No. 645,596. Patented Mar. 20, 1900.

J. P. JOHNSTON & E. E. MORRELL.

OIL SPRAYER FOR GAS GENERATORS.

(Application filed Oct. 12, 1898.)

(No Model.)

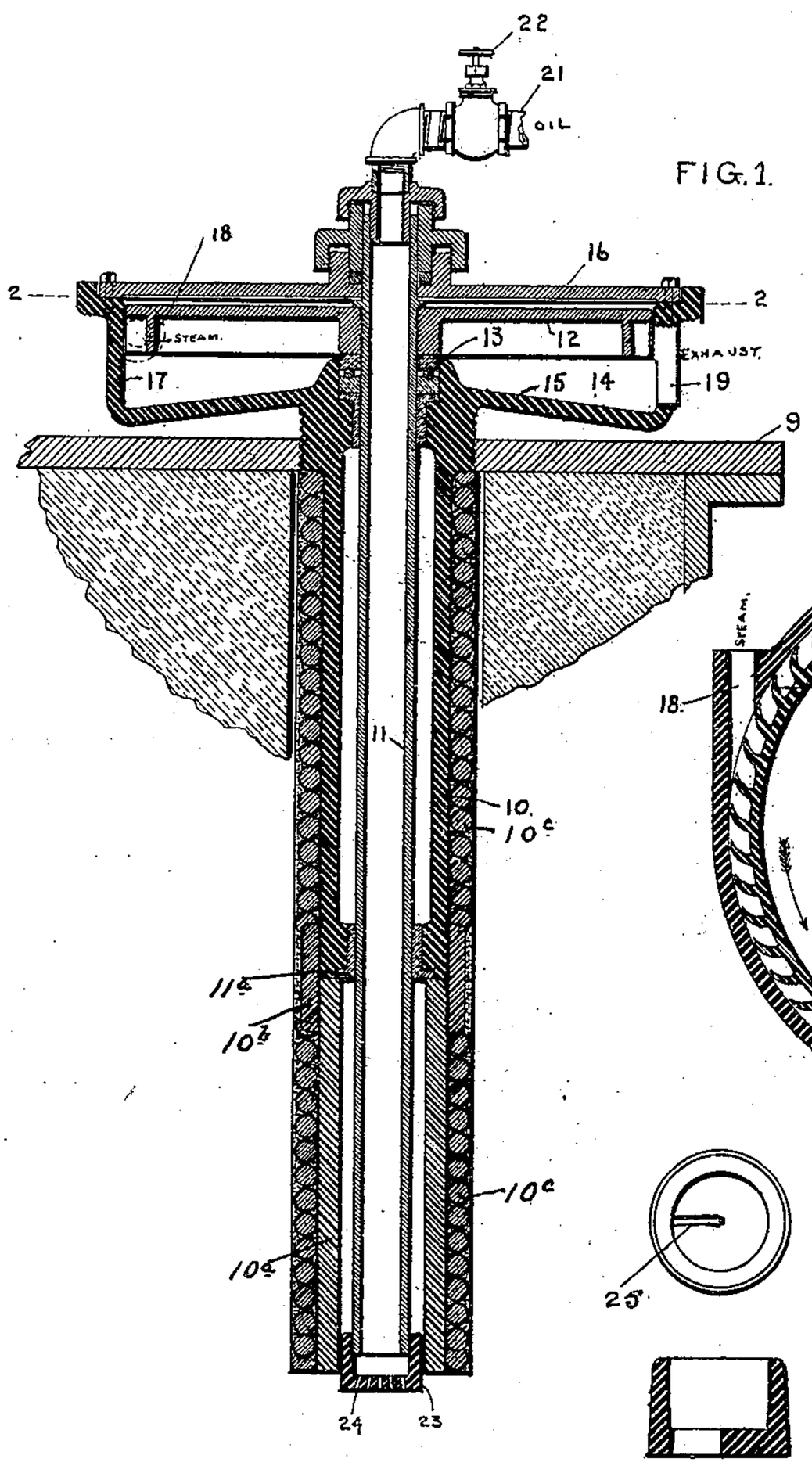

FIG. 1.

FIG. 2.

