

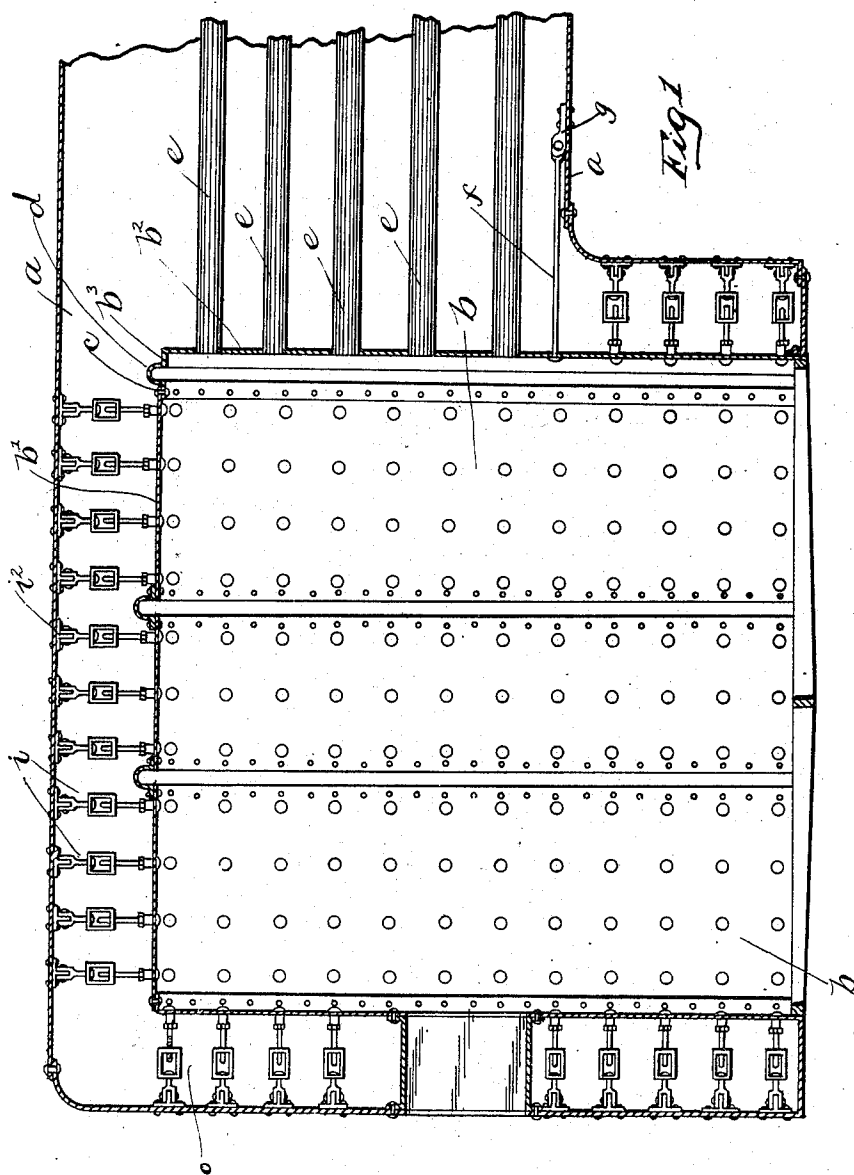
(No Model.)

3 Sheets—Sheet 1.

T. NESSER.
LOCOMOTIVE FIRE BOX AND BOILER.

No. 566,467.

Patented Aug. 25, 1896.



WITNESSES:

H. B. Bradshaw
A. L. Phelps

INVENTOR

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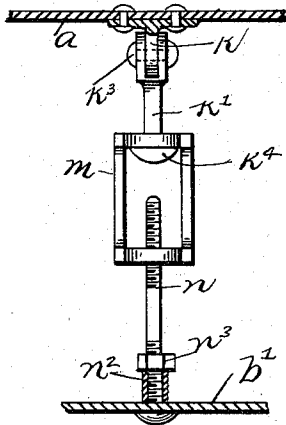


