

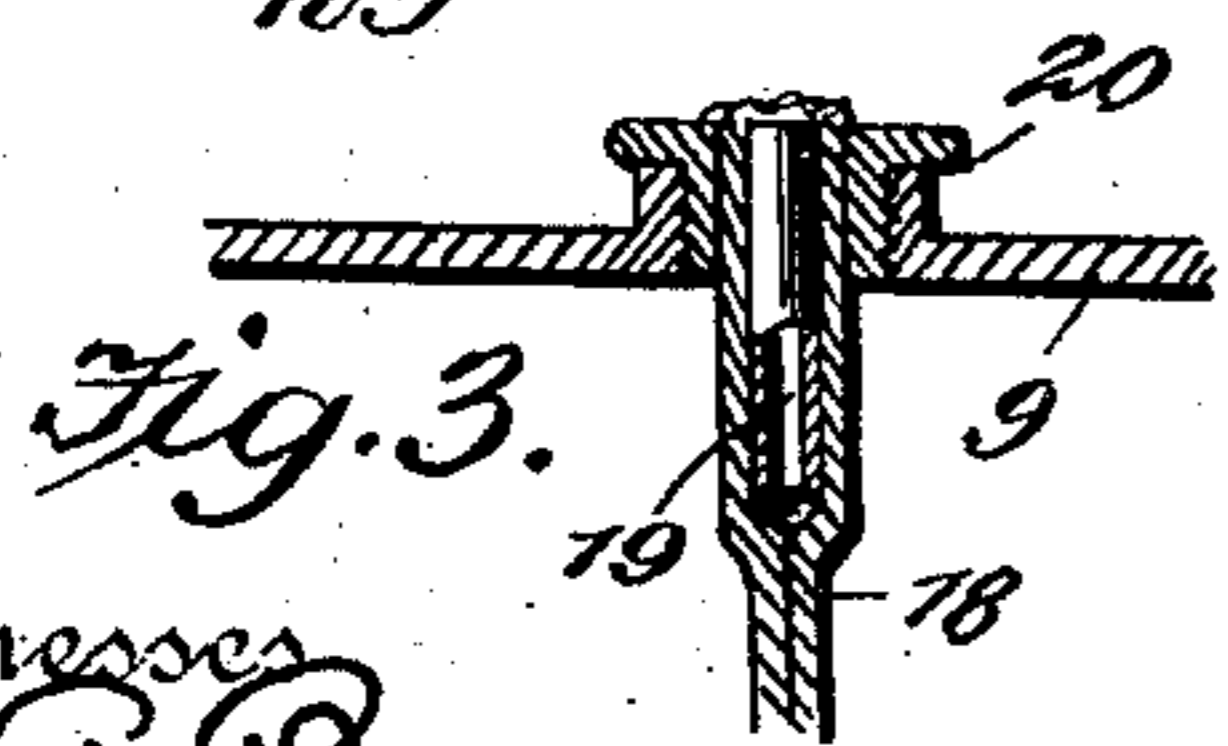
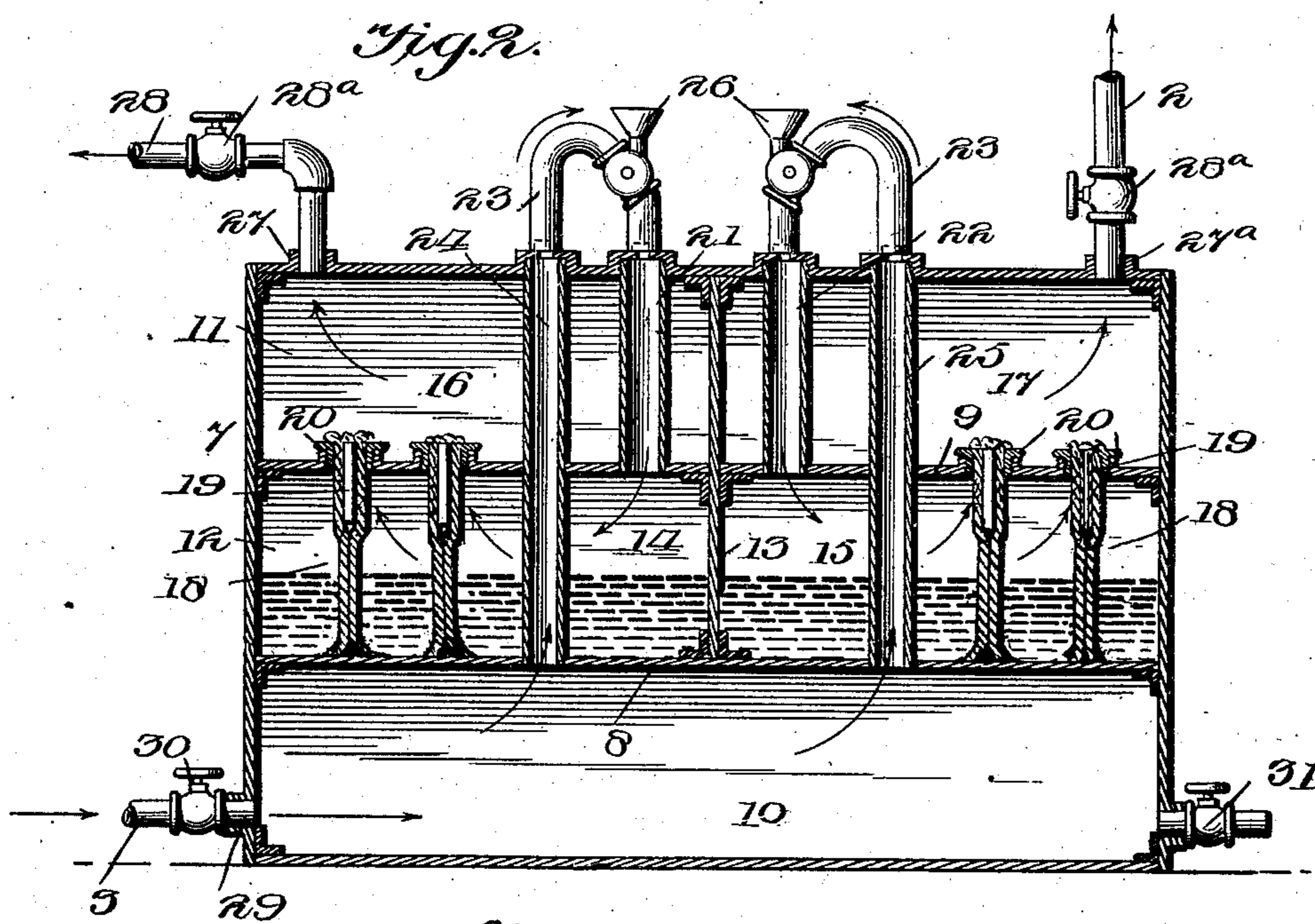
