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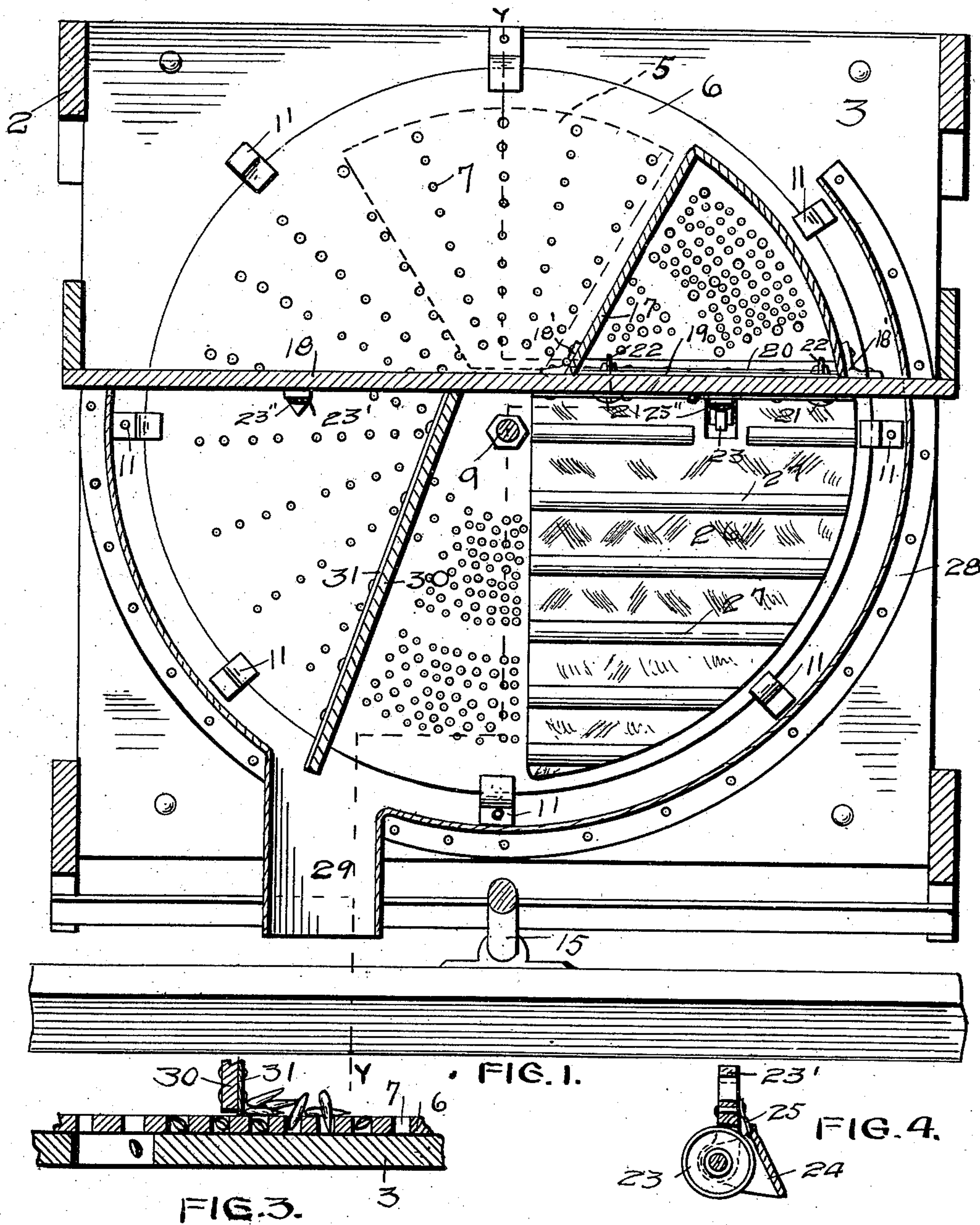
Patented Jan. 28, 1902.

C. H. SCOTT.
SEPARATOR.

(Application filed Nov. 13, 1899. Renewed June 22, 1901.)

(No Model.)

3 Sheets—Sheet I.



WITNESSES
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BY *Paul H. Hawley*
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No. 691,876.

