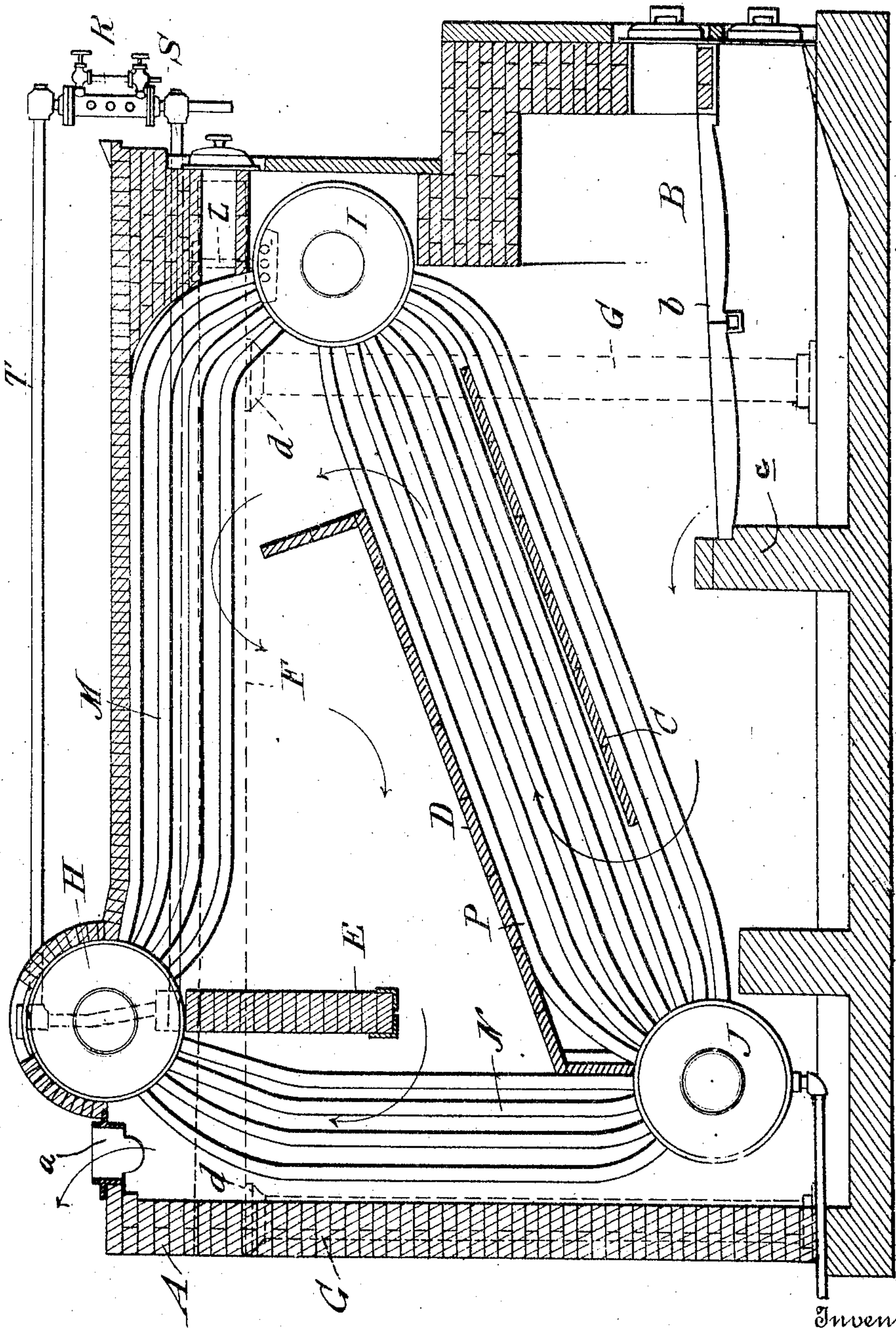


J. P. BADENHAUSEN.
 STEAM GENERATOR.
 APPLICATION FILED MAY 18, 1910.

990,622

Patented Apr. 25, 1911.
 2 SHEETS—SHEET 1.

