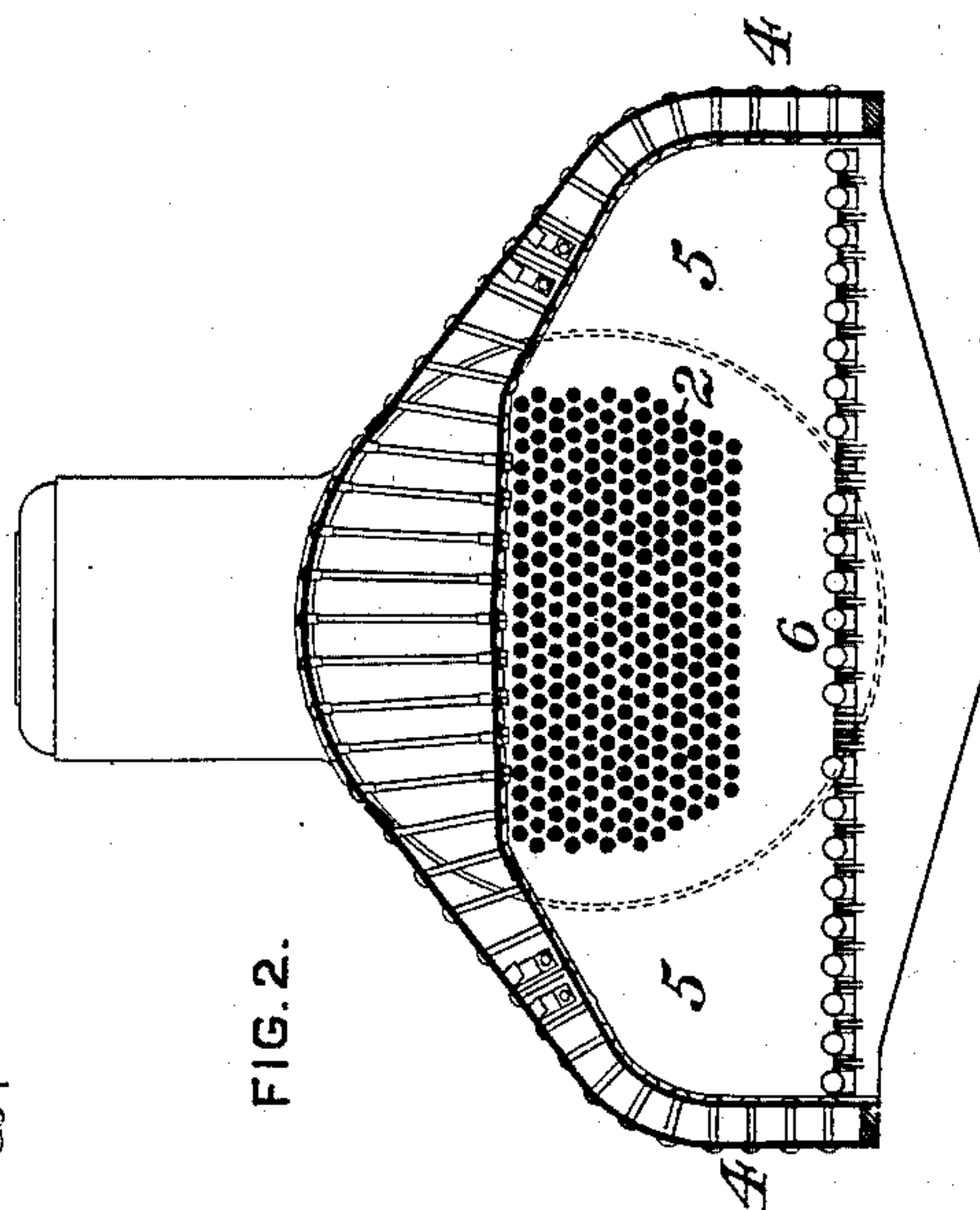
