

No. 687,743.

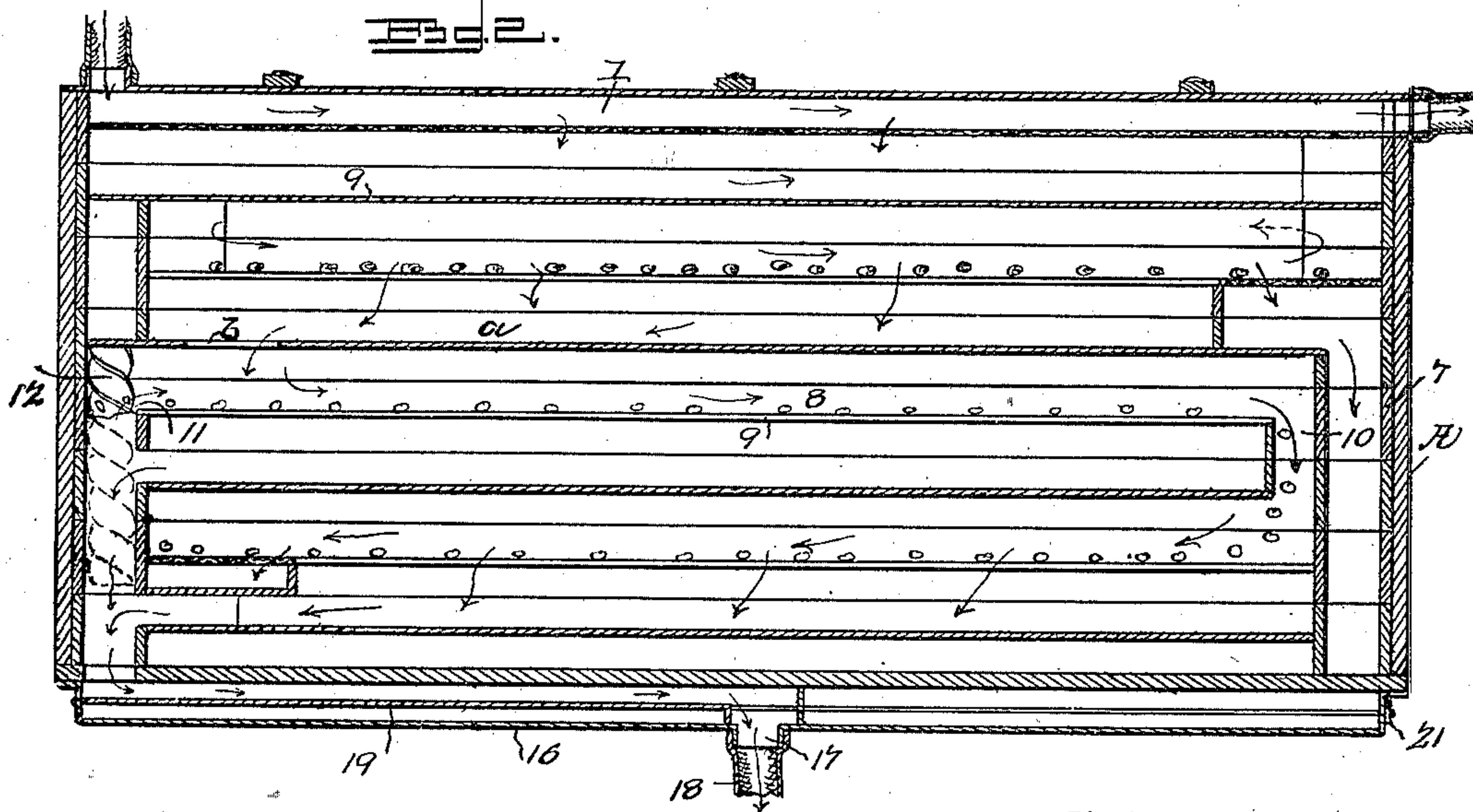
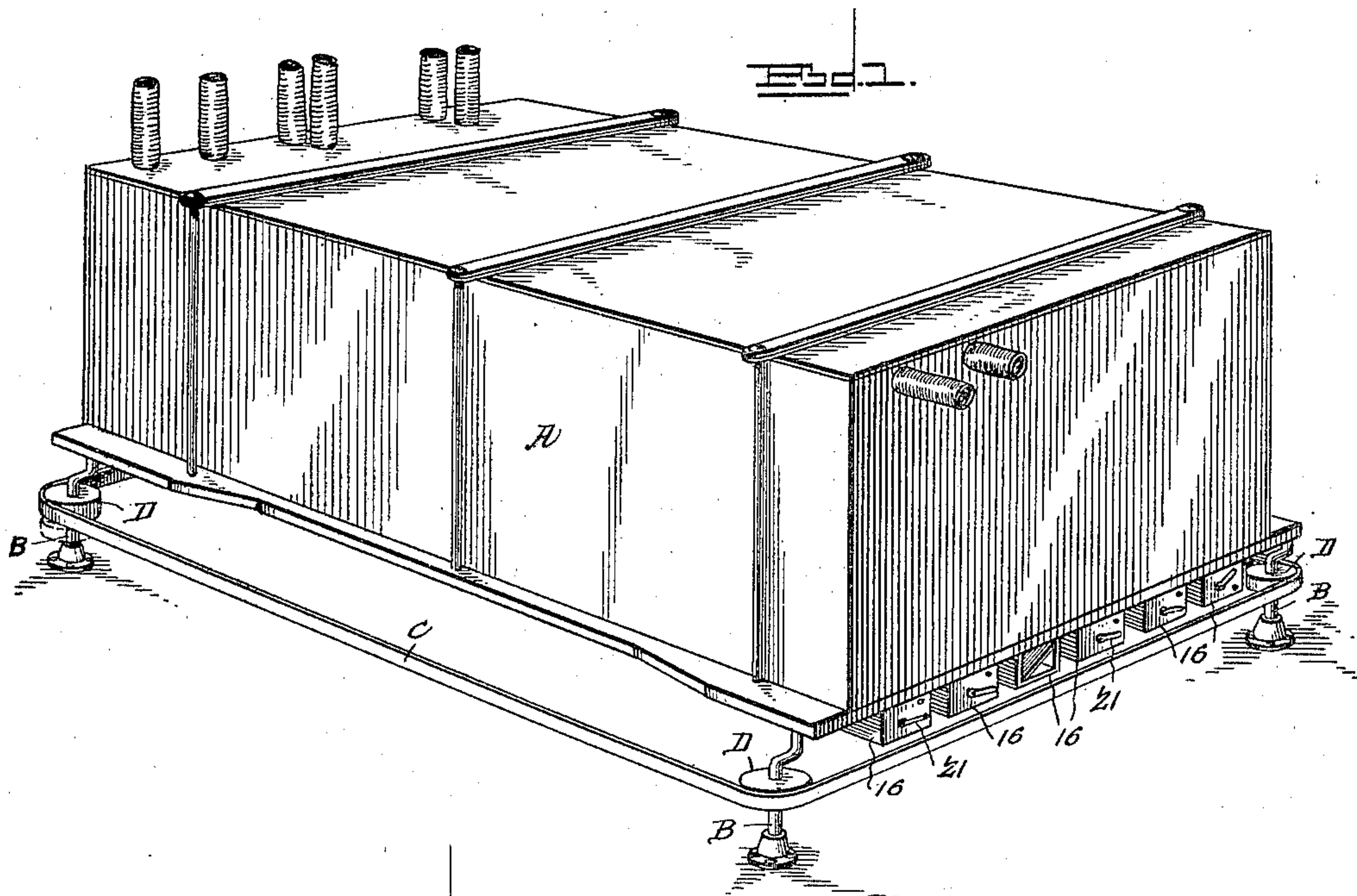
Patented Dec. 3, 1901.

