L. L. GORR.

ECONOMIZER.

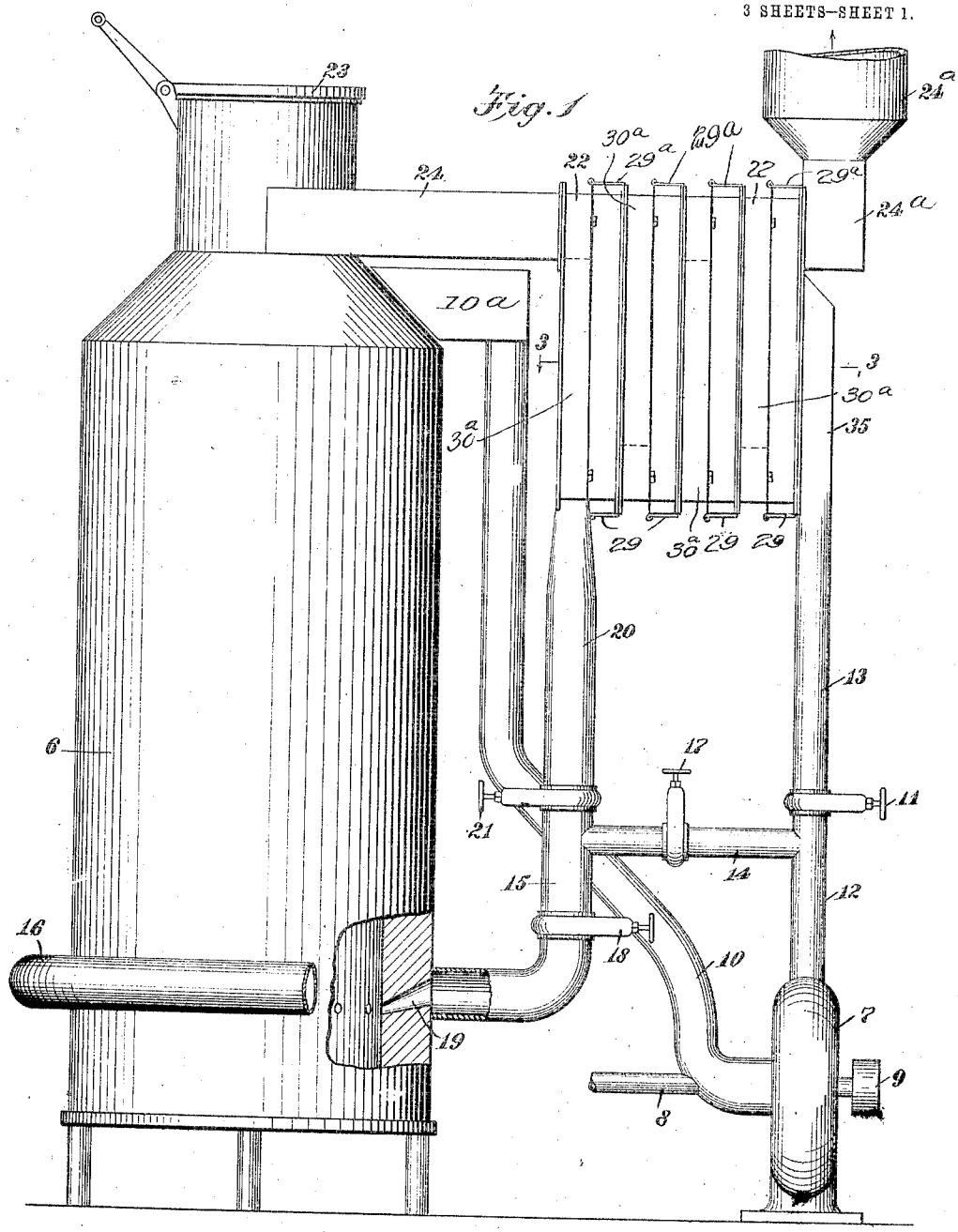
APPLICATION FILED MAY 14, 1912.

1,068,237.

Patented July 22, 1913.