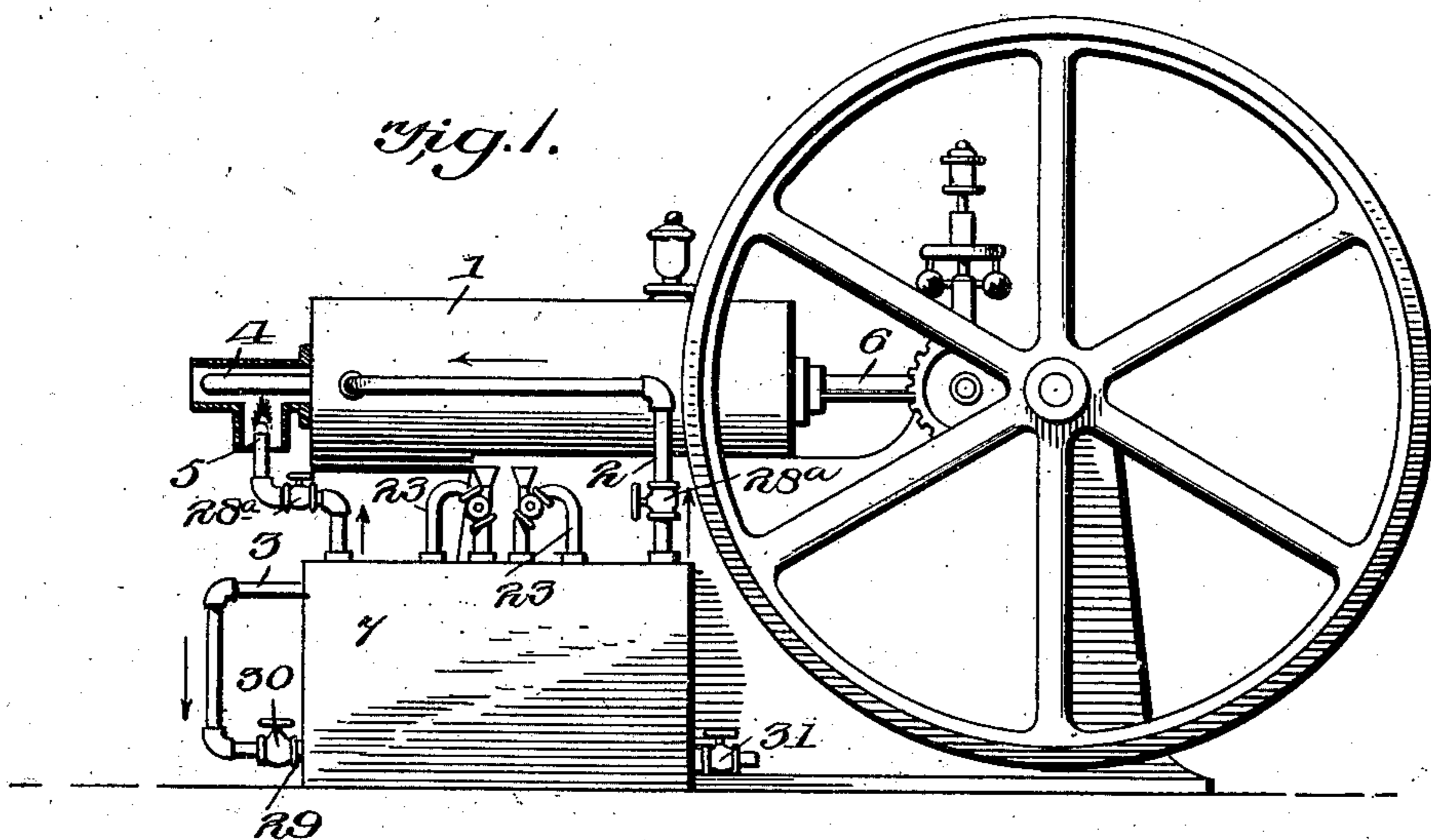
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Patented Apr. 1, 1902.

