

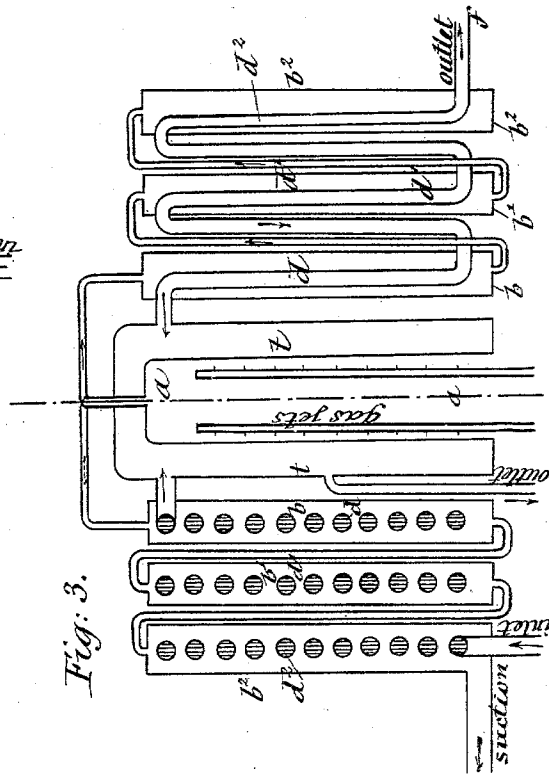
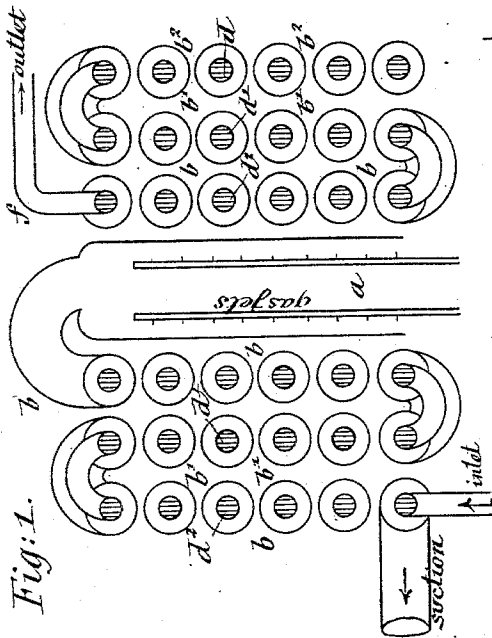
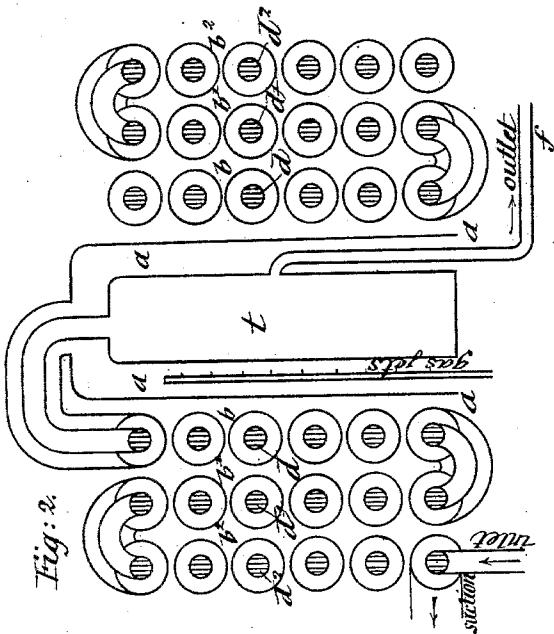
(No Model.)

2 Sheets—Sheet 1.

J. CORBETT.
POWER GENERATOR.

No. 566,713.

Patented Aug. 25, 1896.



