

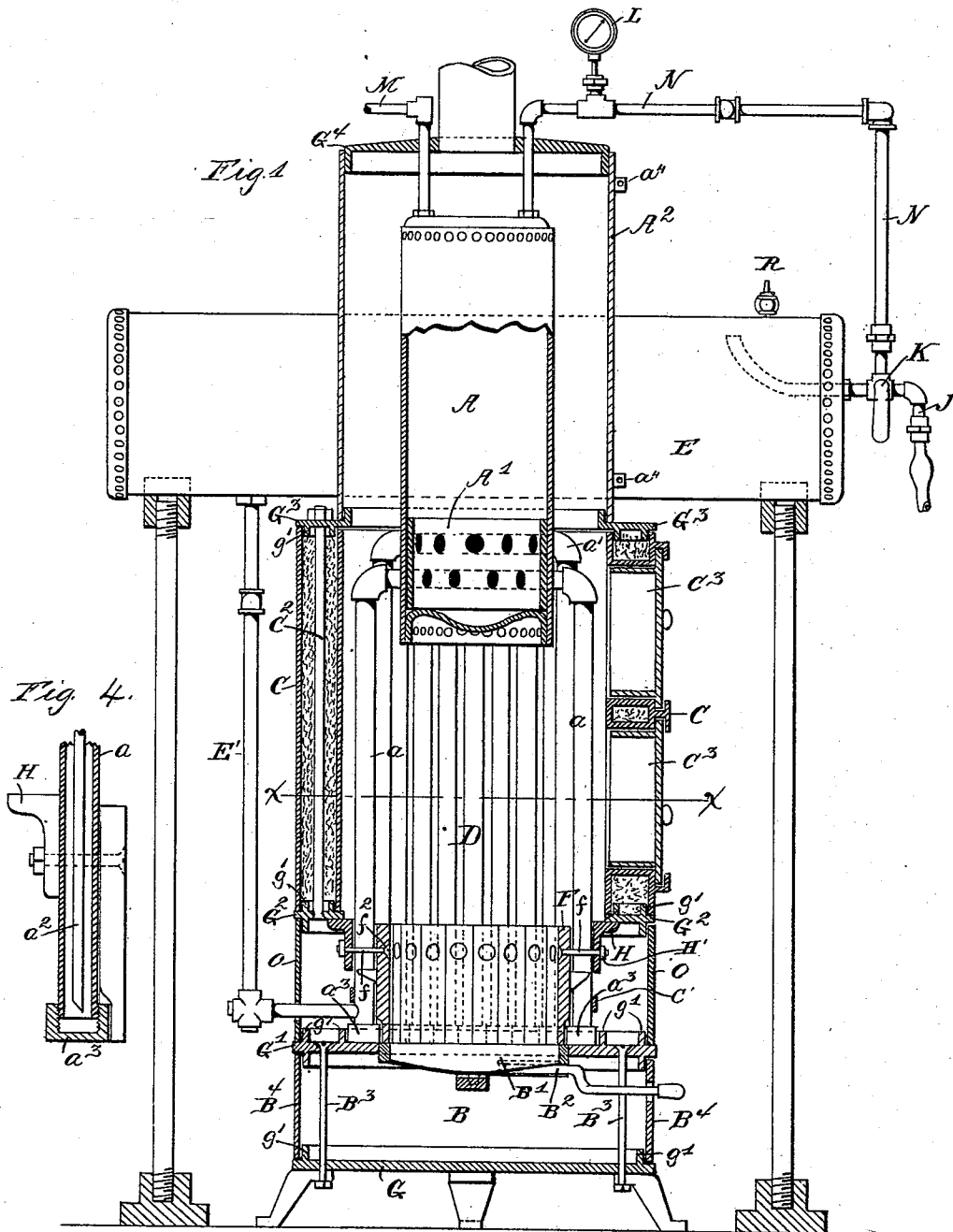
(No Model.)

2 Sheets—Sheet 1.

A. F. MEAD.
STEAM GENERATOR.

No. 468,884.

Patented Feb. 16, 1892.



Witnesses
B. Frank Thomas
Wm. V. Fowler

A. F. Mead Inventor
By his Attorney J. C. Fowler

(No Model.)

2 Sheets—Sheet 2.

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Fig 2.

