

(No Model.)

4 Sheets—Sheet 1.

R. S. MUNGER.  
MACHINE FOR HANDLING, CLEANING, AND DISTRIBUTING SEED COTTON.  
No. 478,883. Patented July 12, 1892.

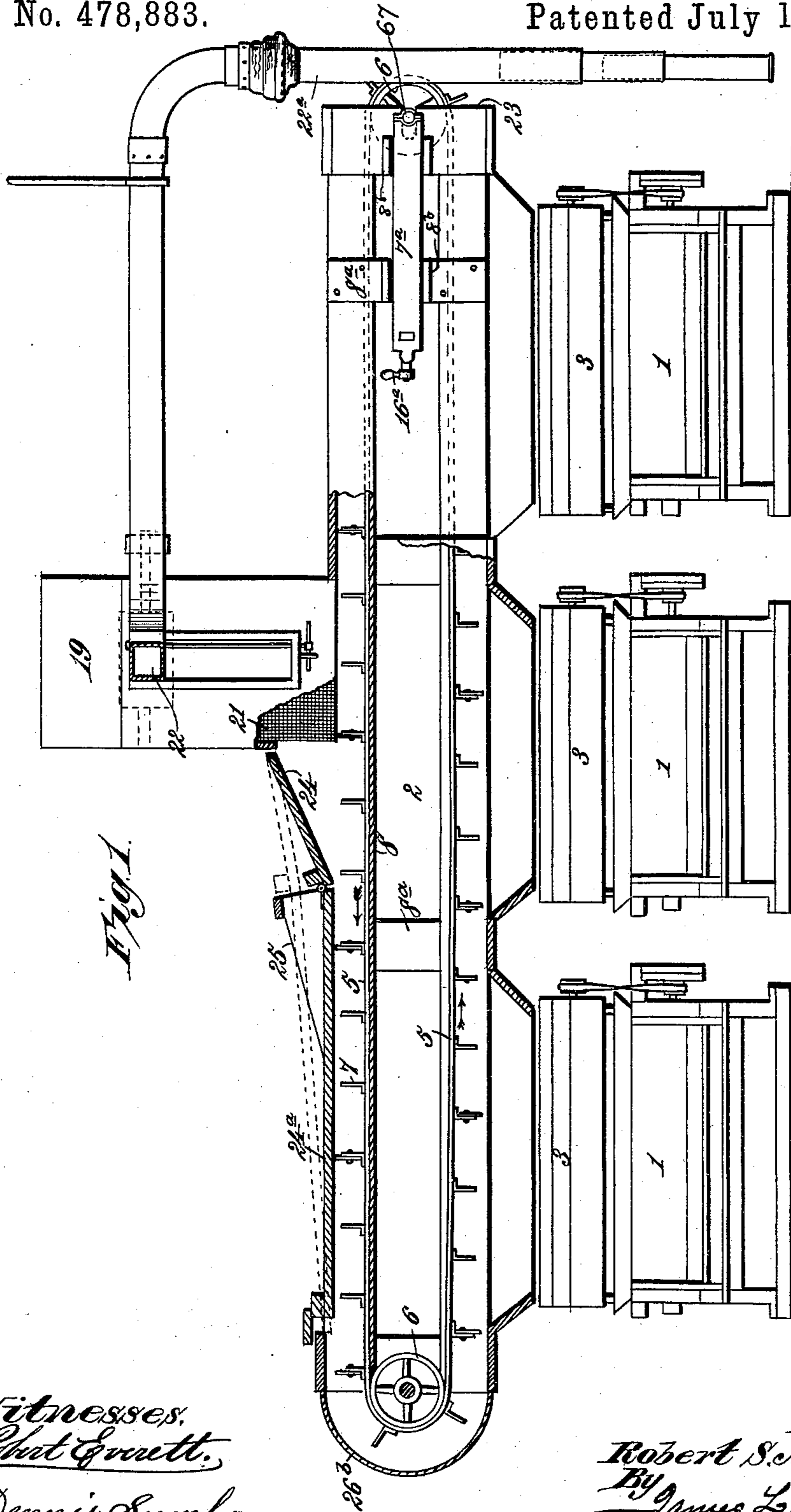


Fig. 1.

Witnesses,  
Robert G. G. G.  
Dennis S. S.

Inventor:  
Robert S. Munger.  
By James L. Norris.  
Atty.

(No Model.)

4 Sheets—Sheet 2.

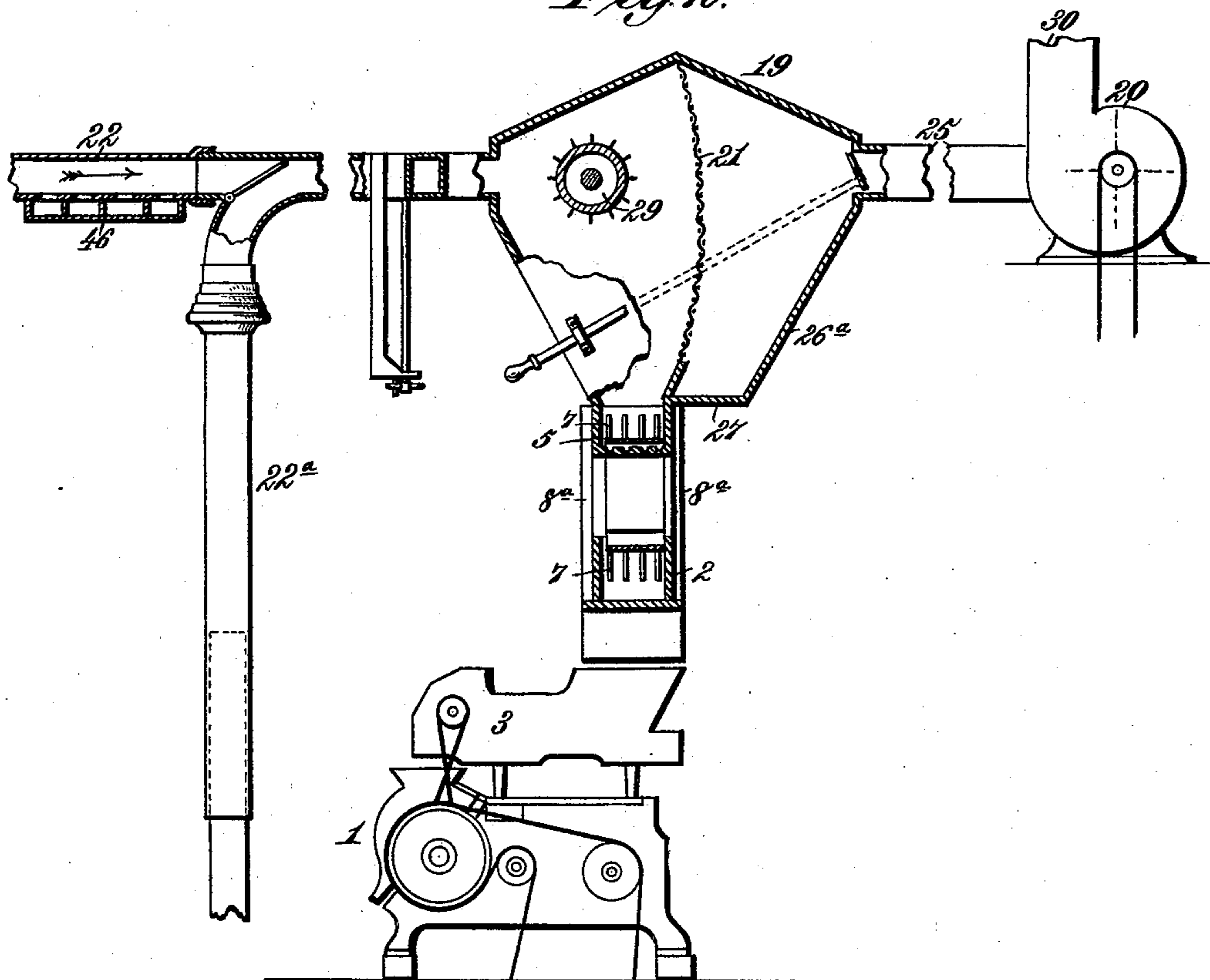
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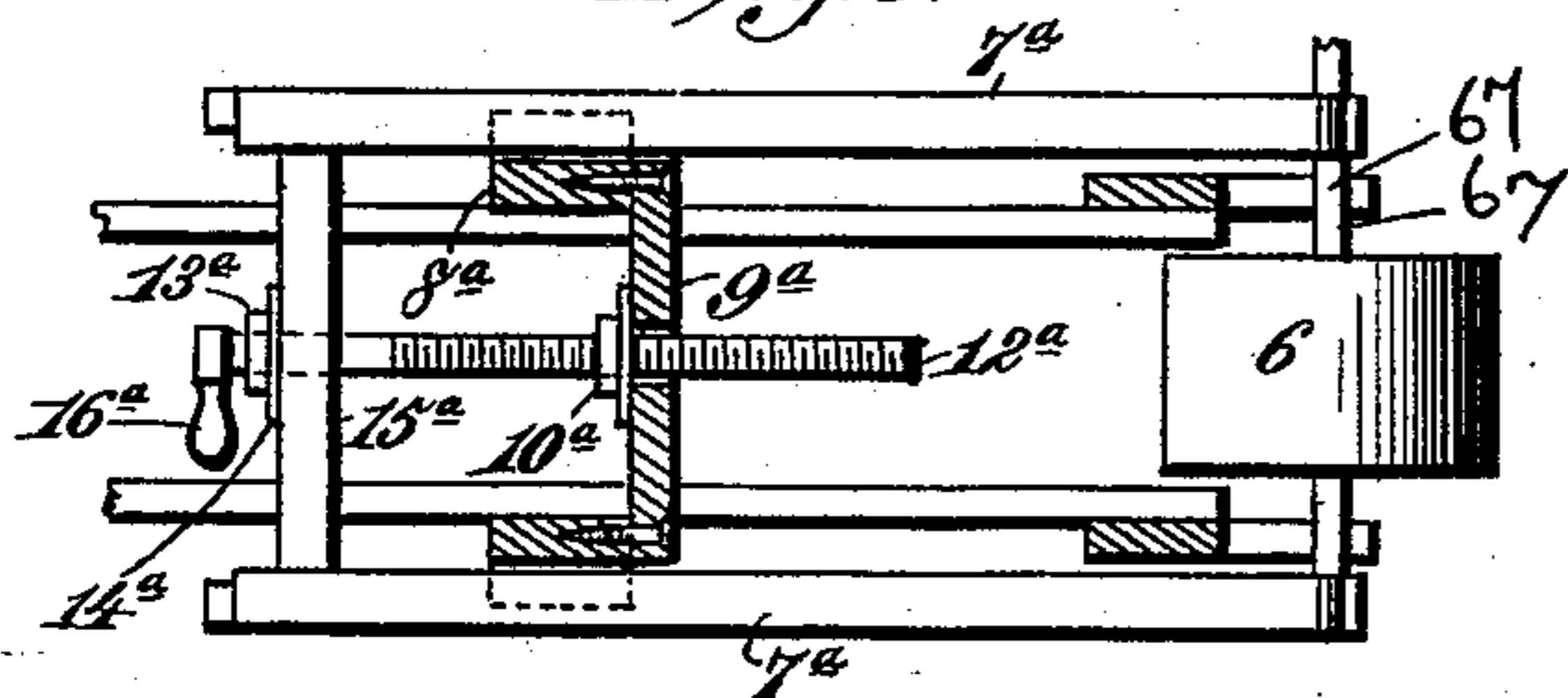
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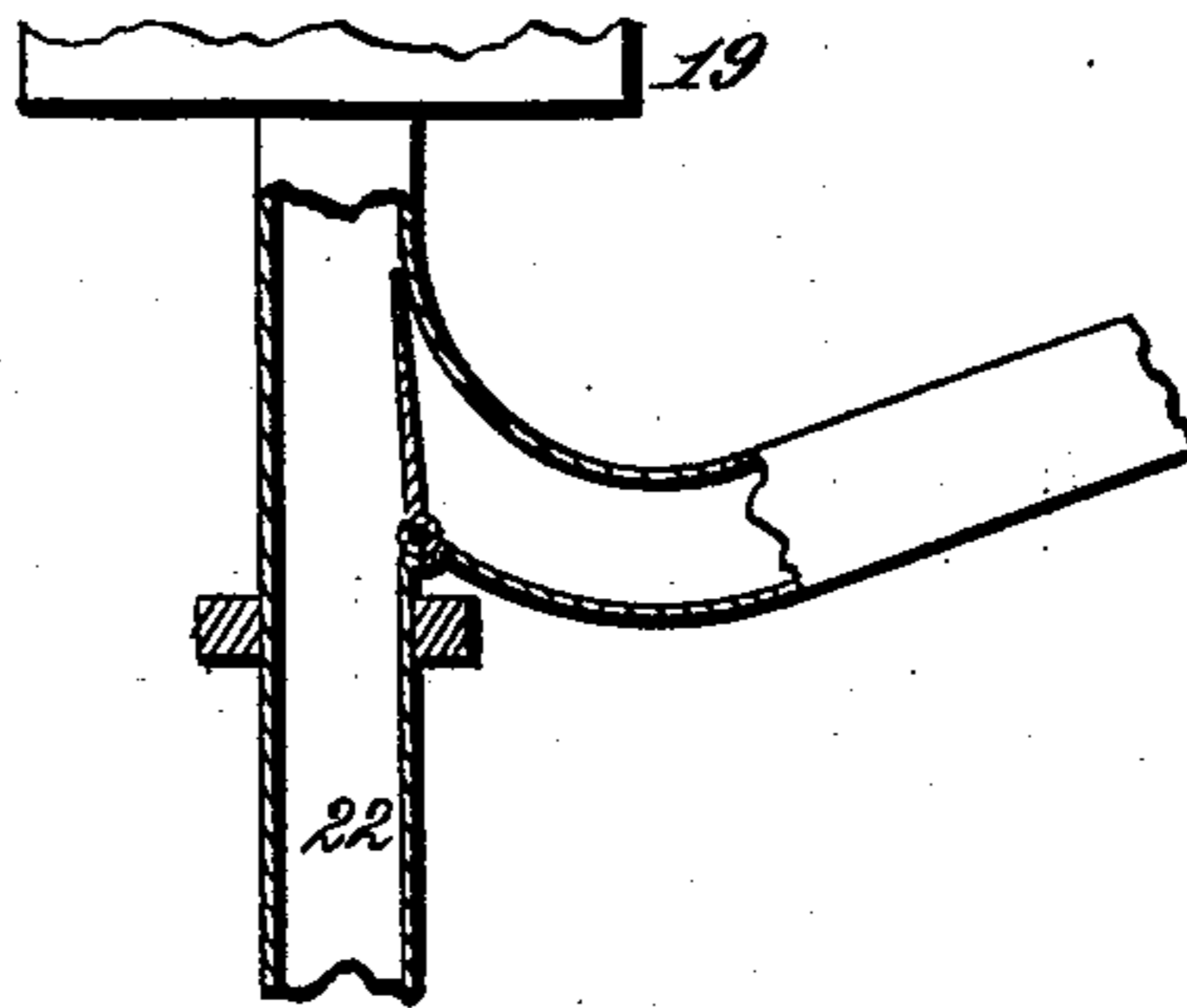
*Fig. 2.*



