

L. J. TRECY.
HOT AIR FURNACE.

No. 371,108.

Patented Oct. 4, 1887.

Fig. 1.

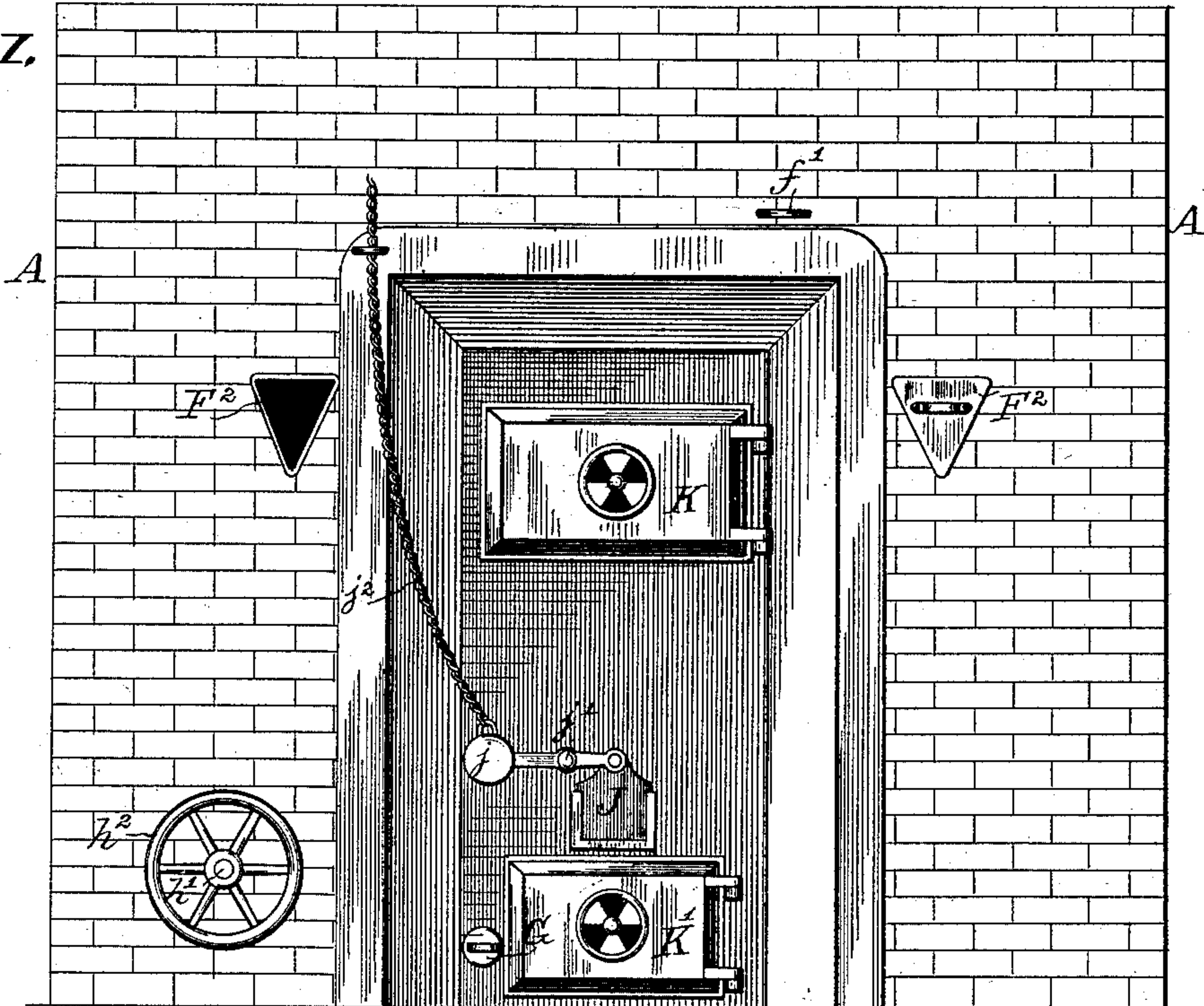
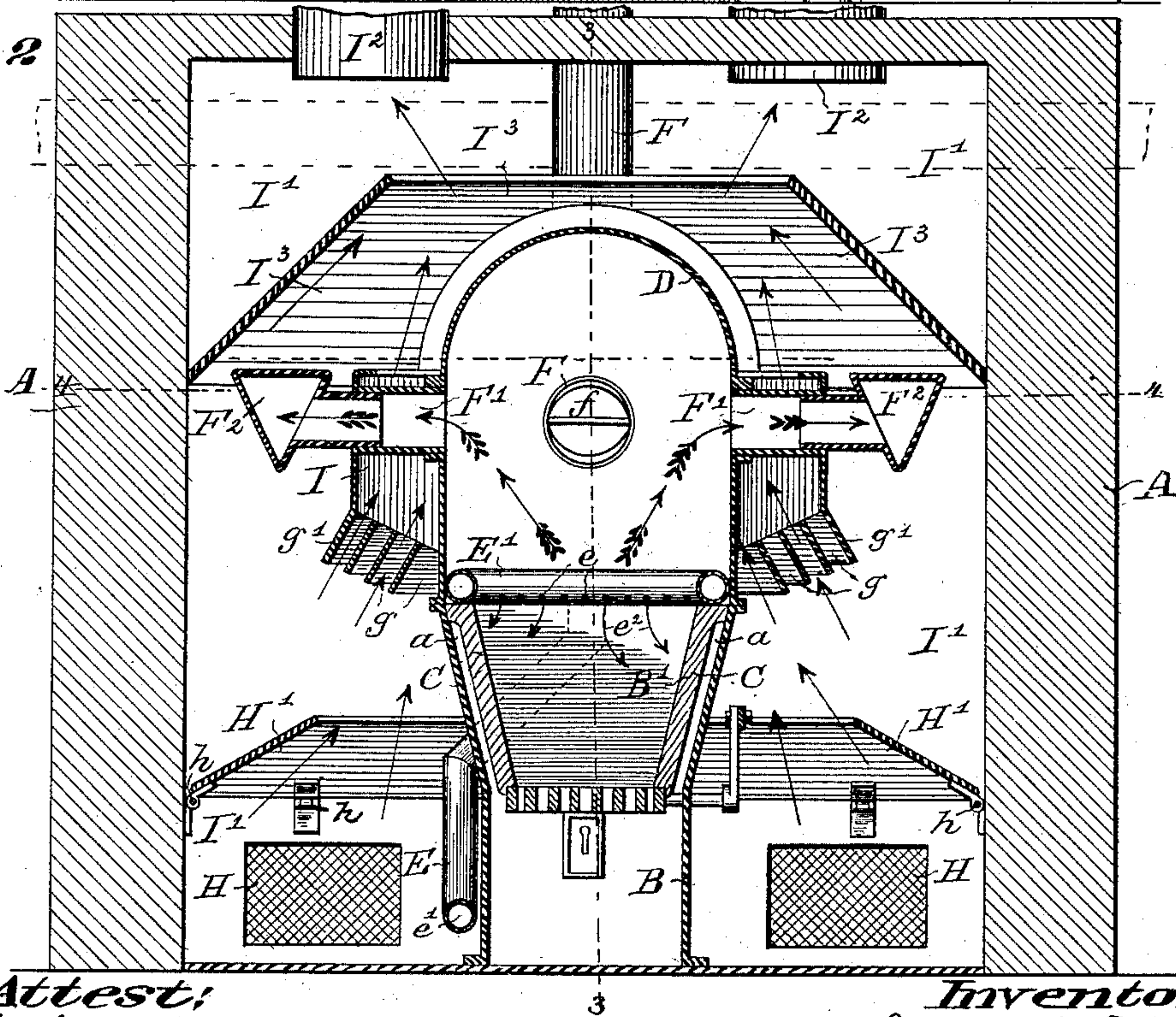


