(No Model.)

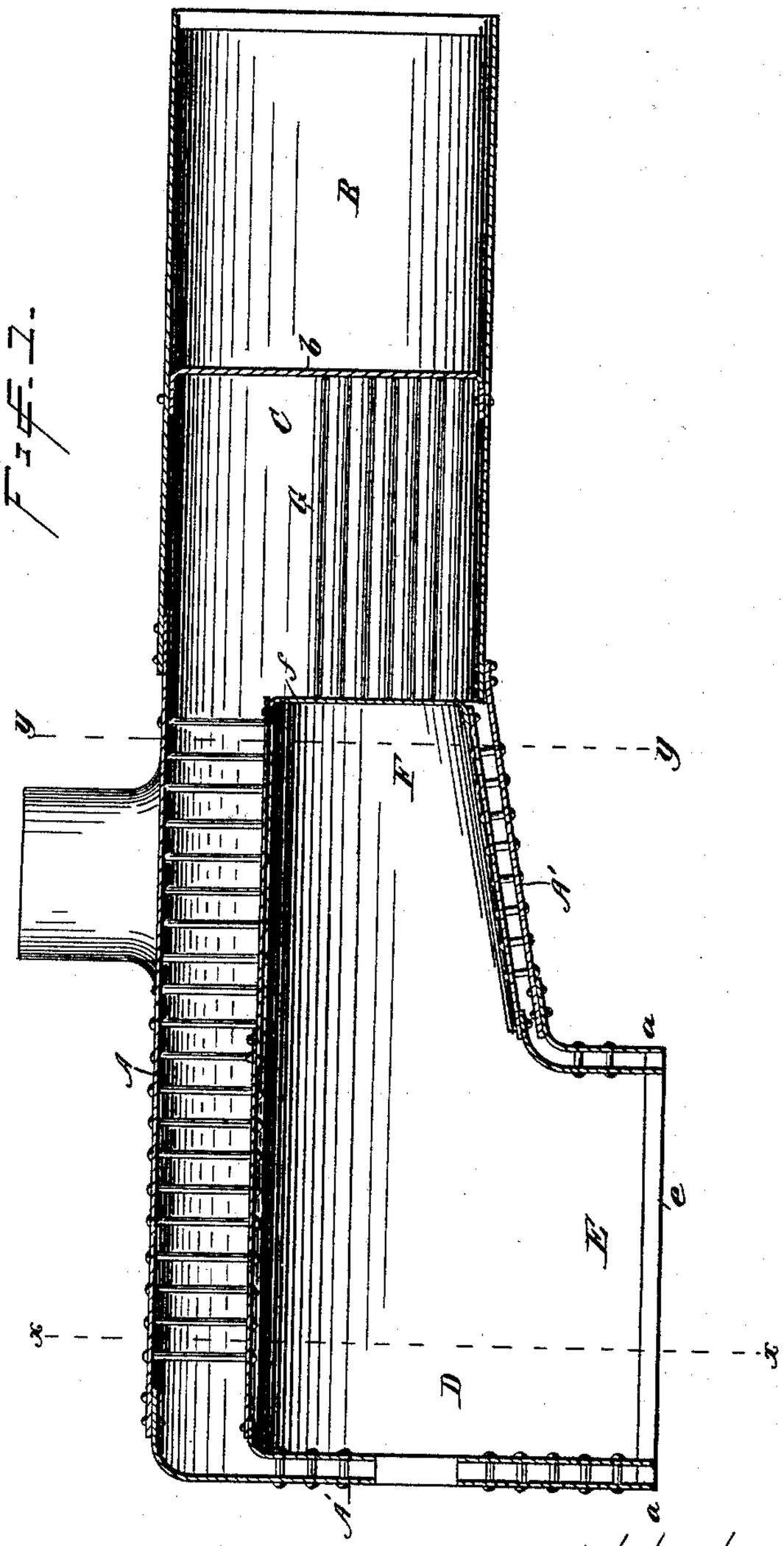
2 Sheets—Sheet 1.

J. T. CONNELLY.

LOCOMOTIVE BOILER.

No. 488,919. Patented Dec. 27, 1892.

Fig. 1.



WITNESSES-
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James T. Connelly,
by his Attorney
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(No Model.) 2 Sheets—Sheet 2.

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LOCOMOTIVE BOILER.

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Fig. 2.