Fig. 2

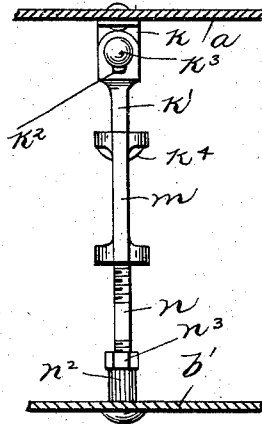


Fig. 3

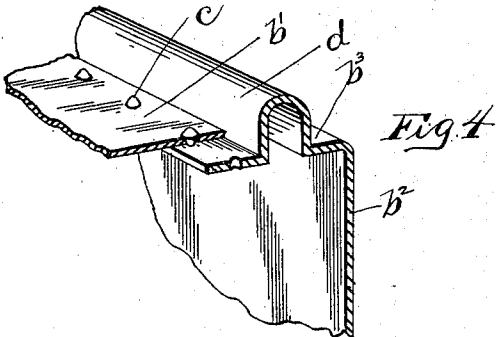


Fig. 4

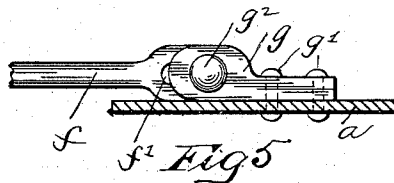


Fig. 5

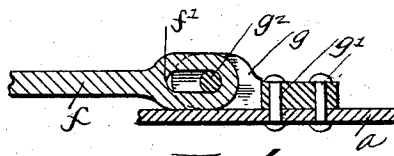


Fig. 6

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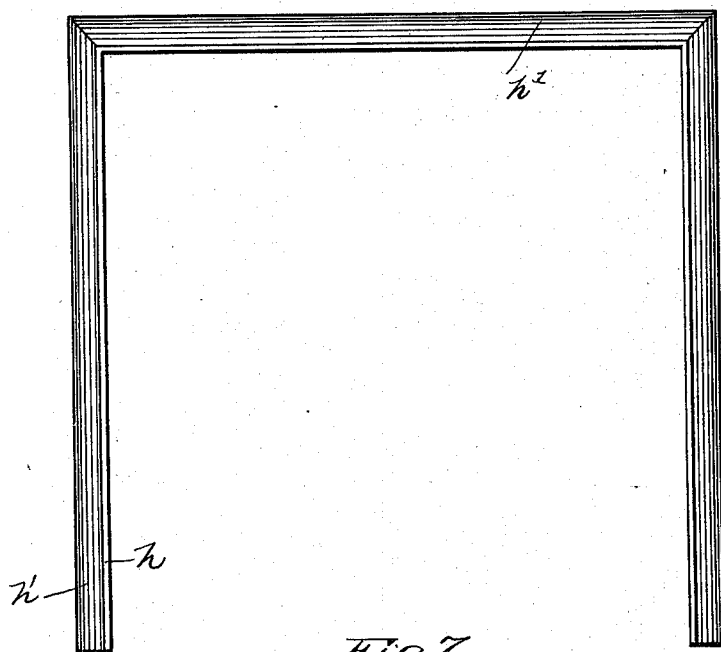


Fig. 7

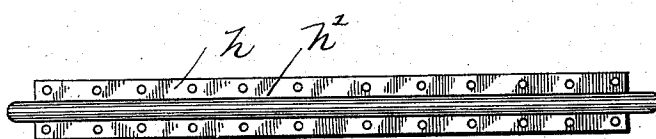


Fig. 8

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UNITED STATES PATENT OFFICE.

THEODOR NESSER, OF COLUMBUS, OHIO.

LOCOMOTIVE FIRE-BOX AND BOILER.

SPECIFICATION forming part of Letters Patent No. 566,467, dated August 25, 1896.

Application filed May 1, 1895. Serial No. 547,729. (No model.)

To all whom it may concern:

Be it known that I, THEODOR NESSER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Locomotive Fire-Boxes and Boilers, of which the following is a specification.

My invention relates to the improvement of fire-box and boiler construction, and has particular relation to that class of fire-boxes and boilers employed in locomotives.

The objects of my invention are to so construct and arrange the parts of the boiler and fire-box as to prevent the leakage of steam and water therefrom, to provide improved means for compensating for the contraction and expansion of the metal forming said parts, and to produce other improvements in details of construction which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of a fire-box and the rear portion of a locomotive-boiler. Fig. 2 is a detail view in elevation of my improved crown-sheet bolt connection. Fig. 3 is a view of the same taken at right angles with Fig. 1. Fig. 4 is a detail view in perspective illustrating the connection of the crown-sheet with my improved fire-box front or extension. Fig. 5 is a view in elevation illustrating the adjustable connection of the fire-box front with the boiler. Fig. 6 is a central vertical section of the same. Fig. 7 is a view in elevation of one of the compensator sections or strips *h*, and Fig. 8 is a plan view of the same.

Similar letters refer to similar parts throughout the several views.

a represents the boiler, near the rear portion of which is located in the usual manner the fire-box *b*. Of this fire-box, *b'* represents the crown-sheet and *b²* is the front-end sheet. As indicated in the drawings, this front-end sheet *b²* is formed with a top and side flange portion *b³*, said flange portion extending rearwardly and being riveted, as indicated at *c*, to the crown and side sheets of the fire-box at its forward end, thus resulting in the production of a forward-end extension of said fire-box. This extension or flange *b³* is formed

with a central swell or bead portion *d*, which extends throughout the length of said flange *b³*. The boiler-tubes, which are indicated at *e*, have their inner ends secured in the end sheet *b²* in the usual manner.

f represents a horizontal adjustable stay-bolt, said stay-bolt extending, as shown, from the fire-box-front plate or sheet to a point in the cylindrical part of the boiler and adjacent to the casing of the latter. The outer end of this bolt *f* has formed therein an elongated opening or slot *f'*.

g represents an attaching-block, which, as indicated at *g'*, has its forward or shank portion rigidly connected with the boiler-casing, and which has its rear and bifurcated portion provided with a cross pin or bolt *g²*, which is adapted, as shown, to pass loosely through the slotted opening *f'* of the bolt or arm *f*, the slotted end of the latter being inserted, as shown, within the bifurcation of said block. It is evident that any desired number of these bolts *f* and blocks *g* may be employed, and that the same may be arranged at such intervals one from the other as is deemed necessary.