T. McCORMICK & A. D. MILLER.
CARBURETING DEVICE FOR EXPLOSIVE ENGINES.

(Application filed Jan. 24, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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CARBURETING DEVICE FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 696,909, dated April 1, 1902.

Application filed January 24, 1901. Serial No. 44,591. (No model.)

To all whom it may concern:

Be it known that we, THOMAS MCCORMICK and ANANIAS D. MILLER, citizens of the United States, residing at Mount Pleasant, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Carbureting Device for Explosive-Engines, of which the following is a specification.

This invention relates to improvements in carbureting devices for gas or vapor engines, but more particularly to a novel carbureting attachment by means of which the fluid-pressure generated within the cylinder of the engine is used in the form of exhaust-gases to operate the carbureter for the purpose of supplying a hydrocarbon vapor to the explosion-chamber of the engine and also to the burner utilized to heat the ignition-tube.

Considered in a more specific aspect, the object of the invention is to utilize the exhaust of a vapor-engine for the purpose of producing and feeding the vapor, under pressure, to the explosion-chamber and burner, the exhaust being forced by its own expansive energy through one or more carbureting-chambers for enrichment before being returned to the explosion-chamber and ignition-burner, as stated.

A still further object of the invention is to so equip or construct the carbureter that the exhaust will be conducted through the oil-chamber of the carbureter to heat and partially vaporize the oil before being liberated within the carbureting-chamber for enrichment.

Still further and subordinate objects of the invention will hereinafter more fully appear as the necessity for their accomplishment is developed in the succeeding description of the preferred form of our invention, illustrated in the accompanying drawings.

In said drawings, Figure 1 is an elevation of an engine with our carbureter attached thereto, the latter being shown in section, and Fig. 2 is a detached view of the carbureter on a somewhat-enlarged scale. Fig. 3 is a detail sectional view illustrating the construction and mounting of the wicks and wick-tubes.