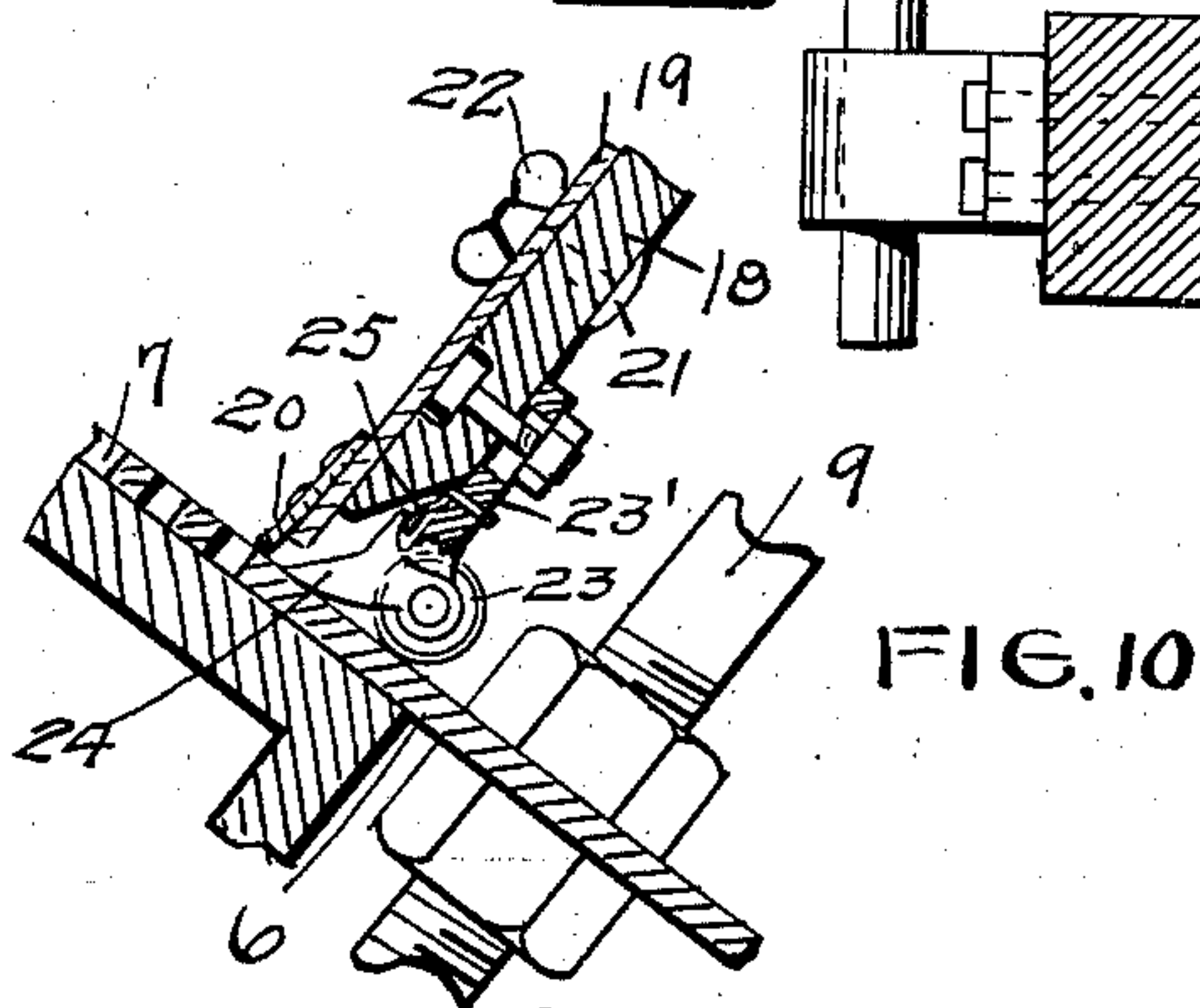
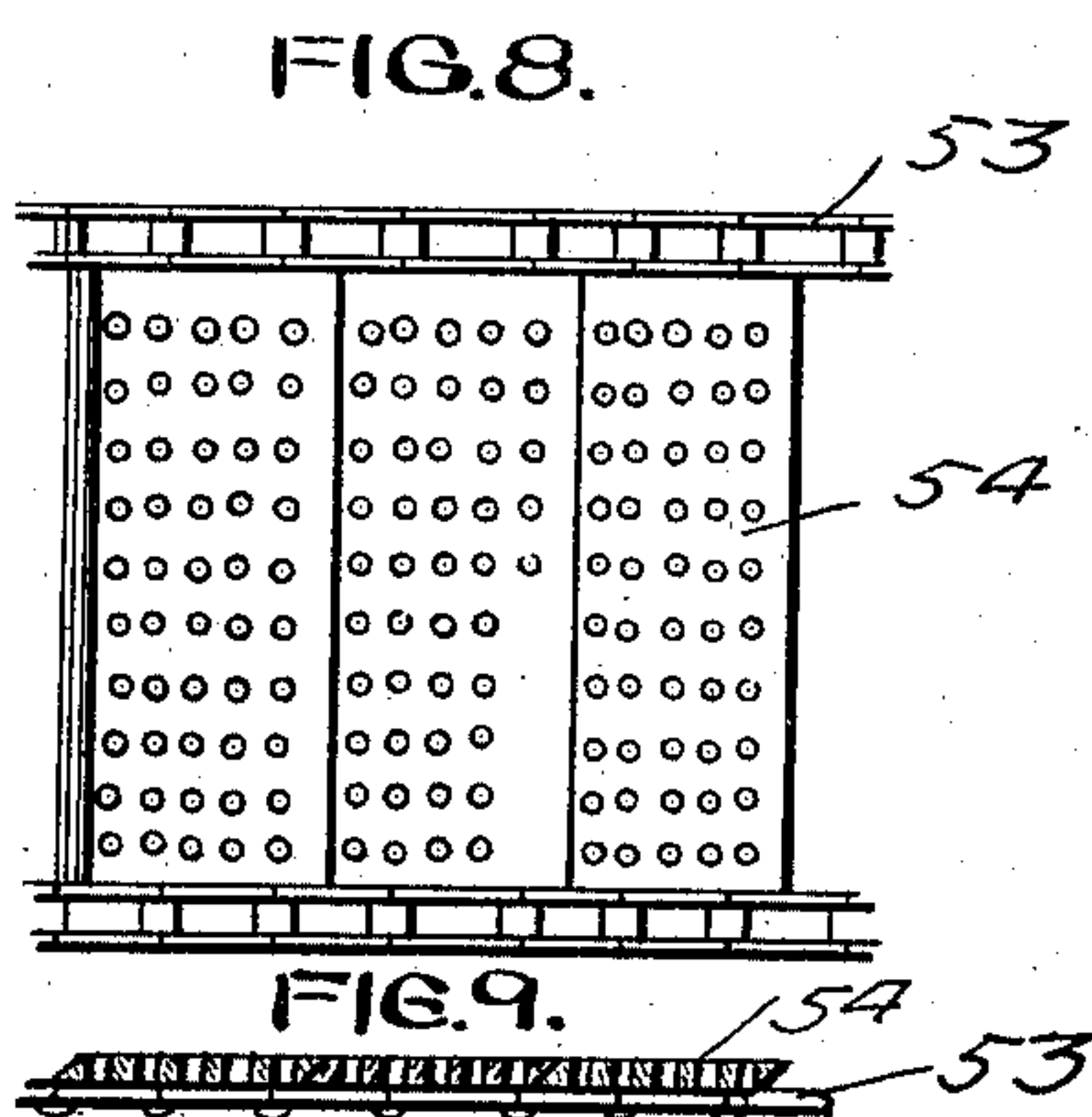