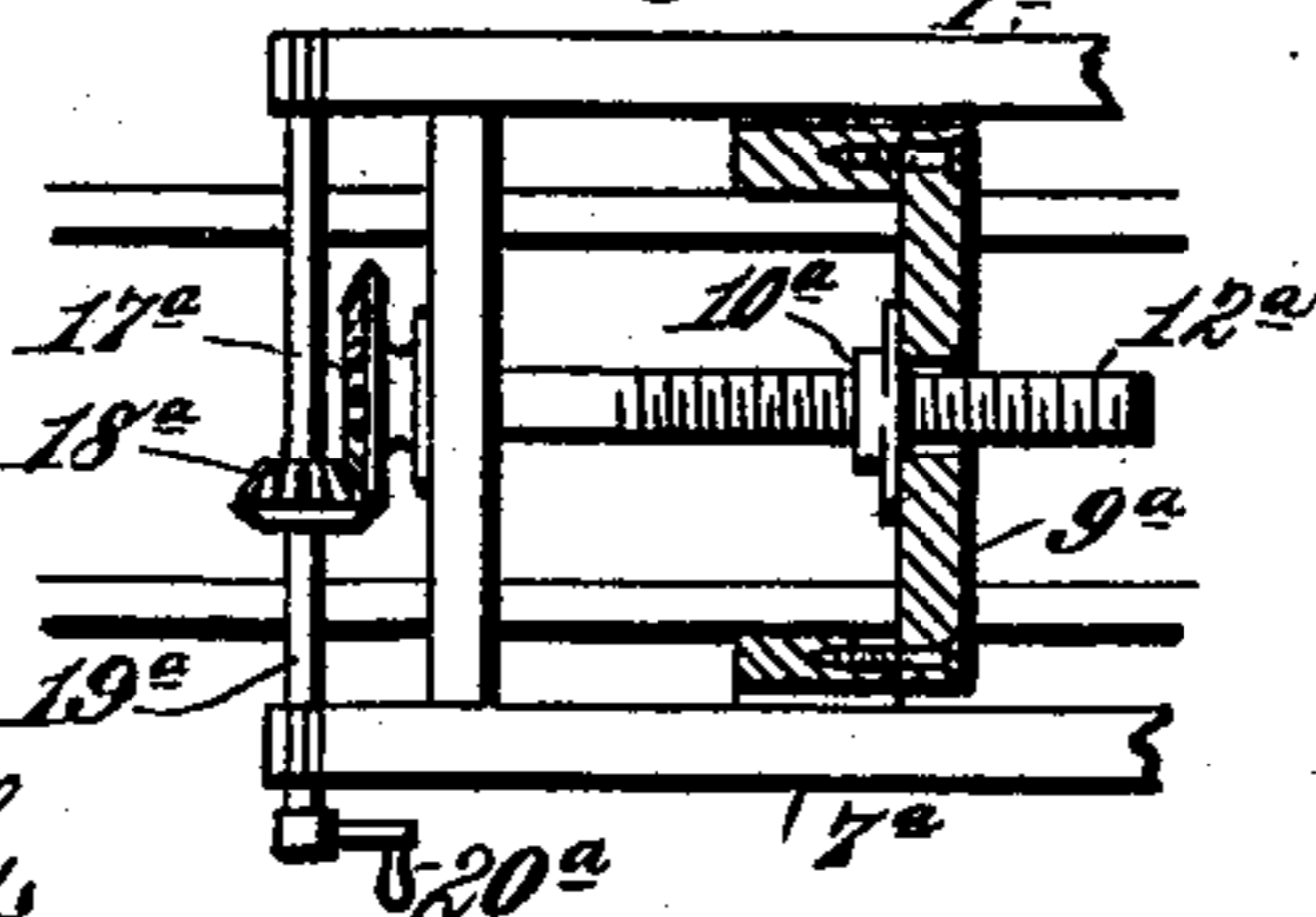
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



Witnesses.

Robert Everett,

Dennis Sumby,

Inventor.

Robert S. Munger.

By

James L. Norris,

Atty.

(No Model.)

