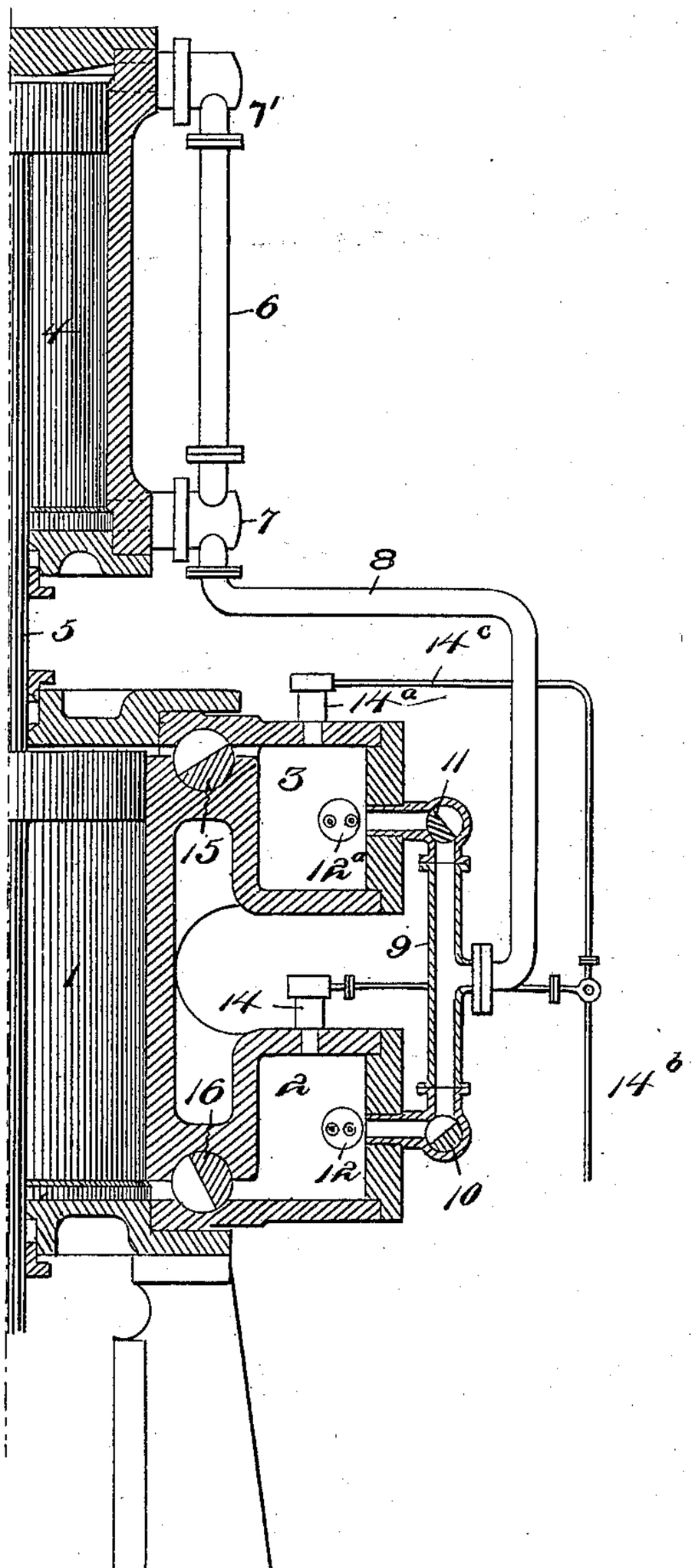
No. 635,095. Patented Oct. 17, 1899.

A. A. FESSLER.

INTERNAL COMBUSTION STEAM GENERATOR.

(Application filed Mar. 18, 1898.)

(No Model.)



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ALFRED A. FESSLER, OF ALLEGHENY, PENNSYLVANIA.

INTERNAL-COMBUSTION STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 635,095, dated October 17, 1899.

Application filed March 18, 1898. Serial No. 674,300. (No model.)

To all whom it may concern:

Be it known that I, ALFRED A. FESSLER, a citizen of the United States of America, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Generators, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to certain new and useful improvements in steam-generators, and may be particularly referred to herein as an "internal-combustion steam-generator."

This invention has for its object to construct a new and useful apparatus for generating steam as a means for driving motors and multiple expansion-engines, for heating, or for any other purpose or purposes.

