(No Model.)

T. KIRKWOOD.

GRATE FOR FURNACES.

No. 388,204. Patented Aug. 21, 1888.

Fig. 1.

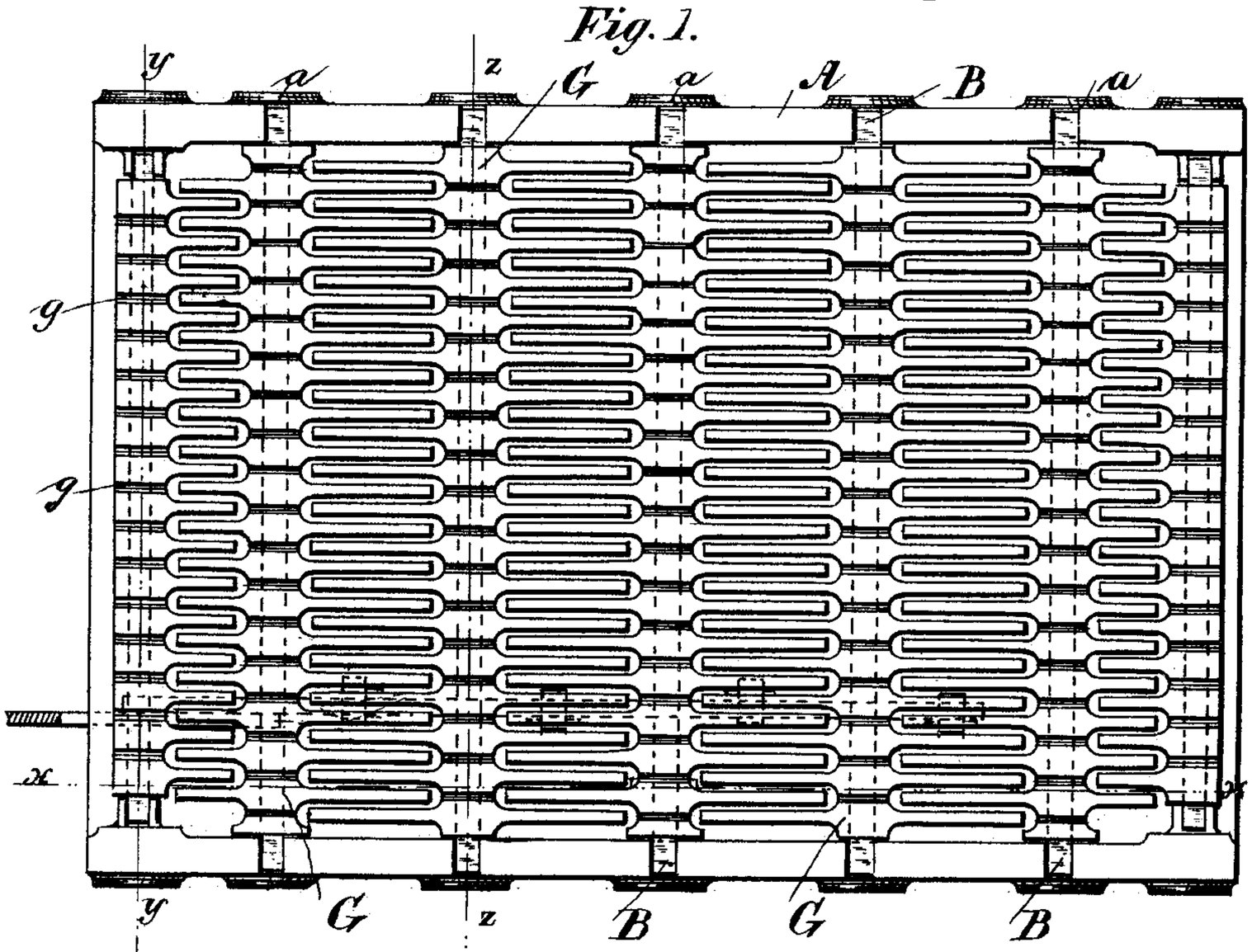

Fig. 2.

