M. HONIGMANN.

SUPERHEATER FOR VAPORS AND GASES.

APPLICATION FILED MAY 27, 1914.

1,117,050.

Patented Nov. 10, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

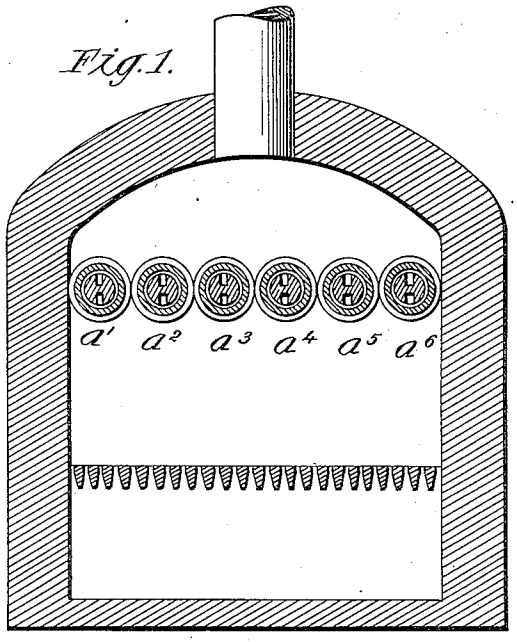
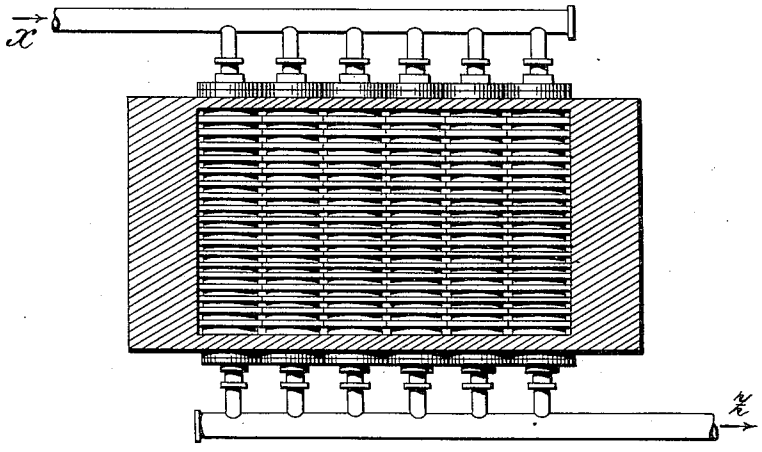


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

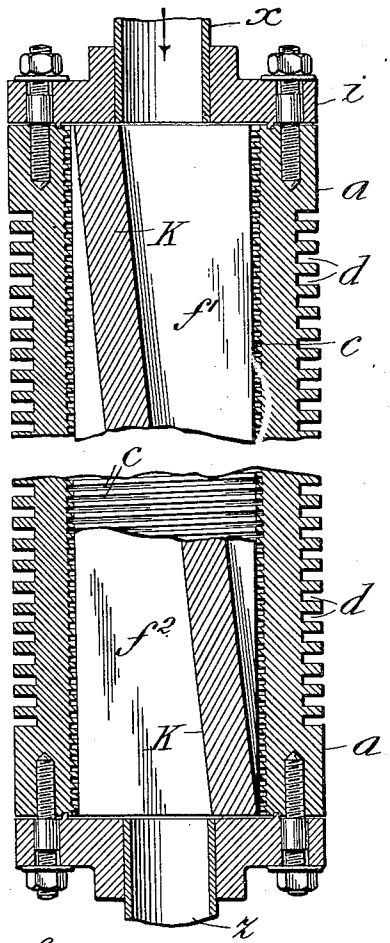
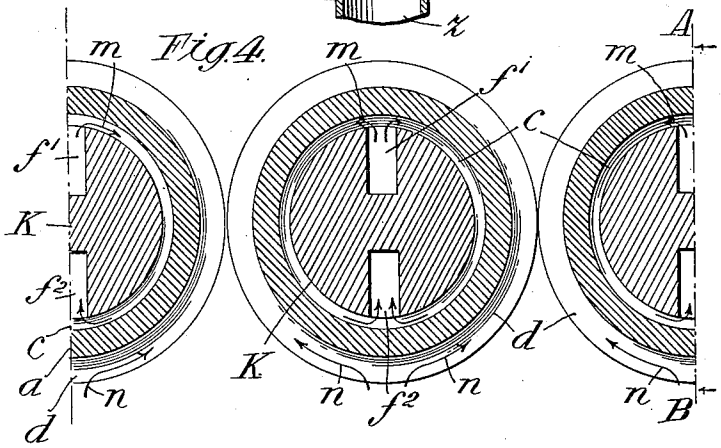


Fig. 4.



