(No Model.) 3 Sheets—Sheet 1.

C. L. MILLER & J. R. GEORGE.

BLAST FURNACE CAST HOUSE.

No. 518,415. Patented Apr. 17, 1894.

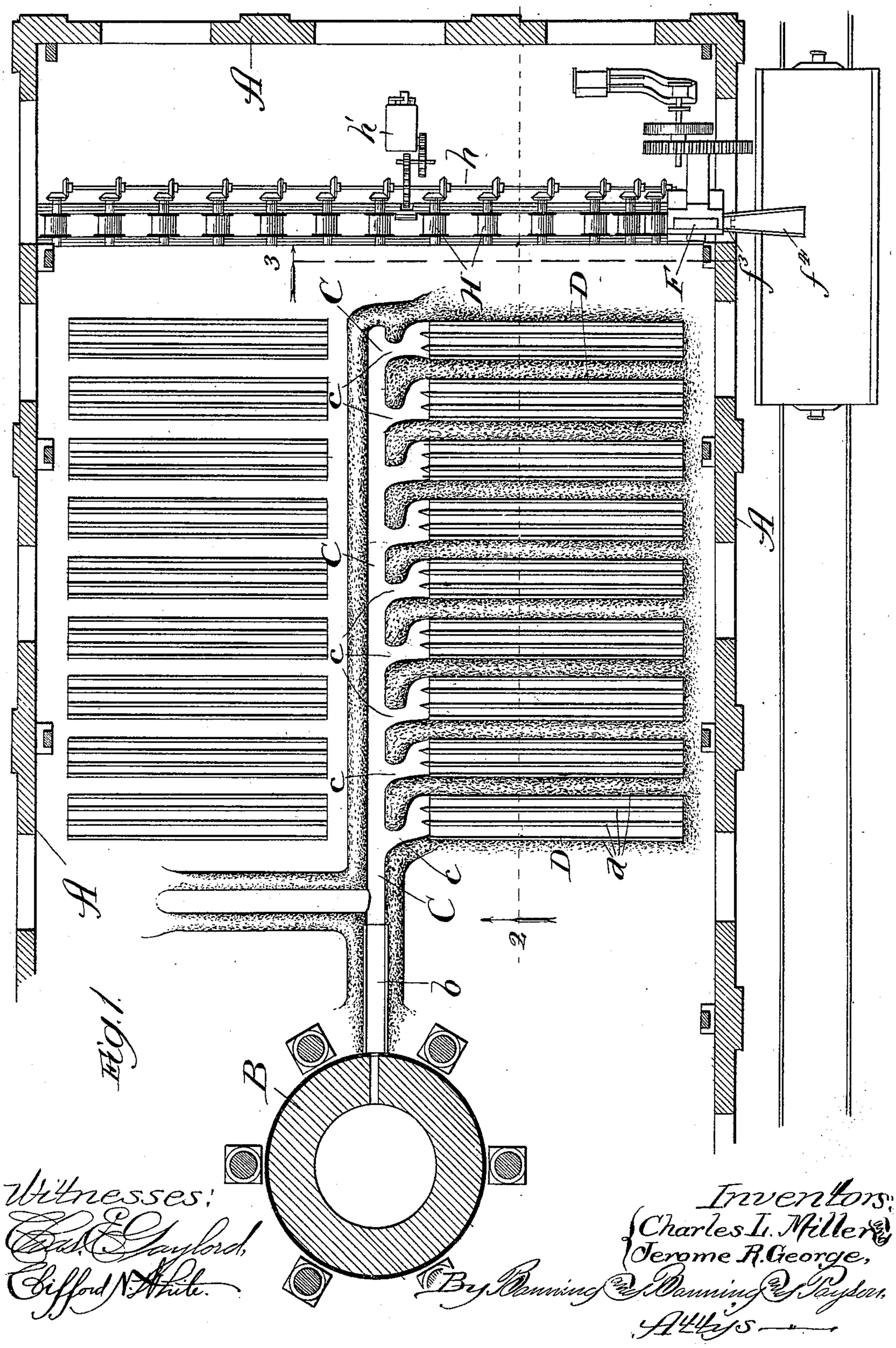

Fig. 1.

