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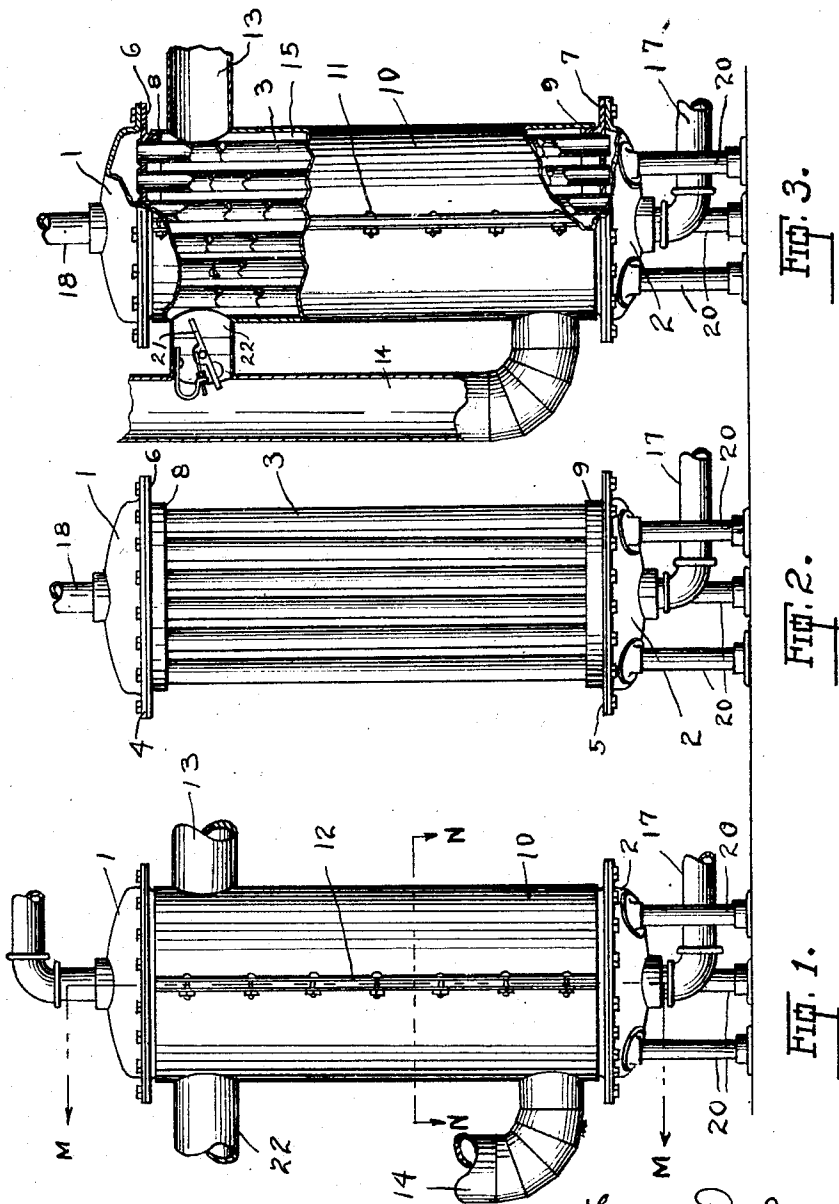
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DETACHABLE HEAD ECONOMIZER FOR HOT WATER AND STEAM BOILERS

Filed Dec. 12, 1927

2 Sheets-Sheet 1



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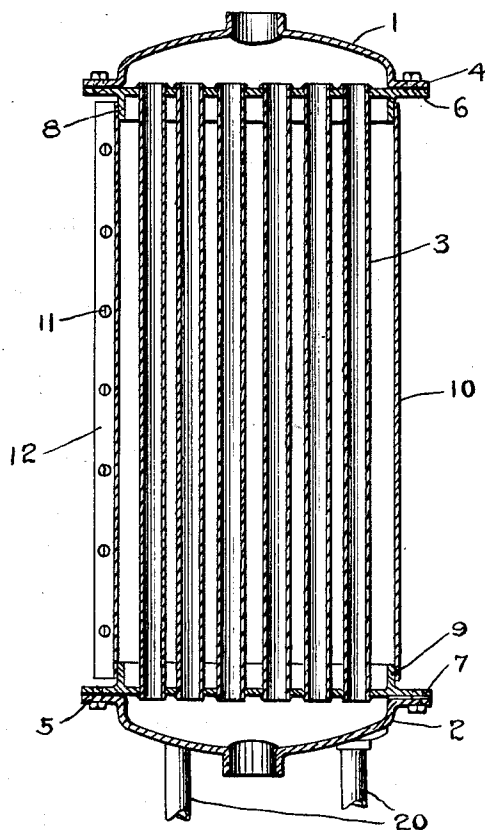


Fig. 4.

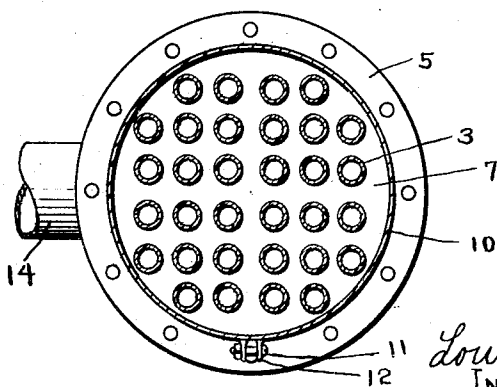


Fig. 5.

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UNITED STATES PATENT OFFICE

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DETACHABLE HEAD ECONOMIZER FOR HOT-WATER AND STEAM BOILERS

Application filed December 12, 1927. Serial No. 239,426.