S. T. GREEN.  
GYRATORY FLOUR BOLT.

(Application filed May 5, 1900.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses

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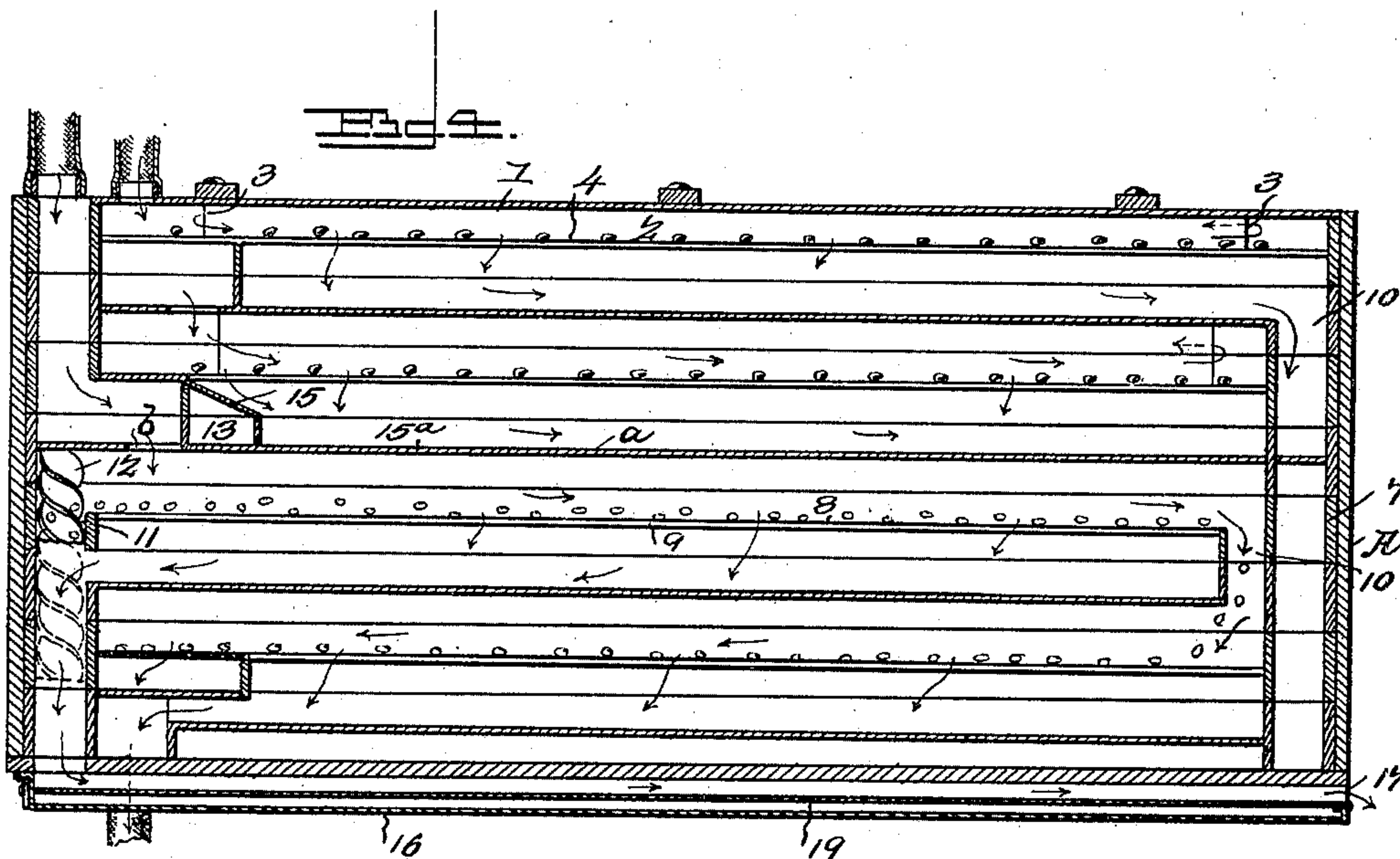
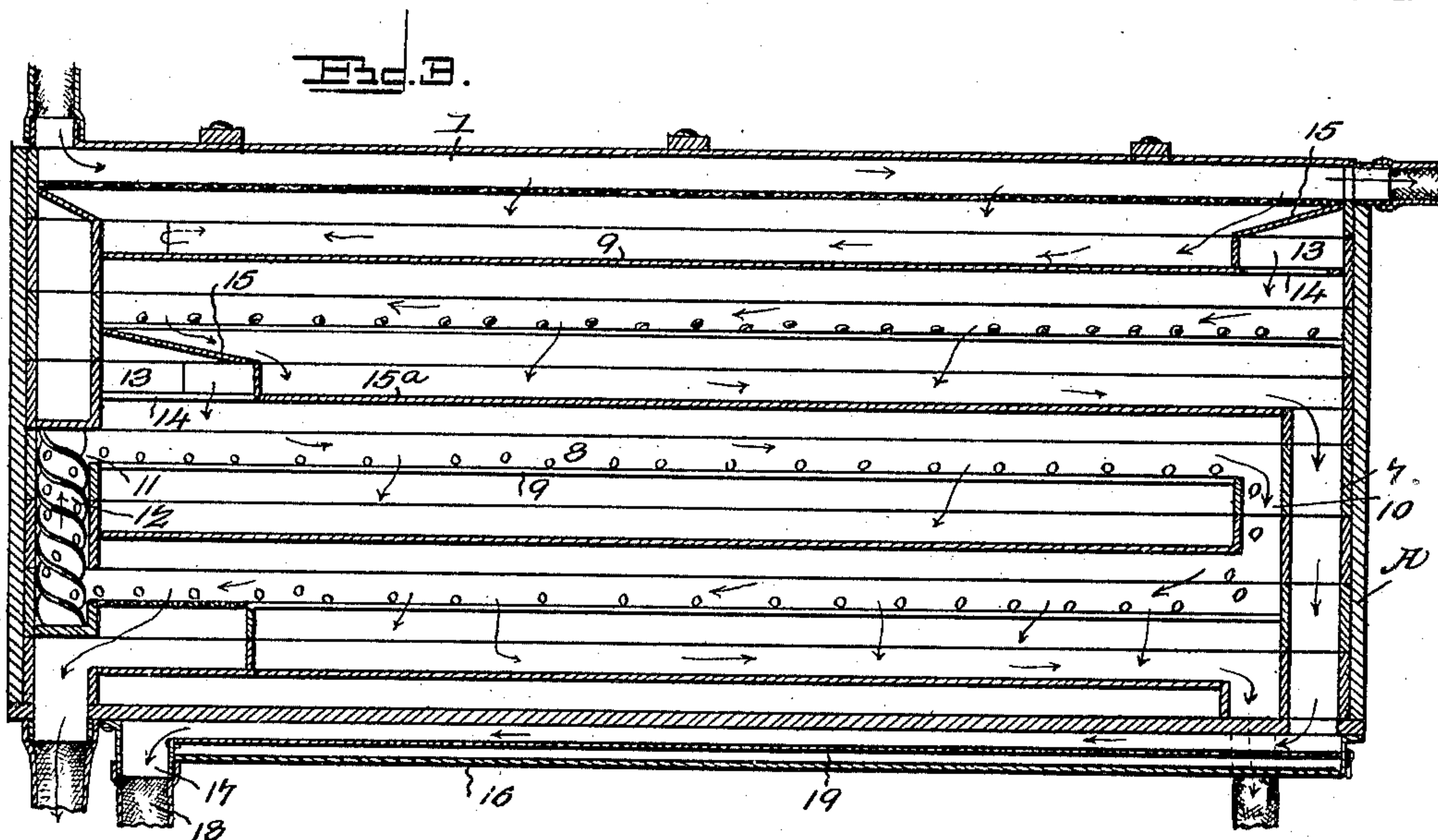
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