(No Model.)

G. R. RICKETTS.

BOILER FURNACE.

No. 256,051. Patented Apr. 4, 1882.

Fig. 1.

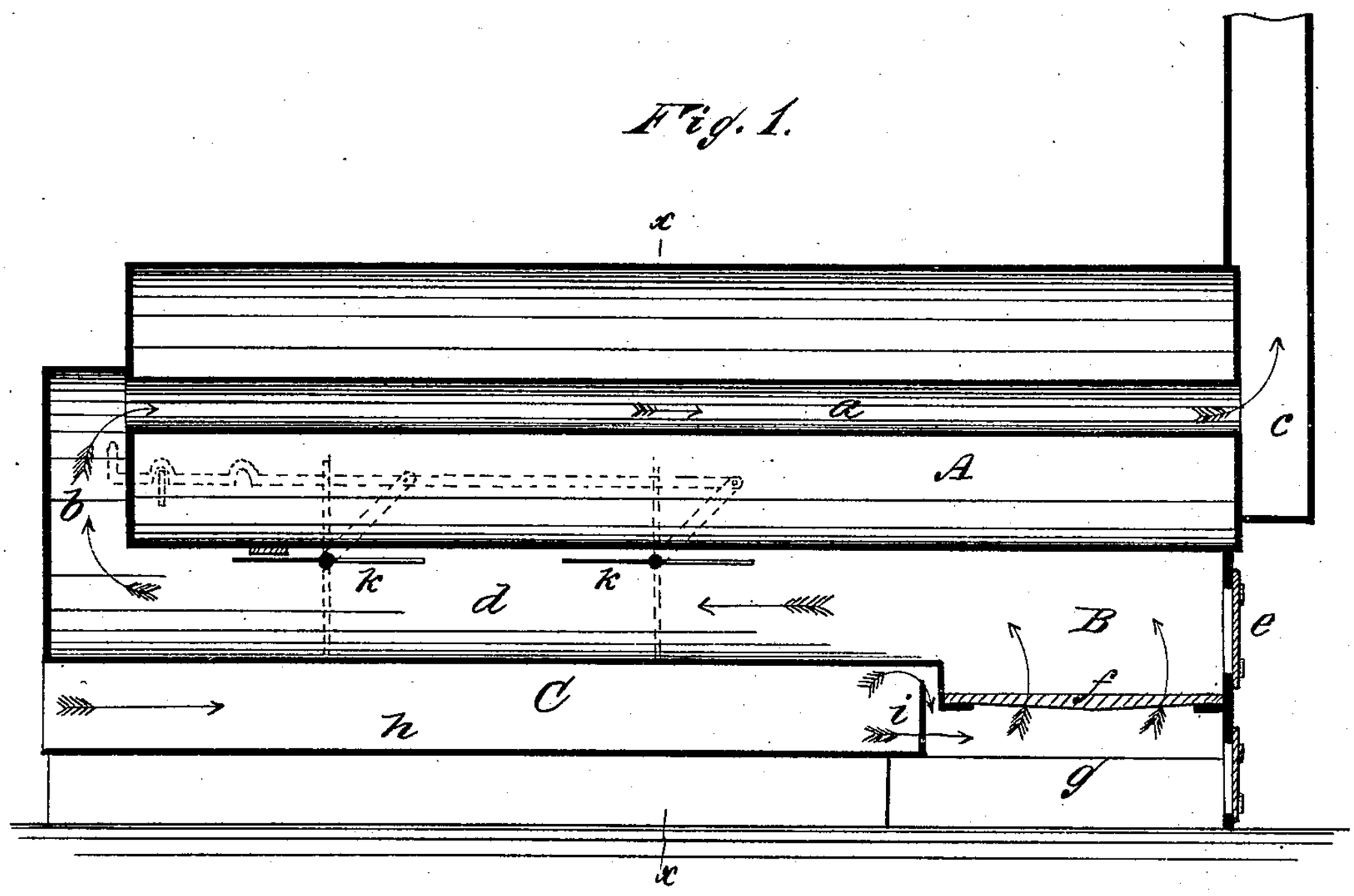
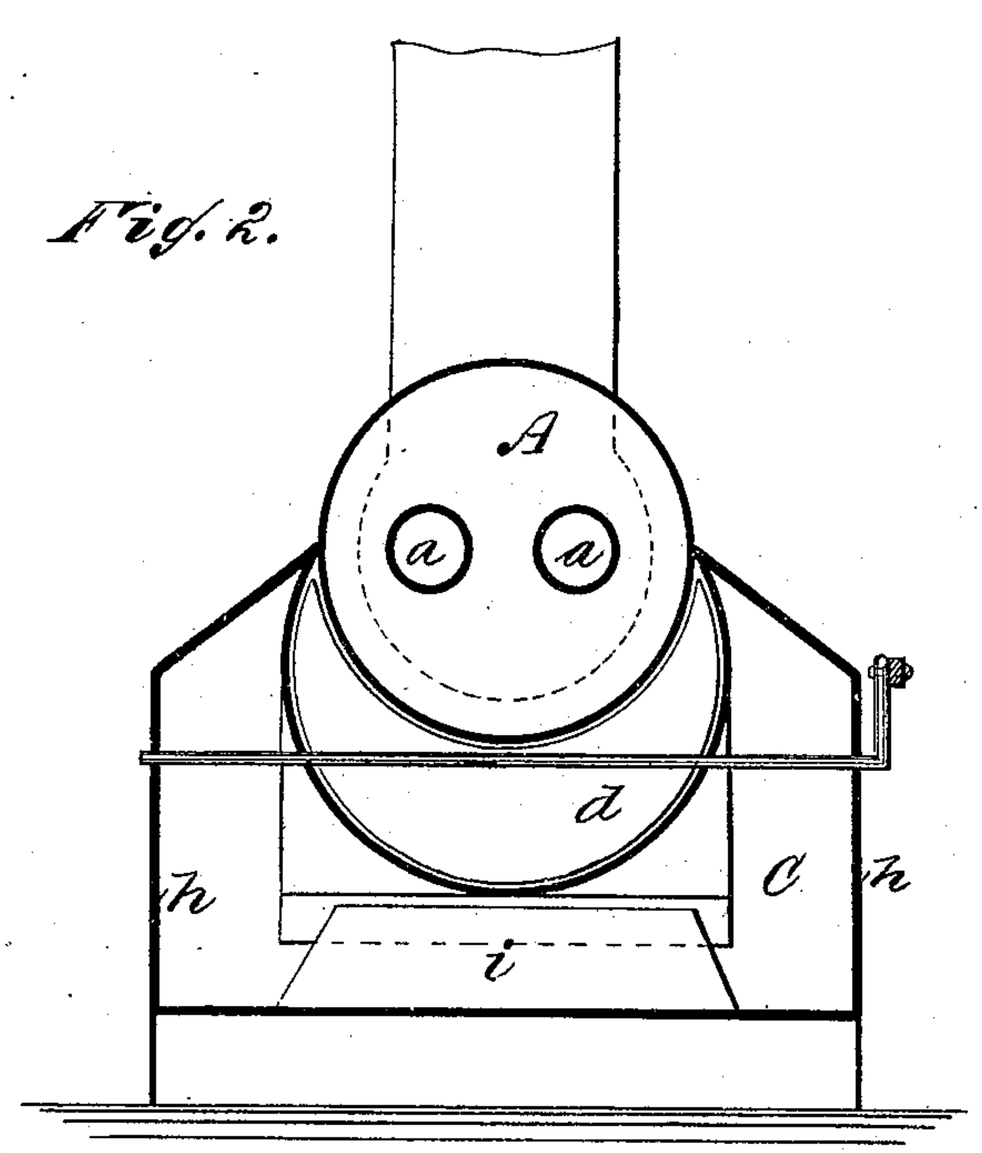


