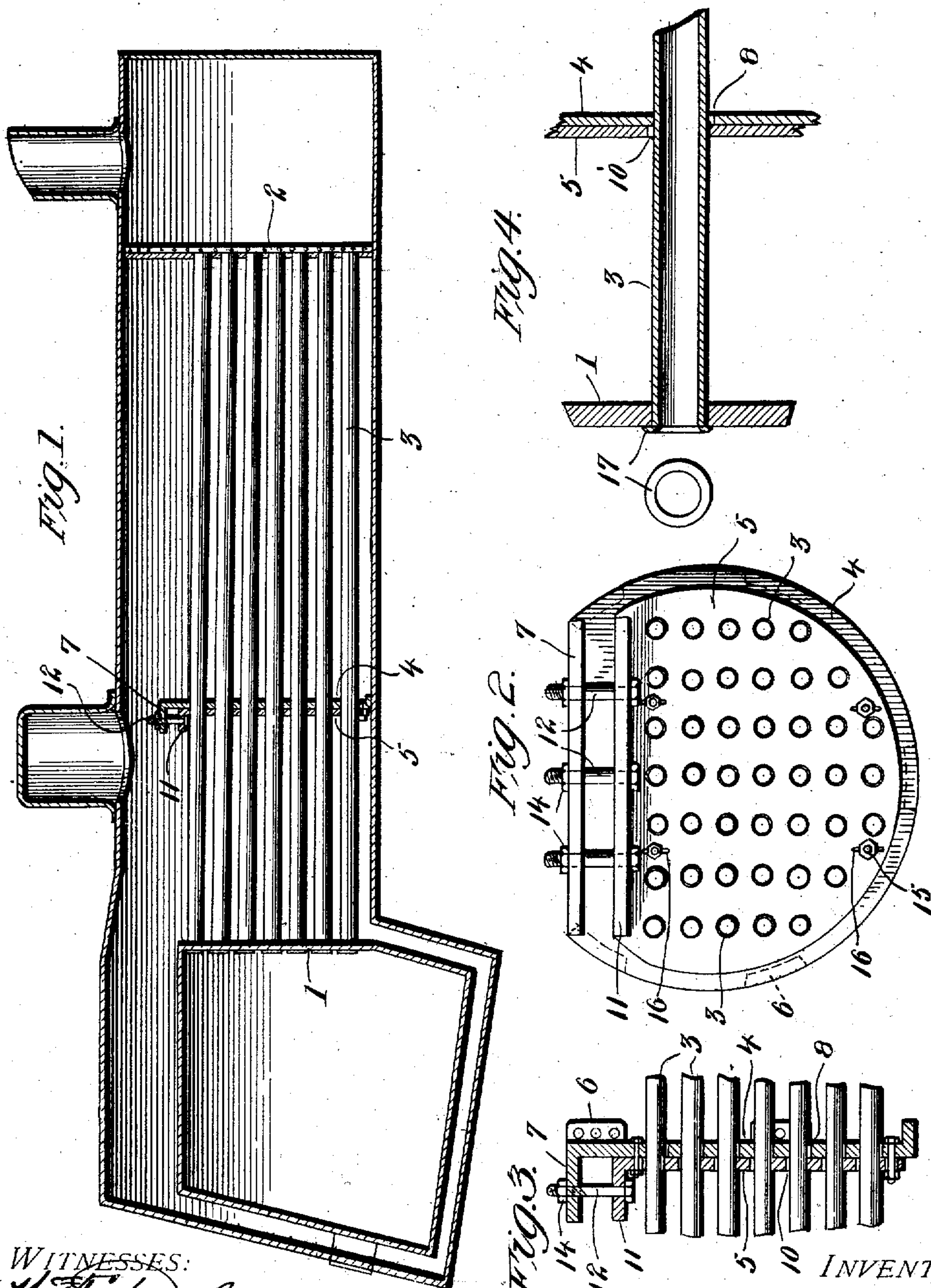


No. 884,013.

PATENTED APR. 7, 1908.

J. J. GAGE.
LOCOMOTIVE BOILER.

APPLICATION FILED OCT. 29, 1906. RENEWED JAN. 28, 1908.



WITNESSES:
H. F. Kagle
M. E. Louny

Fig. 3. 7
Fig. 2. 7
Fig. 4. 7
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UNITED STATES PATENT OFFICE.

JOSEPH J. GAGE, OF MANSFIELD, OHIO.

LOCOMOTIVE-BOILER.

No. 884,013.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed October 29, 1906, Serial No. 341,051. Renewed January 28, 1908. Serial No. 412,992.

To all whom it may concern:

Be it known that I, JOSEPH J. GAGE, a citizen of the United States of America, residing at Mansfield, in the county of Rich-
land and State of Ohio, have invented certain
new and useful Improvements in Locomo-
tive-Boilers, of which the following is a speci-
fication, reference being had therein to the
accompanying drawing.

This invention has relation to certain new
and useful improvements in locomotive
boilers, and the invention has for its objects,
first, to provide means to lengthen the life
and durability of boiler flues in locomo-
tives; second, to prevent a certain amount
of vibration being imparted to the flues
when the engine is in motion, and thereby
obviating to a great extent the loosening of
the flues in the flue-sheet next to the fire box,
and preventing leakage.