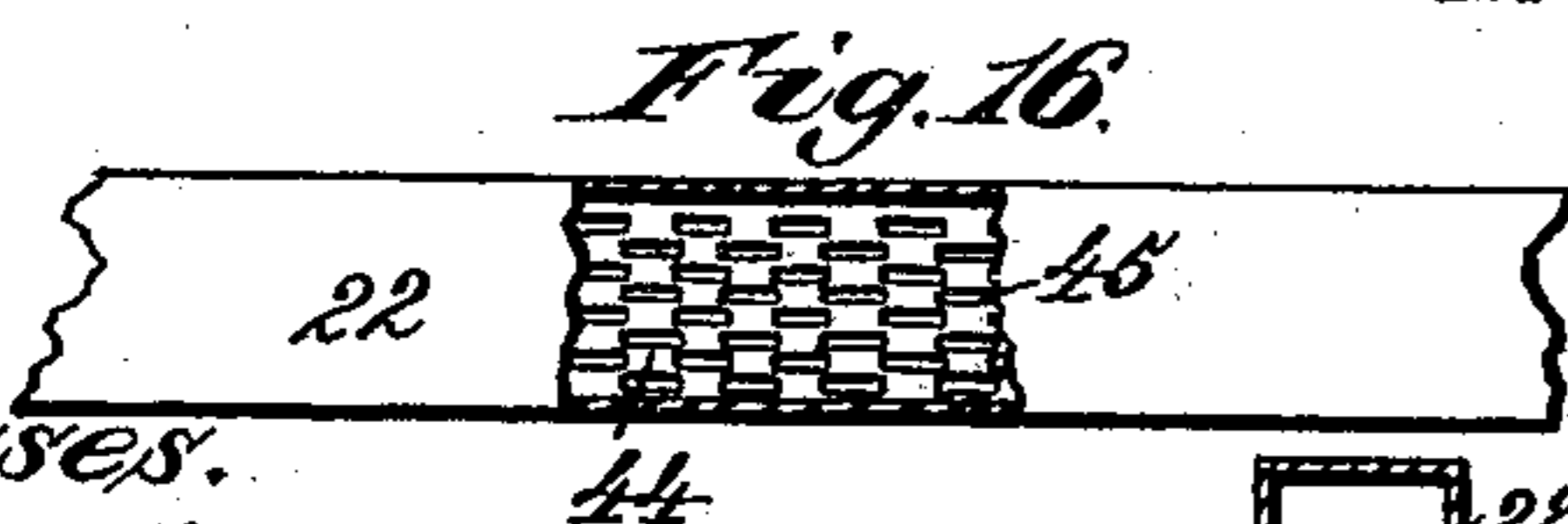
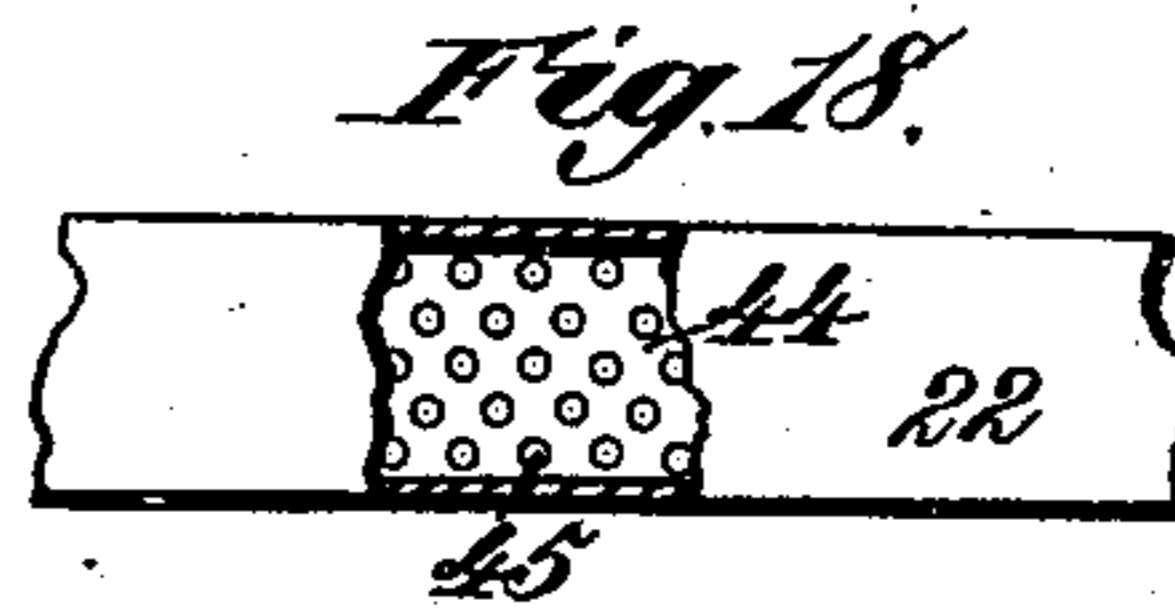
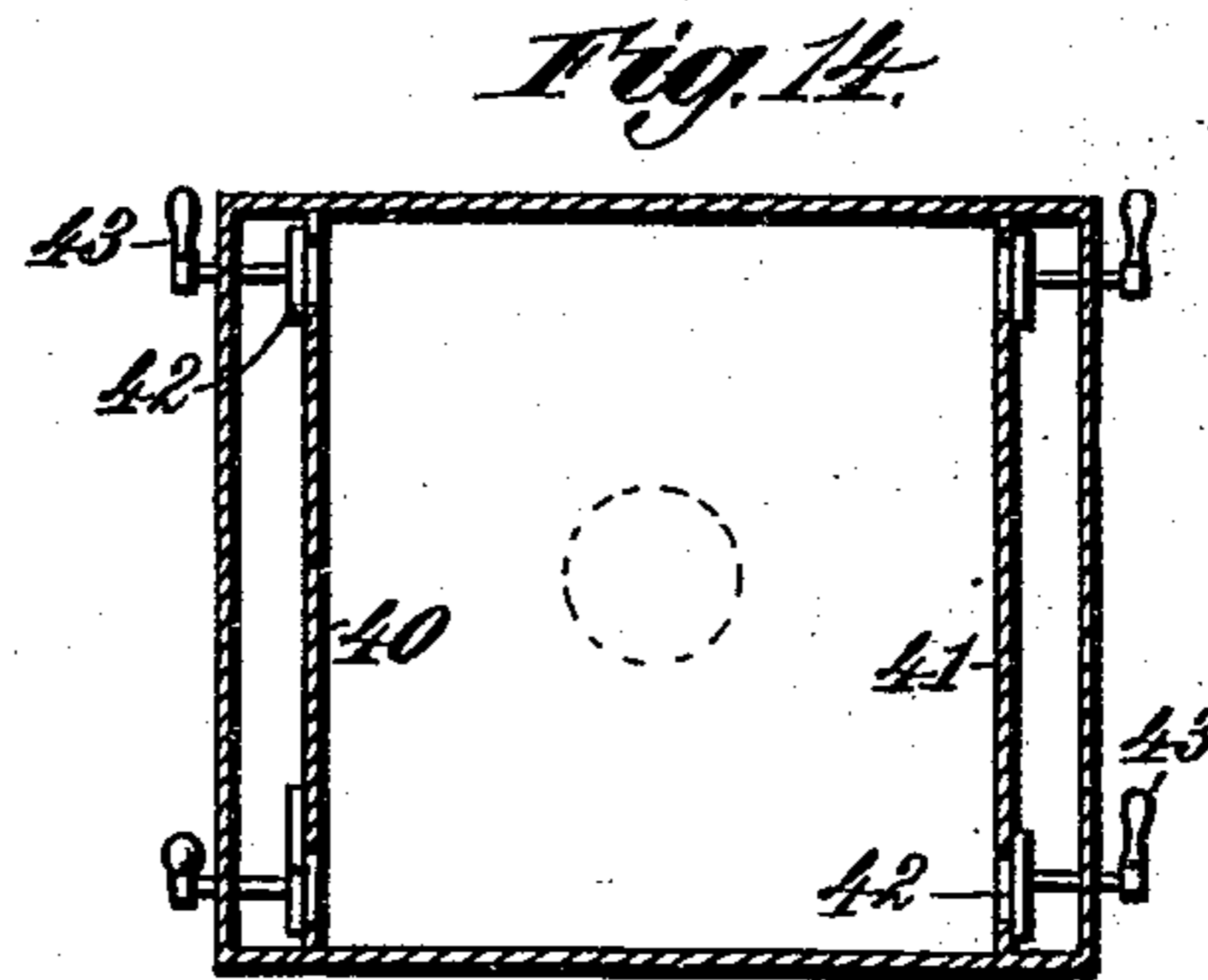
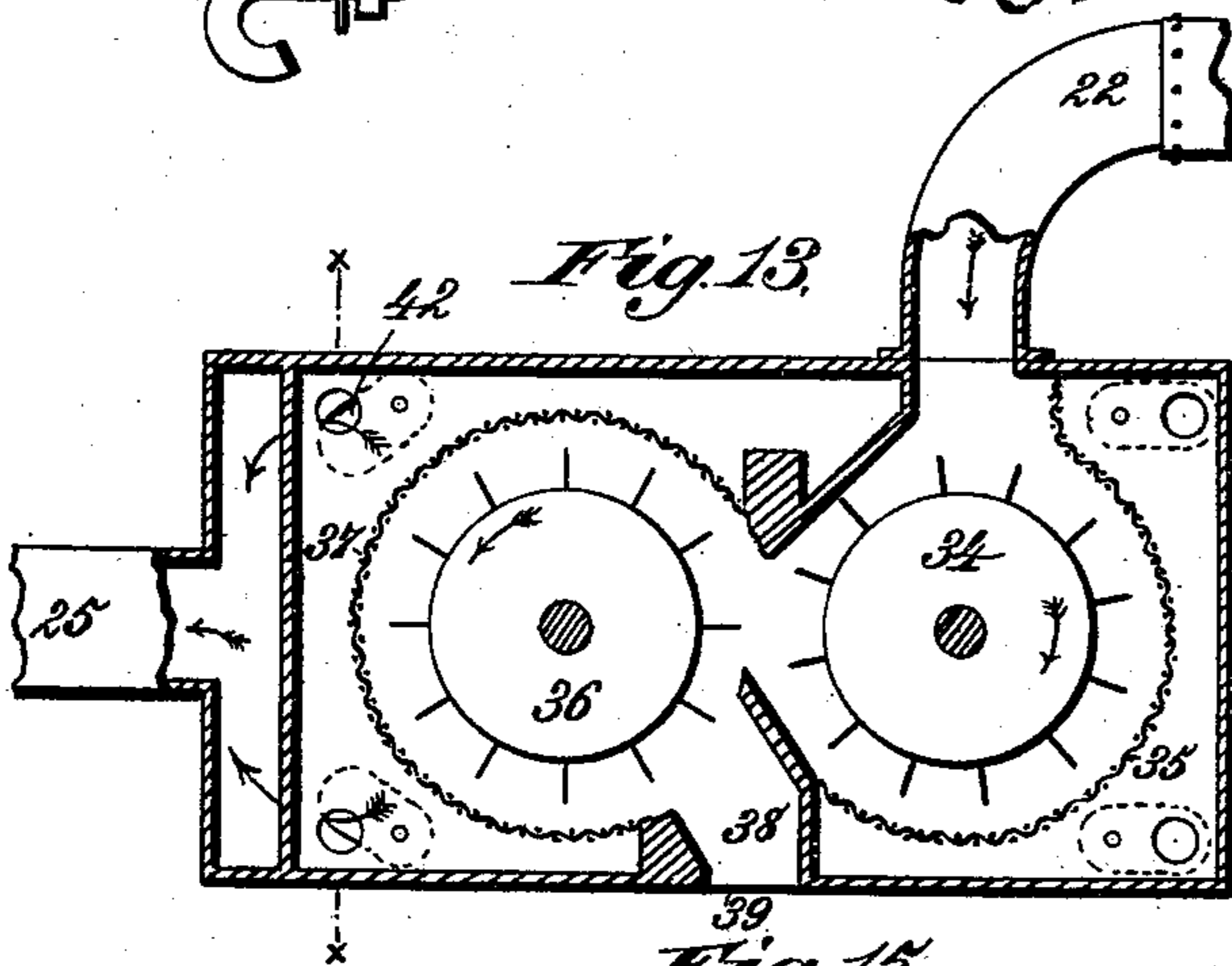
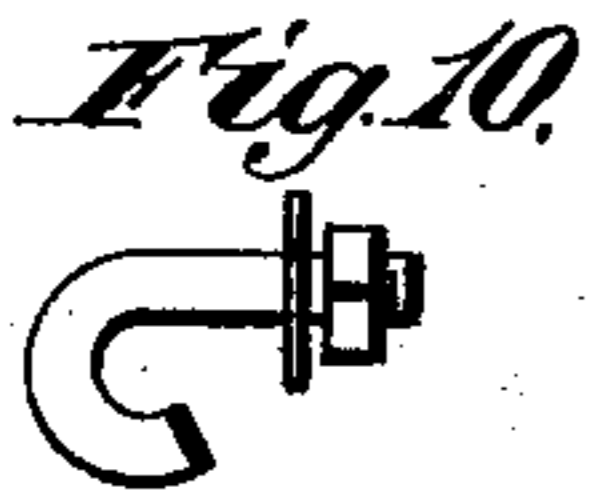
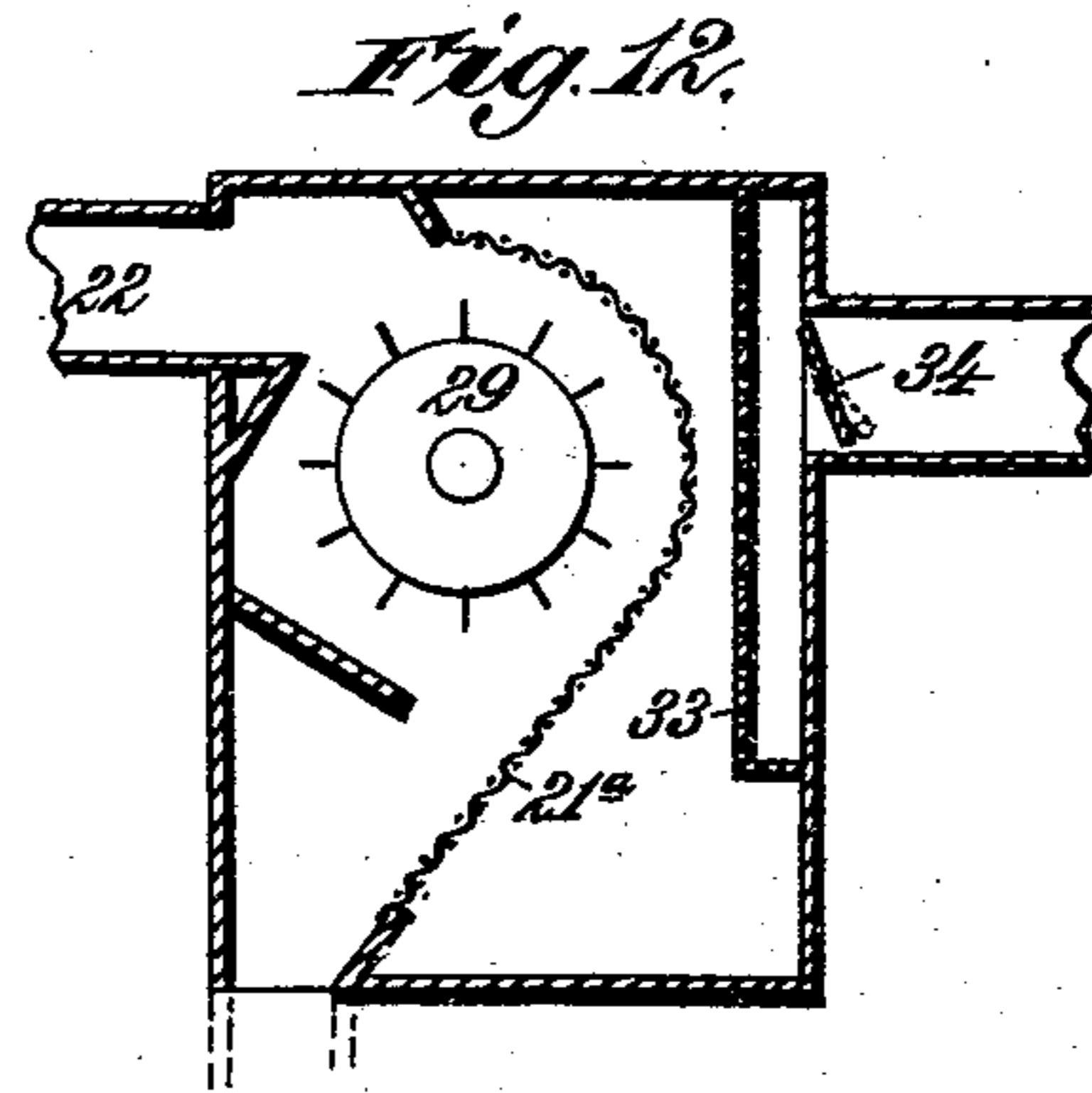
