(No Model.) 2 Sheets—Sheet 1.

W. A. HENNESSEY.

BOILER FRONT.

No. 353,306. Patented Nov. 30, 1886.

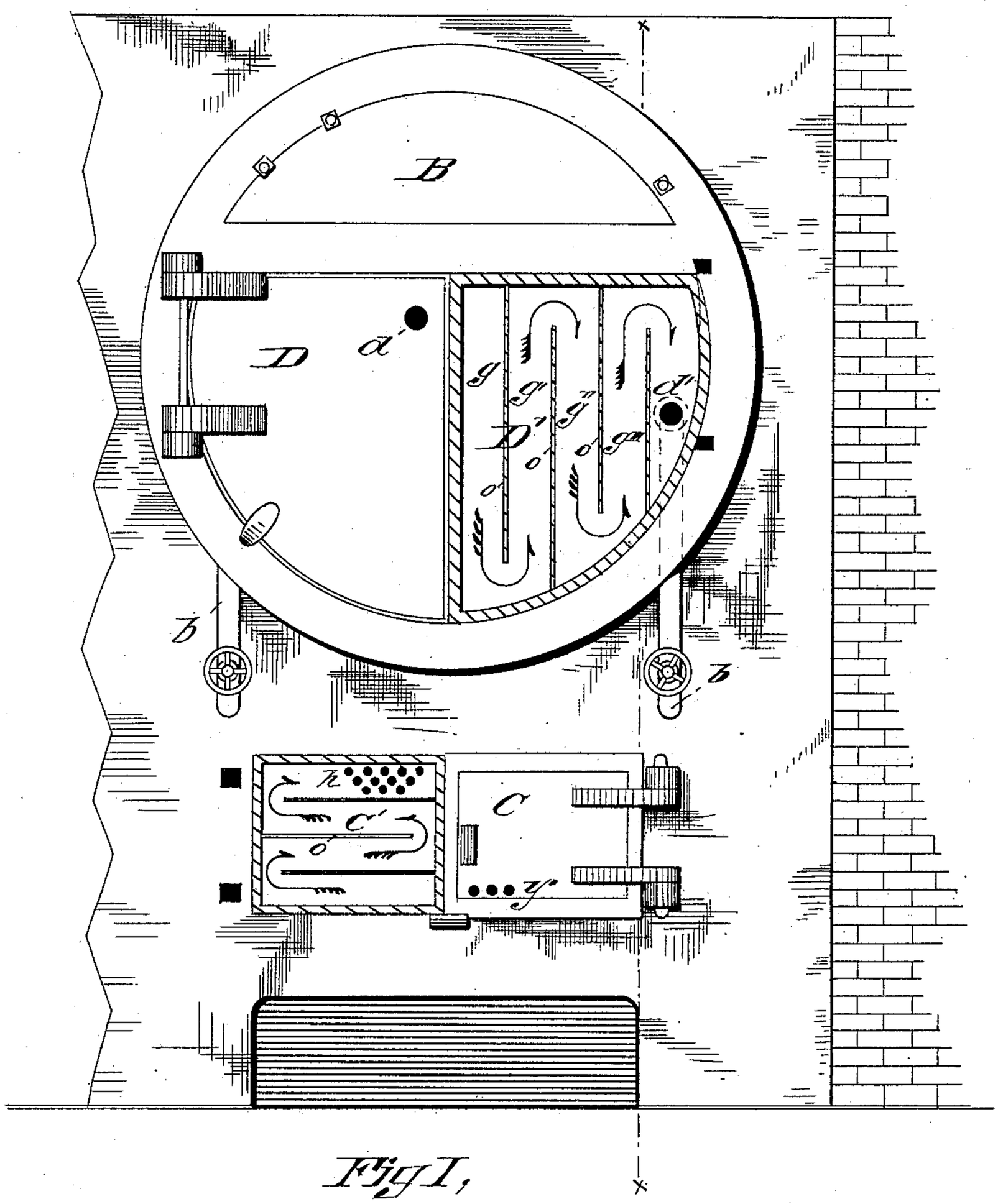

Fig 1,

Witnesses,
Jason Perkins
Lyman H. Perkins.

Inventor,
W A Hennessey
By R F Hyde
Atty.

(No Model.) 2 Sheets—Sheet 2.

W. A. HENNESSEY.

BOILER FRONT.

