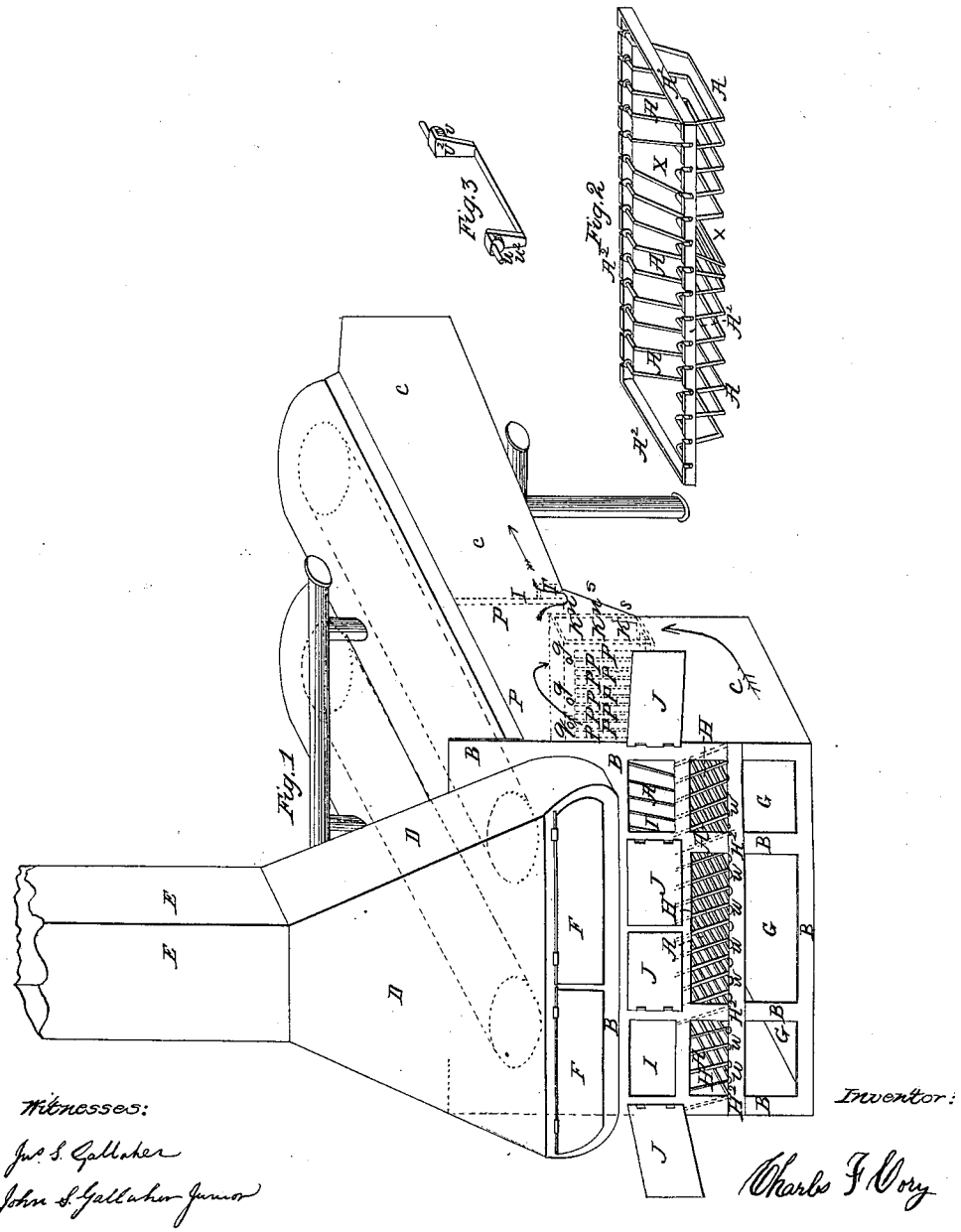
C. F. Cory,

Furnace Grate.

No. 29,248. Patented July 24, 1860.



Witnesses:

Jno. S. Gallaher

John S. Gallaher Junior

Inventor:

Charles F. Cory

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES F. CORY, OF LEBANON, ILLINOIS.

IMPROVED FURNACE-GRATE.

Specification forming part of Letters Patent No. **29,248**, dated July 24, 1860.

To all whom it may concern:

Be it known that I, CHARLES F. CORY, a resident of Lebanon, in the county of St. Clair and State of Illinois, have invented, made, and used certain new and useful Improvements in Grates of Furnaces for Steamboats and for other Purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of a furnace. Fig. 2 is a representation of the fire-grate with swinging or moving bars. Fig. 3 represents a single swinging or moving bar detached.

The nature of my improvements to be comprehended and embraced in this present specification consists in constructing the grates of furnaces of swinging, pendently-movable, and detachable grate-bars, as shown at A A A A, Figs. 1 and 2, and by the use or employment of such a construction of grate-bars, and the peculiar arrangement thereof within a furnace brings about several most important results, as will be hereinafter briefly set forth.

