No. 780,463. PATENTED JAN. 17, 1905.

N. L. WARREN.

LOCOMOTIVE BOILER.

APPLICATION FILED MAR. 23, 1904.

3 SHEETS—SHEET 1.

Fig. 2.

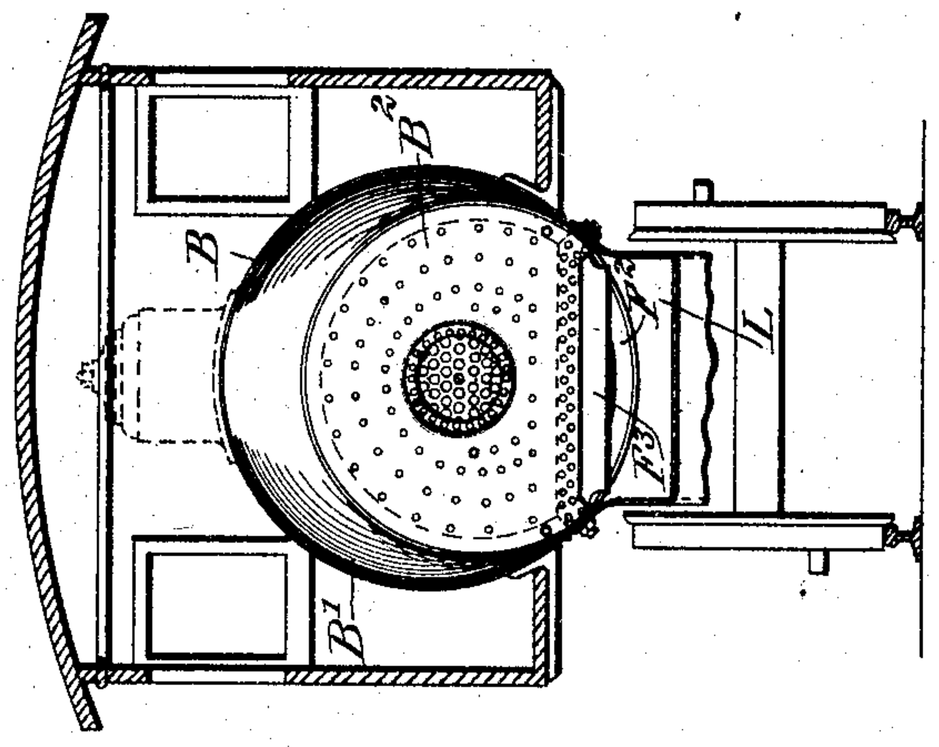
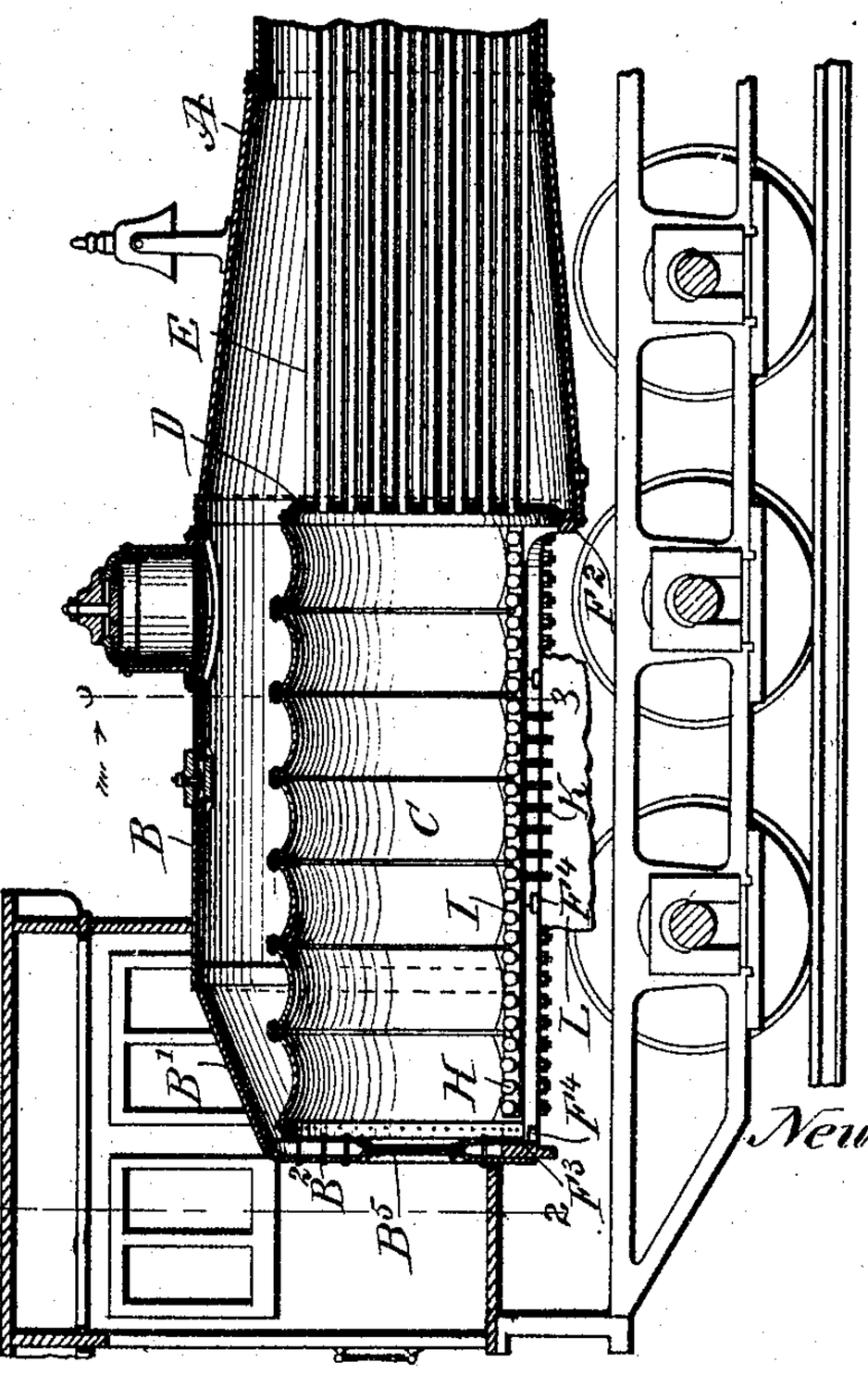


Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 3.

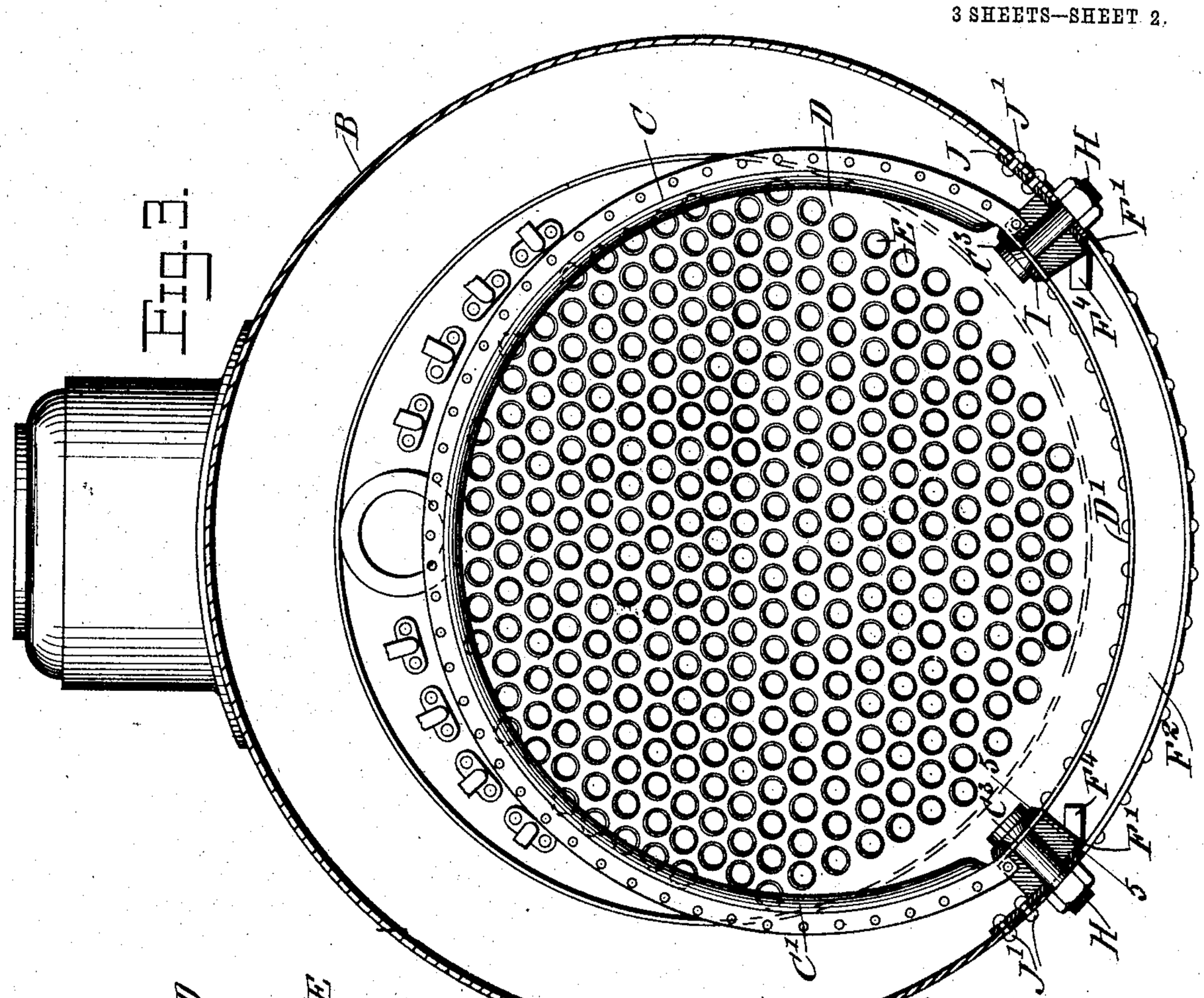


Fig. 4.

