

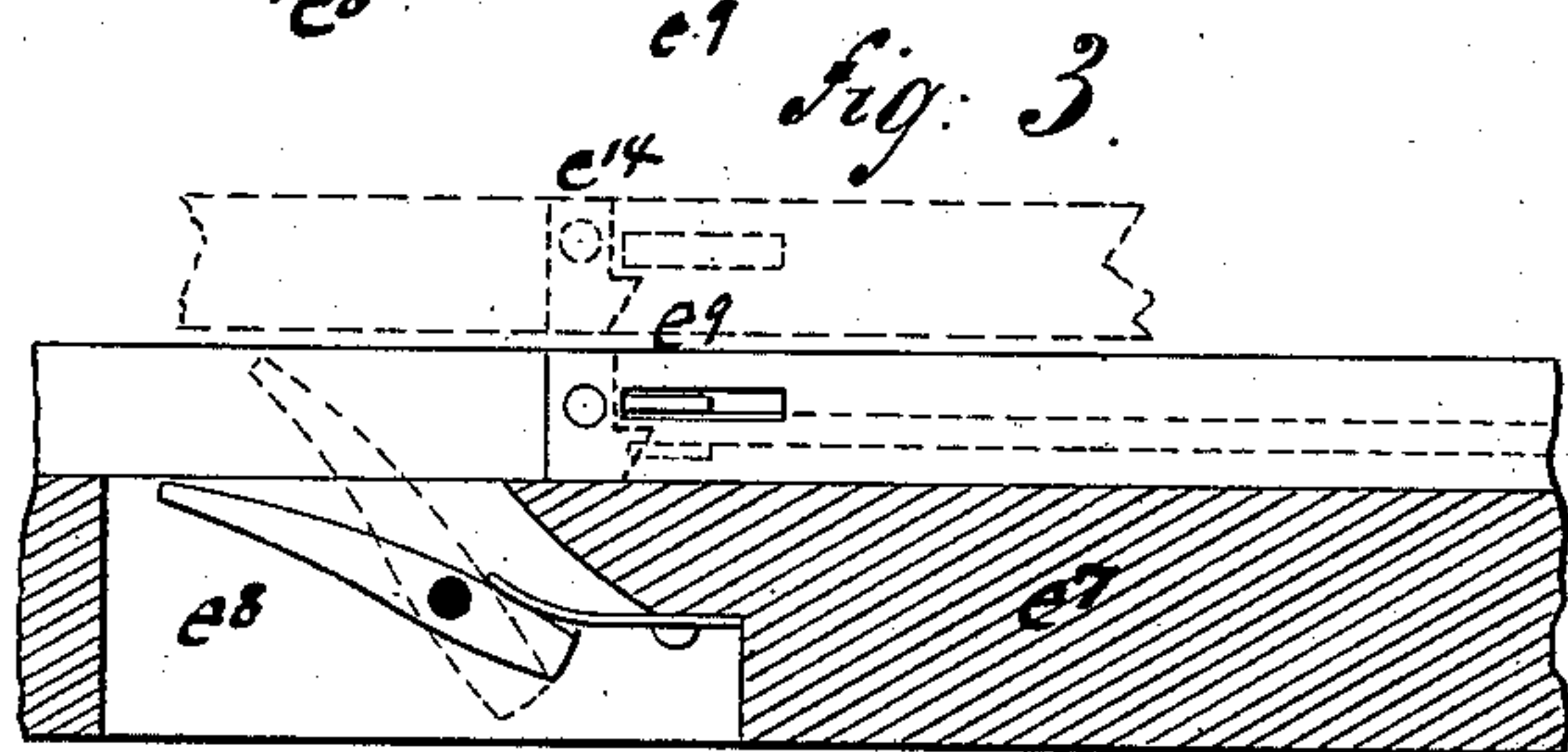
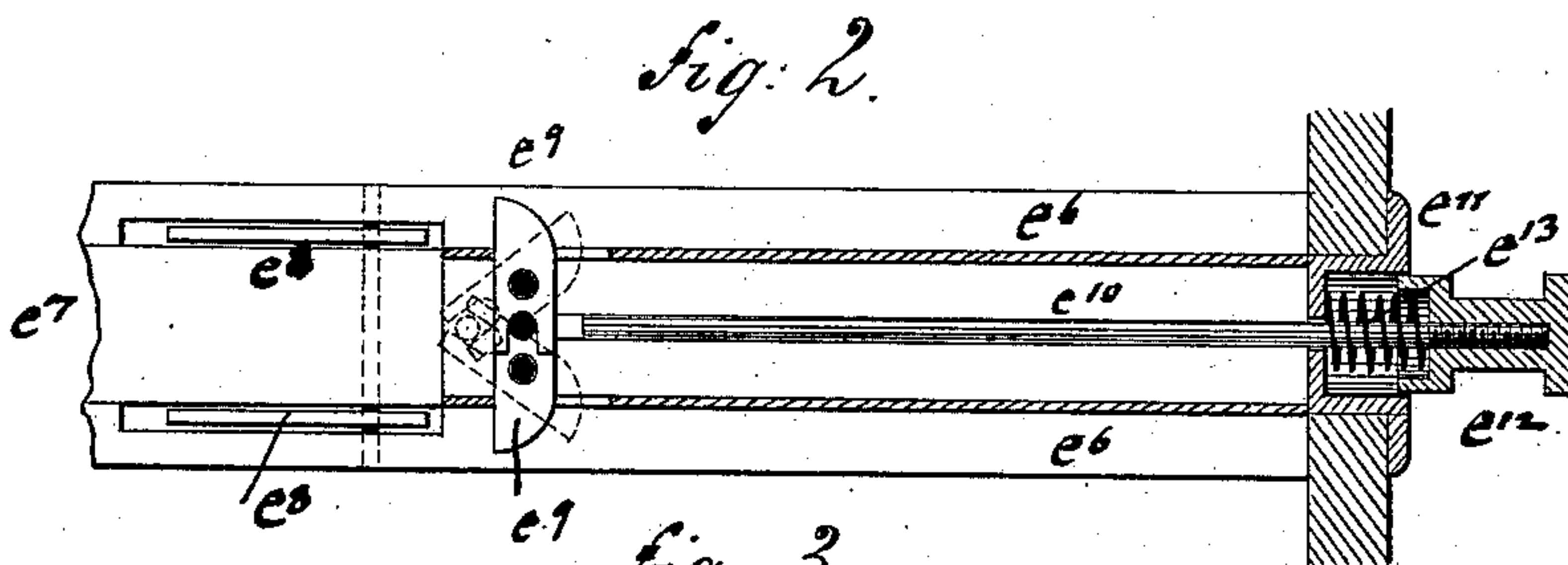
