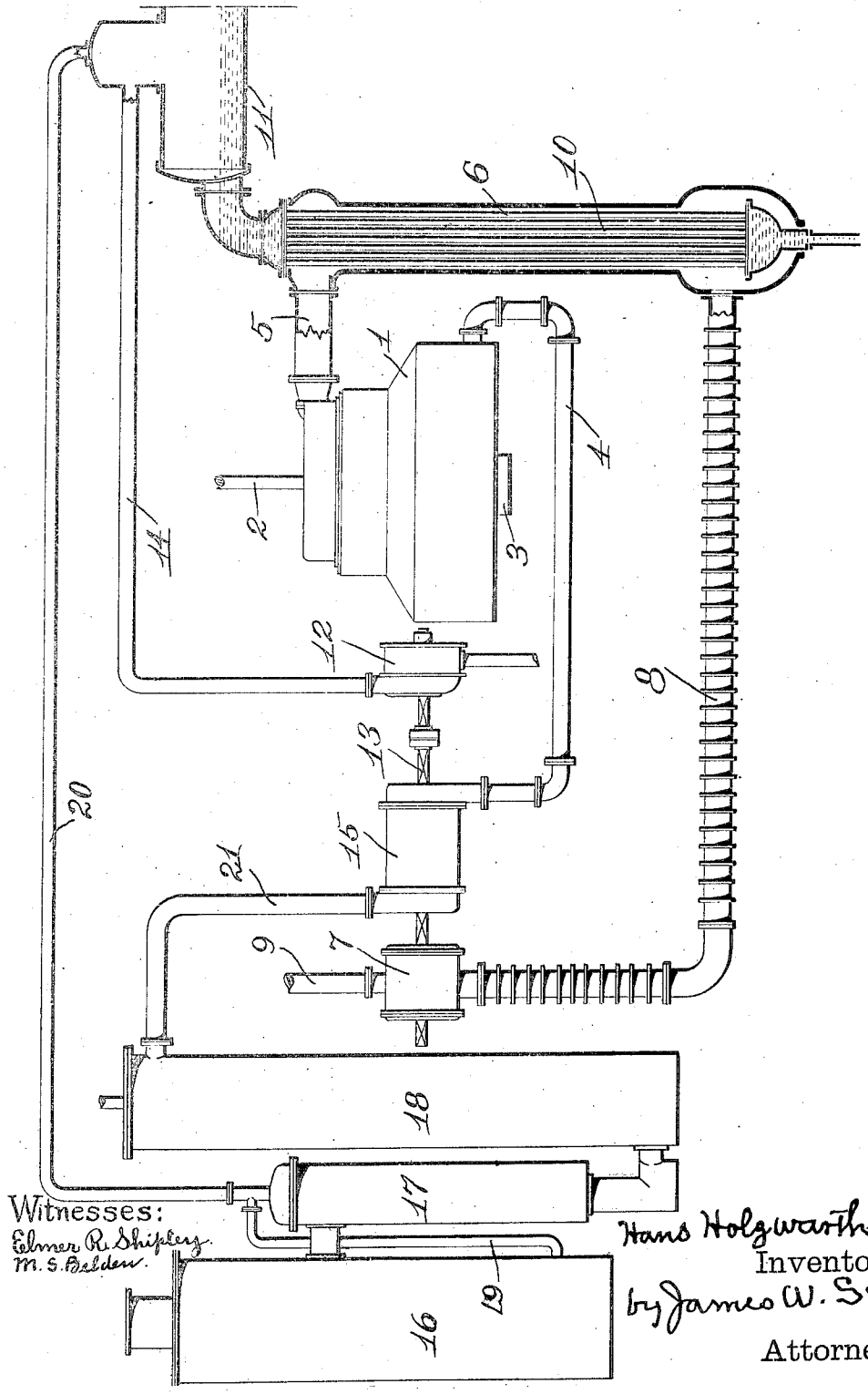
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GAS TURBINE PLANT.

APPLICATION FILED APR. 2, 1910.

1,089,055. Patented Mar. 3, 1914.



Witnesses:
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HANS HOLZWARTH, OF BADEN, GERMANY, ASSIGNOR OF ONE-HALF TO ERHARD JUNGHANS, OF WURTTEMBERG, GERMANY.

GAS-TURBINE PLANT.

1,089,055. Specification of Letters Patent. Patented Mar. 3, 1914.

Application filed April 2, 1910. Serial No. 553,042.

