

(No Model.)

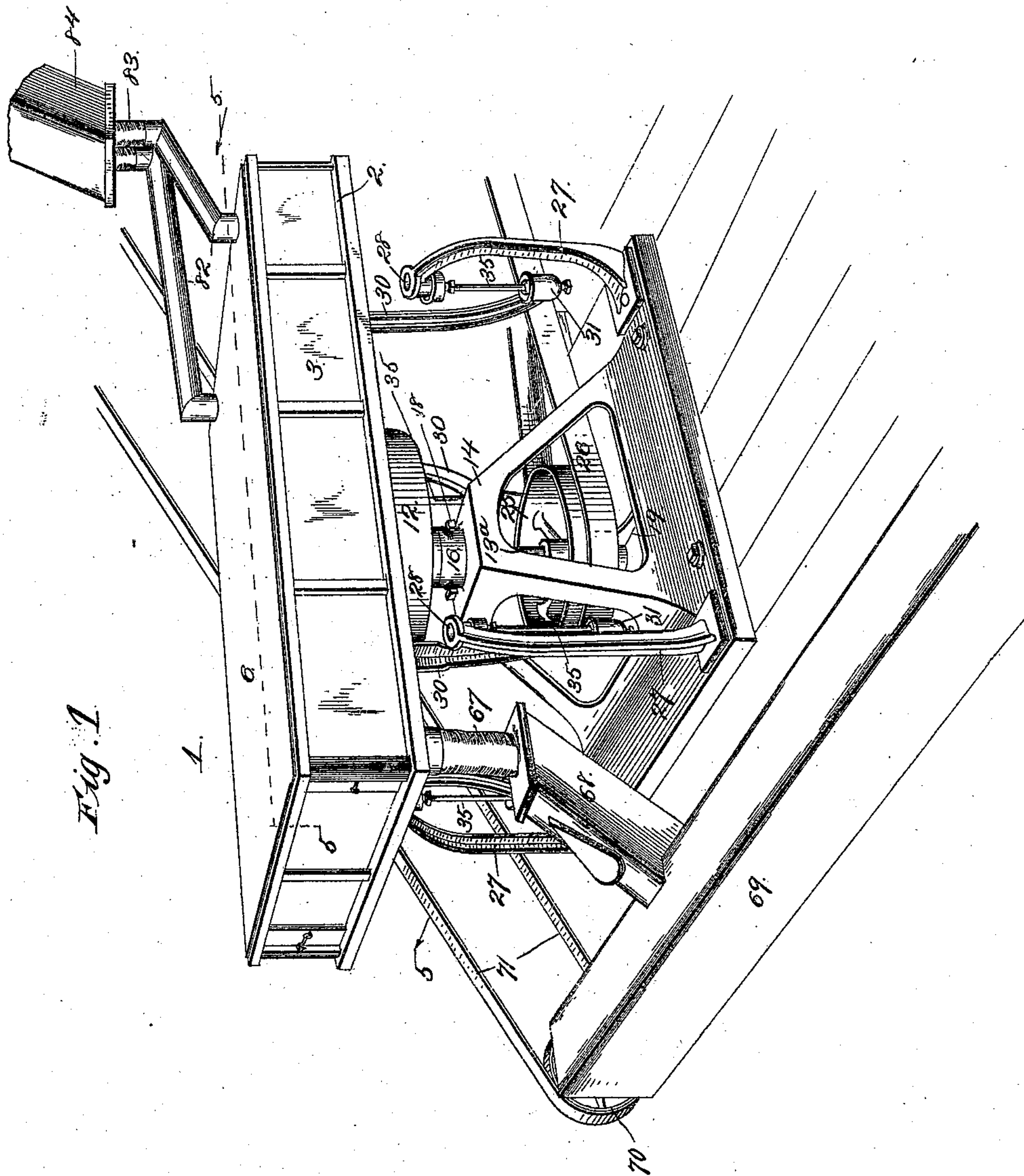
4 Sheets—Sheet 1.

D. R. MORRISON.

MACHINE FOR SIFTING AND SORTING FLOUR, MEAL, &c.

No. 555,461.

Patented Feb. 25, 1896.



Witnesses:

F. G. Fischer

L. J. Thorpe

Inventor:

D. R. Morrison

By Higdon & Higdon
Attys.

(No Model.)