No. 353,306. **Patented Nov. 30, 1886.**

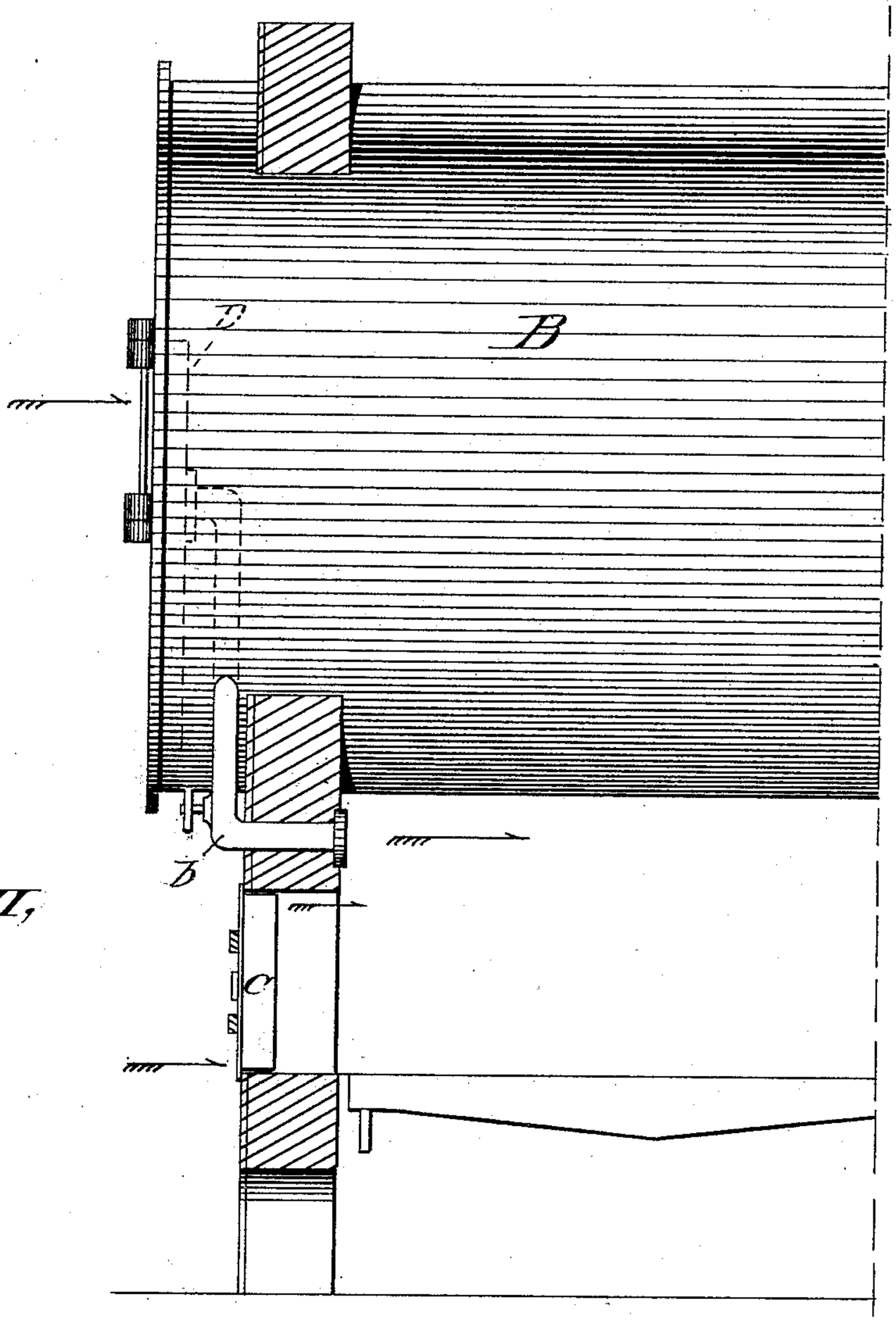

Fig II,

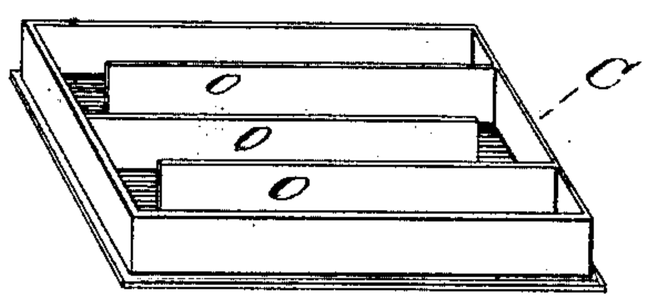

Fig III,

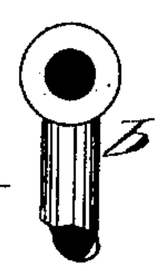

Fig IV,

Witnesses,
Jason Perkins
Lyman H. Perkins

Inventor,
W. A. Hennessey,
by R. F. Hyde
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM A. HENNESSEY, OF SPRINGFIELD, MASSACHUSETTS.

