

(No Model.)

2 Sheets—Sheet 1.

A. HUNTER.
MIDLINGS PURIFIER.

No. 466,962.

Patented Jan. 12, 1892.

Fig. 2.

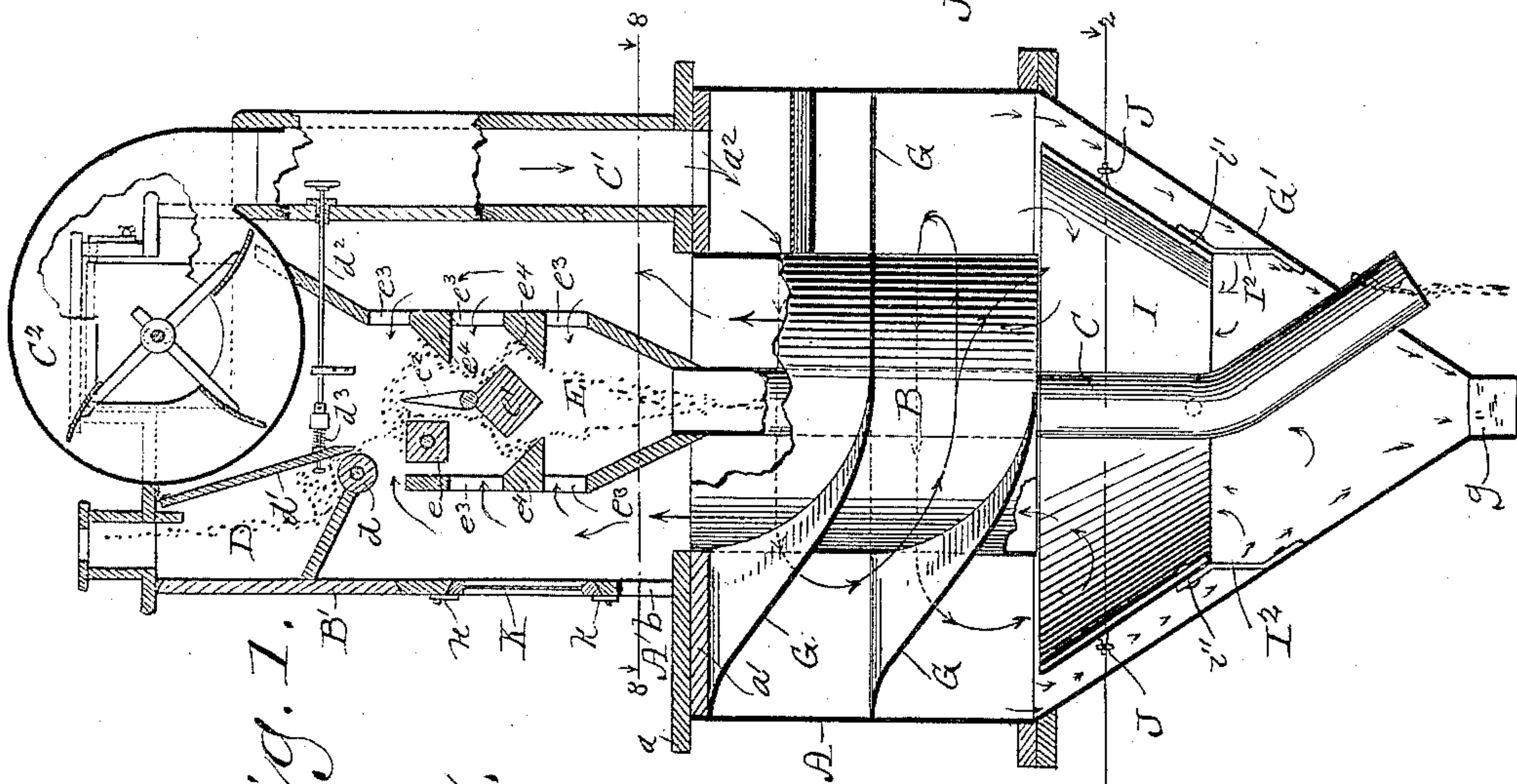
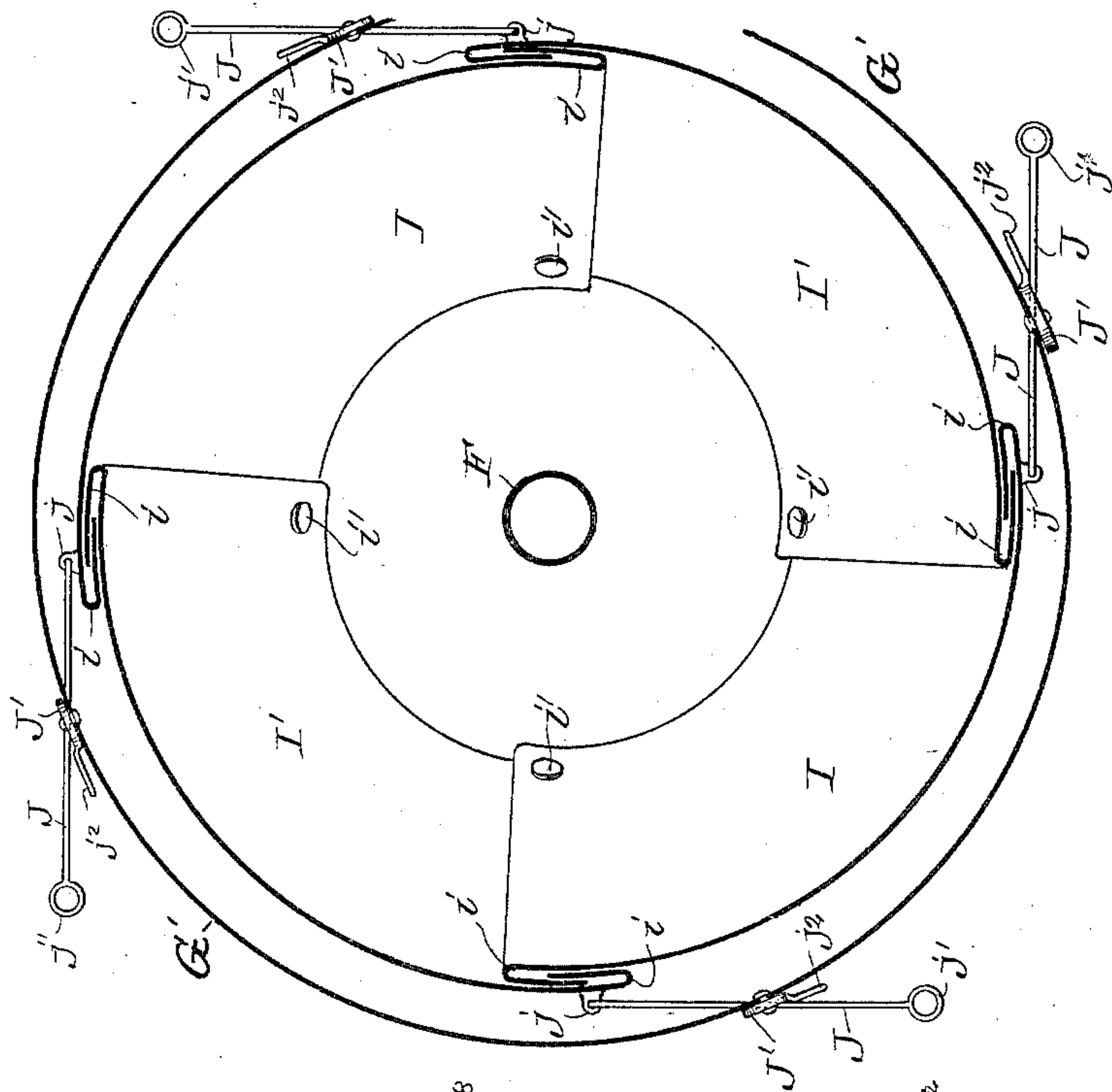


