

No. 653,433.

Patented July 10, 1900.

R. ZEILLER.
FURNACE.

(Application filed Sept. 30, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 3.

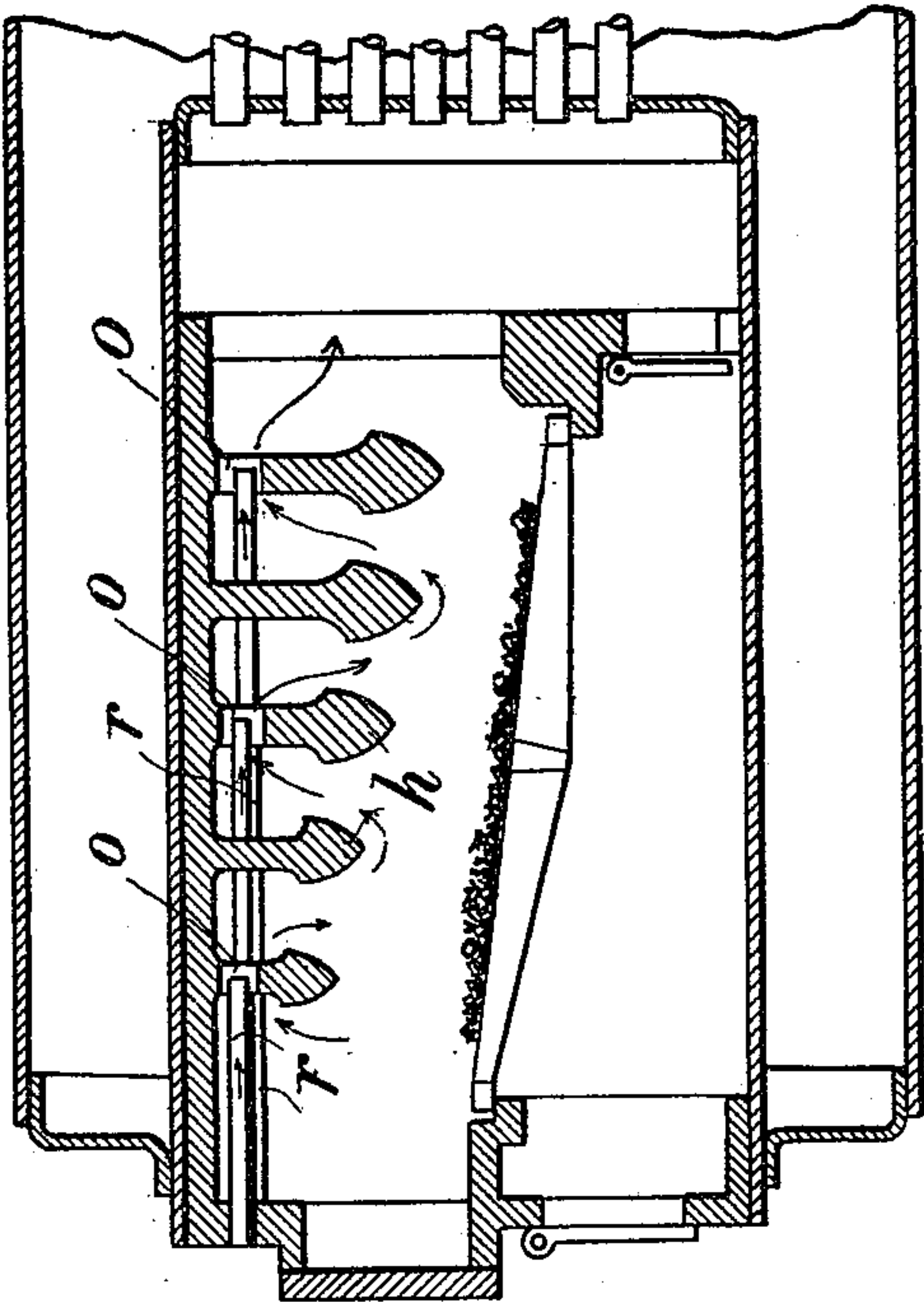


Fig. 4.