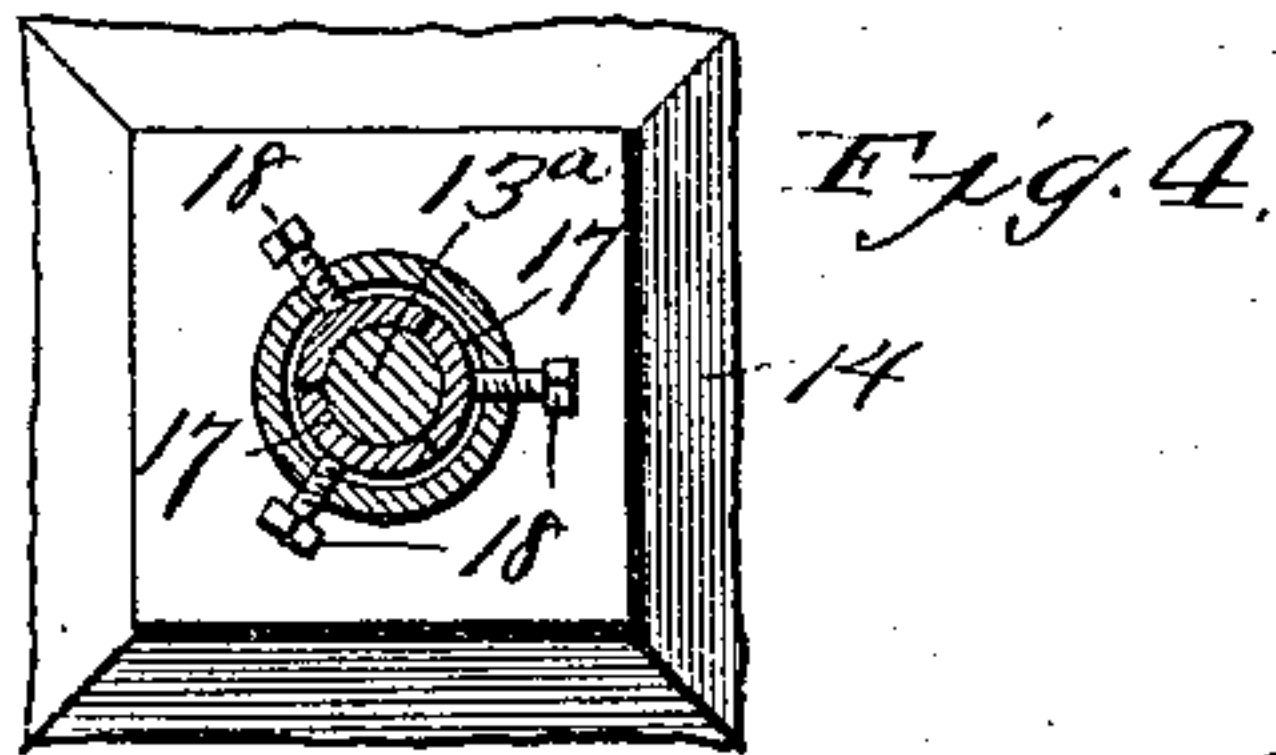
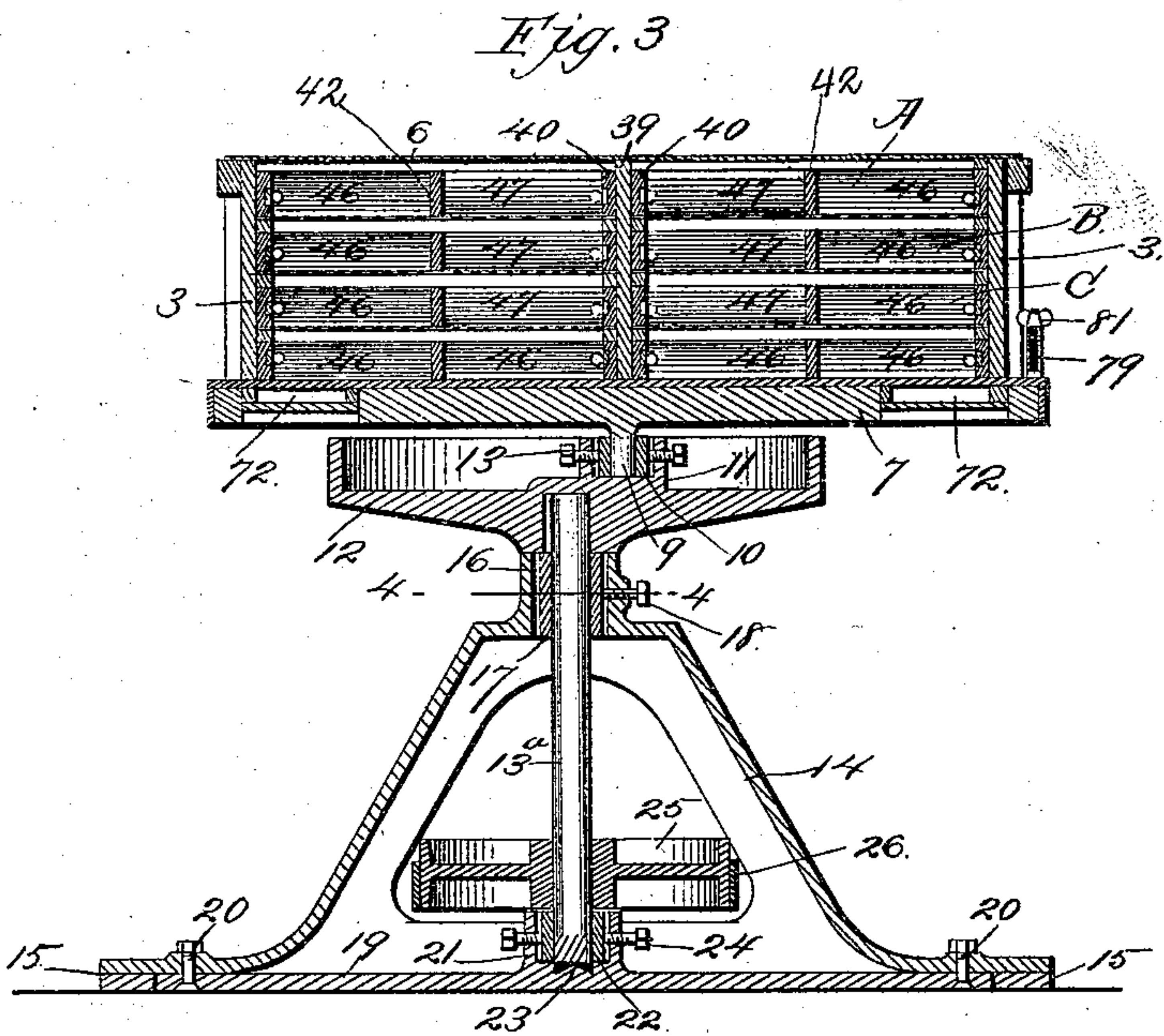
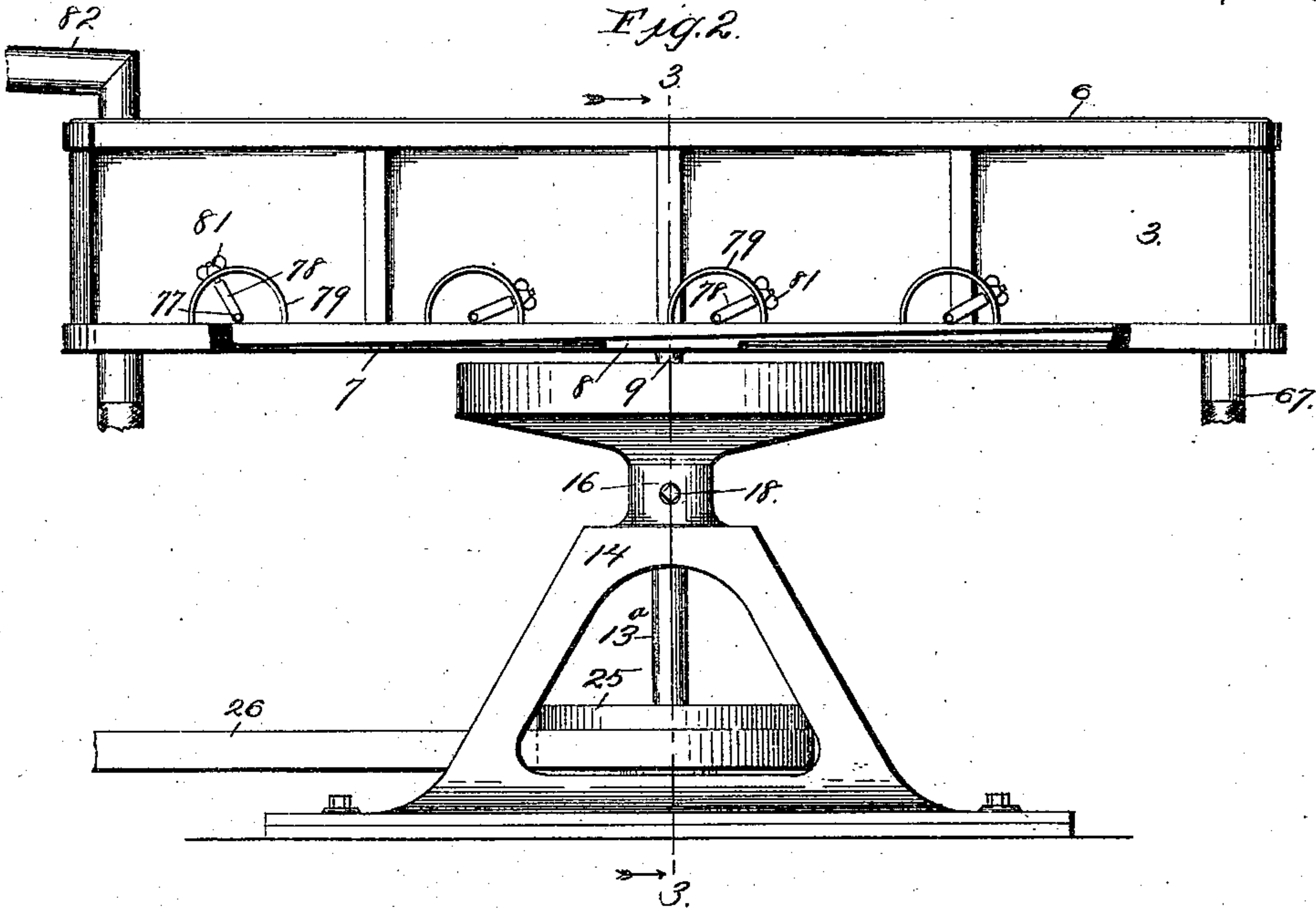
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