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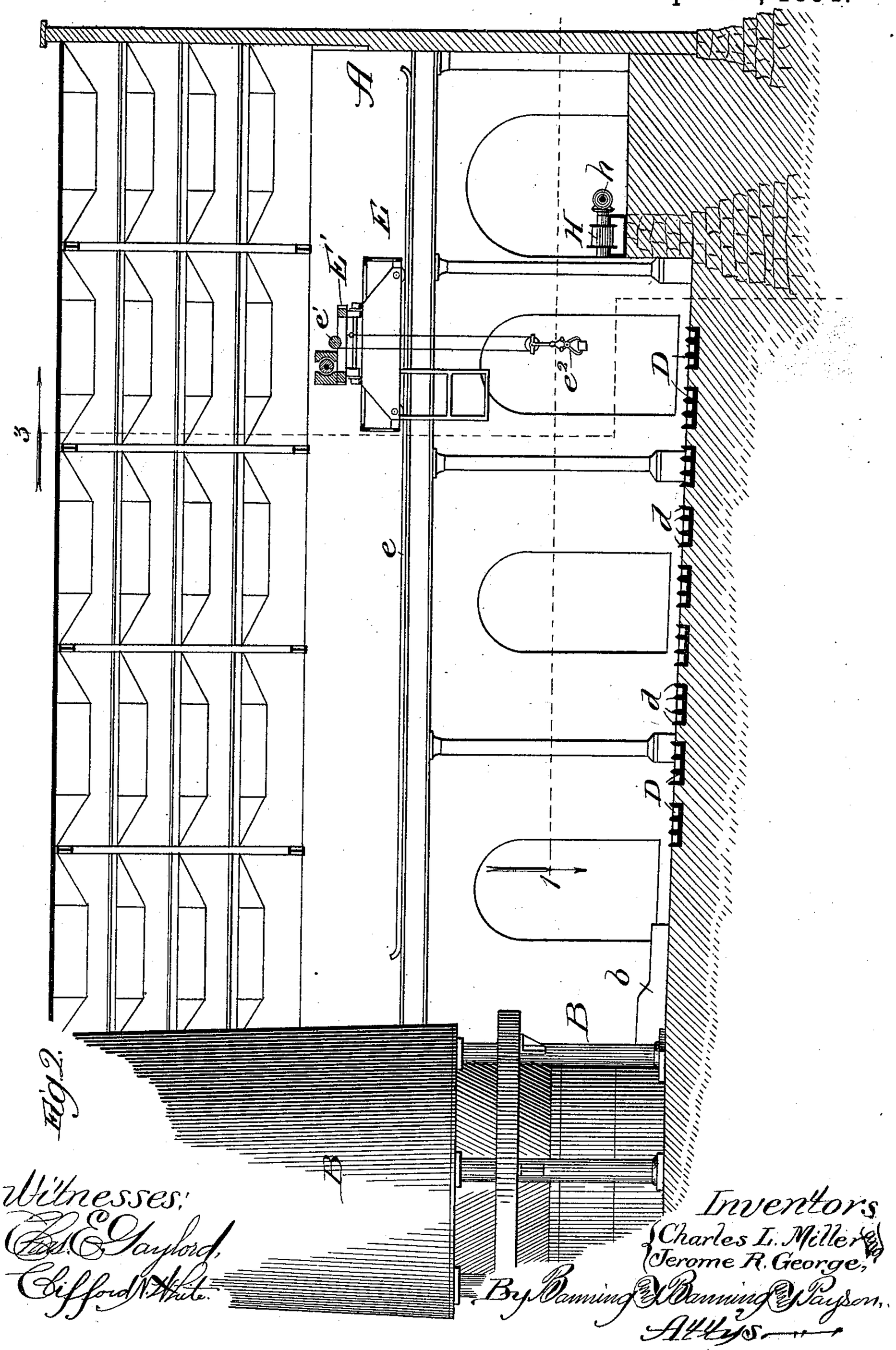
C. L. MILLER & J. R. GEORGE.

BLAST FURNACE CAST HOUSE.

No. 518,415. Patented Apr. 17, 1894.



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C. L. MILLER & J. R. GEORGE.

BLAST FURNACE CAST HOUSE.