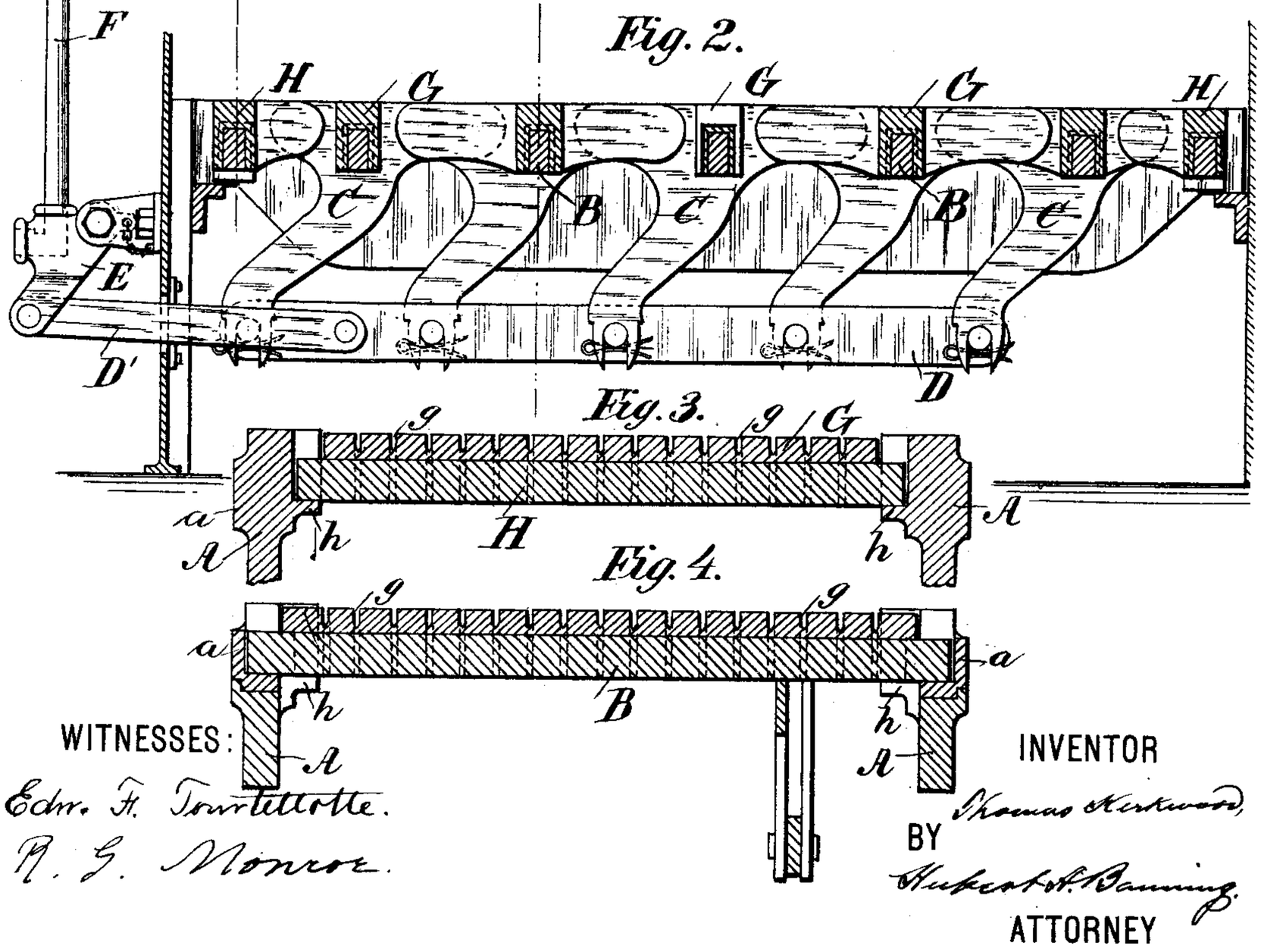

Fig. 3.

Fig. 4.

WITNESSES:

Edwr. F. Tourtellotte.

R. G. Monroe.

INVENTOR

Thomas Kirkwood,

BY Burton & Banning.

ATTORNEY

UNITED STATES PATENT OFFICE.

THOMAS KIRKWOOD, OF NEW YORK, N. Y.

GRATE FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 388,204, dated August 21, 1888.