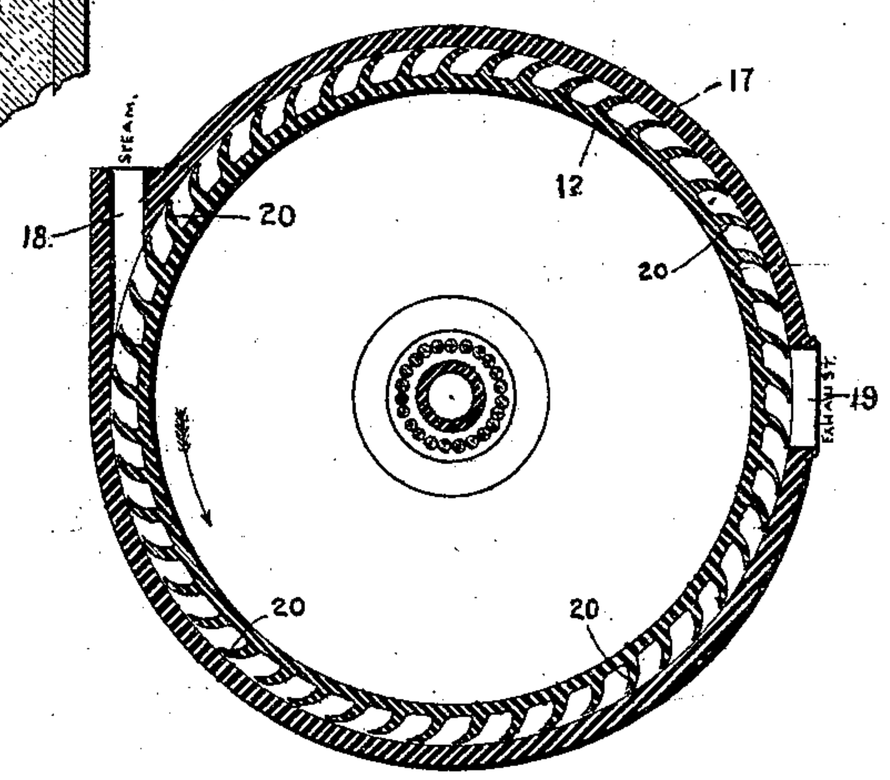

FIG. 3.

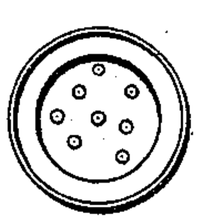

FIG 5

FIG. 4.

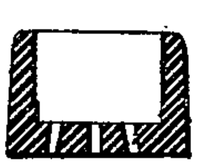

FIG 6.

WITNESSES.

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UNITED STATES PATENT OFFICE.

JOHN P. JOHNSTON AND EDWARD E. MORRELL, OF OAK PARK, ILLINOIS.

OIL-SPRAYER FOR GAS-GENERATORS.

SPECIFICATION forming part of Letters Patent No. 645,596, dated March 20, 1900.

Application filed October 12, 1898. Serial No. 693,298. (No model.)

To all whom it may concern:

Be it known that we, JOHN P. JOHNSTON and EDWARD E. MORRELL, citizens of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spraying Devices for Carbureters, &c., of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to spraying devices for delivering oil or other liquid hydrocarbon evenly in a fine mist over the interior of the carbureter or superheater of a water-gas-generating apparatus. All previous devices that have been used for this purpose are deficient and unsatisfactory in that they do not distribute the oil evenly over the entire surface of the hot checker-brick, and it is therefore impossible to keep the checker-brick at an even temperature, causing a great loss of oil in the carbureting of water-gas and resulting in the formation of lampblack or other fixed carbon in the hot portions of the superheater and of tar in the cooler parts thereof. Furthermore, former devices have not been successful, as the intense heat cracks the nozzles employed and results in the formation of a small deposit of carbon on them, either of which circumstances prevents the uniform distribution of the liquid hydrocarbon. A further objection to prior constructions, besides the large waste of oil, is that the checker-brick rapidly deteriorates, necessitating the frequent cleaning and renewal of the parts of the carbureters or superheaters.

One object of our present invention is to avoid the objections above pointed out and to provide a spraying device which evenly and thoroughly distributes the oil or other hydrocarbon used in a fine mist over the checker-brick.

A further object is to provide means by which the speed of the spraying devices may be regulated, thereby controlling the amount of oil supplied in a given time.

To this end our invention consists in providing steam or compressed-air operated apparatus for rotating the nozzle through which the oil is discharged into the superheater and in certain other improvements which will be hereinafter pointed out.

In this connection we wish to state that although our invention is primarily designed for delivering oil or other liquid hydrocarbon to the carbureter or superheater of a water-gas-generating apparatus it may be applied also for spraying oils or other liquids for other purposes.

Referring to the accompanying drawings, Figure 1 is a vertical section of a part of a superheater or carbureter, showing our improvements in section. Fig. 2 is a horizontal section on line 2 2 of Fig. 1, showing the rotating devices. Fig. 3 is a plan view of one form of nozzle for the oil-pipe. Fig. 4 is a vertical section of the same. Fig. 5 is a plan view of another form of nozzle. Fig. 6 is a vertical section of the same.