Fig. 1.

Fig. 3.

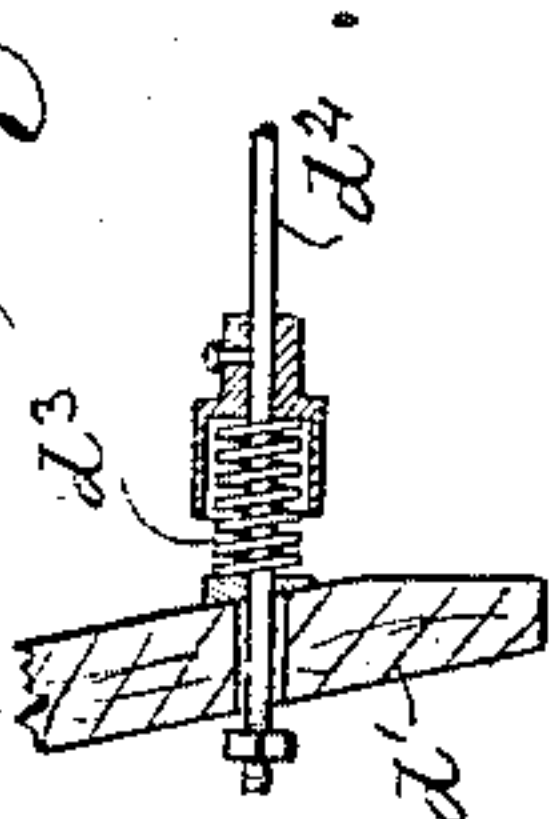
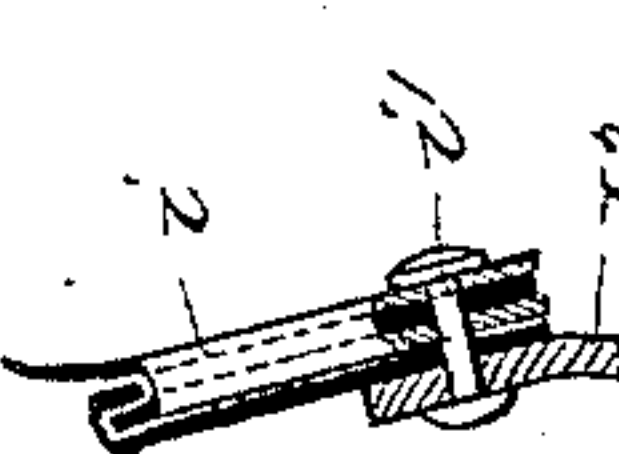


Fig. 6.