Fig. 2.



Attest:
Joseph Wachtel
Chas. E. Metz

Inventor:
Laurence J. Treacy
per Chas. E. Metz
Attorney

(No Model.)

2 Sheets—Sheet 2.

L. J. TRECY.
HOT AIR FURNACE.

No. 371,108.

Patented Oct. 4, 1887.

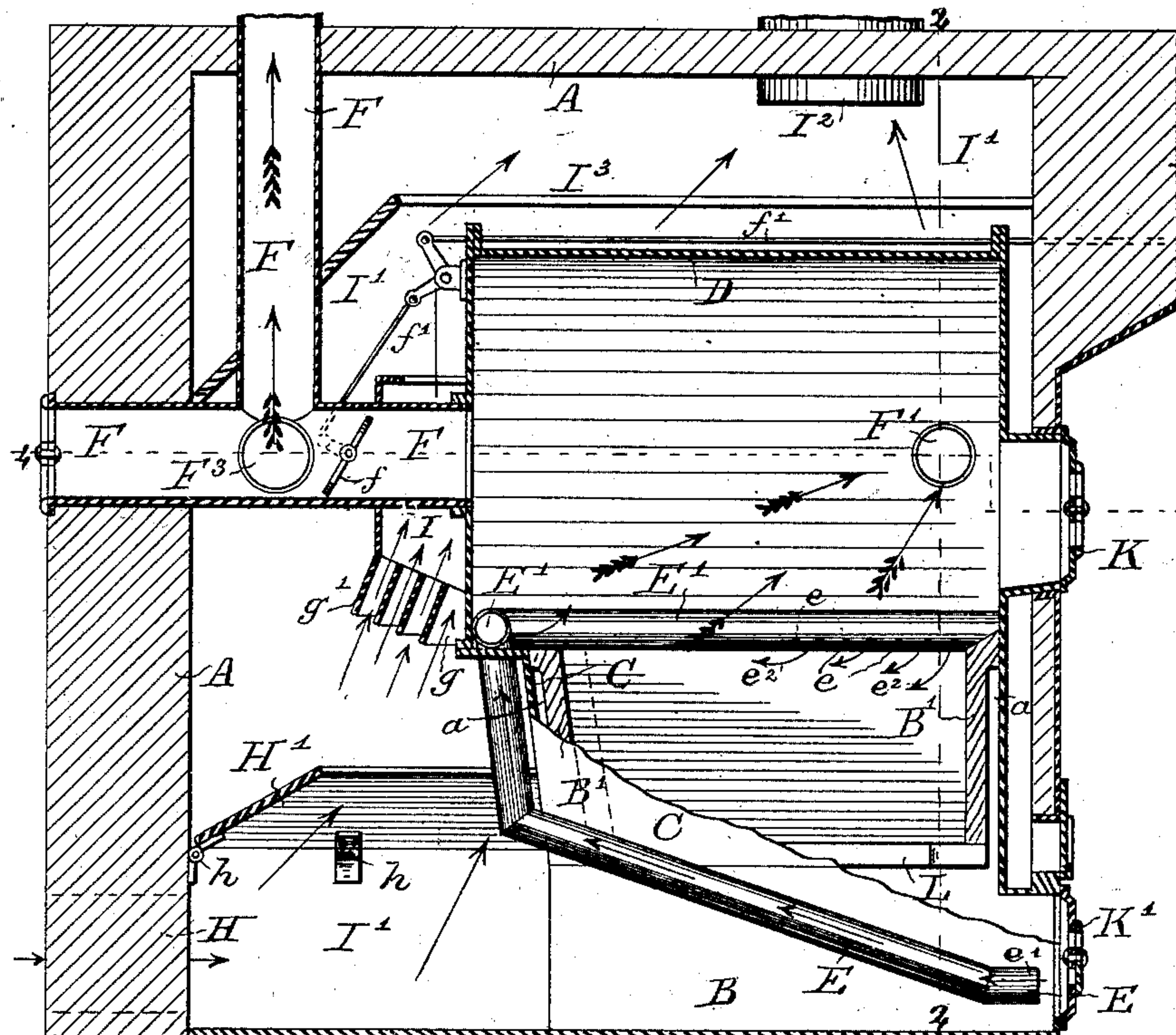


Fig. 3.

Fig. 5.