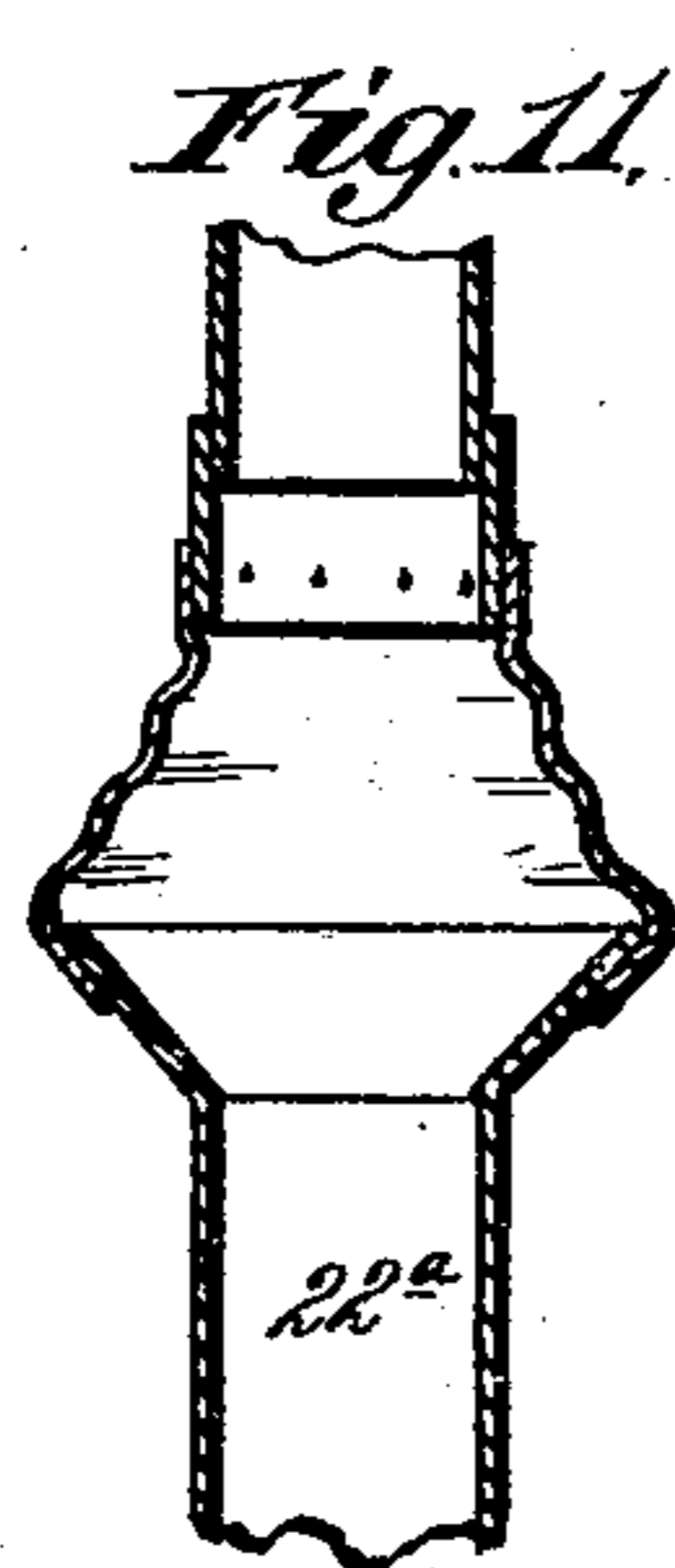
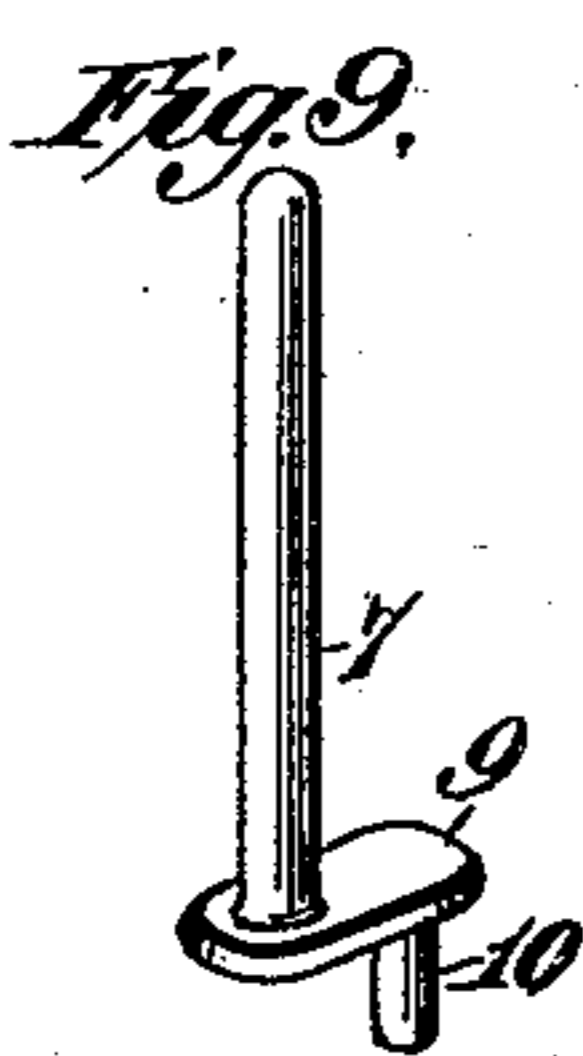
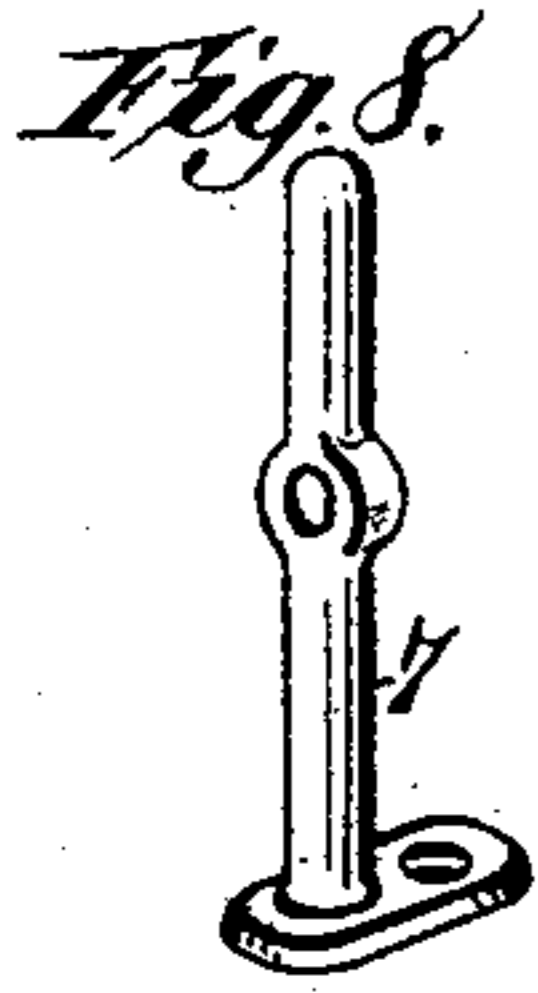
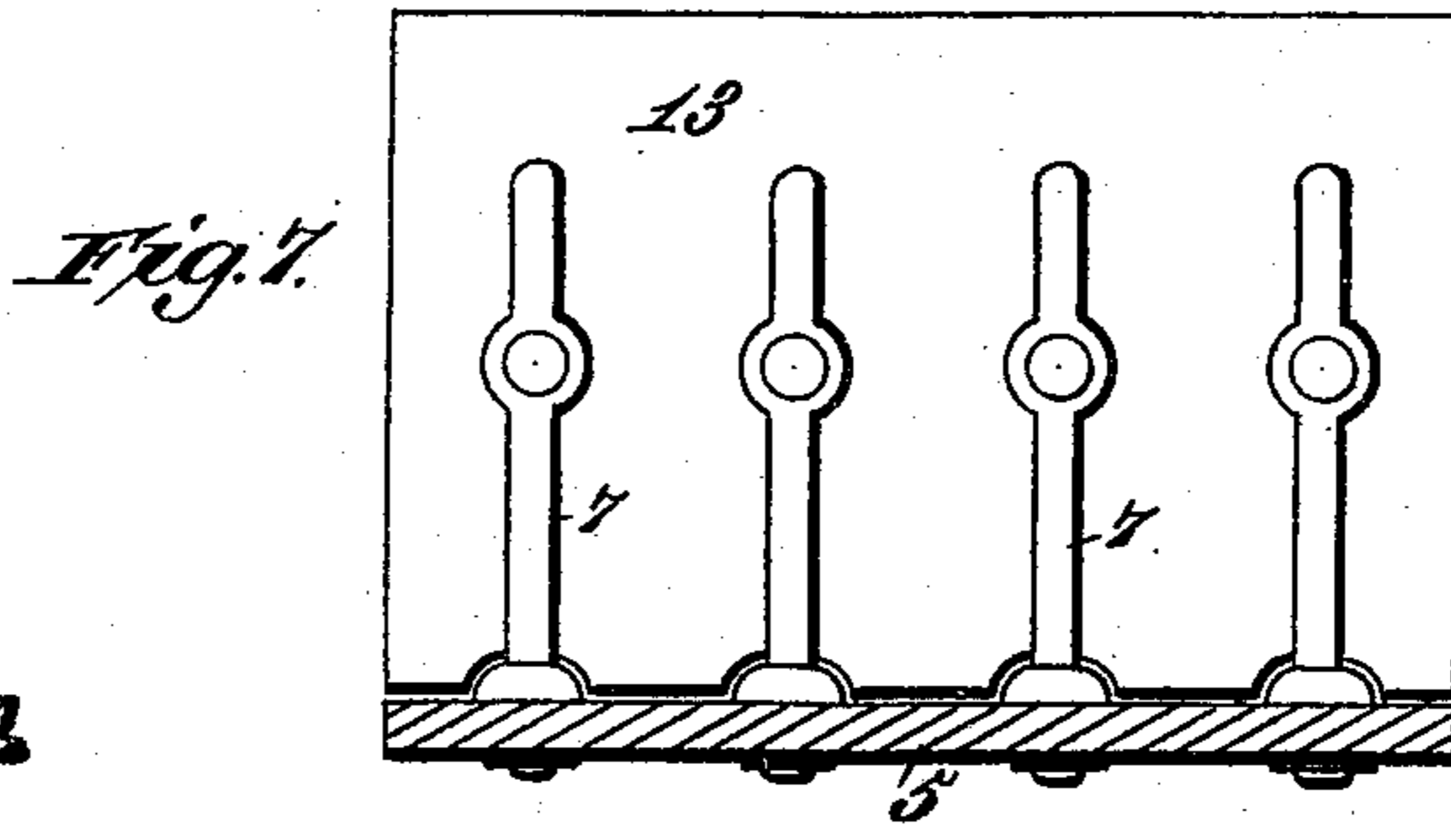
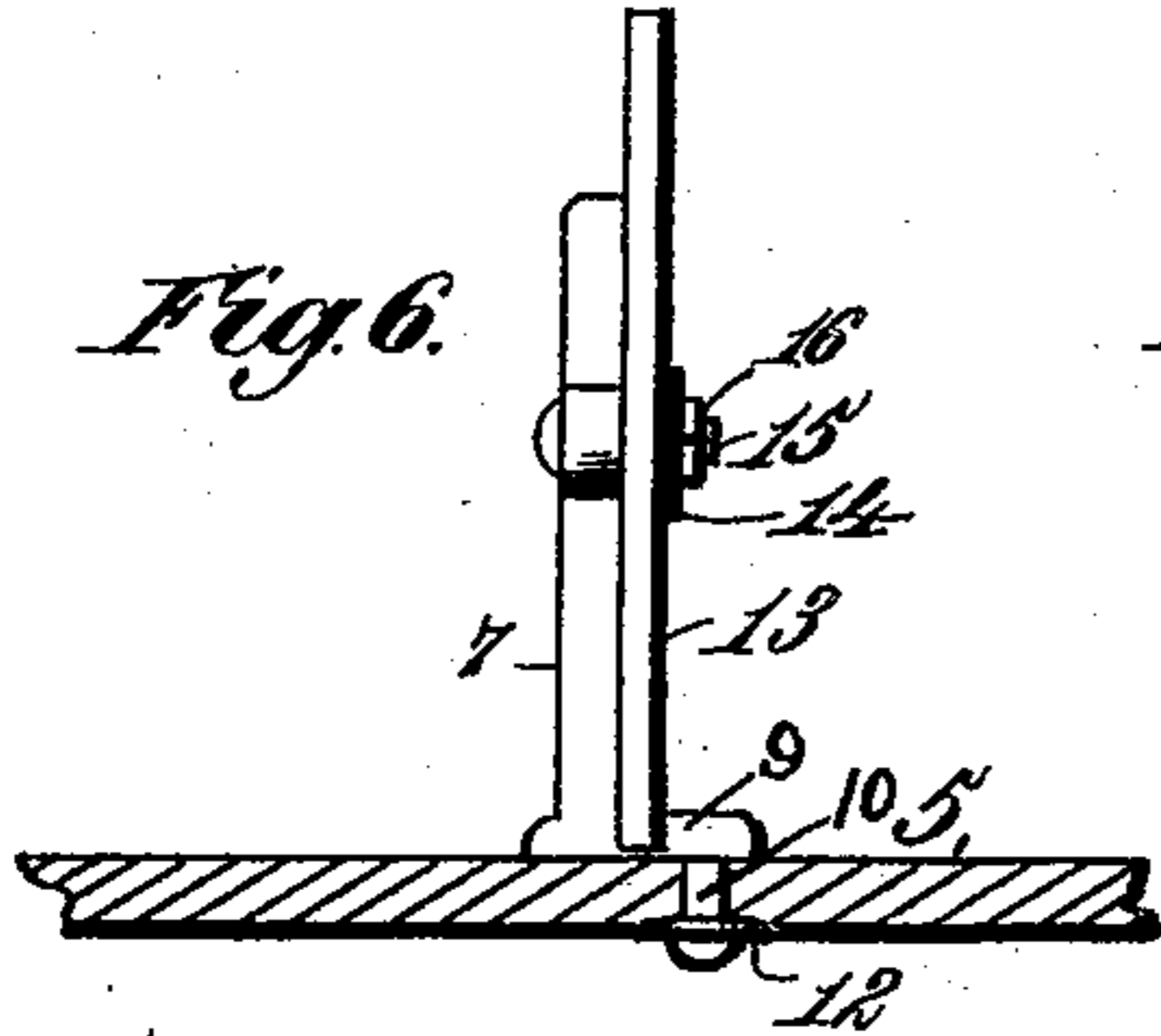
4 Sheets—Sheet 3.