WITNESSES:
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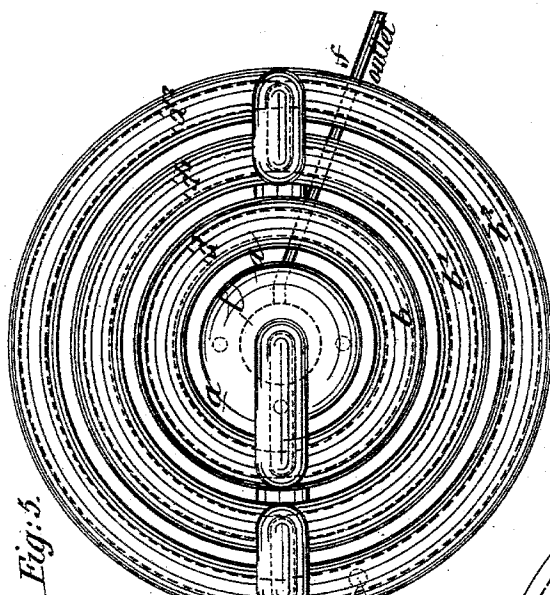


Fig. 5.

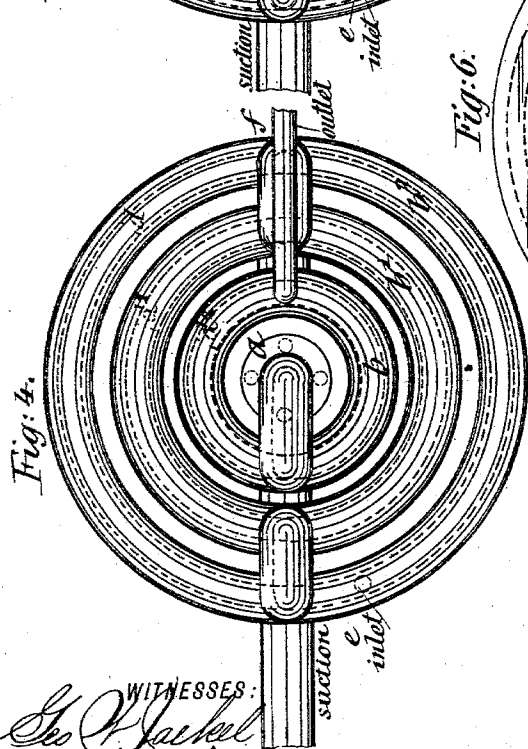
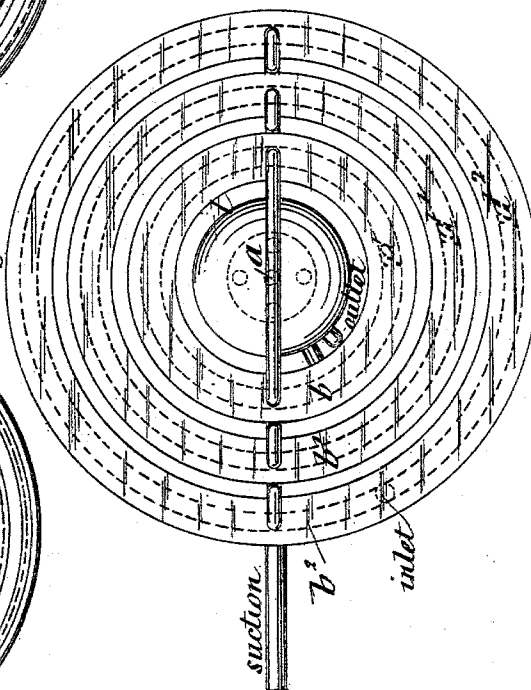


Fig. 4.

Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH CORBETT, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO
HENRY C. BERLIN AND THOMAS F. SHAW, OF NEW YORK, N. Y.

POWER-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 566,713, dated August 25, 1896.

Application filed November 23, 1895. Serial No. 569,874. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH CORBETT, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Processes of Generating Power, of which the following is a specification.

This invention relates to an improved process for the generation of power by heat from liquid or gaseous bodies that possess the property of being expanded by heat; and the invention consists of a process of generating power by subjecting a suitable expansive medium to contact with surfaces heated by products of combustion of gradually-increasing temperature while moving said medium in opposite direction to said products of combustion and continuing said contact until all the heat-units of the products of combustion, with the exception of those lost by radiation, are absorbed by the expansive medium.

The invention consists, secondly, of a process of generating power by subjecting a suitable expansive medium to contact with surfaces heated by products of combustion of gradually-increasing temperature while moving them in a counter-current to said medium until all the heat-units, with the exception of those lost by radiation, are absorbed by the expansive medium, and then subjecting said expansive medium in contact with surfaces heated by the initial heat of the products of combustion.