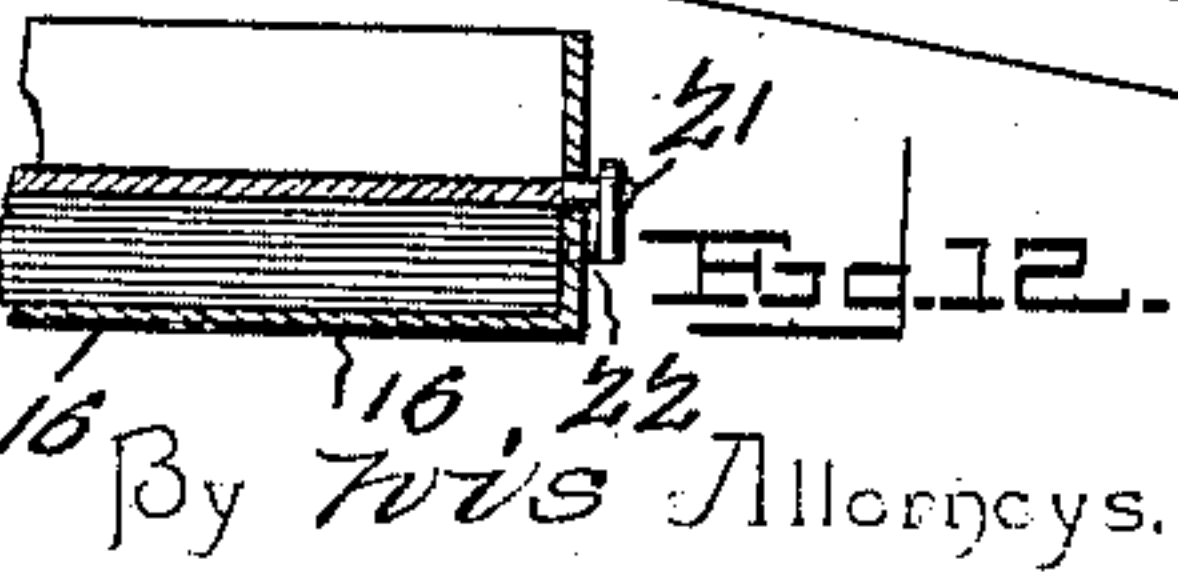
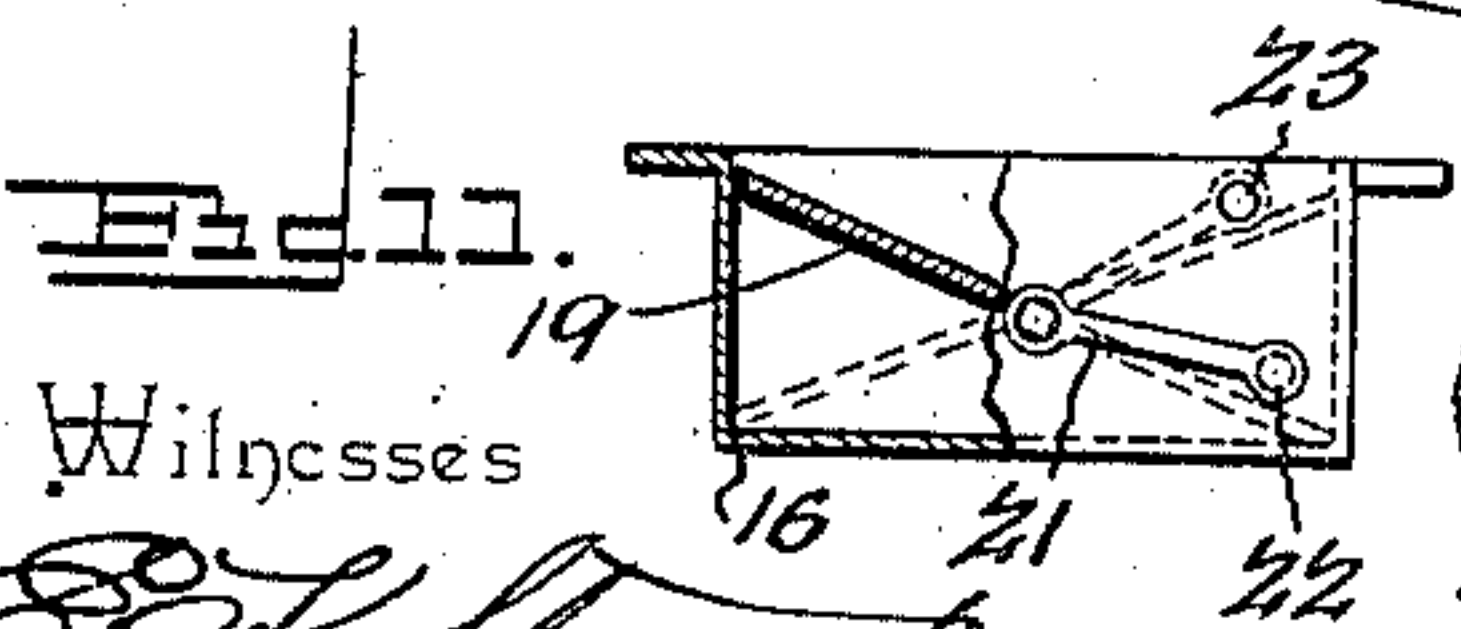
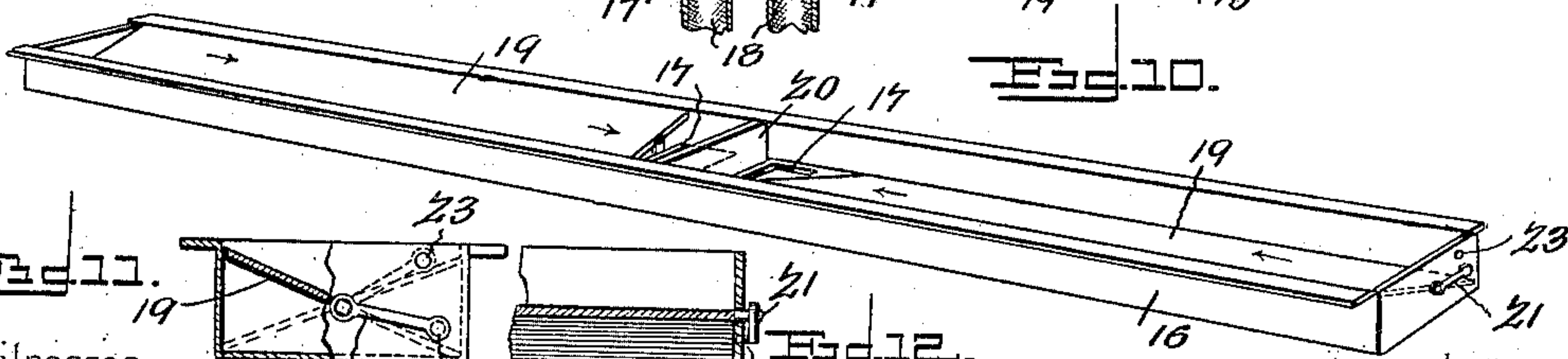
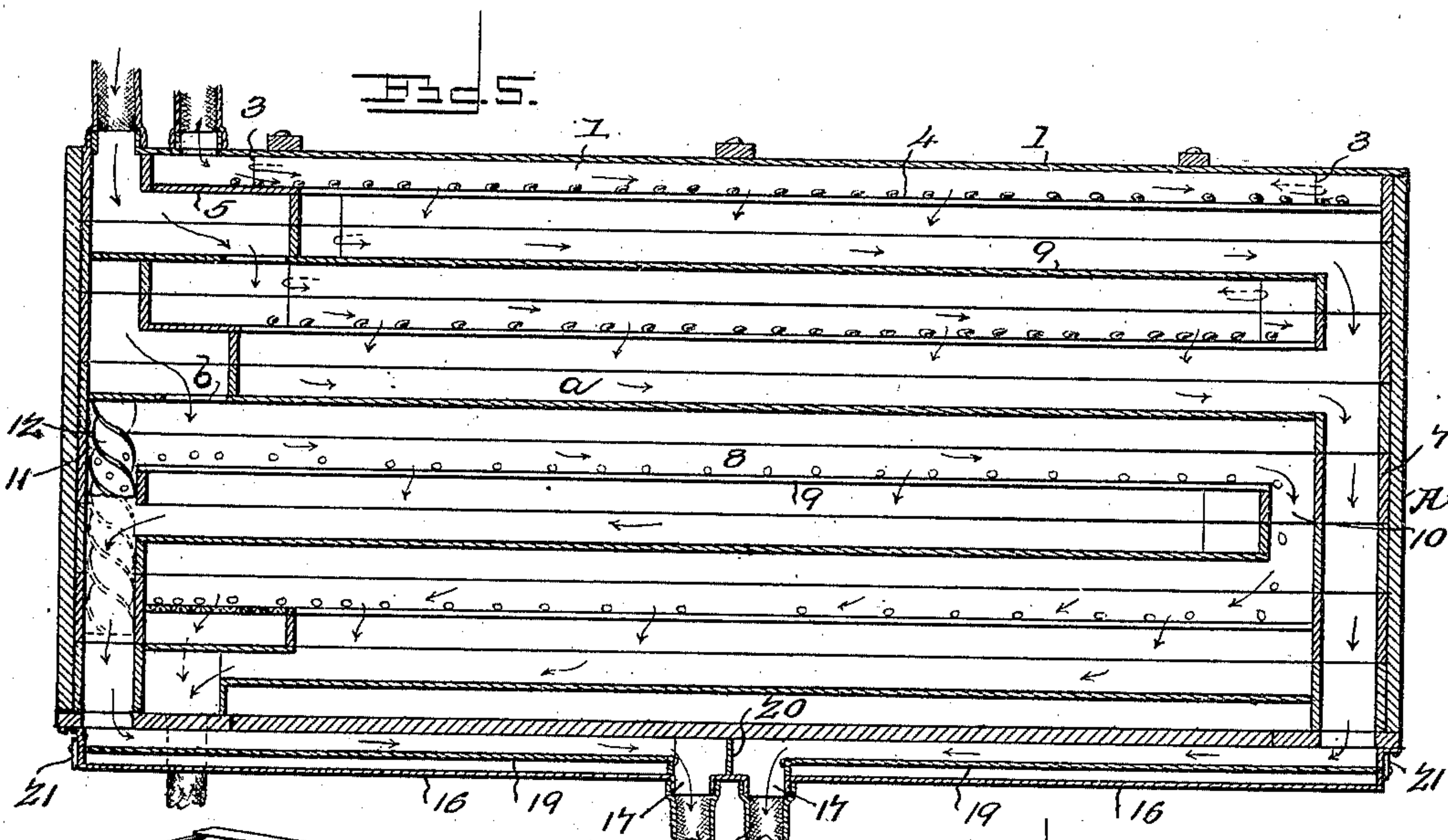