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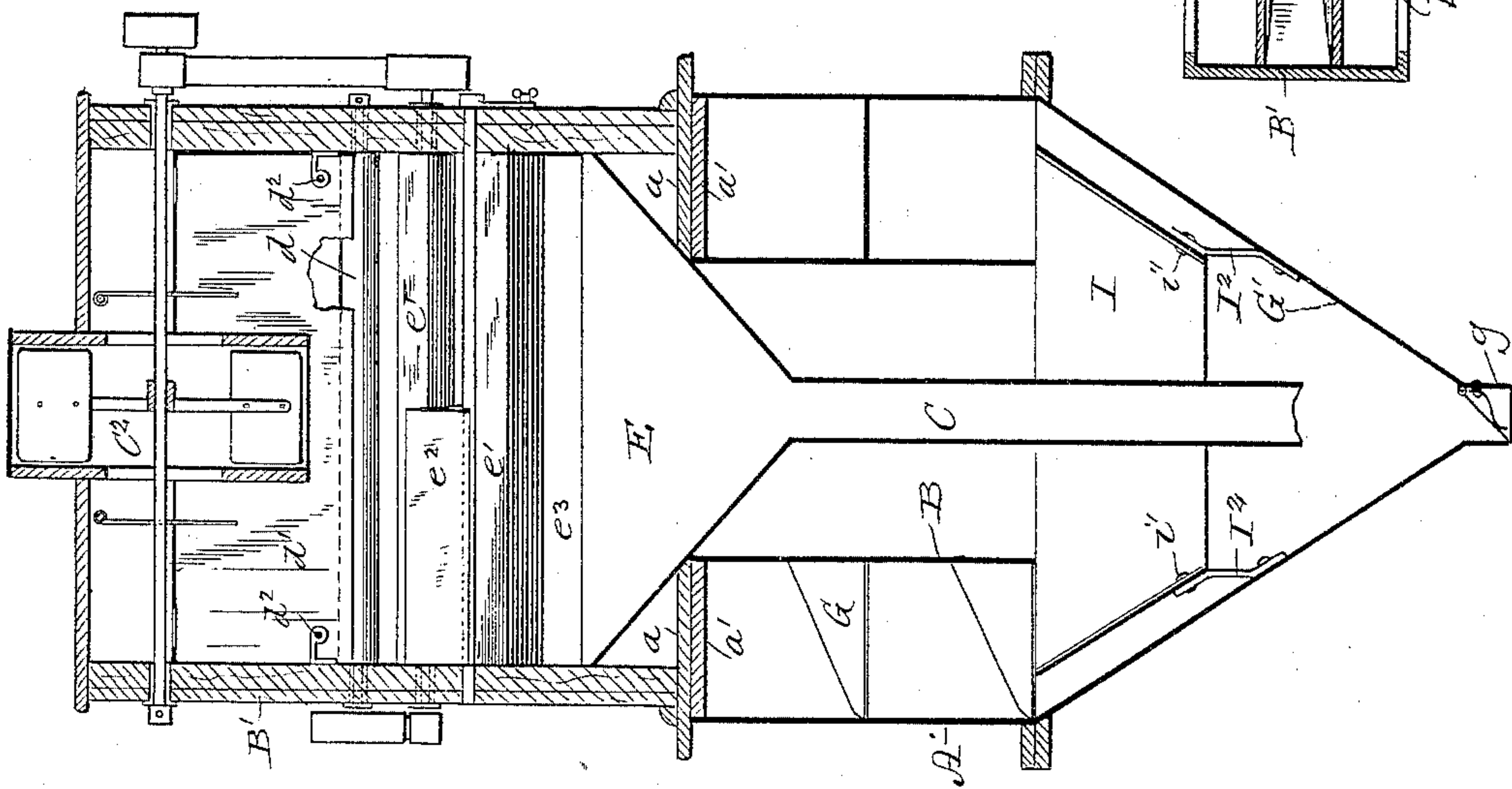