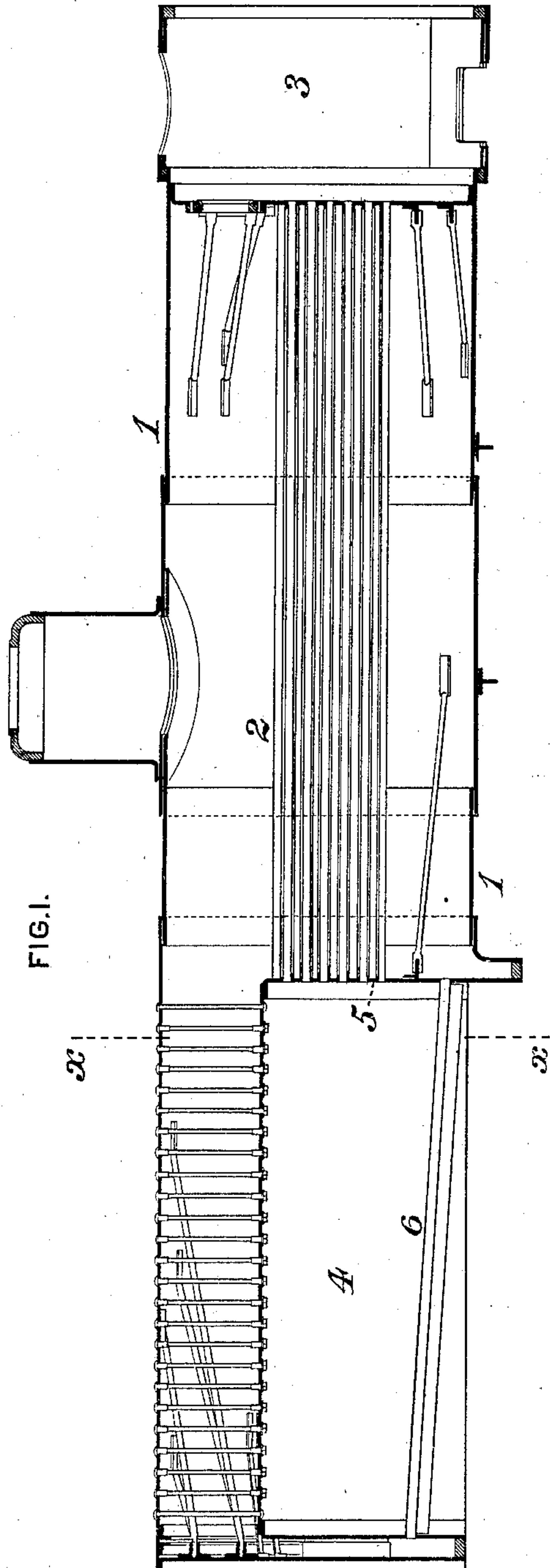