In the drawings, 9 indicates a part of a superheater or carbureter in the upper end of which the oil-feeding devices are mounted.

10 indicates a suitable frame having a tubular portion mounted in the superheater 9 and adapted to support an oil-pipe 11, which, as shown in Fig. 1, is mounted therein in a vertical position. The frame 10 and the extension 10^a thereof, which may be an ordinary standard steam-pipe connected to the frame by a coupling-sleeve 10^b, are insulated by asbestos rope 10^c in order to protect them and the oil-pipe 11 from the intense heat of the superheater. The oil-pipe 11 is supported in position by a wheel 12, mounted in a horizontal position upon the upper end of the frame 10, as shown in Fig. 1, and is guided by the bushing 11^a, secured to the frame 10, suitable ball-bearings 13 being preferably provided in order to facilitate the rotation of said wheel. In the form of apparatus shown in Fig. 1 the wheel 12 is fixedly secured to the pipe 11, so that said pipe rotates with said wheel. At the upper end of the frame 10 a steam-chamber 14 is provided, formed by a flanged web 15, secured upon the upper end of the frame 10, and a cover-plate 16, which is secured to the flange 17 of the web 15. The wheel 12 is mounted in said chamber 14, which is provided with a steam-inlet 18 and an outlet 19, as shown in Figs. 1 and 2. The wheel 12 is provided with a series of projecting wings 20 around its periphery, against which the incoming steam is directed, thereby causing said wheel to rotate in the direction indicated by the arrow in Fig. 2.

The oil-pipe 11 communicates at its upper end with a suitable pipe 21, leading from an oil-supply, said pipe being provided with a valve 22, so that the flow of oil may be regulated as desired. At the lower end of the pipe 11 is a nozzle 23, through which the oil flows into the superheater or carbureter. Said nozzle is formed on or secured to the pipe and rotates with it in the construction shown in Fig. 1, and is provided with a series of perforations 24, through which the oil passes. Instead of this construction, however, a single slit 25, as shown in Figs. 3 and 4, may be provided, or a greater or less number of orifices may be provided, as illustrated in Figs. 1, 5, and 6.

In operation the oil is admitted from pipe 21 to pipe 11, which is rotated at a high rate of speed by steam supplied through inlet 18 and exhausting through outlet 19. The high speed at which the pipe 11 rotates causes the downflowing oil to adhere to the inner surface of the pipe 11 and to be spread out thereover in a thin layer, gradually passing down to the nozzle 23. The rapid rotation of said nozzle and the high speed at which the oil is caused to rotate causes it to be spread by centrifugal force in a fine mist over the interior of the superheater and distributes it uniformly, so that it is applied to all parts of the checker-brick, preventing the formation of lampblack or tar, and consequently preserving the superheater in proper form for efficient service, as hereinbefore suggested.

It will be obvious that by varying the speed at which the nozzle is rotated the distribution of the oil may be varied, and it may also be varied by adjusting the valve 22.

It will be understood that various modifications such as would occur to any one skilled ln the art may be made, and we therefore do not wish to be limited to the specific details of the construction illustrated except as set forth in the claims. Furthermore, the use of our improvements is not limited to gas apparatus, as they may be applied to many other uses—as, for example, they may be employed to supply oil or other suitable liquid fuel to furnaces, &c.—and it will be understood that our invention is not limited to the arrangement of the parts in a vertical position, as shown in the drawings.

That which we claim as our invention, and desire to secure by Letters Patent, is—

1. In a gas apparatus, the combination with the generating or carbureting chamber thereof and an oil-supply pipe entering said chamber having a nozzle at one end, of fluid-pressure-operated mechanism at the supply end of said pipe for rotating it, and means for preventing the actuating fluid from entering said pipe and said chamber, substantially as described.

2. In a gas apparatus, the combination with the generating or carbureting chamber thereof, of an oil-supply pipe entering said chamber, a nozzle thereon, fluid-pressure-operated mechanism outside said chamber for rotating said nozzle, and means for preventing the actuating fluid from entering said pipe and said chamber, substantially as described.

3. In a gas apparatus, the combination with the generating or carbureting chamber thereof, of an oil-supply pipe entering said chamber and provided with a nozzle, a casing outside said chamber provided with inlet and exhaust passages for fluid under pressure, a rotary wheel mounted in said casing secured to said pipe, and provided with wings or blades adapted to be acted upon by the fluid entering said casing, and means for preventing said fluid under pressure from entering said supply-pipe and said chamber, substantially as described.

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