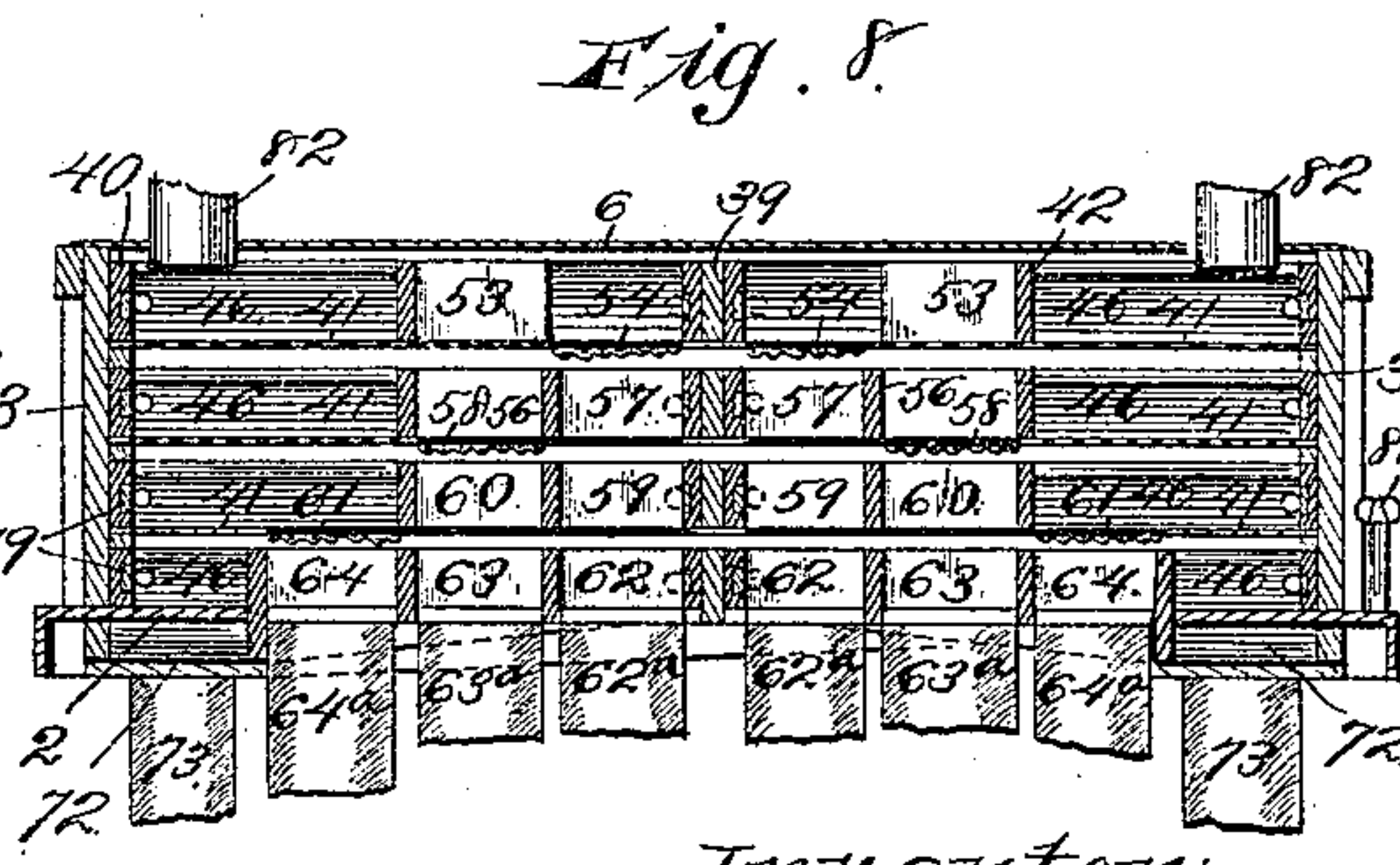
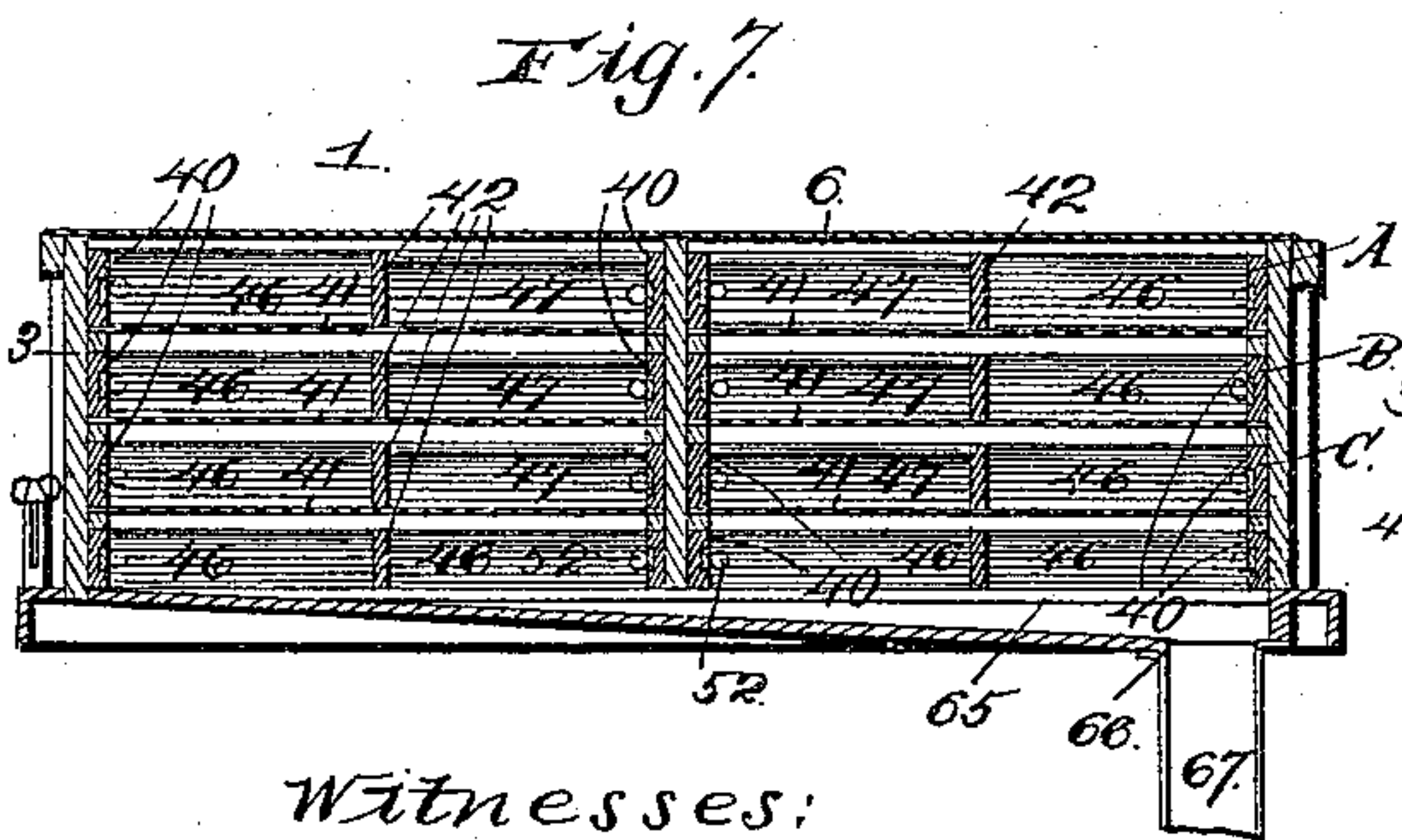
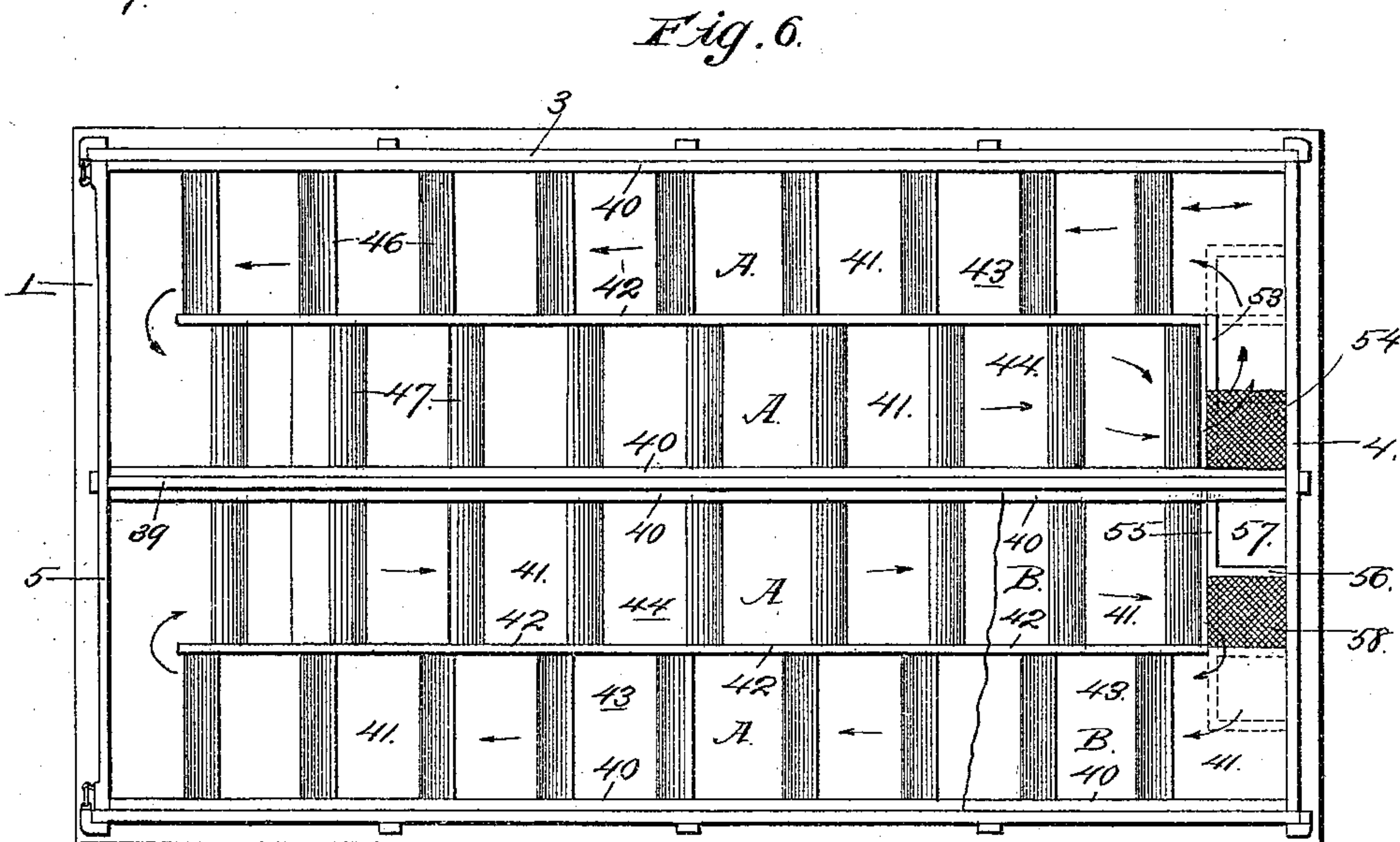
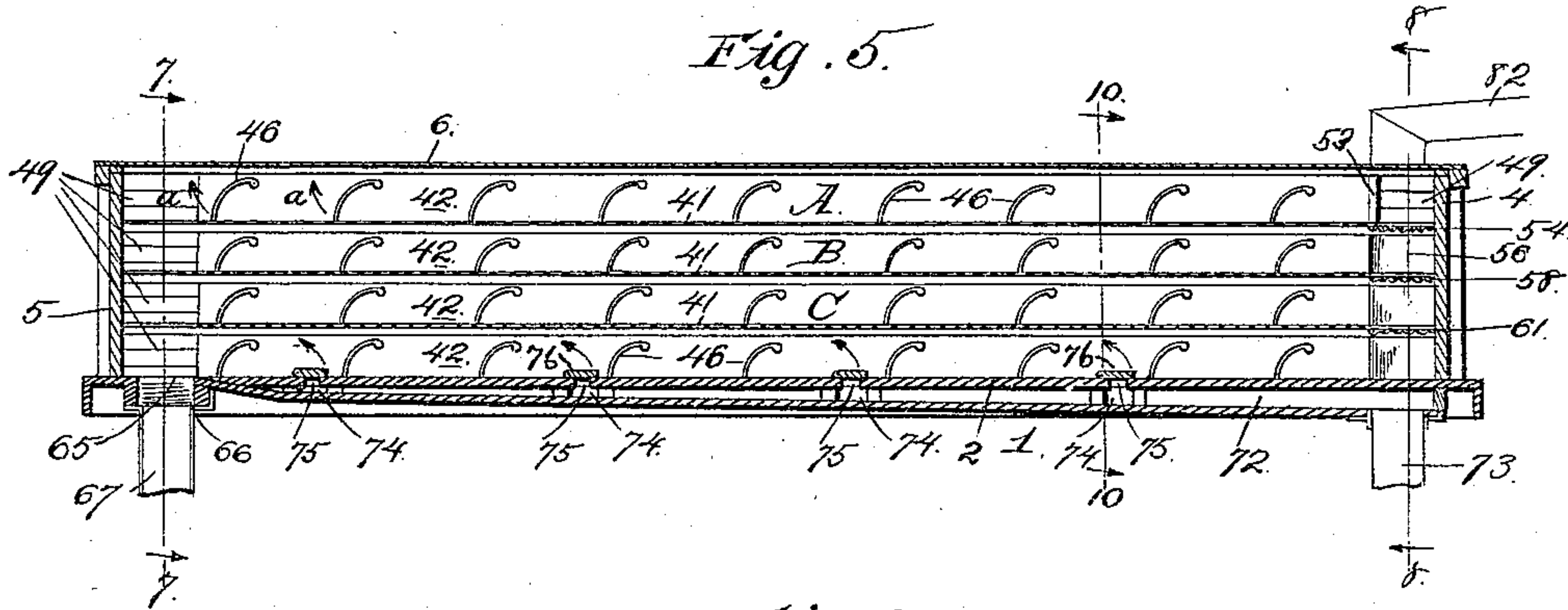