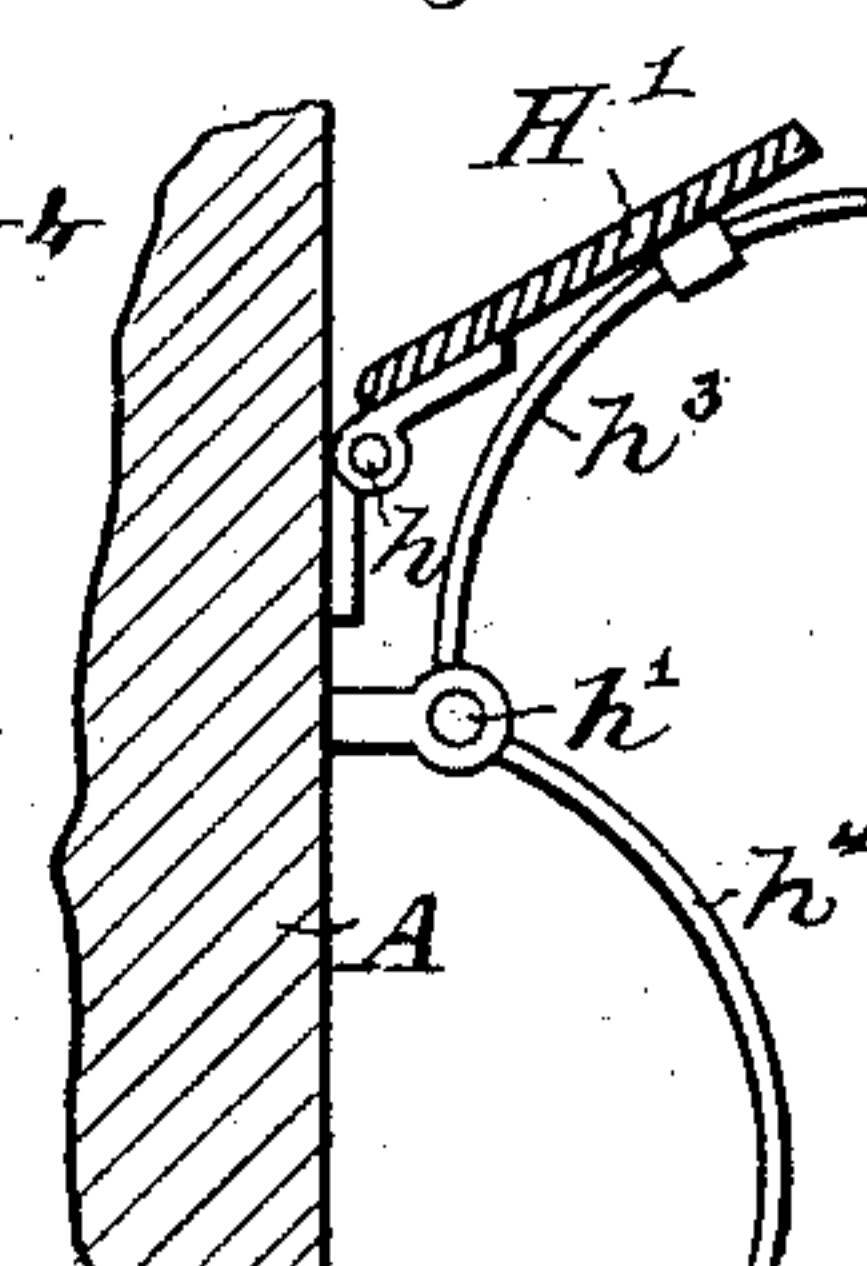
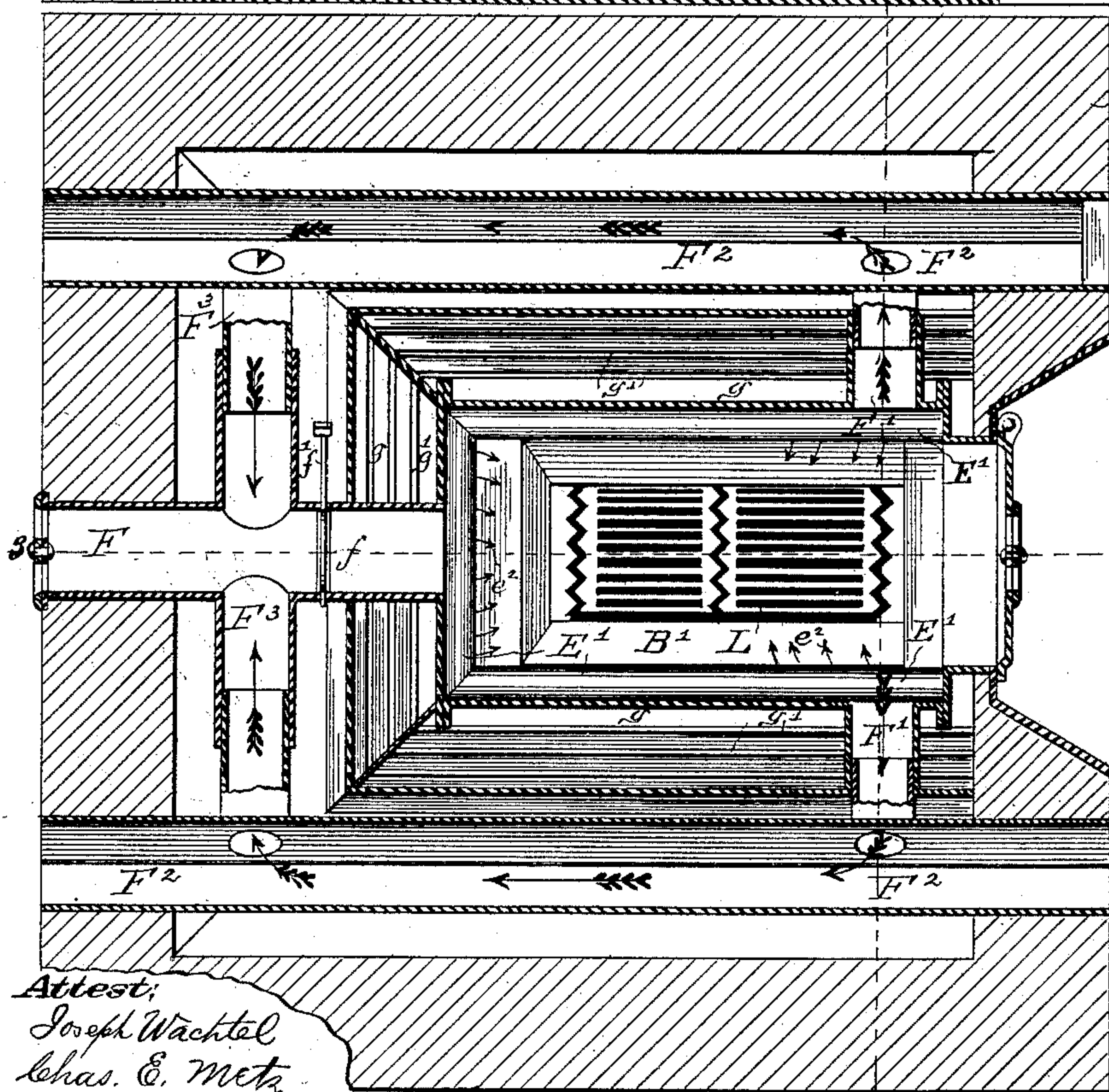