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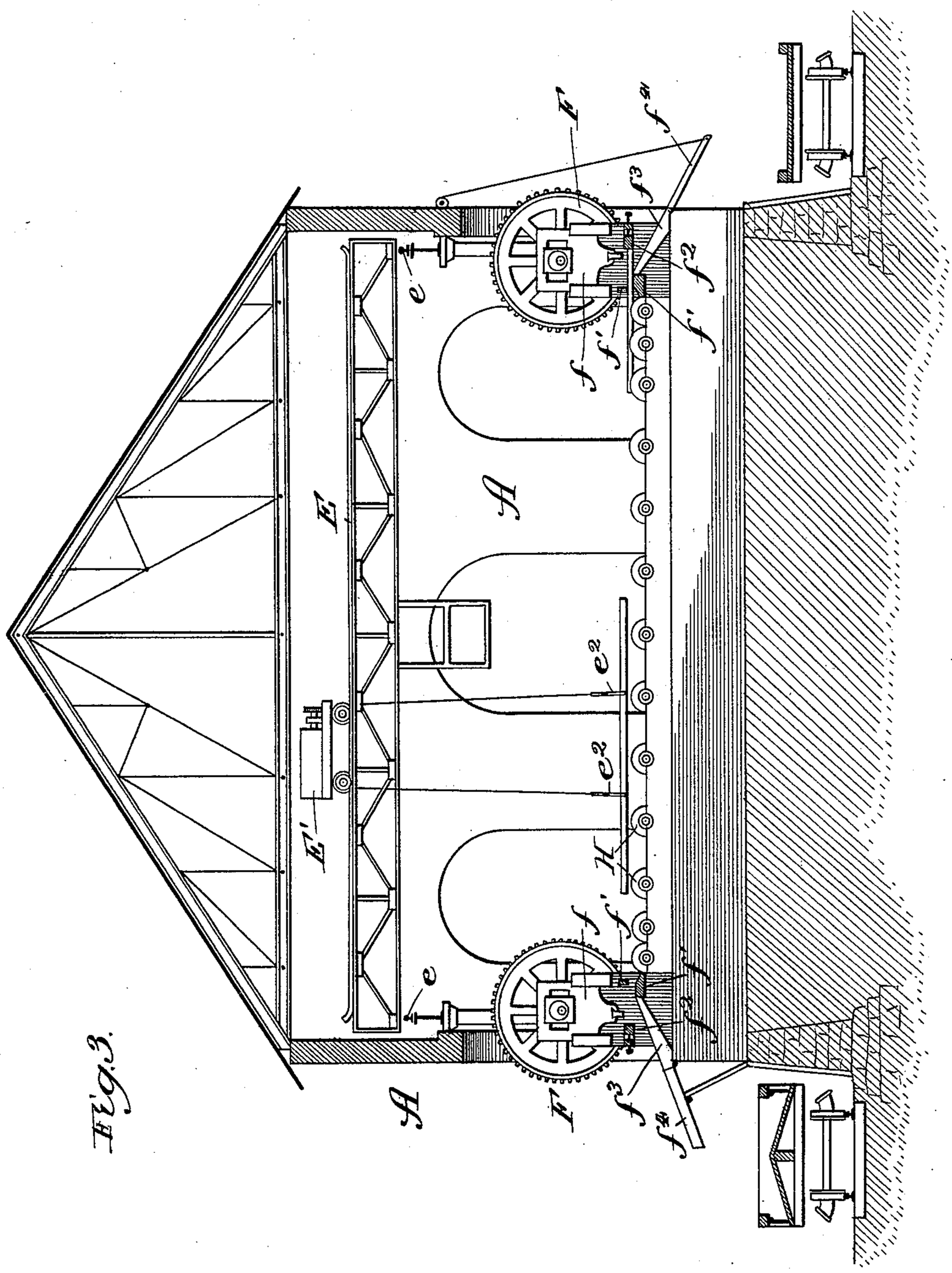

Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES L. MILLER AND JEROME R. GEORGE, OF CHICAGO, ILLINOIS.

BLAST-FURNACE CAST-HOUSE.

SPECIFICATION forming part of Letters Patent No. 518,415, dated April 17, 1894.

Application filed December 31, 1892. Serial No. 456,922. (No model.)

To all whom it may concern:

Be it known that we, CHARLES L. MILLER and JEROME R. GEORGE, of Chicago, Illinois, have invented a new and useful Improvement in Blast-Furnace Cast-Houses, of which the following is a specification.

The object of our invention is to provide for the making of a simple, economical blast furnace cast-house, in which various operations shall be performed by machinery instead of by hand; and the invention consists in the features and combinations hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan sectional view of our improved blast furnace cast-house, taken in line 1 of Fig. 2; Fig. 2 a vertical longitudinal sectional view, taken in line 2 of Fig. 1; and Fig. 3 a transverse sectional view taken in lines 3 of Figs. 1 and 2.