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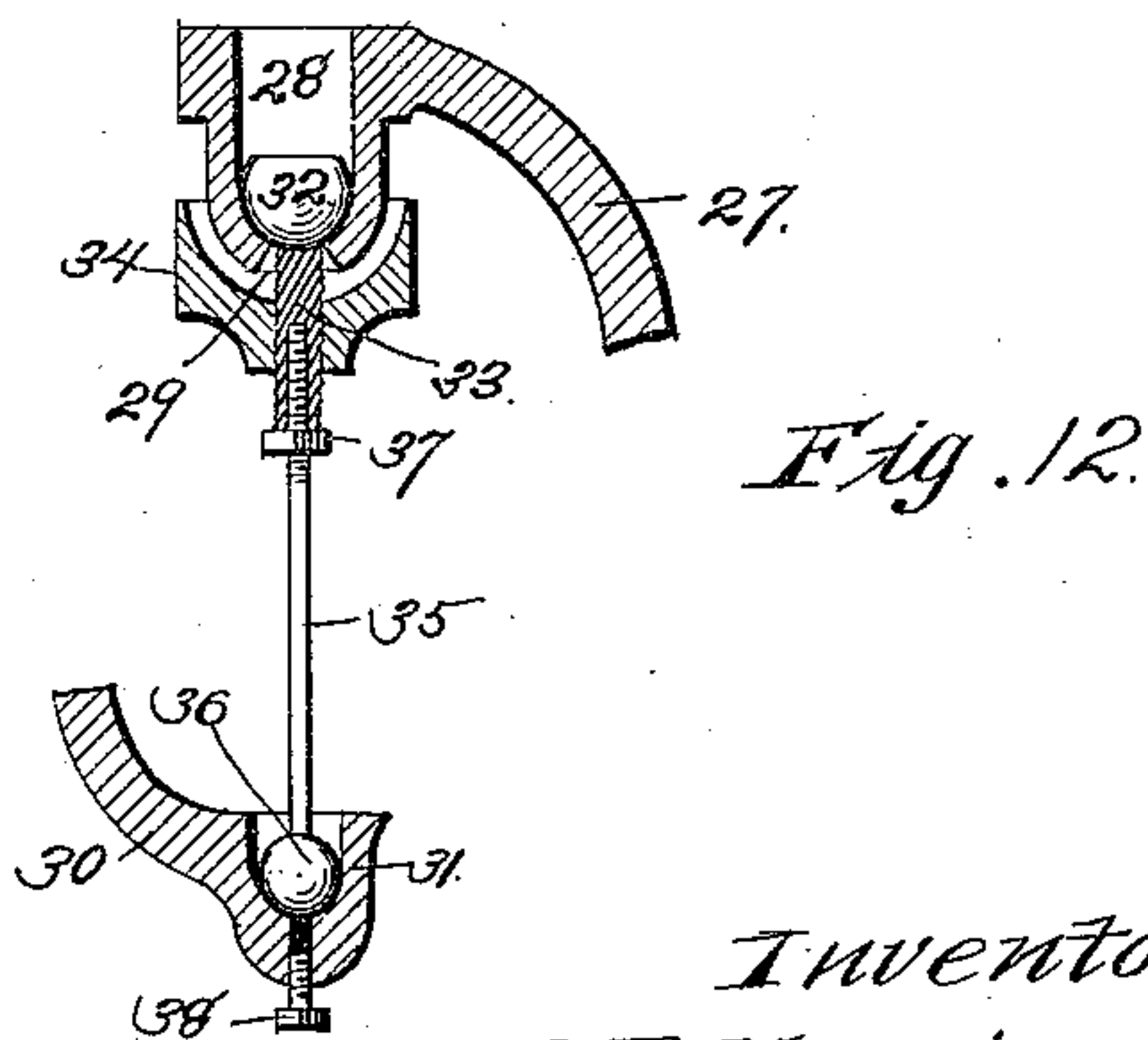
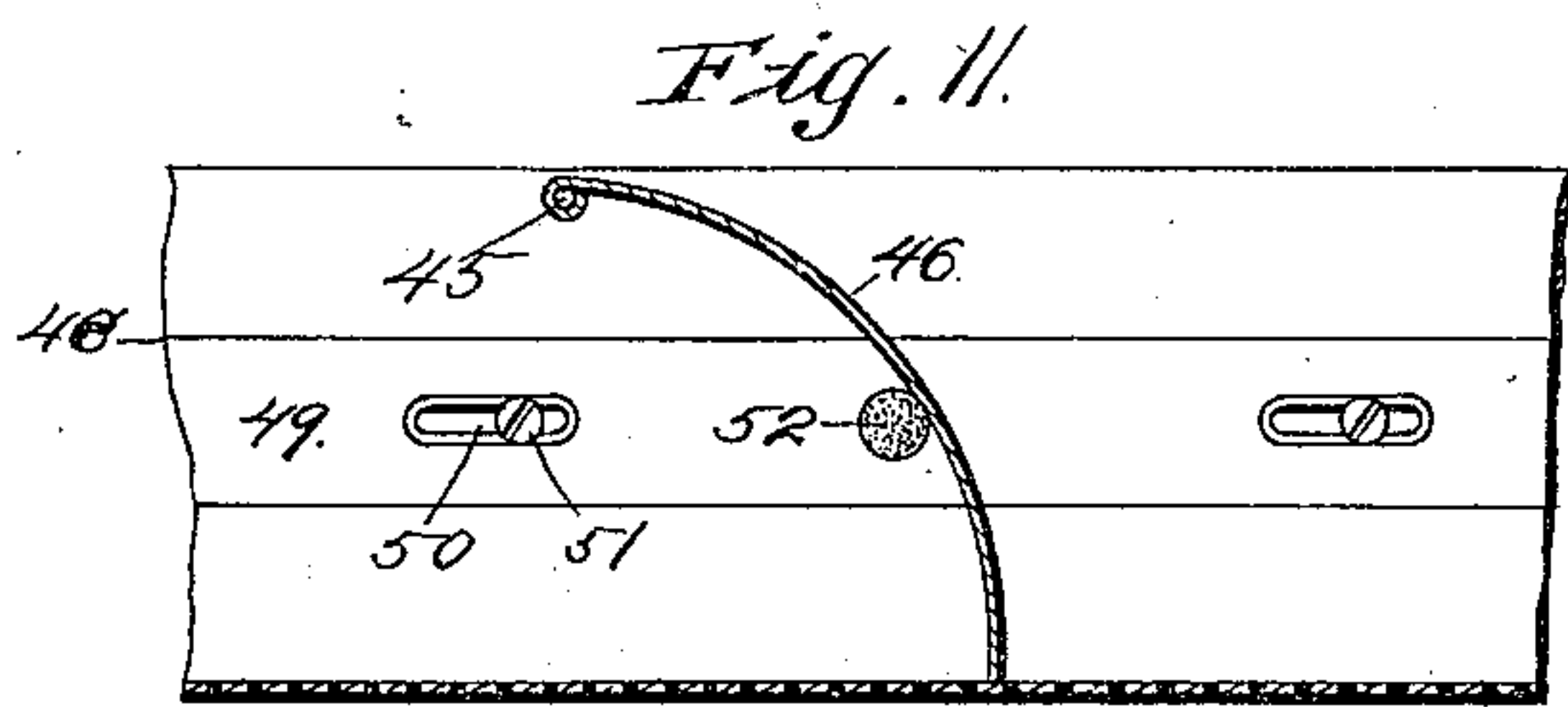
