

NICKOLS & AUGUR.

Refining Iron.

No. 1,293.

Patented Aug. 21, 1839.

Fig. 1

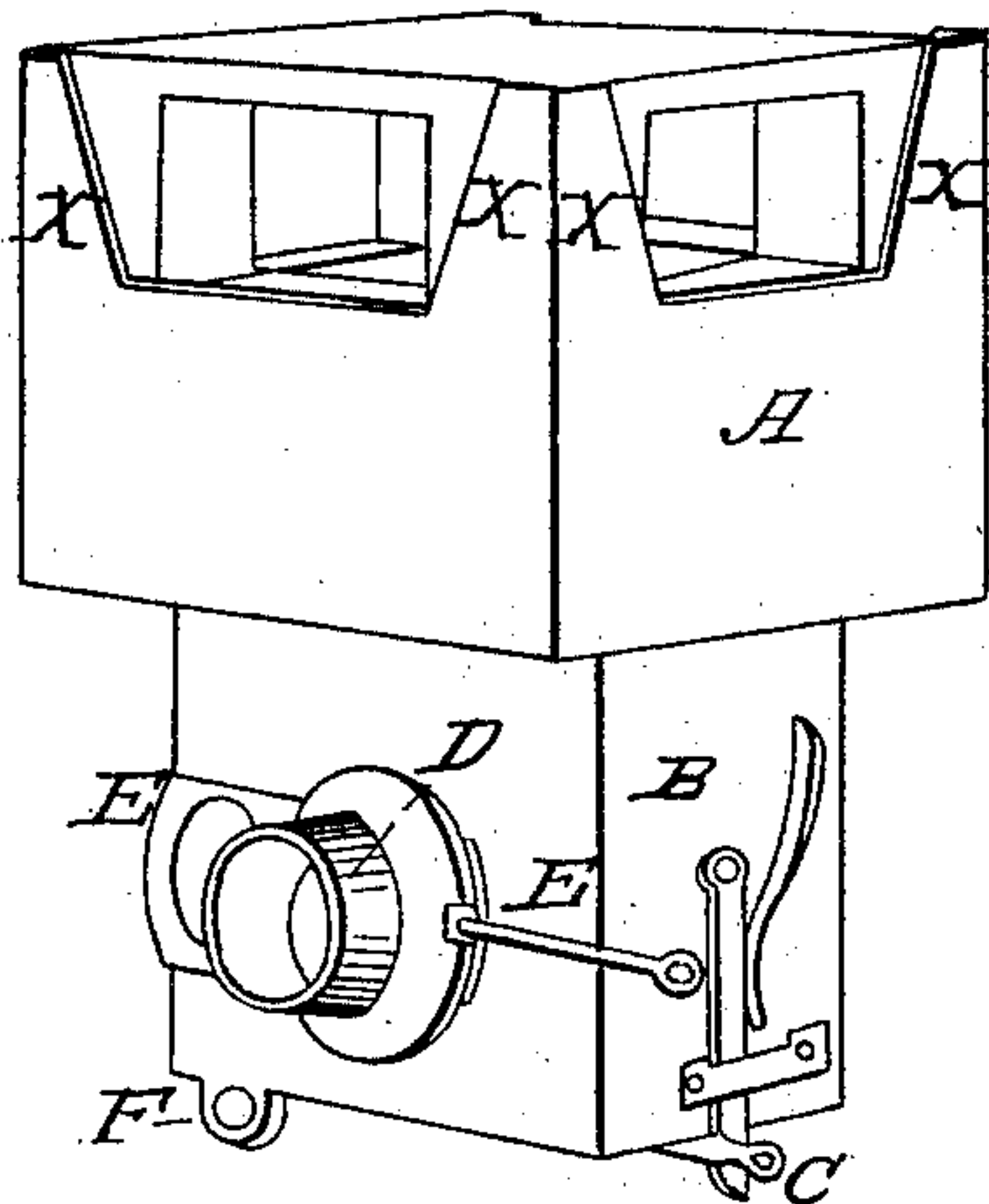


Fig. 2