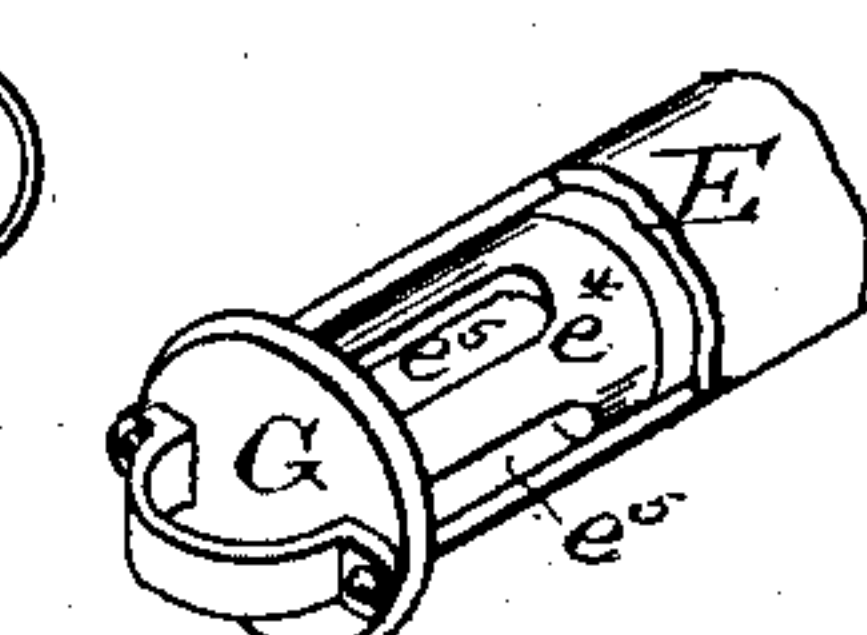