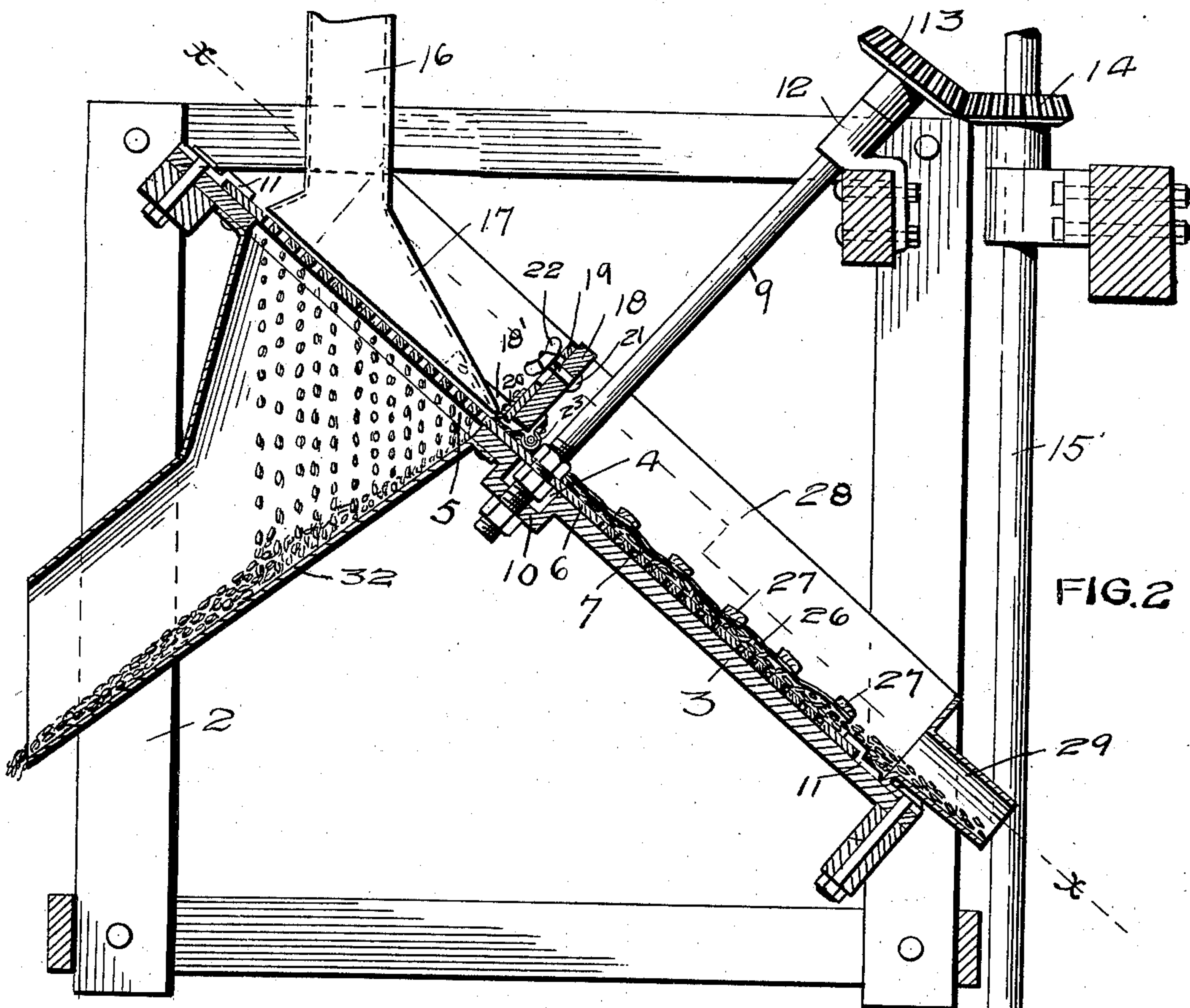
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3 Sheets—Sheet 2.



