

(No Model.)

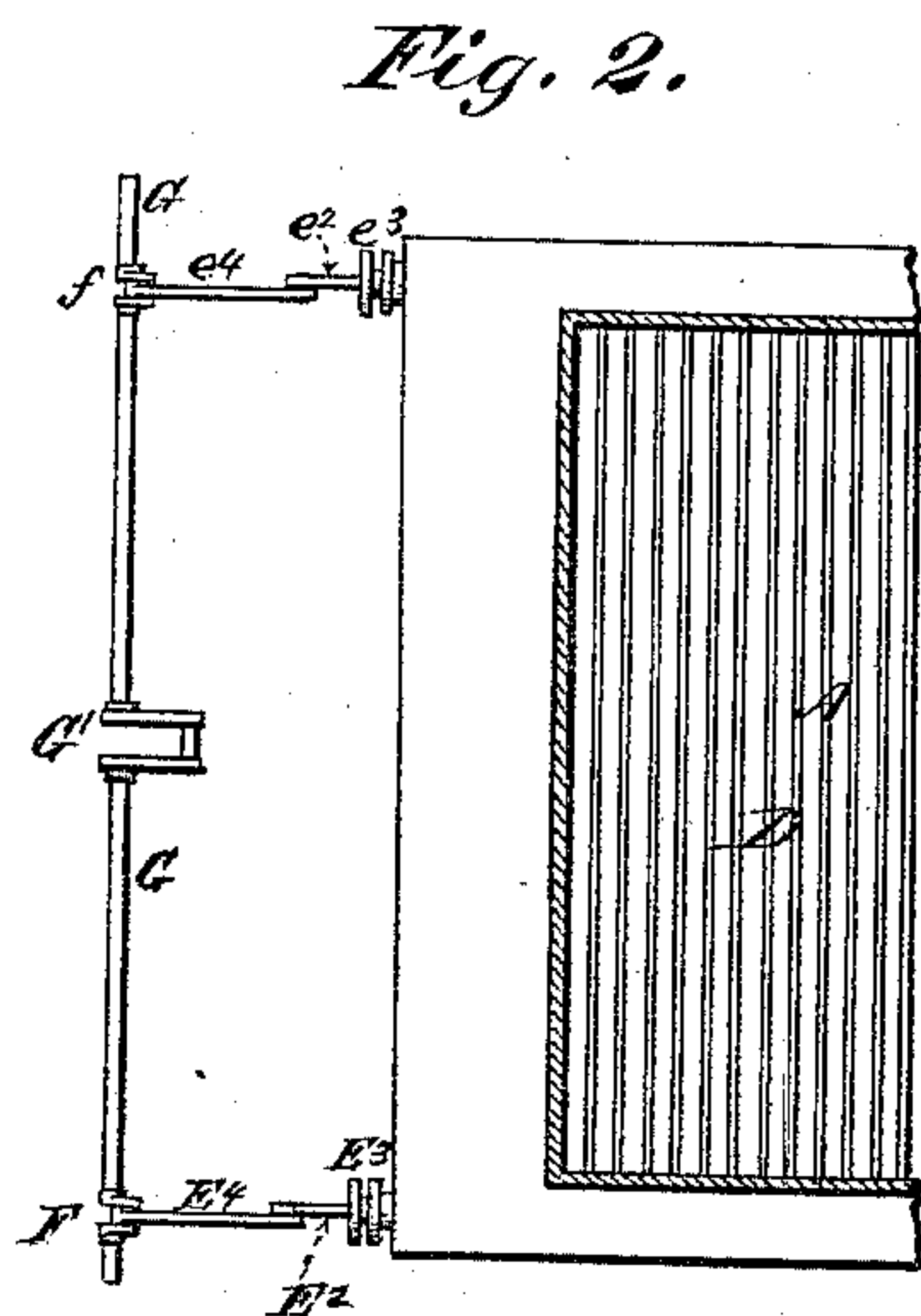
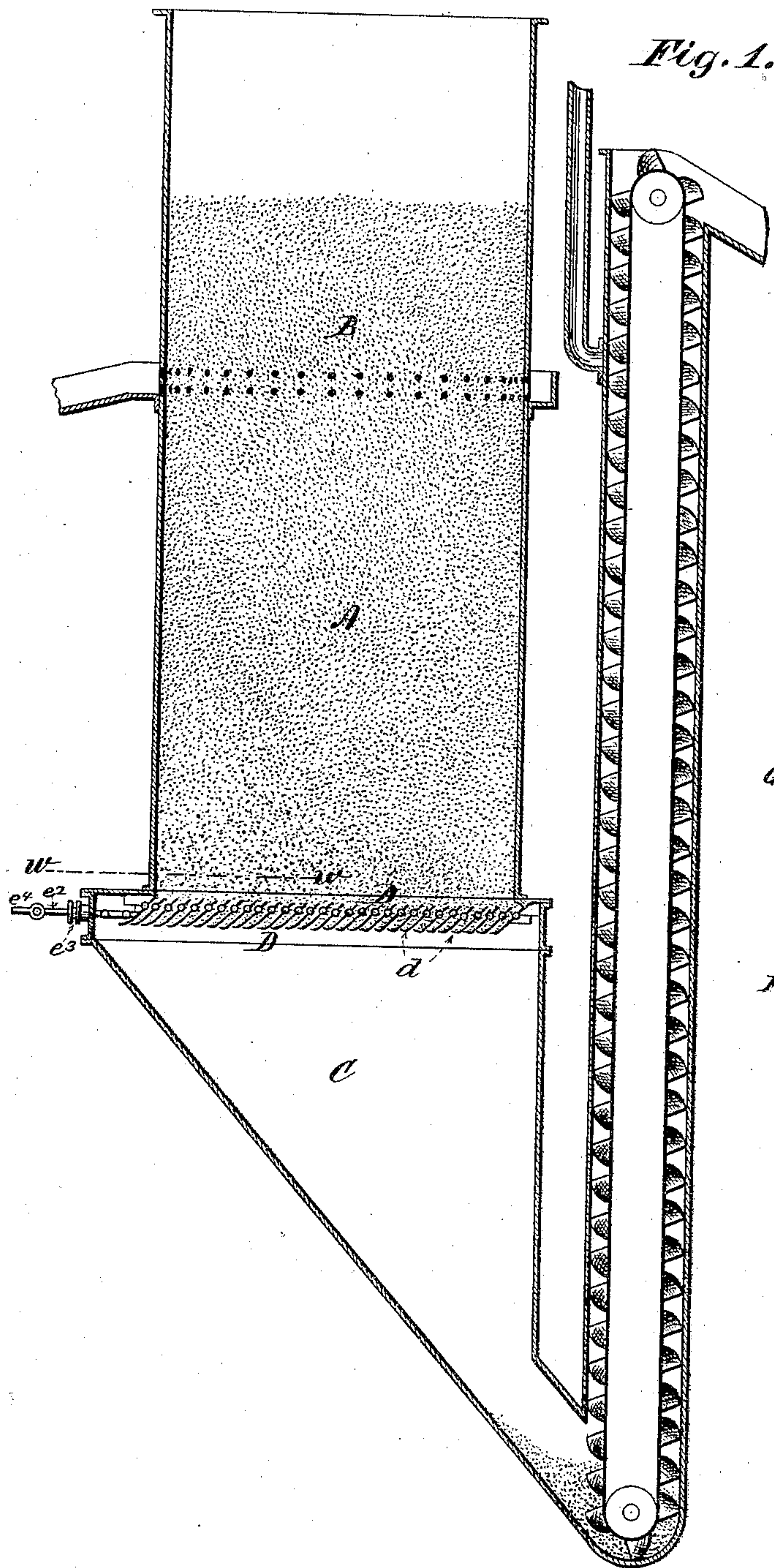
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2 Sheets—Sheet 1.