Referring to the numerals employed to des-

ignate corresponding parts throughout the views, 1 indicates the cylinder of a vapor-engine; 2, the supply-pipe through which the explosive vapor is supplied to the cylinder; 3, the exhaust-pipe, and 4 the ignition-tube, designed to be heated to a state of incandescence by the ignition-burner 5. The operation of engines of this type, which of course include a piston 6 within the cylinder, is well understood in the art, and it need only be stated that the explosive vapor or gas is fed to the interior of the cylinder through the pipe 2 and is compressed by the return stroke of the piston and forced back under compression into the incandescent tube 4. The intense heat of the tube explodes the vapor, which drives the piston 6 to the opposite end of the cylinder and finally exhausts through the exhaust-pipe 3. Our invention is particularly applicable to engines of this type; but it will be evident as the description progresses that the application of the principle of the invention is possible in connection with motors of various other types.

Located at any suitable point, but preferably immediately adjacent to the engine, as shown, I provide a metal casing 7, subdivided by two horizontal partitions 8 and 9 into an exhaust-chamber 10, a gas-compartment 11, and an intermediate oil-compartment 12. The compartments 11 and 12 are further subdivided by a central vertical partition 13, at the opposite sides of which are defined the carbureting-chambers 14 and 15 and the superposed vapor and gas chambers 16 and 17. Within the carbureting-chambers 14 and 15 are provided a number of preferably cylindrical wicks 18, preferably surrounding wick-tubes 19 and having their upper ends extended through thimbles 20, screwed into suitable openings in the partition 9. The wick-tubes 19, which are shorter than the wicks, are located in the upper ends thereof for the purpose of preventing their collapse and also for the purpose of spreading the wicks against the inner faces of the thimbles with sufficient pressure to insure the retention of the upper ends of the wicks by the thimbles in order to prevent the possibility

of the dropping of the former when they become saturated with oil—that is to say, the wick-tubes act as spreaders, which tend to prevent the clogging of the upper ends of the wicks and at the same time assist in the retention thereof within the thimbles.

For the purpose of introducing the liquid hydrocarbon to the carbureting-chambers 14 and 15 we provide filling-tubes 21 and 22, extending through the top of the casing and through the partition 9, and after utilizing these tubes for the purpose indicated they are coupled by means of short sections of hose 23 or by other suitable means to the upper ends of heating-tubes 24 and 25. These heating-tubes, like the filling-tubes 21 and 22, extend through the top of the casing, but are of sufficient length to extend down through the compartments 11 and 12 and through the partitions 9 and 10 for the purpose of placing said tubes in communication with the exhaust-chamber 10. If desired, the hydrocarbon may be introduced through the filling-tubes without moving the hose-sections by providing the latter with suitable filling-valves 26, as shown.

Inasmuch as it is designed to supply the burner 5 and the cylinder 1 with combustible vapor from the carbureter described, the latter is provided, preferably in its top wall, with pipe connections 27 and 27^a, opening into the vapor-chambers 16 and 17, and designed, respectively, for connection with the burner supply-pipe 28, leading to the burner 5, and the supply-pipe 2, leading to the cylinder of the engine. The pipes 2 and 28 are provided, as usual, with controlling-valves 28^a, as shown, for the purpose of controlling the passage of vapor to the explosion-chamber and ignition-burner, respectively.

At one end of the exhaust-chamber 10 we provide a pipe connection 29, controlled by a valve 30 and coupled to the exhaust-pipe 3 of the engine. At the opposite end of the exhaust-chamber 10 is provided a petcock 31, by means of which a portion of the exhaust may be permitted to escape in order to prevent undue compression within the carbureter.

Assuming the device to be equipped and connected to the engine in the manner stated, its operation is as follows: The temperature of the exhaust fluid is very high, and as it is forced from the explosive-chamber of the engine into the exhaust-chamber 10 through the pipe 3 it will escape from said chamber through the heating-tubes 24 and 25. Inasmuch as these tubes are located within the carbureting and vapor chambers, they will serve as vaporizers for the purpose of permitting the use of crude or heavy oils and will serve to raise the tension of the vapor after it has passed from the carbureting-chambers into the vapor-chambers 16 and 17—that is to say, the heated exhaust passing through the tubes 24 25 will first heat the oil within the chambers 14 and 15 and will then