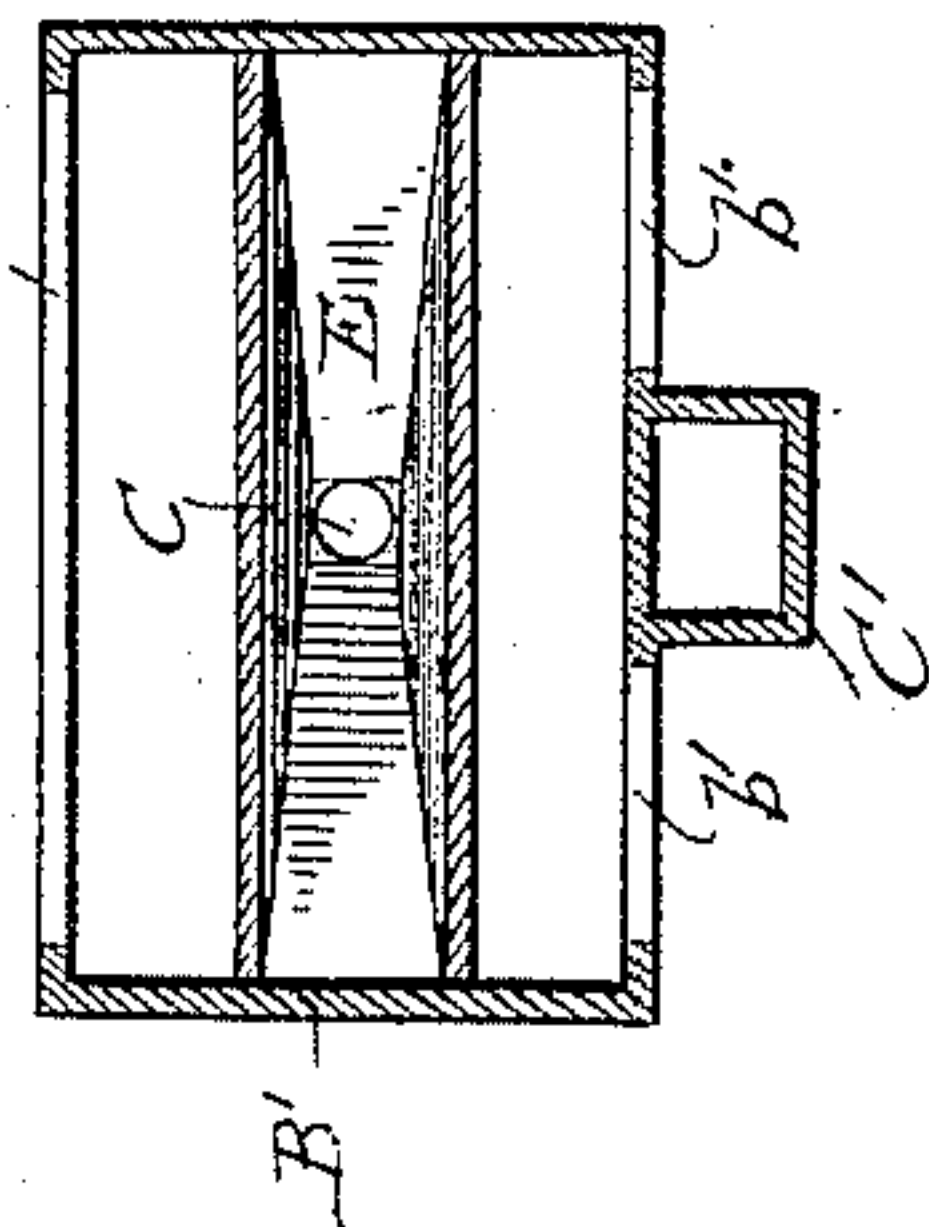
