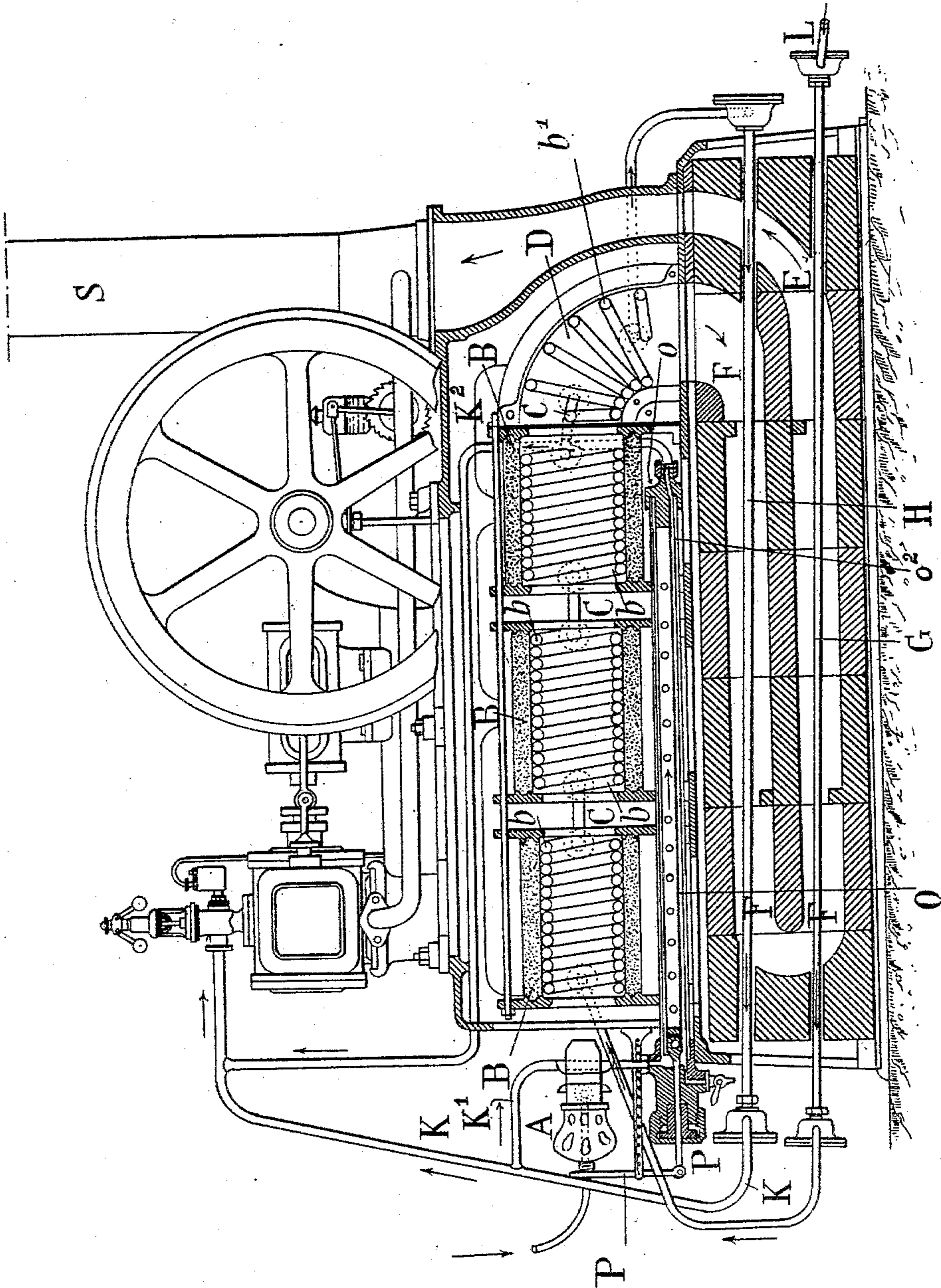


(No Model.)

A. SEIGLE.  
STEAM GENERATOR.

No. 571,696.

Patented Nov. 17, 1896.



Witnesses:  
Thomas M. Smith.  
Richard C. Maxwell.

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# UNITED STATES PATENT OFFICE.

ADOLPHE SEIGLE, OF PARIS, FRANCE, ASSIGNOR TO THE COMPAGNIE INTERNATIONALE DES PROCÉDÉS ADOLPHE SEIGLE, OF SAME PLACE.

## STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 571,696, dated November 17, 1896.

Application filed July 10, 1896. Serial No. 598,697. (No model.) Patented in England January 15, 1896, No. 1,043.