BOILER-FRONT.

SPECIFICATION forming part of Letters Patent No. 353,306, dated November 30, 1886.

Application filed April 19, 1886. Serial No. 199,380. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. HENNESSEY, a citizen of the United States, residing at Springfield, Hampden county, and State of Massachusetts, have invented a new and useful Improvement in Boiler-Fronts, of which the following is a specification.

My invention relates to the construction of the doors upon the boiler-front, the object of the invention being to prevent the radiation of heat into the boiler room or space in front of the boiler; also, to utilize heat which would otherwise be lost to supplying heated air to aid combustion in the fire-box.

My invention is fully illustrated in the accompanying drawings, in which Figure I is a front elevation of a boiler in a boiler-room. Fig. II is a side elevation of the same in partial section on the dotted line *x x* of Fig. I. Fig. III is a perspective view of one furnace-door having one wall removed. Fig. IV is a detail view of the end of the pipe abutting upon the inner side of a flue-door.

The radiation of heat from the ends of boilers and from the furnace doors keeps the space in front of the boiler in which the engineer and attendants are compelled to be at an uncomfortably high temperature; also, this heat conducted from the fire and thus radiated is worse than wasted.

Permanent linings to the boiler-front and furnace-doors—such as asbestus and other non-conductors—have been comparative failures, for the reason that parts of the shells of the boiler and furnace-door conduct the heat directly to the outside of any non-conductor packing, it being impossible to isolate the outer metal coverings from an inner conductor exposed directly to the fire.

By the means illustrated in the accompanying drawings I keep down the temperature of the doors and return the heat taken from them to the space below the boiler.

B is the boiler having upon the end in the boiler-room the flue-doors D D′. These doors being counterparts, the removal of the outer case of the one, D′, as seen in Fig. I, will show in plan view the construction of both.

d is the port through the outer shell, through which the outside air is drawn into the door. Passing first into one end of the passage *g*, it progressively and continuously traverses all parts of the door in following the passages *g′ g″ g‴*, as indicated by arrows, until reaching the port *d′*, when it is drawn through the pipe *b* and delivered, as seen in Fig. II, above the fire-box. The same principle of construction carried out in the furnace-doors C C′ shows the entering port or ports *y* and the ports *h*, through which the air passes to the fire-box, as indicated by the arrow, Fig. II.

The doors are constantly packed by the outer air in constant movement through a passage confining it and conducting it through all parts of the door before delivering it with the heat it has absorbed to the fire, and for this purpose an ordinary metal pipe disposed between the linings of the door would be sufficient; but to lessen the amount of metal in the door and to bring the circulating air in immediate contact with all of the walls of the door I prefer to form the passages *g′ g″*, &c., by diaphragms *o*, as more particularly shown in Fig. III, which form a continuous passage within the door with the employment of the minimum amount of metal.

The ports *y* of the furnace-door and the pipe *b* may be provided with means to regulate the circulation through the doors at will, it sometimes being advisable, as when starting a fire, to have no draft of the kind above it; but when the fire is well under way the mingling of heated oxygenized air with the gases of combustion above the fire-box increases the heat. Where the end of the boiler in the boiler-room is unprovided with flue-doors, a box end may be provided with diaphragms and ports to act exactly as they would upon a door.

In the flue-door shown the port *d′*, when the door is closed, as seen in Fig. II, comes against a flange face on pipe *b* and coincides with the tube-mouth, the tube *b* being held rigid by the boiler-shell, through which it passes.

What I claim is—

1. The within-described improvement in boiler-fronts, consisting of a boiler end provided with a continuous air-passage disposed to extend transversely several times over said end, and provided at one end of said air-passage with a port open to the space in front of the boiler, and at the other with a port communicating with the fire-box, whereby, when

the fire is in operation, the front of the boiler is kept packed by outside air in circulation.

2. The improvement in boiler-fronts, which consists in the combination, with the boiler and usual attachments, of the furnace door having extended and internal walls, and alternating longitudinal partitions extending from one end of the door nearly to the other, and from the front to the rear wall thereof, said door having an external air-port near one end of the passage thus formed, and a port leading into the furnace near the other end, substantially as described.

WILLIAM A. HENNESSEY.

Witnesses:
H. F. HYDE,
D. HOLLAND.