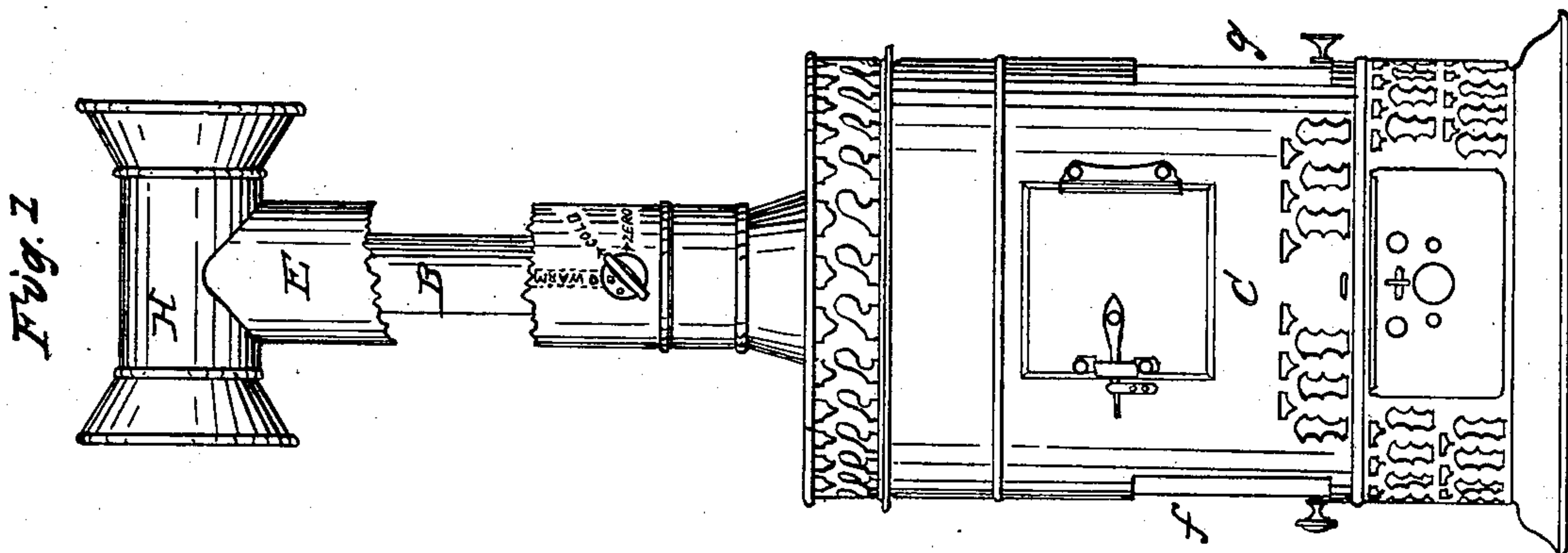
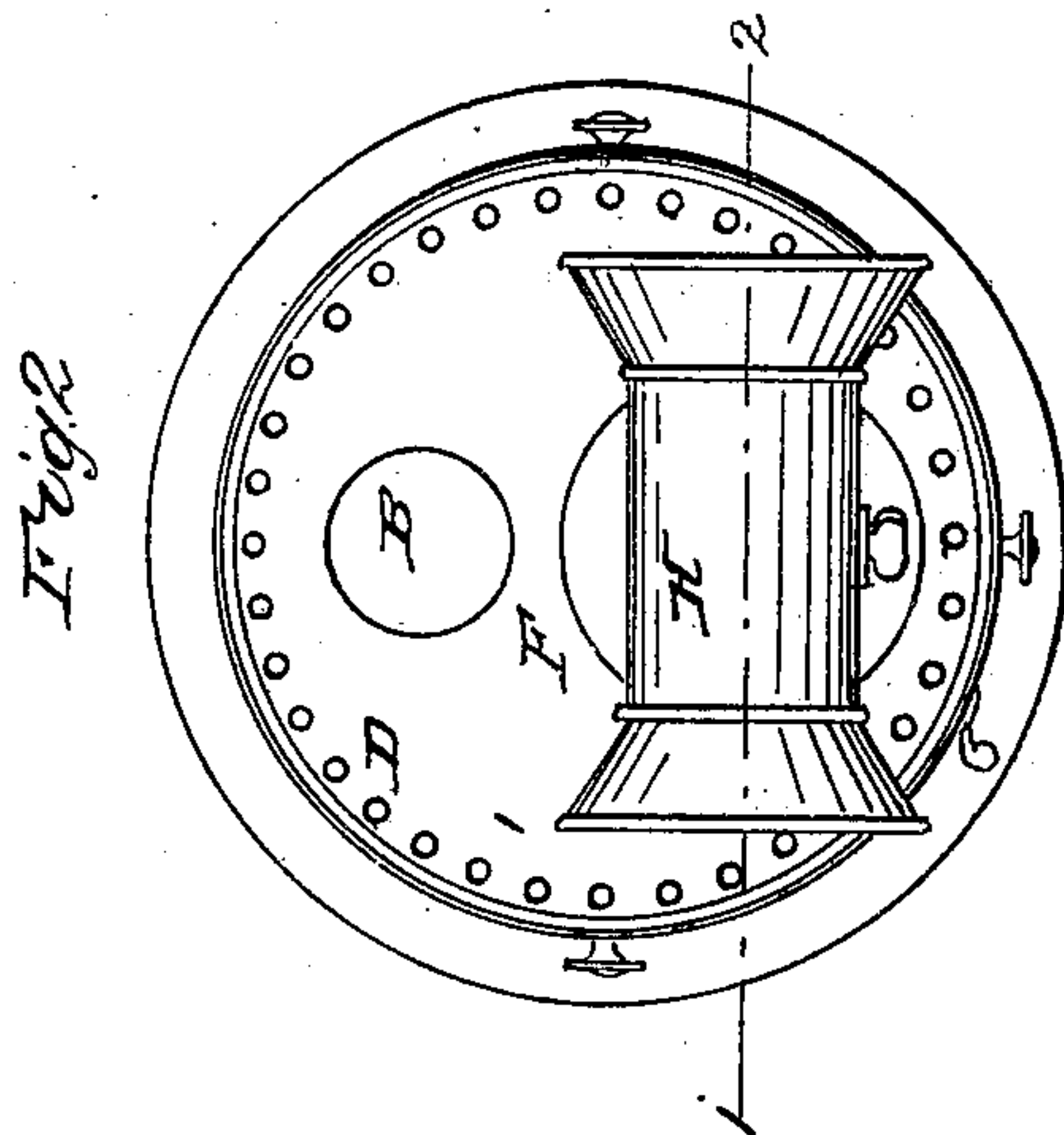