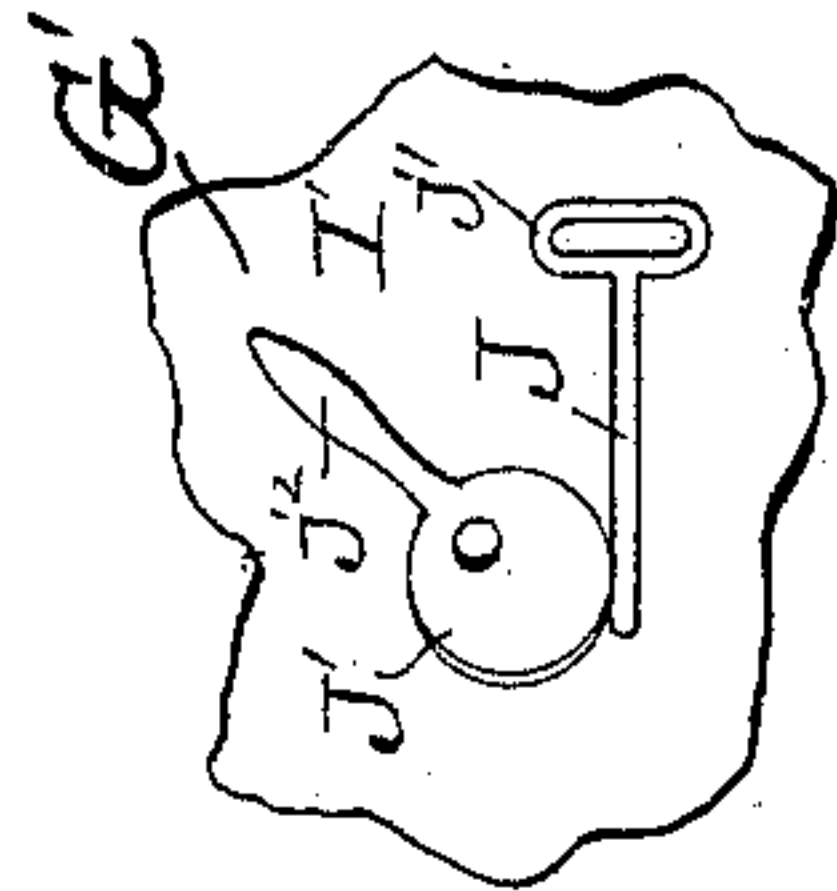
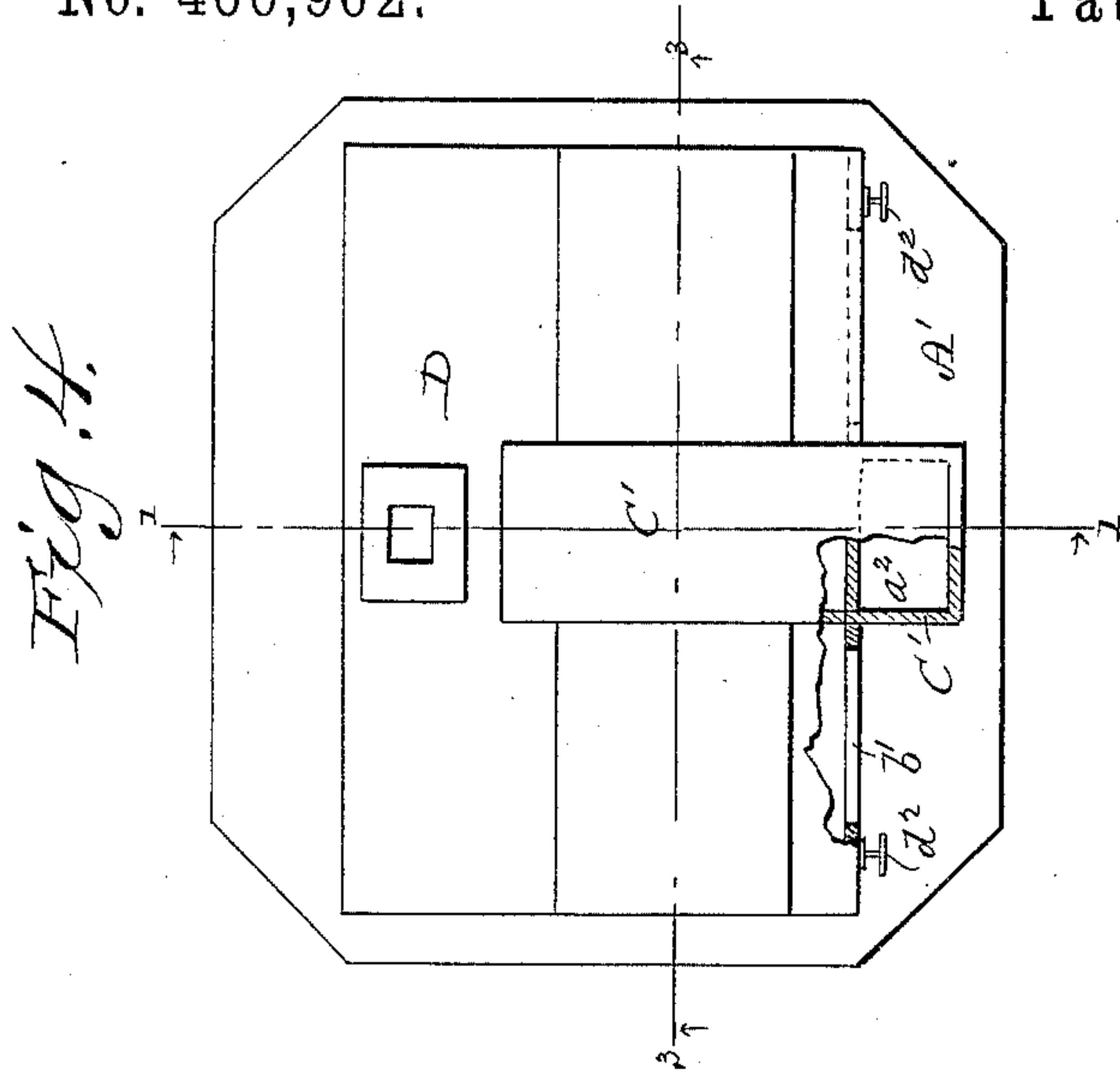
(No Model.)

