(No Model.)

G. P. RANDALL.

HEATING FURNACE.

No. 273,151. Patented Feb. 27, 1883.

Fig. 1.

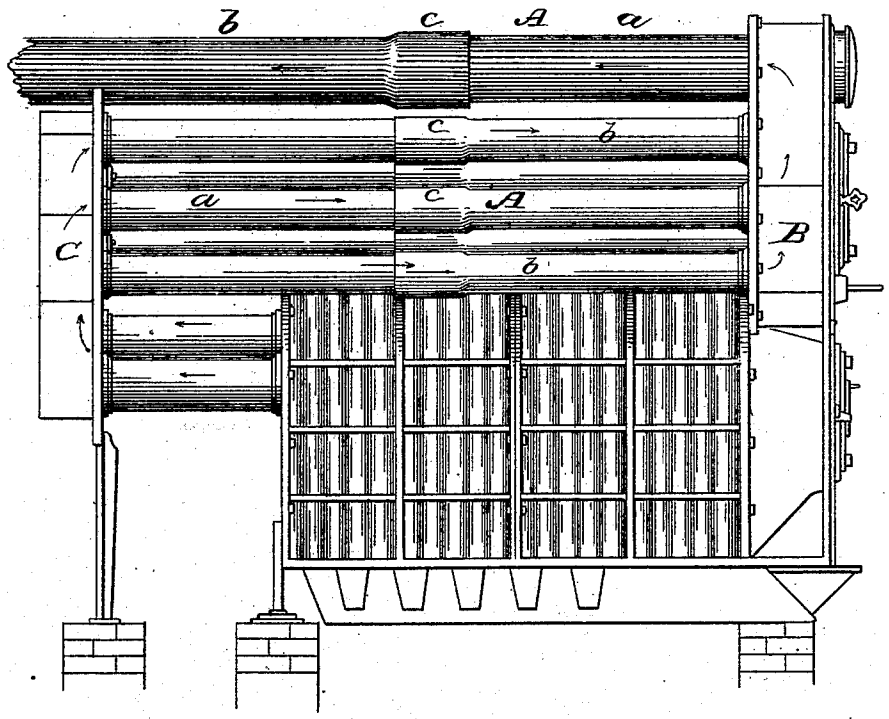
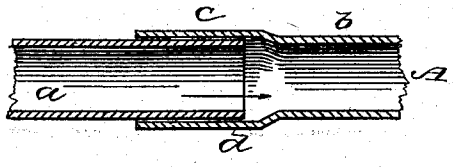


Fig. 2.



Witnesses:
Jas. F. Duhamel.
Walter S. Dodge.

Inventor:
Gurdon P. Randall,
by Dodger Son,
Attys.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GURDON P. RANDALL, OF CHICAGO, ILLINOIS.

HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 273,151, dated February 27, 1883.

Application filed July 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, GURDON P. RANDALL, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Heating-Furnaces, of which the following is a specification.

My invention relates to hot-air furnaces in which cast-iron flues are employed; and it consists in forming said flues in two or more sections and uniting them by a slip-joint, whereby the sections are permitted to move or slide upon one another to compensate for expansion and contraction.

In the accompanying drawings, Figure 1 represents a side elevation of a furnace embodying my improvement, and Fig. 2 a longitudinal central section of one of the flues.

The primary object of my invention is to compensate for the varying expansion and contraction of the flues, and to obviate the straining and loosening of the parts of the furnace consequent thereupon; and with this purpose in view I adopt the construction shown in the drawings, in which—

A represents a flue, which, in the present instance, is made in two sections, *a* and *b*, and united by a sliding or slip joint, *c*, as more clearly shown in Fig. 2. The joint is made sufficiently long to give a proper support to the sections and prevent sagging, besides affording room for all necessary movement of the sections.

In order that there may be no shoulder or contraction in the interior of the flue at the joint the section *a*, which first receives the smoke and products of combustion, is made without enlargement or contraction, and inserted into an enlarged mouth or end, *d*, of section *b*, as shown, by which arrangement I am enabled to construct the flue of one uniform diameter throughout its length. If preferred, however, a slight contraction of the pipe or section *a* may be made; or its thickness may be reduced in the portion which enters into and constitutes a portion of the sliding joint, and thus both the inner and outer surfaces can be made uniform throughout.

The flues will be arranged in any usual or well-known manner, connecting with the front and rear sections, B and C, which will be tied together by bolts or tie-rods running parallel with the flues, as is customary in this class of furnaces. The flues may be made in three or more sections, if preferred, though ordinarily two will be found sufficient. Besides allowing for expansion and contraction, the construction herein described and shown enables the flues to be cast sufficiently thin without difficulty, and, in case of breakage, they may be replaced at less cost than those made all in one piece. By forming the enlarged mouth upon the section *b* the smoke and gases are carried beyond the end of said section before reaching the joint or space between the sections, hence will be carried forward by the draft instead of working out through the joint.

I am aware that a damper has been formed by arranging one part of a smoke-flue to slide upon another, and providing the movable part with suitable operating devices; that the tie-rods by which the ends of a furnace are held together or in place have been left slack or the nuts moved back to allow for expansion and contraction of the flues; that furnace-flues have been made in sections to permit the renewal of one section independently of the other, the joint being, however, a tight one; and, finally, that a smoke-box has been connected with the fire box or chamber of a furnace by short tubular necks of the former encircling similar short necks formed on the latter, the whole surrounded by a sheet-metal tube, and the intervening space filled with clay or sand. I do not claim any of these constructions. By my construction the flue-sections, while joined to the end sections or heads of the furnace in the usual manner, are free to slide one upon the other, and thus to compensate for expansion and contraction of the flues, although the heads or end sections are tied together by tie-rods in the usual manner.

Having thus described my invention, what I claim is—

1. A furnace-flue composed of two or more sections of like internal diameter, one of said

sections being formed with an enlarged end or socket to fit around or upon the end of the adjoining section, and of such diameter as to permit the inserted end to move freely in and out.

2. The combination, in a furnace, of the front and rear sections, B and C, and the intermediate flues, A, consisting of sections *a b*, united by freely-sliding joint *c*, all substantially as shown and described.

GURDON PAINE RANDALL.

In presence of—
NEWTON A. PARTRIDGE,
JOHN HUTCHINSON.