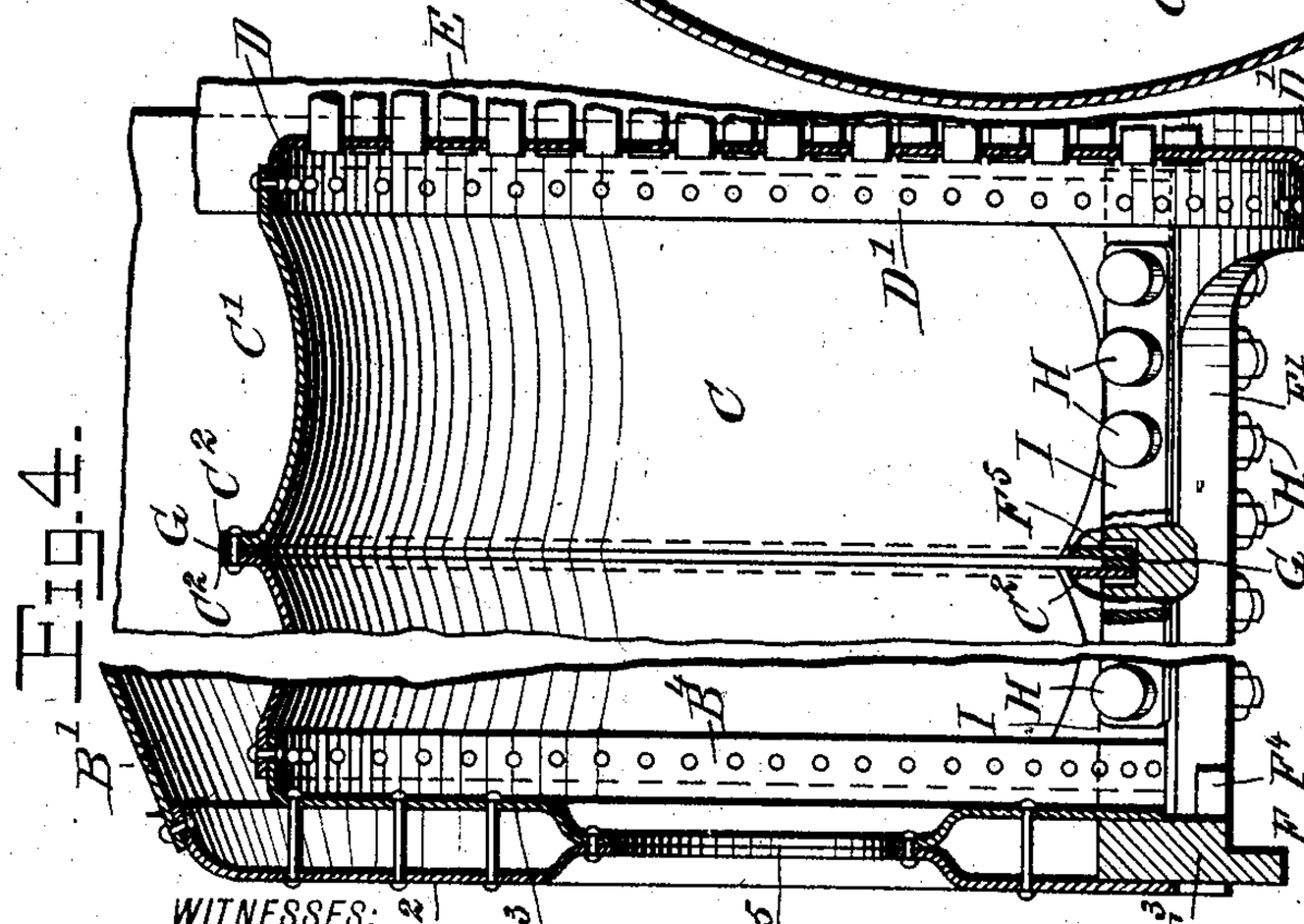
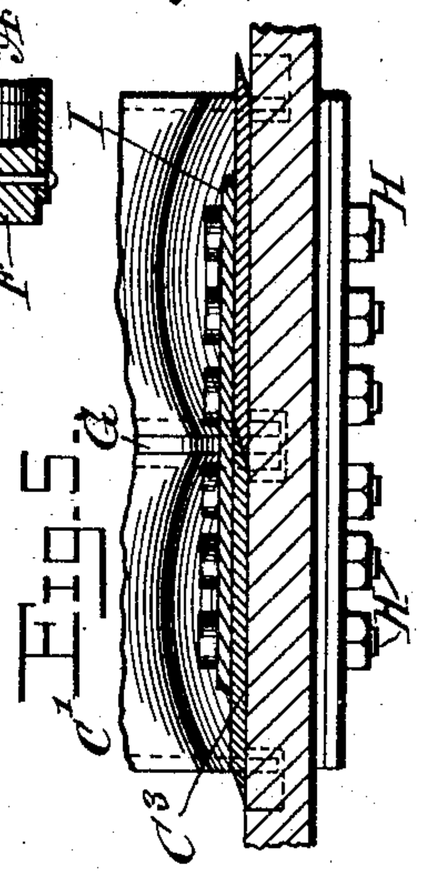


Fig. 5.