2 Sheets—Sheet 2.

A. HUNTER.
MIDDLINGS PURIFIER.

No. 466,962.

Patented Jan. 12, 1892.



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Fig. 3.

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UNITED STATES PATENT OFFICE.

ANDREW HUNTER, OF CHICAGO, ILLINOIS.

MIDDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 466,962, dated January 12, 1892.

Application filed August 24, 1891. Serial No. 403,528. (No model.)

To all whom it may concern:

Be it known that I, ANDREW HUNTER, a citizen of the United States, and a resident of Chicago, in the county of Cook, and in the State of Illinois, have invented certain new and useful Improvements in Middlings-Purifiers; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to new and useful improvements in middlings-purifiers; and it consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a central vertical section of a device embodying my invention, taken on line 1 1 of Fig. 4. Fig. 2 is an enlarged horizontal section of the same on line 2 2 of Fig. 1. Fig. 3 is a vertical section of the same on line 3 3 of Fig. 4. Fig. 4 is a top plan view showing parts broken away. Figs. 5, 6, and 7 are detail views of separate parts. Fig. 8 is a horizontal section of the upper portion of the machine, taken on line 8 8 of Fig. 1.

In the drawings, A indicates an outer cylinder, preferably formed of sheet metal; B, a smaller open-ended cylinder located concentrically within the cylinder A; C, a central discharge-pipe for the purified middlings, extending centrally through the cylinder B and carried to the outside of the machine. The annular space between the cylinders A and B is closed at the upper end by a cover A', preferably consisting of upper and lower portions a a' , respectively, suitably secured together in such a manner as to be readily separable.