My invention relates to a class of heat economizers adapted to be operatively connected with a furnace, particularly of the hot water or steam type; an object being in this device particularly to provide spaced water heads therein communicatively connected and made in sections providing for each head a detachable member so as to make easy access to the inner surfaces thereof when desired.

A further object of this invention is to provide in an economizer of this character an economical and practical convenience for cleaning out the water heads and water tubes therein by providing a detachable cover to the water heads of the economizer.

The intended novel features of construction and design in my device will be hereinafter more fully described in the annexed specification, recited in the claim, and illustrated in the accompanying drawings, in which like reference numerals indicate like parts in the several figures.

Referring to the figures:

Fig. 1 is a side elevation of the detachable head heat economizer of my invention shown detached from the furnace with which it is adapted to be connected.

Fig. 2 is a side elevation of the detachable head heat economizer of my invention shown with the detachable metallic expansive jacket removed from about the gas chamber of the economizer exposing to view a plurality of water tubes uprightly extending from the lower to the upper head.

Fig. 3 is a side elevation of the hot water and steam heat economizer of my invention disclosing by a cut-away the interior details of the economizer's construction.

Fig. 4 is a vertical section M—M Fig. 1.

Fig. 5 is a horizontal cross section N—N Fig. 1 exposing to view a possible arrangement of the hot water tubes in their spaced relation.

The preferred embodiment of my invention and the method of securing desired results therewith will now be pointed out as references are made to the several numerals in the respective figures in drawings illustrating the device of my invention.

A particular merit of my invention will be found in the convenience provided by having the water heads thereof each equipped with a detachable drum body member thereof making it possible to obtain easy access to the inside thereof and to the inside of the water tubes connecting the water heads.

In my invention I provide a pair of detachable head water chambers —1— and —2— communicatively connected by a plurality of water tubes —3— with each head provided respectively with a flange —4— and —5— by means of which the detachable drum portion of the water heads are secured to the header plates —6— and —7— respectively to which pipes —3— are adapted to be secured by welding or expanding the same.

It will be noted that annular bands —8— and —9— respectively are welded to header plates —6— and —7— respectively and it is to these bands that I secure an encompassing expansive metallic jacket —10— extending between the water heads forming an intermediate gas chamber between these water heads and about the water tubes —3—.

Expansive jacket —10— therefore provides a closure member held snugly by a plurality of bolt members —11— through a flange —12— so as to snugly hold the jacket member —10— into operative position.

A pipe —13— adapted to connect my economizer with a combustion chamber of a furnace is connected with expansive jacket —10— so as to admit the hot products of combustion into the upper area of intermediate gas chamber —15— and a pipe —14— is connected with the lower end of jacket —10— as a discharge pipe for the products of combustion after they have settled down through gas chamber —15— in my economizer at which lower level they are ready to pass to the house flue after having given up a greater percentage of their heat.

When the hot products of combustion are admitted to my economizer the heat in the intermediate gas chamber carries a very high temperature sometimes running from 900° to 1600° Fahrenheit; and for this reason the expansive metallic jacket —10— is made to fit around annular bands —8— and —9— re-

spectively in a manner that will permit the jacket to expand lengthwise to whatever extent they may be required to expand under normal operative conditions and therefore is made somewhat shorter than the space between header plates —6— and —7— so that when it does expand it will not come in contact with these two header plates.

Water tubes —3— are preferably welded to header plates —6— and —7—.

When water enters lower water head —2— from the cold water return chamber of a furnace to which it is adapted to be connected through a pipe —17— this water at a relatively low temperature starts moving up through pipes —3— as it becomes heated by the hot gases surrounding the pipes and it accelerates that movement as the water moves higher in the pipes and gets nearer the upper area of the intermediate gas chamber —15— where it strikes the point of application of the hottest gases causing the water to receive its application of highest temperature from the gases and enters upper water chamber —1— from which it is discharged from pipe —18— at its highest temperature.

This economizer is adapted to be normally supported on legs —20— when in operation.

To heating engineers it will be evident that in my economizer I provide structural details in a manner adapted to take advantage of the principle of counterflow in heat transfer from the hot products of combustion over to water in a heating system.

It will be observed in the drawings in Fig. 4 for instance that I provide a heat controlled by-pass damper —21— in pipe section —22— adapted to be thermostatically controlled and normally operated so that the heat controlled element of the damper will register in position at the junction of pipe —14— and pipe —22—.

This automatic heat controlled by-pass damper is therefore provided in order to permit the hot gases entering gas chamber —15— through pipe —13— to pass directly through pipe —22— and out the house flue in the event that a direct draft may be desired when it may be necessary to boost the fire in the combustion chamber from which the hot gases emanate. Then when the fire is sufficiently well started the thermostatic damper —21— automatically shuts off forcing the gases to pass down through the gas chamber —15— and out again through pipe —14—.

It is also true that minor changes may be made in the details of construction of my detachable head economizer but the preferred arrangement is herein above described and illustrated in the drawings.

Having thus described the nature of my invention what I claim is:

In an economizer of the character described having intake and outlet water and hot gas connections and an expansible outer jacket, and a pair of spaced communicatively connected water heads slidably engaged thereby, each of said heads including a dished and flanged cap and a circular header plate detachably connected thereto and a collar of less diameter than and formed integral with said plate and extending at right angles thereto and in a direction away from said cap for detachable slidable engagement with said outer expansible jacket of the economizer.

In witness whereof, I hereunto set my hand this 29 day of November, 1927.

LOUIS D. SUMMERS.