Application filed November 4, 1887. Serial No. 254,288. (No model.)

To all whom it may concern:

Be it known that I, THOMAS KIRKWOOD, a citizen of the United States, and a resident of the city of New York, county and State of New York, have invented certain new and useful Improvements in Grates for Furnaces, of which the following is such a full, clear, concise, and exact description as will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

In grates for furnaces where the supporting-bars and projecting fuel-bars were formed together in a single homogeneous casting there was no provision for the separate disconnection of the respective fuel-bars, and the breaking or burning out of one or more of the same involved the renewal of an entire section. To avoid this difficulty, and also prevent injury by the expansion and contraction of the metal nearest the fire, grates were also made with separate supporting or cross bars, upon which were placed or secured independent and disconnected fuel-bars; but such construction was troublesome and expensive to manufacture, involving the use of many patterns, and even after such bars were cast much time was spent in fitting and adjusting them upon the cross-bars. Especially in shaking-grates, where the projecting fuel-bars of adjacent sections alternated and interlapped and a nice adjustment was required, was this fitting of the separate independent fuel-bars a serious item in the cost of construction.

The object of my invention is to overcome the defects in operation and difficulties in construction heretofore experienced, and at the same time produce a more efficient grate. To accomplish these objects, I cast the fuel-bars in connected series with suitable intermediary grooves, such series being preferably cast directly upon the cross-bars, which act as chilled cores; and my invention consists in the construction and arrangement of the various parts, as hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a shaking-grate embodying my improvement. Fig. 2 is a longitudinal section of the same, taken on the line *x x* of Fig. 1, cutting one of the intermediary grooves, the form of the grooves on other sections being indicated by dotted lines, and showing in side elevation shaking attachments such as have hitherto been used. Fig. 3 is a vertical cross-section, taken on the line *y y* of Fig. 1, showing in section fuel-bars with intermediary grooves and resting upon end bar; while Fig. 4 is taken on the line *z z* of Fig. 1, and shows similarly-formed fuel-bars upon supporting cross-bar.

The side bars, A, of the grate are shown as formed with bearings, in which are slotted trunnions *a* for receiving the ends of the cross-bars B, which bars are provided with rocking plates C, connecting with the general oscillating bar D, and operated through the link D′ and lever E by the shaker-handle F, in the ordinary manner.

Near the ends of the side bars are lugs or seats *h*, for receiving the end bars, H, and upon the cross-bars and end bars are the fuel-bars G, formed in series with intermediary grooves, the said fuel-bars being preferably cast upon the respective cross and end bars, which during the casting act as chilled cores for the metal which forms the fuel-bars.

The grooves *g* form dividing-lines between adjacent fuel-bars, and should be of sufficient depth to permit of the separation of such bars one from another, and preferably terminate their depth in a wedge or V shaped form and extend vertically as well as horizontally between the bars.

In a grate so formed the intermediary grooves afford draft-spaces, reducing the dead area of the floor, as well as allow space for the contraction and expansion of the metal nearest the fire; and when a fuel-bar becomes broken or burned out the said grooves form a dividing-line along which the imperfect bar may be broken off from the adjacent connecting-bars and a new bar substituted; also, being cast in series, few patterns are required, a proper relative position of the respective bars secured, and the interlapping sections properly adjusted. Moreover, when the end and cross bars are used as cores and the fuel-bars cast thereon, the molten iron poured into the mold and striking against the cold iron core becomes chilled, and a denser and more durable casting is secured,

while at the same time a snug fit is made and the adhesion of the parts effected, thereby tending to overcome dangers of warping.

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

1. In a grate for furnaces, the combination, with supporting cross-bars, of fuel-bars formed in series with intermediary or dividing grooves *g*, whereby said fuel-bars are adapted to be separated, substantially as set forth.

2. In a grate for furnaces, the combination, with supporting cross-bars B, of the fuel-bars G, cast onto the said cross-bars and formed in series with intermediary dividing-grooves *g*, whereby the said fuel-bars are rigidly attached to the said cross-bars and are adapted to be separated, substantially as set forth.

THOMAS KIRKWOOD.

Witnesses:

HUBERT A. BANNING,

R. G. MONROE.