

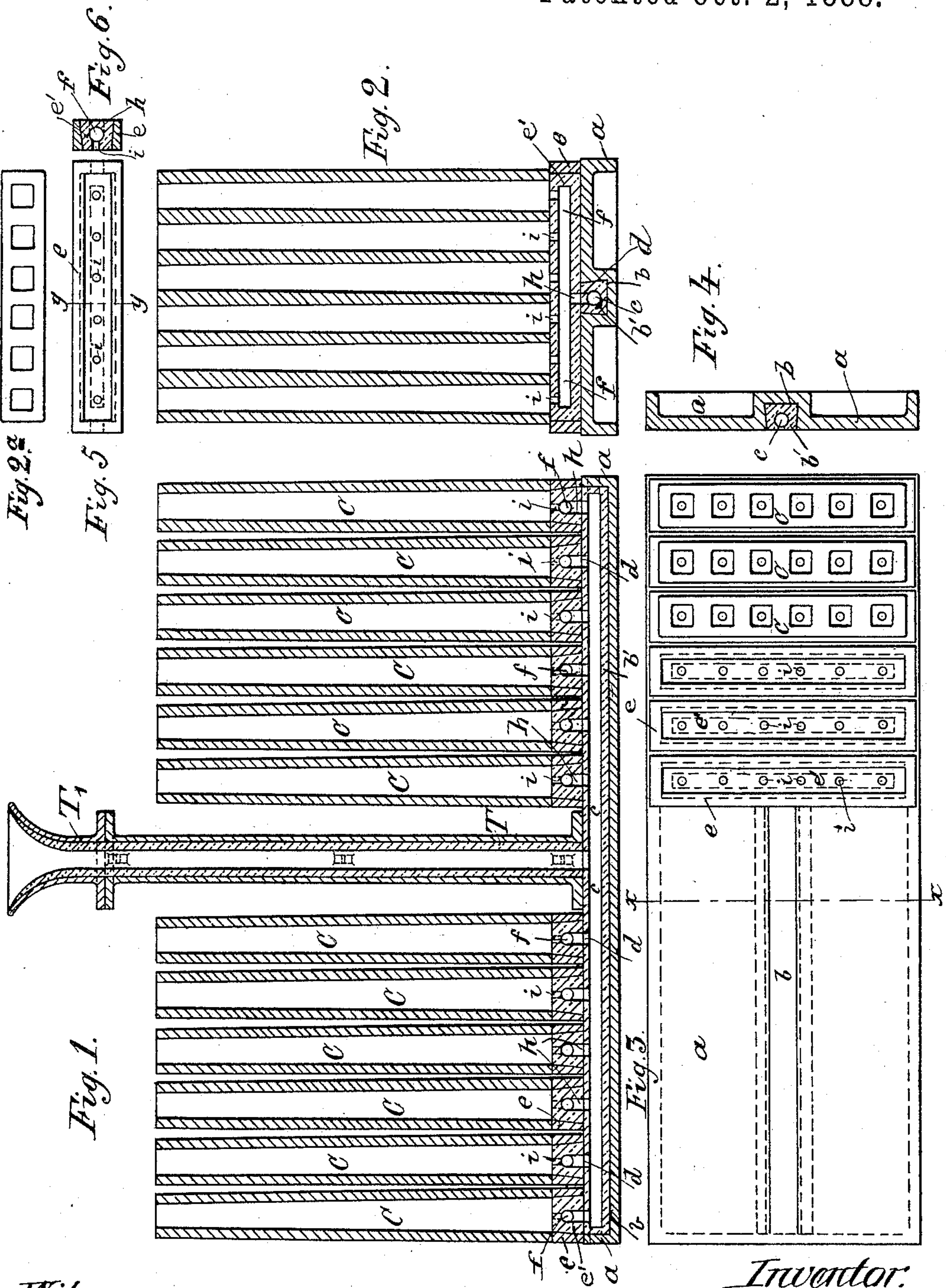
(No Model.)

W. HUFFELMANN.

APPARATUS FOR CASTING METAL INGOTS.

No. 390,371.

Patented Oct. 2, 1888.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR CASTING METAL INGOTS.

SPECIFICATION forming part of Letters Patent No. 390,371, dated October 2, 1888.

Application filed July 9, 1888. Serial No. 279,391. (No model.) Patented in Luxemburg January 6, 1888, No. 933; in England January 13, 1888, No. 587; in France January 14, 1888, No. 188,095, and in Belgium January 14, 1888, No. 80,277.

*To all whom it may concern:*

Be it known that I, WILHELM HUFFELMANN, engineer, a subject of the King of Prussia, residing at Germaniahütte, near Grevenbruck, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in Apparatus for Casting Metal Ingots, (on which Letters Patent have been applied for and granted to me in the following countries: in Luxemburg, No. 933, dated January 6, 1888; in France, No. 188,095, dated January 14, 1888; in Belgium, No. 80,277, dated January 14, 1888, and in England, No. 587, dated January 13, 1888,) of which the following is a full, clear, and exact specification.