3 SHEETS—SHEET 1.

Fig. 1



WITNESSES

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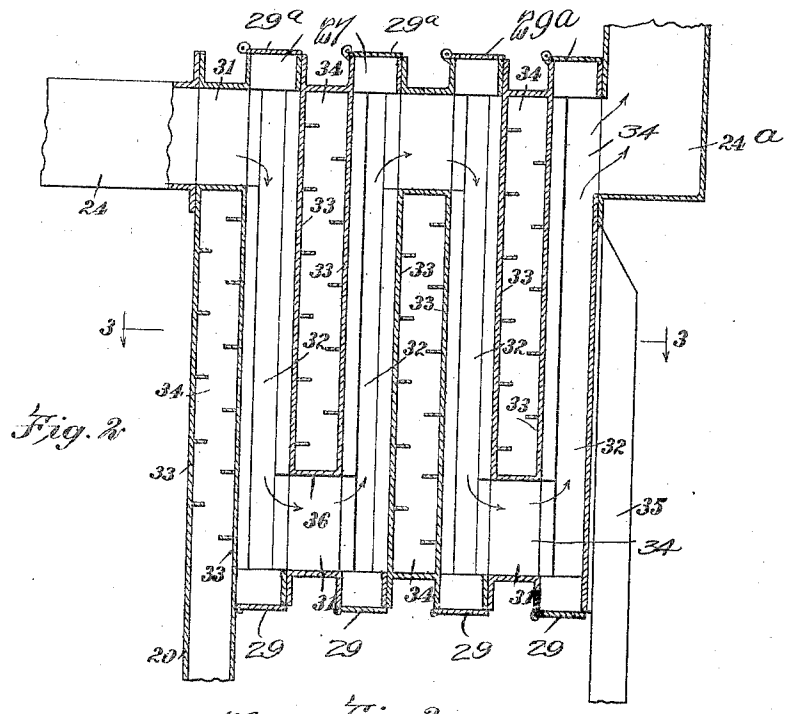


Fig. 2.

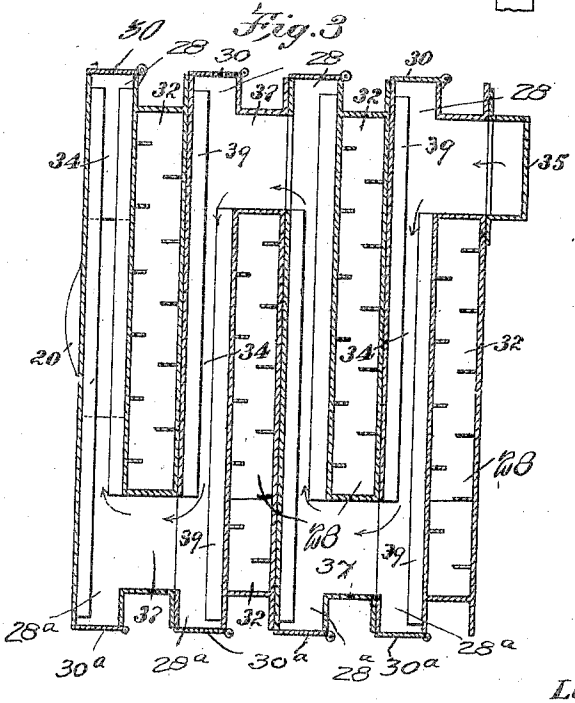


Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 4

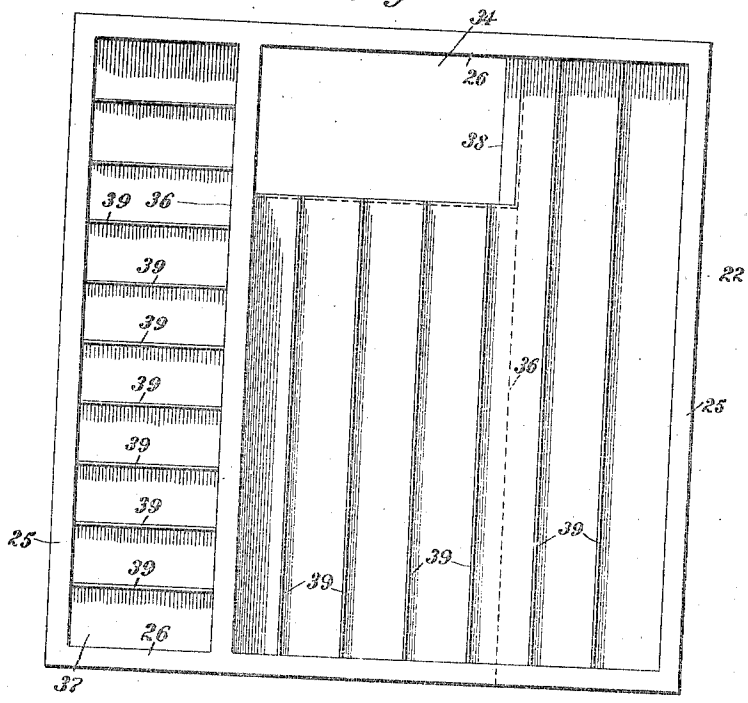
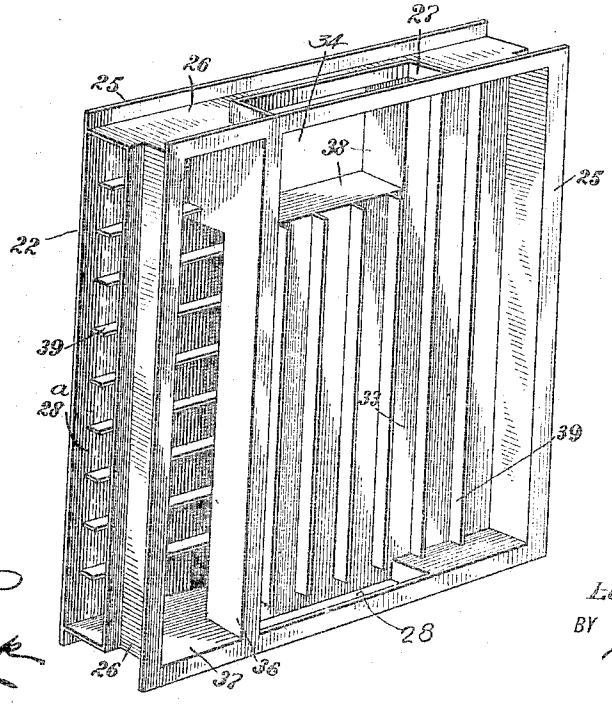


