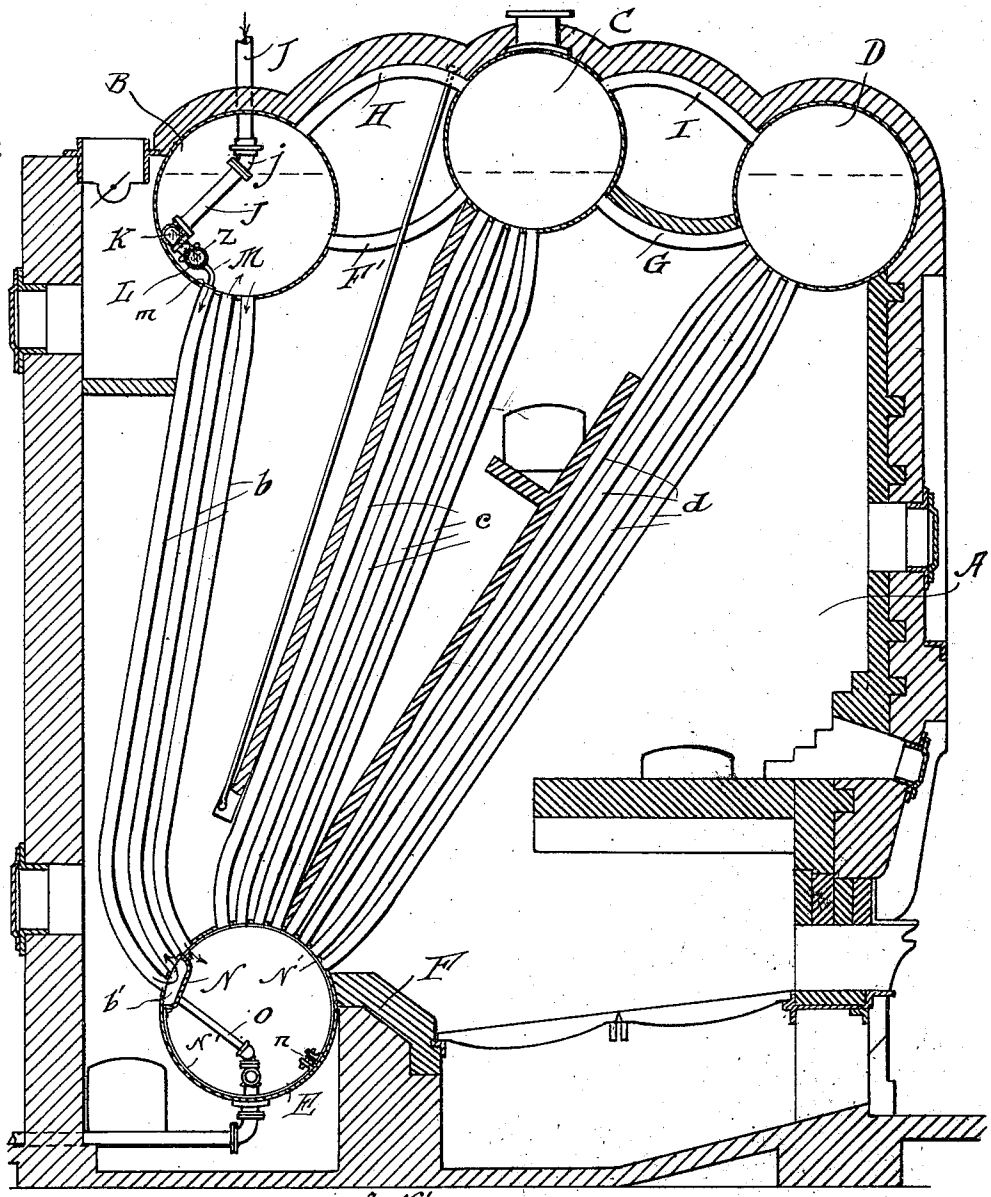
May 1, 1923. 1,453,703

R. CEDERBLOM

BOILER

Filed March 8, 1920 2 Sheets-Sheet 1

Fig. 1.



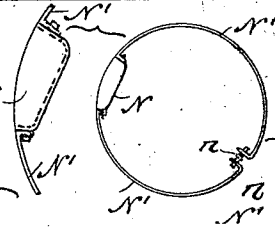


Fig. 4.