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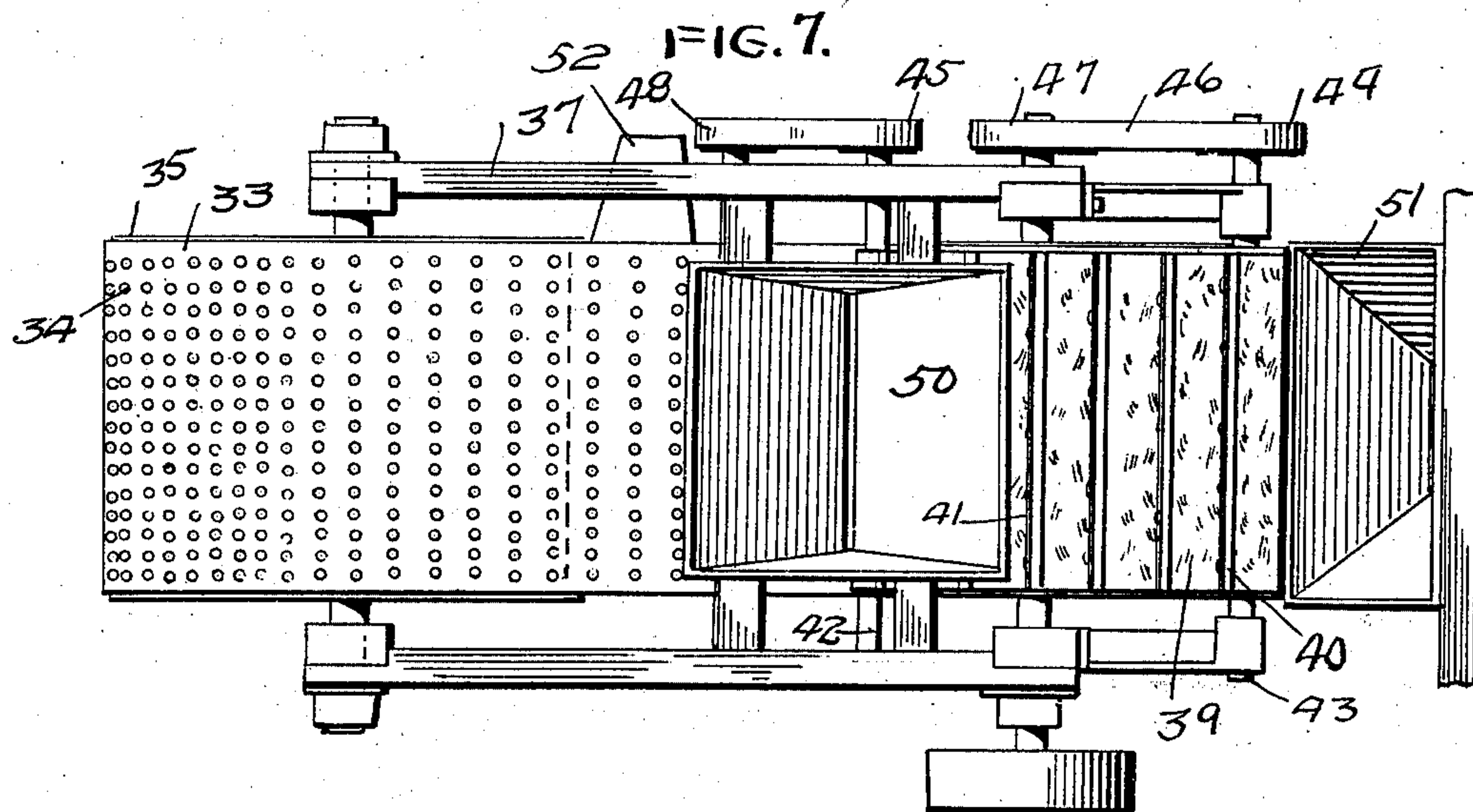
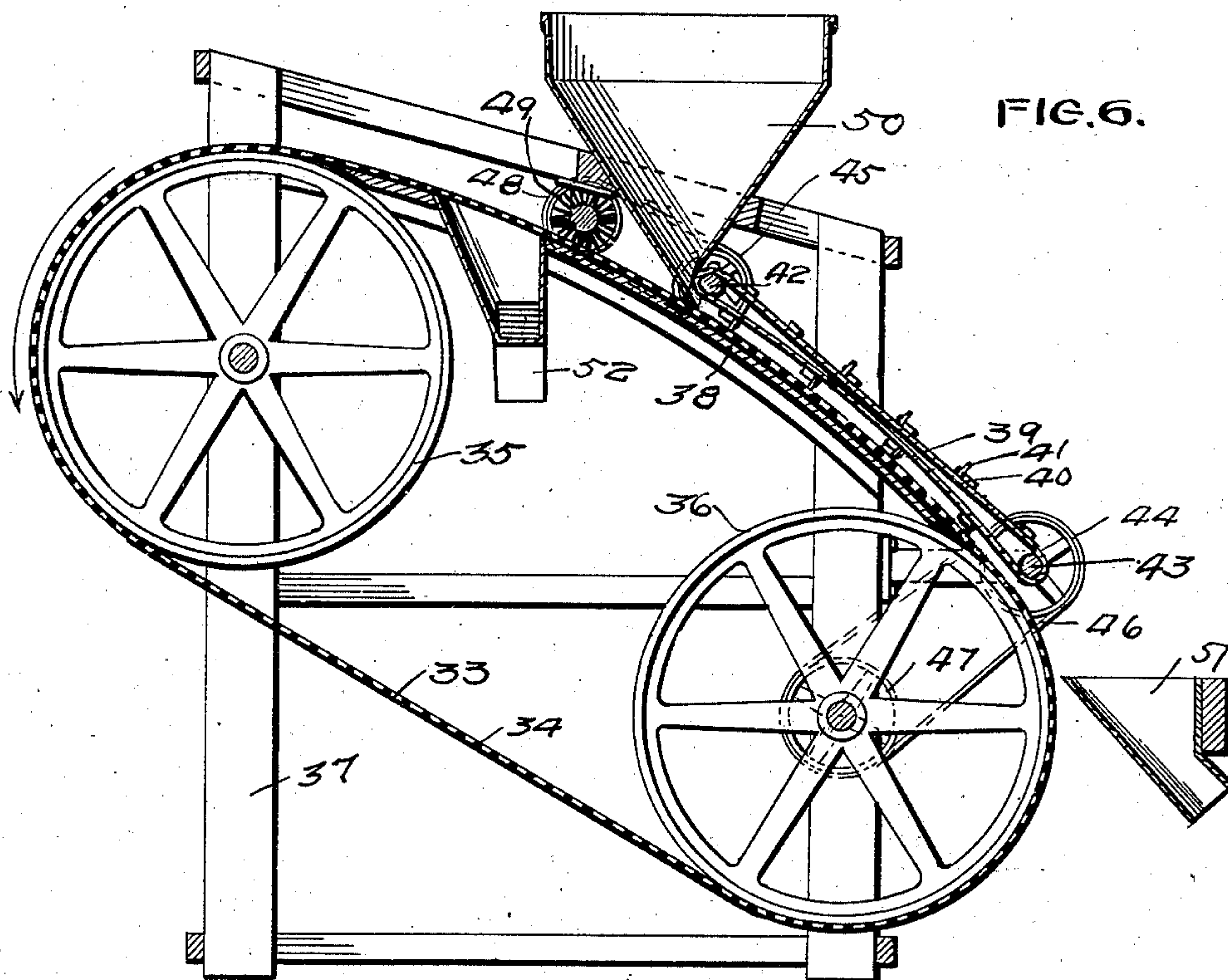
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(Application filed Nov. 13, 1899. Renewed June 22, 1901.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