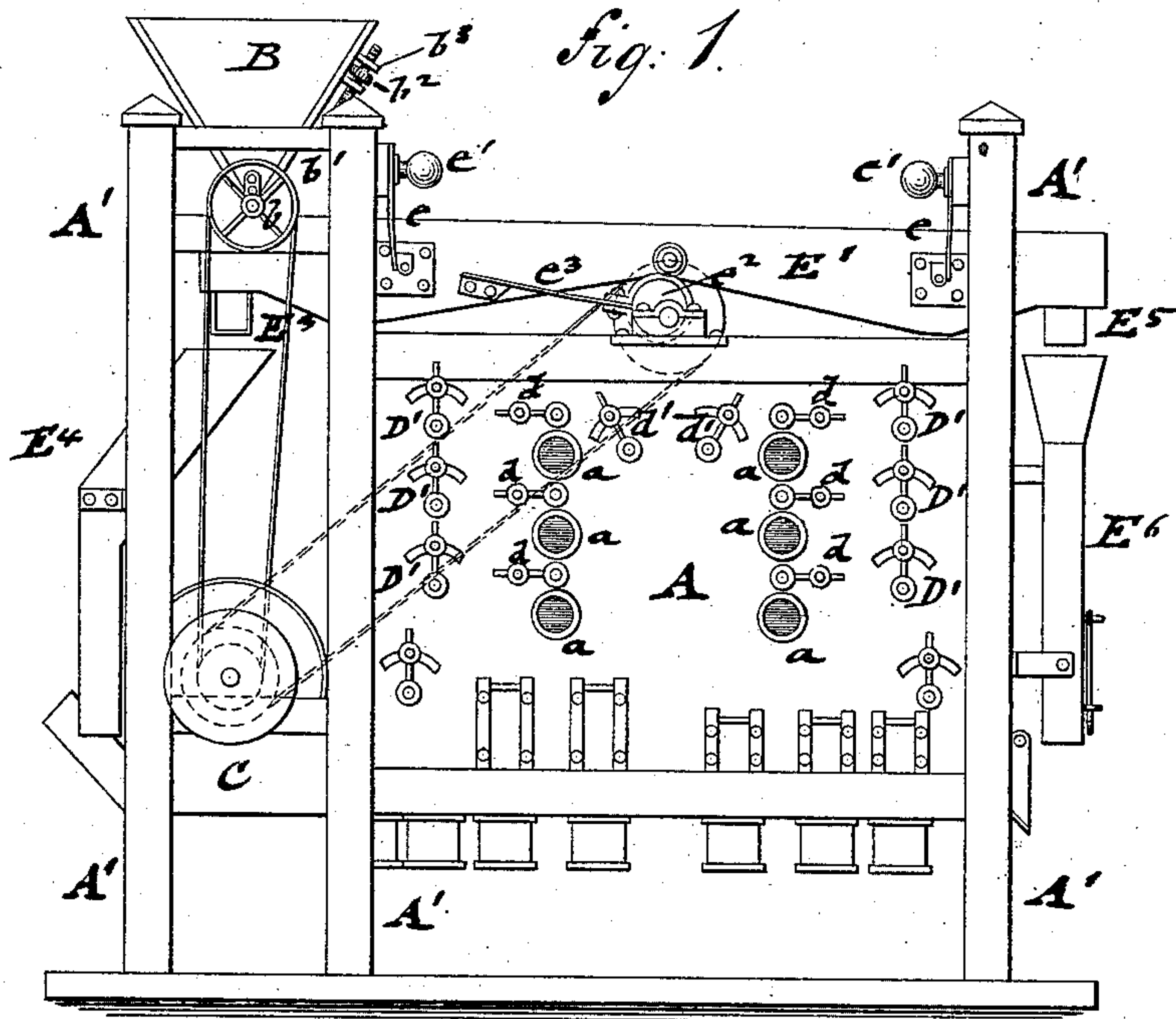
(No Model.)

