

1,300,416.

Patented Apr. 15, 1919.
2 SHEETS—SHEET 1.

Fig. 1.

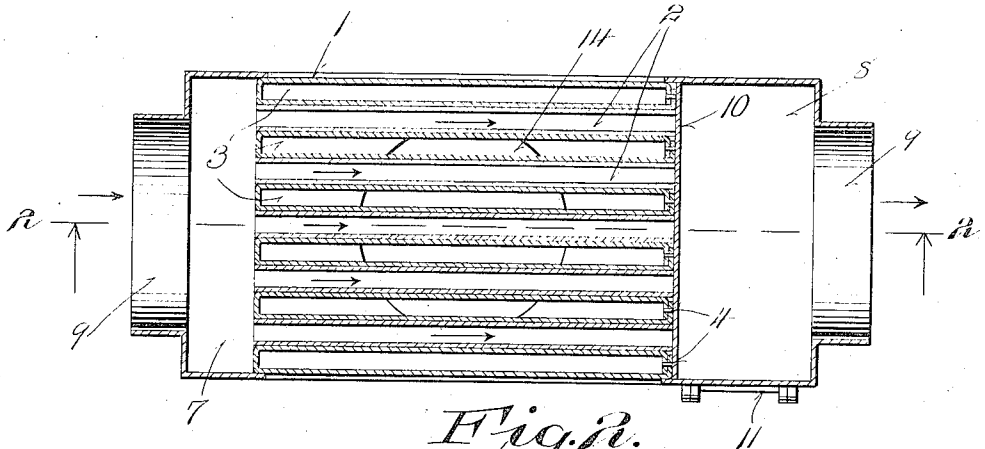
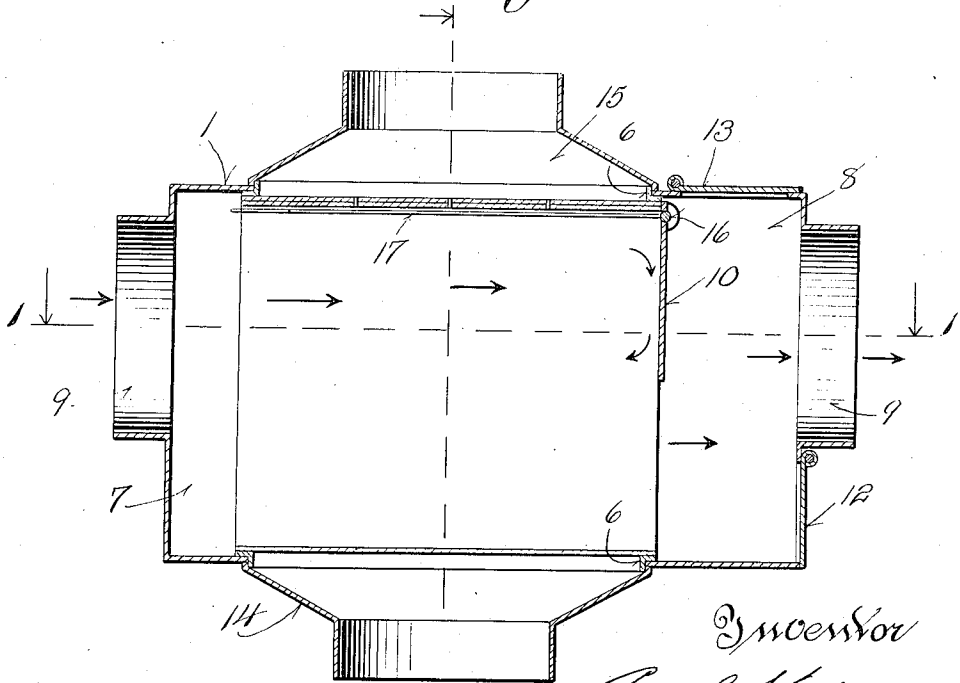


Fig. 2.



Witness
J. P. Brill

By
J. P. Brill

Inventor
Joseph Koenig
C. W. Young
Attorney

J. KOENIG.
HEATING APPARATUS.
APPLICATION FILED FEB. 5, 1918.

1,300,416.

Patented Apr. 15, 1919.
2 SHEETS—SHEET 2.

Fig. 3.