CHARLES H. SCOTT, OF MINNEAPOLIS, MINNESOTA.

SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 691,876, dated January 28, 1902.

Application filed November 13, 1899. Renewed June 22, 1901. Serial No. 65,572. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. SCOTT, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Separators, of which the following is a specification.

The invention relates to devices for separating coarse from fine material wherein advantage is taken of the difference in size or shape between the large and small particles; and the machine is therefore adapted for separating grain and particularly the mixture of wheat and oats known as "succotash."

Machines used for separating wheat from oats or barley where a series of shaking-sieves are employed are generally small and operated by hand, it being found impracticable to increase their size and capacity and operate them by power, and in most of the succotash-separators in use it is necessary to pass the material through the machine several times before a fairly good separation can be made.

The primary object, therefore, of my invention is to provide a machine adapted for use as a succotash-separator which will have great capacity and being driven by power can be made of any desired size.

A further object is to provide an apparatus which will effect a thorough separation with one passage of the material through the machine.

The invention consists generally in providing a separator having a fixed inflexible backing plate or base and a perforated member revolvably movable over said base.

Further, the invention consists in providing a separator with a fixed inflexible backing plate or base arranged at an incline and having a discharge hole or opening in its upside and a perforated plate or disk resting upon and movable over said base.

Further, the invention consists in improved means for feeding the material to be separated upon the moving part.

Further, the invention consists in means for retarding the material as it falls upon the moving part to prevent its too-rapid descent over the same.

Further, the invention consists in improved means for keeping the material flat upon the surface of the disk to prevent the

larger particles from getting into the perforations.

Further, the invention consists in means for directing the larger coarser material to a suitable outlet.