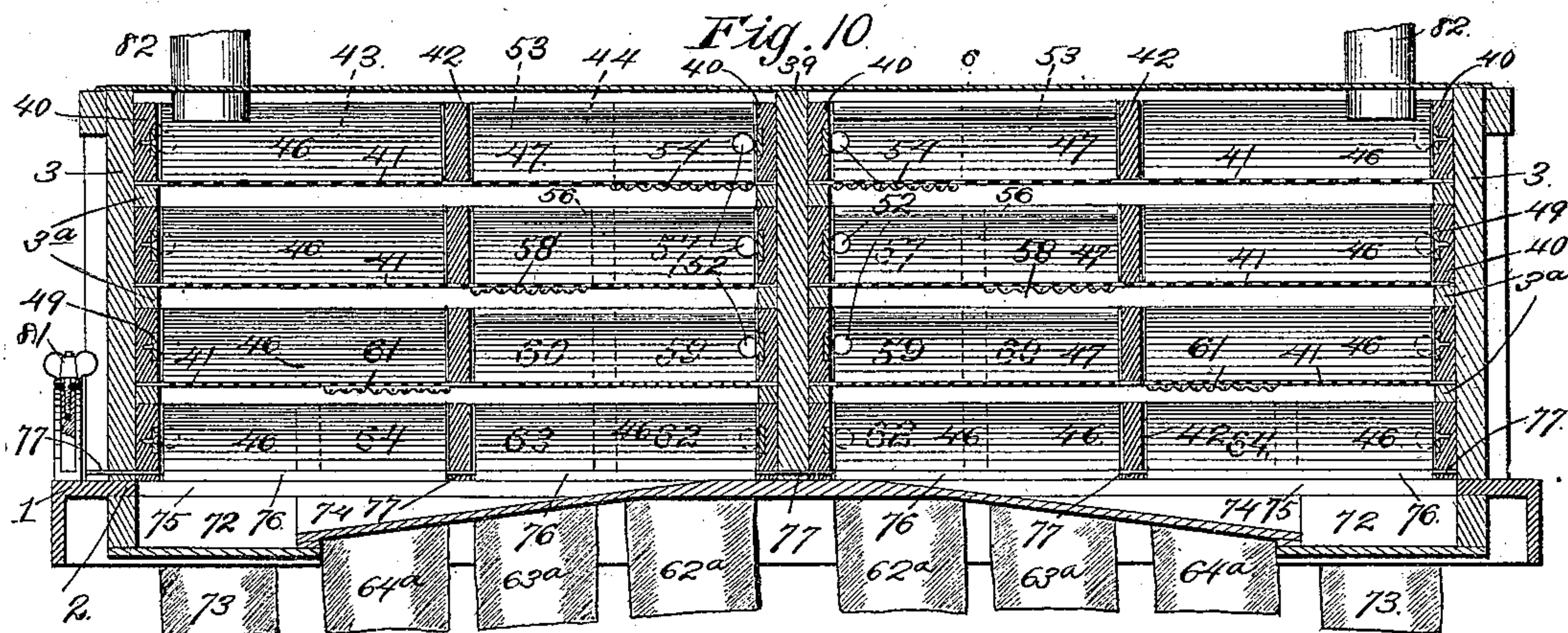
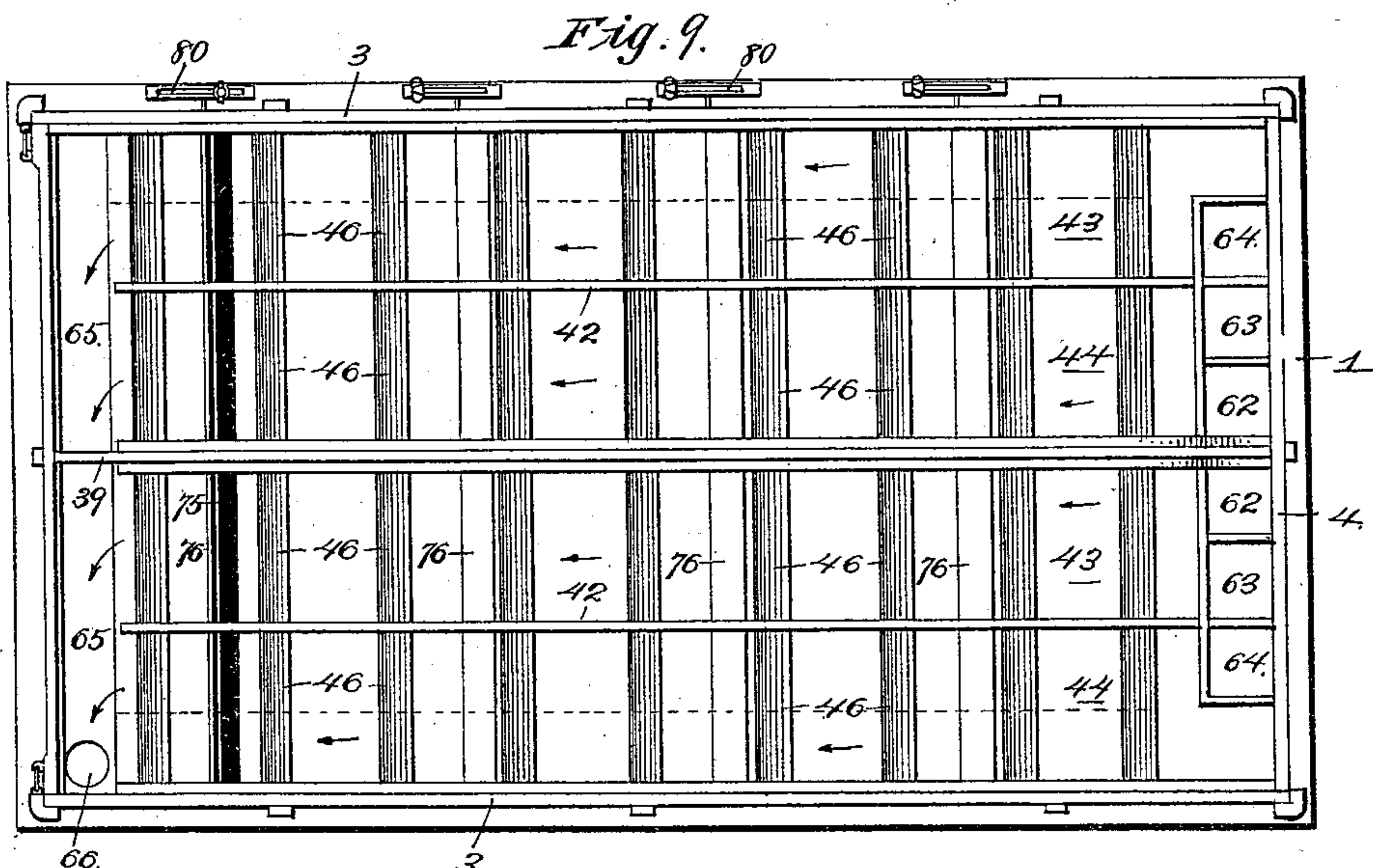
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MACHINE FOR SIFTING AND SORTING FLOUR, MEAL, &c.