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UNITED STATES PATENT OFFICE.

MORITZ HONIGMANN, OF WÜRSELEN, NEAR AACHEN, GERMANY.

SUPERHEATER FOR VAPOR AND GASES.

1,117,050. Specification of Letters Patent. Patented Nov. 10, 1914.

Application filed May 27, 1914. Serial No. 841,284.

To all whom it may concern:

Be it known that I, MORITZ HONIGMANN, manufacturer, a subject of the German Emperor, and resident of Würselen, near Aachen, Germany, (whose post-office address is Crefelderstrasse 4, in Würselen, near Aachen, Germany,) have invented new and useful Improvements in or Relating to Superheaters for Vapor and Gases, of which the following is a specification.

This invention relates to a novel superheater for vapors and gases and has for its object to improve the super-heater of that class in which the super-heater elements consist of massive heavy metal cylinders capable not only of bearing a super-heating temperature up to 600° C. and more, but in consequence of their great mass also serving for the storage of heat. This storage of heat contributes to the uniformity of the superheating and renders it possible if need be to bring up the super-heater to an efficiency far beyond the efficiency of the firing arrangement adopted for the same, owing to the fact that the heating elements have stored up the heat during the preceding heating period and give it off when under high load.

Now the invention consists in providing the inner cores fitted in the super-heating cylinders, on both sides, with longitudinal grooves rising obliquely in different directions and in the arrangement between the cores and the inner wall of the metal cylinders of annular passages so that the vapors or gases to be super-heated may be able to pass from the entrance to the outlet only by flowing in a counter-current with regard to the fire gases jacket-wise through the passages remaining between the core and the inner wall of the elements.

The invention is illustrated by way of example in the accompanying drawing, in which:

Figure 1 is a vertical section of a superheater of this kind. Fig. 2 is a horizontal section thereof. Fig. 3 shows a longitudinal section of one individual heating element, and Fig. 4 is a cross section of several elements arranged side by side.

The super-heater consists of a number of similar heating elements a^1 a^2 and so on, arranged side by side in the fire chamber so as to completely fill the same.

Each heating element is produced by drilling a massive cylinder a so that the drilled hole has a diameter of about two-thirds of the diameter of the cylinder. Narrow passages c are then milled into the drilled or inner cylinder wall by means of a screw thread after which a massive core K consisting of the same metal is introduced into the drilled hole, which core has previously been provided with passages f^1 f^2 for the inlet and outlet of the vapor. These passages f^1, f^2 are diametrically opposite one another. They are, however, provided with rising bottoms so that to begin with they are quite flat but gradually increase in depth so that at the point at which the passage f^1 is flattest the passage f^2 is deepest and vice versa. Lids i close the two ends of the heating elements and are fitted closely against the front faces of the core. In this manner if steam is admitted at x it can travel to z only as shown in Fig. 4 by the arrows n by flowing jacket-wise around the core K in a direction opposite to that of the fire gases whose travel is indicated by the arrows n. In addition, each cylinder is provided on its surface with slots d through which the fire gases are forced to pass. The heating element thus formed protrudes with its ends beyond the fire chamber, the lids i being secured by means of screws so as to form a strong closure.

The super-heater thus constructed may without danger be heated up to red heat if desired.

The heating elements are given a large diameter of 300 to 400 mm. so that they become very heavy and thereby are capable of receiving a great deal of heat so that even if the admission of the vapor is temporarily stopped they are protected against damage. The vapors and the fire gases by traveling on the counter-current principle enable the fire gases to be thoroughly utilized and the vapor easily to attain the desired superheating degree.

The heating bodies may of course be arranged in a vertical instead of in a horizontal position and heating bodies of square or rectangular cross section may be used in the place of cylindrical bodies if desired.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A superheater for vapors and gases, comprising jackets provided with inlet and outlet passages and with grooved passages

extending around the inner walls thereof, cores fitting in said jackets provided on opposite sides with longitudinal grooves rising in opposite directions and connected with said inlet and outlet passages so that the medium to be superheated is forced to flow from one longitudinal groove to the other in counter current to the heating gases, substantially as described.

2. A superheater for vapors and gases, comprising cylinders provided with narrow spirally grooved passages on the inner surfaces thereof, covers secured on each end of said cylinders provided with inlet and outlet passages, respectively, cores fitting in said cylinders provided on opposite sides with longitudinal grooves rising in opposite directions and connected with the said inlet and outlet passages, so that the medium to be superheated is forced to flow from one longitudinal groove to the other in counter current to the heating gases, substantially as described.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 11th day of May, 1914.

MORITZ HONIGMANN.

Witnesses:
ANTON BOWEN,
PAUL BREES.