BONE BLACK DISCHARGER FOR CONTINUOUS FILTERS.

No. 335,602.

Patented Feb. 9, 1886.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

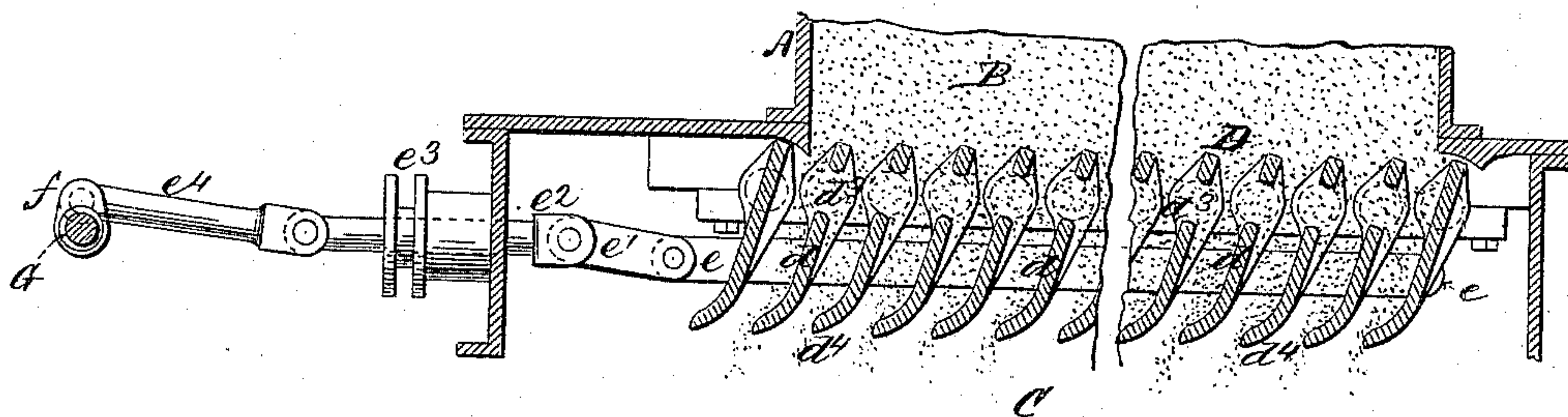


Fig. 4.

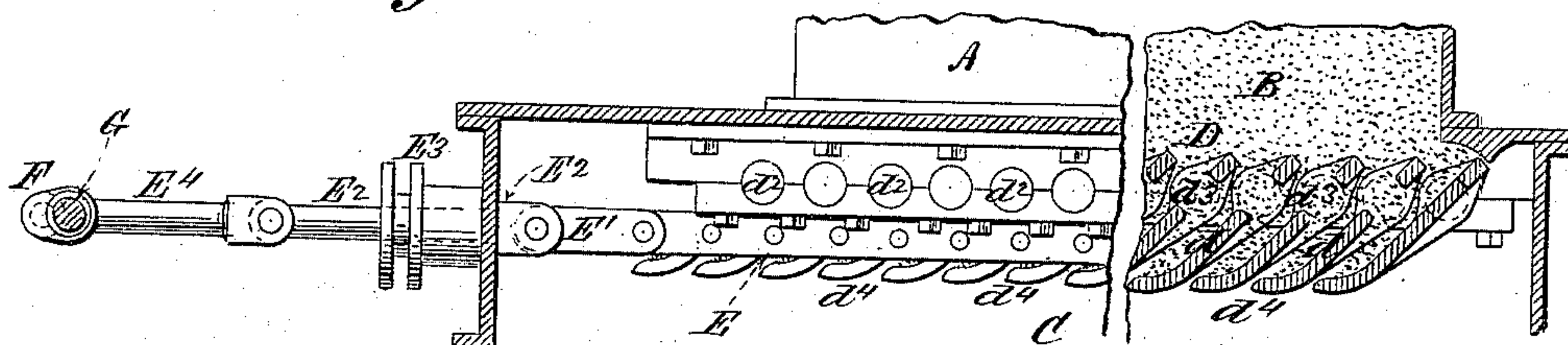


Fig. 6.