Fig. 5



WITNESSES

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UNITED STATES PATENT OFFICE.

LOUIS LAURENCE GORR, OF MARSHFIELD, OREGON.

ECONOMIZER.

1,068,237. Specification of Letters Patent. Patented July 22, 1913.

Application filed May 14, 1912. Serial No. 697,348.

To all whom it may concern:

Be it known that I, LOUIS L. GORR, a citizen of the United States, and a resident of Marshfield, in the county of Coos and State of Oregon, have invented a new and Improved Economizer, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to provide a system for supplying to a furnace cupola, air which has been heated by escaping gases to separate any escaping mineral or liquid matter held in suspension; to provide means for cleaning the apparatus; and to provide an apparatus which may be expanded or contracted at will.

One embodiment of the present invention is disclosed in the construction illustrated in the accompanying drawings, wherein like characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a cupola having connected therewith an economizer constructed in accordance with my invention; Fig. 2 is a vertical section of an upper fragment of the same; Fig. 3 is a cross section taken on the line 3—3 in Figs. 1 and 2; Fig. 4 is a vertical side view of one of the economizer sections; and Fig. 5 is a perspective view of the said section.

When applied to a cupola such as shown in Fig. 1 of the drawings, an apparatus constructed in accordance with the present invention employs a rotary fan 7 of any desired construction. This fan is driven by a suitable motive power, which is operatively connected with the shaft 8 of the fan by a pulley 9. The fan shown in the drawings is of the centrifugal type, and has a supply duct 10 at the intake end whereof there is an open hood 10^a juxtaposed to the dome of the cupola to receive the warmed air arising therefrom. The delivery duct is divided by a valve 11 into two sections 12 and 13. Intermediate the valve 11 and fan 7 is a branch duct 14, communicating with a lower section 15 of a supply duct 20 for the cupola, and connected with the bustle 16 thereof. The branch 14 is provided with a suitable valve 17, and the section 15 with a valve 18. From the bustle 16 extend twyers 19. The lower section 15 of the supply duct 20 is divided from the pipe section 15 by a valve 21. Duct sections 13 and 20 are connected through an economizer formed from sections 22, 22.

When starting the cupola, the valves 11 and 21 are closed, cutting off the sections 13 and 20. In this disposition, the air delivered by the fan 7 is carried by the ducts 14 and 15, bustle 16 and twyers 19, into the cupola. The fumes from the cupola are, as in ordinary constructions, carried to the dome thereof. When the hood 23 of the cupola 6 is closed, the fumes are conveyed off by a flue having sections 24 and 24^a. Interposed between the extremes of said flue sections is the economizer formed by the sections 22, 22. The fumes are compelled to travel through the tortuous passage provided in the economizer, before being delivered to the surrounding air. When the "heat" has been produced, the hood 23 is dropped; the valve 17 is closed; and the valves 11 and 21 are opened. By the closing of the hood 23, the heated gases are diverted to pass through the said economizer and the flue 24. By opening the valves 11 and 21 and closing the valve 17, the air travels through the duct sections 13 and 20 and through the said economizer. The passage through the economizer is formed to spread the gases in a thin layer. The gases are thus brought into more complete contact with the walls of the sections 22, 22.

