

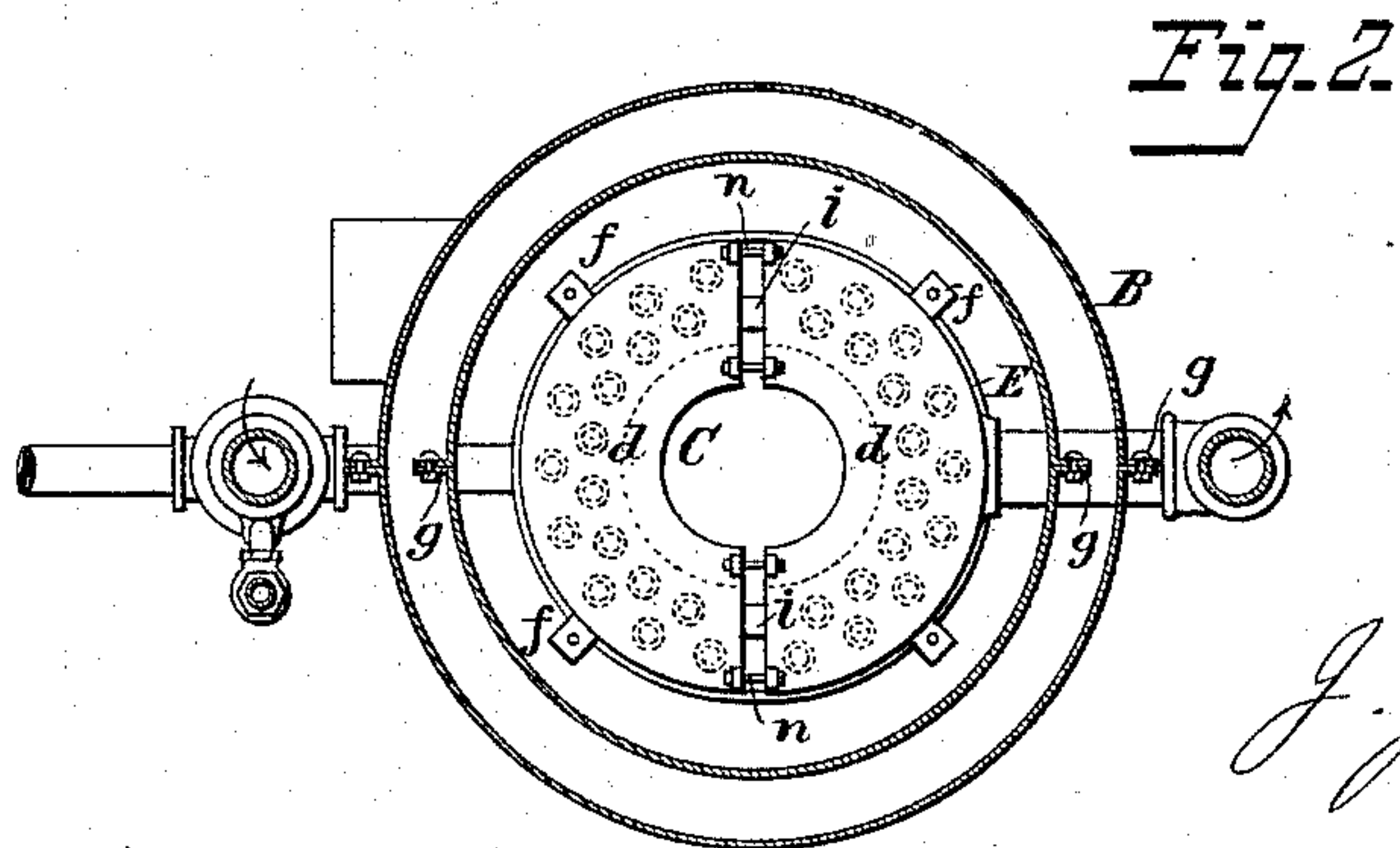