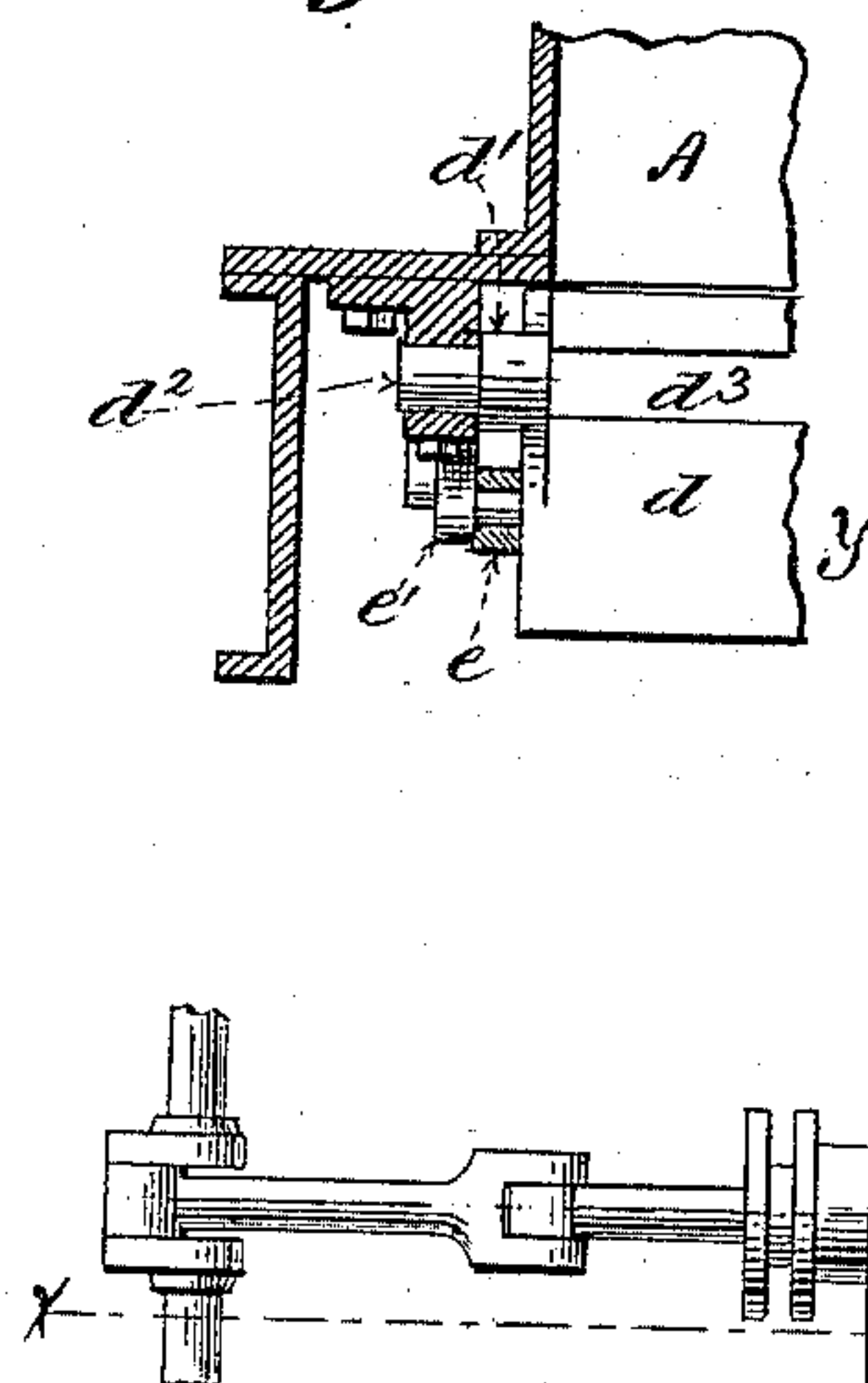