The sections 22 from which the economizer is in part constructed are provided each with side walls 26 and bolting flanges 25 secured thereto. Each frame-like construction thus formed is divided longitudinally and upon the median plane by a partition 33. The partition 33 terminates against a partition 36 in each of the sections, which, as seen in Fig. 5 of the drawings, extends vertically between the upper and lower walls 26 and from the median plane or the level of the partition 33 outward to the level of the flanges 25. The partition 33 is cut away to form an opening to register with the partitions 38 which form a passage 34. The partitions 33, 36 and 38 divide the section into two distinct compartments, each compartment being on opposite sides of the median plane or of the partition 33, and each of the compartments having outlet passages formed by the partitions 36 and 38.

Each section is provided with a partition 33^a, which partly closes one side of each section, extending between both horizontal walls 26 thereof, and from one vertical wall 26 to adjacent the opposite vertical wall to form a passage therewith to register with the passage 37 of the adjacent section 22 when two or more sections are united.

Referring to Figs. 4 and 5 of the draw-

ings, it will be understood that the sections 22, when united, are turned to present the passages 34 and 37 of each successive section in opposite relation to the preceding section; that is, if a second section 22 should be united with the section shown in Fig. 4, it would be turned so that the opening 34 in the section being added would be placed at the bottom of the economizer, and the passage 37 would be at the right of the economizer, or oppositely disposed from the location of the passages 34 and 37, as shown in Fig. 4 of the drawings, and so with a third and other succeeding sections 22. The sections 22, when thus united, would form in the economizer two continuous channels for gases, one of said channels forming a tortuous path in the horizontal plane, and the other of said channels a tortuous path in the vertical plane; or in other words, the sections of one of said channels communicate through the passages 37, and convey the supply air from the box 35 or duct section 13 to the duct section 20. The section of the vertical channel communicates through the passage 34, and conveys the heated gases from the inner to the outer section 24^a of the flue.

It will be understood from the foregoing that after the hood 23 is lowered to compel the heated gases to travel through the economizer above described and through the vertical channel and openings 34 thereof, the relatively cool air supply is delivered through the horizontal channel by way of the passage 37 thereof on the way to the bustle 16 of the cupola. During the time when the air and gases are both in the economizer, they are separated by the thin partition 33. To aid the radiation or transfer of heat from said gases to said air, I provide flanges 39, which are mounted upon the partitions 33, and are disposed in each of the channel sections, in line parallel with the travel of the air or gases therein. To clean the channel sections thus formed, openings are provided in the vertical sides 26 at the vertical edge of each of the horizontal channel sections, which openings in service are closed by the doors 30 and 30^a, said doors, as shown in Fig. 3 of the drawings, being disposed in vertical arrangement on the economizer. When the doors are opened or removed, as shown in Fig. 5 of the drawings, it will be understood that a cleaning implement could be moved lengthwise of the channel section, and the flanges 39, which therein extend horizontally, could be thoroughly cleansed.

The walls 26 disposed at the top and bottom of the economizer when the sections are united in service position, have formed therein oppositely-disposed openings 27 and 28, which are normally closed by doors 29 and 29^a, as shown in Fig. 2 of the drawings. When these doors are opened or removed, as shown in Fig. 5 of the drawings, it will be seen that a cleaning implement could be passed from end to end of the vertical sections of the channel through which is passed the heated gases from the inner to the outer section of the flue 24. Any deposit of mineral or liquid held in suspension in the heated gases would collect upon the doors 29, to be therefrom removed and saved.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In an economizer such as described; a plurality of sections adapted to be joined to form two continuous passageways, separated by radiating walls, one of said passageways having vertical extensions, and the other of said passageways having horizontal extensions, and arranged to pass the air and gas contained by the one and the other passageway, respectively, completely around and to extend on both sides of the said extensions of each.

2. In an economizer such as described; a plurality of sections adapted to be joined to form two continuous passageways separated by radiating walls, one of said passageways having vertical extensions, and the other of said passageways having horizontal extensions and arranged to pass the air and gas contained by the one and the other passageway, respectively, completely around and to extend on both sides of the said extensions of each; and side openings for said extensions to admit a cleaning implement.

3. An economizer, comprising a plurality of sections adapted to be joined to form two continuous passageways separated by radiating walls, one of said passageways having horizontal extensions, and arranged to pass the air and gas contained by the one and the other passageway, respectively, completely around and to extend on both sides of the said extensions of each; and elongated, outwardly-extending radiating flanges placed on said radiating walls in parallel arrangement on each side of the walls and in diametrically opposite arrangement of said flanges on each side of the wall to the flanges on the opposite side thereof

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS LAURENCE GORR.

Witnesses:
BENNETT SWANTON,
GRACE L. GORR.