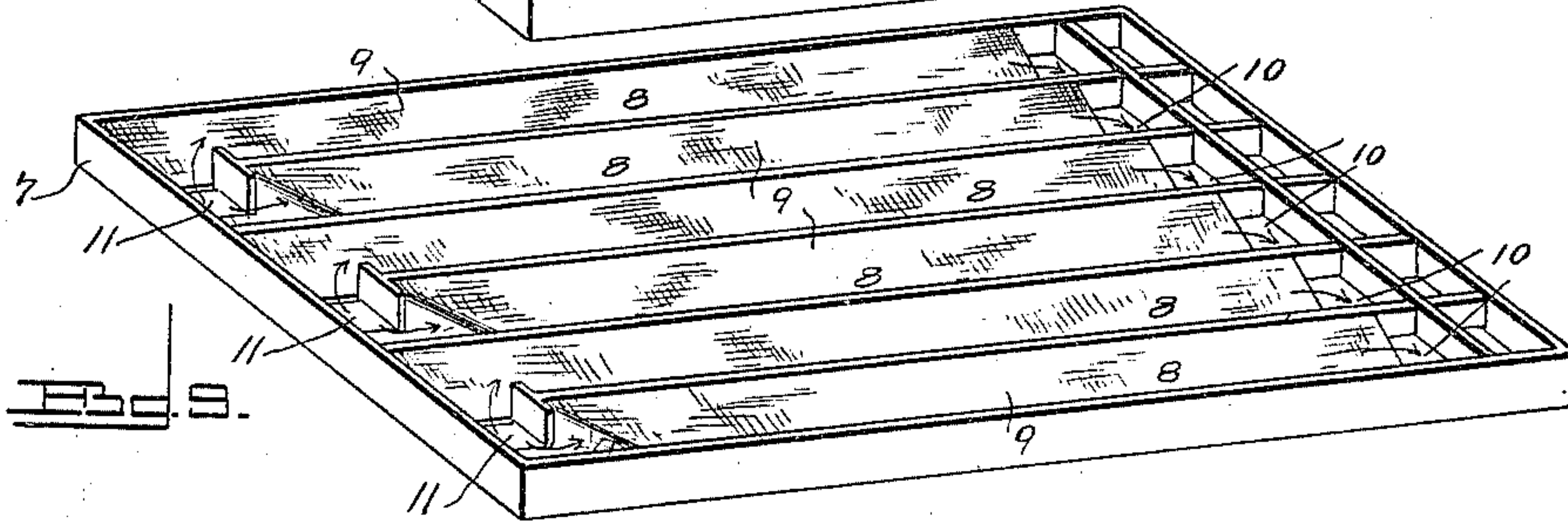
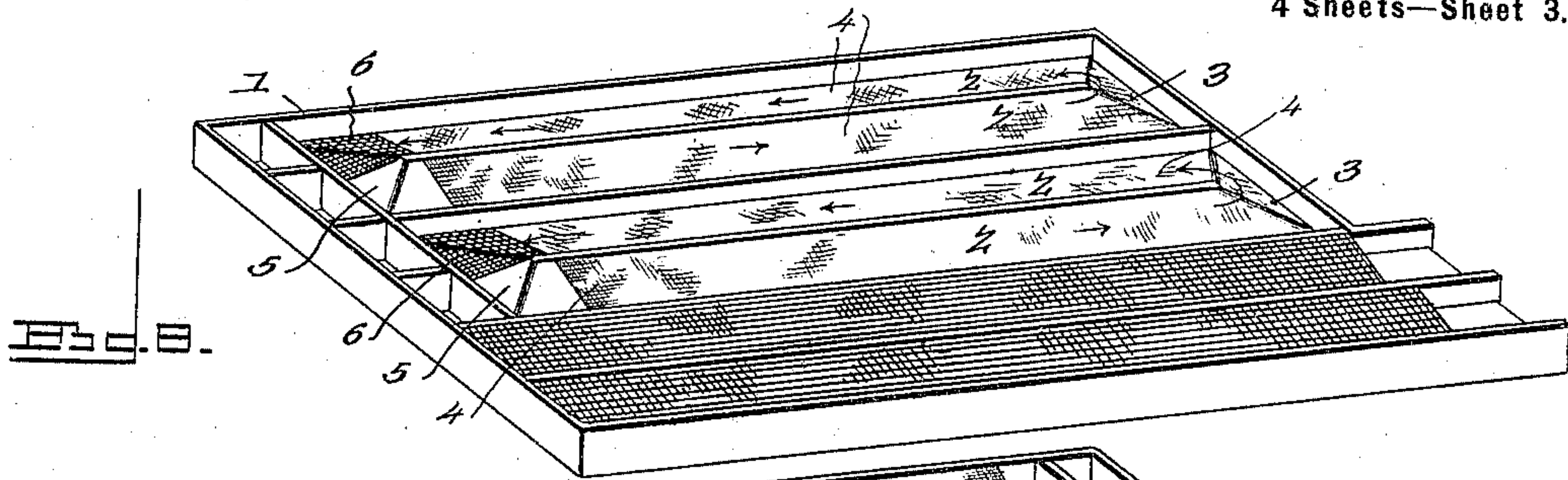
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4 Sheets—Sheet 3.



