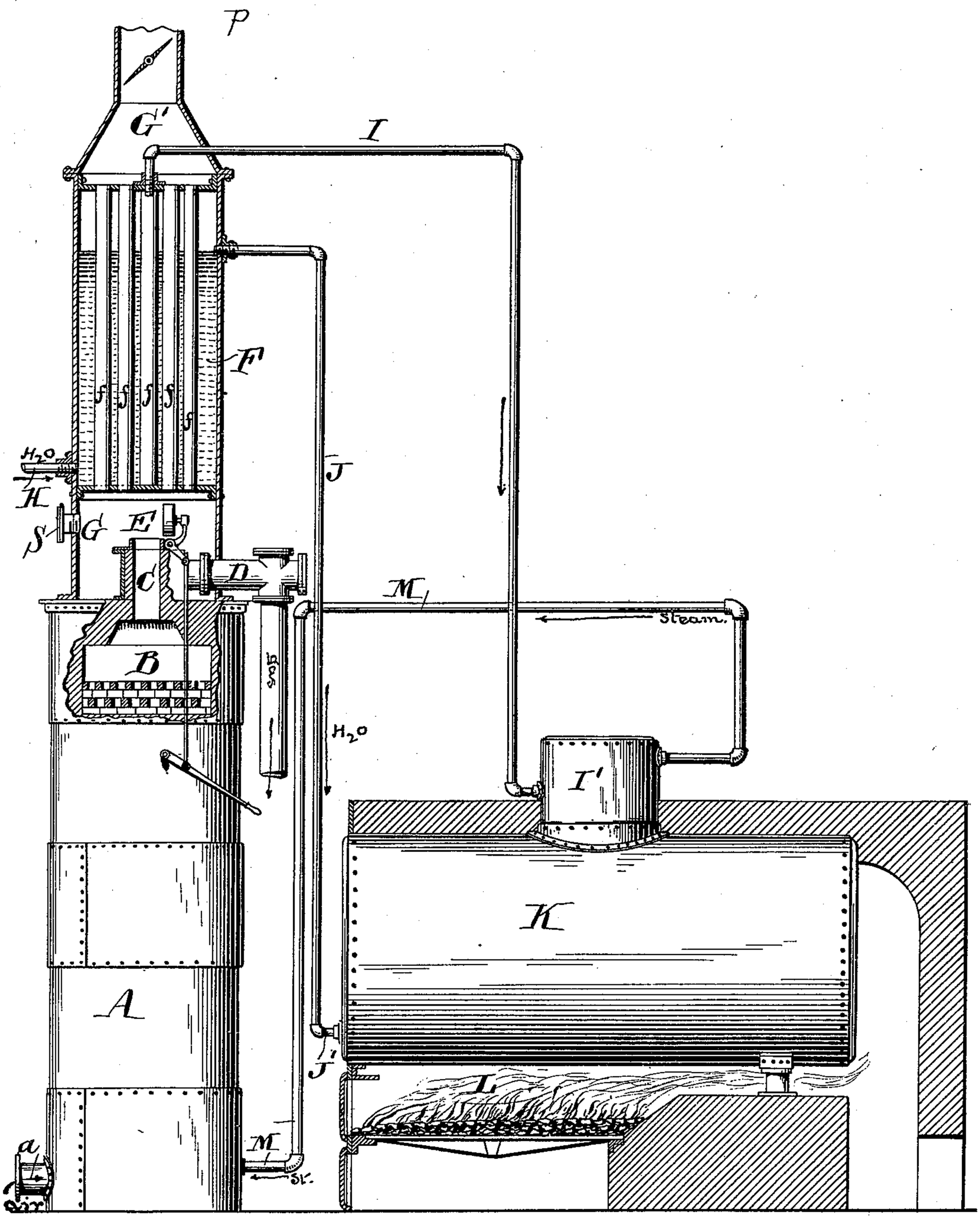
(No Model.)

A. G. GLASGOW.

APPARATUS FOR MANUFACTURING WATER GAS.

No. 532,778. Patented Jan. 22, 1895.



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ARTHUR GRAHAM GLASGOW, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR MANUFACTURING WATER-GAS.

SPECIFICATION forming part of Letters Patent No. 532,778, dated January 22, 1895.

Application filed December 6, 1892. Serial No. 454,222. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR GRAHAM GLASGOW, a citizen of the United States, residing at the city and county of Philadelphia, State of Pennsylvania, have invented a certain new and useful Improvement in Apparatus for Manufacturing Water-Gas, of which the following is a true and exact description, reference being had to the accompanying drawing, which forms a part of this specification.