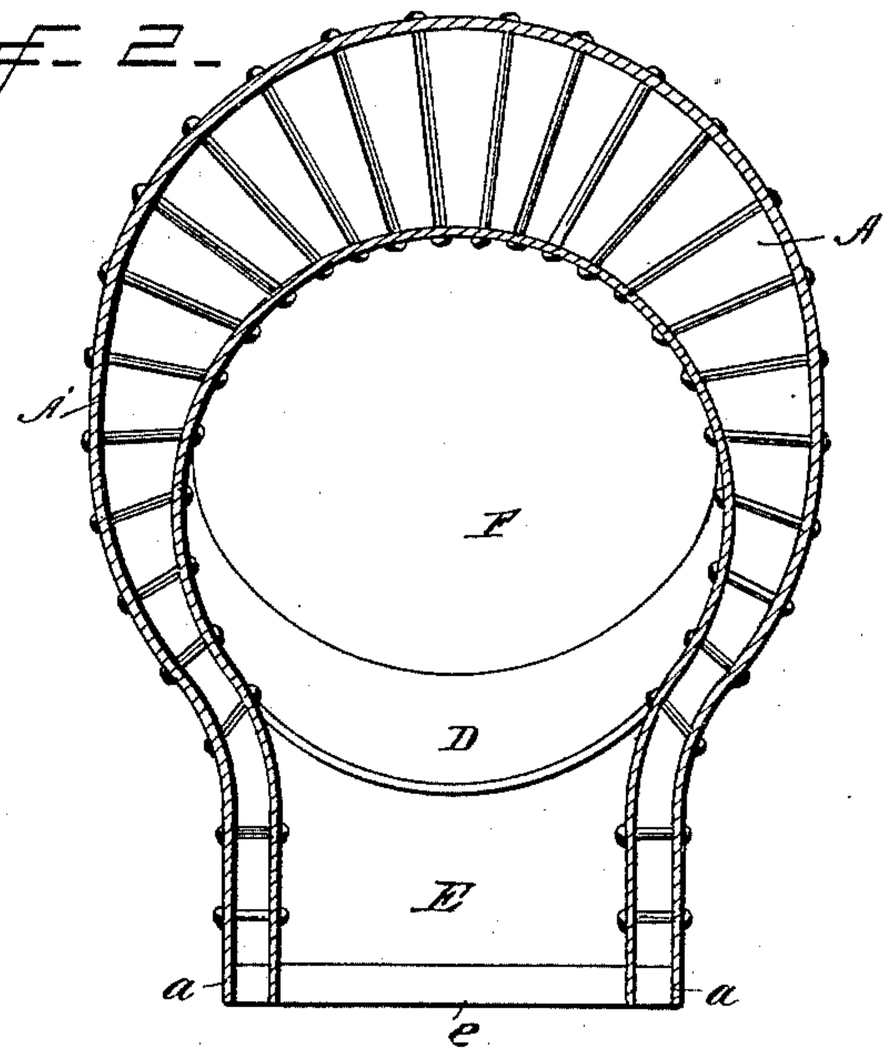
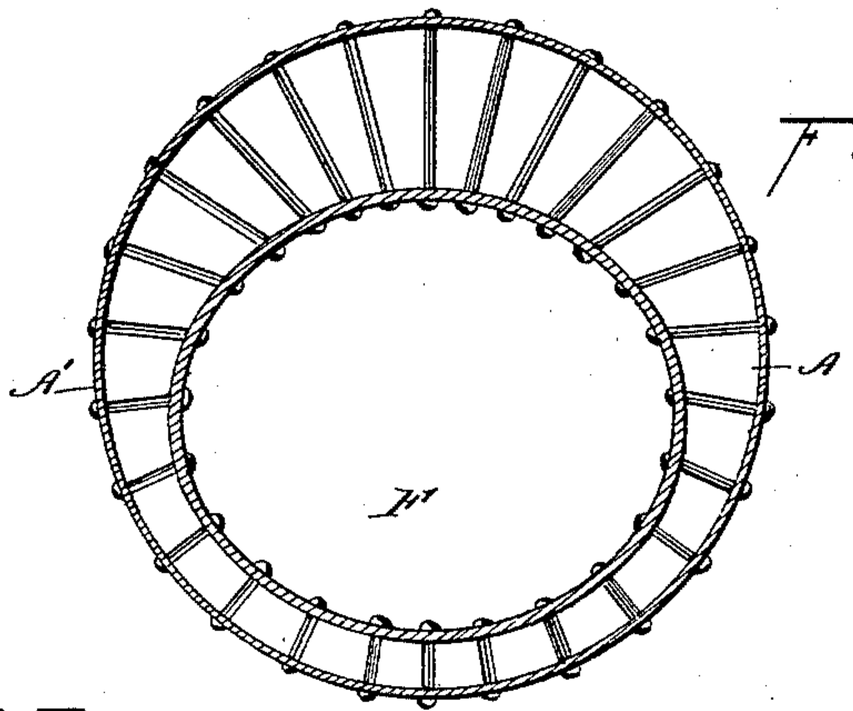


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES THOMAS CONNELLY, OF MILTON, PENNSYLVANIA.