To illustrate the invention clearly, I have shown a pair of steam-generators attached to a double-acting motor, the view being a vertical sectional one showing a portion of the cylinder and charging-pump with the two internal-combustion steam-generators cast in one piece secured to the working cylinder.

Referring now to the drawing by reference-figures, 1 indicates the working cylinder of the motor, with which are cast two of the internal-combustion steam-generators. (Designated 2 and 3.) The charging-pump 4 may be driven by the extension of the motor piston-rod 5 and supplies these internal-combustion steam-generators with the ready mixture of air and combustibles through the pipe 6, which communicates with the pump 4 through cocks 7 and 7′ and through pipe 8 into the pipe 9, which connects and is in communication with the internal-combustion steam-generators 2 and 3. The admission of this mixture is controlled by means of the valves 10 and 11, suitably disposed in the pipe 9. Engaging into the internal-combustion steam-generators are the injectors 14 and 14^a, having suitable feed and supply pipes 14^b and 14^c. In the walls of these steam-generators are arranged the valves 15 and 16, which admit the ready mixture of combustion-gases and steam into the working cylinder 1 of the motor.

I will now describe the operation in accordance with the foregoing description and construction as follows: The pistons are on the upper dead-points. Within the generator 3 is the previously-formed mixture of combustion-gases and steam. Valve 11 is closed, while valve 15 commences to open and admit the contents of steam-generator 3 into the motor-cylinder 1. The piston commences to move downward, and at about three-fourths of its downward stroke the valve 15 closes. Valve 11 opens and admits into the steam-generator 3 the compressed charge from the charging-pump. The charge of this generator 3 is completed upon the pistons reaching the lower dead-points and at which time valve 11 is closed, while the charge in the generator 3 is ignited by the electric igniter 12^a and burned through the combustion within the said generator 3. The injector 14^a being actuated, water is introduced into the generator and coming into contact with the combustion-gases of high temperature evaporates at once and the generated steam mixes immediately with the combustion-gases, thereby forming the steam or working fluid for the next downward stroke during the time that the pistons have moved a part of their upward stroke. On the other side the pistons reaching the lower dead-points find in the internal-combustion steam-generator 2 the previously-formed steam or working fluid. The valve 16 commences to open and admit the contents of the generator 2 into the working cylinder 1. The pistons commence their upward stroke and the same cycle as described on the downward stroke of the pistons is repeated, with the valves 10 and 16, the igniter 12, and the injector 14^a in a part of the upward stroke of the pistons. Thus it will be noted that the generation of the steam or working fluid is about one stroke in advance of the stroke of the working piston in the cylinder 1.

The drawing as herein shown and described is given as an illustration of how this improved method or process may be carried out, and I of course do not wish to limit myself to any construction such as herein shown, as it will of course be observed that the construction will depend largely upon the application of the invention, and various changes may be made in the details without departing from the general spirit of my invention.

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

1. The herein-described means for generating steam comprising in combination, a working cylinder, a piston operating in said cylinder, a pump-cylinder, a piston operating in said pump-cylinder and connected to the piston in the working cylinder, one or more combustion-chambers, means for admitting combustibles thereto, and separate means for admitting water to said combustion-chambers for generating steam within the combustion-chambers before its admission to the working cylinder, substantially as described.

2. In an apparatus for generating steam one or more internal-combustion steam-generators adapted to receive a charge of combustibles and air, means for igniting the same, ejectors connected to the said generators adapted to bring into contact with the combustion-gases a charge of water or fluid thereby generating steam, a pump connected to the said generators, a cylinder, a piston operating in the said cylinder, and means connected to the piston of the working cylinder for charging the said generators with combustibles and air, substantially as set forth.

3. The herein-described means for generating steam which consists of a pair of internal-combustion chambers adapted to receive a charge of combustibles and air, means for igniting the same, a cylinder, connections between the said cylinder and said generators, valves arranged in the said connections, a piston operating in the said cylinder, ejectors suitably connected to the said generators adapted to discharge water or other liquid into contact with the combustion-gases for the purpose of generating steam, a pump, connections between the said pump and said generators, valves arranged in the said connections, and means connected to the piston of the working cylinder for charging the said generators with combustibles and air, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

ALFRED A. FESSLER.

Witnesses:

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