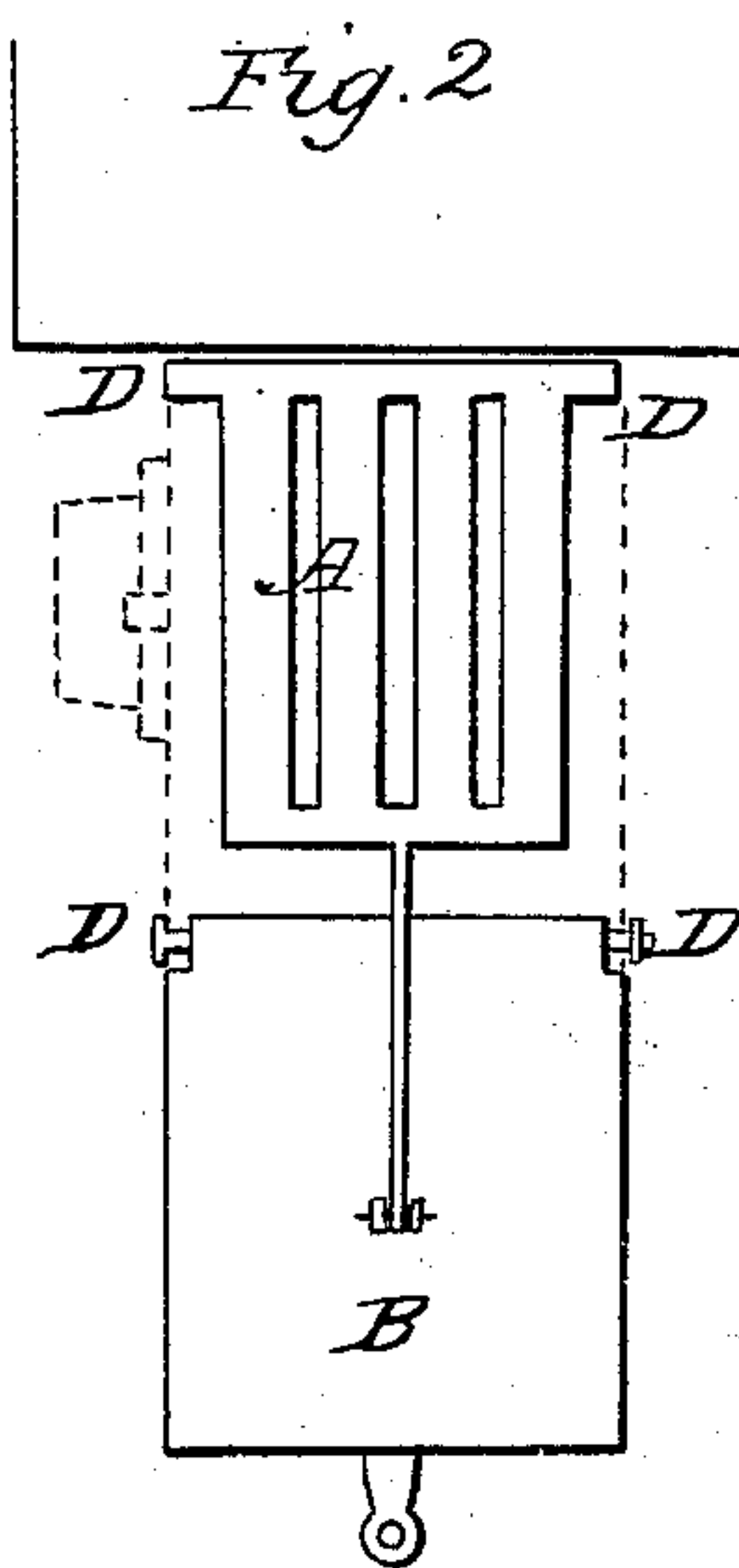


Fig. 3

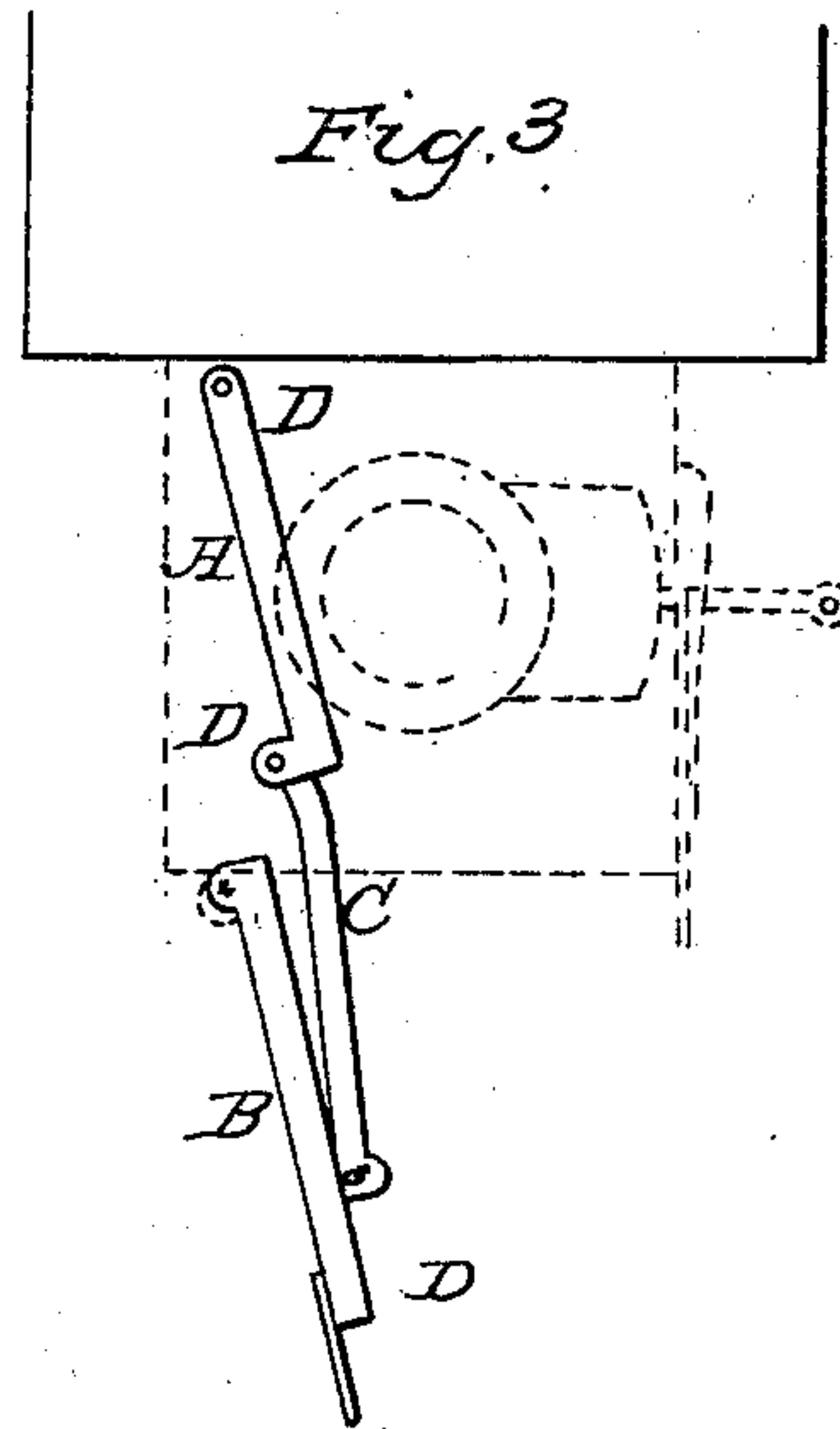