R. S. MUNGER.

MACHINE FOR HANDLING, CLEANING, AND DISTRIBUTING SEED COTTON.

No. 478,883.

Patented July 12, 1892.



Witnesses.  
Robert G. Smith,  
Dennis Sumby.



Inventor:  
Robert S. Munger.  
By James L. Norris,  
Atty.

(No Model.)

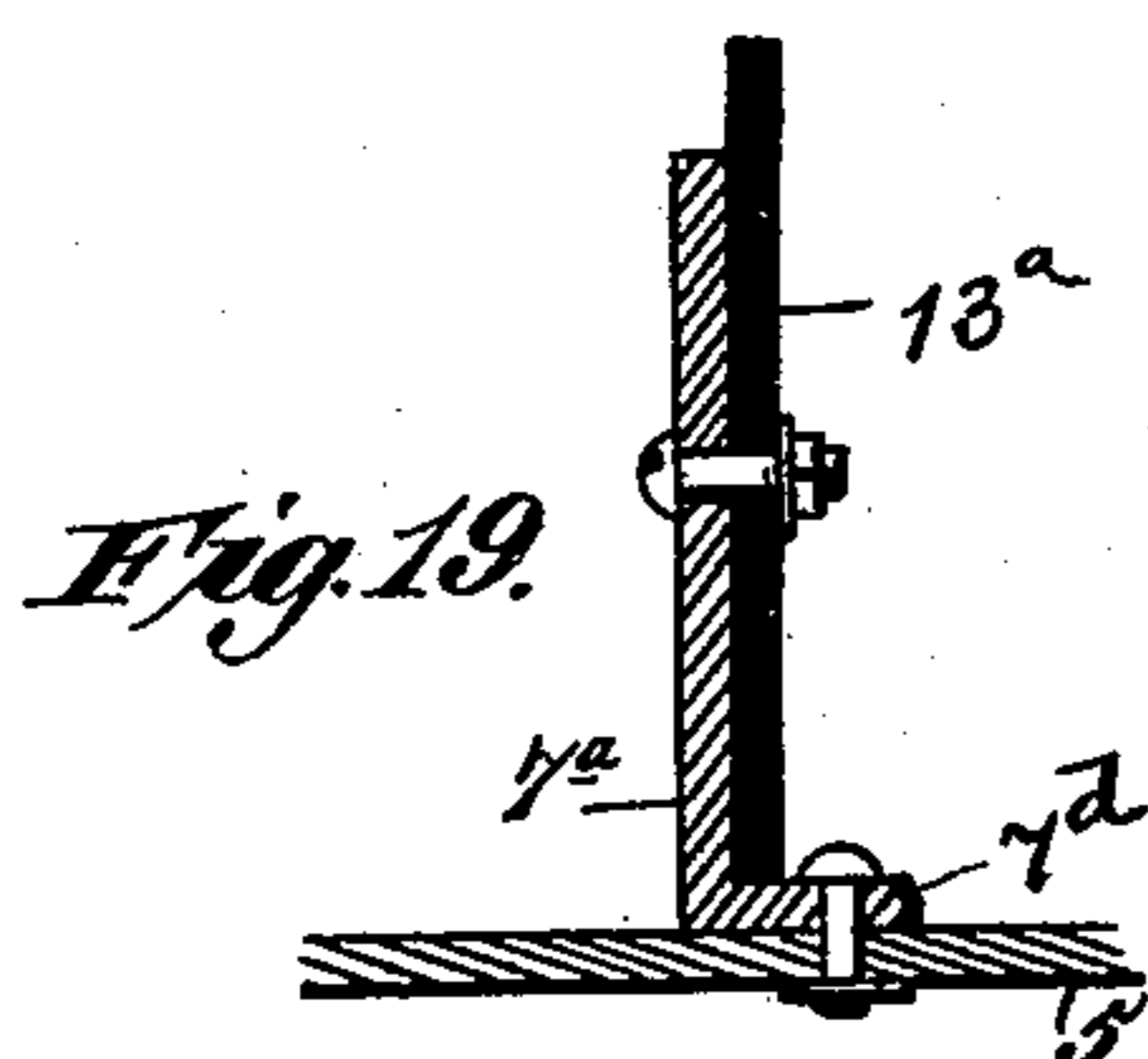
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R. S. MUNGER.

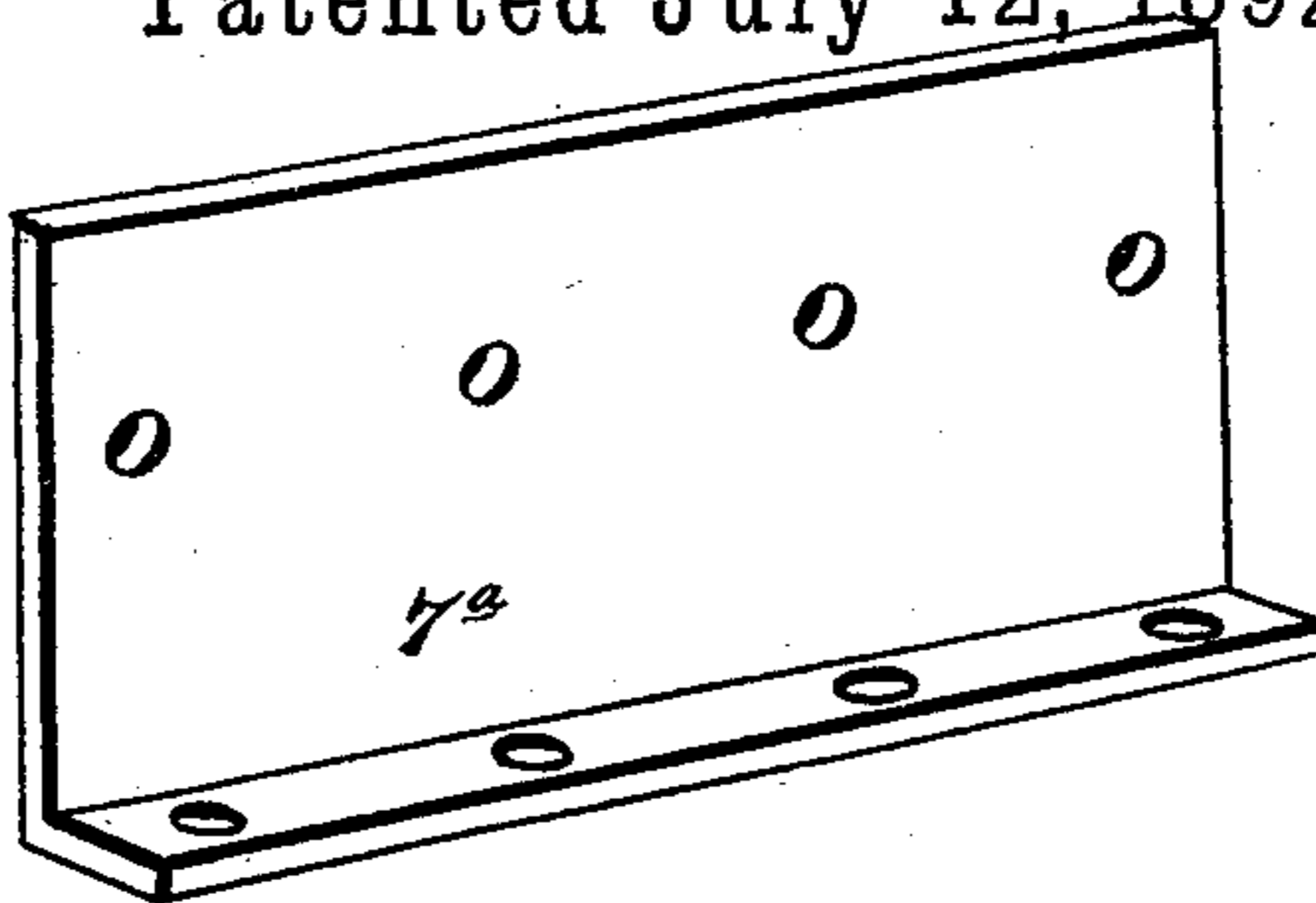
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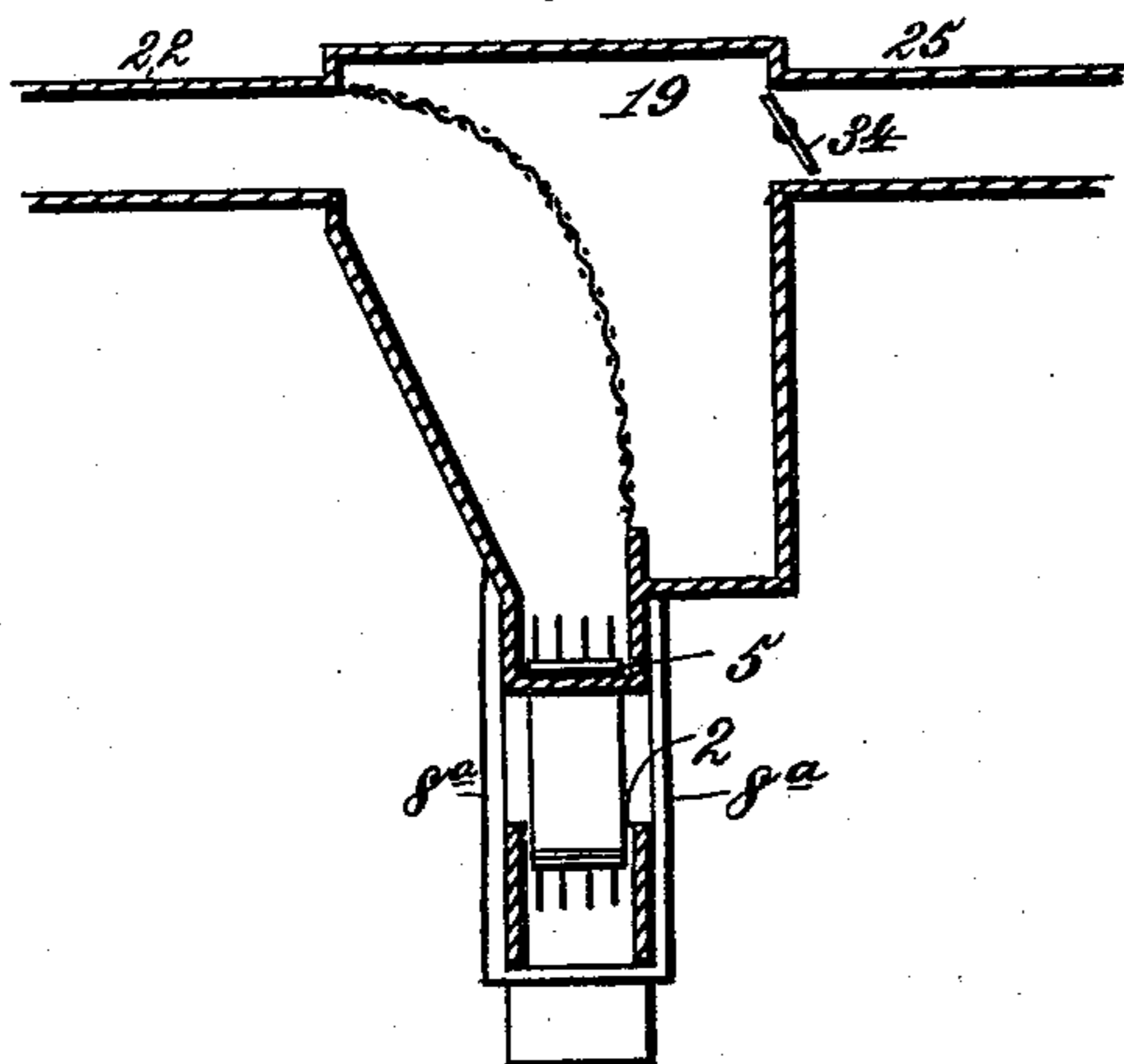
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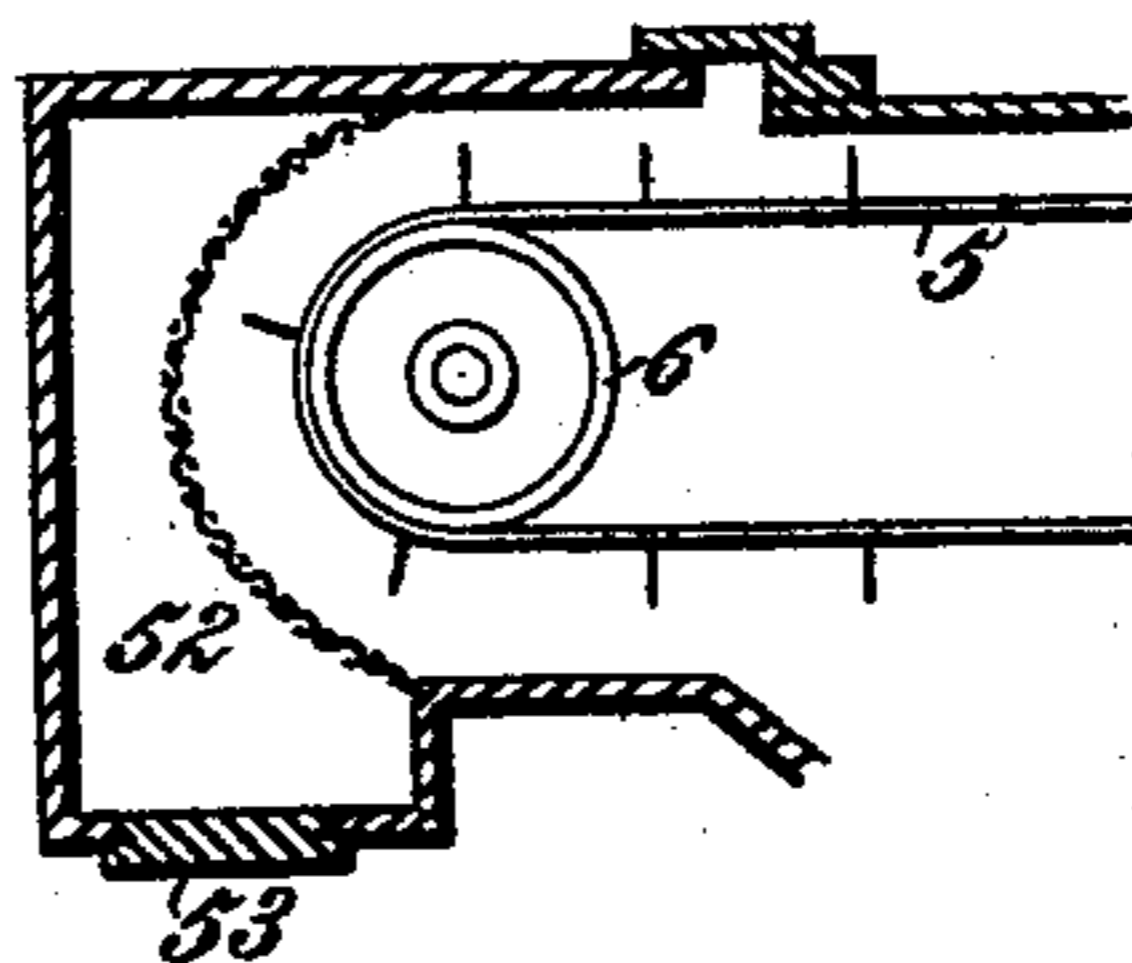
*Fig. 20.*



