(No Model.)

S. F. COLLINS.

HOT WATER APPARATUS.

No. 354,305. Patented Dec. 14, 1886.

Fig. 2.

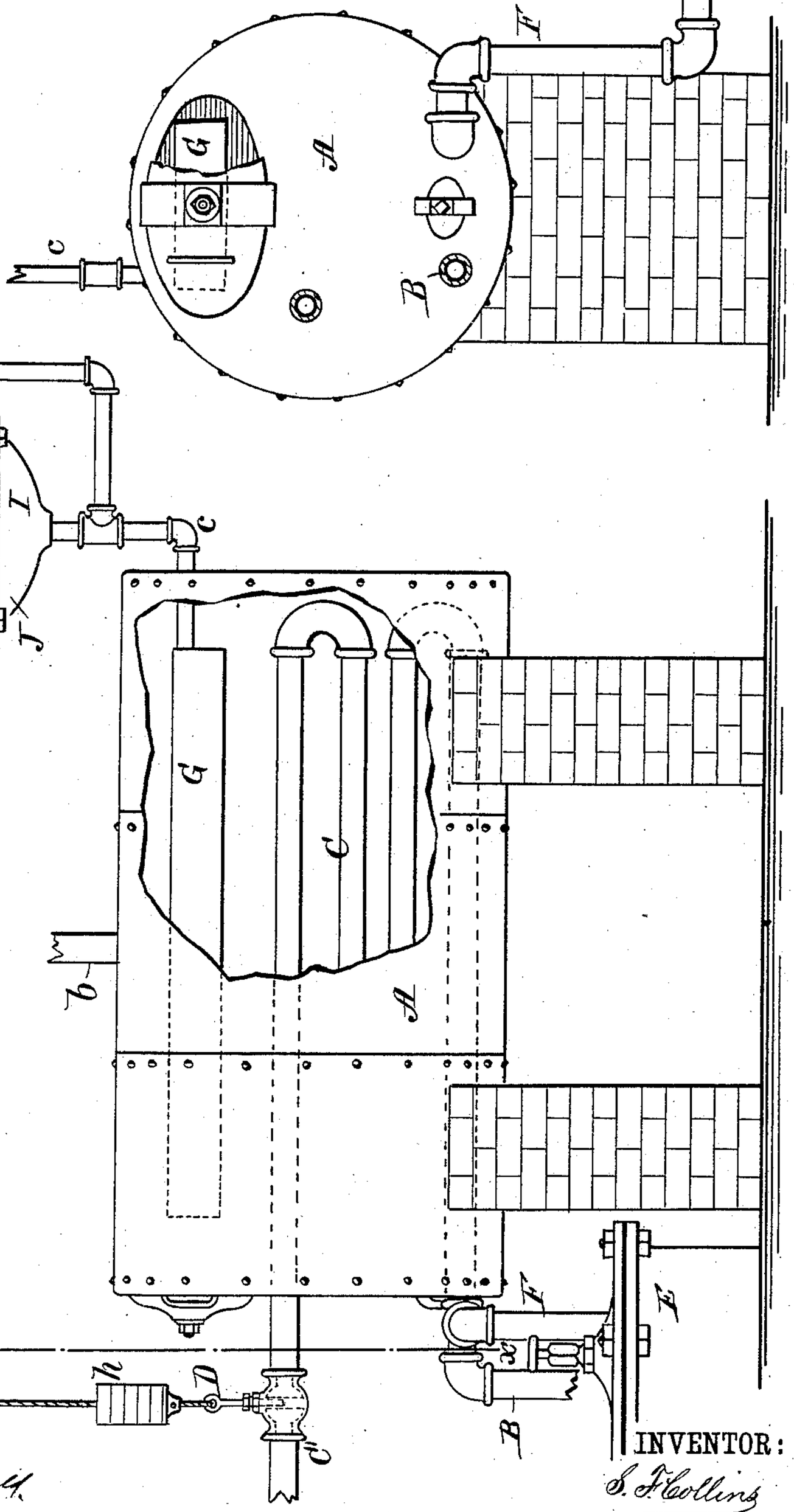

Fig. 1.

WITNESSES:

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SAM. F. COLLINS, OF BINGHAMTON, NEW YORK.

HOT-WATER APPARATUS.

SPECIFICATION forming part of Letters Patent No. 354,305, dated December 14, 1886.

Application filed April 14, 1886. Serial No. 198,812. (No model.)

To all whom it may concern:

Be it known that I, SAM. F. COLLINS, of Binghamton, in the county of Broome and State of New York, have invented new and useful Improvements in Hot-Water Apparatus, of which the following is a full, clear, and exact description.