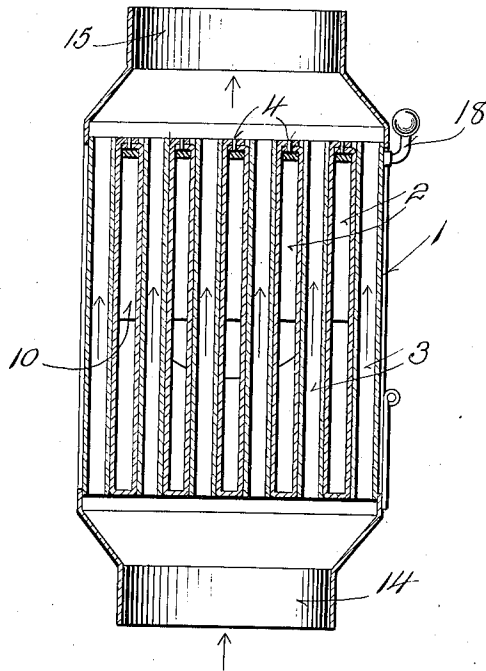
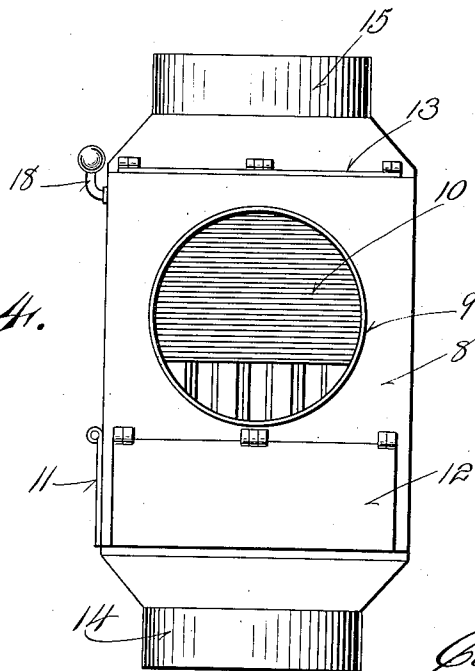


Fig. 4.



Witness
J. P. Britt

by

Inventor
Joseph Koenig
Geo. Young
Attorney

UNITED STATES PATENT OFFICE.

JOSEPH KOENIG, OF TWO RIVERS, WISCONSIN.

HEATING APPARATUS.

1,300,416.

Specification of Letters Patent.

Patented Apr. 15, 1919.

Application filed February 5, 1918. Serial No. 215,498.

To all whom it may concern:

Be it known that I, JOSEPH KOENIG, a citizen of the United States, and resident of Two Rivers, in the county of Manitowoc and State of Wisconsin, have invented certain new and useful Improvements in Heating Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to new and useful improvements in heat economizers which belong to the same general class as the economizer illustrated in my co-pending patent application filed Feb. 5, 1918, Serial No. 215,499.

This device is adapted to heat air by means of the gases which are ordinarily wasted in the consumption of fuel in furnaces and stoves of the usual construction. That is to say in most types of furnaces and stoves, considerable hot gases mixed with smoke pass up the chimney before the heat can be taken therefrom.

The present invention is designed to be disposed in the usual furnace flue or smoke pipe between the furnace or stove and the chimney, particularly where there is considerable room between the last mentioned members; the economizer illustrated in the above mentioned co-pending patent application is for use where space is more or less limited.

My invention is also designed with the idea of constructing a device of this character as inexpensively as possible, therefore the parts are preferably constructed of sheet metal.

With the foregoing objects and advantages in view, the invention resides in novel features of construction, combination and arrangements of parts which will be hereinafter more particularly described and claimed and shown in the drawings wherein:

Figure 1 represents a horizontal sectional view taken on the plane of the line 1—1 of Fig. 2.

Fig. 2 is a vertical sectional view on the plane of the line 2—2 of Fig. 1.

Fig. 3 is a vertical transverse sectional view on the plane of the line 3—3 of Fig. 2, and

Fig. 4 is an end elevational view of the economizer.

In these drawings the invention is not shown applied to any particular form or type of furnace or stove, owing to the fact

that it may be used with practically any heater. However, the direction of flow of hot gases and air to be heated is indicated in the several figures by means of arrows, the heavy arrows denoting the passage of hot gases, while the light arrows as shown in Fig. 3 show the flow of air through the device.

The body or heater portion of the device consists of a casing 1 formed of a plurality of flue members 2 and 3 disposed side by side in abutting relation. Each of these flue members is formed of a single sheet of material bent upon itself with its free ends riveted together as at 4, the opposite ends of each flue member being open to form a clear passage-way therethrough. From Figs. 1 and 3 it will be seen that the flue members 2 alternate with the members 3 and that the former have their passage-ways extending horizontally while the passage-ways of the other members extend in a cross direction, or vertically.

The several individual flue members are held together in the above mentioned relation by means of angle metal bands 6 which are disposed around opposite ends, one flange of the bands being preferably welded or soldered to more effectively hold the flue members together and to prevent leakage of gas from one to the other. By this construction an economizer of any desired size may be formed by adding to or subtracting from the number of flue members.