(No Model.)

J. E. WOOTTEN.  
LOCOMOTIVE BOILER.

No. 354,370.

Patented Dec. 14, 1886.



WITNESSES:

*R. H. Whittlesey*  
*C. M. Clarke*

INVENTOR,

*J. E. Wootten*  
*By J. Snowden Bell*  
Att'y.



# UNITED STATES PATENT OFFICE.

JOHN E. WOOTTEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE  
WHARTON RAILROAD SWITCH COMPANY, OF SAME PLACE.

## LOCOMOTIVE-BOILER.

SPECIFICATION forming part of Letters Patent No. 354,370, dated December 14, 1886.

Application filed October 21, 1886. Serial No. 216,853. (No model.)

### *To all whom it may concern:*

Be it known that I, JOHN E. WOOTTEN, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain  
5 new and useful Improvement in Locomotive-Boilers, of which improvement the following is a specification.

The object of my invention is to enable the maximum practicable area of grate and fire-  
10 box heating surface to be made available in a locomotive-boiler without either unduly elevating the waist or cylindrical portion of the boiler or involving the employment of a combustion-chamber and fire bridge, as heretofore  
15 ordinarily embodied in the application of boilers of the wide fire-box type to practical service.

To this end my invention, generally stated, consists in a locomotive-boiler having a fire-box which is extended laterally beyond and  
20 located substantially entirely above the lower line of the waist, so as to present as large an area of grate and heating surface as desired, and admit of being extended over the driving-wheels of the engine, and a waist or cylindrical  
25 shell having a series of tubes extending from the fire-box flue-sheet to the smoke-box, the lowermost row of said tubes being located at such distance above the grate as to provide a blank or unperforated area at the lower  
30 portion of the flue-sheet sufficient to serve as the forward boundary of the bed of fuel on the grate.

The improvement claimed is hereinafter fully set forth.

35 In the accompanying drawings, Figure 1 is a vertical longitudinal central section through a locomotive-boiler embodying my invention, and Fig. 2 a vertical transverse section through the same at the line *x x* of Fig. 1.

40 In the practice of my invention a cylindrical waist or shell, 1, is riveted at its forward end to a smoke-box, 3, and similarly connected at its rear end to a fire-box, 4, which is extended laterally beyond the waist and the  
45 planes of the driving-wheels of the engine as far as desired within the limit admissible for passage over the road, and is located entirely above the lower line of the waist, its bottom being in a plane slightly above or closely adjacent to said line, so that, as in previous  
50 constructions of the wide fire-box type, the driv-

ing-wheels may be placed beneath it without undue or inconvenient elevation of the boiler above the rails. The fire-box is provided with a suitable grate, 6, extending from its  
55 flue-sheet 5 to its rear water-space, and which is preferably, as shown, composed of alternate water-tubes and bars, although any other approved form may be employed in the discretion of the constructor.

60 A series of fire-tubes, 2, extends from the flue-sheet 5 to the smoke-box, and the lowermost tier or row of said tubes, instead of being placed, as in the ordinary constructions, as near as practicable to the lower line of the  
65 shell, is located at such distance above the line of the top of the grate as to cause a blank or unperforated area to be presented at the lower portion of the flue-sheet 5 of sufficient height to serve as the forward boundary of  
70 the bed of fuel placed upon the grate, and to admit of the same being supported thereon entirely below the lowest row of tubes. By such construction I am enabled to dispense  
75 with a combustion-chamber in the rear portion of the waist having a fire-bridge at its end next the fire-box, which has heretofore been usually employed in boilers of this type, and by which, among other things, a function similar to the result here effected by the blank or  
80 unperforated lower area of the flue-sheet 5 was performed. In addition to the structural economy thus attained, the flues 2 are of correspondingly greater length, being extended through that portion of the waist in which the  
85 combustion-chamber has heretofore been located.

The employment of a laterally-extended fire-box, which, by the abundant grate-area that it presents, enables a comparatively light  
90 and shallow fire to be carried upon the grate, and combustion to be maintained under so easy an exhaust-blast that the tendency to the projection of particles of fuel into the tubes is materially reduced, renders practicable the  
95 use of a blank area of flue-sheet which is so small comparatively that the number of flues omitted from the lower portion of the waist to provide it is not found to materially deteriorate from the steam-generating capacity of the  
100 boiler, and the provision of such blank area of flue-sheets affords the capacity of utilizing an

enlarged fire-box without the necessity of the provision of special adjuncts for separating the forward portion of the bed of fuel from the openings of the lower tubes, as has heretofore  
5 been the case.

I claim as my invention and desire to secure by Letters Patent—

The combination, in a locomotive-boiler, of a waist or shell, a fire-box extended laterally  
10 beyond the waist and located in such horizontal relation thereto as to admit of driving-wheels being placed beneath it, and a series of

fire-tubes leading from the flue-sheet through the waist, the lowermost row of said tubes being located at such distance above the ordinary grate-level of the fire-box as to provide  
15 a blank or unperforated area at the lower portion of the flue-sheet sufficient to serve as the forward boundary of the bed of fuel on the grate, substantially as set forth.

JOHN E. WOOTTEN.

Witnesses:

L. B. PAXSON,

JAS. M. LANDIS.