Further, the invention consists in improved means for holding the disk down upon its stationary base.

Further, the invention consists in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a sectional view on the line *x x* of Fig. 2. Fig. 2 is a sectional view of a complete machine on the line *y y* of Fig. 1. Fig. 3 is a detail section showing the method of separating wheat from oats. Figs. 4 and 5 are details of the pressure devices for holding the disk down upon its base or backing. Fig. 6 is a vertical section of a separator of modified construction. Fig. 7 is a plan view of the same. Figs. 8 and 9 are details of a modified form of belt from that shown in Figs. 6 and 7. Fig. 10 is a detail of the feed-scraper and pressure devices.

In the drawings, Figs. 1 and 2, 2 represents a frame, generally square, as shown, of wood or any suitable material and of any preferred size, according to the size or number of disks that are being employed. 3 represents a stationary base or backing, preferably of metal, secured to the frame of the machine by bolts or in any suitable way and arranged at an angle or incline, preferably of about forty-five degrees, having a central hole 4 and in or near its upper side a hole or opening 5, preferably in the form of a segment of a circle, and resting upon said base and concentric therewith is a disk 6, preferably of steel, provided with a series of perforations 7 and having a central opening 8 to receive a shaft 9, that is secured rigidly to said disk by lock-nuts upon each side of the same, and extending through the hole in the base is supported in the box 10, on the under side thereof. The disk 6 rests upon the smooth surface of the base 3, forming a close joint therewith, and is held in position thereon by a series of clamps 11, provided on said base at the edges of the disk, which, while holding the disk se-

curely in position, permit it to revolve freely over the surface of the base. The shaft 9 at its outer end is supported in a suitable bearing 12 and is provided with a beveled gear-wheel 13, meshing with a similar wheel 14 on an upright shaft 15, driven from a suitable source of power and whereby the disk is revolved at such a speed as may be found best suited to effect the desired separation of the material. As before stated, this machine may be adapted for separating various kinds of material, particularly grain, and I have shown the apparatus as adapted for the separation of wheat from oats, the mixture being called "succotash," in which case I have taken advantage of the difference in length between the kernels of wheat and oats and have therefore formed the perforations 7 in the disk 6 so that when the disk is placed over the stationary base little round pockets or recesses are formed which are quite capable of receiving a kernel of wheat, but are not of sufficient width to permit an oat-grain to drop into the same unless it is tipped up on end. Therefore when a quantity of material, such as succotash, is dropped upon the revolving disk the kernels of wheat working to the bottom of the body of material and spreading over the surface of the disk as it revolves will drop into the pockets therein and be carried around to the desired discharging-point, while the oat-grains, being too large to drop into the pockets, will slide or roll or be brushed off into the discharge-spout provided to receive them. I have found that the best results are obtained by feeding or delivering the material upon the upper down quarter of the disk, and I therefore provide a spout 16, having a spreading triangular lower portion 17, that is adapted to cover a segment of the disk, and extending down to a point near the surface of the same permits the operator to deposit a considerable body of the material directly upon the disk, and the material being constantly agitated by the movement of the disk most of the pockets will be filled while the disk is passing under the hopper. The rest of the grain, aided by gravity and the movement of the disk, will slide forward from beneath the hopper; but it is desirable to provide means to prevent its too-rapid descent over the disk. I provide, therefore, across the upper side of the base a bar 18, to which the lower edge of the hopper 17 is secured by brackets 18', said bar being provided on its upper side with a slotted plate 19, to which is secured, near the lower side of the hopper, a flexible strip 20, of rubber or other suitable material, forming a scraper that is adapted to bear upon the disk and retard the descent of the grain and also cause it to spread out over the face of the disk, and thus aid in filling the pockets that were not filled in the hopper. The plate 19 is secured to the bar 18 by bolts 21, passing through the slots in said plate, said bolts having thumb-nuts 22, by means of which the operator may raise or

lower said plate and regulate the pressure of the scraper on the disk and the flow of the grain.