Fig. 4.

Fig. 6.



Attest:
Joseph Wächter
Chas. E. Metz

Inventor,
Lawrence J. Treacy
per,
Chas. E. Metz
Attorney

UNITED STATES PATENT OFFICE.

LAURENCE J. TRECY, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO
THEODORE ALBES, OF SAME PLACE.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 371,108, dated October 4, 1887.

Application filed January 25, 1887. Serial No. 235,477. (No model.)

To all whom it may concern:

Be it known that I, LAURENCE J. TRECY, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification.

My invention relates to improvements in hot-air furnaces used for heating schools, churches, and other buildings, and my object is to save fuel, gain time in heating, as well as to gain heat, and to make the furnace so as to be easily handled and controlled.

Of the drawings, Figure 1 is a front view of my improved furnace. Fig. 2 is a vertical cross-section on line 2 2 of Fig. 4. Fig. 3 is a vertical longitudinal section on lines 3 3 of Figs. 2 and 4. Fig. 4 is a plan section on lines 4 4 of Figs. 2 and 3. Fig. 5 is a detail view showing the manner of operating the fresh-air dampers. Fig. 6 is a detail perspective view of the cap for regulating the supply of hot-air through the igniting-pipes.

Similar letters refer to similar parts throughout the several views.

A is the brick wall in which my furnace is placed, as ordinarily.

B is the ash-pit; C, the fire-box; D, the drum. The ash-pit and fire-box I construct of wrought-iron, thereby causing same to give out greater heat than in the usual manner now in use, where the same are made of thick brick walls, whereby a large percentage of heat is lost, but which I now by my new construction save and utilize.

Within the fire-box is placed a cast-iron lining, forming my fire-pot B', which is so placed and constructed as to leave an air space or passage, *a*, between it and the fire-box, which air-passage prevents my fire-pot from burning through. Around the ash-pit, fire-box, and drum the cold fresh air is passed to be heated before being led to the different parts of the building.

In order to derive as much heat from the fire as possible, a pipe, E, commencing at the front face of the furnace-wall and extending along the outside wall of the ash-pit and fire-pot, and being made larger in its diameter until reaching the back of the fire-box, to allow

for the expansion of the air as it gets hotter, and entering at the rear of the fire-box, communicates or connects with the pipes E', placed along the rear and sides of the top edge of the fire-pot. The pipe E may, however, be placed as shown in dotted lines, entering the fire-pot below and communicating with the pipes E' above, in order to obtain a more rapid heating of the air in said pipe. The pipes E' are provided with jets or perforations *e*, through which the heated air passes. Air entering the pipe E at *e'*, and in its passage through the pipe becoming intensely heated, and coming out through the perforations of the pipes E', meets the smoke at these outlets, as shown by arrows *e''*, Figs. 2, 3, and 4, igniting the gases in the smoke as they arise before escaping through the flue.

G is a cap placed in the hot-air inlet *e'* of the pipe E, and within reach, having a slotted tube, *e''*, closely fitting the inside of the pipe, for the purpose of admitting more or less air as the same is withdrawn more or less, allowing the slots *e'''* to extend out more or less.