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Witnesses:

F. G. Fischer
L. J. Thorne

Inventor:

D. R. Morrison

By Higdon & Higdon
Attys.

UNITED STATES PATENT OFFICE.

DUDLEY R. MORRISON, OF McCUNE, KANSAS.

MACHINE FOR SIFTING AND SORTING FLOUR, MEAL, &c.

SPECIFICATION forming part of Letters Patent No. 555,461, dated February 25, 1896.

Application filed April 12, 1895. Serial No. 545,481. (No model.)

To all whom it may concern:

Be it known that I, DUDLEY R. MORRISON, of McCune, Crawford county, Kansas, have invented certain new and useful Improvements in Machines for Sifting and Sorting Flour, Meal, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to machines for sifting and bolting flour, meal, &c., and my principal objects are to provide a more positive and reliable bolting-screen than any at present in use with which I am familiar, to provide a construction whereby the flour, if it becomes specked, may be deflected from its course to prevent its mixing with the pure or unspecked article, and to provide an improved construction whereby the machine may be gyrated with a minimum of friction.

Other objects of the invention will appear hereinafter, and the novel and peculiar features of construction and combinations of parts will be pointed out in the claims.

In order that the invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 represents a perspective view of a machine embodying my invention. Fig. 2 represents the same as viewed toward its opposite side. Fig. 3 represents a vertical transverse section taken on the line 3 3 of Fig. 2. Fig. 4 is a horizontal section taken on the line 4 4 of Fig. 3. Fig. 5 is a vertical longitudinal section taken on the line 5 5 of Fig. 1. Fig. 6 is a top plan view of the machine with the cover removed and with one of the upper sieves broken away to disclose that immediately below. Fig. 7 is a vertical transverse section taken on the line 7 7 of Fig. 5. Fig. 8 is a vertical transverse section taken on the line 8 8 of Fig. 5. Fig. 9 is a top plan view of the machine with all of the sieves omitted. Fig. 10 is a transverse vertical section, taken on an enlarged scale, on the line 10 10 of Fig. 5. Fig. 11 is an enlarged view of one of the bolting-screens to show more clearly the construction of the propellers or flighters and the means for adjusting the same relative to the bearing-surface of the screen.

Fig. 12 is a vertical sectional view of one of the guides of the machine.

In the said drawings, 1 designates the casing, which is of the usual rectangular form, comprising the bottom 2, the sides 3, the fixed or permanent end 4, the removable end or door 5, and the cover 6 of cloth or equivalent material. This casing has secured to the underside of its bottom a metallic plate 7, which extends over a large part of its surface, and said plate at its middle is preferably thickened by the transverse rib 8, from which centrally depends the bearing-pin 9, and engages a bearing formed by a series of segmental plates 10, mounted in a boss 11 projecting eccentrically from the upper side of the wheel 12. The plates 10 are adjusted to accommodate wear by the set-screws 13. The wheel 12 is keyed or otherwise rigidly secured upon the upper end of a shaft 13^a. This shaft extends vertically downward through a metallic framework 14, which is bolted or otherwise rigidly secured preferably upon the strips or cleats 15, secured to the floor of the mill in which the machine is located. Said framework is formed at its upper end with a sleeve or collar 16, and arranged therein are bearing-plates 17 for the shaft 13, which are adjusted by set-screws 18. A cross-bar 19, also of metal, and bolted at its opposite ends to the lower portion of the frame, as shown at 20, is provided centrally with the upwardly-projecting sleeve 21 and within said sleeve with the adjustable bearing-plates 22, which engage the lower end of the shaft 13 while said shaft rests squarely at its lower end upon the apex of the conical bearing-surface 23, projecting from said cross-bar internally of said collar or sleeve. Said bearing-plates are also adjusted by set-screws 24.