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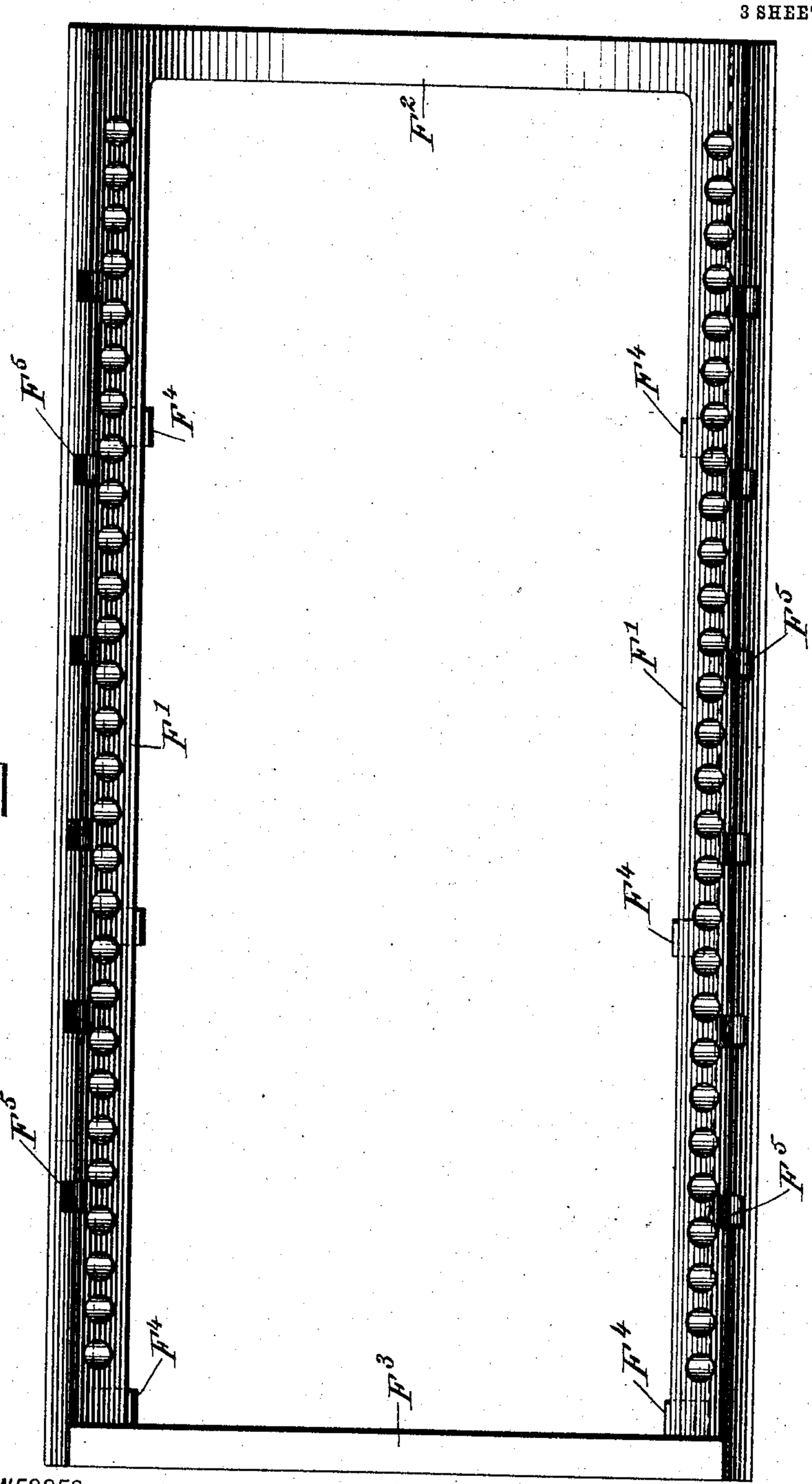
3 SHEETS—SHEET 3.