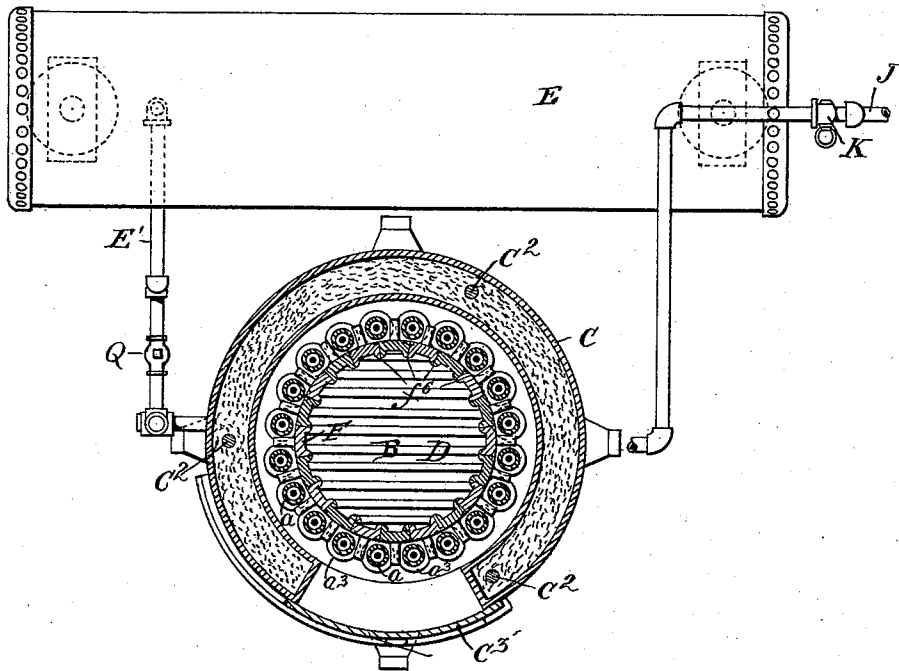
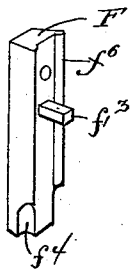


Fig. 3.



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UNITED STATES PATENT OFFICE.

ARTHUR F. MEAD, OF NEW YORK, N. Y.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 468,884, dated February 16, 1892.

Application filed April 15, 1891. Serial No. 389,006. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR F. MEAD, a citizen of the United States, and a resident of New York, county and State of New York, have invented a certain new and useful Improvement in Steam-Generators, of which the following is a specification.

My invention relates to steam-generating apparatuses, and has for its object the provision of a generator which is simple in construction, inexpensive in manufacture, easily taken care of, and which is efficient in practical use.

To attain the desired end my invention consists in the construction and arrangement of parts hereinafter first fully described, and then pointed out in the claims.

In the drawings which form a part of this specification, Figure 1 represents a vertical section of my steam-generator; Fig. 2, a transverse section on the line $x x$, Fig. 1. Fig. 3 is a detail view of a section of my sleeve-lining, and Fig. 4 is a sectional view of the lower portion of one of my water-legs.

Like letters of reference wherever they occur indicate corresponding parts in all the figures.

Referring again to the drawings, A represents my generator proper, consisting of a steam and water reservoir or body provided with a series of supporting water legs or pipes a communicating therewith. The body of the generator A is constructed ordinarily of wrought-iron riveted together, a strengthening-band A' being applied to the lower portion of the same. A series of holes made to offset each other serve to contain elbows a' , into which elbows are screwed the independent vertical water-legs a . By this arrangement the single row of pipes a , of two or more lengths, may be placed close to each other without weakening the body A to any considerable extent. The vertical water-legs a extend, as stated, almost entirely around the lower portion of the body A and, depending therefrom, form a chamber, which I designate as a "fire-box" D, sufficient space, however, being left bare or devoid of pipes in order to afford a provision for the admission of fuel into the same. The water-legs a are provided at their lower extremities with caps a^3 and serve to contain independent pieces of pipe a^2 ,

shorter than the water-legs a and provided with an uneven edge, or being diagonally cut across at the lower end of the same, so as to allow a free circulation of water through the pipe. At the lower ends of the water-legs a is placed an iron band C' , of sufficient strength to hold the parts rigidly together in a circular relation for purposes of handling or transportation.

Around the lower portions of the water-legs a , and within the circle formed by the same, I place a sectional sleeve F, which forms a lining around my fire-box D. Each section of my sleeve F is beveled along the side edges thereof and is provided with a countersunk hole f^2 , into which is placed a bolt f , which serves, in connection with the washer or nut H' , to fasten the sleeve F to the water-legs a , projections f^3 , located on the back of each section, assisting to keep the same in position, and grooves f^4 , placed in the lower inside corners thereof, allowing room for the caps a^3 of the water-legs, in order that the lining F may stand closely adjacent to the pipes a . The side edges of each of the sections of the sleeve F, which sections are preferably provided with longitudinal ribs f^5 , in order both to impart greater strength to the same and to prevent the body of hot coal lying too close to the same, may be beveled to a greater or less degree, in order that the sectional sleeve F shall conform to the size of the circle required.