Fig. 1



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Witnesses

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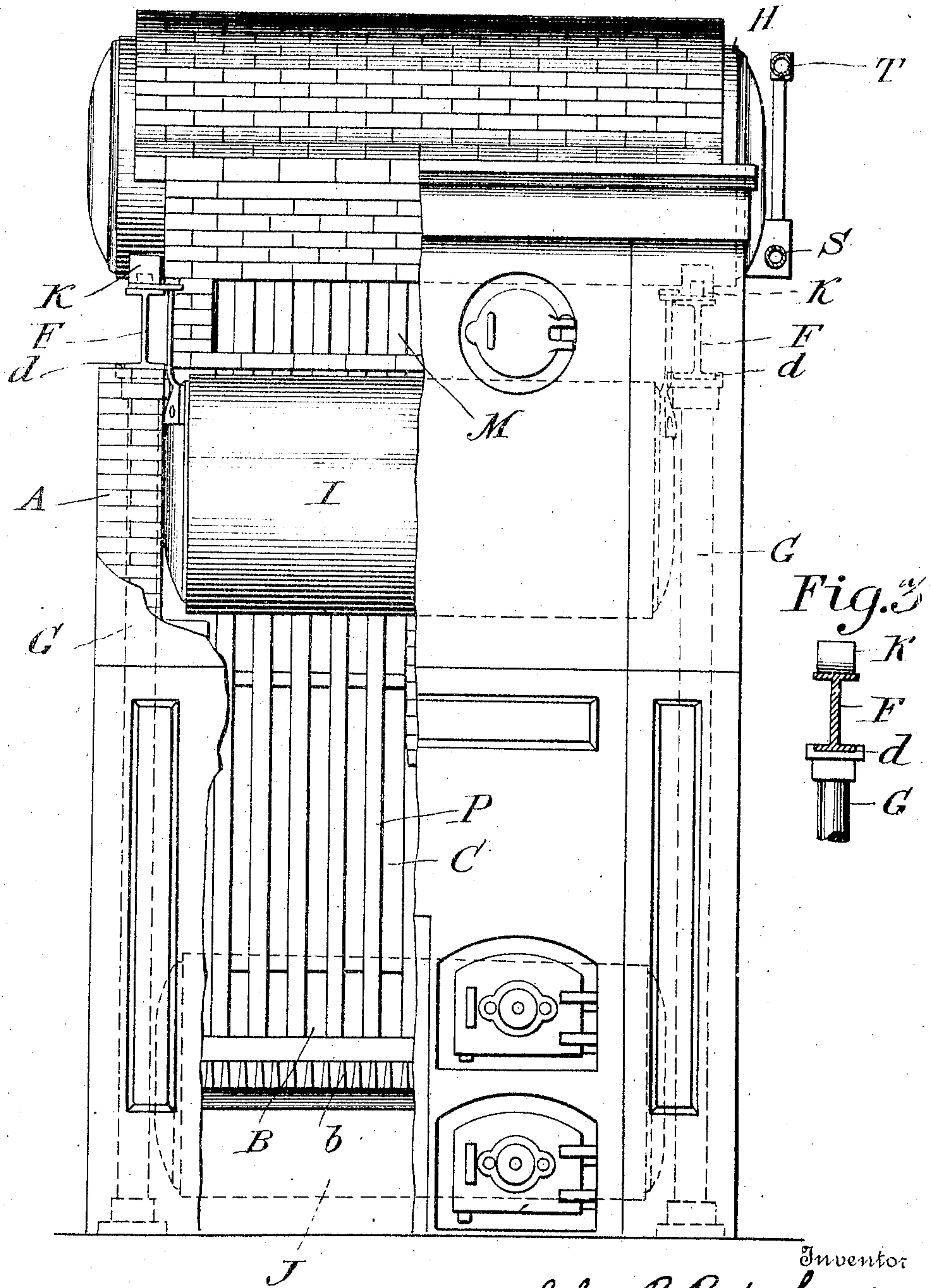
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2 SHEETS—SHEET 2.

Fig 2.



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UNITED STATES PATENT OFFICE.

JOHN P. BADENHAUSEN, OF SEATTLE, WASHINGTON.

STEAM-GENERATOR.

990,622.

Specification of Letters Patent. Patented Apr. 25, 1911.

Application filed May 18, 1910. Serial No. 562,033.