The shaft is rotated by means of the belt-wheel 25, which is engaged by a belt 26, leading to any suitable motive power—such, for instance, as a counter-shaft. The casing is guided in its gyrating movement and held in its proper position relative to the stock-supply chute and the chute arranged to receive the finished product, by mechanism which will be presently described. These chutes will be hereinafter referred to. As the said guiding mechanism near each corner of the

casing is of similar construction, a description of one will suffice for all. 27 designates a standard, which is bolted at its lower end to the framework 14 at or near one of its corners and curves inwardly at its upper end and terminates in a vertically-depending cup 28, which is provided with an opening 29 at its lower end. A similar standard 30 is bolted at its upper end to the plate 7, or may be formed integral therewith, and curves outwardly at its lower end to a point a suitable distance below the cup 28 and terminates at said lower end in a cup 31. A ball 32 finds a bearing in the cup 28 and is provided with a depending stem 33, which is both externally and internally threaded, the external threads carrying the drip-cup 34, for oil or lubricating material, a suitable distance below the cup 28. The internal threads are engaged by the upper threaded end of a rod or stem 35 projecting from its spherical head or ball 36, which finds a bearing in the cup 31. An adjusting-nut 37 also engages said rod and bears at its lower end against the sleeve 33, and a screw 38 engages and closes an aperture in the cup 31.

From the above description it will be apparent that as the shaft 13 is rotated the pin 9, depending centrally from the plate 7, will travel concentrically around the axis of the said shaft, owing to the fact that it is arranged eccentrically of the same, and it is also apparent that the gyrating movement of the casing thus obtained is confined within its proper limits and the longitudinal arrangement of the casing is maintained by the guiding mechanism near its corners, above described.

Referring now to the casing, 39 designates a vertical and centrally-arranged partition which extends from end to end of the casing and divides the same into two similar portions. In each of these portions are arranged a series of superimposed sieves or bolting-screens. In the present instance I have shown three of such sieves or bolting-screens, lettered respectively A, B, and C, though it is to be understood that a greater or less number may be employed as the character of the work may demand.

A designates the upper sieve, B the sieve next below, and C the lowest sieve. The bolting-surfaces of these sieves are arranged a distance apart equal to the distance between the lower sieve, C, and the bottom of the casing. Each sieve comprises the side bars, 40, which correspond in length with the distance between the opposing or inner faces of the ends of the casing, the bolting-surface 41 of the usual material, such as silk, which corresponds in length with and connects said sides at their lower margins, and the centrally-arranged partition 42, which rests upon the bolting-surface and divides the screen into passages 43 and 44, and in order that the stock, or rather the seed which is employed in all flour-sifters of this character to keep

the interstices of the bolting-surface clear may circulate or have an endless path to travel in said partition 42 terminates short of the bolting-surface, so that said passages may communicate with each other at opposite ends of the screen, as shown clearly in Fig. 6. A series of parallel rods 45 extend transversely of each sieve and are mounted in the sides and the partition 42 near their upper edges. Pivotaly mounted upon said rods are two series of propellers or flighters, which are of segmental form, preferably, in cross-section.

The propellers or flighters 46 are of length to extend clear across the passage 43, and are disposed in such manner that they rise in the direction indicated by the arrows *a*, Fig. 5, or toward the tail end of the machine. The propellers or flighters 47, also mounted on the same rods, are disposed to rise in the opposite direction, or toward the head or front end of the machine, and extend across the passage 44. Therefore it will be apparent that one series of these flighters are at rest while the other series are in operation, each series being in operation during one part of each gyratory movement of the casing. The lower edges of these propellers or flighters are prevented from striking or coming in contact with the bolting-surface and injuring the same by devices which I will now proceed to describe.

Each screen, at its inner side, is provided with longitudinal grooves 48, (see Fig. 11,) and fitting snugly therein are the strips 49, provided at suitable intervals with longitudinal slots 50, which engage screws or pins 51, carried by the sides of the screen to hold said strips in place and to secure them at the required point of adjustment, so that the pins 52, preferably of rubber, shall engage the concave sides of the propellers or flighters, and thereby limit the downward movement of the same, thus preventing their cutting or injuring the bolting-surfaces. These pins of rubber or equivalent material also serve to prevent the clicking noise or racket which would occur with each operation of the flighters were a stop-pin of any hard material employed in lieu thereof. By properly adjusting said strips 49 the movement of the flighters may be shortened or diminished, so that a space of varying widths may be provided between the bolting-surface and the lower ends of the flighters, which thus permits the bolting capacity of the screen to be increased or diminished—to be increased by preventing the too rapid passage of the stock in quantity, which therefore remains upon the bolting-surface longer, and to be diminished by preventing the accumulating of the stock to any great extent, and thereby permitting it to pass more rapidly along the bolting-surface. The construction of the sieves thus far is identical. The differences of construction will now be pointed out.

Referring first to the top sieve, A, 53 designates

nates a transverse strip which extends from the front end of the partition 42 about half-way across the passage 44 and terminates at the margin of an opening in the bolting-surface, which is covered by a screen-section 54, the interstices of which are sufficiently large to permit the chop to pass through, and thus become separated from the flour and middlings, which sift through the bolting-surface onto the screen-section B below, but which are not large enough to permit therethrough the passage of the seed employed to keep the bolting-surface clean.

Referring now to the sieve B, immediately below the sieve A, 55 designates a transverse strip, which extends from the inner side bar, 40, about half-way across the passage 44, and 56 designates a longitudinally-arranged strip, which connects the strip 55 with the permanent end 4 of the casing. These strips, in conjunction with the inner side bar of the sieve and the permanent or fixed end bar 4 of the casing, form a rectangular opening or passage 57, which registers with a similar opening in the bolting-surface of the sieve B and with the screen-section 54 of the top sieve, A. Interposed between said strip 56 and the contiguous end of the partition 42 of the screen, and also extending to the end 4 of the casing, is a screen 58, which covers an opening in the bolting-surface. By reference to Fig. 6 it will be seen that the bran is separated from the middlings and flour and escapes from the sieve by way of the screen-section 58, while the seed employed to keep the bolting-surface clean circulates in the direction indicated by the arrows, same figure, being too large to pass through said screen-section 58. The middlings and flour sift through the bolting-surface down upon the third screen C, which is formed at its front end between the inner side 40 and the partition 42, with the vertical openings or passages 59 and 60. (Shown in dotted lines, Fig. 10.) These openings or passages register, respectively, with the opening or passage 57 of the sieve B and with the opening of said sieve covered by the screen-section 58. Outward of said partition 42, at its front end, the bolting-surface of the sieve C is provided with an opening covered by a screen-section 61, which, as before observed with reference to the screen-sections 54 and 58, will not permit the passage therethrough of the cleaning-seed, but does permit the passage therethrough of the middlings, the flour sifting down through the bolting-surface of said sieve upon the bottom of the casing. The said casing at its front end is formed with vertical openings or passages 62, 63 and 64, which communicate through openings in the bottom of the casing with the flexible conveyers 62^a, 63^a, and 64^a, respectively. Said openings or apertures 62, 63 and 64 also register, respectively, with the passages 59 and 60 of the sieve C and with the screen-section 61 thereof, as shown clearly in Figs. 8 and 10.

