A. INOKUTY.

MEANS FOR STIFFENING BOILER HEADS.

APPLICATION FILED JUNE 29, 1910.

**1,000,266.** **Patented Aug. 8, 1911.**

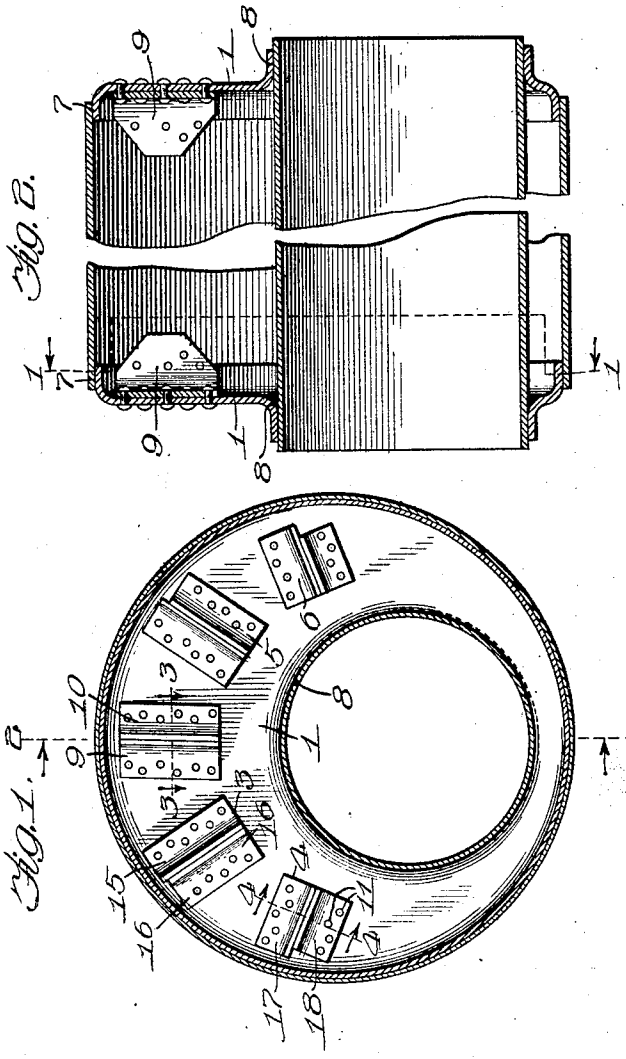

Fig. 1.



Fig. 2.

Fig. 3.

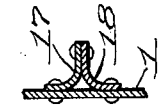

Fig. 4.

Witnesses:
F. C. Davison.
Geo. H. Nelson Jr.

Inventor:
Ariya Inokuty
By P. Singer
Atty.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

ARIYA INOKUTY, OF TOKYO, JAPAN.

## MEANS FOR STIFFENING BOILER-HEADS.

1,000,266. Specification of Letters Patent. **Patented Aug. 8, 1911.**

Application filed June 29, 1910. Serial No. 569,529.

*To all whom it may concern:*

Be it known that I, ARIYA INOKUTY, a subject of the Emperor of Japan, residing at 40 Nichome, Nishiharamachi, Koishikawa-ku, Tokyo, Japan, have invented a new and useful Improvement in Means for Stiffening Boiler-Heads, of which the following is a specification.

This invention relates to improved means for stiffening boiler heads to enable them to withstand the internal pressure.

One of the objects of the invention is to provide improved stiffening means designed to enable the use of boiler plates or heads of high pressure boilers, of a lighter weight of plate, than has been heretofore possible.

A further object of the invention is to stiffen the heads of boilers without employing means extending longitudinally of the boiler from head to head.

A further object of the invention is to lessen injurious straining action arising from the difference of expansion or contraction between the flue tube and the boiler shelf or head and also to render the interior of the boiler more accessible for cleaning purposes.

Further objects of the invention will hereinafter appear in the description of the accompanying drawings and in the specific statement of novelty in the claim.

In the drawing:—Figure 1 is a sectional view on line 1—1 of Fig. 2. Fig. 2 is a longitudinal vertical section of the boiler illustrating the use of my invention in connection therewith. Fig. 3 is a sectional view on line 3—3 of Fig. 1. Fig. 4 is a sectional view on line 4—4 of Fig. 1.

Like numerals of reference designate similar parts throughout the different figures of the drawing.

As illustrated the means for stiffening boiler heads 1, consists of a plurality of independent elements connected with each head. In practice it has been found that gusset plates, or angle plates, provide a simple and effective stiffening means.

Referring to Fig. 1 it will be seen that a plurality of elements 2, 3, 4, 5, 6, are disposed on the inside face of the heads 1 and are spaced apart from each other in a suitable manner to distribute the strengthening functions thereof. Said elements are also spaced apart from the outer and inner junctures, 7 and 8 respectively, of the head 1 with the boiler shell and tubes.

Referring to element 2, the same consists of two angle or gusset plates 9 and 10 which are shown secured together by rivets 11 and also secured to the head 1 by rivets 12. The outer margins 13 of the element 2 are spread so as to diverge from the point of juncture of the plates 9 and 10 for the purpose of further stiffening the same. Furthermore the plates 9 and 10 are preferably not bent at a right angle but are curved, as at 14, so as to increase the strength thereof.

By reference to Fig. 1 it will be seen that elements 3 and 5 are relatively shorter than element 2 and elements 4 and 6 are relatively shorter than elements 3 and 5 and while this arrangement and proportioning of the elements are well adapted for the type of boiler shown it will be understood that wide variations of arrangement and proportioning may be and can be utilized for boilers of different types without departing from the spirit of my invention. In the present construction the plate 15 of element 3 is longer than plate 16 and likewise plate 17 of element 4 is longer than plate 18 and it will be seen that this arrangement gives the widest possible latitude of disposition of the stiffening elements to accommodate the gradual reduction of surface of the heads 1 from a point above the tube to a point toward the sides thereof.

It will be seen that the widest possible latitude of expansion and contraction of the two heads of the boiler may take place without one influencing the other. If the tube should extend at one end more than at the other the expansion or contraction of the head nearest to such end would not affect the other heads. Furthermore it will be seen that the heads are effectively stiffened by a relatively small amount of material thereby greatly reducing cost of construction.

While I have shown and described one specific embodiments of my invention it will be understood that I do not wish to be limited to such specific showing except for such limitations as the claim imports.

I claim:—

A boiler comprising in combination, a shell, end plates or heads therefor and a flue extending through the shell and supported by the end plates and disposed eccentrically with respect to the longitudinal axis of the shell whereby greater area of the inner faces of said heads is disposed on one side of the flue than on the other side thereof

and a plurality of stiffening devices for such greater area of each head, said devices being radially disposed with respect to the longitudinal axis of said shell and each device being independent of and unconnected with the remaining devices, and each device comprising a pair of angle pieces having two of its flanges secured to the head and the remaining flange of such pair secured to each other.

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

ARIYA INOKUTY.

Witnesses:

UHACHI ISHINARY,

HARUHIKO IIDA.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."