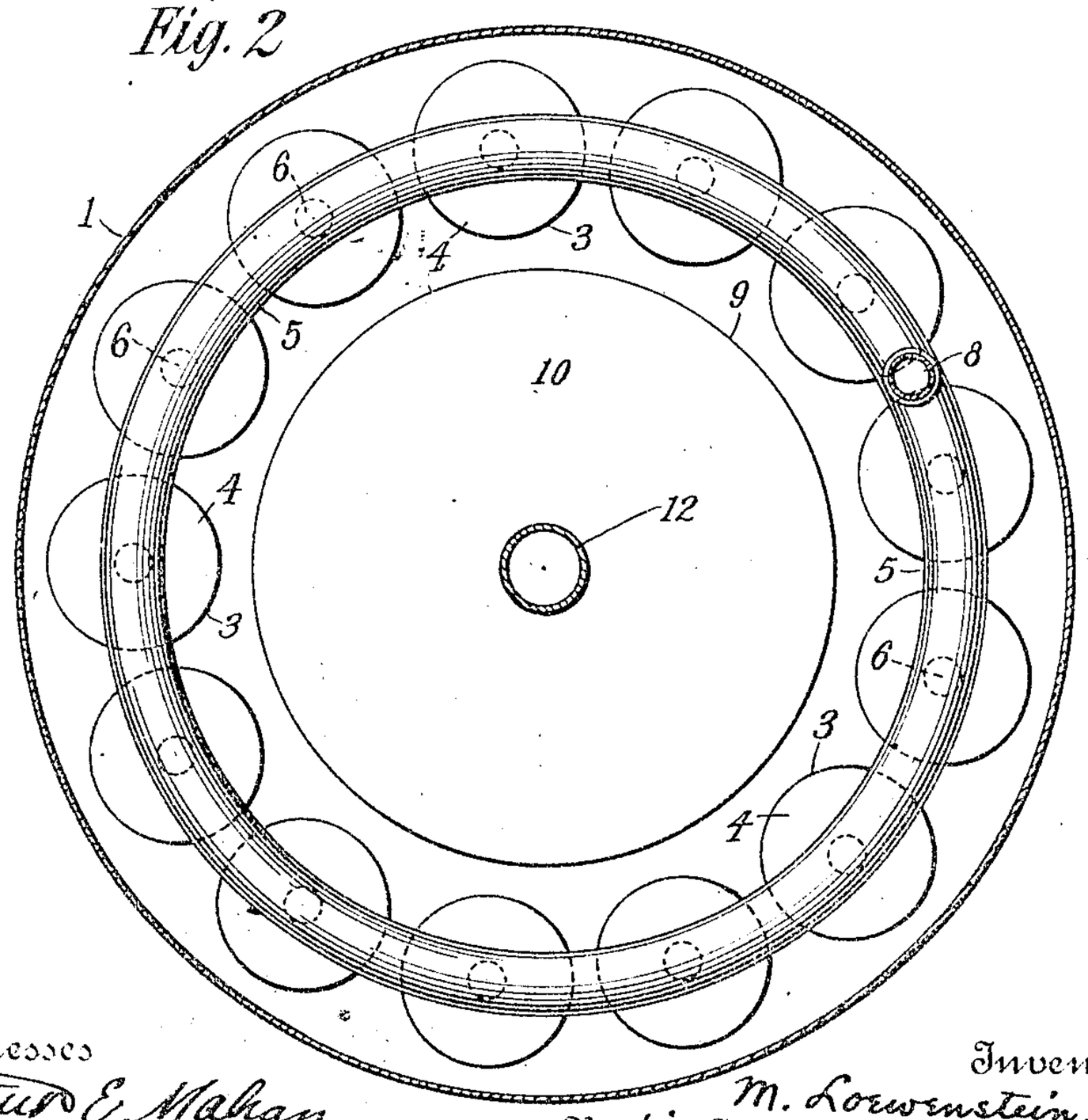


Fig. 2



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UNITED STATES PATENT OFFICE.

MAXMILIAN LOEWENSTEIN, OF NEW YORK, N. Y., ASSIGNOR OF ONE-THIRD TO MAURICE KIND, OF NEW YORK, N. Y., AND ONE-THIRD TO JONAS STORK, OF BRUSSELS, BELGIUM; SIMON LOEWENSTEIN ADMINISTRATOR OF SAID MAXMILIAN LOEWENSTEIN, DECEASED.

CARBURETER.

No. 885,265. Specification of Letters Patent. Patented April 21, 1908.

Application filed November 24, 1906. Serial No. 344,969.

To all whom it may concern:

Be it known that I, MAXMILIAN LOEWENSTEIN a subject of the Emperor of Germany, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Carbureters, of which the following is a specification, reference being had to the drawing accompanying and forming part of the same.