To all whom it may concern:

Be it known that I, HANS HOLZWARTH, of Mannheim, B, 7–18, Baden, Germany, a citizen of Germany, have invented certain new and useful Improvements in Gas-Turbine Plants, of which the following is a specification.

This invention, designed to utilize the very considerable heat-wastes from the exhaust of the gas turbine will be readily understood from the following description taken in connection with the accompanying drawing which is a side elevation, part vertical section, of a gas turbine plant exemplifying my invention.

In the drawing: 1, indicates a gas turbine: 2, its shaft: 3, its air inlet: 4, its gas supply pipe: 5, its exhaust pipe: 6, an enlarged portion of the exhaust conduit: 7, exhaust suction pump: 8, suction pipe of exhaust suction pump, connecting the pump with the enlarged portion 6 of the gas turbine exhaust conduit: 9, discharge pipe of exhaust suction pump: 10, a tubular regenerator arranged in the enlarged portion 6 of the exhaust conduit: 11, an evaporator connected with the regenerator: 12, a steam turbine: 13, the shaft of the steam turbine by means of which it drives the exhaust suction pump 7: 14, steam pipe supplying the steam turbine 12 from the evaporator 11: and 15, the gas pressure pump for supplying the gas turbine with gas under pressure through pipe 4.

The gas turbine may, as a mere example, be of the type illustrated in my United States Patent No. 877,194 of January 21st, 1908. The water in the tubes of the regenerator becomes heated by the passage around them of the hot exhaust gases whereby steam becomes generated in the evaporator 11. The exhaust gases, in thus parting with heat, becomes sufficiently cooled to be satisfactorily handled in the exhaust suction pump 7, especially if the exhaust line 8 be provided with cooling flanges as illustrated. The steam from the evaporator goes to and drives the steam turbine 12, the steam turbine driving the accessories exemplified by the gas compression pump 15 and the exhaust suction pump 7, and can manifestly drive other accessories likely to be called for by the gas turbine plant. The regenerator and evaporator, considered together, will be apprehended as constituting a steam generator heated by hot gases. The temperature of the gases exhausting from the gas turbine will be about 600 degrees Fah., a high-enough temperature to generate steam.

If a suction gas producer be employed in producing the gas for the gas turbine the surplus steam from the evaporator of the producer plant may join with the previously considered steam in giving motion to the auxiliary steam turbine which drives the accessories.

Proceeding with the drawing: 16, indicates the gas producer: 17, the evaporator of the gas producer plant: 18, the scrubber: 19, the steam pipe from the evaporator to the gas producer: 20, the pipe connecting the evaporator 17 of the gas producer plant with the steam turbine 12, preferably through the medium of the evaporator 11: and 21, gas supply pipe leading from the scrubber to the gas pressure pump 15.

The evaporator of a suction gas producer plant produces more steam than is needed in the gas producer and thus surplus steam joining the steam generated by the waste heat of the exhaust from the gas turbine still further raises the efficiency of the general plant. Even without the assistance of the surplus steam from the evaporator of the gas producer it is possible, under my system, to operate all of the accessories of the gas turbine plant by means of heat recovered from the exhaust of the gas turbine.

I claim:—

1. A gas turbine plant comprising a gas turbine provided with an exhaust conduit, a steam generator disposed in said exhaust conduit, a gas compression pump for the gas turbine and a pump to cause the flow of air through the turbine, a steam engine having driving connection with said pumps, and a steam supply connection from the steam generator to the steam engine.

2. In a gas turbine plant, the combination of a gas turbine, an exhaust conduit therefor, a pump for supplying fuel to the turbine, an exhaust pump, a steam engine connected to drive said pumps, a steam generator in said exhaust conduit, a steam supply connection from said generator to the steam engine, and an exhaust connection from said exhaust conduit to the exhaust pump.

3. The combination of a suction gas producer plant, a steam container, a connection to carry surplus steam from said producer plant to the container, a gas turbine, an exhaust conduit therefor, a steam generator in said conduit, a connection from said generator to said steam container, a steam turbine motor, a supply connection from said steam container to said motor, a fuel pump for pumping fuel from said gas producer to said gas turbine, a connection between said pump and said steam turbine, an exhaust pump, a connection between said pump and said steam turbine, and an exhaust pipe connecting said pump with said exhaust conduit.

4. In a gas turbine plant, the combination of a gas turbine, an exhaust conduit therefor, a steam generator in said conduit, a pump for drawing exhaust gas away from said steam generator, a steam motor for said pump, and a steam connection from said generator to said steam motor.

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