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C. WEHNER.  
MIDDLINGS PURIFIER.

No. 287,597.

Patented Oct. 30, 1883.



WITNESSES:

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Carl Karp

INVENTOR

Christian Wehner

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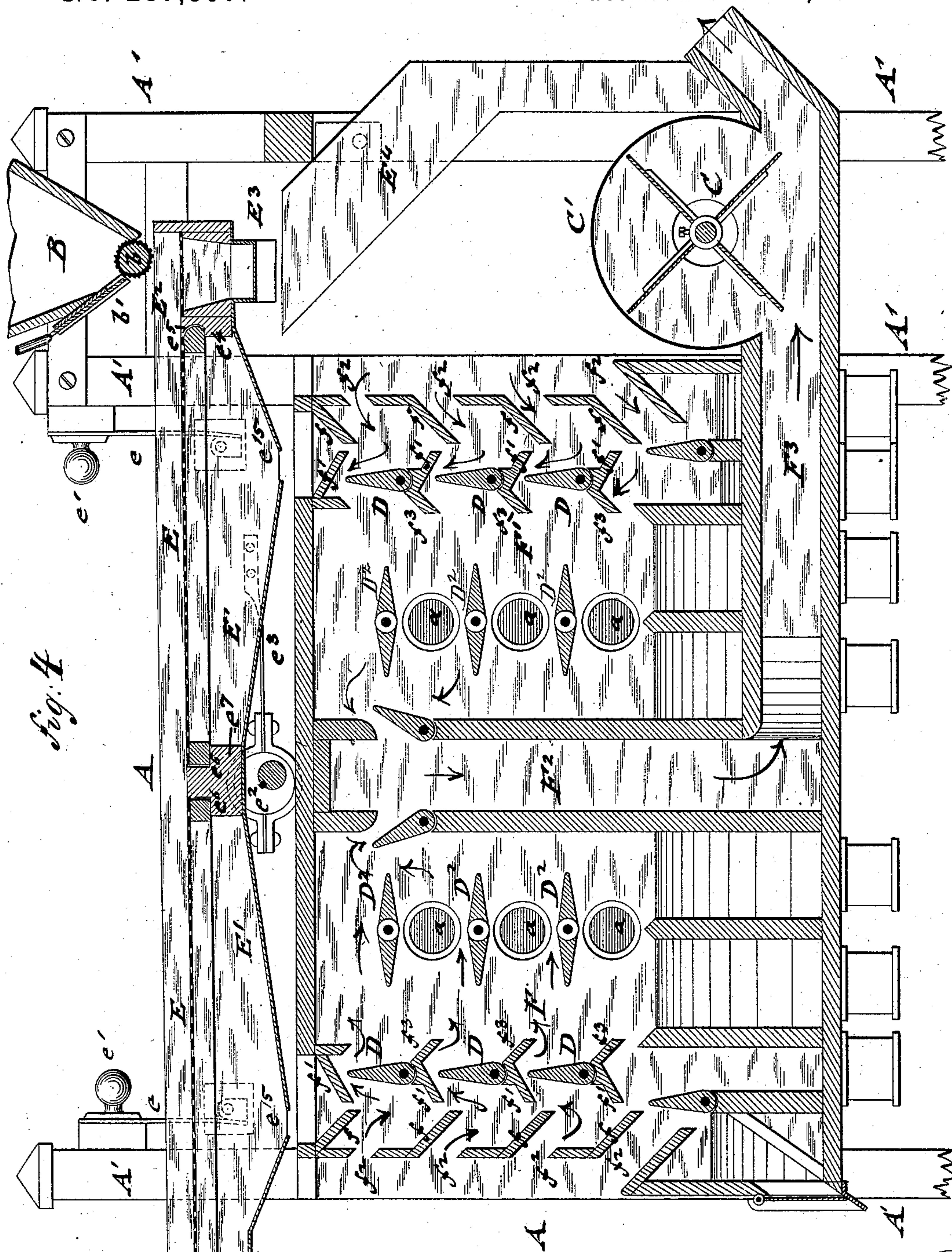
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# UNITED STATES PATENT OFFICE.