The construction by which I carry into
effect the aims and objects of my invention
will be hereinafter fully described and then
specifically claimed, and in describing the
invention in detail, reference will be had to
the accompanying drawings forming a part of
this application, and wherein like numerals
of reference will be used to indicate like parts
throughout the several views in which:

Figure 1 is a longitudinal sectional view
of a locomotive boiler embodying my in-
vention. Fig. 2 is a detached view show-
ing in plan, the plates forming the auxiliary
or supplemental support for the boiler flues.
Fig. 3 is a transverse vertical sectional view
thereof, and Fig. 4 is a longitudinal sec-
tional view of a part of one of the flues, show-
ing in vertical section a part of the front flue-
sheet, and a part of the plates constituting
the auxiliary or supplemental support for
the boiler flues.

The construction which forms the subject-
matter of the present application is an im-
provement upon that shown in my prior
patent 706,490.

In my present invention I employ an ad-
ditional intermediate flue-sheet to that shown
in my prior patent noted above, which is
adjustable vertically whereby to hold the
flues secure, and thereby dispensing with the
sleeves shown and described in my former
patent, the adjustability of said additional
flue-sheet permitting the ready removal and
replacing of the flues when desired.

The present invention also relates to an
improvement in the manner of fastening the

ends of the flues in the flue-sheets, the
present construction embodying a copper
ring over the ends of the flues next to the
fire box, the beads of the flues being drawn
over these copper rings, thereby eliminating
possibility of the flues leaking, and giving
long life to the beads.

In the practice of my invention as involved
in the present application, I provide an
auxiliary or supplemental flue support which,
in practice, is located usually approximately
one-fourth the distance between the two end
flue-sheets 1 and 2, as illustrated in Fig. 1 of
the drawings. The object of this auxiliary
supplemental flue-sheet is to shorten the
length of the bearings, by forming a support
for the flues 3 between the two end flue-
sheets 1 and 2. This auxiliary or supple-
mental flue-sheet comprises two plates 4 and
5. These plates are placed one against the
other, in a vertical position within the boiler.
The plate 4 is stationary, and may be held so,
in any desirable manner, a preferable method
being to provide this plate 4 with aper-
tured flanges 6 to be riveted or otherwise
secured to the boiler. At its upper end the
plate 4, is provided with a flange 7, which
extends at right angles to the bead of the
plate. The said plate 4 is provided with
openings 8 to receive the flues 3, which open-
ings, as best seen by reference to Fig. 4, are
of such shape as to allow for slight adjust-
ment of the flues 3 therein. Placed against
the one face of the plate 4 is an additional
flue-plate 5, which, like the plate 4, is pro-
vided with flue openings designated 10, and
registering with the flue openings 8 in the
plate 4. The said flue openings 10, are
shaped similarly to the flue openings 8. The
plate 5 carries a flange 11, which, like the
flange 7 on the plate 4, extends at right
angles to the bead of the plate, and lies
underneath the flange 7. Bolts 12, are passed
through these flanges, and the plate 5 is
adjusted up or down by tightening or loosen-
ing nuts 14, on said bolts 12. The plate 5 is
held against the plate 4, and is guided during
its vertical movement by bolts or studs 15,
carried by the plate 4, and extending through
slots 16 in the plate 5.

In Fig. 4 of the drawings, I show an im-
proved manner of securing the ends of the
flues 3 in the end flue-sheet 1, embodying a
copper ring 17, which the bead of the flues
is swaged over, thus preventing the flues
from becoming loose and leaking which is of

common occurrence in all locomotive boilers. By the employment of the auxiliary or supplemental support for the flues 3, it will be observed that the flues will be to a great extent prevented from vibrating and springing from their normal line when the locomotive is in motion. The openings 8 and 10, are sufficiently large to permit the admission and removal of the flues 3 easily, and when the flues are in position they are securely held by tightening nuts 14, so as to draw plate 5 upwardly and bring the lower wall of the openings 10, into contact or engagement with the flues, at which time the upper wall of the openings 8 in plate 4 also engage the flues 3, as clearly seen in Fig. 4 of the drawings, whereby the flues are securely held.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a device of the type set forth, the combination with a boiler having front and rear heads or flue-sheets, of an intermediate vertical head or flue-sheet secured in front of the rear head or flue-sheet, with a series of horizontal flues passing through all of said heads or flue-sheets, the intermediate head or flue sheet supporting the weight of the flues between the front and rear heads or flue-sheets, and the said intermediate head or flue-sheet being a double plate which allows one of the plates to be drawn up or down and which securely fastens the flues in said intermediate head or flue-sheet.

2. In a device of the type set forth, the combination with a boiler, having front and rear flue-sheets, and horizontal flues sup-

ported in said sheets, of an intermediate supplemental flue-sheet comprising two plates one of which is stationary within the boiler, and the other of which is movable vertically, the said plates being provided with openings to receive said flues, and means for securing the movable plate in fixed position with relation to the stationary plate.

3. In a device of the type set forth, the combination with a boiler having front and rear flue-sheets, and flues supported in said sheets, of an intermediate supplemental flue-sheet comprising a stationary member, and a movable member both provided with openings to receive said flues, the openings in one member being so disposed with relation to the openings in the other member that opposite walls of said openings engage the flues.

4. In a device of the type described, the combination with a boiler having front and rear flue-sheets, and flues supported in said flue-sheets, of an intermediate supplemental flue support comprising a stationary plate secured in the boiler, and a vertically movable plate engaging the face of said stationary plate, both of said plates having flue-openings, means for securing the movable plate to the stationary plate, and means for securing the movable plate in adjusted position with relation to the stationary plate.

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

JOSEPH J. GAGE.

Witnesses:

H. M. HOUT,
S. D. HOOVER.