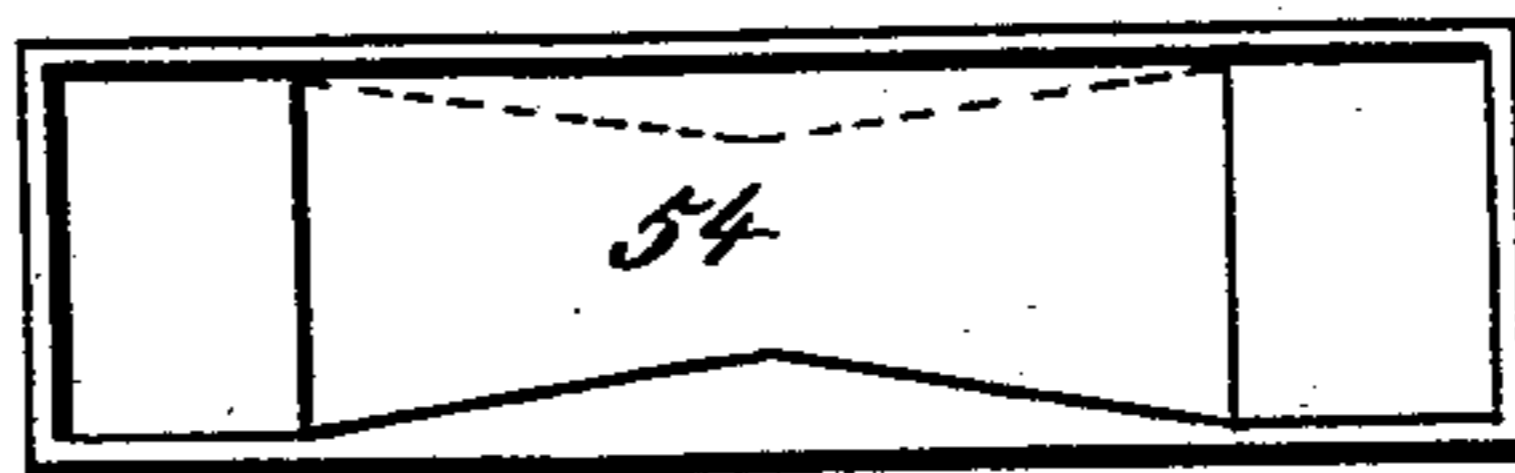
*Fig. 21.*



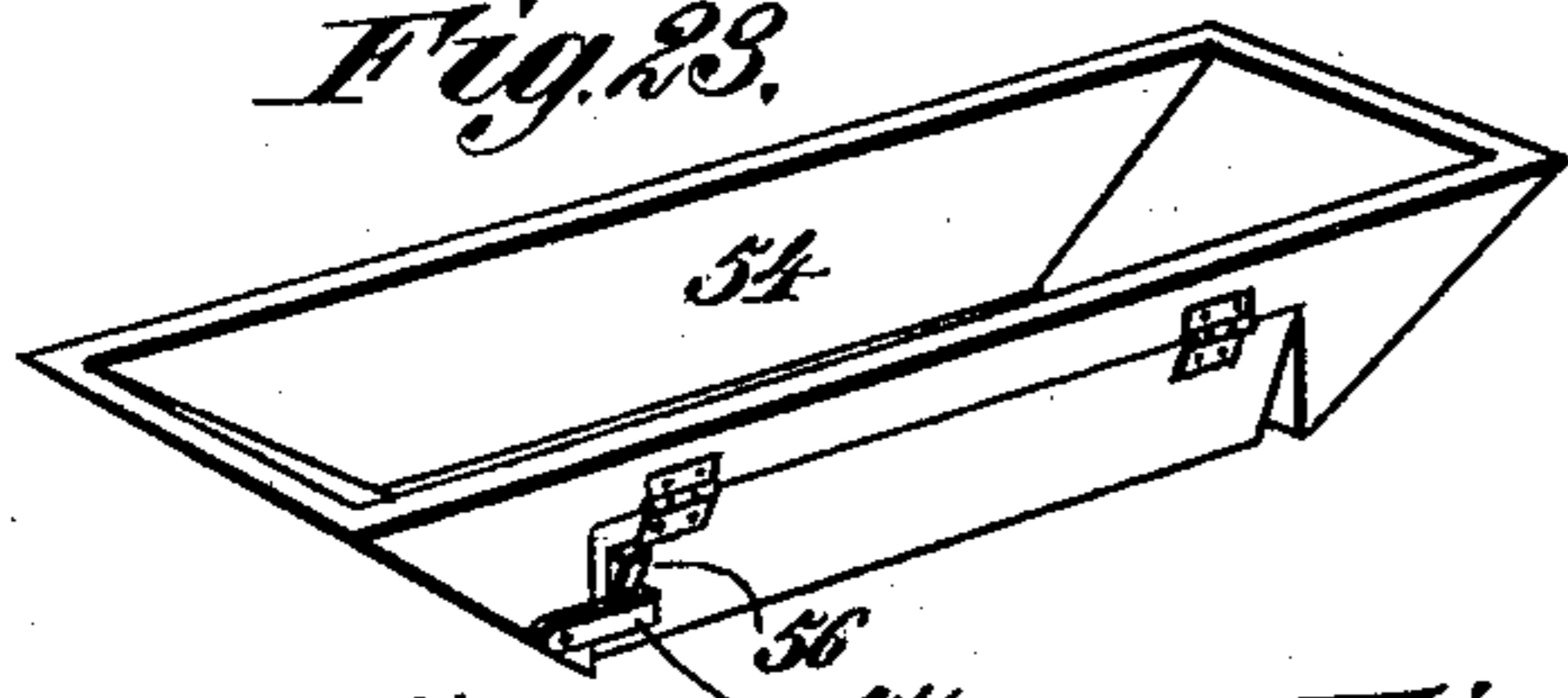
*Fig. 22.*



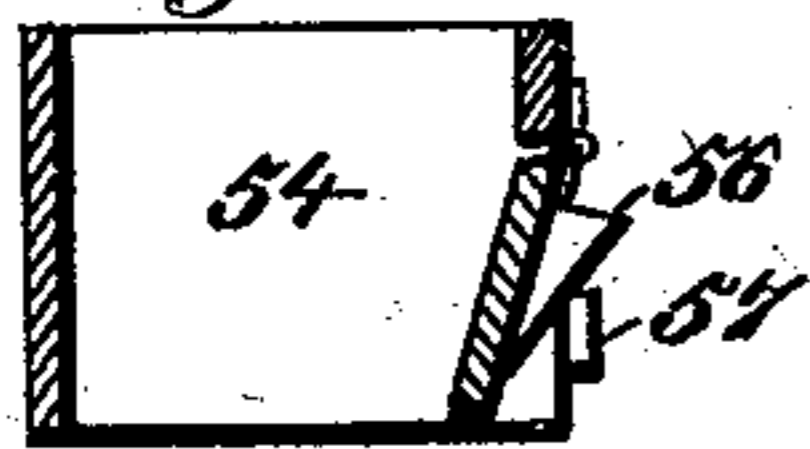
*Fig. 25.*



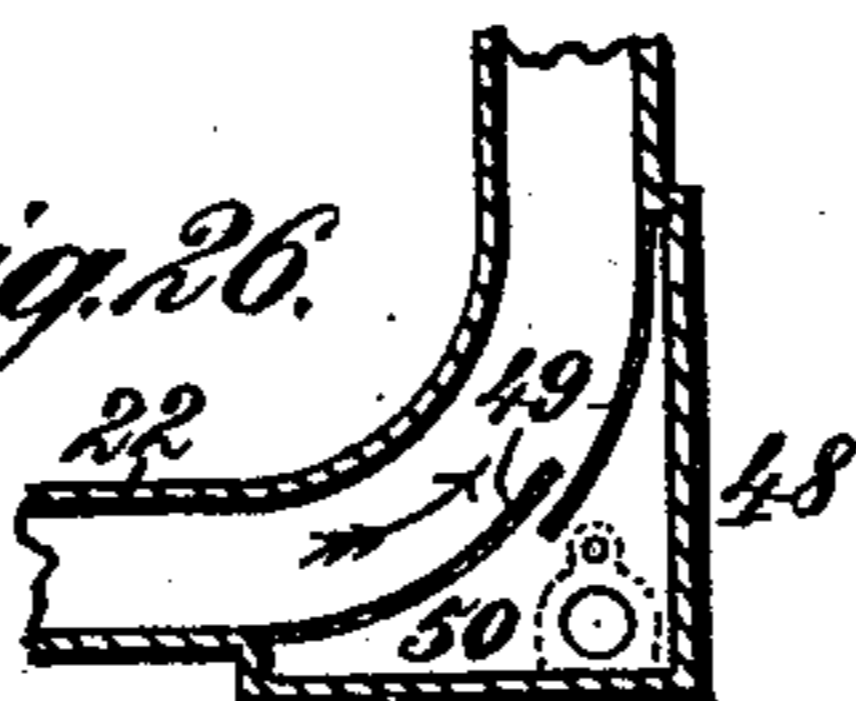
*Fig. 23.*



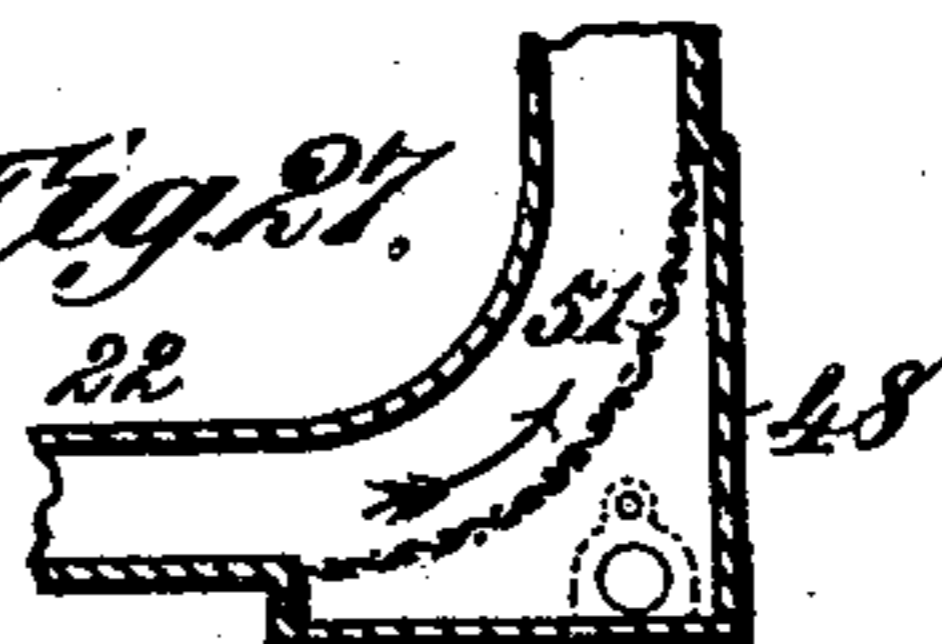
*Fig. 24.*



*Fig. 26.*



*Fig. 27.*



Witnesses.

*Robert S. Munger.*

*Dennis Sully.*

Inventor.

*Robert S. Munger.*

By

*James L. Norris.*

*Atty.*

# UNITED STATES PATENT OFFICE.

ROBERT S. MUNGER, OF BIRMINGHAM, ALABAMA.

MACHINE FOR HANDLING, CLEANING, AND DISTRIBUTING SEED-COTTON.

SPECIFICATION forming part of Letters Patent No. 478,883, dated July 12, 1892.

Application filed March 31, 1891. Serial No. 387,178. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT S. MUNGER, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Machines for Handling, Cleaning, and Distributing Seed-Cotton, of which the following is a specification.

My invention relates to certain improvements in mechanism for handling, cleaning, and distributing seed-cotton to a gin, or series of gins, and the purpose thereof is to provide a simple, compact, and wholly automatic cotton-distributor capable of a constant and accurate operation. It is my purpose, also, to combine with the suction conveyer and cleaner shown and described in my Letters Patent, No. 308,790, dated December 2, 1884, a new and improved form of cotton-distributor for feeding the gins, whereby I am able to wholly dispense with the valve-chamber and valve-buckets shown in my said patent and place the vacuum-box directly upon the distributor, whereby I economize in space in the material employed in construction and in the cost, time, and labor involved in manufacture.