heat and raise the tension of the vapor which has passed into the chambers 16 and 17 from the carbureting-chambers. Having performed this office, the exhaust will pass through the hose-sections 23 and through the filling-tubes 22 for delivery to the carbureting-chambers 14 and 15. It will now be seen that the exhaust in order to escape from the carbureting-chambers must penetrate the oil-laden wicks 18, which will obviously carburete the fluid and form a combustible gas, which escapes into the vapor-chambers 16 and 17 and is finally delivered under more or less pressure through the pipes 2 and 28 to the cylinder of the engine and to the burner 5, respectively. Thus it will appear that a complete cycle of utility is established, inasmuch as the exhaust from the engine is employed to force fluid through the carbureter for the formation of a combustible gas subsequently supplied to the explosion-chamber and ignition-burner of the engine, the exhaust being also utilized for the purpose of heating the oil and of raising the tension of the vapor prior to its delivery. In conclusion it may be stated that the heated fluid passing into the carbureting-chambers under pressure is passed into the vapor-chambers; but in doing so is compelled to pass through the saturated wicks, a portion of the fluid passing through the wicks around the tubes and another portion through the material of the wicks and up through the wick-tubes 19.

From the foregoing it will be observed that we have produced a simple, ingenious, and effective carbureting attachment for vapor-engines arranged to supply a combustible vapor to both the explosion-chamber and ignition-burner and operated by the exhaust of the engine; but while the present embodiment of the invention is believed at this time to be preferable, we desire to reserve the right to effect such changes, modifications, and variations of the illustrated structure as may be suggested by experience and experiment, so long as such changes are embraced within the scope of the protection prayed.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. The combination with a vapor-engine, of a carbureter comprising a carbureting-chamber and a vapor-chamber, means for passing a heated fluid through, but not into, said chambers, means for liberating said fluid within the carbureting-chamber, means for leading the carbureted fluid through the carbureting-chamber into the vapor-chamber, and means for leading the vapor or gas from the vapor-chamber to the engine for consumption.

2. The combination with a vapor-engine, of a carbureter comprising a carbureting-chamber and a vapor-chamber communicating therewith, a heating-tube extending through said chambers, means for establishing communication between one end of said tube and the interior of the carbureting-chamber,

means for leading a heated fluid through the tube to heat said chambers prior to the delivery of said fluid to the interior of the carbureting-chamber, and means for leading the gas or fluid from the vapor-chamber to the engine.

3. The combination with a vapor-engine, of a carbureter comprising an exhaust-chamber, a vapor-chamber and an intermediate carbureting-chamber, of means for leading the exhaust from the engine into the exhaust-chamber of the carbureter, means for leading the exhaust fluid from the exhaust-chamber to the interior of the carbureting-chamber, means for establishing communication between the carbureting-chamber and the vapor-chamber, and means for leading the gas or vapor from the vapor-chamber of the carbureter to the engine for consumption.

4. The combination with a vapor-engine having an explosion-chamber and an ignition-burner, of a carbureter comprising a plurality of vapor-chambers disposed to supply vapor to the explosion-chamber and ignition-burner, respectively, carbureting-chambers in communication with said vapor-chambers, an exhaust-chamber disposed to receive the exhaust fluid from the engine, and having communication with the interior of each of the carbureting-chambers, and means for leading the exhaust through the vapor-chambers before delivery to the carbureting-chambers, whereby the tension of the vapor is raised prior to its delivery to the engine.

5. In a carbureter, the combination with a casing comprising an exhaust-chamber, carbureting-chambers and vapor-chambers, of wicks controlling communication between the carbureting-chambers and the vapor-

chambers, means for supplying a fluid under pressure to the exhaust-chamber, means for leading said fluid from the exhaust-chamber to the carbureting-chambers and for leading said exhaust fluid through the carbureting-chambers before delivery thereto, and means for leading the vapor from the vapor-chambers.

6. In a carbureter, the combination with a casing subdivided to define a pair of carbureting-chambers, vapor-chambers above and an exhaust-chamber below the carbureting-chambers, of wicks located within the carbureting-chambers and extended into the vapor-chambers, heating-tubes extending from the exhaust-chamber through the carbureting and vapor chambers, filling-tubes extending through the vapor-chambers and opening into the carbureting-chambers, and means for establishing communication between the upper ends of the heating and filling tubes.

7. In a carbureter, the combination with a casing having an apertured partition defining a carbureting-chamber and a vapor-chamber at opposite sides thereof, of cylindrical wicks located in the carbureting-chamber and extended into the apertures of the partition, short wick-tubes disposed within the upper ends of the wicks, and means for leading a fluid through the carbureter.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

THOMAS McCORMICK.
ANANIAS D. MILLER.

Witnesses:

JOHN H. SIGGERS,
FLORENCE E. WALTER.