*To all whom it may concern:*

Be it known that I, ADOLPHE SEIGLE, a citizen of France, residing at 147 Rue de Courcelles, Paris, in the Republic of France, have  
5 invented certain new and useful Improvements in Steam-Generators, (for which I obtained Letters Patent of Great Britain, No. 1,043, dated January 15, 1896;) and I do hereby declare the following to be a full, clear,  
10 and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference  
15 marked thereon, which form a part of this specification.

My invention has relation to a steam-generator, and in such connection it relates particularly to the construction and arrangement  
20 of such a generator.

The principal objects of my invention are, first, to provide an apparatus for the rapid generation of steam of simple construction, durable, compact, and efficient in operation,  
25 and, second, to provide a steam-generator consisting of a series of helically-wound tubes into which the water is introduced, secured to the interior of a series of separated shells forming a continuous combustion-flue, the  
30 tubes being wound upon increasing diameters of shells in the series, the adjacent worms being connected by branch tubes, and the last in series of worms being connected with a superheater, while the first in series  
35 is connected with the feed-water supply.

My invention, stated in general terms, consists of an apparatus for the rapid generation of steam constructed and arranged in substantially the manner hereinafter described  
40 and claimed.

The nature and scope of my invention will be more fully understood from the following description taken in connection with the accompanying drawing, forming part hereof,  
45 and which illustrates in longitudinal central section a generator embodying the main features of my invention and adapted to be heated by the combustion of heavy hydrocarbons.

Referring to the drawing, A represents a sprayer or burner for heavy hydrocarbon oils,

such as petroleum, coal-oil, schist-oil, and the like.

B B B are shells of increasing diameters, forming an open-ended combustion-flue. On  
55 the interior of each shell is wound a helically or spirally formed water-tube *b*, the tubes *b* of adjacent shells being connected together by means of a short branch tube C. The flue B serves as a fire-box for the incandescent gases projected from the burner A. The  
60 flue B is connected by an elbow D with a passage F for the spent products of combustion, and this passage F is in turn connected with a passage E, leading to the chimney or stack  
65 S. In the passage E is placed a pipe G, connected at one end with the feed-water pipe L and at the other end with the first in series of the worms *b*.

The last in series of the worms *b* is connected by a branch C and a coil *b'*, placed in  
70 the elbow D with a pipe H, extending through the passage F and terminating in a pipe K, leading to the cylinder of the engine. The coil *b'* and pipe H constitute a superheater  
75 or drier for the steam generated in the worms *b*. Below the worms *b* is placed a pyrometer, consisting of a metallic rod O, secured at one end to a fixed support *o* and pivoted at its  
80 free end to a rod P, suitably connected with the burner A in such a manner that the contraction of the rod O will open the burner wider than its normal position and the expansion of the rod O will correspondingly  
85 close the burner. The rod O is enveloped in a sleeve *o'*, to which live steam is admitted from the pipe K through the pipe K' and from which the steam is led through the pipe K<sup>2</sup>. The circulation of the feed-water and steam  
90 is indicated by the arrows on the figure.

Instead of connecting the worms *b* in series, as shown, with the feed-water pipe and steam superheater or collector it is obvious  
95 that each worm may be connected directly with the pipe and superheater. Between the shells B an opening or space is left through which the air necessary for the combustion of the gases from the burner A is drawn by the suction of the flame passing through the shells. It is obvious that more or less than  
100 three shells B and worms *b* may be used without departing from the spirit of my invention.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A steam-generator, consisting of a series of helically-wound tubes suitably connected with the feed-water and steam collector, and a series of shells of increasing diameters upon the inner surface of which the tubes are secured, substantially as and for the purposes described.

2. A steam-generator, comprising a series of disconnected shells of increasing diameters forming a combustion-flue, a series of worms wound upon the inner surface of the shells, a pipe connecting the first worm with the feed-water, and a superheater connected with the last worm, substantially as and for the purposes described.

3. A steam-generator, comprising a series of disconnected shells of increasing diameters forming a combustion-flue, a series of worms helically wound upon the inner surface of the shells, a pipe connecting the first worm with the feed-water, a superheater connected with the last worm, a pyrometer-rod, a sleeve inclosing the same, a steam-pipe adapted to convey live steam from the superheater through the sleeve, and a hydrocarbon-burner controlled by said pyrometer-rod, substantially as and for the purposes described.

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

ADOLPHE SEIGLE.

Witnesses:

G. DE MESTRAL,

E. P. MACLEAN.