It is my further purpose to provide a distributor in which provision is made for an unusual accumulation or choking of cotton in the passage from the vacuum-box to the distributor; to provide simple means whereby immediate access may be had at any time to that portion of the belt conveying the cotton from the vacuum-box; to combine with the distributor-casing means whereby the centrifugal force of the cotton-carrying belt shall effect a further cleansing of the cotton after it passes from the vacuum-box, and to provide a conveyer-pipe or pneumatic conduit for the cotton having a construction whereby heavy foreign substances may be automatically eliminated therefrom during the passage of the cotton, and whereby, also, further means of separating foreign matter by gravity may be employed during the passage of the cotton through the pipe or conveyer.

It is my purpose, also, to provide a novel flexible joint connecting the drop-pipe with the conveyer and to combine therewith a single valve of simple and novel construction, whereby the exhaust may be turned into

either one of the two communicating pipes at will.

It is my further purpose to combine with the suction-pipe a foraminous diaphragm over which the cotton shall travel in its passage, its heavier and finely-divided impurities falling through the diaphragm into a series of closed receptacles below, said diaphragm having doors whereby such separated impurities may be discharged.

It is my further purpose, also, to combine the vacuum-box with the distributor by removing the valve-chamber and valve and replacing the latter by strips or valve-plates carried by the distributor-belt, which, in conjunction with the casing of the distributor, forms a complete, simple, and highly efficient cut-off to the vacuum-box.

It is my purpose, finally, to simplify and improve the construction and organization of the mechanism, to render the operation more certain and uniform, to reduce the labor of handling the cotton and improve its quality.

To these ends the invention consists in the several novel features of construction and new combinations of parts hereinafter fully described, and then definitely pointed out in the claims which follow this specification.

To enable others skilled in the art to make and use my invention, I will now describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional side elevation of the distributor and vacuum-box. Fig. 2 is a vertical sectional elevation of the distributor, the section being taken transversely, said figure also showing the vacuum-box, pneumatic conveyer, the fan-blower, and the drop-pipe. Fig. 3 is a detail view of the devices for adjusting the tension of the distributor-belt. Fig. 4 is a detail section showing the manner of connecting the return-conveyer to the main pipe. Fig. 5 is a view showing a modification of the construction shown in Fig. 3. Fig. 6 is a detail section of a part of the distributor-belt, showing the method of attaching the valve strips or plates thereto. Fig. 7 is a transverse section of the distributor-belt, taken just in front of the valve-strip. Fig. 8 is a detail perspective of one of the spikes, showing the construction by which the valve-strip is sup-

ported. Fig. 9 is a similar view showing the spike with a modified construction. Fig. 10 is a detail view showing a modified device for attaching the valve-strips. Fig. 11 is a sectional view of the flexible joint in the drop-pipe. Fig. 12 is a sectional view showing the vacuum-box having one form of construction. Fig. 13 is a vertical section showing a modified construction. Fig. 14 is a section taken on the line  $x x$  in Fig. 13. Fig. 15 is a detail section of a portion of the pneumatic conveyor, showing a construction whereby separation of the finely-divided heavier impurities is effected before the cotton reaches the vacuum-box. Fig. 16 is a broken plan view of Fig. 15. Fig. 17 is a transverse section of Fig. 16. Fig. 18 is a broken plan view showing a modified construction of the conveyor illustrated in Figs. 15 and 16. Fig. 19 is a transverse vertical section showing a modified construction of the valve-strips and a different method of attaching them to the distributor-belt. Fig. 20 is a detail perspective of the metallic bracket to which the valve-strip in Fig. 19 is attached. Fig. 21 is a sectional view showing a modified construction of the vacuum-box. Fig. 22 is a detail section showing a modified construction of the distributor-casing, whereby a centrifugal separation of finely-divided and comparatively heavy foreign impurities may be effected. Fig. 23 is a detail perspective of one of the gin-hoppers, showing means for varying the thickness of the bat. Fig. 24 is a transverse vertical section of the part shown in Fig. 23. Fig. 25 is a plan view showing a modified construction of hopper. Figs. 26 and 27 are detail sections showing slight modifications in the means interposed in the conveyor for catching and separating heavy substances, which resist the suction by their gravity.

In the said drawings the reference-numeral 1 denotes a series of gins arranged in a single line or rank. I have shown in the drawings three of these gins; but they may be of any number desired, from one upward. Upon these gins I place a continuous casing 2, extending over the whole series of gins and communicating with each gin feeder or hopper 3 by means of an opening, which may be closed at pleasure. Within the casing is arranged an endless belt 5, running over pulleys 6 at the ends of the casing. This belt is provided at suitable intervals with spikes 7, which stand at right angles with the belt. The upper part of the belt travels and has its weight supported upon a strip 8, parallel with the outer wall of the casing, and separated from it by a distance a little greater than the length of the spikes, in order that there may be no interference between the latter and the walls of the casing. These spikes are formed, preferably, of malleable iron, with an expanded base 9 and rivet 10, Fig. 9, said parts being all formed in one piece. The rivet is driven through an opening in the belt and

on its end receives a washer 12, upon which its end is upset and by which it is fastened in place. At suitable intervals upon the belt are mounted valve strips or plates 13, which are secured in place transversely of the belt and are of such size as to closely fit the interior of the casing without excess of friction, by which the movement of the belt might be impeded. These strips are placed at substantially equally intervals; but these intervals vary in accordance with the number of gins fed by the distributor. For example, if there is but a single gin, the distributor-belt will be provided with these transverse valve-strips at such points that at least two or more of the said strips shall be in engagement with the distributor-casing upon each side of the vacuum-box at the same time, and in like manner if two, three, or more gins are fed by the same distributor the arrangement is the same, the interval between the valve-strips being simply increased. In the latter case the casing is considerably increased in length and the intervals between the valve strips or plates will be correspondingly increased. While these valve-strips may be made in different ways and secured to the belt by a variety of means, I prefer to construct them of rubber, though I may, nevertheless, form them of some rigid material, such as wood or even metal, and apply to each an edge of rubber or other elastic or flexible material, extending along its longer edge as well as upon its ends, said material being applied to the rigid body of the valve-strip in any suitable manner—as, for example, by screws, rivets, nails, or cement. I may also substitute for the rubber any other substance, such as leather or leather-board, provided it has a proper degree of strength and flexibility.

The valve-strips are applied to the belt and arranged immediately in front of the transverse rows of spikes set in said belt. The upright valve-strip thus rests against the spikes, which stand immediately in rear thereof and is secured by small bolts 15, passing through apertures formed in said spikes and penetrating the rubber, as shown in Figs. 6 and 8, their ends receiving nuts 16, which may rest against washers 14. By this arrangement the transverse rows of spikes, secured to the belt in the manner already set forth, afford a secure support for the valve-strip, which rises above the points of the spikes and has its ends extended beyond or slightly beyond the side edges of the belt to form an air cut-off, which, as already stated, fits the wall of the casing with sufficient accuracy to prevent any material escape of air while at the same time it does not interfere with the ready travel of the belt. I may, however, form the strips and attach them in the modified manner shown in Figs. 19 and 20, in which I substitute for the transverse series of spikes a metallic bracket 7<sup>a</sup>, having a foot-flange 7<sup>a</sup>, which is bolted to the belt. Upon this foot-flange rests the edge of

the valve-strip 13<sup>a</sup>, which is supported by bolts passing through said strips and through the brackets, as shown in Figs. 19 and 20.

The numeral 19 denotes the vacuum-box, which consists of a chamber usually having a roof-shaped or oppositely-inclined top, said chamber having communication with a fan 20, whereby a constant suction is maintained in said box, the air-draft passing through a section of foraminous material 21, arranged between the air-exit and the entrance for the cotton. This entrance is by way of a conveyer 22 entering said vacuum-box and communicating with any suitable point or points, such as a cotton-house or a wagon loaded with cotton, as fully set forth in the Letters Patent granted me the 2d day of December, 1884, No. 308,790.

For the purpose of unloading a cotton-wagon by means of this conveyer I provide a drop-pipe 22<sup>a</sup>, connected with the main conveyer by a flexible joint having a construction fully described in a subsequent portion of this specification, said drop-pipe having the telescoping section or end shown in my patent referred to. In said Letters Patent the organization is such that in order to maintain the suction through the conveyer some means must be employed to cut off the inflow of air through the feed-opening in the lower part of the vacuum-box. In my Letters Patent referred to above I employ a valve-chamber having a rotating shaft provided with buckets or valves of flexible material, which closely fit the walls of said chambers and cut off the upward air-current, a passage for the cotton being provided by which it may enter between the buckets or within the pockets of the valve-shaft and rest upon the said buckets until brought by the further revolution of the shaft opposite the discharge-opening in the lower end of the valve-chamber through which said cotton drops by its own gravity upon the belt of the distributor. By my present invention I wholly do away with this valve-chamber, together with the rotating valve-shaft, buckets, or wings and seat the vacuum-box directly upon the distributor-casing at a suitable point, this being preferably about the center of the casing. The lower end of the vacuum-box opens directly through the upper wall of the casing, whereby the cotton sucked through the conveyer 22 and thence passing through the vacuum-box may descend from the latter directly upon the upper portion of the distributor-belt which travels in the direction indicated by the arrow. The valve-strips mounted upon this belt, whereof two or more are always in engagement with the upper parallel portion of the casing upon each side of the open end of the vacuum-box, effectually cut off the upper air-current (which would otherwise counteract the suction in the conveyer and in the vacuum-box) and take the cleansed descending cotton as it is fed from said box, carrying it forward and around the end pulley and

supplying the gin-feeders. When the feeder of the first gin is level full, the cotton will pass over the same to the next gin-feeder, filling it in like manner, and so on in succession throughout the entire series of the gins. When all are filled, the distributor will retain them all at this point—that is to say, even or level full—as long as cotton continues to pass through the conveyer and vacuum-box. Should the supply of cotton from these sources prove in excess of the capacity of the series of gins, the surplus cotton is allowed to flow from the open end 23 of the distributor and fall upon the floor or into a suitable receptacle, whence it is taken up by automatic means and again returned to the moving distributor-belt, and again offered to the gin-feeders. This portion of the apparatus, however, forms no part of the present specification, being the subject-matter of a separate application for Letters Patent filed by me of even date herewith and numbered in serial 387,180.

While I may form the upper wall of the casing of the distributor perfectly level or straight up to the point where it unites with the vacuum-box I prefer to adopt a construction by which the choking of the cotton, should it be delivered in large clots or lumps, as may sometimes happen, shall be avoided. To accomplish this result, I divide the outer wall of the casing of the distributor into two parts, forming a section 24, adjacent to the vacuum-box, and on the side entered by the cotton as it leaves said box. Upon the other section or part 24<sup>a</sup> and upon the opposite vertical edges between which the longer section 24<sup>a</sup> is arranged are mounted blocks 25, which approximate the form of a right-angled triangle, the hypotenuse of each being laid upon one of the edges of the casing. The section 24 of the casing is raised to an inclined position and its end rested upon the wall of the vacuum-box or on a support upon said box, while the other end is hinged to the end of the long horizontal top 24<sup>a</sup> of the casing, which may be arranged to have a limited sliding movement between the vertical sides inclosing the distributor-belt. The purpose of this is to enable the top to rise at the point where it is hinged in the event of the cotton accumulating at that point in such quantities as to crowd or choke between the moving belt and the top of the casing.

The blocks 25 (shown in Fig. 1) are practically risers on the sides of the distributor-casing, and serve both as guides for the cover and to prevent an influx of air when the cover lifts.

I also employ any suitable form of belt-stretching or belt-tightening device for preserving the tension of the distributor-belt. These devices are substantially as follows: I prefer to use for this purpose the simple means shown in Figs. 3 and 5, whereby an equal adjustment of both ends of the pulley-shaft 67 may be effected simultaneously in contradistinction to the form of device some-

times used heretofore, in which the two ends of the pulley-shaft are adjusted independently. To effect my purpose in this respect, I connect the ends of the journals of the pulley-shaft, with parallel arms 7<sup>a</sup> arranged about the median line between the upper and lower members of the distributor-casing, and arrange said arms outside the vertical cleats 8<sup>a</sup>, which connect said members, and between guides 8<sup>b</sup>. Arranged between these arms and rigidly connected with the distributor-casing or with the cleats 8<sup>a</sup> is a transverse bar 9<sup>a</sup>, having a boss 10<sup>a</sup>, provided with a female thread receiving a screw-rod or shaft 12<sup>a</sup>, which is provided with a rigid collar 13<sup>a</sup> at the end most remote from the pulley. This collar rests upon a washer or wear-plate 14<sup>a</sup>, lying against a cross-brace 15<sup>a</sup>, which is mortised into the parallel arms 7<sup>a</sup>. It will be seen that by turning the screw 12<sup>a</sup> by a crank-arm 16<sup>a</sup> upon its end, the cross-brace 15<sup>a</sup> will be drawn toward the rigid transverse bar 9<sup>a</sup>, thereby forcing the parallel arms 7<sup>a</sup> simultaneously in such direction as to increase the tension of the belt of the distributor. By this simple construction, consisting of a movable rectangular frame, one end thereof carrying the belt-pulley and the other forming a support for the adjusting-screw, in conjunction with the single rigid transverse bar supporting the nut for the adjusting-screw, I am able to obtain an exact and equal movement of the pulley and of both journals thereof simultaneously.