CHRISTIAN WEHNER, OF NEW YORK, N. Y.

## MIDDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 287,597, dated October 30, 1883.

Application filed June 28, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN WEHNER, of the city, county, and State of New York, have invented certain new and useful Improvements in Middlings-Purifiers, of which the following is a specification.

This invention has reference to certain improvements in the construction of middlings-purifiers, whereby the more perfect separation of the flour particles from the bran, and consequently a greater yield and a better quality of flour, may be obtained.

In the accompanying drawings, Figure 1 represents a side elevation of my improved middlings-purifier. Figs. 2 and 3 are, respectively, a detail horizontal section of the mechanism for locking the oscillating screens and a detail vertical longitudinal section of the same; and Fig. 4 is a vertical longitudinal section of my improved middlings-purifier, drawn on a larger scale.

The same letters of reference indicate the same or corresponding parts.

A in the drawings represents the casing of my improved middlings-purifier, which casing is made of oblong shape and supported on strong upright posts A'. A supply-hopper, B, is arranged at the top part of the casing, and a suction-fan, C, at the lower part, vertically below the supply-hopper at one end of the machine. At the upper part of the casing A are arranged the shaking screens E and screen-boxes E', and below the same in the casing the symmetrically-arranged separating-chambers F F', into which the screen-boxes discharge their contents. The side walls of the casing A are provided with glass-covered eye-holes a, and with means for adjusting a number of draft-regulating deflectors that are arranged at the interior of the separating-chambers F F'. Intermediately between the separating-chambers F F' is arranged a vertical transverse air trunk or passage, F<sup>2</sup>, in which the air-currents that are drawn in, by the action of the suction-fan C, through openings in the end walls of the casing A are united and then conducted through bottom channels, F<sup>3</sup>, and the fan-casing C' to the outside.

The middlings to be separated are conducted to the machine through the hopper B, the lower part of which is arranged with a

longitudinally-grooved roller b, and at one side thereof with a vertically-adjustable slide-gate, b', that is moved higher or lower by means of a screw-nut, b<sup>2</sup>, applied to the threaded shank of the gate, which shank is guided in exterior lugs, b<sup>3</sup>, of the hopper, as shown clearly in Fig. 1. The roller b is revolved by a belt-and-pulley transmission from the shaft of the suction-fan and the slide-gate b', set to proper height, whereby a uniform and accurately-controllable supply of the middlings to the screens E E is supplied. The screen-boxes E' E' are hung to band-springs e e, that are secured by fastening devices e' e' to the posts A' A', and oscillated by eccentrics e<sup>2</sup>, that are connected by straps e<sup>3</sup> to the screen-boxes E' E'. The eccentrics e<sup>2</sup> are keyed to a transverse shaft, e<sup>4</sup>, which is also revolved by a belt-and-pulley transmission from the fan-shaft.