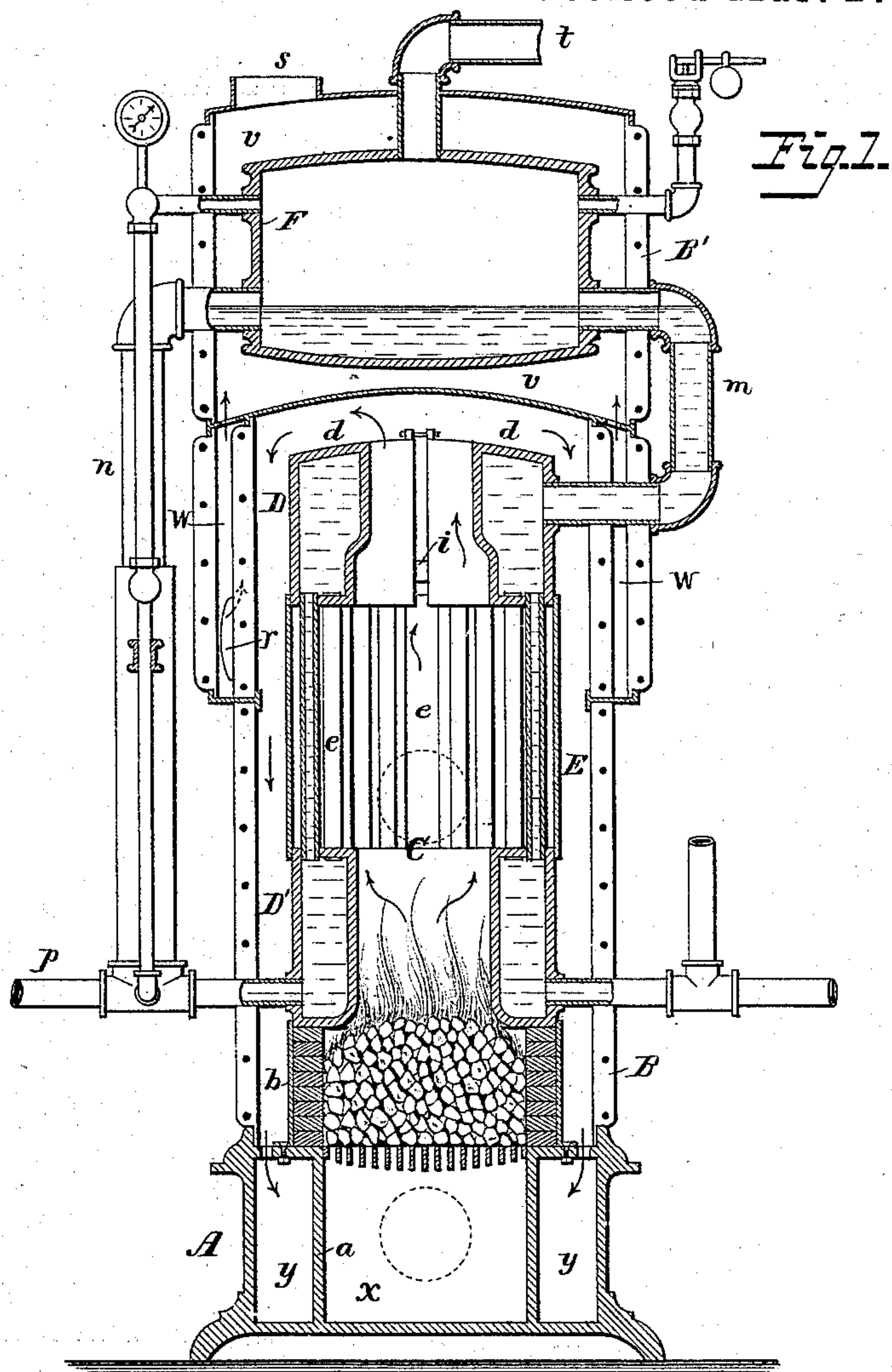
(No Model.)

