

(No Model.)

K. M. JARVIS.
FURNACE.

No. 302,848.

Patented July 29, 1884.

Fig. 1.

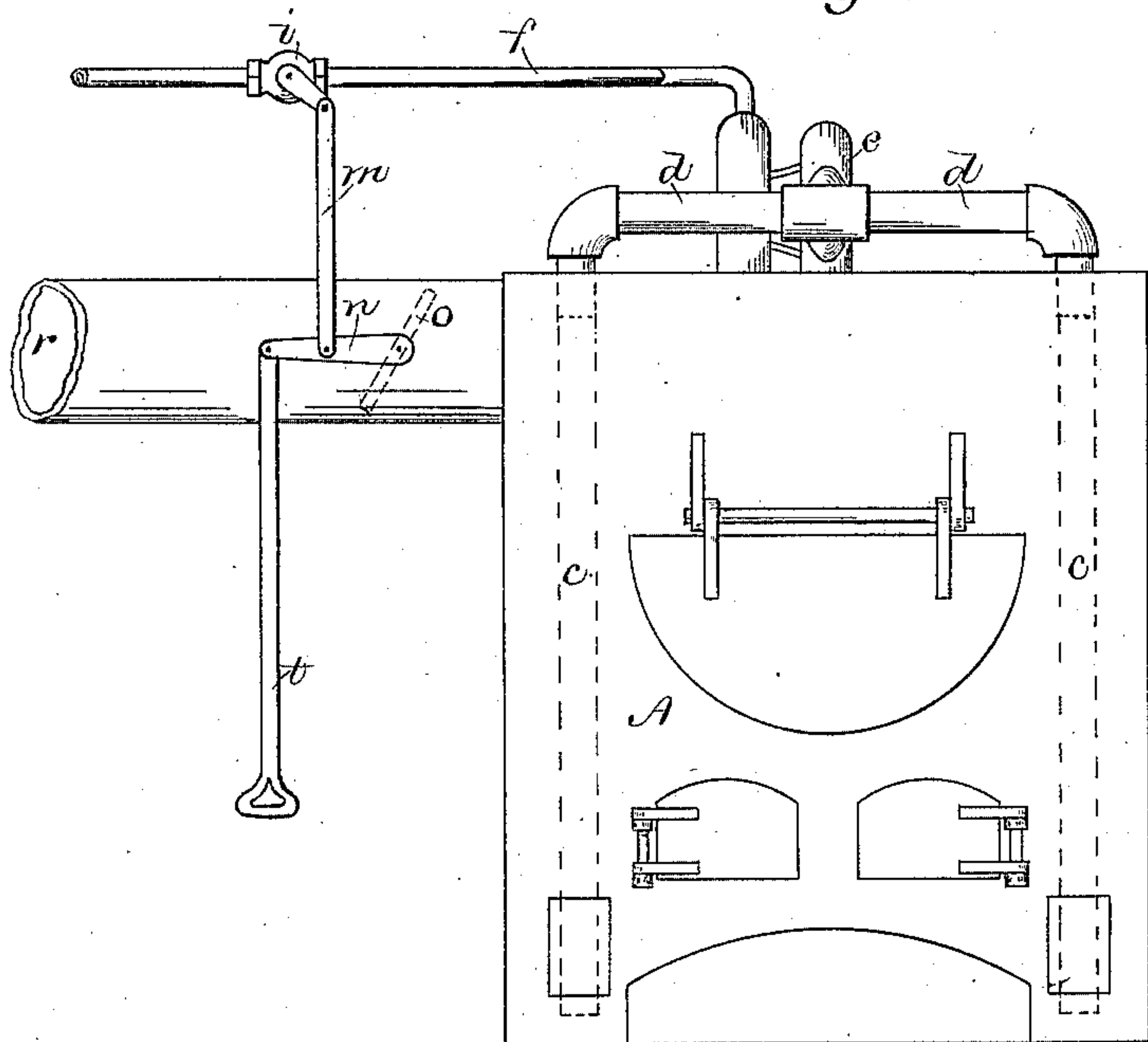
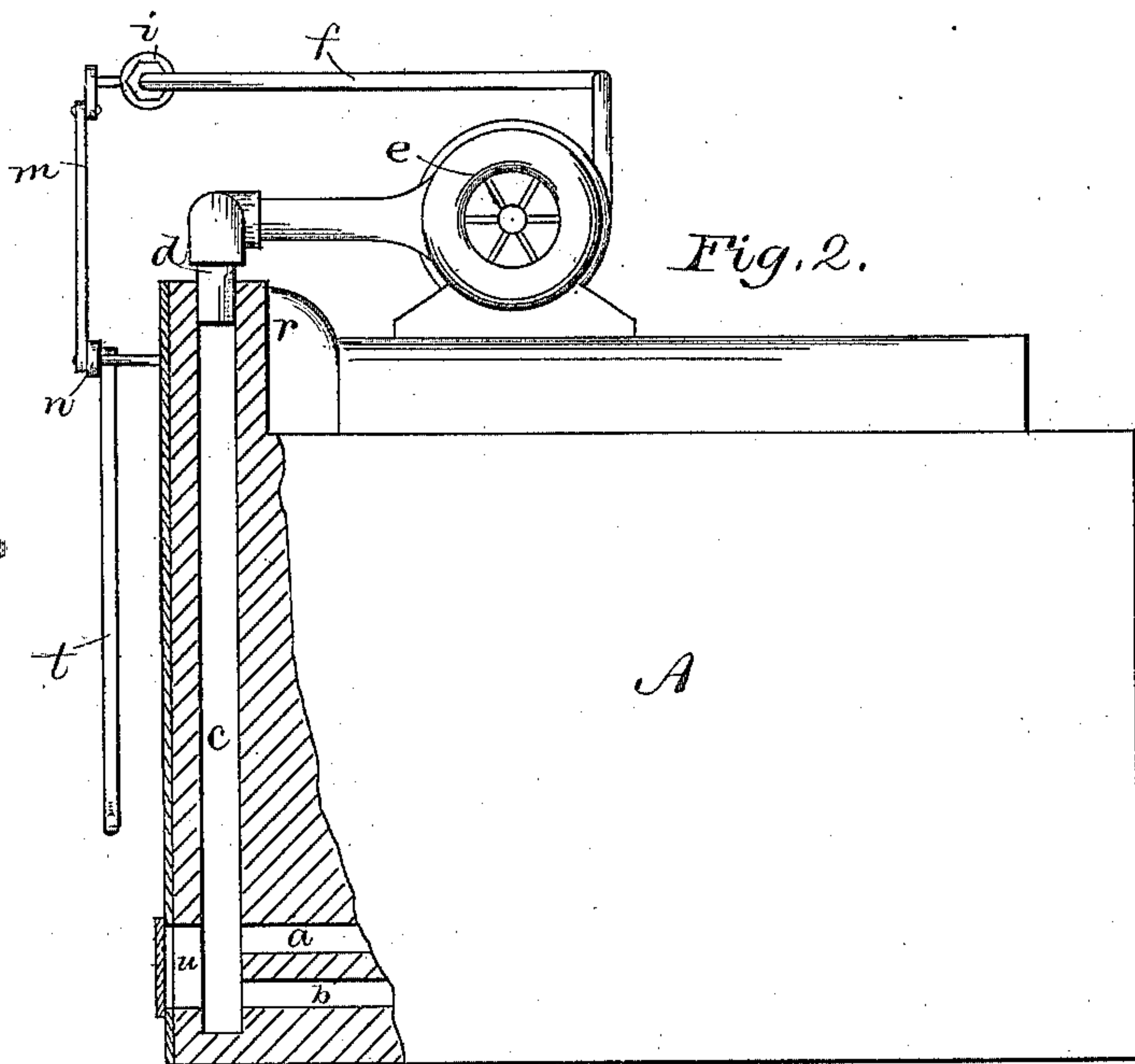