Immediately below the feed-hopper B is arranged a narrow finely-meshed screen, E<sup>2</sup>, and below the same a transverse channel, E<sup>3</sup>, with inclined bottom, which communicates with a discharge-trunk, E<sup>4</sup>, through which the finest particles of flour are directly conducted off without passing through the entire machine. From the screen E<sup>2</sup> the middlings pass to the first screen, E, which is of somewhat wider mesh than the screen E<sup>2</sup>, and then over the same to the second screen E, which is of still wider mesh than the first screen E. The larger particles, which cannot pass through the screens E E, are conducted over the end of the second screen E to a transverse channel, E<sup>5</sup>, having an inclined bottom, and to a discharge-trunk, E<sup>6</sup>, that is arranged diagonally opposite to the discharge-trunk E<sup>4</sup>, as shown in Fig. 1. The screens E E are so secured in the screen-boxes E' that they can be readily removed for being cleaned or exchanged. For this purpose the transverse end pieces, e<sup>4</sup>, of the boxes E' are provided with concave seats e<sup>5</sup>, into which the rounded-off end pieces of the screens E E are accurately fitted. The inner end strips of the screens E E are supported on shoulders or seats e<sup>6</sup> of the transverse center piece, e<sup>7</sup>, of the screen-boxes E' E', said center piece being provided with suitable recesses with fulcrumed and spring-acted fingers e<sup>8</sup> and with fulcrumed catches e<sup>9</sup>,



that are thrown laterally across the shoulders  $e^6$  of the center piece,  $e^7$ , as shown in Figs. 2 and 3. The inner forked ends of the catches  $e^9$  are pivoted to an actuating-rod,  $e^{10}$ , which extends 5 through a socket,  $e^{11}$ , of the center piece,  $e^7$ , to the outside, it being provided at its outer end with a button or handle,  $e^{12}$ , for actuating the catches  $e^9$ . A spiral spring,  $e^{13}$ , is interposed 10 between the button  $e^{12}$  and the socket  $e^{11}$  of the actuating-rod  $e^{10}$ , so as to return the latter to the normal position when the pressure on the rod is relaxed.

When it is desired to place the screens  $E$  into position in the screen-boxes  $E'$ , the 15 rounded-off ends are first placed on the concave seats  $e^6$  of the end pieces,  $e^4$ , and then the opposite strips of the screens dropped on the seats or shoulders  $e^6$  of the center piece,  $e^7$ , and pressed down upon the spring-actuated fingers, so as to press them down into their re- 20 cesses, as shown in Fig. 3. The catches  $e^9$  are simultaneously pushed back by hook-shaped projections  $e^{14}$  of the screens, (shown in dotted lines in Fig. 3,) and the screens then locked by 25 the catches and projections when fully seated on the transverse center piece,  $e^7$ .

When it is desired to remove the screens  $E$ , the actuating-rod  $e^{10}$  is pushed in, whereby the locking-catches  $e^9$  are released from the 30 projections  $e^{14}$  of the screens, and the latter then lifted by the spring-fingers  $e^8$  above the catches  $e^9$ , so that they can be readily removed for being cleaned or repaired. By this arrangement the screens are reliably held in po- 35 sition during the running of the machine, but are quickly removed and replaced after the machine is stopped without any loosening and tightening of screens or otherwise releasing the fastening devices used with the shaking-screens 40 of purifiers heretofore in use. The bottoms of the screen-boxes  $E'$  are made hopper-shaped, and provided with a transverse discharge-opening,  $e^{15}$ , that is located near the end walls of the separating-chambers  $F$ . 45 The middlings are dropped from the screen-boxes  $E'$  in a fine sheet into troughs formed by inclined and converging pieces  $f$  vertically below the openings  $e^{15}$ . The air is drawn in 50 through the transverse air-induction openings  $f^2$  in the end walls of the casing  $A$ , then along the inclined pieces  $f$ , which serve to deflect the air-currents in a downward direction, so that they strike and break up the fine sheet of mid- 55 dlings, and carry them toward and over deflectors  $D$ , that are pivoted to the side walls of the casing at the apices of the inner inclined strips,  $f'$ . The base part of the deflectors  $D$  is rounded off, so as to fit accurately into concave grooves of said strips, as 60 shown in Fig. 4. One of the pivots of the deflectors  $D$  is provided at the outside of the casing with a pointer or index arm,  $D'$ , that is set by a set-screw along an arc-shaped scale to produce the required inclination of the deflect- 65 ors  $D$ .