A is the blast furnace cast-house; B the blast furnace, and *b* the tap or spout of the furnace; C the main runner for conducting the molten metal from the furnace, and *c* short runners leading therefrom to the molds; D the molds, and *d* upwardly extending ribs or flanges separating the same into channels or compartments; E the crane for lifting and carrying the cooled metal, and *e* a track supporting the crane; E′ the traveling carriage or hoist in the crane, *e′* an elevating drum on the carriage, and e^2 grappling tongs or hooks secured thereto; F mechanism for breaking the cooled metal into desired lengths, *f* a vertical reciprocating head in the breaker, *f′* cross guides for holding the metal as it is broken, f^2 a stop for regulating and limiting the length of the projecting end of the metal, f^3 a way or chute leading from the breaker, and f^4 an extension pivoted to the chute; and H a conveyer for conducting the cooled metal from the crane to the breaker, *h* a drive shaft for operating the conveyer, and *h′* a motor for imparting power to the drive shaft.

In our improved blast furnace cast-house, the blast furnace and the tap and main runner therefrom are all of the usual or any convenient construction; but, instead of the sows usually employed for conducting the molten metal to pig molds, the main runner is provided with a series of short runners which conduct the metal into the molds adapted to form it into desired shapes. Each of these molds is preferably long and separated into several channels or compartments, this separation being effected by upwardly projecting ribs or flanges extending along its entire length. In this way, by having one end of the molds close to the main runner, we economize floor space, and also avoid waste of material, taking up of sand, &c., which necessarily results when the molten material is conducted out into sows and thence into molds. Although we have shown the molds as made of iron, it will of course be understood that they may be made of sand, or other suitable material.

The crane may be of any convenient construction. As shown, it consists of girders supported on a track at either side of the cast-house, and mounted upon tracks on top of the girders is a traveling car and hoist, commonly called a trolley, the hoist being provided with tongs, hooks or other holding devices at its lower end adapted to seize, grapple or otherwise hold the cooled metal in the molds.

In operation, the cooled metal, being secured by the grappling tongs, hooks or holding devices, is lifted out of the molds by the hoist, and then carried to any point desired by the traveling car and crane. The cooled metal is preferably delivered from the crane onto a conveyer, which is shown in the form of a series of drums mounted upon a suitable bed, the spindle of each drum being provided with a miter engaging with a corresponding miter upon the drive shaft propelled by any suitable power, preferably steam or electricity. If desired, however, the rollers of the conveyer may be otherwise driven, as, for instance, by an endless chain. From the conveyer the metal passes into a breaker of any convenient construction. As shown, this breaker consists of a vertically reciprocating head, actuated by a cam or eccentric upon the main driving shaft, and having a depending piece, ram or jaw adapted to strike the metal in its downward stroke so as to break the same into lengths as desired, the reciprocating head being confined within suitable guides. At the side of the breaker adjacent to the conveyer, I have shown two cross pieces between which the cooled metal passes,

and at the other side I have shown a stop or abutment which causes the metal to stop in proper position for breaking. I prefer to make this stop adjustable, so as to provide for breaking the metal into different lengths. When adjusted, however, the stop is fixed in position, so that until changed the metal is always broken into uniform lengths. When broken, the pieces of metal preferably fall into a chute, by which they are conducted into a car or elsewhere as desired.

Although we have shown the breaker in the cast-house, it will of course be understood that it may be placed outside in any convenient position. In fact, it may often be convenient to thus place the breaker outside, especially when it is desired to use a single breaker for different furnaces. In a sense, this is true as to other parts, the location of which is of comparatively little importance, so long as they occupy such positions relative to each other as to enable them to perform their several functions. As will be seen, we thus provide for economizing space and preventing waste, and also for handling, breaking and loading the material by machinery, and thus saving the time and expense of much hand-work.

It will of course be understood that we do not intend to limit ourselves to minor features or details of construction, or to the use of all our improvements together.

We do not herein claim the method of mechanically handling and breaking metal or the special forms of mold, crane or breaking mechanism above described, the same being the subject of other applications filed by us December 31, 1892, No. 456,921.

We claim—

1. In combination with a blast furnace, a mold to receive the molten metal from the furnace and form it into desired shapes, a crane for lifting and carrying the cooled metal from each mold-compartment separately, a train of rollers for receiving and conducting the cooled metal from the crane, a breaker for receiving the cooled metal from the conveyer, means for stopping the forward movement of the cooled metal in the breaker and holding it in desired position, and a ram to come down upon the cooled metal to break it into desired lengths, substantially as described.

2. In combination with a blast furnace, molds to receive the molten metal from the furnace and form it into desired shapes, a crane for lifting and carrying the cooled metal, a conveyer for conducting the cooled metal from the crane, a breaker for receiving the cooled metal from the conveyer and breaking it into desired lengths, and a chute for conducting the broken metal to a car or place of delivery, substantially as described.

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