The flue members 2, the passage-ways of which extend horizontally, are adapted to convey the hot gases from one end of the casing 1 to the other. As hereinbefore mentioned the casing is adapted to be placed in a furnace flue or smoke pipe, this connection is carried out by an inlet hood 7 and an outlet hood 8, each of which has a short pipe section 9 formed thereon. Each of the hoods is in the form of a substantially rectangular pan-shaped member, the edges of which are engaged with the angle metal bands 6 and secured thereto in any convenient manner. From Figs. 1 and 2 it will be seen that these hoods 7 and 8 are disposed over the opposite ends of the flue members 2.

Within the outlet hood 8 and disposed across the upper end of the flue members 2 so as to close the upper portion thereof, is a baffle plate 10. This plate is adapted to retard the passage of hot gases through the

flue members 2 so that as much of the heat therefrom as is possible will be radiated therefrom. The hood 8 is also provided with a pair of clean-out doors 11 and 12 which are disposed adjacent the bottom thereof. In the top of this hood between its outer end and the baffle plate 10 is a check damper 13, this damper taking the place of the usual check damper in the furnace flue or smoke pipe.

Air to be heated by the hot gases passing through the flue members 2 is conveyed into the flue members 3 by an inlet 14, and after being heated it passes from the casing through an outlet 15. The inlet may obviously be connected with any suitable source of air supply and the outlet may direct the heated air to any desired point.

A cleaning device is disposed within the casing 1 so that the soot may be cleaned from the walls of the flue members 2 from time to time. This is similar to the cleaning device shown in the above referred to co-pending application and consists of a horizontally extending rock shaft 16 disposed across one end of the casing adjacent the top thereof, a plurality of scraper plates 17 which project from the shaft 16, one being disposed in each of the flue members 2, and a handle lever 18 projects laterally from the shaft externally of the casing. This lever has its free end weighted so that the scraper plates will normally lie in engagement with the tops of the flue members 2. Oscillation of the scraper plates will obviously knock the soot from the walls of the flue members and it may then be cleaned out of the casing through either one of the clean-out doors 11 and 12 respectively. The scraper plates obviously do not engage the lower portions of the walls of the flue members adjacent the clean-out doors, these portions of the walls being cleaned by any convenient manually wielded device, it being appreciated that the major amount of accumulation of soot would occur in the upper portion of the casing on the surfaces transversed in scraping action by the plates 17.

From the foregoing description taken in connection with the accompanying drawings, it will be seen that this device is somewhat similar to that illustrated in the application hereinbefore referred to, but is used in a somewhat different manner, consequently the parts are arranged accordingly. This device will, however, save a considerable amount of fuel inasmuch as all of the heat units will be extracted from that which is burned.

Having thus described my invention what I claim as new is:

1. In a device of the class described, a casing having a series of hot gas passage-ways extending in one direction and a second series of fluid passage-ways extending in a cross direction, the ends of said passage-ways opening through the adjacent walls of the casing, an inlet hood disposed over one end of the casing, an outlet hood disposed over the opposite end of the casing, said hoods being in communication with said hot gas passage-ways, a pipe connection on each of said hoods, a baffle plate in the outlet hood to retard the flow of fluid through said hot gas passage-ways, an inlet into the casing, and an outlet from the casing, said inlet and outlet communicating with the second series of fluid passage-ways.

2. In a device of the class described, a casing having a series of hot gas passage-ways extending in one direction and a second series of fluid passage-ways extending in a cross direction, the ends of said passage-ways opening through the adjacent walls of the casing, an inlet hood disposed over one end of the casing, an outlet hood disposed over the opposite end of the casing, said hoods being in communication with said hot gas passage-ways, a pipe connection on each of said hoods, a baffle plate in the outlet hood to retard the flow of fluid through said hot gas passage-ways, a check damper in the outlet hood between the outer end thereof and the baffle plate, an inlet into the casing, and an outlet from the casing, said inlet and outlet communicating with the second series of fluid passage-ways.

3. In a device of the class described, a casing comprising a plurality of flue members, each formed of a single sheet of material bent upon itself into rectangular shape, the opposite ends of each member being open to form an unobstructed passage-way, said members being disposed side by side in abutting relation, the open ends of the alternate members being disposed in the same position, whereby to form a series of hot gas passage-ways and a series of fluid passage-ways, an inlet hood disposed over one end of the casing, and an outlet hood disposed over the opposite end of the casing, said hoods being in communication with said hot gas passage-ways.

In testimony that I claim the foregoing I have hereunto set my hand at Two Rivers, in the county of Manitowoc, and State of Wisconsin.

JOSEPH KOENIG.