Fig. 6

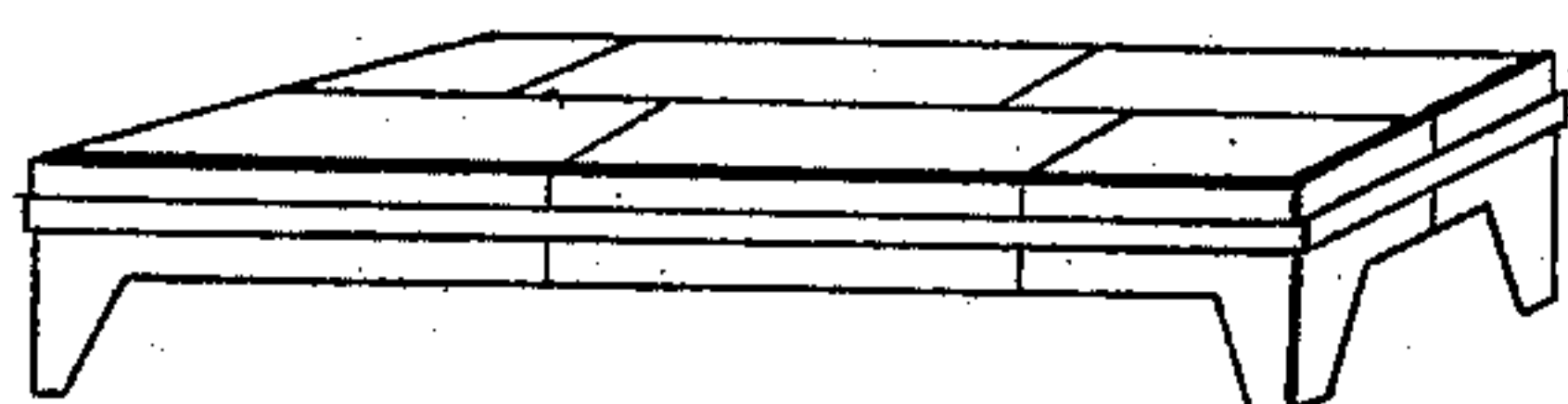


Fig. 4