F is the main flue, through which the fire and smoke escapes direct, when first starting same; but a damper, *f*, operated by suitable rods *f'*, &c., when closed, compels the fire and smoke to pass forward and divide, half passing to one side and half to the other, and entering radiating-pipes F' at the forward end of the furnace, connecting to triangular-shaped radiating-pipes F², along each side of the furnace, (see Fig. 2,) and finally through radiating-pipes F³ along the back of the furnace into the main flue F, behind the damper. The object of making the radiating-pipes F² triangular is to gain more heating-surface. These radiating-pipes F', F², and F³ are each capable of passing one-half the amount of smoke which the main flue F is capable of doing; hence the areas of these pipes on both sides together in cross-section equal that of the main flue in cross-section. The hot air, as before described, mingling with the smoke and igniting the gases contained in same, causes the radiating-pipes F', F², and F³ to become and remain red-hot.

H are the inlets for fresh cold air, and are placed, preferably, in the rear furnace-wall.

Directly above the top line of these inlets, and extending along both sides and the rear of the furnace, are deflector-plates H' , turning on hinges h , (see Figs. 2, 3, and 5,) and operated from the front by a rod, h' , and wheel h^2 , said rod having an arm, h^3 , attached to the under side of the deflector-plates, and a leg, h^4 , resting on the floor supporting the deflector-plates in the position shown in Fig. 5, causing the fresh air to be deflected inwardly against the body of the furnace and to pass through air-spaces g and against the inclined deflecting-plates g' , and become still more heated as it passes on and ascends through an inner heating-chamber, I , coming in contact with the hot sides of same and the hot sides of the furnace, then passing through the main chamber I' , and out through the openings I^2 to the different parts of the building. The air which escapes the air-spaces g and deflecting-plates g' is heated by passing around the pipes F' , F^2 , and F^3 , which are red-hot. To insure a still further heating of the air before passing into the outlets to the various rooms of the building a canopy, I^3 , is provided, extending around the two sides and rear of the inside of the furnace-walls, as shown in Figs. 2 and 3. This canopy is inclined upward, and extends toward the center of the furnace over the drum and deflects the air toward the center of the furnace on its upward course, where it is still more heated before passing around the canopy and over it to the outlets.

In case the air is not required so hot the deflecting-plates H' are raised and the air mostly passes outside of the air-spaces and deflecting-plates, thereby coming in contact with less heating-surface.

In order to operate all the deflector-plates H' at the same time the rear one overlaps the one having the operating parts, and the one opposite to this overlaps the rear deflector-plate. Thus all three communicate with each other, and the movement of one is communicated to the others.

J is a check-draft for controlling the fire. The air passing through enters the ash-pit under the fire. This check-draft is closed, shutting off the air to the fire below after same has a fair start, the coals thus glimmering and burning, but very slowly, and the gases being ignited above, thus cause a great saving of fuel. j is a weighted lever attached to the check and pivoted at j' to the front of the furnace. A chain, j^2 , attached to the weighted arm of the lever, extends or leads to the hall or room over the furnace, where it can be operated to regulate the draft by any person, the tightening of the chain closing the check-draft, the weighted lever opening same when the chain is slack. K is the feed-door, K' the door to the ash-pit, and L is the grate.

Having now fully described the construction of my hot-air furnace, the operation of same is as follows: On starting the fire the damper f of the main flue F and the check J are opened to allow a free direct draft and passage of the

smoke through the furnace. The opening or inlet e' of the hot-air pipe E is closed until the fire has become fairly started. The damper f is then closed and the air contained in the pipes E and E' has become heated. The cap G is withdrawn more or less to admit more or less hot air to the flames above the fire-pot, as before described. As the fresh air around the furnace now becomes heated, it rises and is led to the rooms, and fresh air enters the inlets H . The deflector-plates H' are set and the air is thrown against the body of the furnace, passing between the inclined deflecting-plates and through the air-spaces g into the inner heating-chamber, I , becoming heated by contact with its sides and the body of the furnace, thence passing through the main chamber I' , up and around the canopy I^3 , and out through the outlets I^2 . The air, as before described, which escapes the deflector-plates g' and air-spaces g passes around the radiating-pipes F' , F^2 , and F^3 , which, being red-hot, heat the same, which, meeting the hot air from the inner chamber, I , passes out with same, and in case the air is not required so hot the deflector-plates H' are raised, allowing the air to pass at pleasure and become less heated by coming in contact with less heating-surface. Should it be desired to have more or less draft to the fire, the check can be opened or closed from the hall or room to which the chain is led from same, as before described.