In Fig. 1 at B B B is indicated the front wall of the furnace, and at C C C the sides, at D D a flue, at E E the smoke-stack or escape, and at F F the doors or openings of the flue. At G G G are indicated the lower openings of the ash or cinder bed or receptacle, and at H H H are indicated the middle or draft openings into the grate A A A, and at I I I are indicated the outside and at J J the middle openings of the fire-place or furnace, the ones at I I having their doors shown as opened and the ones at J J with their doors closed.

In Fig. 1 (indicated at *k k k* in dots) is designed to be used a hollow apartment, formed of metal, brick, or stone, the bottom L being formed with a longitudinal opening or throat *m*, the back *n n n* being solid, the front *o o o* being formed of a series of openings P P P P P, more or less in number and of any size or form found most suitable, while the top *q q q* is closed, and at the double row of dots *r r* is indicated a vertical diaphragm wall or partition in the rear of the hollow chamber or apartment *k k k*. This diaphragm wall or partition extends downwardly to within four or five inches of the sloping back *s s*, and about five or six inches from the back *n n n*. Immediately in the rear of the wall or partition *r r* is a low ridge wall or break-back T, about five or six inches high and from five to six inches from the wall or partition *r r*.

In Fig. 2 is represented the swinging, movable, detachable grating, the bars A A A A A being arranged in suitable metal frame A^2 A^2 A^2 A^2, formed with a succession of notches or slots at equal distances, of one or more inches apart. This frame being inserted or arranged within the fire-place of the furnace, the swinging, movable, detachable bars A A A A A are pendent therefrom, their ends resting in the slots of the frame. The bars are designed to be cast or formed with collars or shoulders U U and of the form represented in Fig. 3, the elbows U^2 U^2 being shaped broad above and tapering or sloping in wedge shape, as respresented in Fig. 3, though I claim no especial shape.

The advantages claimed for my improved fire-grate are several. In all furnaces heretofore constructed and used it has generally been required that the grate be nearly if not quite filled with coal from the bottom of the bars to the top of the grate, and the draft or current of air supplying the oxygen to induce combustion entered, or was introduced beneath the grate-bars, the grate being entirely inclosed in front, the draft being introduced through the ash or cinder receptacle at G G G. This consequently made a very strong draft and caused a most rapid deposit of cinders or partly-decomposed coal, as the cold current rushing in would chill or cause the lower portion of the coal to cool and die out, and thereby requiring repeated stirring up and renewal of the fuel in the grate, with a rapid accumulation of dead coal and ashes and consequent loss of volume of heat; but by my construction and arrangement of grates for bituminous coal a saving of at least fifty per cent. in consumption of fuel is brought about, affording a more economical supply of heat, with greater volume from a given quantity of fuel. In the use of my improvements I also require from one to two persons less in number to attend the fires of a furnace, while the usual most injurious overheating exhausting duties required of the attendants of the furnace are greatly diminished, all of which advantages are brought about in the following manner: In firing up a furnace a quantity of dead

coal or clinker or other vitreous substance devoid of carbon may be deposited in the grate and a supply of coal placed on the top thereof and ignited, the doors J J J J being closed, while the current or draft supplying the oxygen enters the openings H H H, and passing into the grating A A A through the incombustible deposits on the bottom of the grate causes a most regular, equable, steady, and perfect combustion, producing the least possible deposit of cinders or ashes and requiring much less frequent renewal or replenishing of the fire with fuel. Again, too, from the fact of the volume of fire or bed of coals half the depth of the grate, a most important result ensues, whereby the fireman or attendant is not at all incommoded or overheated or exposed to the intense heat of the fire, as is ordinarily the case in supplying or replenishing the fires of furnaces, and the necessity of stirring up the coals and shaking the grate by opening the doors of the furnace is obviated, instead of which the attendant or fireman uses a rod or poker by resting it in the notches *w w w w* of the cross-strip H^2 H^2 H^2 of the furnaces, the notches answering rests or fulcrum places for the rod or poker. Again too, when found necessary to clean out the grate in the event of choking up with clinkers, the grate-bars being pendently swinging and movable right and left and up and down, the grate can be most readily cleaned by pressing or opening out the bars A A A or spreading them apart, as represented at X X, Fig. 2, and by such a form of and arrangement and use of grate-bars the bars cannot burn out so soon as in the ordinary kind of fixed grating.

Having set forth, shown, and described the nature, construction, adaptation, and advantages of my improvements in grates for furnaces, what I desire to secure by Letters Patent of the United States, and what I claim, is—

The construction and arrangement of pendent, swinging, movable, and detachable grate-bars and grates for furnaces, substantially as herein set forth, shown, and described.

CHARLES F. CORY. [L. S.]

Witnesses:

JNO. S. GALLAHER,

JOHN S. GALLAHER, Jr.