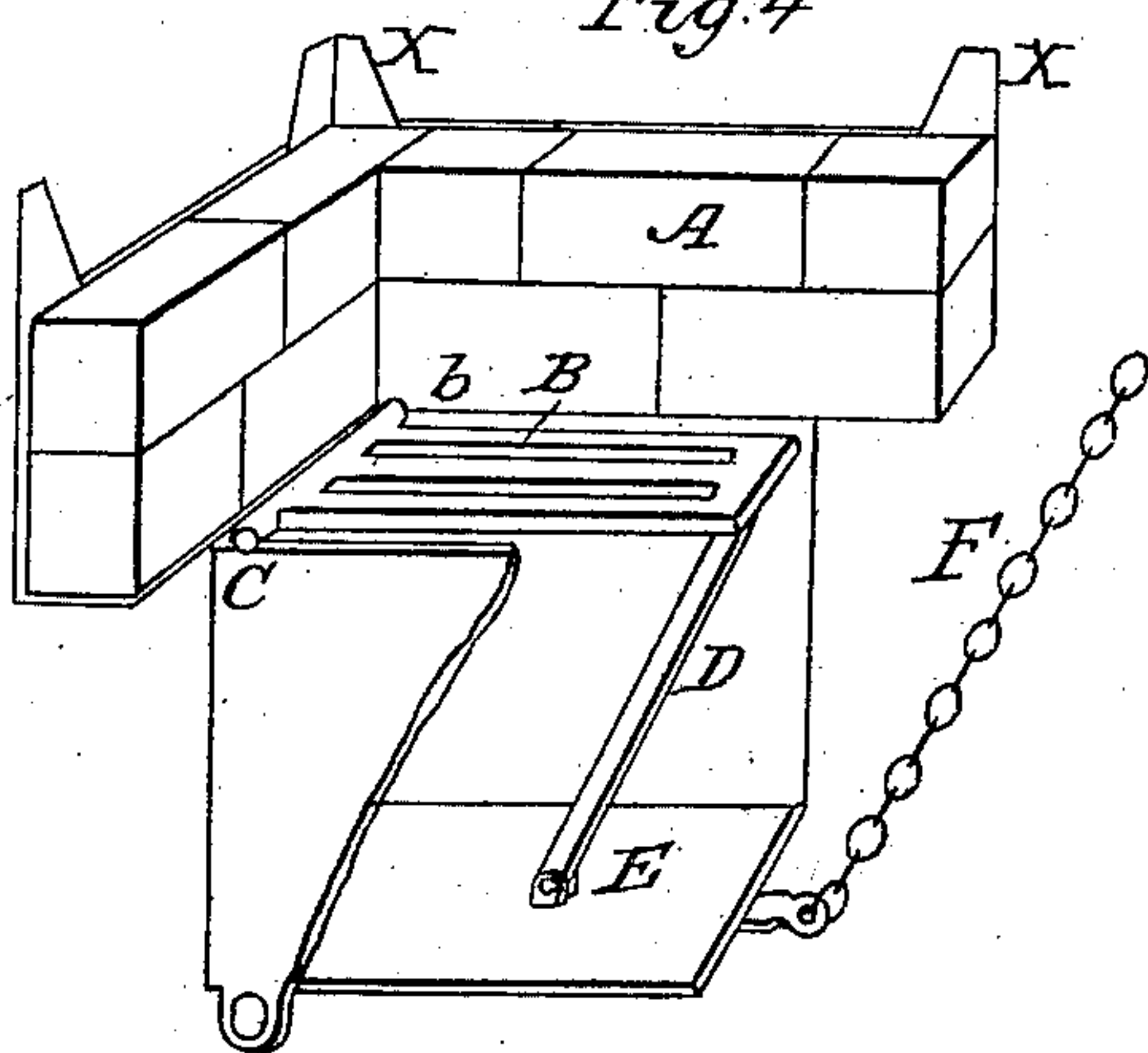
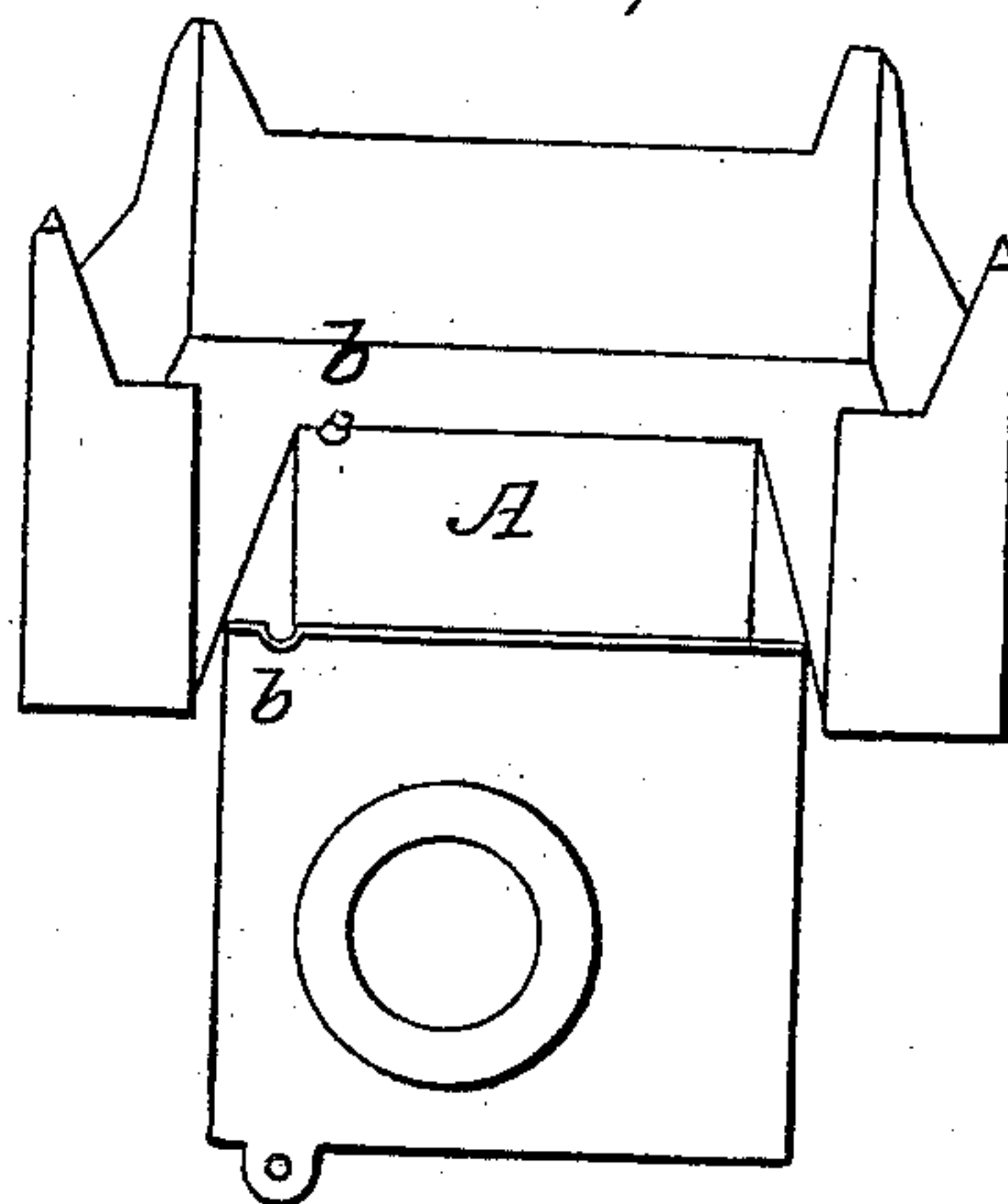