This invention relates to attachments for boilers or vessels from which frequent drafts of hot water have to be taken, and in which it is desirable to keep the water at a uniform or given temperature, that may either be above or below the boiling-point.

The invention is not restricted to use in connection with any particular form of boiler or vessel, nor to any special application of its use, whether for domestic purposes, including the supplying of hot water to bath-tubs, wash-sinks, laundries, kitchens, and other places where hot water is used, or otherwise.

In apparatus of this kind it is usual to heat the water, which is fed into the water heater or boiler as required, by passing a current of steam derived from another boiler through the body of water in said heater—as, for instance, by circulating the steam through a coil of pipes therein. Whenever such apparatus is used there is usually much trouble in keeping the water in the heater at a uniform temperature, owing to the irregular drafts made upon the same, the irregular influx of cool or feed water thereto, and the varying temperature or irregular supply of the steam used in heating the body of water in the heater, and in some cases it has required almost the constant vigilance of an attendant to regulate the heat of the water by turning the steam on and off, otherwise when drawing from the heater either water much too cool, or steam, instead of water, is discharged from the heater.

My invention consists in a combination, with an apparatus of the above description, of certain means, substantially as hereinafter described, and pointed out in the claims, for automatically regulating the heat of the water in the boiler or vessel from which the drafts of hot water are made.

Reference being had to the accompanying drawings, Figure 1 represents a side elevation, partly broken away to show the interior of a hot-water-supply apparatus with my invention applied; and Fig. 2 is an end elevation of the same, parts being shown in section, upon the line *x x* in Fig. 1.

A indicates the water heater or boiler, from which the drafts of water are made, as by a pipe, *b*.

B is the pipe for supplying cool or feed water from any suitable source to the vessel A, and C is the usual steam-coil within the body of water in said vessel or heater for heating the water in said vessel.

C′ is the pipe for supplying live steam to the coil C, and D the valve, which should be a counterweighted one of suitable construction, for turning on and shutting off the steam.

E is the usual or any suitable steam-trap for discharging the water of condensation from the coil C, with which it is connected by the pipe F.

Arranged inside of the water-heater A is a closed expansion water chamber or receptacle, G, of suitable capacity, which may be a pipe coiled or straight or of any other desired form. This receptacle G is connected by a pipe, *c*, with a stand-pipe, H, having a suitable valve or cock, *d*, with a box or case, I, having a rubber or other elastic diaphragm, J, below the level of the top of the filling-pipe H, and upon or in a cup on which rests a spindle, *s*. This spindle carries weights *e*, and is connected—as, for instance, by a cord or chain, *f*, passing over pulleys *g*—with the valve D, and the connection carries a weight or weights, *h*, counterbalancing the weights *e* over the diaphragm J.

The operation of the invention is as follows: The valve *d* is opened and water poured down the stand-pipe H to fill the receptacle G and stand-pipe H till the box or case I is charged with water up to a level with the diaphragm J. The valve *d* is then closed. Thus, whenever the water in the heater A arrives at its required maximum temperature and the water in the receptacle G becomes correspondingly or highly heated, the water in said receptacle G expands so as to relieve the pressure of the weights *e* upon the diaphragm, and by the motion thus given to the connection between the diaphragm J and the valve D, aided by the counter-balance *h*, said valve D is closed and steam shut off from the coil in the heater A. On the other hand, as the water cools in the heater and in the expansion water-receptacle

G therein, the water in the receptacle G will contract, the diaphragm J will be relieved of pressure, and the weights *e* over the diaphragm will descend. This will cause the valve D to open again, and so turn on the steam to the heater. In this way the valve D is automatically opened and closed to keep up a uniform temperature in the generator A, and after the apparatus has been once set or regulated by adding to or taking off weight from over the diaphragm, according to the degree of temperature required, no further attention is necessary.

I claim—

1. The combination, with the hot-water heater and a steam-heating attachment therefor, of a closed liquid containing receptacle within the heater, a pipe leading outward through the heater from said receptacle, a flexible diaphragm at the outer end of said pipe, a filling-pipe for the closed receptacle extending above the level of the said diaphragm and provided with a cock or valve, a valve controlling admission of steam to the steam-heating attachment, and intermediate mechanism connecting said valve and diaphragm, substantially as set forth.

2. The combination, with the vessel A and the steam-heating attachment C C′, of the closed water-receptacle G, the stand-pipe H, the valve *d*, the box or case I, the elastic diaphragm J, the spindle *s*, the weight or weights *e*, the connection *f*, the weight or weights *h*, and the valve D, controlling admission of steam to the heating attachment, essentially as and for the purpose herein described.

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Witnesses:
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