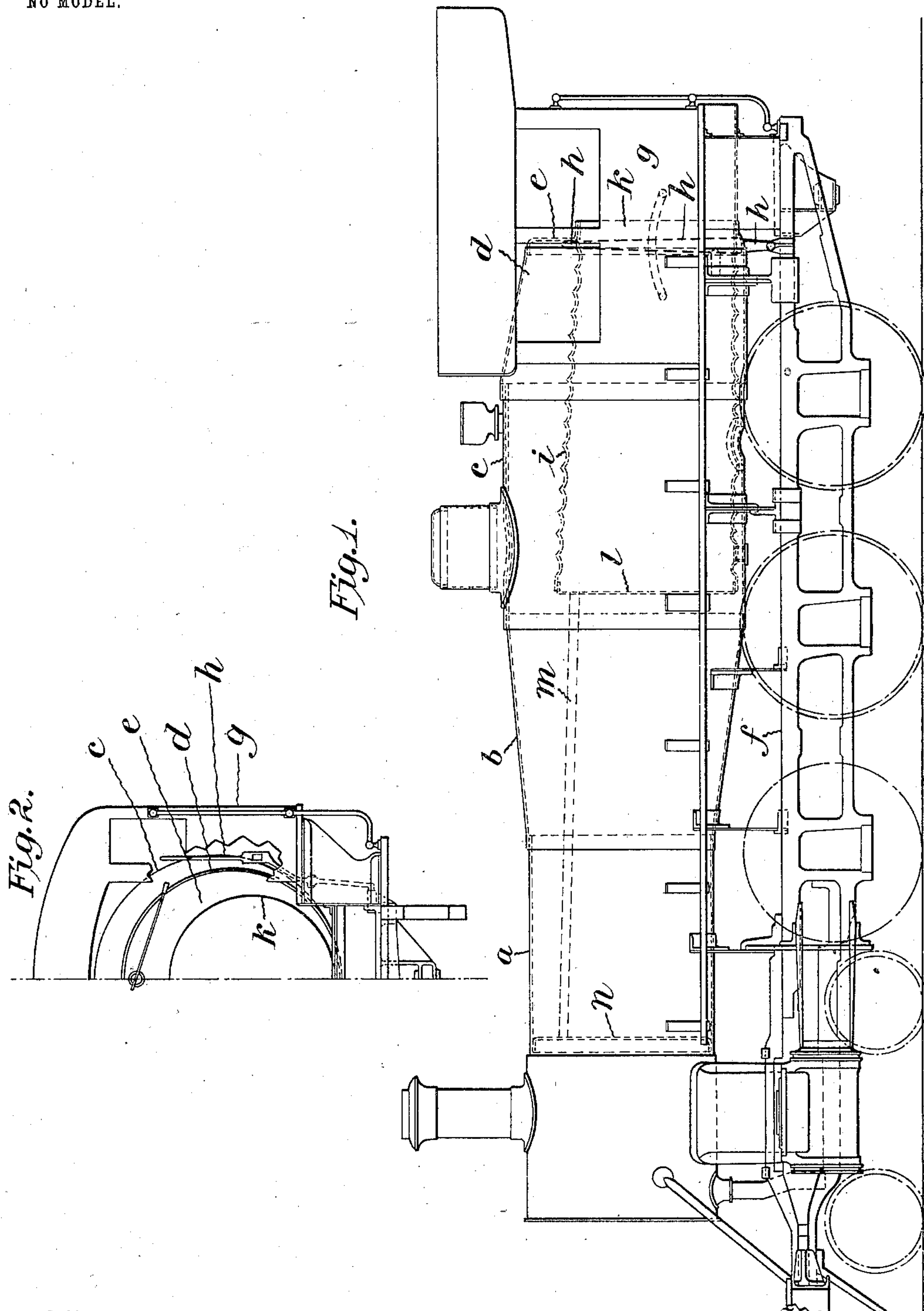


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C. VANDERBILT.  
FIRE BOX FOR BOILERS.  
APPLICATION FILED JUNE 12, 1902.

NO MODEL.



Witnesses  
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# UNITED STATES PATENT OFFICE.

CORNELIUS VANDERBILT, OF NEW YORK, N. Y.

## FIRE-BOX FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 726,382, dated April 28, 1903.

Application filed June 12, 1902. Serial No. 111,287. (No model.)