From the apices of the inclined strips  $f'$  extend, at the opposite side of the deflectors  $D$ ,

downwardly-inclined strips  $f^3$ , against which the middlings that are carried by the air-cur- 70 rents over the deflectors  $D$  impinge, so as to be conducted around the same to the interior of the separating-chamber  $F$  or  $F'$ . Below the troughs and inclined strip  $f^2$  are arranged inclined chutes or conveying-channels, that 75 are separated by transverse partitions, and thence through their valved openings to the different storage-bins, as customary in mid- dlings-purifiers. The heaviest particles are 80 dropped through the openings in the troughs formed by the inclines  $f$  to the conducting-chutes vertically below the same. The lighter particles are carried over the deflectors and 85 along the inclined strips  $f^2$ , and then dropped and conducted off, while the still lighter particles are drawn over centrally-pivoted and oscillating deflectors  $D^2$ , that are arranged inter- 90 mediately between the troughs  $f$  and the transverse walls of the central air trunk or channel,  $F^2$ . The pivots of the deflectors  $D^2$ , at one side thereof, are extended to the outside of the cas- 95 ing and provided with exterior weighted arms  $d$ , as shown in Fig. 1, by which the deflectors  $D^2$  are balanced. They adjust themselves automatically to the proper degree of inclination, according to the pressure of the currents upon 95 them. The finer particles of flour are thereby conducted in a more or less upwardly-inclined direction over the oscillating deflectors  $D^2$ , and the finest and lightest particles drawn 100 over pivoted deflectors  $D^3$ , that are arranged in openings of the walls of the transverse air-trunk  $F^2$ . The automatically-yielding deflect- 105 ors  $D^2$ , being interposed between the deflectors  $D$  and  $D^3$ , serve not only as obstructions and guides to deflect the air-currents laden with middlings of varied fineness from direct lines 110 to the exit-openings, but they have a flapping or vibratory motion, which again disturbs the middlings and more thoroughly separates the finer from the coarser particles thereof. The 115 deflectors  $D^3$  are adjusted to a more or less inclined position by exterior index-arms,  $d'$ , along graduated scales of the casing  $A$ , in the same manner as the deflectors  $D$ , as shown in Fig. 1, they being rigidly secured by set-screws 115 to the proper position, as required by the force of the draft and the character of the middlings to be purified.

By means of the glass-covered openings  $a$  the course of the middlings at the interior of 120 the separating-chamber can be readily observed from the outside and the deflectors adjusted accordingly. The lighter particles are finally drawn over the deflectors  $D^3$ , and, 125 through the air-trunk  $F^2$ , bottom channels,  $F^3$ , and fan-casing, to the outside, as indicated by arrows in Fig. 4. The same operation takes place in both separating-chambers  $F$  and  $F'$ , the air-currents uniting in the center trunk, 130  $F^2$ , whereby the middlings are not only effectively graded, but also the bran separated from all the particles of flour adhering there- to by the repeated impact of the same with the different deflectors, whereby a better yield



of flour and a more perfect separation of the middlings are obtained.

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

5 1. In a middlings-purifier, the combination of the screen-boxes having transverse end pieces with concave seats, detachable screens having rounded-off strips at one end, and means for locking the opposite end strips of the screens  
10 to the transverse center piece of the screen-boxes, substantially as set forth.

2. In a middlings-purifier, the combination of screens of different mesh, a screen-box provided with a transverse center piece, spring-  
15 actuated lifting-fingers, locking-catches that engage the screens, a rod for operating the catches, and a spring for retaining them in locking position, substantially as described.

3. In a middlings-purifier, the automatically-yielding deflectors  $D^2$ , in combination with a suction-fan and induction-openings, substantially as described. 20

4. In a middlings-purifier, the combination of the pivoted deflectors  $D^2$ , the weighted arms  $d$ , and a suction-fan, substantially as set forth. 25

5. In a middlings-purifier, the combination of the automatic deflectors  $D^2$ , the trunk  $F^2$ , and a suction-fan, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses. 30

CHRISTIAN WEHNER.

Witnesses:

CARL KARP,  
SIDNEY MANN.