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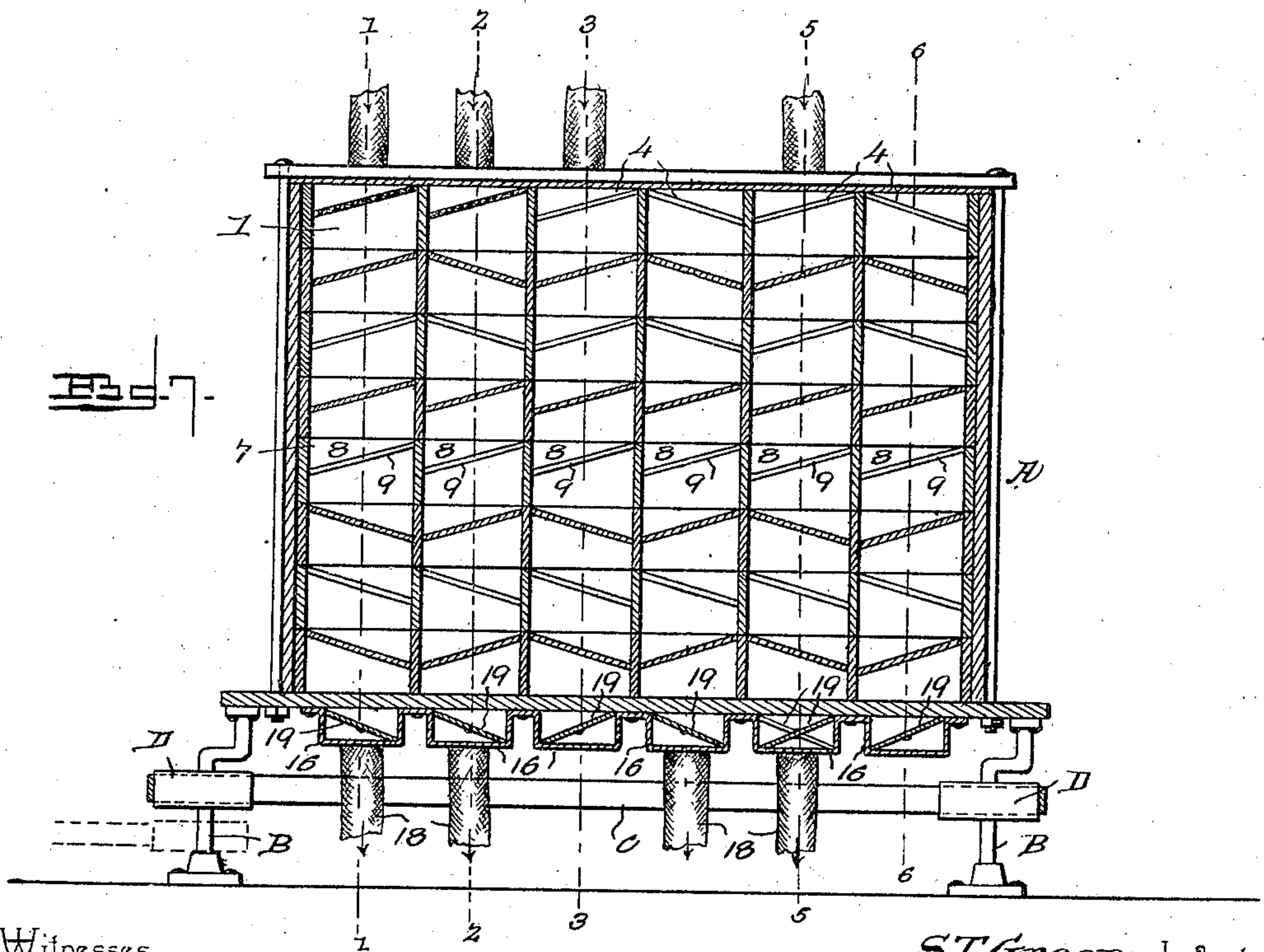
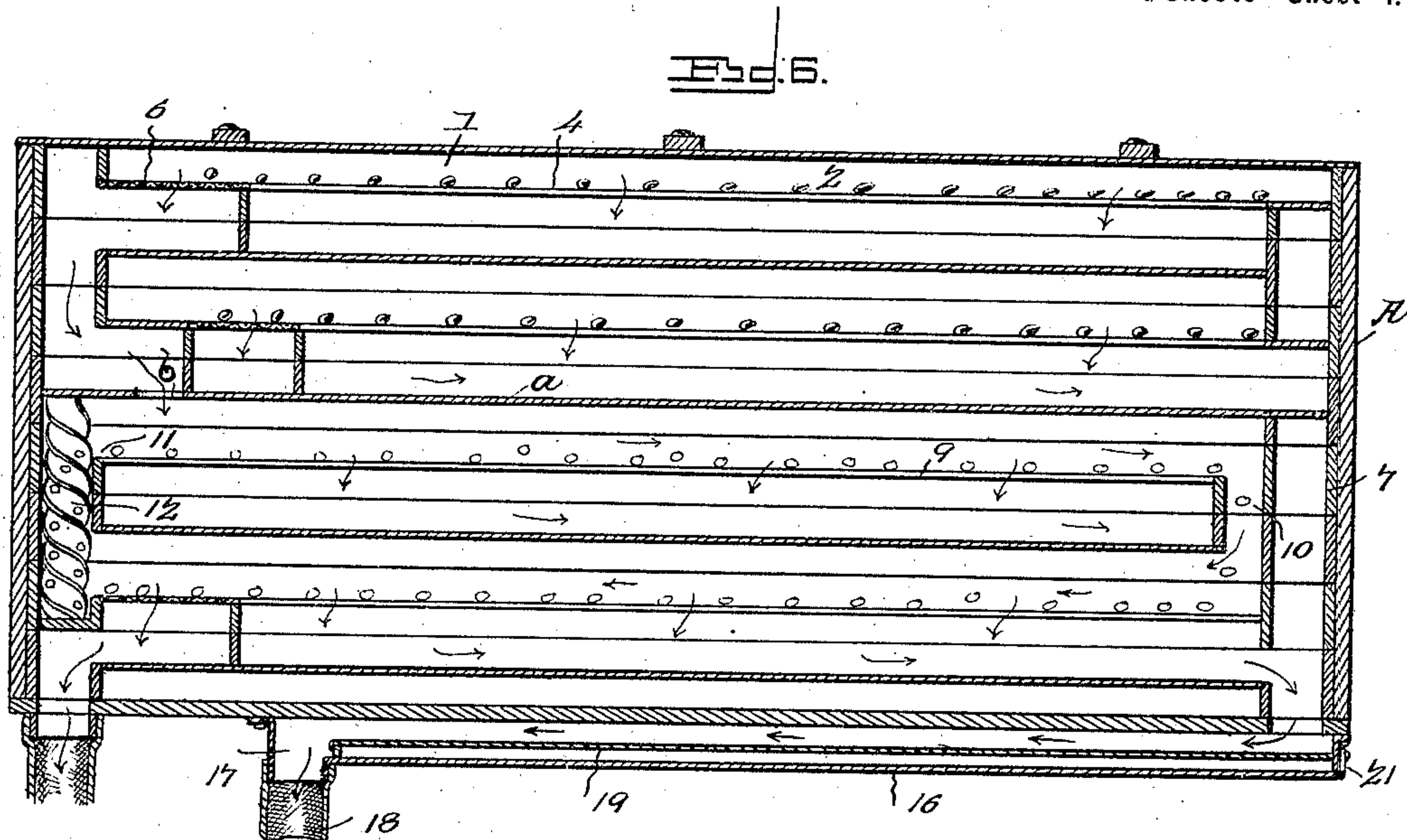
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4 Sheets—Sheet 4.