Fig. 5



UNITED STATES PATENT OFFICE.

EDWD. NICKOLS, OF HAMDEN, AND JAS. AUGUR, OF NEW HAVEN, CONNECTICUT.

BLACKSMITH'S FURNACE FOR BURNING ANTHRACITE COAL.

Specification of Letters Patent No. 1,293, dated August 21, 1839.

To all whom it may concern:

Be it known that we, EDWARD NICKOLS, of Hamden, and JAMES AUGUR, of New Haven, in the county of New Haven and State of Connecticut, citizens of the United States, have invented new and useful Improvements in Smiths' Furnaces for Burning Anthracite Coal.

These furnaces as heretofore used consist of two principal parts in connection, viz, the furnace or chamber for the coal and fire, and the wind chest, with their appendages. Our improvements extend to both parts.

To make our improvements more intelligible and to enable others to make and use the same, we describe our improvements in connection with a furnace thereby improved, designating our improvements both in the description and in our claim for a patent.

The coal chamber.—The chamber for the coal and fire consists of an outward case of cast iron, half an inch thick, usually about sixteen by fourteen inches square, and six deep on the outside, open on the top and having a bottom with an open orifice in the center about eight inches square, opening into the wind-chest below, as seen in Figure 5 at A, to receive the grate hereafter described. This chamber is to be lined with fire brick, and we prefer the English fire brick, say eight inches long, four wide, and two thick, leaving in a case of this size, when inserted flatwise with mortar, an inner chamber for the coal 72 by 52 inches square, by 52 deep, as seen in Fig. 4; but they may be inserted edgewise, or other suitable materials for lining may be used, and the case may be reduced, or the inner chamber enlarged as occasion may require for different uses.

In our improved furnace the case rises at each corner about three inches, as seen in the accompanying drawings, Figs. 1, and 4, *xx*, thereby forming an angle, as seen in Fig. 4, to receive and hold in place at each corner a fire brick support, for the cap, which covers the furnace. This is an improvement on the ordinary mode of supporting the cap. The cap covers the whole furnace, about three inches above the fire and is made of the same kind of fire brick laid flatwise side by side and firmly bound together with bars and bolts around the outward edge; as seen in Fig. 6.