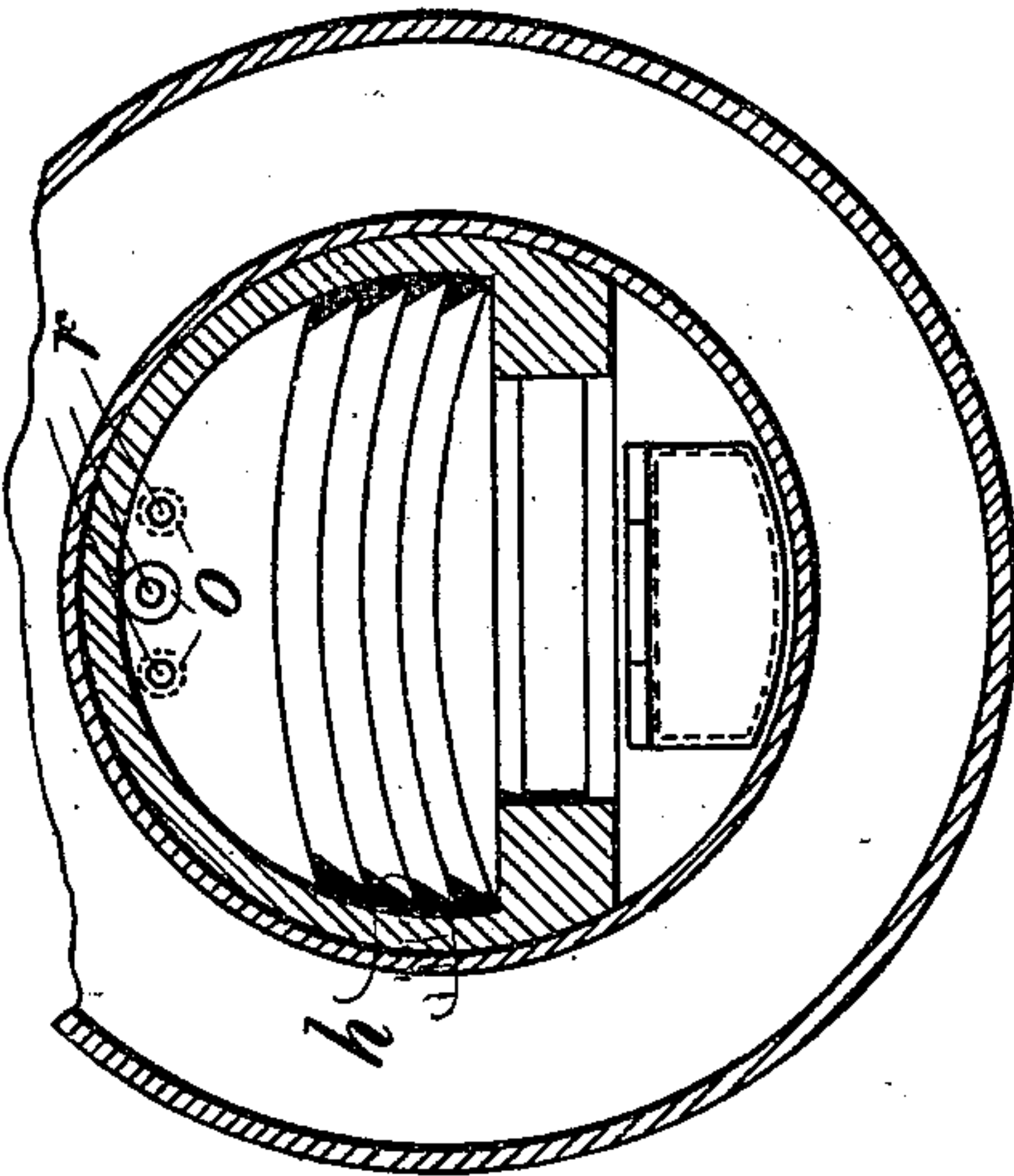


Fig. 1.