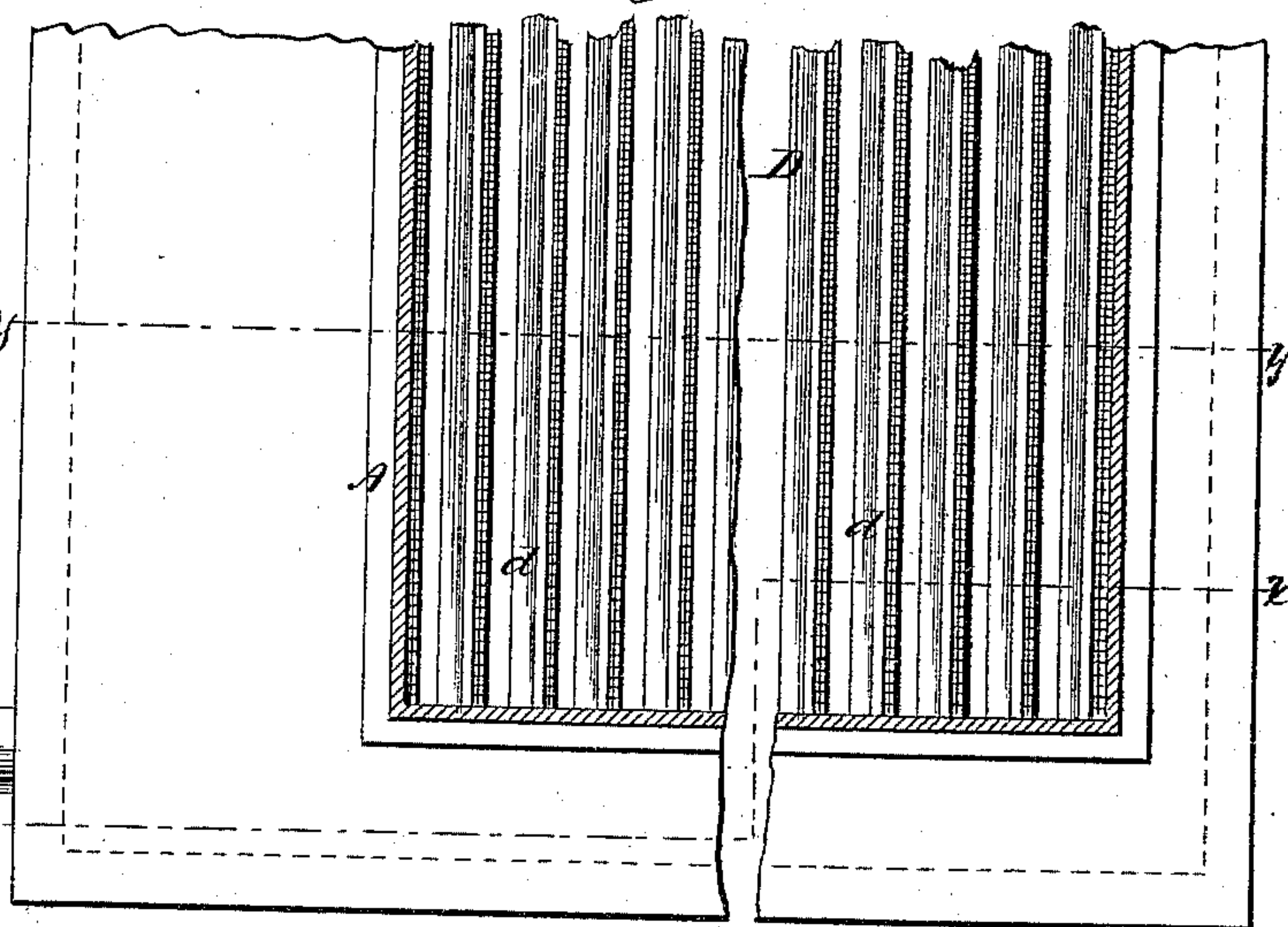