The casing below the sieve C is preferably

provided with longitudinal bars corresponding to the side bars of the several sieves and designated by like reference-numerals. These bars are also provided with the adjustable strips 49, carrying the stop-pins 52, though it is to be understood that said bars may be dispensed with and the adjustable strips carried by the sides proper, 3, of the casing and by the partition 39. The bottom is also preferably divided by the longitudinal partitions 42, which terminate at their rear ends in line with the partitions of the various sieves, but at their opposite ends are connected to the transverse strips which form one side of the openings or passages 62, 63 and 64, and therefore do not permit of any circulation of flour upon the bottom of the casing. This is not desirable, however. As it is necessary or desirable that the flour be discharged at one end only of the casing, it will be noticed that the propellers or fighters 47 are dispensed with and that the propellers or fighters 46 are employed in the passage 44 as well as in the passage 43. These passages at their rear or tail ends communicate with the transversely-extending inclined passage 65, provided with an opening 66 at its lowest end, with which communicates a flexible conveyer 67. This conveyer communicates with the chute 68, communicating in turn at its lower end with the casing 69, wherein is located a conveyer (not shown) of any suitable or preferred construction, receiving motion preferably from a wheel 70 and a belt 71.

The casing below its bottom 1 is provided at each side with a longitudinal passage 72. (Shown in dotted lines, Fig. 9, and in full lines in Figs. 3, 5, 8 and 10.) These passages incline downwardly from the rear or tail end toward the front or head end of the casing, as shown clearly in Fig. 5, and communicate at their lower ends with the flexible conveyers 73. At intervals the casing is provided with inclined passages 74, which extend transversely, and at their lower ends communicate with the inclined longitudinal passages 72 and at their upper ends communicate with the interior of the casing through the transverse slots 75 in the bottom thereof. These slots extend over and communicate with the longitudinal passages 72 also, as will be understood by referring to Fig. 10 particularly, and they are closed normally by valves or cut-offs 76. (See Figs. 5, 9 and 10.) These valves or cut-offs correspond in length to the distance between the side bars, 40, and the interposed partitions 42 and are mounted rigidly at their rear edges upon the hinge-rods 77, which extend transversely of and are journaled in the casing and the side bars and partitions thereof, as shown most clearly in Fig. 10. At one side of the machine said hinge-rods are extended and carry levers in the form of internally-threaded tubes 78 upon their outer ends. These levers are adapted to work in the plane of the concentrically-extending brackets 79 carried by the casing,

and extending through slots 80 in said brackets and engaging the threads of said levers are clamping-bolts, provided preferably with wing-nut heads, so that they may be easily
 5 turned by hand when it is desired to open or close communication between the slots 75 and the said transverse and longitudinal passages and to secure said valves or cut-offs in the required position by clamping the heads of the
 10 bolts 81 down upon said curved brackets. In Figs. 2 and 9 one of the levers is clamped in position to hold the valve or cut-off in its vertical position that the slot 75 may be exposed.

It is to be understood, of course, while I
 15 have shown the downwardly-diverging passages 74, which communicate each with an elongated passage 72, that without departing in the least from my invention I may employ only one longitudinally-extending passage
 20 and have, in lieu of the diverging passages, inclined passages which would extend from the longitudinal passages at one side of the casing to the opposite side thereof, like the passage 65.

25 The machine is supplied with stock by way of the tubes 82, which communicate with the front ends of the passages 43 of the topmost sieve, as shown clearly in the several figures, and at their opposite ends with the flexible
 30 tubes 83, leading from the supply-chute 84.

A recapitulation of the entire description will be unnecessary, it being desirable only to state that the stock fed to the outer passages of the topmost sieve proceeds in the direction indicated by the arrows, Fig. 6, as the
 35 gyrating motion of the casing causes the flighters 46 to rise in the direction hereinbefore indicated, and that it proceeds in the opposite direction as the flighters 47 rise. It will be
 40 apparent that the flighters, as they spring upward with the gyratory movement of the casing, not only permit the stock to pass, but also assist in propelling it. This action is the same in all of the sieves, which are graduated
 45 as to fineness, so that nothing but the pure flour shall descend upon the bottom of the casing, the chop, bran, and middlings passing out of the machine by way of the conveyers 62^a, 63^a, and 64^a, as hereinbefore indicated. If, how-
 50 ever, the machine begins to bolt too low, and the flour therefore becomes specked, it is necessary only to open one or more of the valves or cut-offs, and the flour, as it proceeds in the direction indicated by the arrows, Fig. 9, or
 55 toward the tail end of the machine, drops through the slots 75 thus exposed and passes into the longitudinal passages 72, from which it escapes into the conveyers 73, which may lead to any required point in the mill. The
 60 same is true as regards the conveyers 62^a, 63^a, and 64^a. The various sieves are supported upon cleats 3^a, projecting inwardly from the sides 3 of the casing, and may be removed at any time by simply unlatching the removable
 65 door 5 and sliding them from position. They are replaced in the same manner.

From the above description it will be ap-

parent that I have produced a machine which possesses the valuable features hereinbefore referred to as desirable objects, and that a
 70 machine constructed as above described is simple, strong, durable, and may be manufactured at a nominal figure.

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

1. A machine for sifting and sorting flour, meal, &c., comprising a casing inclosing a series of superimposed sieves, a plate secured to the bottom thereof, provided centrally with
 80 a depending pin, a standard bolted to the floor of the mill below said casing, a shaft journaled vertically therein, a wheel mounted rigidly upon the upper end of said shaft, and provided with an eccentrically-arranged and
 85 upwardly-projecting boss, which is engaged by the depending pin of said plate, a series of arms depending from said plate near its corners and terminating at their lower ends in upwardly-disposed cups, a series of arms
 90 projecting upwardly from the standards, provided also with cups, rods connected together and provided with spherical heads or balls, which are journaled in said cups, substantially as set forth.

2. A machine for sifting and sorting flour, meal, &c., comprising a casing inclosing a series of superimposed sieves, a plate secured to the bottom thereof, provided centrally with
 100 a depending pin, a standard bolted to the floor of the mill below said casing, a shaft journaled vertically therein, a wheel mounted rigidly upon the upper end of said shaft, and provided with an eccentrically-arranged and
 105 upwardly-projecting boss, which is engaged by the depending pin of said plate, a series of arms depending from said plate near its corners and terminating at their lower ends in upwardly-disposed cups, a series of arms
 110 projecting upwardly from the standard, balls journaled in cups of said last-mentioned arms and provided with depending arms which are externally and internally threaded, and project through openings in said cups, drip-cups
 115 carried by the external threads of said stems, rods threaded at their upper ends and engaging the internal threads of said stems, and provided with spherical heads at their lower ends, engaging the cups of the depending
 120 arms, and adjusting-nuts carried by said rods and bearing against the lower ends of said stems, substantially as set forth.

3. In a machine for sifting and sorting flour, meal, &c., a sieve comprising parallel
 125 side bars, a bolting-surface connecting the same at their lower margins, a partition dividing the space between the said sides into two passages which communicate at their opposite ends, and adjustable pins carried by the frame of the sieve to oppose said flighters
 130 and limit their downward movement, substantially as set forth.

4. In a machine for sifting and sorting flour, meal, &c., a sieve comprising parallel

side bars, a bolting-surface connecting the same at their lower margins, a partition dividing the space between the said sides into two passages which communicate at their opposite ends, fighters pivotally mounted within said passages and adapted to operate in opposite directions, adjustable strips carried by the frame of the sieve, and provided with pins which project into the path of and limit the downward movement of said fighters, substantially as set forth.

5. In a machine for sifting and sorting flour, meal, &c., a sieve comprising parallel side bars, a bolting-surface connecting the same at their lower margins, a partition dividing the space between said sides into two passages which communicate at their oppo-

site ends, fighters segmental in cross-section pivotally mounted in said passages, the fighters in one passage being disposed in the opposite direction to those in the other, strips slidably engaging grooves in the side bars of the sieves, and provided with longitudinal slots, guide-screws engaging the same, and cushion-pins carried by said strips contiguous to the concave sides of said fighters and adapted to limit the downward movement of the same, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

DUDLEY R. MORRISON.

Witnesses:

SEVIER WILSON,
LEMUEL P. ALLEN.