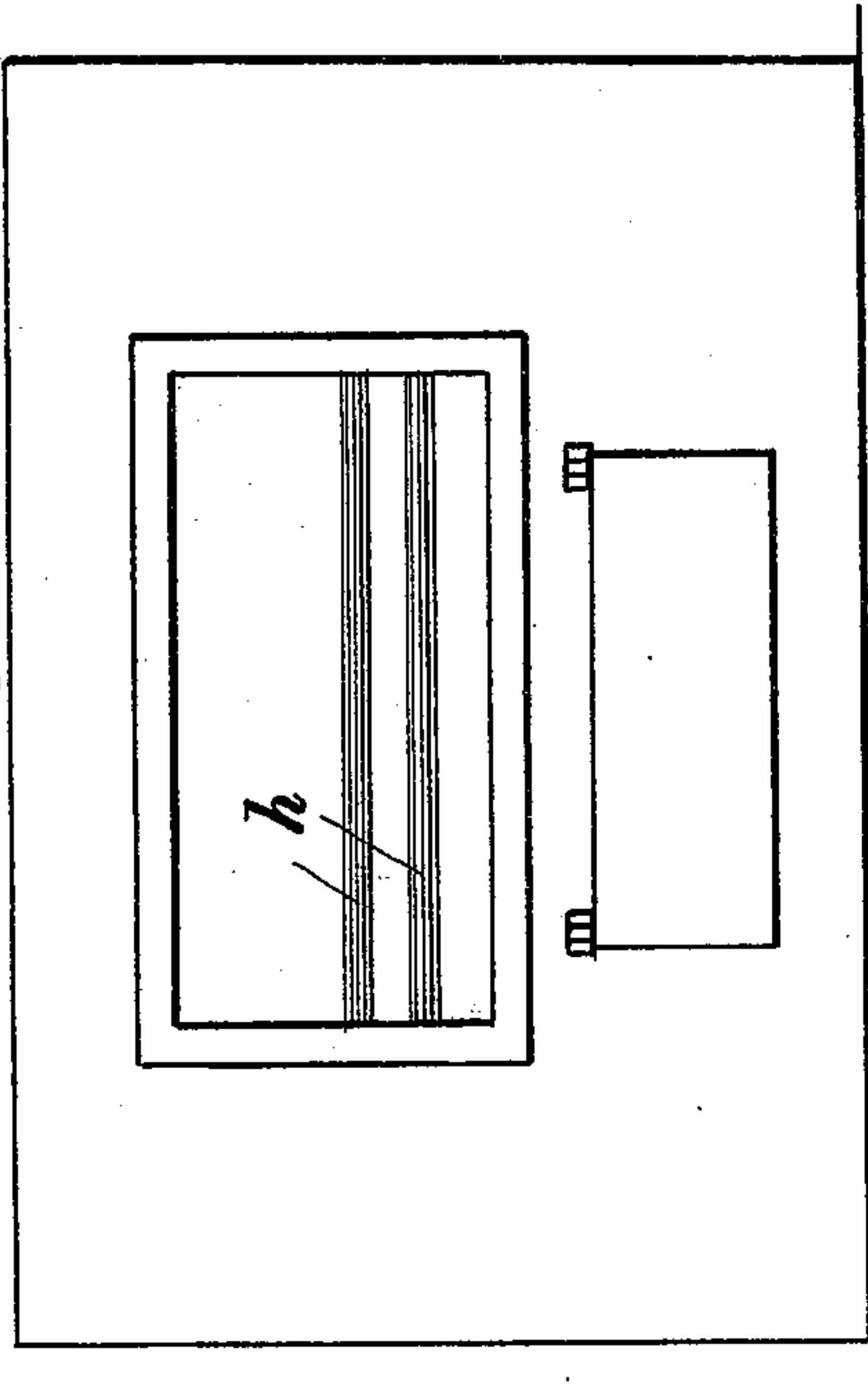
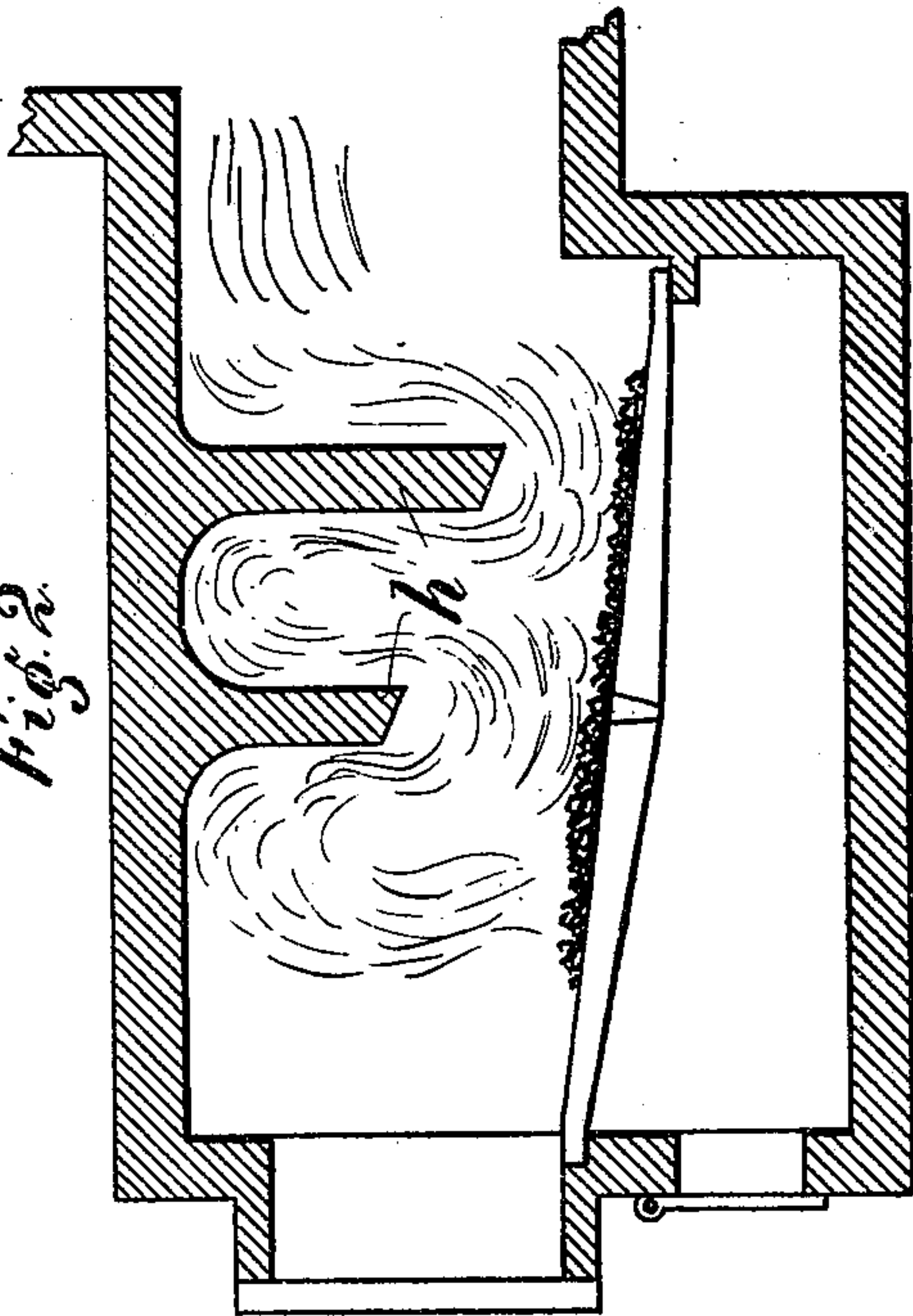