Witness,

Inventor

Ragnar Cederblom

By Frank L. Belknap Atty.

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Fig. 2.

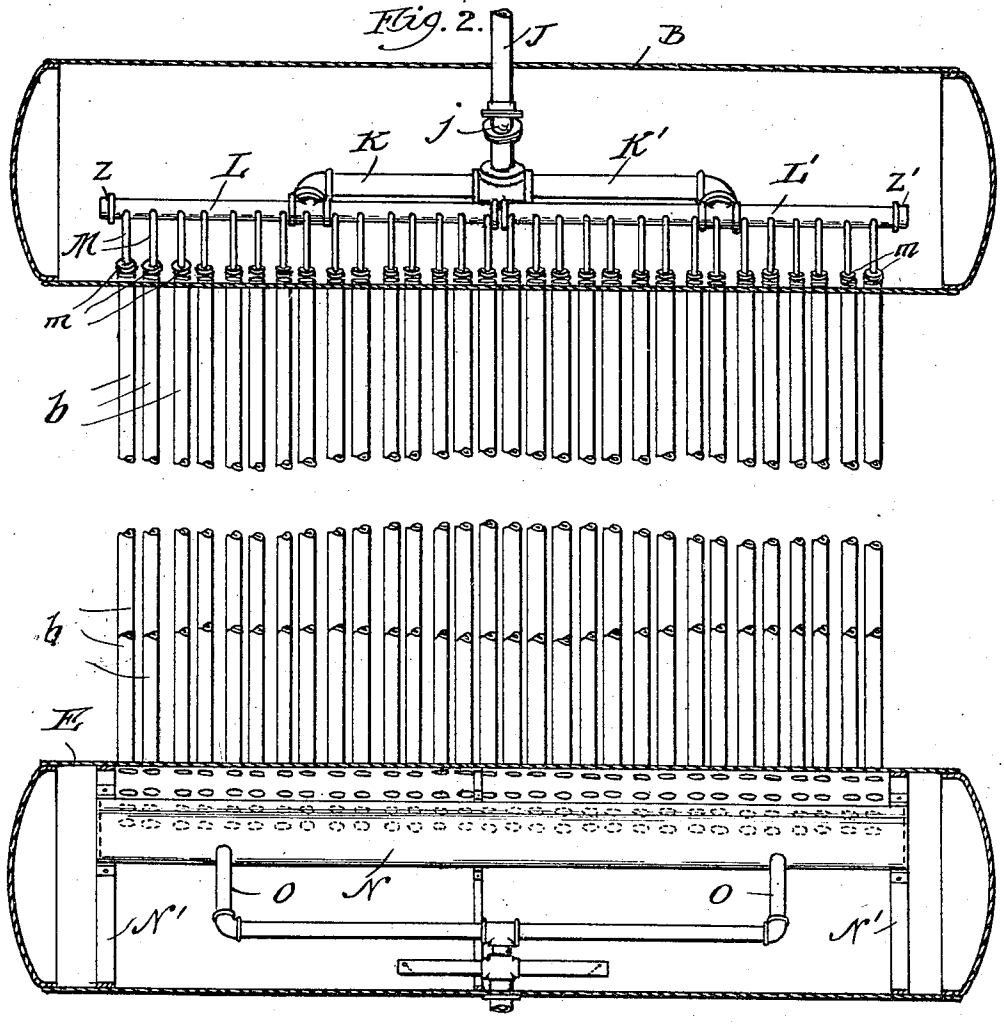
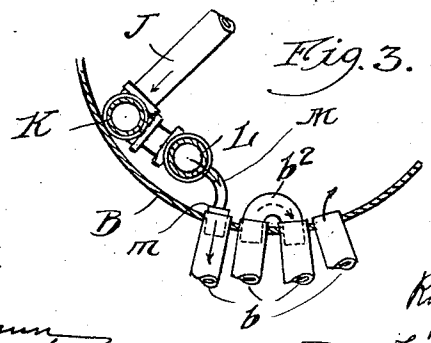


Fig. 3.



Witness

Inventor,
Ragnar Cederblom.
By Frank L. Belknap Atty.

Patented May 1, 1923. 1,453,703

UNITED STATES PATENT OFFICE.

RAGNAR CEDERBLOM, OF YOUNGSTOWN, OHIO.

BOILER.