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# UNITED STATES PATENT OFFICE.

SQUIRE THOMAS GREEN, OF BEESPRING, KENTUCKY.

## GYRATORY FLOUR-BOLT.

SPECIFICATION forming part of Letters Patent No. 687,743, dated December 3, 1901.

Application filed May 5, 1900. Serial No. 15,602. (No model.)

*To all whom it may concern:*

Be it known that I, SQUIRE THOMAS GREEN, a citizen of the United States, residing at Beespring, in the county of Edmonson and State of Kentucky, have invented a new and useful Gyratory Flour-Bolt, of which the following is a specification.

My invention is an improved gyratory flour-bolt, and is especially adapted for sifting flour in accordance with the requirements of my improved flouring process, for which I have executed an application for Letters Patent of the United States, March 8, 1900, filed in the United States Patent Office simultaneously herewith and bearing Serial No. 15,601.

My invention consists in the peculiar construction and combination of devices herein-after fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a sifting apparatus embodying my improvements. Fig. 2 is a vertical longitudinal sectional view of the same, taken on the line 1 1 of Fig. 7. Fig. 3 is a similar view taken on the line 2 2 of Fig. 7. Fig. 4 is a similar view taken on the line 3 3 of Fig. 7. Fig. 5 is a similar view taken on the line 5 5 of Fig. 7. Fig. 6 is a similar view taken on the line 6 6 of Fig. 7. Fig. 7 is a vertical transverse sectional view of the same. Fig. 8 is a detail perspective view of the upper or first tray. Fig. 9 is a similar view of the next lower or second tray. Fig. 10 is a detail perspective view of my novel conveyer adapted to convey stock from the ends of the sifting apparatus in opposite directions and discharge the same through centrally-disposed spouts under the sifting apparatus. Fig. 11 is a detail view, being partly an end elevation of the said conveyer and partly a transverse sectional view thereof. Fig. 12 is a detail longitudinal sectional view of one end of the said conveyer.

My improved sifting apparatus comprises a suitable number of trays disposed one above the other and inclosed in a chest A, which is mounted at its four corners on crank-shafts B, connected together and rotated in unison by a belt C and pulleys D, as is usual in this class of machines, whereby the sifting motion is imparted to the sifting apparatus.

In carrying out my improved flouring proc-

ess, fully described in my application for Letters Patent hereinbefore mentioned, I employ in connection with the various trays of the sifting apparatus systems of independent cleaners or such cleaners as operate only on one tray and systems of circulating cleaners or such cleaners as operate upon two or more trays having vertical communicating drop-passages and means for elevating the cleaners from a lower tray to a higher tray.

I will first describe a tray constructed for the operation of independent systems of cleaners. Such a tray (indicated by the numeral 1 and shown in Fig. 8) is provided with parallel passages 2, which communicate with each other at the ends thereof, as at 3. The bottoms of said parallel communicating passages are formed by oppositely-inclined bolting-cloths 4, imperforate bottom sections 5, located at one corner of the communicating passages, and a separating cloth or screen 6, located at the corner contiguous to the imperforate bottom, section 5. The independent cleaners, which are grains of wheat or the like and of suitable number, being placed in the passages 2 of the tray are caused by the sifting motion imparted to the sifting apparatus to traverse the said passages and pass over the bolting-cloths, imperforate bottom section, and separating-screen, as indicated by the arrow in Fig. 8, together with the material fed thereto, which drops upon the imperforate bottom section from above, as from a spout or the like, passes over the bolting-cloths, and is bolted thereby, such material as fails to pass through the bolting-cloths passing through the coarser-mesh separating-screen 6 as it reaches said screen and dropping downward through the same to an appropriately constructed and arranged lower tray for further treatment or discharge from the sifting apparatus, as the case may be, according to the nature of such material, the cleaners, owing to their size, of course failing to pass through said separating-screens, and hence remaining and continuing to operate in the said passages of the said tray on which they are disposed.

I will now describe a tray constructed for the operation of a system of circulating cleaners. Such a tray (indicated by the numeral 7 and shown in Fig. 9) has its parallel



passages 8, which are arranged in pairs, as shown, and clothed with bolting-cloths 9, which are inclined in the said passages, provided with openings 10 at one end of one of the passages of each pair, which openings 10 establish vertical communication between said tray and a similar tray (one or more) below the same. Vertical openings 11 at the ends opposite the openings 10 also establish communication between the said trays, and in said openings 11 are disposed elevating-spirals 12 of usual construction, which are adapted, because of the sifting motion of the sifting apparatus, to elevate the circulating cleaners which are fed thereto from a lower tray to a higher tray in the series. Hence the circulating cleaners after traversing the entire length of the pair of passages in a higher tray drop from the same through an opening 10, together with such material as has failed to pass through the bolting-cloths in said passages, onto a lower tray, where said circulating cleaners traverse the lengths of the passages of said lower tray until they reach the elevating-spiral, up which they travel and from which they are discharged onto the upper tray in the series. Hence the said circulating cleaners operate efficiently on both the upper and lower trays.