Fig. 2.



Witnesses:
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Inventor:
Robert Zeiller
by Max Georgie
his attorney

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Fig. 5.

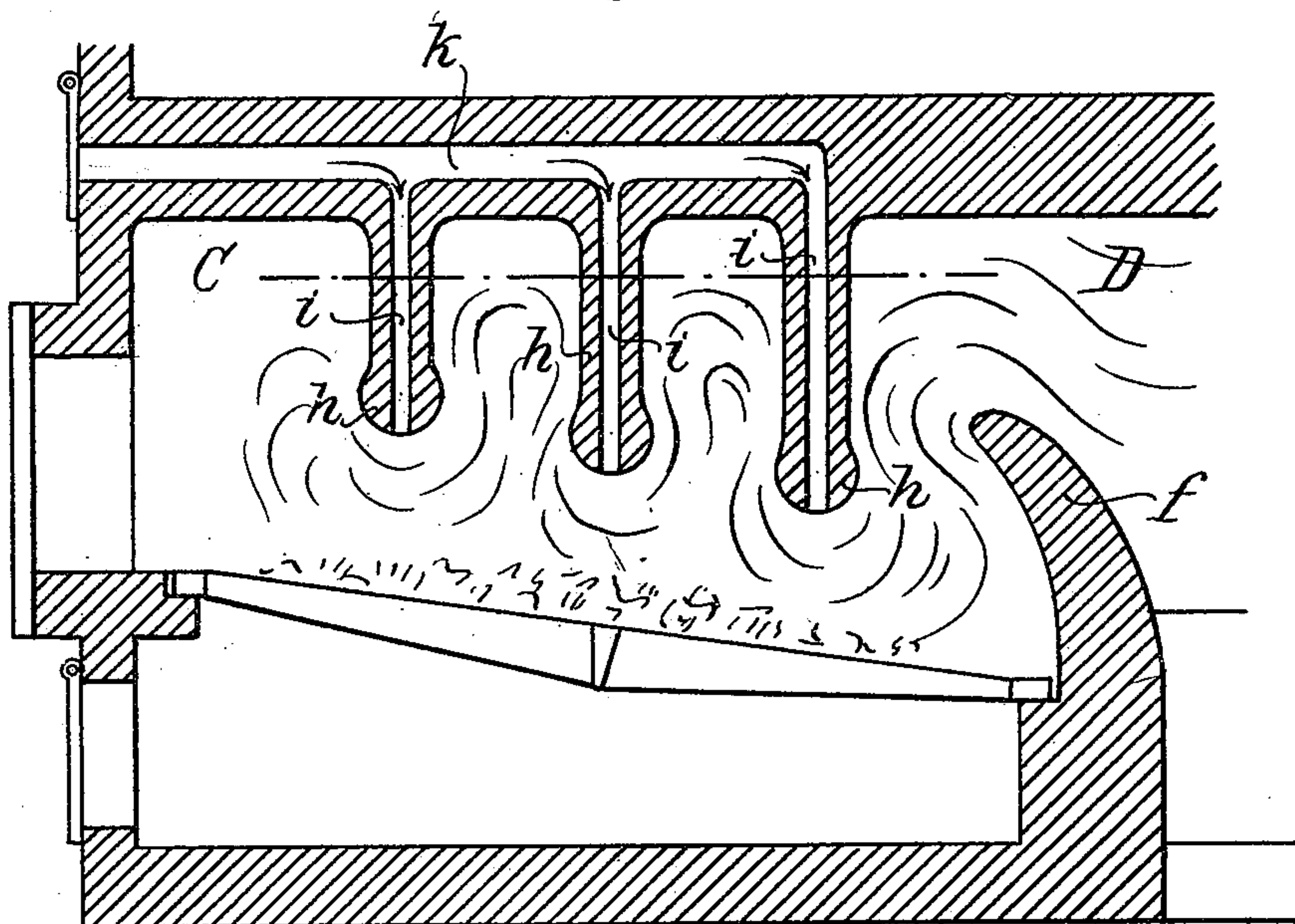
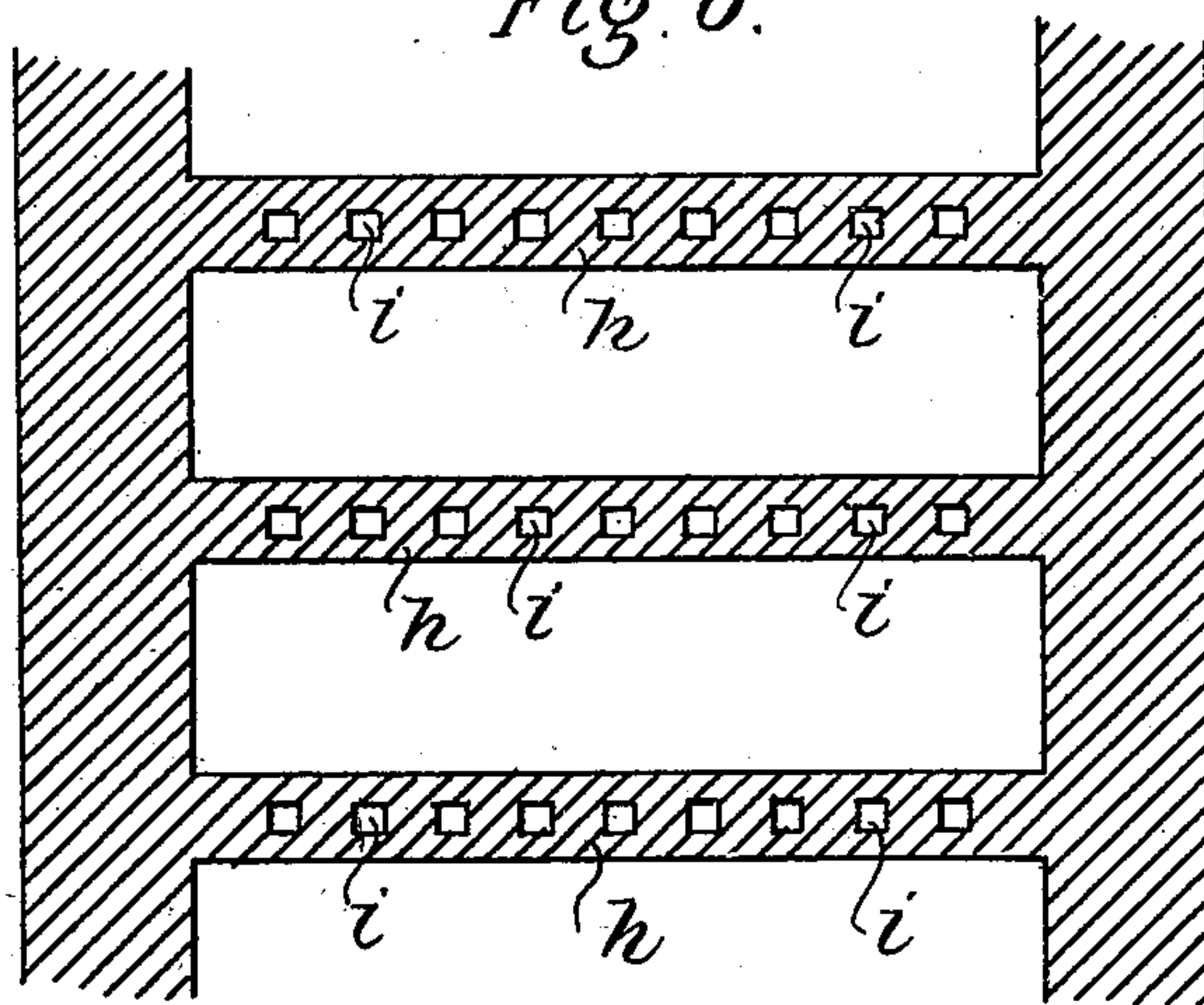