B' is a casing located above and communicating with the cylinder B. An aperture a^2 is provided in the annular cover A', and an air-conduit C' is arranged to communicate with said aperture a^2 at one end and with a blast-fan C² at its other end. A hopper D, of any convenient form, is provided, from the lower end of which the middlings are fed in the usual manner by means of a feed-roller d . An apertured purifying-chamber E is located below the discharge end of the hopper D and is arranged so as to receive the middlings as they leave said hopper. A square roller e is located in the upper end of said apertured purifying-chamber and is arranged to rotate therein in such a manner as to throw

the middlings upwardly as they are discharged into the upper part of said chamber. A squared bar e' extends across the purifying-chamber E, and a divider e^2 is pivotally connected with its angular upper edge, as shown more particularly in Figs. 1 and 2. Apertures e^3 e^3 are provided in the side walls of the purifying-chamber E, and intermediate inclined portions e^4 e^4 are provided upon the inside surfaces of said side walls. The discharge-conduit C is connected with the lower end of the purifying-chamber E, so as to carry off the purified middlings which descend through said chamber. An adjustable gate d' is pivotally connected with the casing B', and is adjustably held adjacent to the feed-roller d at the lower end of the hopper D by means of a longitudinally-movable rod d^2 , provided with a spiral spring d^3 , which engages with the free edge of the gate d' and permits said gate to yield outwardly to permit the escape of any unusually large substance from the hopper D.

Within the annular chamber or space between the outer cylinder A and the inner cylinder B is provided a continuous spiral partition G, which serves to divide said chamber or space into a circuitous air-conduit, which communicates at its upper end with the air-inlet aperture a^2 . A conical bottom G' is provided at the lower end of the cylinder A, and is in turn provided with a discharge-spout g . An adjustable cone I is located within said conical bottom G', this cone being composed of a plurality of sections I' I', adjustably secured together at their lower edges in such a manner as to permit their upper edges to be expanded or contracted so as to give an increased or decreased area to the upper or larger end of said cone. As illustrated more particularly in Fig. 2, the side margins of each of the sections I' I' are bent or folded over, as shown in Fig. 2, at i i , and the adjacent curved edges of said sections are movably engaged with each other. Pivotal connections i' i' are preferably provided at the lower portions of said adjacent curved edges, about which connections the sections I' I' may be moved to produce the requisite expansive or contractive movement of said sections I' I'. Suitable supporting-arms I² I² are engaged with said pivotal connections i'

2', and extend downward and are engaged
 with the inclined side walls of the conical
 chamber G', said arms serving to support the
 cone I centrally within said chamber. Any
 5 suitable means may be provided for operat-
 ing the movable sections I' I'—as, for in-
 stance, rods J J, engaged with ears *j j* on the
 outer surfaces of said sections I' I', and ex-
 tending through apertures in the side walls
 10 of the conical chamber G', and provided
 with operating-handles *j' j'*. Any suitable
 means may be provided for locking the rods
 J J in their adjusted positions, so as to retain
 the sections I' I' of the cone I in any desired
 15 position. As illustrated in Fig. 5, locking-
 cams J' J' are employed for this purpose,
 said cams being provided with levers *j² j²*,
 and journaled upon the outside of the con-
 ical chamber G', adjacent to the apertures
 20 through which the rods J J are passed, said
 cams being arranged to engage with the rods
 J J, so as to hold said rods from moving.
 The casing B' is preferably provided with
 one or more air-inlet openings *b b'*, through
 25 which outside air is free to enter. A window
 K is also preferably provided in one side of
 the casing B', opposite the purifying-cham-
 ber E, through which the operation of the
 device may be observed. This window is
 30 preferably made removable, and is secured
 in the side wall of the casing B' by means of
 buttons *k k*. By this construction the win-
 dow may be readily removed and access had
 to the interior of the machine when desired.
 35 As illustrated more particularly in Figs. 1
 and 3, the casing of the fan C² is arranged to
 communicate with the interior of the purify-
 ing-chamber E, so as to draw air from the up-
 per portion of said chamber, and the dis-
 40 charge-outlet of said fan-casing being con-
 nected with the air-conduit C' it is obvious
 that the air which is drawn up by the fan C²,
 through the purifying-chamber E, will be dis-
 charged through the conduit C' into the an-
 45 nular chamber between the cylinders A and B.
 The operation of my improved device is as
 follows: The middlings are fed from the hop-
 per D into the upper part of the purifying-
 chamber E, falling upon the rotating square
 50 shaft *e*, by means of which they are thrown
 upwardly into the upper portion of the puri-
 fying-chamber, where they momentarily re-
 main suspended, during which time the as-
 cending currents of air which are drawn by
 55 the fan C², through the apertures *e³ e³*, sepa-
 rate the dust and other light particles from
 the middlings. The ascending currents of
 air also assist in holding the middlings in
 suspension within the top of the purifying-
 60 chamber, so that the air is permitted to act
 for a longer time upon the middlings, and
 thus more effectually remove the dust there-
 from. By the whirling or circular motion of
 the currents of dust-laden air all particles of
 65 dust and other substances heavier than the
 air are carried to the outside of the annular
 chamber, while the purified air is forced into