My invention relates to an improvement in apparatus for producing cast-metal ingots of small cross-section—say from fifty to ninety millimeters—suitable for the manufacture of wire, light sections, thin sheets, and the like, and has for its object the production of ingots of great density at their outer part, and also to reduce as much as possible the loss usually sustained in the methods heretofore adopted, owing to waste in the runner and gates.

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

Figure 1 is a longitudinal vertical sectional view of my improved apparatus. Fig. 2 is a transverse vertical sectional view of the same. Fig. 2<sup>a</sup> is a plan view of the ingot-molds. Fig. 3 is a plan view of a part of the base-plate and the frames and ingot-molds thereon. Fig. 4 is a transverse section of the base-plate, taken on the line *x x* in Fig. 3. Fig. 5 is a plan view of one of the base-plate frames detached; and Fig. 6 is a transverse section of the same, taken on the line *y y* in Fig. 5.

The metal base-plate *a* is square or rectangular in form and of any desired dimensions, having at the outer edge of its bottom a downwardly-projecting flange and centrally and longitudinally of its bottom a projection of similar depth to that of said flange, in which projection is formed a rectangular groove, *b*, extending from end to end thereof, said groove being provided with a lining, *b'*, of suitable refractory material, in which lining is formed, at

or near its center, a longitudinal cylindrical channel, *c*, and in its upper side a series of openings, *d*, leading into said channel, located at such a distance apart as the size of the ingot-molds, hereinafter referred to, may render necessary.

Upon the base-plate *a* are transversely arranged a series of metal frames, *e*, each provided with a lining, *e'*, of suitable refractory material, in which lining is formed, at or near its center, a longitudinal cylindrical channel, *f*, at its bottom a longitudinal opening, *h*, and at its top a series of openings, *i*, the openings *h*, when the frames are in place upon the base-plate, communicating with the openings *d* in said plate, as shown in Figs. 1 and 2, thus establishing communication between the channels *c* and *f*, above mentioned, the channels *f* being situated transversely in the channels *c*, as shown best in Fig. 2.

The ingot-molds *C*, of the usual construction, are placed vertically upon the frames *e* over the openings *i* therein, and stand at their lower ends upon the sides of said frames, six of such molds being shown in the drawings as placed on each of said frames and twelve of said frames being shown as placed on the base-plate. It will be understood, however, that a greater or less number of either may be employed, as desired or as circumstances may render necessary, the same depending upon the size of the base-plate used. When the ingot-molds are placed in position, as shown in Figs. 1 and 2, the channels *c* and *f*, respectively, of the base-plate and each particular frame are, through the openings *i* in the frames, placed in communication with the several molds on said frame.

On the bed-plate *a*, and preferably at its center, is detachably supported, in any suitable manner, a feed-pipe, *T*, provided with a flaring mouth or funnel, *T'*, said pipe communicating through an aperture in the base-plate in alignment with its bore with the cylindrical channel *c* thereof. By this means the molten metal which is poured into said pipe passes downward therefrom into the channels *c*, through the openings *d* and *h*, up into the channel *f*, and thence upward through the openings *i* into the molds *C*, in the form of in-



gots, until said molds are filled, it being possible with the apparatus here shown to cast seventy-two ingots from one feed-pipe.

Care must be taken that the molds are well  
5 heated before the casting is commenced, in order that the metal shall not be cooled too rapidly. Such heating may be easily accomplished by connecting the funnel of the feed-pipe in any proper manner to a blast-pipe,  
10 and then driving hot air through the pipe, channels, and openings into the molds; or any other means for heating said molds may be employed, as seems most advantageous and desirable.

15 By the novel arrangement of the channel and openings in the base-plate in relation to those in the transverse frames the molten metal on its way from the feed-pipe to the molds is caused to pursue a somewhat tortuous course,  
20 and, being also subjected to successive compressions as it passes through the said openings, emerges from the openings *i* in the form of ingots of great density and small diameter.

The construction of the apparatus is such  
25 that it may be easily arranged and operated, and its parts may be readily separated for the purpose of cleansing the same or for the substitution of new ones for those which may become warped, burned out, or broken.

Having thus described my invention, what I 30  
claim as new, and desire to secure by Letters Patent, is—

An apparatus for casting ingots, consisting of a base-plate having a central longitudinal groove lined with refractory material, said 35  
lining having a longitudinal channel and a series of openings in its top, a series of metal frames arranged transversely of said base-plate and having a lining of refractory material, said lining having a longitudinal chan- 40  
nel, a series of openings in its top, and a longitudinal opening in its bottom communicating with the openings in the base-plate, a series of molds supported by said frames over the series of openings therein, and a feed-tube supported 45  
on the base-plate and communicating with the channel therein, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two sub- 50  
scribing witnesses.

WILHELM HUFFELMANN.

Witnesses:

W. GESENBERG,  
LOUIS RICHTER.