LOCOMOTIVE-BOILER.

SPECIFICATION forming part of Letters Patent No. 488,919, dated December 27, 1892.

Application filed May 10, 1892. Serial No. 432,479. (No model.)

To all whom it may concern:

Be it known that I, JAMES THOMAS CONNELLY, a citizen of the United States, residing at Milton, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Locomotive-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to locomotive boilers, and it has for its object to provide a construction of boiler of this class in which the maximum quantity of steam is generated and maintained with a given quantity of fuel.

A further object of the invention is to produce a boiler of such construction as will obviate the collection of mud or other deposits on top of the fire-box, in which a greater area of heating surface is secured, and of materially increased strength and durability.

To this end, my invention consists, substantially, in the construction, combination and arrangement of parts as will be hereinafter more fully described and particularly pointed out in the claims.

In the drawings—Figure 1 is a vertical longitudinal sectional view of a boiler embodying my invention. Fig. 2 is a transverse sectional view, taken on the line *x*—*x*, Fig. 1. Fig. 3 is a similar view on the line *y*—*y*, Fig. 1.

Corresponding parts in the figures are denoted by the same letters of reference.

Referring to the drawings, A designates the boiler, comprising the front chamber B, barrel C and fire-box chamber D, said parts being in the main of any well known or approved construction.

E designates the fire-box, which is by preference formed of a single-sheet, and is in cross-section segmentally-curved at its top and sides. From the lower edge of the latter, the sheet is extended downwardly and parallel, as shown, forming a grate space, *e*, and water-legs, *a a*, between said extensions of the sheet and the outer shell A′. The fire-box shell is removed at all points from the outer shell A′ and is secured thereto in any suitable and mechanical manner by stay-bolts and radial stays.

At its forward end, the fire-box is provided with an extension, F, projecting within the barrel C preferably for more than one-half the space usually occupied by the boiler flues. This extension is also by preference formed of a single sheet secured at its rear edge to the front edge of the fire-box shell. In cross-section, the extension is circular from its rear end to about its longitudinal center, and from the latter point its contour is changed to its extreme front end, which is approximately oval. The bottom of this extension is inclined from its front end downwardly to its rear end, thus preventing the accumulation of coal or dust therein. It will be further noted that by the provision of this extension, and its novel shape the heating surface is greatly increased. The forward end of the extension F is provided with a head, *f*, and the chamber B and barrel C are divided by the usual partition *b*.

Within the barrel C, and mounted between the head *f* and partition *b*, are the boiler flues G. The latter are secured to said head and partition in any well known or approved manner, but are essentially shorter, and consequently more rigid, than is customary.

The operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains. It is well-known that in the usual construction of locomotive boilers, the extreme length of the flues cause them to sag after a brief period of time, and lying one upon the other the slight space between them after short service becomes filled with mud or other deposit, impairing the offices of the boilers and causing what is known as "mud burning." This condition of the flues, and form of construction where the flues are in direct contact with the fire, causes as a consequence burning of the ends of the flues and the resultant expense and danger. Another disadvantage of the long flues is the material difficulty in cleaning the same. It may also be noted that usually in boilers of this class, by reason of the general construction, the inner sheets are formed with flat top surface, upon which mud or other deposit collects, affecting the efficiency of the boiler.

To obviate these and other objections, is

the purpose of my present invention. In the latter construction, by reason of the provision of the fire-box extension, the flues are removed from the fire, and the danger of burning of the ends of the same obviated. This extension also provides an additional heating surface, and by its employment the flues are shortened and rendered more rigid, thus obviating the liability to sag and the consequent evil results above noted. It will also be apparent that by constructing the parts of the boiler subject to the greatest pressure approximately cylindrical, and having no weak flange or sharp corners, greater strength is insured, while being without flat surfaces, except the legs, back head and throats, the accumulation of mud or other deposits is obviated.

I claim as my invention—

1. As an improvement in locomotive boilers, a fire-box approximately circular in cross-section, and an extension at the forward end of the same and projecting within the barrel of the boiler, said extension being circular in cross-section at its rear end, and approximately oval at its forward end, and having its bottom inclined from its forward to its rear ends; substantially as set forth.

2. A fire-box approximately circular in cross-section, and a forward extension projecting within the barrel of the boiler; said extension being circular in cross-section at its rear end, oval at its forward end, and having its bottom inclined from its forward to its rear ends, in combination with contracted boiler flues secured in the head of the extension, as specified.

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

JAMES THOMAS CONNELLY.

Witnesses:
WILLIS H. LAWRENCE,
H. E. AUGSTADT.