Fig. 5.



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No. 780,463. Patented January 17, 1905.

UNITED STATES PATENT OFFICE.

NEWTON L. WARREN, OF MACON, GEORGIA.

LOCOMOTIVE-BOILER.

SPECIFICATION forming part of Letters Patent No. 780,463, dated January 17, 1905.

Application filed March 23, 1904. Serial No. 199,569.

To all whom it may concern:

Be it known that I, NEWTON L. WARREN, a citizen of the United States, and a resident of Macon, in the county of Bibb and State of Georgia, have invented a new and Improved Locomotive-Boiler, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved locomotive-boiler which is simple and durable in construction and arranged to provide a clear space between the fire-box and the wagon-top unobstructed by stays or the like.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal central section of the improvement. Fig. 2 is a transverse section of the same on the line 2 2 of Fig. 1. Fig. 3 is an enlarged cross-section of the improvement on the line 3 3 of Fig. 1. Fig. 4 is a longitudinal sectional elevation of the same. Fig. 5 is an inverted sectional plan view of part of the fire-box and its connection with the mud-ring, the section being on the line 5 5 of Fig. 3; and Fig. 6 is a plan view of the mud-ring.

The shell A of the boiler is provided with a wagon-top B, within which extends a fire-box C, connected at its forward end with the rear flue-sheet D for the usual boiler flues or tubes E, the said wagon-top B, fire-box C, and flue-sheet D being connected with a rectangular skeleton frame or, as ordinarily called, a "mud-ring" F in such a manner that the fire-box is supported wholly independent of the wagon-top and a clear unobstructed space is had between the fire-box and the wagon-top, as hereinafter more fully described.

The fire-box C is formed of sections C′, arranged one alongside the other and each in the form of a segment of a circle, as plainly indicated in Fig. 3, the sections having their peripheral bodies bulged inwardly, as plainly shown in Figs. 1 and 4, and each section C′ is provided with outwardly-extending connecting-flanges C^2 for fastening the several sections together, a segmental packing or calking ring G being interposed between the flanges of adjacent sections C′, as plainly indicated in Fig. 4, the flanges and calking-ring being fastened together by rivets or similar fastening devices. The terminals C^3 of each section C′ are straight or in the shape of flanges abutting against the inner faces of the side bars F′ of the mud-ring F, and the sides of each terminal C^3 are beveled, so that the beveled sides of adjacent terminals C^3 overlap each other, as will be readily understood by reference to Fig. 5.

The terminals C^3 are fastened to the side bars F′ of the mud-ring by bolts H, which also fasten the terminals of the segmental wagon-top B to the outer faces of the side bars F′ of the said mud-ring. In order to cover the joints or overlapping sides of the terminals C^3, covering-strips I are provided, interposed between the inner heads of the bolts H and the inner faces of the terminals C^3, as plainly shown in Figs. 3, 4, and 5, and in order to strengthen the wagon-top reinforcing-strips J are interposed between the terminals of the wagon-top and the outer faces of the side bars F′, and the said reinforcing-strips J are in addition attached by bolts J′ to the wagon-top (see Fig. 3.)

By the arrangement described the fire-box is supported from the side bars of the mud-ring, and by giving the peculiar shape to the sections C′ of the said fire-box it is not necessary to employ stay-bolts or the like for connecting the fire-box with the wagon-top.

As illustrated in Fig. 6, it will be seen that the mud-ring F is formed of a single piece—that is, the side bars F′ are integrally connected with each other by the front cross-bar F^2 and the rear cross-bar F^3, and on the bottom faces of the side bars F′ are formed lugs F^4 for supporting a grate K and an ash-pan L, as indicated in Fig. 1. The forward cross-bar F^2 is in the shape of a segment of a circle, the curvature extending downwardly, the top face of the cross-bar F^2 being engaged by the

lower portion of the flange D′ of the flue-sheet D, and the under side of the said front cross-bar F^2 is engaged by the lower portion of the forward end of the wagon-top B, the same rivets being used for fastening the flange of the flue-sheet D and the wagon-top B to the said forward cross-bar F^2.