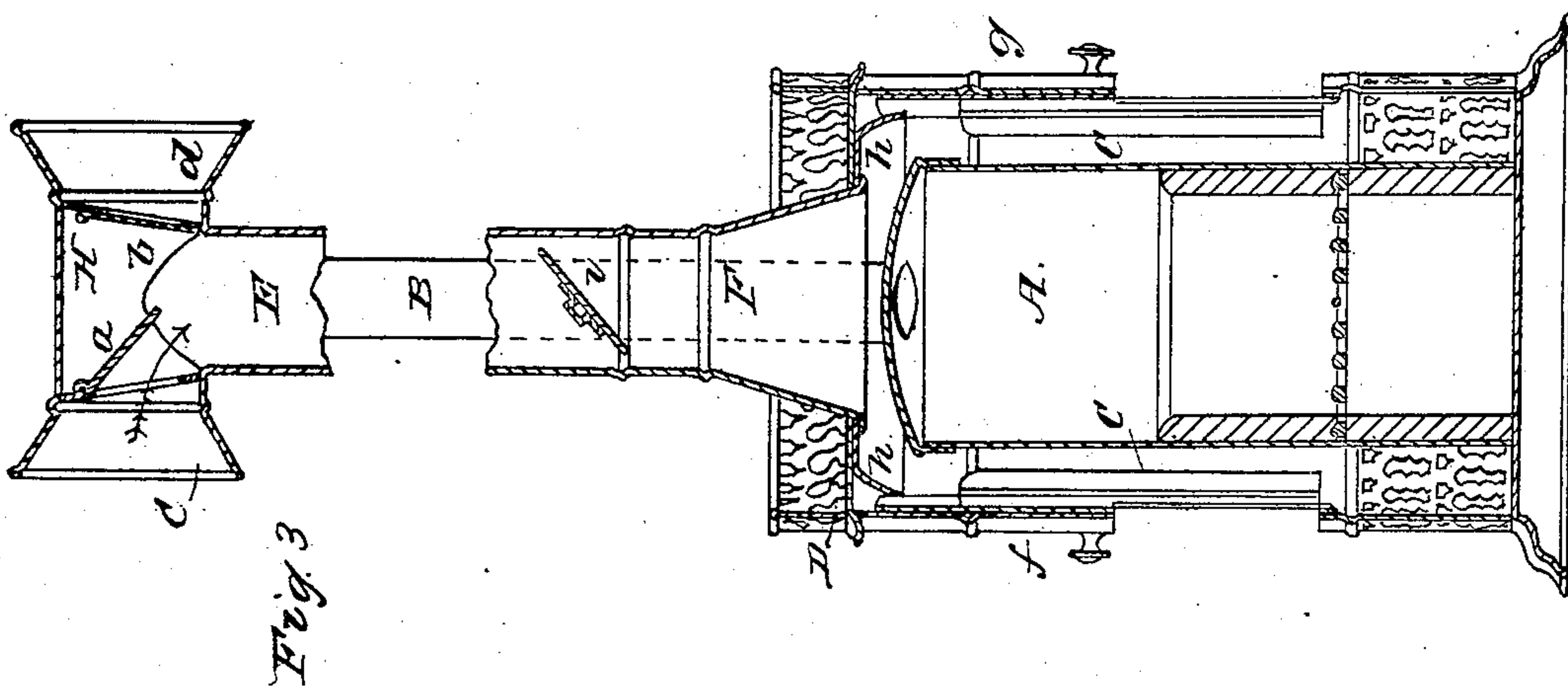


