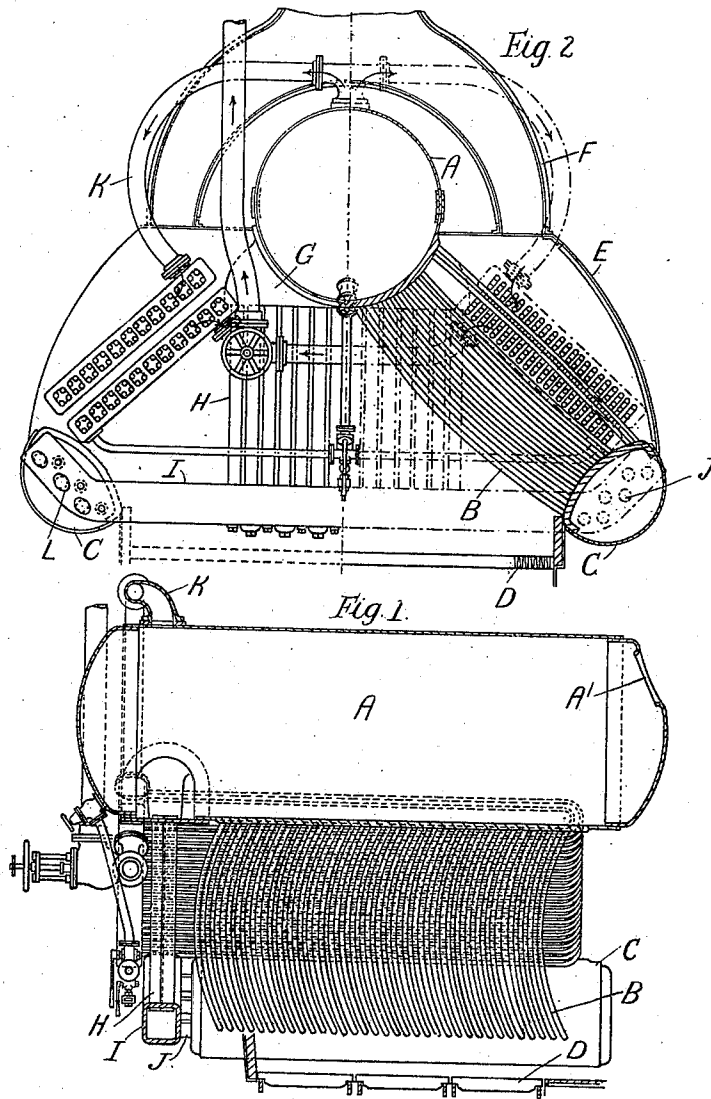


J. H. ROSENTHAL & E. C. CARNT.
STEAM GENERATOR.
APPLICATION FILED NOV. 9, 1908.

990,905.

Patented May 2, 1911.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES HERMANN ROSENTHAL, OF LONDON, AND EDWIN CHARLES CARNT, OF EAST COWES, ISLE OF WIGHT, ENGLAND.

STEAM-GENERATOR.

990,905.

Specification of Letters Patent.

Patented May 2, 1911.

Application filed November 9, 1908. Serial No. 461,763.

To all whom it may concern:

Be it known that we, JAMES HERMANN ROSENTHAL and EDWIN CHARLES CARNT, subjects of the King of the United Kingdom of Great Britain and Ireland, and residents at London, England, and East Cowes, Isle of Wight, England, respectively, have invented a certain new and useful Improvement in Steam-Generators, of which the following is a specification.

This invention relates to water tube steam generators in which an upper central steam drum is connected to two lower water drums, located one on each side of a furnace, by means of curved water tubes bent to the same radius and so fitted that though of greater length than the diameter of the steam drum they can be drawn into said drum and removed through a manhole in the end thereof.

The present improvements have for their object to provide for better circulation of the water in such a generator.

In the accompanying drawings which illustrate the invention Figure 1 is a longitudinal vertical section and Fig. 2 a cross section of a water tube steam generator embodying the invention.

The steam generator shown comprises a steam drum A having expanded into thickened plates at its lower sides water tubes B connected in banks to water drums C of ovoid section, the tubes B being curved to one radius and adapted on disconnection from the water drum to be pushed endwise through the tube holes into the steam drum and to be withdrawn through a manhole A¹ in the end of the drum. The usual fire grate D is fitted below the banks of tubes and the whole is inclosed by a casing E and connected uptake F for leading off the fire gases. The water circulating arrangement provided comprises a horizontal cross box G of greater width than the steam drum A and attached to the lower side of the steam drum A near the back end beyond the connection of the water tubes to the steam drum. In to the bottom of this cross box are expanded staggered rows of downcomer tubes H, the lower ends of these downcomers being expanded into the central part of the upper side of a horizontal transverse water box I of rectangular cross section which is located below

and in the same vertical plane as the cross box G, and whose ends are suitably bent upward to extend across the ends of the water drums C to which they are connected by short nipples J, the transverse box I being of greater length than the cross box G. The water circulation is thus downward through the downcomer tubes H, transversely through the box I, upwardly into the water drums, to the water tubes B in which steam is generated by impingement on their external surfaces of the hot products of combustion of the furnace D rising toward the uptake; the steam passing into and being separated from the water in the steam drum A and led off by a steam pipe or pipes K in the usual way. Suitable hand-holes fitted with hand-hole covers L are provided in the box I opposite the ends of the downcomer tubes H and nipples J for access in expanding, cleaning and renewing these tubes and nipples.

Having now described our invention what we claim and desire to secure by Letters Patent of the United States is:—

A steam generator comprising an overhead steam drum, two water drums below said steam drum, one at each side of the steam drum, two banks of water tubes curved to the same radius connecting said steam drum to said water drums so as to afford with said drums an inclosed combustion chamber, a horizontal cross box of greater width than the steam drum fitted at one end of the steam drum beyond the connection of said water tubes to said steam drum, a horizontal transverse box of rectangular cross section located below the said cross box in the same vertical plane, said transverse box being of greater length than the cross box and having upturned ends extending across and nipped to the water drums, and a number of parallel vertical downcomers connecting said cross box to the central part of said transverse box.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JAMES HERMANN ROSENTHAL.
EDWIN CHARLES CARNT.

Witnesses:

H. PELHAM SMITH,
JAMES HUNT.