The canopy I^3 may be made to extend all around the four sides of the furnace, if desired.

What I claim is—

1. The combination, with a hot-air furnace, of the radiating-pipes F' F^2 F^3 , the main flue F , the damper f , and the deflecting-plates g' , forming the air-spaces g , substantially as and for the purpose set forth.

2. The combination, with a hot-air furnace, of the radiating-pipes F' F^2 F^3 , the main flue F , the damper f , the inner heating-chamber, I , and the deflecting-plates g' , forming the air-spaces g , substantially as and for the purpose set forth.

3. The combination, with a hot-air furnace, of the radiating-pipes F' F^2 F^3 , the main flue F , the damper f , the deflecting-plates g' , forming the air-spaces g , the fresh-air inlets H , and the deflector-plates H' , placed directly above the fresh-air inlets H , and extending along both sides and rear of the furnace, turning on hinges h , secured to the inner faces of the furnace-walls A and operated from the outside by a wheel, h^2 , attached to a rod, h' , or by other similar means, said rod having an arm, h^3 , attached to the under side of one of said plates, and a leg, h^4 , for supporting said plate, all of said plates being operated by the movement of this one plate by one overlapping the other, as described, substantially as and for the purpose set forth.

4. The combination, with a hot-air furnace, of the radiating-pipes F' F^2 F^3 , the main flue F , the damper f , the inner heating-chamber, I ,

the fresh-air inlets H, and the deflector-plates H', placed directly above the fresh-air inlets H and extending along both sides and rear of the furnace, turning on hinges h, secured to the inner faces of the furnace-walls A and operated from the outside by a wheel, h², attached to a rod, h', or by other similar means, said rod having an arm, h³, attached to the under side of one of said plates, and a leg, h⁴, for supporting said plate, all of said plates being operated by the movement of this one plate by one overlapping the other, as described, substantially as and for the purpose set forth.

5. The combination, with a hot-air furnace, of the radiating-pipes F' F² F³, the main flue F, the damper f, the deflecting-plates g', forming the air-spaces g, and the canopy I³, substantially as and for the purpose set forth.

6. The combination, with a hot-air furnace, of the radiating-pipes F' F² F³, the main flue F, the damper f, the inner heating-chamber, I, the deflecting-plates g', forming the air-spaces g, and the canopy I³, substantially as and for the purpose set forth.

7. The combination, with a hot-air furnace, of the radiating-pipes F' F² F³, the main flue F, the damper f, the deflecting-plates g', forming the air-spaces g, the canopy I³, the fresh-air inlets H, and the deflector-plates H', placed directly above the fresh-air inlets H and extending along both sides and rear of the furnace, turning on hinges h, secured to the inner

faces of the furnace-walls A and operated from the outside by a wheel, h², attached to a rod, h', or by other similar means, said rod having an arm, h³, attached to the under side of one of said plates, and a leg, h⁴, for supporting said plate, all of said plates being operated by the movement of this one plate by one overlapping the other, as described, substantially as and for the purpose set forth.

8. The combination, with a hot-air furnace, of the radiating-pipes F' F² F³, the main flue F, the damper f, the inner heating-chamber, I, the deflecting-plates g', forming the air-spaces g, the canopy I³, the fresh-air inlets H, and the deflector-plates H', placed directly above the fresh-air inlets H and extending along both sides and rear of the furnace, turning on hinges h, secured to the inner faces of the furnace-walls A and operated from the outside by a wheel, h², attached to a rod, h', or by other similar means, said rod having an arm, h³, attached to the under side of one of said plates, and a leg, h⁴, for supporting said plate, all of said plates being operated by the movement of this one plate by one overlapping the other, as described, substantially as and for the purpose set forth.

LAURENCE J. TRECY.

Witnesses:

CHAS. F. MEISNER,
J. HENRY SCHMIDT.