Fig. 6.



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UNITED STATES PATENT OFFICE.

ROBERT ZEILLER, OF MUNICH, GERMANY.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 653,433, dated July 10, 1900.

Application filed September 30, 1899. Serial No. 732,228. (No model.)

To all whom it may concern:

Be it known that I, ROBERT ZEILLER, a subject of the King of Bavaria, residing at Munich, Kingdom of Bavaria, Empire of Germany, have invented certain new and useful Improved Furnaces, of which the following is a specification.

The present invention relates to smoke-consuming furnaces; and it consists of the details of construction hereinafter set forth, and particularly pointed out in the claims.

Referring to the accompanying drawings, in which the letters of reference refer to the same parts in the several views, Figure 1 is a front elevation of the furnace. Fig. 2 shows a longitudinal section. Fig. 3 is a longitudinal section of a modification. Fig. 4 is a transverse section of the furnace shown in Fig. 3. Fig. 5 is a longitudinal section showing the improved fire-wall. Fig. 6 is a horizontal section on the line C D of Fig. 5.

The invention consists in providing a series of transversely-arranged depending ribs *h h*, of fireproof material, the said ribs depending from the top of the interior of the fire-box toward the top of the grate. These ribs serve to detain the gases of combustion, keeping them in contact with the glowing mass of fuel instead of their being allowed to pass off directly to the flues. These ribs are advantageously made longer toward the back of the grate, as shown in the drawings, so as to cause the fire-gases to follow the incline of the grate and also to cause them to make a longer passage between the hot ribs at the rear end of the grate, so as to more effectually burn and thoroughly consume them.