The side bars F′ of the mud-ring are formed at their upper corners with cut-out portions F^5 (see Fig. 4) for accommodating the flanges C^2 and calking-rings G to allow the said flanges and calking-rings to rest on the side bars F′ of the mud-ring.

The back ring B′ of the wagon-top B is curved rearwardly and downwardly, as indicated in Figs. 1, 2, and 4, and the terminals of this back ring B′ engage the outer faces of the side bars F′ of the mud-ring F the same as the wagon-top, and the rear end of the said back ring B′ is closed by a back head B^2, fastened to the rear cross-bar F^3 of the mud-ring F. The back ring B′ is provided with an inner plate B^3, having a longitudinally-extending flange B^4, connected with the rear end of the rearmost section C′ of the fire-box, and the said plate B^3 forms, with the back ring B′, a fire-door opening B^5. The lower ends of the back ring B′ and its reinforcing-plate B^3 straddle the rear of the cross-bar F^3 of the mud-ring to firmly connect the entire wagon-top with the mud-ring in the manner above set forth.

By arranging the inner and outer faces of the side bars F′ of the mud-ring in the manner described—that is, in the plane of the terminals of the segmental wagon-top and fire-box sections C′—it is evident that an exceedingly strong connection is made between the several parts, and the said terminals can be readily connected to the mud-ring without forming angular joints and the like.

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

1. A locomotive-boiler provided with a wagon-top, a rectangular mud-ring in the lower portion of the wagon-top, a fire-box within the wagon-top and wholly supported from the said mud-ring, and a grate supported upon said mud-ring.

2. A locomotive-boiler comprising a wagon-top, a mud-ring in the lower portion of said wagon-top, a fire-box within the wagon-top and supported upon said mud-ring, said mud-ring having oppositely-disposed bars with projections extending into the space therebetween, and a grate supported upon said projections.

3. A locomotive-boiler provided with a wagon-top, a rectangular mud-ring in the lower portion of the wagon-top, a fire-box within the wagon-top and wholly supported from the said mud-ring, and a rear flanged flue-sheet fastened to the forward end of the box and to the upper face of the cross-bar of the mud-ring.

4. A locomotive-boiler provided with a mud-ring, a fire-box constructed thereupon and consisting of a plurality of connected sections, said sections being incompletely circular in form with flat extremities attaching to the inner face of said mud-ring, said sections having flanges at the edges thereof for connecting the same.

5. A locomotive-boiler provided with a wagon-top and mud-ring attached thereto, a fire-box constructed upon said mud-ring and consisting of segmental sections, said sections having laterally-disposed flanges for connecting the same, and flat extremities attaching to the inner face of said mud-ring, and reinforcing-strips disposed longitudinally on the inner faces of said mud-ring above the extremities of said segments.

6. A locomotive-boiler provided with a wagon-top, a rectangular mud-ring in the lower portion of the wagon-top, a fire-box within the wagon-top and wholly supported from the said mud-ring, and a reinforcing-plate interposed between the side bars of the mud-ring and the inner face of the wagon-top.

7. A locomotive-boiler provided with a wagon-top, a rectangular mud-ring in the lower portion of the wagon-top, and a fire-box within the wagon-top and wholly supported from the said mud-ring, the fire-box being formed of segmental sections arranged side by side and having outwardly-turned fastening-flanges at the sides, each section being bulged inwardly, the non-bulged terminals of the sections being secured to the side bars of the mud-ring, the side edges of the said terminals overlapping each other.

8. A locomotive-boiler provided with a wagon-top, a rectangular mud-ring in the lower portion of the wagon-top, and a fire-box within the wagon-top and wholly supported from the said mud-ring, the fire-box being formed of segmental sections arranged side by side and having outwardly-turned fastening-flanges at the sides, each section being bulged inwardly, the non-bulged terminals of the sections being secured to the side bars of the mud-ring, the side edges of the said terminals being beveled and overlapping each other.