Fig. 3.



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# UNITED STATES PATENT OFFICE.

FRANZ O. MATTHIESSEN, OF IRVINGTON, NEW YORK.

## BONE-BLACK DISCHARGER FOR CONTINUOUS FILTERS.

SPECIFICATION forming part of Letters Patent No. 335,602, dated February 9, 1886.

Application filed September 18, 1885. Serial No. 177,487. (No model.)

*To all whom it may concern:*

Be it known that I, FRANZ O. MATTHIESSEN, of Irvington, New York, have invented certain Improvements in Bone-Black Dischargers for Continuous Filters, of which the following is a specification.

This improvement is for employment in connection with continuous filters for purifying sugar-liquor by the process of upward filtration through bone-black. In such filters the bone-black at the bottom of the filtering-chamber requires to be gradually removed as it becomes charged with impurities and loses its decolorizing power.

The invention consists in the provision, at the bottom of the filtering-chamber, of a grate with adjustable rocking bars or slats, which, when held at a prescribed angle of inclination, support the superincumbent bone-black, but when moved to a different angle permit the bone-black to fall by its own gravity through the spaces between the bars or slats into a receiving-chamber, from which it is removed by suitable means without interrupting the continued upward flow of the sugar-liquor through the filtering-chamber.

The accompanying drawings of a continuous filter containing this improvement are as follows:

Figure 1 is a central vertical section. Fig. 2 is a horizontal section through the line *ww* on Fig. 1, affording a top view of a portion of the grate and of the crank-shaft for imparting reciprocating motion to the grate. Fig. 3 is a horizontal section taken through the same plane as Fig. 2, but on a larger scale. Fig. 4 is a vertical section through the offset line *xx* on Fig. 3, showing the grate bars or slats in such inclined positions that the discharge of the superincumbent bone-black is prevented. Fig. 5 is a vertical section through the line *yy* on Fig. 3, showing the grate bars or slats rocked into less inclined positions for effecting the discharge of bone-black from the bottom of the filtering-chamber. Fig. 6 is a side elevation of a portion of one of the grate bars or slats, showing one of its trunnions in elevation, and showing the trunnion-bearing and adjoining parts of the structure in vertical section.

The filtering-chamber A, containing a col-

umn of bone-black, B, surmounts the receiving-chamber C, which receives the exhausted bone-black and collected impurities discharged from the bottom of the filtering-chamber. The column of bone-black in the filtering-chamber is supported upon the horizontal grate D, composed of the equidistant parallel rocking slats *d d*, &c. The slats *d* are each pivotally attached to the connecting-rods E *e*. Each end of each slat is provided with a flange, *d'*, and a trunnion, *d''*. The trunnions are provided with bearings in suitable boxes, which may be fastened to the side walls or to the top of the receiving-chamber C. The trunnions *d''* of each slat or bar are in alignment with each other and with the center of a slot, *d'''*, extending longitudinally through the slat from one of its end flanges to the other. The larger portion of each slat is below its axis of oscillation. The lower edge of the slat is preferably formed into a curve, *d<sup>4</sup>*, the concave side of which is upward.

It is not absolutely essential that the slats or grate-bars shall be provided with the slots *d'''*; but when they are so provided all the superincumbent bone-black rests upon portions of the slats which are comparatively distant from their respective axes, and hence during oscillation have a range of movement which makes them especially effective in causing the dislodgment and discharge of the bone-black.

Motion to rock the grate bars or slats may be communicated to the connecting-rods E *e*, respectively, by means of the links E' *e'*, pivoted to the inner ends of the horizontal sliding rods E<sup>2</sup> *e*<sup>2</sup>, provided with suitably-packed bearings E<sup>3</sup> *e*<sup>3</sup> extending through the upper part of the side wall of the receiving-chamber, the outer ends of the sliding rods being respectively connected by the links E<sup>4</sup> *e*<sup>4</sup> to the cranks F *f* of the operating-shaft G.

The operating-shaft G may be either continuously or intermittently rotated, or it may be provided with the operating-crank G', by the application of power to which the shaft may have imparted to it a variable range of rocking motion, according to the range of rocking motion which it may be found useful to give to the grate bars or slats.

It will be understood that varying either the rapidity or the range of motion of the



grate-bars will have the effect of varying the rate of discharge of the exhausted bone-black from the bottom of the filtering-chamber, and that the proper motions for the grate-bars will  
5 depend partly upon the sizes of the grains of bone-black employed, and partly upon the proportion of impurities contained in the sugar-liquor which is being filtered, and the consequent degree of rapidity with which the  
10 bottom stratum of bone-black becomes exhausted and requires removal.

I claim as my invention—

1. In apparatus for purifying sugar-liquor by the process of upward filtration through a  
15 body of bone-black, the combination of a filtering-chamber surmounting a receiving-chamber, with a discharger at the bottom of said filtering-chamber in the form of a grate pro-

vided with rocking slats or grate-bars, and means for rocking said slats or grate-bars from 20 positions in which they support and hold up the bone-black in said filtering-chamber to positions in which they permit the bone-black to be discharged from the said filtering-chamber through the spaces between the slats or 25 grate-bars into said receiving-chamber, substantially as set forth.

2. In a bone-black discharger substantially such as described, the rocking slats or grate-bars *d d*, &c., provided, respectively, with the 30 longitudinal slots *d' d'*, &c., as set forth.

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Witnesses:

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