It will be observed by reference to Fig. 2 of the drawings that the imperforate bottom section *a*, which is interposed between the tray having the independent cleaners and the uppermost tray on which the circulating cleaners operate, has an opening *b*, through which the flour and fine middlings drop onto the said upper circulating-cleaner tray at a point at some distance from the elevating-spirals 12 and where the circulating cleaners are in full motion and when they serve to break up the stock, thus preventing the stock from arresting the circulating cleaners and clogging on the tray. Similar openings *b* are shown in Figs. 4, 5, and 6, said openings forming passages to discharge stock onto upper circulating-cleaner screens at points at some distance from the elevating-spirals, which return the circulating cleaners from the lower to the upper circulating-cleaner screens and where the circulating cleaners are in full motion on said upper circulating-cleaner screens. At the points where the circulating cleaners are discharged by the elevating-spirals onto the upper circulating-cleaner screens said cleaners lie for an appreciable time almost inert and move very sluggishly before they are set in full motion by the gyrations of the apparatus, and hence it is necessary to so locate the passages that discharge the stock onto the upper circulating-cleaner screens that the stock shall fall thereupon at points where the circulating cleaners are in full motion, thereupon to avoid clogging said screens and to secure the efficient operation of the circulating cleaners.

In constructing the sifting apparatus in accordance with the requirements of my im-

proved flouring process, hereinbefore mentioned, the trays of the sifting apparatus are provided at various points in the series with transverse passages, such as indicated at 13, and openings, such as indicated at 14. Where such openings and passages occur under screens or bolting-cloths, it is of course necessary to prevent material from passing through said screens and bolting-cloths into said passages and through said openings, and it is important in order not to impair the efficiency of the sifting apparatus that the length of the said sifting-screens and bolting-cloths be not diminished to an extent equal to the width of such passages and openings. To effect this, I provide inclined baffles 15, which are disposed over said openings and transverse passages and under the ends of the screens and bolting-cloths, as indicated in the drawings, Figs. 3 and 4 thereof. Said inclined baffles, as will be readily understood, convey such material as falls upon them from the end of the screens and bolting-cloths onto the imperforate bottoms 15<sup>a</sup> below said screens and bolting-cloths.

In many instances it is necessary that the sifting apparatus be exceedingly compact in order to adapt it to the contracted space provided for it in the mill.

The sifting apparatus discharges material from each of its trays at one or both ends thereof, and such material has to be conveyed to the discharge-spouts that lead to the appropriate bins and to the breaks or rolls. It will be observed by reference to the drawings that the discharge-openings from the trays extend through the bottom of the inclosing chest of the sifting apparatus, and I have devised an improved conveyer adapted to be secured to the lower side of the chest and to convey the material from the trays to the discharge-spouts at points under the sifting apparatus, thus effecting an economy of space. Each of the said conveyers comprises a trough 16, which may be in one or more sections longitudinally, and has one or more discharge-openings 17, with which communicate the discharge-spouts 18. The bottom of each section of each conveyer-trough is formed by an axially-pivoted plate 19, which is adapted to be inclined in either direction in order to convey the material discharged thereon from the tray or sifting apparatus to the discharge-spout. In Fig. 10 I have shown a conveyer in two sections, which is adapted to receive material from the sifting apparatus at its outer end and to convey the same to the discharge-openings 17 near the center of the trough on opposite sides of the partition 20, which divides the two sections. In said conveyer the bottom plates 19 in the respective sections are oppositely inclined and adapted to work the material from the ends of the trough to the discharge-openings at the center thereof, as indicated by the arrows. The pivoted bottom plates 19 are provided at their outer ends with crank-arms 21, by which they may be



adjusted and inclined as required, and said crank-arms are provided with studs 22 at their outer ends, which are adapted to engage openings 23 in the ends of the troughs and lock the said plates 19 when adjusted. By thus providing the conveyer-troughs with the adjustable plates, which may be inclined at any required angle, the said troughs are adapted for conveying material in either direction, as required.

Having thus described my invention, I claim—

1. In a sifting apparatus of the class described, a tray having a pair of passages arranged side by side and communicating with each other at their ends, the bottoms of said passages being formed of bolting-cloth, a separating-section and an imperforate section, said separating and imperforate sections being interposed between said bolting-cloths, and in the planes occupied thereby, and independent cleaners on said tray, said cleaners being adapted in the operation of the apparatus to completely circulate through said passages and to be retained therein, substantially as described.

2. In a sifting apparatus of the class described, a tray having a pair of passages arranged side by side and communicating with each other at their ends, thereby forming an endless raceway, the bottoms of said passages being formed by oppositely-inclined bolting-cloths, which incline downward and outward from the center between the said passages, a separating-section, an imperforate section, said separating and imperforate sections being interposed between said bolting-cloths and in the planes occupied thereby, and a series of independent cleaners adapted in the operation of the apparatus to circulate through said passages and to be retained therein, substantially as described.

3. A gyratory bolt having trays disposed one above the other, the upper tray having a bottom of bolting-cloth and the lower tray having an imperforate bottom, leaving a transverse passage at one end, under the bolting-cloth of the tray above, an opening through a wall of the tray, to which said passage leads, and a baffle-plate, disposed over said passage and inclined from under the rear edge of the

bolting-cloth of the upper tray, to avoid diminishing the effective area of said bolting-cloth, substantially as described.

4. In a gyratory flour-bolt, a series of screens disposed one above another, and having a communicating drop-passage at one end and an elevator at the opposite end, said elevator establishing communication between the said screens, circulating cleaners to drop from the upper screen, together with the stock, through the said drop-passage onto the lower screen, the latter having a separator through which the unbolted stock is discharged and by which the said unbolted stock is separated from the circulating cleaners, the latter being returned by the said elevator to the upper screen, substantially as described.

5. In a gyratory flour-bolt, a series of screens disposed one above another and having a communicating drop-passage, an elevating-spiral, said elevating-spiral establishing communication between the said screens, circulating cleaners to drop from the upper screen, together with the stock, through the said drop-passage onto the lower screen, the latter having a separator through which the unbolted stock is discharged and by which the said unbolted stock is separated from the circulating cleaners, the latter being returned by the said elevating-spiral to the upper screen, substantially as described.

6. In a gyratory flour-bolt, a series of screens disposed one above another and having a communicating drop-passage and an elevating-spiral, circulating cleaners to drop from the upper screen, together with the stock, through the said drop-passage onto the lower screen, said elevating-spiral arranged and adapted to return said circulating cleaners to the upper screen, and a passage to discharge stock onto said upper screen at a point well beyond the point of delivery thereupon of the circulating cleaners where the latter are in full motion, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

SQUIRE THOMAS GREEN.

Witnesses:

L. L. SANDERS,  
J. R. STEWART.