As indicated, the fire-box may be formed in two or more transverse sections, the crown-sheet and side walls thereof being connected by intervening compensator-strips *h*, each of which, as provided for the extension *b³*, is provided with a central elevation or bead portion *h'*.

i represents my improved crown-bolts, which serve to adjustably connect the crown-sheet and boiler-casing in the manner hereinafter described. In producing this connection I employ a suitable bracket or lug *i²*, which, as shown, is riveted to the inner side of the boiler-casing. The inwardly-projecting portion *k* of this bracket is embraced by the bifurcated head or outer end of a bolt *k'*, the arms formed by this bifurcation being provided with oppositely-located elongated or slotted openings *k²*, through which passes loosely a pin or rivet *k³*, which extends through the portion *k* of the bracket *i*. The bolt *k'* passes through and has its usual head *k⁴* engaging with the outer end of a turnbuckle *m*. Into the inner end of this turnbuckle is screwed the outer-end portion of a bolt *n*, which extends outwardly through the crown-

sheet *b'*, the head of said bolt *n* engaging with the inner surface of said crown-sheet. The bolt *n* is, as indicated, threaded in its inner-end portion and surrounded by a short sleeve *n*², which bears against the crown-sheet and on the outer end of which is adapted to bear a nut *n*³, which, as shown, screws upon said bolt *n*. As shown in the drawings, bolts *o*, corresponding in construction with the bolts *i*, above described, may be employed, if desired, in connecting the ends of the fire-box with other portions of the boiler-casing.

It is well known that the heat resulting from the fire and steam of locomotive-boilers causes an expansion of the parts of the boiler and fire-box, which, owing to the ununiform distribution of heat, is unequal, and this unequal expansion of the metal forming said parts and the contraction thereof, which is naturally followed by a reduction in heat, result in a straining of the bolt connections and in a consequent leakage of water and steam. Owing to the construction of the beaded or fold portion of the end extension *b*³ of the fire-box, it is evident that an additional area or quantity of material is provided, which may be moved outward or inward as a result of the varying temperatures without straining the fire-box sheeting or the connections therewith of the tubes *e*. Owing to the adjustable connection of the bolts *f* with the blocks *g*, it is evident that said bolts *f* may be moved forward in case of a forward movement of the fire-box front without a disconnection of said bolts and blocks. It is evident that the limit of forward movement of the fire-box front will be regulated by the length of the slot *f'*, thus providing means for preventing too great an expansion of said front sheet. In producing the crown-bolt connections hereinbefore described of the crown-sheet and external casing, it will be seen that the turnbuckles *n* or nuts *n*³ may be so rotated as to provide a normally taut connection of said parts, and it will also be seen that any expansion of the crown-sheet will be compensated for by the contraction of said connections which is permitted by the slots *k*². It will thus be seen that the expansion of the crown-sheet will not result in a straining or springing of the bolt connections with the boiler-casing.

In order to compensate for the backward and forward movement of the fire-box body,

I have provided the intersecting compensator-strips *h*, the beaded portions of which will, as prescribed for the beads *d* of the extension *b*³, take up or compensate for the contraction and expansion of the metal of which said fire-box is composed.

From the construction and operation which I have herein shown and described it will be seen that the straining or springing of the various metal parts of the fire-box and its connections will be obviated and the leakage of the same thereby prevented. It will also be observed that by the employment of the riveted internal brackets *i*² the necessity of employing nuts on the outer side of the boiler-casing is entirely obviated.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a locomotive fire-box and boiler construction the combination with the fire-box body consisting of the forward end, side and crown sheeting, of a separately-formed front fire-box sheet, an inwardly-projecting flange formed thereon and a fold or bead portion formed in said flange, the latter being connected with and forming an extension of the forward end of the fire-box, a horizontal stay-rod *f* having one of its ends connected with said front fire-box sheet and having a slotted opening in its remaining end, a block *g* projecting from the boiler-casing and having its rear end bifurcated and a transverse pin extending through said bifurcation and through the end slot of said rod *f*, substantially as and for the purpose specified.

2. In a locomotive boiler and fire-box construction the combination with the boiler-casing and fire-box, of bolts *k'* having their upper ends jointedly connected with the inner side of the boiler-casing, bolts *n* having their lower ends rigidly connected with the crown-sheet and turnbuckles having their upper ends engaging with the bolts *k'* and having their lower ends adjustably connected with the bolts *n* threads on the inner portions of said bolts *n*, sleeves *n*² on said threaded portions, and nuts *n*³ on said bolts adapted to bear on said sleeves substantially as and for the purpose specified.

THEODOR NESSER.

In presence of—

C. C. SHEPHERD,
O. H. MOSIER.