The bottom of the inner chamber, and which we claim as our improvement, is a

drop-grate of cast iron, supported on the back side by pivots, and on the front, by a pitman, resting on the bottom of the wind-chest hereafter described; as seen *in situ* in Fig. 4.

The wind-chest.—The wind chest is a hollow shell of cast iron of cubical form, the sides about eight inches square, and half an inch thick, open at the top and bottom when cast. The case of the furnace and the wind chest are cast together in one piece, and so that the open top of the wind chest will embrace the orifice for the grate, in the bottom of the furnace, and the pivots or gudgeons of the grate are to play in open mortises on the top of the sides, near the back of the chest as seen in Fig. 5. The bottom of the wind chest is closed by an iron door or drop, hung on hinges or gudgeons on the bottom of the sides directly under the pivots of the grate. The drop door of the wind chest and the grate are connected by a pitman, one end playing in a hinge on the door, the other end in a hinge on the grate near the front, so that both will fall or rise together, and both are secured in place by a latch on the door and a spring catch on the front side of the chest.

The application of the drop grate and the drop bottom of the chest with the mode of connecting them as above described we claim as our principal improvement. On one of the sides, either on the right or left of the front of the chest, we make an orifice, about two inches in diameter, armed with a lip or ledge about two inches in height to receive the wind pipe. Behind this lip we place a slide to shut off the wind when required.

For further illustration we refer to the drawings accompanying this specification as part thereof.

Fig. 1, exhibits the outward appearance of the improved furnace—viz: A, the front of the coal chamber; B, the front of the wind chest; C, the latch and spring catch; D, the orifice and tip to receive the wind pipe; E, E, slide to open and close it; F, hinge of drop door.

Fig. 2 exhibits the grate of the furnace and the bottom or drop-door of the wind chest connected by a pitman, as they appear when dropped from their place.

Fig. 3 exhibits a side view of the same. A, the grate; B, the drop-door; C, the pitman; D D D D, their joints or hinges.

Fig. 4 exhibits the lining of the coal

chamber with brick and the grate, pitman and drop-door in place, viz, A, the lining with brick; B, the grate suspended by the pivots C, C, and held in place by the pitman D, resting on the drop-door E; F, the chain attached to the latch.

Fig. 5 exhibits at A the open orifice in the center of the bottom of the coal chamber, opening into the wind chest—the lining, one side and the grate being removed; B B, mortises for pivots of the grate.

Fig. 6 exhibits the cap of fire brick and the band connecting them.

The operation of this furnace is such, that by forcing the air into the wind chest by means of a fan or bellows worked by water, steam, or other power, anthracite coal may be made to produce a clean fire of intense heat, in the blaze between the top of the coal and the cap, better calculated for welding and most other purposes than an immersion among the coals of any fire.

Another advantage resulting from the peculiar construction of this improved furnace is the ease and despatch of discharging the contents of the coal chamber, often required several times in a day, thereby saving much time, and also preventing the accumulation of cinders and slough upon the

sides of the furnace, so often attending the usual slow process of clearing the furnace by hand. All this is instantly done by closing the valve of the wind-pipe, and unlocking the bottom, when the door and grate will drop and discharge their contents, and then by the chain attached to the latch, may be immediately raised to their place and there secured, ready to be charged anew.

The size of the furnace as above described is such as we advantageously use in our factory for welding gun barrels; but they may be larger or smaller for other purposes, according to the object of general use.

We claim as our invention and improvement—

The manner in which the drop-door is combined with the grate, by means of which, when the door is opened the grate is let down, in the method and for the purposes as specified above, and therefore we solicit Letters Patent, and we do not claim the protection of Letters Patent for any other parts of the furnace above described.

EDWARD NICKOLS.
JAMES AUGUR.

Witnesses:

SIMEON BALDWIN,
ROGER S. BALDWIN.