To all whom it may concern:

Be it known that I, JOHN P. BADENHAUSEN, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented new and useful Improvements in Steam-Generators, of which the following is a specification.

My present invention has to do with steam generators, and is designed more particularly as an improvement upon the generator constituting the subject matter of my Letters-Patent No. 862,872, granted August 13, 1907.

The object of the present invention is to provide a simple generator comprising a steam drum, a water drum and a mud drum, connected together and communicating with each other through interposed tubes, and constructed and arranged in such manner that all strains incidental to contraction and expansion are taken care of and prevented from deteriorating the generator.

The invention will be best understood by reference to the following description when taken in connection with the accompanying illustration of one specific embodiment thereof, while its scope will be more particularly pointed out in the claim appended.

In the drawings which are hereby made a part hereof: Figure 1 is a view, partly in longitudinal vertical section and partly in elevation, of my improved water-tube steam generator. Fig. 2 is a front elevation of the generator with a portion of the front wall of the casing removed. Fig. 3 is a detail view showing by full lines the arrangement of one longitudinal beam in the channeled seat at the upper end of one upright, and the interposition of the said beam between the said upright and one of the saddles.

Similar letters designate corresponding parts in both views of the drawings, referring to which:

A is the casing of the generator. This casing may be of the construction illustrated or of any other construction consonant to the purpose of my invention, and is provided at *a* with an outlet for products of combustion.

B is a furnace located in the lower front portion of the casing and having the usual grate *b* and bridge wall *c*.

C and D are lower and upper, suitably-supported baffles, and E is a transverse

baffle or wall located in the upper rear portion of the casing; the said baffles C, D and E being preferably arranged as shown, relative to each other and the furnace B and outlet *a*, in order to assure the products of combustion taking the course indicated by arrows in Fig. 1 in passing between the furnace and the outlet.

F F are horizontal and parallel I-beams superposed on uprights G and disposed in channeled seats *d* at the upper ends of said uprights.

H is the steam drum; I, the water drum, and J, the mud drum, all three of which are arranged transversely of the casing, as shown. The steam drum H is supported by saddles K, preferably of cast-iron, which rest on the I-beams F, while the water drum I is hung from the said beams F through the medium of bolts L, suitably connected with the beams and drum.

Interposed between and connecting as well as effecting communication between the steam drum H and the water drum I is a group of water-tubes M, and connected with the mud drum J are two groups N and P, of water tubes, which serve to suspend the mud drum from the steam drum and the water drum, respectively, as well as to establish communication between the same; the group P, by preference, comprising a greater number of tubes than either group M or N in about the proportion illustrated.

R is a water column, and S and T are lower and upper pipes which effect communication between said column and the interior of the steam drum H in the manner shown in Fig. 1 or in any other approved manner.

The three drums H, I and J supported and connected together in the manner described constitute a simple and highly efficient generator; the latter being largely due to the fact that the circulation of steam and water through the water and steam containing elements is continuous and with a minimum of breaks and interruptions. It will also be noted here that by reason of the drums being connected through interposed tubes and the steam drum and water drum being supported by a metal frame-work while the mud drum is hung through the tubes from the steam drum and water drum and solely supported by said tubes, all

strains due to contraction and expansion are provided for and are effectually prevented from shortening the period of usefulness of the generator. This is due in large measure to the fact that the arrangement of the longitudinal beams F in the channeled seats d at the upper ends of the uprights G, enables the said beams F to work or move endwise between the uprights and the saddles, and hence permits of expansion and contraction of the tubes M and P, notwithstanding the connection of the drum I to the beams F through the medium of the hangers L.

While I have shown and described one form of my invention, it is to be understood that I am not limited to the details or the form or relative arrangement of parts disclosed, but that modifications may be made therein without departing from the spirit thereof.

Having described my invention, what I

claim and desire to secure by Letters-Patent, is:

A steam generator comprising uprights having longitudinally-disposed channeled seats at their upper ends, longitudinal beams superposed on the said uprights and disposed in the said channeled seats thereof, saddles resting on the said longitudinal beams, hangers connected with the beams, and spaced drums connected together and communicating with each other; one of the said drums resting in the said saddles, and another drum being connected to the said hangers.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN P. BADENHAUSEN.

Witnesses:

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GOLDIE L. LOVETT.