J. JOHNSON.

HEATER.

No. 274,785.

Patented Mar. 27, 1883.



Attest:
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UNITED STATES PATENT OFFICE.

JONATHAN JOHNSON, OF LOWELL, MASSACHUSETTS.

HEATER.

SPECIFICATION forming part of Letters Patent No. 274,785, dated March 27, 1883.

Application filed November 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN JOHNSON, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Heaters, of which the following is a specification.

My invention relates to that class of heaters in which radiators are supplied with steam or hot water from a furnace; and my invention consists in constructing the furnace, as fully described hereinafter, to reduce its cost and secure increased strength and efficiency.

In the drawings, Figure 1 is a sectional elevation of a portable heater illustrating my improvements. Fig. 2 is a transverse section.

I have shown my invention in connection with a portable heating apparatus adapted to be sold as a completed article for application in cars, dwellings, &c.; but the devices shown and hereinafter described may be employed in what are known as "stationary" furnaces.

The base A is constructed in any suitable manner, as shown, and is of cast metal divided by an annular partition, *a*, into an ash-chamber, *x*, and a combustion-chamber, *y*, which communicates with the flue.

The fire-pot *b* is contained within an outer casing, B, and supports or is below the generator or boiler C. The general form of the boiler is that shown in the Letters Patent granted to me February 7, 1882; but the casings D at the top and bottom, instead of being annular, as in said boiler, are segmental, or of such form that when the sections are put together they will constitute annular casings. Thus each casing D, as shown, consists of two hollow segments, *d d*, connected by series of vertical pipes, *e*, to similar segments constituting the lower casing, D', the adjacent segments being connected by short pipes or nipples *i*, so that water or steam can circulate freely from one to the other. An auxiliary connection may be effected by bolts *n*, passing through lugs on the opposite segments, and the segments of the upper casing may have lugs *f*, by which to suspend it. By thus forming the boiler of connected sections I am enabled to readily repair any part without replacing the whole, while the loss from imperfect casting is reduced, only such portion of a casing as is imperfect being discarded.

It will be seen that there are two series of vertical pipes *e*, one outside of the other. This not only affords additional heating-surface, but retains the gases longer in contact, preventing them from escaping before their heat is abstracted.

In the boiler described in the aforesaid patent the upflowing gases were confined by the outer casing of the furnace. This prevented a downdraft. I therefore combine with the casings and their tubes *e* a cylinder, E, overlapping each casing and covering the tubes, so that the gases can pass between the tubes and cylinder, but cannot escape laterally beyond the cylinder, but must pass outward at the top, whence they can pass downward between the boiler and the outer body, B, to the combustion-chamber *y*. By this means the gases, while hottest, are retained in contact with the boiler, where the greatest heat is required, and thence pass in contact with the cylinder B, which is heated without being overheated, as was liable to be the case heretofore.

To secure increased strength for the outer cylinder, facilitate the building of the heater, and the repairs thereof, I make the said cylinder in two or more curved sections, each with vertical edge flanges, *g*, which are bolted to the like flanges of the adjacent section, forming vertical strengthening-ribs and facilitating the building and dismemberment of the structure. The inlet and outlet pipes communicating with the boiler pass through openings at the points of separation of the sections of the body B, so that the section can be removed without detaching the pipes from the boiler.

With the parts constructed as set forth may be combined an air-heater, consisting of a second cylinder, B', preferably constructed like the cylinder B, larger than and overlapping the latter, to form an intermediate air-chamber, *w*, and extending above the top of the body B, and inclosing an air-chamber, *v*, within which is situated a tank, F.

The tank F is in communication with the upper casing, D, by a pipe, *m*, and with the lower casing, D', by a pipe, *n*, which also communicates with the water-inlet pipe *p*, and cold air is admitted to the chamber *w* through an opening, *r*, and the heated air escapes through an outlet, *s*. The water is maintained at the level of the pipes *m n* in the tank F, so that

the boiler is always full and cannot burn out, while the steam escapes through the pipe *t*. By this construction I secure the heating of a large volume of air for use outside of the furnace, I maintain the boiler full of water without interfering with the circulation, secure a convenient chamber for the separation of the water and steam, so that no foam can enter the steam-pipes, and yet maintain the compact character of the apparatus, especially desirable in portable heaters.

The apparatus is supplied with the usual gages, indicators, and regulators.

I claim—

1. The boiler consisting of casings *D D'*, composed of separate hollow segments communicating by tubes, and vertical pipes *e*, substantially as set forth.

2. The combination of the casings *D D'* and pipes *e*, arranged in concentric series, as specified.

3. The combination of the casings *D D'*, pipes *e*, and cylinder *E*, substantially as set forth.

4. The combination of the boiler consisting of casings, tube and surrounding cylinder, and the body-casing *B*, and combustion-chamber *y*, communicating with the flue, as set forth.

5. The combination of the boiler, body *B*, separating tank *F*, surrounding air-casing *B'*, having air inlet and outlet, and pipes *m'n*, extending from said tank to the upper and lower casings of the boiler, substantially as set forth.

6. The body-cylinder consisting of bent sections having edge flanges, *g*, connected as set forth, and inlet and exit pipes extending through openings formed in the lines of separation of said sections, substantially as set forth.

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

JONATHAN JOHNSON.

Witnesses:

J. N. MARSHALL,
JOHN B. BROWN.