In practically carrying out my improved process a number of different apparatus may be used, several modifications being shown in the accompanying drawings, in which—

Figure 1 is a vertical central section of the simplest form of apparatus. Figs. 2 and 3 are vertical transverse sections of still other modifications; and Figs. 4, 5, and 6 are plan views of Figs. 1, 2, and 3, respectively.

Similar letters of reference indicate corresponding parts.

In carrying out my improved process a heating-chamber *a* is used, in which any suitable fuel, whether the same be solid, liquid, or gaseous, is burned, care being taken that the required quantity of oxygen be conducted to the fuel to sustain combustion. The upper

end of the heating-chamber *a* is connected by a pipe with a coil-section *b*, that is arranged concentrically to the heating-chamber *a*. The lower end of said coil-section *b* is connected with a second concentric coil-section *b'*, the upper end of which is again connected to a third coil-section *b''*, and so on, if more coil-sections are required. The outer end of the outermost coil-section is connected to a suitable suction apparatus by which the products of combustion are drawn from the heating-chamber through the coil-sections *b*, *b'*, and *b''*, &c. At the interior of the coil-sections *b*, *b'*, and *b''* are arranged coil-sections *d* of smaller diameter than the exterior coil-sections, which are likewise connected with each other alternately at the upper and lower ends of said coils. The inlet-pipe *e* of the outermost coil *d* is connected with a suitable supply of water, air, or other liquid or gaseous body which has the property of expanding by heat, said expansive medium being forced through the interior coil-sections by a suitable pump, so as to move in a counter-current to the products of combustion that are drawn through the exterior coil-sections. The end of the innermost coil-sections *d* is connected by an outlet-pipe *f* with a suitable motor. In place of the exterior coils cylindrical tanks may be used which inclose the interior coil-sections, as shown at the left-hand side of Fig. 3, or in place of the exterior and interior coil-sections exterior and interior cylindrical tanks may be used, as shown at the right-hand side of Fig. 3, or any other equivalent arrangement by which the products of combustion are conducted in a counter-current to the expansive medium may be employed, the term "coil-sections" being intended to indicate all the different means by which the expansive medium is subjected to the gradually-increasing heat of the products of combustion. If water is used as the expansive medium, the same is gradually heated by the action of the products of combustion until its temperature arrives at the boiling-point, it being then changed into saturated steam, which, by being passed through the interior coil-sections nearest to the heating-chamber, is gradually changed into superheated steam of any required tem-

perature and pressure. The number of heating-coils arranged around the heating-chamber is in proportion to the temperature and pressure which are desired to be produced, so that a certain direct proportion between the length of the coils and the temperature and pressure to which the expansive medium is to be subjected is established. In the case of air or other gaseous bodies the air is gradually heated in its passage through the interior coil-sections until it is heated to the required temperature, when it is taken off at the outlet end of the innermost coil. During the passage of the expansive medium through the interior coil-sections the thermal units contained in the products of combustion are gradually absorbed by said medium, so that the temperature of the same is raised until the required degree of temperature is obtained. From the outlet-pipe the expansive medium is conducted to a steam-engine, air-engine, or other motor. In the heating-chamber may be arranged a tank *t*, the top part of which is connected with the interior coil-section next to the heating-chamber, while the lower part is connected to the motor, or a tank may be arranged around the heating-chamber, as shown, respectively, in Figs. 2 and 3. The tank has the advantage that the expansive medium, which is heated up by the absorption of the thermal units contained in the products of combustion, can be finally brought into contact with surfaces subjected to the initial heat of the products

of combustion, by which a still higher degree of heat and pressure can be imparted to the expansive medium. By the passage of the expansive medium in contact with surfaces heated indirectly and directly by the products of combustion all the thermal units contained in the latter are gradually absorbed, with the exception of a comparatively small quantity of the same which is lost by radiation, which, however, is comparatively insignificant, as all the thermal units of the fuel which were heretofore lost in the generation of power by way of chimneys, exhausts, &c., are almost entirely retained and utilized.

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

The combination of a steam-tank, a heating-chamber in said tank and a series of coils encompassing the tank and composed of exterior and interior pipes respectively for the products of combustion and the feed-water, the latter passing in a counter-current to the products of combustion so that the heat of the products of combustion is absorbed by the feed-water, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOSEPH CORBETT.

Witnesses:

PAUL GOEPEL,
GEO. W. JAEKEL.