According to the form of embodying the invention illustrated in Figs. 3 and 4 a series of ribs *h* are employed, having their lower edge curved or arched, Fig. 4, and having alternate ribs provided with openings *o o* at the upper part, so that the gases of combustion will be forced to take a zigzag path between the ribs, as indicated by the arrows in Fig. 3, the said gases being thus forced at intervals downwardly onto the glowing mass of fuel and upwardly between the hot ribs and being effectively consumed. In some cases secondary air-feed may be introduced into the openings *O* by means of the pipes *r r*, or instead of air fluid-fuel may be introduced through

the said pipes or agents which assist combustion, such as benzene, naphtha, or the like. The ribs are advantageously provided with a thickened lower edge, as shown at Fig. 3, the object of which is twofold—first, to strengthen the said ribs, and, secondly, the construction has the effect of causing the combustion-gases to whirl or eddy between the ribs at the upper part of the fire-box, and thus to more thoroughly combine and mix with the secondary air fed through the pipes *r*. The air fed through these pipes also has the effect of drawing the fire-gases from the space between one pair of ribs to that between the next.

The number of transverse depending ribs employed is different and in some cases even one may be sufficient. If the ribs are plain, the ends are advantageously beveled off to conform to the slant or incline of the grate.

A further arrangement is represented in Fig. 5 in a longitudinal section, and in Fig. 6 in a cross-section on the line C D. One or several ribs depending from the top of the interior of the fire-box toward the top of the grate are also arranged, whereby said ribs are provided with holes or conduits *i*. These conduits, in connection with the horizontal main conduit *k*, serve for the direct secondary air-feed into the fireplace. The secondary air-feed in this manner has a twofold advantage—first, the ribs *h* are cooled, and, secondly, the secondary air when passing through the holes or conduits *i* is sufficiently heated. The secondary air when passing through the conduits or holes *i* causes the combustion-gases to whirl or eddy, by which an energetic mixing of the same is produced. Behind the last rib *h* a vaulted fire-bridge *f* is arranged, by which particles of ashes and fuel are retained and by which at the same time an energetic contact of gases of combustion with the last rib *h* again takes place.

I claim as my invention—

1. In a furnace, the combination of a series of transversely-disposed ribs extending downwardly from the roof of the fire-box, said ribs depending for a distance increasing toward the smoke-exit of the furnace, substantially as and for the purposes set forth.

2. In a furnace, the combination of a series of transversely-disposed ribs extending downwardly from the roof of the fire-box, said ribs

having apertures therein, and means for bringing external air from the front of the furnace and delivering it into said apertures, substantially as and for the purposes set forth.

3. In a furnace, the combination of a series of transversely-disposed ribs extending downwardly from the roof of the fire-box, said ribs having apertures connecting their interspaces and arranged in proximity to the roof of the fire-box, and means for bringing external air from the front of the furnace and delivering it into said apertures, substantially as and for the purposes set forth.

4. In a furnace, the combination of a series of transversely-disposed ribs extending downwardly from the roof of the fire-box, the alternate ribs having apertures therein, and means for bringing external air from the front of the furnace and delivering it into said apertures, substantially as set forth.

5. In a furnace, the combination of a series of transversely-disposed ribs extending downwardly from the roof of the fire-box, said ribs depending for a distance increasing toward the smoke-exit of the furnace, said ribs hav-

ing an enlarged lower edge, substantially as and for the purposes set forth.

6. In a furnace, the combination of a series of transversely-disposed ribs, extending downwardly from the roof of the fire-box, said ribs having apertures connecting their interspaces and arranged in proximity to the roof of the fire-box, and a tube extending through the front of the furnace and along the upper portion of the fire-box and terminating in each of the said apertures, substantially as and for the purposes set forth.

7. In a furnace, the combination of a series of transversely-disposed ribs extending downwardly from the roof of the fire-box, said ribs depending for a distance increasing toward the smoke-exit of the furnace and a deflector-wall at the rear of the fire-box extending upwardly and inwardly toward said ribs, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ROBERT ZEILLER.

Witnesses:

EMIL HENZEL,
ALBERT SEECINBACH.