9. A locomotive-boiler having a mud-ring formed of side bars and front and rear cross-bars, the side bars and the rear cross-bar being straight and the front cross-bar in the form of a segment of a circle.

10. A locomotive-boiler having a mud-ring formed of side bars and front and rear cross-bars, the side bars and the rear cross-bar being straight and the front cross-bar in the form of a segment of a circle, the curvature extending downward.

11. A locomotive-boiler having a mud-ring formed of side bars and front and rear cross-bars, the side bars and the rear cross-bar being straight and the front cross-bar in the form

of a segment of a circle, and means on the side bars for supporting the grate-bars and ash-pan.

12. A locomotive-boiler having a mud-ring formed of side bars and front and rear cross-bars, the side bars and the rear cross-bar being straight and the front cross-bar in the form of a segment of a circle, and lugs on the lower edges of the side bars for supporting the grate-bars.

13. A locomotive-boiler having a wagon-top provided with a back ring, beveled rearwardly and downwardly, and a mud-ring having its side bars engaged by the wagon-top and its back ring.

14. A locomotive-boiler having a wagon-top provided with a back head, and a mud-ring attaching at its side bars with the said wagon-top and at its rear cross-bar to the said back head.

15. A locomotive-boiler having a wagon-top provided with a back ring beveled rearwardly and downwardly, a back head for the said back ring, and a mud-ring connected at its side bars with the said wagon-top and its back ring, the rear cross-bar of the mud-ring being connected with the said back head.

16. A locomotive-boiler having a wagon-top provided with a back ring beveled rearwardly and downwardly, a back head for the said back ring, a fire-box within the wagon-top, and a mud-ring having its side bars connected at the outer faces with the said wagon-top and its back ring, the inner faces of the said side bars being connected with the said fire-box and the rear cross-bar of the said mud-ring being connected with the said back head.

17. A locomotive-boiler having a wagon-top provided with a back ring beveled rearwardly and downwardly, a back head for the said back ring, a fire-box within the wagon-top, a mud-ring having its side bars connected at the outer faces with the said wagon-top and its back ring, the inner faces of the said side bars being connected with the said fire-box and the rear cross-bar of the said mud-ring being connected with the said back head, and a rear flue-sheet connected with the front end of the fire-box and with the front cross-bar of the said mud-ring.

18. A locomotive-boiler having a wagon-top, a fire-box therein, a mud-ring connected at the inner faces of its side bars with the said fire-box and at its outer faces with the said wagon-top, and reinforcing-strips interposed between the wagon-top and the fire-box.

19. A locomotive-boiler having a wagon-top, a fire-box therein, a mud-ring connected at the inner faces of its side bars with the said fire-box and at its outer faces with the said wagon-top, reinforcing-strips interposed between the wagon-top and the fire-box, and bolts for connecting the terminals of the wagon-top and the fire-box with the said mud-ring side bars.

20. A locomotive-boiler having a wagon-top, a fire-box therein, a mud-ring connected at the inner faces of its side bars with the said fire-box and at its outer faces with the said wagon-top, reinforcing-strips interposed between the wagon-top and the fire-box, bolts for connecting the terminals of the wagon-top and the fire-box with the said mud-ring side bars, and covering-strips interposed between the inner heads of the bolts and the terminals of the fire-box.

21. A locomotive-boiler having a fire-box made in sections, a mud-ring adapted to be engaged at the inner faces of its side bars by the terminals of the said fire-box sections, bolts for fastening the terminals to the side bars, and covering-strips interposed between the inner heads of the bolts and the said terminals, to cover the joints of adjacent sections.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

NEWTON L. WARREN.

Witnesses:
MALLORY BEDINGFIELD,
A. J. SMITH.