In those cases where a considerable number of gins are fed by a single distributor the tension of the belt may be so great that the length of the crank-arm 16<sup>a</sup> may be insufficient to enable the operator to impart the necessary stretch to the belt, inasmuch as the length of the crank-arm is limited by the interval between the upper and lower members of the distributor-casing. In these cases, therefore, I mount upon the head of the screw-shaft a miter-gear 17<sup>a</sup>, meshing with a miter-pinion 18<sup>a</sup>, carried by a shaft 19<sup>a</sup>, journaled in the ends of the parallel bars 7<sup>a</sup>, and provided with a crank 20<sup>a</sup>. The relatively small size of the pinion 18<sup>a</sup>, together with the fact that the crank 20<sup>a</sup> may be of any length required, furnishes any necessary degree of power without any marked addition to or complication of the mechanism previously described for a like purpose.

The distributor-belt carried by the pulleys in the ends of the casings is provided, as already set forth, with spikes arranged at suitable intervals and standing erect upon the belt upon its upper portion. Communicating with the upper horizontal member of the casing is the vacuum-box, consisting of a chamber usually inclosed by a double inclined top, as already described, joining two opposite walls, through one of which enters the conveyer-pipe 22, while from the opposite wall opens the suction-pipe 25, communicating with the fan-blower 20. Below the points of

connection of these pipes the walls 26<sup>a</sup> of the vacuum-chamber converge to a floor-piece 27. Within the vacuum-box is arranged a diaphragm 21, of foraminous material, which is carried in some instances almost vertically through the center of the vacuum-chamber, its lower end being attached to the floor-piece at such a distance from the wall 26<sup>a</sup> as to permit an opening in the floor-piece equal in width to the width of the distributor-casing, whereby the cotton drawn through the conveyer-pipe shall be thrown forcibly against the wire screen 21, thereby expelling a large percentage of the dust contained in said cotton as well as the sand and other foreign matters, which are carried through the screen. In order to facilitate the separation of these impurities, one or more spiked revolving beaters 29 may be placed in the vacuum-box between the point where the cotton enters from the conveyer and the point where it passes from the vacuum-box to the distributor. The dust and lighter impurities passing through the screen and separated from the cotton by the disintegration and beating up of the cotton by the rapidly-revolving beaters will be drawn off and carried through the fan, and thence driven off through the chimney or flue 30, passing out of the gin-house, while more or less of the heavy foreign matter—such as the larger particles of sand and gravel—will pass through the screen and fall upon the floor of the vacuum-box upon the suction side thereof, whence it may be removed as it accumulates in any suitable manner. I may, however, modify the form and arrangement of the screen or diaphragm 21 by giving it such a curve that the cotton thrown against it by the suction-conveyer will impinge upon the screen at a small angle therewith—as, for example, in Fig. 21—the screen being curved upon such a radius that the cotton may shoot across the same, in contradistinction to the sudden arrest and impact of the cotton which takes place when the diaphragm is arranged as heretofore described—as, for example in Fig. 2. The beater 29 is driven by a belt from one of the shafts of the gin next the center of the distributor, the shaft of said beater being provided with a pulley 29<sup>a</sup>, Fig. 1, for such purpose. When the double beater 34 36 is used, one is driven in the manner described and the second beater is belted to the shaft of the first in any well-known manner.

As a modification of the construction shown in Fig. 2, wherein I use the single revolving beater, I may employ the form shown in Fig. 12, wherein the foraminous diaphragm is given a greater curvature and brought into approximate parallelism with a portion of the periphery of the beater 29, which receives the cotton upon its upper portion and carries it round over the curved screen or diaphragm. In the rear wall of the vacuum-box, through which the suction-blast is withdrawn through the fan 20, I may also arrange a perforated casing 33, by which the suction is more evenly

distributed throughout a considerable portion of the whole extent of the screen or foraminous diaphragm 21<sup>a</sup>, and in regulating the exhaust a valve 34 may be mounted at the mouth of the exhaust-pipe, Fig. 12. In some cases, however, I prefer to use the duplex or double beater shown in Fig. 13, whereby the entering cotton is drawn in through the conveyer, delivered to the first beater 34, by which it is carried around upon the substantially concentric diaphragm 35, and thrown to the second and similar beater 36, which performs, essentially, the same operation by rapidly beating up the cotton against a similar screen or diaphragm 37, which terminates in a chute 38, leading to an opening, which connects the entrance to the distributor below. This opening 39 is arranged over the central part of the distributor-casing. In this construction shown in said Fig. 13 the beaters revolve in opposite directions, but they may be arranged to turn in the same direction, if preferred.

In order to distribute the exhaust or suction over the surfaces of the diaphragms 35 and 37, I insert partitions 40 and 41 in the ends of the vacuum-box and provide them with valves 42, arranged at the upper and lower portions of said partitions, whereby the air-suction is exerted at points widely removed with relation to the peripheral surfaces of the diaphragms within which the beaters have rotation. These valves are operated from the exterior of the vacuum-box by levers 43.

In order to effect the most complete separation possible between the cotton and its various impurities, some of which may be of various size while others are more or less finely divided, all, however, being of such specific gravity that it is doubtful whether the suction can draw them through the screen or screens in the vacuum-box, I provide the following means: In the conveyer-pipe 22 at one or more suitable points I form the lower wall of the same (which is ordinarily rectangular) of a screen or diaphragm 44, having formed therein a series of openings 45 of any suitable shape and relative arrangement, as shown in Figs. 15 and 16, in which the openings are shown as being formed longitudinally. Beneath the diaphragm is a chest or chamber 46, divided into compartments by walls 47 and provided with doors 47<sup>a</sup>, either formed on the ends or on the bottoms of said chambers, as seen in Fig. 15. The openings 45 may be of any form preferred, either elongated, as in Fig. 15, or round, as in Fig. 18, of any other shape. As the cotton is drawn through the conveyer heavy substances—such as nails, gravel, and other heavy material—will drop through these openings into the compartments of the chest, and may be removed through the chest-doors 47. The openings 45 are preferably arranged to alternate or break joints in order to present every possible location of said openings within the space afforded. I may also form in the conveyer-pipe, at one or

more points, an interceptor 48, arranged at a point where the pipe is curved, as shown in Figs. 26 and 27. The longer wall of the curve may be formed of two flexible or elastic strips 49, one overlapping the other, as in Fig. 26, whereby any heavy material pressed by the centrifugal force of the traveling cotton against said strips may disengage itself and drop by its own weight into the chest 50 inclosing said curve, or I may employ a diaphragm 51 of netted or other similar material, as in Fig. 27. Another valuable aid in this separation is effected by the construction of the distributor, the curved end thereof being formed of a screen or any suitable foraminous material which is inclosed by a chest or chamber 52, having a slide 53 in the bottom. The centrifugal force imparted to the cotton in passing around the end of the distributor under the impulse of the belt throws a certain percentage of the sand or other finely-divided and heavy impurities through the screen into the box or chamber 52, whence they are removed by way of the slide 53. By employing these several means of separation at the several points named I am able to effect a cleansing of the cotton which is so thorough that its appearance and quality are both greatly improved.

In the construction of the gin-hoppers 54 I may hinge one wall thereof, as seen in Fig. 23, whereby it may be swung inward or outward its adjustment being effected by a small bracket 56, with which engages a turn-button 57, pivoted upon the rigid wall of the hopper. By this device the bats delivered by the gin may be varied in thickness. I may also contract the longitudinal walls of the hopper from the ends toward the center, as shown in Fig. 25, thus checking the tendency of the cotton to thicken up at that point.

In connecting the telescoping drop-pipe 22<sup>a</sup> to the conveyer I make the flexible joint 58 in the manner shown in Figs. 1 and 2. In this construction the joint is formed of any suitable flexible or elastic material, such as rubber, leather, cloth, or other substance. The joint is formed, practically, of two parts, one being that portion connected to the upper end of the drop-pipe, from which point it expands or increases in diameter and is connected to a ring 60 of rigid material, said ring having a diameter considerably in excess of the diameter of the drop-pipe. The other portion of the joint is of substantially similar form and expands from the end of the branch conveyer which enters the main conveyer until it is of the diameter of the ring 60, to which it is connected. The purpose of this construction is to enable the drop-pipe to swing in any direction without contracting the passage through the flexible joint. In the construction shown in the patent granted me December 2, 1884, No. 308,790, the deflection of the drop-pipe is very apt to crowd the flexible material of the joint inward upon one side, and thereby cause such a narrowing of

the passage as to choke the cotton. By the construction shown and described in this specification such a result cannot be produced and the objection is entirely removed.

5 What I claim is—

1. In an apparatus for conveying, cleaning, and distributing seed-cotton to a gin or a series of gins, the combination, with a distributor-casing, of an endless spiked belt provided with transverse valve-strips closely fitting said casing, pulleys arranged in the ends of said casing to carry the belt, and a vacuum-box having its lower open end seated upon or discharging into the distributor-casing, substantially as described.

2. In a distributor for feeding seed-cotton to one or more gins, the combination, with a casing mounted upon and communicating with each gin-feeder, of an endless spiked belt provided with a series of transverse valve-strips arranged at suitable intervals and substantially fitting the casing, and a vacuum-box discharging its contents upon the distributor-belt, substantially as described.

3. In a distributor for feeding one or more cotton-gins, the combination, with a casing, of an endless spiked belt, a vacuum-box seated upon or communicating with said casing, and valve strips or plates within the distributor-casing to maintain the suction, substantially as described.

4. In a distributor for feeding one or more cotton-gins, the combination, with a casing having communication with each gin-feeder, of an endless spiked belt traveling in said casing and a vacuum-box seated upon or communicating with the distributor-casing, the distributor-belt being provided with flexible or elastic valve strips or plates arranged at suitable intervals, substantially as described.

5. In an apparatus for ginning cotton, the combination, with a distributor arranged above and communicating with one or a series of gins, of an endless spiked belt moving in said casing, a vacuum-box seated upon or discharging into the distributor, and flexible or elastic valve strips or plates carried by the spiked belt and having support upon or against the spikes at suitable intervals, substantially as described.

6. In an apparatus for conveying, cleansing, and distributing seed-cotton to one or a series of gins, the combination, with a conveyor and with a vacuum-box having a wall formed wholly or in part of foraminous material, of one or more beaters arranged within the vacuum-box and having a constant rotation, a distributor having a casing resting upon and communicating with each gin, an endless spiked belt traveling in said casing and receiving the cotton from said beater or beaters, and flexible or elastic valve-strips carried by said belt and cutting off the inward air-current on both sides of the opening communicating with the distributor, substantially as described.

7. In an apparatus for ginning cotton, the

combination, with one or more gins, of a distributor-casing having a spiked belt running therein and provided with flexible or elastic valve-strips and a vacuum-box having direct communication with the distributor-casing, the cover thereof on one side of the vacuum-box being formed in two parts hinged together, one of said parts being short and inclined with its end resting against the vacuum-box or other support and the other part being substantially horizontal and extended toward the end of the distributor-casing and loosely connected thereto, substantially as described.

8. In an apparatus for ginning cotton, the combination, with one or more gins, of a distributor-casing having an endless spiked belt traveling therein, said casing having one end formed of a curved foraminous or netted material, and a vacuum-box communicating with and delivering the cotton to said distributor-belt, substantially as described.

9. In an apparatus for conveying, cleansing, and feeding seed-cotton to one or more gins, the combination, with a pneumatic conveyor and with a vacuum-box having a foraminous screen, of a closed casing having communication with the vacuum-box, a spiked distributor-belt arranged in the closed casing and having a series of flexible elastic valve-strips mounted on the belt, and a fan maintaining a suction in the vacuum-box, the said closed casing having a section of its cover hinged to a movable portion of said cover to yield either separately or in conjunction with the movable portion to unusual accumulations of cotton upon the distributor-belt, substantially as described.

10. In an apparatus for distributing and feeding cotton to one or more gins, the combination, with a spiked distributor-belt, of an inclosing casing having a portion of its cover longitudinally movable and provided with an inclined section hinged at one end to the main portion and resting at its other end against the device feeding the cotton to the distributor, the sides of the casing being provided with angular blocks upon which the hinged connection between the two-part cover rises and falls, substantially as described.

11. In an apparatus for cleaning and conveying seed-cotton, a distributor-casing having a continuously-traveling spiked belt, one end of said casing being constructed of foraminous material, and a belt-carrying pulley concentric with the end of the distributor, substantially as described.

12. In an apparatus for cleansing, conveying, and feeding seed-cotton to a gin or a series of gins, the combination, with a vacuum-box provided with duplex foraminous diaphragms, of a distributor with which said vacuum-box has direct communication and duplex spiked beaters revolving in opposite directions in the foraminous diaphragms in said vacuum-box and acting upon the cotton successively to loosen up the same and de-

liver it to the distributor; substantially as described.

13. In an apparatus for cleansing, conveying, and distributing seed-cotton to one or  
5 more gins, the combination, with the conveyer-pipe, of the flexible or elastic joint to enable one part of said tube to be moved to gather up the cotton, said joint having sub-

stantially the form of a frustum of a cone, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

ROBERT S. MUNGER.

Witnesses:

THOS. HARDEMAN,  
D. C. BUCKSHAW.

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