the cone I, and thence upwardly through the
 cylinder B. The air containing the dust at
 the periphery of the annular chamber is then 70
 forced downwardly into the annular space be-
 tween the inclined wall of chamber G' and
 the cone I, and by the conical form of said
 chamber G' the air containing the dust is
 compressed as it descends through said annu- 75
 lar space (meanwhile continuing its circular
 motion) until it reaches a point below the
 lower edge of the cone I, when the purified
 air is free to ascend through the interior of 80
 said cone I, thus relieving the pressure with-
 in the lower part of the conical chamber G',
 and thereby forming a dead-air space, into
 which the dust and other heavy particles are
 permitted to gravitate and from which they
 are discharged through the spout *g*. It may 85
 happen that a greater or less amount of open-
 ing is necessary to the proper operation of
 the machine in separating the dust-laden por-
 tion of the air from the purified portion, and
 by my improved construction the machine 90
 may be readily adjusted so as to give the nec-
 essary amount of opening between the cone
 I and the inclined wall of the chamber G' by
 a simple operation of the adjusting-rods J J
 and the locking-cams J' J'. By this construc- 95
 tion, therefore, the operation of the currents
 of air in separating the dust is placed en-
 tirely under the control of the operator, and
 he is enabled to readily adjust the machine
 so as to effect a perfect separation of the dust 100
 under all circumstances.

Valves may be provided in the outlet-pas-
 sages C and *g* to prevent air from being drawn
 upwardly through said passages by the fan.

Having thus described my invention, what I 105
 claim as new, and desire to secure by Letters
 Patent of the United States, is—

1. In a middlings-purifier, the combination,
 with a purifying-chamber, a blast-fan com-
 municating therewith, a circuitous air-pas- 110
 sage below said purifying-chamber communi-
 cating with said fan, and a conical dust-cham-
 ber into which said circuitous air-passage is
 arranged to discharge, of a cone located con-
 115 centrically within said chamber and suitable
 means for giving an expansive adjustment to
 said cone, substantially as described.

2. In a middlings-purifier, the combination,
 with a purifying-chamber, a blast-fan com-
 municating therewith, a circuitous air-pas- 120
 sage located below the purifying-chamber and
 communicating with the discharge-opening
 of the fan-casing, and a conical dust-chamber
 communicating with the discharge end of said
 circuitous air-passage, of a cone located con- 125
 centrically within said dust-chamber, said
 cone provided with a plurality of sections
 pivotally connected with each other at their
 adjacent lower edges, and means connected
 with the upper portions of said sections for 130
 giving an expansive adjustment to said sec-
 tions, substantially as described.

3. In a middlings-purifier, the combination,
 with a purifying-chamber, blast-fan, a cir-

5 cuitous air-passage, and a conical dust-chamber, of an adjustable cone located concentrically within said dust-chamber, said adjustable cone comprising a plurality of sections adjustably engaged with each other along their inclined side margins, rods pivotally connected with the upper edges of said adjustable sections and extending to the outside of said dust-chamber, and means for locking said rods in their adjusted positions, substantially as described.

10 4. The combination, with a purifying-chamber and a blast-fan communicating therewith, a circuitous air-passage communicating with the discharge-opening in said fan-casing, and
15 a conical dust-chamber into which said circuitous air-passage is arranged to discharge, of an adjustable cone located concentrically within said chamber, said cone comprising a plurality of sections having their inclined side margins curved or folded into a substantially U shape and adjustably engaged with each other, pivotal connections between the adjacent lower edges of said sections, and
20 25 means connected with their free upper edges

for effecting an expansive adjustment of said sections, substantially as described.

5. The combination, with a purifying-chamber and a blast-fan communicating therewith, of a casing surrounding said purifying-chamber, and provided with apertures for the admission of external air, a chamber communicating with the lower end of said casing and open at its lower end, a circuitous air-passage communicating with the discharge-opening in the fan-casing, a conical dust-chamber communicating with the lower end of said first-mentioned chamber and with the discharge end of said circuitous air-passage, and an adjustable inverted truncated cone located concentrically within said conical chamber, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

ANDREW HUNTER.

Witnesses:

JOHN E. WILLS,
WM. KLUG.