My invention relates to apparatus for manufacturing water gas, and has for its object to provide a supply of steam for the generator or generators for the blower engine or engines and for the other usual purposes with a minimum expenditure of fuel. It has been attempted heretofore to utilize the heat of the waste gases issuing from the generator or superheater—according to the type of the apparatus—to heat a boiler from which the steam supply of the generator is drawn, but as this source of heat is irregular and uncontrollable, there being no relation between the supply and the demand, this attempt has met with indifferent success in the manufacture of straight water gas, and has, I believe, been entirely abandoned in the case of carbureted water gas.

Generally speaking, my invention consists in combining with the generator a boiler, the tubes of which form part of the conduit for escaping gases, and also a boiler heated by means independent of the escaping gases, uniting the steam spaces of the boilers, and also preferably the water spaces as hereinafter described.

My invention will be best understood as described in connection with the drawing in which it is illustrated, and which shows a water gas plant in elevation and partly in section.

A, is the water gas generator, *a* indicating the air blast and M, the steam supply pipe.

B, is a fixing chamber, shown as superimposed on the generator.

C, is the flue leading from chamber B, connecting with the gas flue D, and delivering when valve E is open, into the blast gases conduit G, G′.

S, is the inlet for the air necessary to complete the combustion of the escaping blast gases provided the flue G, be practically closed as shown.

In case the space G, be left freely open to the atmosphere, the indraft of air to complete the combustion of the escaping blast gases is regulated by the damper P; E, indicating the valve by which the course of the gases is governed.

F, is a boiler set in the blast gases conduit G, G′; the upper and lower parts of which connect through the boiler flues, *f*, *f*, &c.

H, is the feed water supply pipe; I, a steam pipe leading from the steam space of boiler F; J, a water pipe leading from the water level of boiler F, to a boiler K, with the steam space of which boiler, pipe, I, connects as shown. This boiler K, is independently heated as by a furnace L, and preferably from it leads the steam supply pipe M. Obviously the steam pressure in the two boilers F and K, is always the same as they are connected by pipe I, and the boiler heated by means independent of the gases escaping from the gas generator can be so run as to obtain the full benefit of all the waste heat of the gases passing through boiler F, while at the same time its own independent furnace will, and does insure a sufficient heat supply at all times to maintain the necessary generation of steam for use in the generator or generators, blower engines and for the other usual purposes.

While I have claimed the boiler F as situated in the conduit for gases leading from a gas generator it is of course obvious that a superheater may be inserted between the generator and boiler as shown in the drawing at B and the gases first passed through this. It is also of course obvious that not only the blast gases but also the commercial gases may be passed through the boiler situated in the gas conduit in a manner well known in the art as shown in the United States Patent to J. L. Stewart, No. 333,691, of January 5, 1886, and I do not wish to be considered as limiting myself to the exact construction shown.

While in the foregoing description I have in general indicated the boiler heated by the escaping blast gases as of tubular design, the invention is equally applicable to any form of steam generator.

Having now described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a water gas generator, of a boiler having fire tubes or flues, constituting part of the conduit for the gases escaping from the generator whereby the boiler will be heated by the hot gases which intermittently escape from the generator, a boiler heated by means adapted to act constantly thereon and independent of the intermittent and varying volume and heat of the gases drawn off from the generator, a connection between the steam spaces of the two boilers and a pipe for conveying steam therefrom whereby the benefit of the heat of the gases passing off from the generator will be obtained, and at the same time a constant supply of steam will be insured by the boiler heated by the constantly acting source of heat.

2. The combination with a water gas generator, of a boiler having fire tubes or flues constituting part of the conduit for the gases escaping from the generator whereby the boiler will be heated by the hot gases which intermittently escape from the generator, a boiler heated by means adapted to act constantly thereon and independent of the intermittent and varying volume and heat of the gases drawn off from the generator, a connection between the steam spaces of the two boilers, a pipe for conveying steam therefrom and an air inlet leading into the gas conduit below the boiler therein to permit the entrance of air to complete the combustion of the gases, all substantially as specified and so that the heat of the gases passing off intermittently from the generator may be utilized and at the same time a constant supply of steam insured by the boiler heated by the constantly acting source of heat.

3. The combination with a water gas generator of a boiler having fire tubes or flues constituting part of the conduit for the gases escaping from the generator, a feed conduit leading to said boiler, a boiler heated by means adapted to act constantly thereon and independent of the intermittent and varying volume and heat of the gases drawn off from the generator, a water connection leading from the water level of the flue boiler to the boiler heated by the constantly acting source of heat, a connection between the steam spaces of the two boilers and a pipe for conveying steam therefrom, all substantially as specified and so that the heat of the gases passing off intermittently from the generator may be utilized and a constant supply of steam insured at the same time by the boiler heated by the constantly acting source of heat.

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