My invention relates to apparatus for carbureting air, and has for its chief object to provide a simple, compact, and inexpensive apparatus for carbureting air for heating and illuminating purposes, for the operation of explosion engines, etc.

The nature of the invention, which consists in the novel features of construction, arrangements of parts, and combinations of elements hereinafter described, and more particularly pointed out in the appended claims, will be more readily understood when explained in connection with the accompanying drawing, in which

Figure 1 is a vertical cross-section of the preferred embodiment of the invention. Fig. 2 is a horizontal section, on line II—II.

The outer casing of the apparatus is indicated by 1, and may be of any suitable size and shape, the form shown being cylindrical. The casing is provided with a cover or closure 2, preferably removable to afford access to the interior of the apparatus, and making an air-tight fit with the casing. Inside the casing, and near the wall of the same, is a circular series of carbureting cylinders or receptacles, 3, resting on the bottom of the casing, and preferably spaced slightly from the wall thereof and equidistant from each other. These cylinders are made of textile or fibrous material, as felt or wicking, by preference the latter, and are closed at the top, preferably by metal plates 4, which are secured thereto and which serve also to maintain the cylinders or chambers in their proper form.

Above the carbureting chamber is an annular air distributing pipe 5, provided with discharge nozzles or pipes 6, extending downward through the closures 4 into the carbureting cylinders 3. These discharge pipes or nozzles may be open or closed at their bottoms, but are provided with lateral perforations or air outlets, as 7, in annular series around the pipes and increasing in size, from the uppermost row or series, downward, as clearly shown in Fig. 1.

Extending through the cover or closure and into communication with the air distributing pipe 5 is an air supply pipe or conduit 8, connected with any suitable and convenient source of air under pressure, not shown.

Within the circle of carbureting chambers and the annular distributing pipe is a chamber of wire gauze or other foraminous material, 9, closed at its top preferably by an imperforate plate 10 provided with a central opening 11 for the carbureted air outlet pipe 12. The latter extends downward to a point slightly above the plane of the first or uppermost row of apertures 7 in the discharge pipes 6, and leads out through the cover 2 to the point of utilization or to a suitable storage tank or holder, not shown. The central chamber 9 and the carbureting chambers 3 are substantially filled with material having great liquid-absorbent power, as for example sponge, which is the best material of which I am at the present time aware for the purpose.

From the foregoing the operation of the carbureter will be readily understood. Kerosene, gasolene, alcohol, or other suitable liquid hydrocarbon or mixture thereof is introduced into the apparatus through a filling opening 13 in the cover, normally closed by a screw stopper 14, until the level of the liquid stands between the uppermost row or annular series of outlet apertures 7 and the row next below, the height of the liquid being readily determined by a gage-glass 15 which may be provided on the side of the outer casing for that purpose. The liquid being at the same height in the pipes themselves, the apertures below the first row are sealed; and since the pressure necessary to carry the air through the apparatus need be only moderate, the liquid will not be forced out of the pipes, but the air will escape through the uppermost row of perforations into the mass of sponge which, although thoroughly wet with the liquid is not submerged therein. The air escaping from the outlet apertures in the discharge pipes is brought into intimate contact with the liquid and picks up hydrocarbon vapor therefrom. This vapor-bearing air passes through the porous sides of the chambers or cylinders 3, and from the space above the liquid in the

outer casing the vapor-laden air passes through the foraminous wall of the central chamber 9, through the sponges in the upper part of the same, which have become saturated with liquid hydrocarbon by capillary action. Acquiring more vapor in its passage through the chamber 9 the air, now thoroughly carbureted, or laden with hydrocarbon vapor, passes into the open lower end of the outlet pipe 12 and is conducted to the point of utilization or to the storage receptacle. As the liquid held by the sponges above the liquid level is evaporated, more liquid is supplied by capillary action, thus slowly lowering the liquid level until the second row of apertures is exposed. At the same time, the uppermost portion of the mass of sponges becomes less wet by reason of the fact that the capillary action is not sufficient to keep that part of the filling as wet as the part adjacent to the liquid level, as will be readily understood. Hence if air escaped only through the uppermost row of perforations it would not come in contact with as much liquid as it had formerly, and therefore might not pick up as much vapor. But the second row being now opened, and being as close to the liquid level as the first row was formerly, the air issuing from said second row of apertures passes through the requisite quantity of saturated sponge and therefore acquires the desired quantity of vapor. Furthermore, the total mass of sponge to be traversed by the air from the second row is greater than that traversed by the air from the first row, and the greater resistance thus encountered by the air would necessitate an increase of air pressure to insure an equal amount of air from said second row, if the openings of the latter were of the same size as those in the first. But the apertures of the second row are larger than those of the first, and consequently permit an equivalent quantity of air to issue, though its velocity may be less. Of course some air escapes through the upper row, but a less amount than through the other, because of the greater outlet capacity of the latter, as will be readily understood. This operation goes on as described, the liquid falling and uncovering the rows of apertures in succession, which aperture increases in size downward, so that as the resistance to the air increases the outlet capacity of the escape openings also increases, thus insuring that the greater portion of the air discharged from the pipes 6 will pass through those portions of the masses of sponge which lie nearest to the liquid and which are thus thoroughly saturated therewith. In time, as the liquid falls, the upper portions of the sponge in the chambers may and usually does become quite dry, but, for the reasons just mentioned, the air is nevertheless carbureted to the desired degree by the wet sponge near the liquid. This operation goes on continuously so long as the supply of air is maintained through the pipe 8 and any liquid hydrocarbon remains in the apparatus. The supply of hydrocarbon may of course be replenished from time to time, as required.