Fig. 2.



Witnesses
a. O. Ome
Fred A. Powell.

Inventor
Kingsbury M. Jarvis
by Crosby & Gregory
Attys.

UNITED STATES PATENT OFFICE.

KINGSBURY M. JARVIS, OF MALDEN, ASSIGNOR TO JARVIS ENGINEERING COMPANY, OF BOSTON, MASSACHUSETTS.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 302,848, dated July 29, 1884.

Application filed March 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, KINGSBURY M. JARVIS, of Malden, county of Middlesex, State of Massachusetts, have invented an Improvement in Furnaces, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention, relating to furnaces, has for its object to control the admission of air or oxygen to combine with the fuel, and also to control the passage for the escape of the products of combustion to the uptake or chimney, so that the said escape or outlet of the furnace will always be proportional to the amount of air admitted, and the furnace will thus always work freely, and the fire will be completely under control of the attendant.

The invention is shown embodied in a furnace substantially such as described in Letters Patent No. 222,631, granted to me December 16, 1879, in which the walls of the furnace are provided with air-heating passages, through which the air is admitted to the combustion-chambers above the fuel on the grate, the said air thus being heated to a high temperature, and combining readily with the partially-consumed gases and smoke arising from the fuel and producing perfect combustion. In my former furnaces the air thus admitted and heated in its passage through the walls has simply been drawn in by the natural draft of the furnace, the said passages having as their inlet merely openings to the atmosphere. In my present invention the said heating-passages are connected with an air-forcing apparatus, shown in this instance as a fan operated by steam in any suitable or usual manner, and the said forcing apparatus and the damper in the flue or passage to the stack have controlling mechanism common to them both, whereby the said damper is opened and a freer exit is afforded to the products of combustion in proportion to the increase in amount of air admitted or introduced by the forcing apparatus.

Figure 1 is a front elevation of a furnace embodying this invention, and Fig. 2 a side elevation thereof.

The furnace A may be substantially the same as in Letters Patent Nos. 176,633, 186,734, 189,862, or 222,631, it being provided with one

or more air-heating passages or ducts, *a b*, in its walls, through which air circulates, and from which it is admitted to the combustion-chamber of the furnace at a high temperature. In the present invention the said ducts *a b* are connected with passages *c*, shown as formed in the front walls of the furnace, and themselves connected with pipes *d*, branching from an air-forcing apparatus, consisting in this instance of a fan-blower, *e*, of any usual or suitable construction, actuated by steam from the steam-pipe *f*. The flow of steam through the pipe *f*, and the consequent speed of the blower and amount of air carried into the pipes *d* and ducts *a b*, is controlled by a cock or valve, *i*, which thus constitutes a draft-controlling device, and is operated by a rod or link, *m*, connected with the actuating-arm *n* of the damper *o* in the escape-flue *r* of the furnace, by which the escape of the products of combustion is controlled. The said damper *o* and cock *i* are thus caused to operate in unison, and are so arranged that they are both opened and closed together, thus increasing or decreasing the passage for the escape of the products of combustion from the furnace in proportion as the amount of air admitted is increased or decreased. The damper and cock are operated by a suitable handle or rod, *t*, connected with the arm *n*, so that the attendant, by a single movement, operates both the damper and the cock by which the introduction of air is controlled.

The invention is not limited to the particular form of apparatus shown, as it is obvious that the air might be forced by other apparatus than the fan-blower, and that the amount of air admitted to the furnace might be controlled by a valve or gate in the pipe leading to the pipe *d*, the essential feature of the invention being that the admission of air and outlet for the products of combustion are controlled in unison, so that they always have the proper relation to one another to insure the proper operation of the furnace. A novel fan-blower especially adapted for this use will form the subject of another application for Letters Patent.

When the present invention is to be applied to furnaces already constructed in accordance with the improvements referred to, the pipes *d* might pass down the outside of the walls of the furnace to the original inlet-opening of the

ducts *ab*. An inlet-opening is preferably provided in the front wall of the furnace, as at *u*, it being provided with a covering-plate, which may be removed if it is desired to work the furnace by natural draft only, or in case the air-forcing apparatus becomes temporarily disabled.

I claim—

1. In a furnace, the smoke-flue and damper therein, air-ducts leading to the fire and separate from said smoke-flue, and an air-forcing apparatus for said ducts, combined with mechanism for controlling the air-forcing apparatus and the damper in the smoke flue or stack common to both, whereby the exit in the smoke-flue is properly proportioned to the admission of air to the fire, substantially as described.

2. The heating-ducts in the walls of a furnace, and fan-blower for forcing air into them, and a cock or valve controlling its operation,

combined with the outlet-flue or uptake and damper therein, and actuating mechanism common to the said damper and controlling cock or valve for the fan-blower, substantially as and for the purposes set forth.

3. In a furnace, the heated air-ducts *c* and an air-forcing apparatus for said ducts, combined with the cock or valve *i*, for controlling the operating medium of the air-forcing apparatus, and the damper *o* in the smoke-flue, both the valve *i* and damper *o* operable by mechanism common to both, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

KINGSBURY M. JARVIS.

Witnesses:

G. W. GREGORY,
W. H. SIGSTON.