The function of the sectional sleeve or lining F is fourfold: First, it protects the fire from the chill of the water-legs, thus making good combustion in a small fire-box; second, it protects the lower ends of the water-legs from too great a heat, which has a tendency to drive the water up out of the bottom of the water-legs; third, it throws the intensity of the fire up from the bottom of the water-legs, the water being thus heated the hottest between the inside and outside pipes a^2 a some distance above the bottom, and, thus rising, it afterward flows down again through the inside circulating-pipe a^2 , by this means creating a constant current of water; fourth, in case the generator is allowed to "run dry" and get red hot, or even white hot, around the fire-box, no serious damage would necessarily be done to the generator. In the latter

case; however, the sectional sleeve F would be apt to be burned out, which lining could be readily replaced, as before mentioned, without disturbing the other parts of my apparatus.

The water-legs *a* are supported by a double-flanged grate-ring G', which is sustained by bolts B³, secured to the flanged bottom G of the ash-pit, the grate B' being supported by the arm B². The sides of the ash-pit are formed by a sheet-iron wall B⁴, provided with a door of ordinary construction.

Supported by brackets H, extending upward from the nut or washer H' and revolving thereon, is my double-shell casing C, consisting of two double-flanged rings G² G³ and two sheet-iron cylinders, the rings G² G³ being bolted together by rods C² and the space between the sheet-iron cylinders being filled or packed with a non-combustible and non-heat-conducting material, as asbestos, mineral wool, fossil meal, &c., and being provided with a door-frame extending practically the entire length of the cylinders, in which are located doors C³. These doors C³ serve to afford access to the interior of the combustion-chamber D, and also to allow the pipes *a* to be cleaned and the sectional sleeve F to be inspected, and as the double casing C revolves upon the brackets H access to any pipe or to any particular section of the sleeve may readily be obtained.

A single sheet-iron band O incloses the space outside of the water-legs *a* between the ash-pit B and double shell C, and a similar one A² is located between the flanged rings G³ and G⁴ and extends around the body A of the generator. These sheet-iron bands are ordinarily provided with ears *a*⁴, in order that the respective ends of the same may be fastened together after the double shell C has been set up in its proper place.

The generator A is provided with a steam-outlet pipe M and gage L, and also with an air-cock R, the pipe N serving, in connection with the three-way valve K, when open, to admit steam from the generator A to a supply-reservoir for water, as E. The water is fed from a water-supply pipe J, through the three-way valve K, into a reservoir E, and thence down through a water-connecting pipe E', which is provided with a check-valve Q, into one of the water-legs *a*, from which it flows into the body A of the generator. The three-way valve K causes the steam in the pipe N to be shut off when the water-supply pipe J and the reservoir E are united, and, on the other hand, closes the connection between the water-pipe J and the reservoir E

when steam is admitted thereto through the pipe N, in order to equalize the pressure in the generator-body A and reservoir E, the pressure of the steam serving to close the check-valve Q.

As it is evident that many slight changes in the construction and relative arrangement of parts might be resorted to without departing from the spirit and scope of my invention, I would have it understood that I do not restrict myself to the particular construction and arrangement of parts shown and described, but that I reserve the right to make such changes, and that

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

1. In a generator, the combination, with a row of water-legs, of a sectional sleeve F, provided with projections *f*³ and grooves *f*⁴, substantially as described.

2. The combination, with a series of pipes *a*, of a sectional sleeve F, bolts *f*, and brackets H, substantially as described.

3. In a generator, an ash-pit constructed by means of a flanged bottom and double-flanged grate-ring bolted together and provided with an external sheet-iron wall, substantially as described.

4. In a generator, a double-packed revolving casing consisting of two double-flanged rings bolted together and an outer and inner shell and intermediate packing, substantially as described.

5. In a generator, a revolving casing consisting of two double-flanged rings bolted together and an intermediate double-packed shell and provided with a door-frame of practically the entire length of the same, substantially as described.

6. In a generator consisting of a body provided with water-legs, two double-flanged rings bolted together and a revolving casing consisting of a double shell and intermediate packing and traveling on brackets attached to the water-legs, substantially as described.

7. The combination, with a steam-generator and with a water-reservoir provided with a water-supply pipe and with a steam-pipe connecting the generator and reservoir, of a three-way valve controlling the steam and water supply pipes, substantially as described.

In testimony of the foregoing specification I do hereby sign the same, in the city of New York, county and State of New York, this 18th day of March, A. D. 1891.

ARTHUR F. MEAD.

Witnesses:

J. ODELL FOWLER, Jr.,
B. FRANK THOMAS.