Extending the outlet pipe 12 down into the mass of sponge in the chamber 9 but terminating above the liquid level is also an important feature of the invention. If by any mischance back-firing should be caused in the pipe 12 and the flame run back into the carbureter, the flame will be extinguished by the mass of wet sponge around the end of the pipe and will not be communicated to the body of carbureted air in the space outside of the chamber 9. At the same time the force of any slight explosion will be taken up or cushioned by the yielding sponges and the liquid will not be materially disturbed or thrown away from the outlet pipe to any considerable degree.

The apparatus herein specifically shown and described is of course merely the preferred form of the invention, which may be embodied in a variety of forms without departure from its proper scope, as defined by the following claims:

1. In a carbureter, the combination of an outer casing, a series of carbureting chambers having porous walls, arranged around the periphery of the casing inside of the same, an air distributing pipe extending around the series of carbureting chambers above the same, discharge pipes extending downward from the distributing pipe into the carbureting chambers and provided with air outlet apertures, a collecting chamber having foraminous walls inside the series of carbureting chambers, an outlet pipe for carbureted air extending from the said collecting chamber, and fillings of absorbent material in the carbureting chambers and collecting chamber, as set forth.

2. In a carbureter, the combination of an outer casing, a series of carbureting chambers inside the casing around the periphery of the same, said chambers having porous walls and fillings of absorbent material, an air-distributing pipe extending around the series of carbureting chambers above the same, discharge pipes extending downwardly from the distributing pipe into the carbureting chambers so as to be embedded in the absorbent fillings therein, said discharge pipes being provided with lateral apertures for the escape of air, and an outlet pipe for carbureted air extending out of the casing from the space inside the series of carbureting chambers, as set forth.

3. In a carbureter, the combination of an outer casing, a series of carbureting chambers having porous walls arranged inside the casing around the periphery of the same and having fillings of absorbent material, an air-

distributing pipe extending around the series of carbureting chambers above the same, discharge pipes extending downwardly from the distributing pipe into the carbureting chambers so as to be embedded in the absorbent material therein and provided with lateral apertures for the escape of air, said apertures successively increasing in size downward, and an outlet pipe for conducting the carbureted air out of the casing, as set forth.

4. In a carbureter, the combination of an outer casing, a carbureting chamber having porous walls inside the casing and having a filling of absorbent material, an air-discharge pipe extending downwardly into the carbureting chamber so as to be embedded in the absorbent material therein and provided with lateral apertures for the escape of air, said apertures being of successively larger size from the uppermost to the lowermost, and an outlet pipe for carbureted air connected with the casing, as set forth.

5. In a carbureter, the combination of a carbureting chamber, a filling of absorbent material in the chamber, an air-discharge pipe extending downwardly into the absorbent material in the chamber and provided with a vertically extending series of apertures for the escape of air, the lower apertures being larger than the upper apertures, and means for conducting off the carbureted air, as set forth.

6. In a carbureter, the combination of an outer casing adapted to contain liquid hydrocarbon, a chamber therein having foraminous walls and a filling of absorbent material, means for conducting air into the body of liquid in the casing, and an outlet pipe extending out of the said chamber and casing from a point in the chamber above the level of the liquid therein, the inlet end of said pipe being embedded in the absorbent material in the chamber, as set forth.

7. In a carbureter, the combination of a cylindrical outer casing adapted to contain liquid hydrocarbon, an annular series of carbureting chambers arranged around the periphery of the casing inside the same and having walls of fibrous material, and fillings of absorbent material, an annular air-distributing pipe above the series of carbureting chambers, discharge pipes extending from the distributing pipe down into the absorbent material in the carbureting chambers, said discharge pipes being provided with vertical series of air-escape apertures successively increasing in size downward, a central cylindrical chamber having foraminous walls inside of the annular series of carbureting chambers and having a filling of absorbent material, and an outlet pipe for carbureted air, extending through the top of the central chamber into the absorbent material therein and terminating above the level of the liquid hydrocarbon in the chamber, as set forth.

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