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GERARD R. RICKETTS, OF PROCTORVILLE, OHIO.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 256,051, dated April 4, 1882.

Application filed October 10, 1881. (No model.)

To all whom it may concern:

Be it known that I, GERARD R. RICKETTS, of Proctorville, in the county of Lawrence and State of Ohio, have invented a new and useful Improvement in Boiler-Furnaces, of which the following is a full, clear, and exact description.

The object of my invention is to obtain perfect combustion of fuel in furnaces, and consequently to insure economy of fuel.

The nature of the improvement consists in heating the air supplied to the fire-box, utilizing for that purpose the waste heat of the furnace, and also detaining the smoke and gases until they are consumed, for which purposes the furnace is constructed as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical longitudinal section of a boiler and furnace embodying my invention, and Fig. 2 is a vertical transverse section of the same.

A is the boiler, provided with flue-tubes *a*, connecting the smoke-box *b* at the rear with the uptake *c* at the forward end in the usual manner.

B is the fire-box, connected by flue *d* beneath the boiler with the smoke-box *b*, and provided with doors *e*, for use when required.

f are the grate-bars, and *g* the ash-pit, having a door for closing it tightly.

The furnace-shell is surrounded by an outer shell or casing, *h*, by which a space or flue, C, is formed at the sides and bottom of the furnace, communicating at the front with the ash-pit *g*, where the inlet is narrowed by a deflecting plate or bridge, *i*. At the rear the shell is open for the free admission of air.

k k are deflectors, arranged in the flue *d*, for the purpose of directing and forcing down the heated products of combustion upon the shell of furnace, so as to impart thereto the heat necessary to warm the air coming through the flue C. The shafts to which these deflectors are attached are provided or connected with means by which they may be held at any desired adjustment. These deflectors serve also as dampers by which the draft may be regulated.

In operation the doors of the fire-box and ash-pit are kept closed, except when it is necessary to supply fuel and remove ashes, and the fire is supplied with air by the flue C alone. The air entering the flue C becomes heated by contact with the furnace-shell and by the heat radiated therefrom, so that it enters the ash-pit in a condition for insuring combustion without check. The deflectors *k* act to detain the smoke and gases until they are consumed, and the heated products will pass off at an intense and uniform heat.

The shell *h* being of large capacity, an adequate supply of heated air is insured at all times. The open end may be curved forward and outward for obtaining stronger draft on steam-vessels when the headway is liable to create back-draft.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

The combination, with the boiler A, having tubes *a*, opening into the uptake *c*, and the dampers *k k*, of the fire-box B, connected by a flue, *d*, controlled by said dampers, with a smoke-flue, *b*, communicating with tubes *a*, and the outer shell having a flue, C, open at the rear and connecting at front with the ash-pit *g*, whereby the air enters flue C, is heated from the shell of furnace to thoroughly ignite the fuel in the fire-box, and then passes with the products of combustion through flue *d*, smoke-flue *b*, and tubes *a* to the uptake *c*, as shown and described.

GERARD ROBINSON RICKETTS.

Witnesses:
CORY I. BUSH,
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