J. SPEAR.
Car Heater.

No. 17,756.

Patented July 7, 1857.



UNITED STATES PATENT OFFICE.

JAMES SPEAR, OF PHILADELPHIA, PENNSYLVANIA.

RAILROAD-CAR STOVE.

Specification of Letters Patent No. 17,756, dated July 7, 1857.

To all whom it may concern:

Be it known that I, JAMES SPEAR, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Railroad-Car Stoves; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front elevation of a stove. Fig. 2 is a top view, and Fig. 3 a vertical section in the line 1, 2, of Fig. 2

The letters of reference indicate the same parts in the different figures wherever they occur.

My improvements relate to hot-air stoves for warming the interior of railroad cars, where the supply of air is driven into the stove by the force of the wind or of the current created by the rapidity of the motion of the cars.

The following is a description of the stove and improvements:

A is a cylindrical cast iron stove or heater with a convex top, and fire door, grate, and ash pit, of the usual construction. Its smoke flue or chimney B, passes up through the roof of the car and is surmounted by a cap. The heater A is surrounded at a few inches distance by a cylinder or casing (C), of sheet iron, the lower portion of which is perforated with numerous apertures through which the heated air enters the car. The casing C is covered on the top, leaving a space between the top piece D, and the convex top of the heater A. From the top of the casing, and communicating therewith rises an air tube E which passes up through the roof of the car, and is continued by a cross tube (H) toward both the forward and rear ends of the car. This cross tube has at each end a bell-mouthed opening and is provided with swinging valves (*a* and *b*) hinged at the top, opening inward and closing against inclined flanges or seats (*c* and *d*).

When a strong breeze is blowing in the direction of the car or when a current of air is created in the same direction by the rapid motion of the cars, the external air opening the valve *a*, rushes down the tube E and impinging upon the convex top of the heater A passes down the sides thereof, becomes warmed and enters the car through the perforations in the lower part of the casing C. This same effect will be produced

when the direction of the motion of the car is reversed, the valve *b*, will then open, and the valve *a*, will close. These valves are thus self adjusting, and require no attention when the cars are backed or when the direction of the current of air is changed from any other cause.

When the cars are at rest in calm weather the valves *a* and *b* remain closed by their own gravity upon their inclined seats, and prevent the heated air from escaping upward.

In the sides of the casing are large sliding doors *f* and *g* which can be opened when it is desirable to use the direct radiation from the heater A to heat the cars when at rest.

To the underside of the top piece D a circular curved flange or deflector *h* is secured the object of which is to give such a direction to the current of air, which comes down the tube E, that it may pass down the sides of the heater A. Without this addition a large portion of the air admitted would pass into the car through the holes in the top piece D, without having been sufficiently heated.

When the train is at rest and the valves *a* and *b* closed upon their respective seats, the operation of the stove is that of a common hot air stove, the air entering at the perforations in the lower part of the casing, becoming heated by passing over the surface of the heater A rises and passes out into the car through the holes in the top piece D, a space being left between the deflector and the walls of the casing for that purpose.

When the current of air that enters through the tube E is very strong or when its temperature is very low, the air would pass into the car without having been sufficiently heated. To prevent this I place a regulating damper *i*, in the tube E, which being of less diameter than the inside of the tube never entirely closes it. An index handle is attached to the axis of the damper *i*, by which its position is shown. To this handle a disk is fixed into holes in which a spring stop enters for the purpose of locking the damper in any required position. It is unlocked by pressing the spring back with a suitable key, which being in the possession of the party in charge of the fires, leaves the control of the damper with him to the exclusion of the passengers.

I am aware that cars have been heated by a current of air caused by their motion,

and admitted through the top of the car to a heater inside, but this I do not claim. But,

What I do claim and desire to secure by Letters Patent, is—

The combination of the cross tube H and its self acting valves *a* and *b*, with the air tube E, so constructed and arranged as to conduct the external air to the heater when the cars are in rapid motion either forward

or backward, and to prevent the escape of the heated air when there is no descending current as herein specified.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

JAMES SPEAR.

Witnesses:

THOMAS Y. ENGLAND,
SAML. N. HALL.