Application filed March 8, 1920. Serial No. 363,977.

To all whom it may concern:

Be it known that I, RAGNAR CEDERBLOM, a citizen of the United States, residing in the city of Youngstown, county of Mahoning, and State of Ohio, have invented certain new and useful Improvements in Boilers, of which the following is a specification.

This invention relates to improvements in boiler construction of the tubular type and has for its object to provide a construction wherein the feed water is caused to circulate through an economizer in the heating zone of the furnace connected therewith, thereby causing the otherwise wasted heat from the gases escaping to the stack to circulate around the economizer composed of tubes arranged in the furnace, through which the incoming or feed water or liquid is circulated before mingling with the water in the boiler.

As the ordinary economizer is a costly and complicated apparatus requiring considerable space which is often not available and in general is too expensive, I have devised a simple and inexpensive device which can be applied to boilers, which will increase the available heat for such boilers and thus increase their efficiency.

In the accompanying drawings:

Fig. 1 is a cross section through a furnace and boiler having my improvements applied thereto.

Fig. 2 is a fragmentary sectional detail of two of the drums of a tubular boiler showing my improvements applied thereto.

Fig. 3 is a fragmentary sectional detail of a modified form of construction of part of my device.

Fig. 4 is a detail of a deflector plate and strap connections, parts connected by brackets are enlarged.

With reference to the drawings, A is a furnace provided with the upper drums B, C and D, connected at their bottoms through the tubes *b*, *c* and *d* to the drum E located adjacent the bridge wall F of the furnace. The drums B, C and D are connected by tubes F′, G, H and I.

The feedwater pipe J leads into the drum B and is deflected at *j* and connects with branch pipes K and K′ which in turn connect with pipes L and L′ which are closed at their ends by caps or plugs Z and Z′. The pipes L and L′ are provided with curved tubes M which enter the first row of tubes *b* through suitable plugs *m*.

The drum E has a deflector plate N secured to straps N′, which straps are provided with turn bolt connections *n* whereby the deflector plate is clamped within the drum E, and covers the ends of the first and second row of tubes *b*. The deflector plate is provided with a blowoff pipe O.

It will be noted that the incoming water or fluid will be forced downwardly through the first row of tubes *b* into the chamber *b′* formed by the plate N and the wall of the drum E, and upwardly through the second row of tubes *b* into the drum B before mingling with the water in the boiler and in so doing is subjected to the heat generated from the gases at the back of the furnace that are about to escape through the stack. This arrangement is inexpensive and can be applied to most boilers of tubular construction, thereby utilizing heat that is at present wasted and consequently reducing the cost of operation.

In Fig. 3 of the drawings I have shown a modified construction wherein I increase the number of tubes connecting drums B and E by introducing a simple return bend connection as shown at b^2. I do not wish to limit myself to the precise details of construction shown, as changes may be made without departing from the spirit of my invention.

I claim as my invention:

1. A boiler of the class described, comprising a plurality of drums having tubular connections with each other, of means for feeding liquid into certain of the tubular connections, said connections being coupled to a header and feed water pipe in one drum and communicating through a chamber in another drum formed by an adjustable and removable partition therein, whereby the liquid in the said tubular connections is caused to circulate independently of the liquid contained in the drums, said tubular connections passing through the heating zone of the boiler.

2. A boiler of the class described, comprising a plurality of drums having tubular connections with each other, of means for feeding liquid into certain of the tubular connections, said connections being coupled to a header and feed water pipe in one drum and communicating through a chamber in another drum formed by an adjustable and removable partition therein, said partition comprising a plate secured to straps pro-

vided with means whereby the plate and straps are caused to tightly engage the inner wall of the drum, thereby causing the liquid in the tubular connections to circulate independently of the liquid contained in the drums, the tubular connections passing through the heating zone of the boiler.

3. A boiler of the class described, comprising a plurality of drums having tubular connections with each other, of means for feeding liquid into certain of the tubular connections, said connections being coupled to a header and feed water pipe in one drum and communicating through a chamber in another drum formed by an adjustable and removable partition therein, said partition comprising a plate secured to straps having turnback connections with each other adapted to secure the plate closely within the drum whereby the liquid in the said tubular connections is caused to circulate independently of the liquid contained in the drums, said tubular connections passing through the heating zone of the boiler.

RAGNAR CEDERBLOM.