*To all whom it may concern:*

Be it known that I, CORNELIUS VANDERBILT, a citizen of the United States, residing in the borough of Manhattan, city of New York, State of New York, have invented certain new and useful Improvements in Fire-Boxes for Boilers, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

10 In locomotive-boilers having fire-boxes which are circular in cross-section the fire-boxes as heretofore constructed are substantially cylindrical or have a greater diameter at the rear end than at the forward

15 or tube-sheet end. It is usually desirable to have the fire-boxes as large as possible, and the boiler-shell is of necessity larger than the fire-box, so that when the rear end of the fire-box is of the same diameter as the

20 forward end the necessarily large diameter of the boiler-shell in heavy locomotives has made it necessary to locate the reverse-lever behind the end of the boiler, thus necessitating a corresponding increase in the length

25 of the locomotive-frame. Another result of the use of cylindrical fire-boxes of maximum diameter is that if the level of the water in the boiler is low there is danger that the rear end of the fire-box will be uncovered by water when the locomotive is descending a heavy

30 grade. It is primarily the object of this invention to overcome the difficulties above alluded to in the use in locomotives of fire-boxes circular in cross-section by providing a fire-

35 box circular in cross-section and tapered, the diameter of the rear end being substantially less than the diameter of the forward end, the fire-box being at the same time corrugated transversely in order that it may have the

40 necessary strength without the use of stay-bolts. It will be understood, however, that tapered transversely-corrugated fire-boxes may be advantageously employed in other than locomotive-boilers, and it is therefore

45 not intended to restrict the invention to locomotive-boilers alone.

The invention will be more fully described hereinafter with reference to the accompanying drawings, in which—

50 Figure 1 is a view, partly in side elevation and partly in outline, of a locomotive equipped

with a tapered corrugated fire-box, the fire-box and some other parts of the locomotive being shown by dotted lines. Fig. 2 is a partial rear elevation of the locomotive shown in Fig. 1, the cab being partly broken out to show the starting-bar.

The locomotive or other structure to which the invention is applied may be of any suitable form or construction, except as herein- 60 after indicated. As represented in the accompanying drawings, the boiler may have a forward cylindrical portion *a*, an intermediate tapered section *b*, enlarging rearwardly, a cylindrical fire-box section *c* of maximum 65 diameter, and a tapered fire-box section *d*, diminishing rearwardly to the boiler-head *e*. The boiler is shown as supported upon a suitable frame *f*, which also supports the usual cab *g*, inclosing the rear tapered section *d*. The 70 reduced diameter of the rear end of the boiler leaves sufficient space between the boiler and the side wall of the cab to permit the starting-lever *h* to be placed alongside the boiler and to be conveniently manipulated, whereas in 75 other heavy locomotives, in which the maximum diameter of the fire-box section of the boiler is continued to the boiler-head, the starting-lever is necessarily placed far enough behind the boiler-head to permit it to be 80 swung through its full arc, thus necessitating a corresponding extension rearwardly of the locomotive-frame.

The fire-box *i*, as clearly shown by dotted lines in Fig. 1, is corrugated transversely that 85 it may have the necessary strength without the use of a great number of stay-bolts and is circular in cross-section, as indicated at *k* in Fig. 2, having its maximum diameter at its forward end and being tapered toward its rear 90 end, having its minimum diameter where it is secured to the boiler-head *e*, as at *k*. The fire-box tube-sheet *l* receives, as usual, the tubes, one of which is indicated at *m*, the forward ends of the tubes being supported, as usual, by 95 the forward tube-sheet *n*. The tapered form of the fire-box permits the tube-sheet *l* to be of maximum diameter to receive the maximum number of tubes, while it permits the rear end of the boiler-shell to be reduced in 100 diameter, as before described, without sacrificing the necessary space between the fire-



box and the boiler-shell. Provision is thus made for a sufficient volume of water about the fire-box under all conditions, it being particularly noted that when the locomotive is descending a heavy grade there will be no danger that the rear end of the fire-box will be uncovered if the level of the water in the boiler is low, as would be the case if the fire-box were cylindrical, having at its rear end the necessary diameter of its forward end.

I claim as my invention—

1. The combination with a boiler having a rearwardly-tapered rear section, of a fire-box circular in cross-section, corrugated transversely, and tapered from its forward end to its rear end, whereby when the boiler is in place a space will be formed between it and

the side of the cab for the starting-lever, substantially as described.

2. In a locomotive, the combination of a boiler having a tapered rear section, a fire-box circular in cross-section, corrugated transversely and tapered rearwardly, and a cab inclosing the tapered section of the boiler, a space for the starting-lever being thereby formed alongside the tapered section of the boiler and between the same and the side wall of the cab, substantially as described.

This specification signed and witnessed this 20th day of May, A. D. 1902.

CORNELIUS VANDERBILT.

In presence of—

EDWIN C. FARLOW,  
LOUIS A. SHEPARD.