As shown in Fig. 1, the bar 18 extends entirely across the disk, having its ends secured to the frame of the machine in any suitable way, and upon each side of said disk, at a point substantially midway between the circumference and the center, I prefer to arrange wheels 23, having slotted shanks 23' to receive bolts 23'', and whereby said wheels are adjustably supported on said bar. These wheels bear upon and travel over an imperforate annular section of the disk and act as pressure or bearing rolls to hold the same down upon the plate or base. To prevent the grain from being crushed by the wheels as it slides down over the disk, I provide shoes 24, carried by said bearing-wheels and held in yielding contact with the face of the disk by springs 25, and engaging the stream of grain prevent any kernels from passing under the wheels. The bearing-wheels serve to prevent any particles of material from getting in between the disk and plate; but should a kernel of grain accidentally work therein it would be crushed by the pressure of the wheels upon the disk. To hold the oats flat upon the disk after the material has passed under the flexible scraper, I prefer to provide an apron 26, of canvas or other suitable material, secured at one side to the bar 18 and extending down over the lower quarter of the down side of the disk and held down upon its surface and prevented from rolling up by the weight of a series of slats 27. This apron besides retarding the flow of the grain and aiding the kernels of wheat to drop into the pockets in the disk will also prevent the oat-kernels from tipping up on end and dropping into the pockets. Upon the lower side of the base I arrange a semicircular guard or casing 28, having opposite the lower up side of the disk a discharge opening or spout 29, and opposite said discharge-opening I arrange a bar 30, secured at its inner end to the bar 18 and extending over said disk in the direction of the discharge-opening and provided on one side with a flexible scraper 31, which bears upon the surface of the disk and deflects any oat-grains that may collect thereon or may be tipped up on end and resting in the pockets toward the discharge-opening. The purpose of this scraper is shown quite clearly in Fig. 3, wherein it is shown collecting the oat-grains and scraping them out of the pockets to prevent their passing up to the wheat discharge-opening. A quantity of succotash being placed in the hopper and the disk started, the grain will pass out from beneath the hopper, spreading over the surface of the disk, the wheat-kernels falling into the pockets and passing down beneath the feed-scraper, and so on down under the apron, the oats being held flatwise by it, and any wheat that has passed under the scraper will be caught by the pockets as it passes under the apron un-

til the lower up side of the disk is reached, where the oats will be deflected into the oat discharge-spout, and the wheat resting in the pockets will be carried around to the opening 5 in the base and thence discharged into the wheat-hopper 32.

In Figs. 6 and 7 I have shown a modified form of separator which consists in providing a steel belt 33, having a series of perforations 10 34 and adapted to travel over the smooth-face pulleys 35 and 36, that are mounted at the top and bottom, respectively, of the frame 37. These pulleys are driven by a suitable power, and in the upper part of the frame 37 I arrange a plate 38, having, preferably, a 15 curved upper surface over which the upper portion of the belt slides. I also provide a canvas belt 39, having a series of slats 40, provided with flexible strips 41, that are adapted to scrape over the surface of the belt 33, 20 said belt 39 passing around shafts 42 and 43, whereon are secured pulleys 44 and 45, said pulley 44 being driven by a belt 46 from a pulley 47 on the shaft of the pulley 36. A belt 48 on the pulley 45 drives a brush 49. The belt 39 and the brush 49 are driven in a direction opposite to that of the belt 33, so that 25 when the grain is discharged from the hopper 50 it will be engaged by the flexible strips 41 and dragged down over the perforated belt, the kernels of wheat dropping into the pockets, while the oats will be swept down over the same and discharged at the lower end of the belt 39 into the hopper 51, and the 30 wheat will be carried by the belt 33 up over the curved plate 38 to the wheat discharge-spout 52. Should any kernels of oats pass under the hopper or drop endwise into the pockets and be carried up with the wheat, the same will be engaged and scraped out by the 35 brush 49 and thrown back under the feed-hopper and prevented from mingling with the wheat in the wheat-hopper. The construction of this machine, it will be noted, is similar to the one having the revolving disk 45 in that in both I have taken advantage of the difference in length between the wheat and oat kernels to effect a separation, and while I may prefer to use the form of machine 50 shown in Figs. 1 and 2 I may find the modified construction preferable for the separation of certain kinds of material or in places where the disk form of machine cannot readily be used.

In Figs. 8 and 9 I have shown still another modification, which consists in employing sprocket-wheels in place of the smooth-faced pulleys 36 and providing belts 53 to pass over the same and connecting a series of plates 54 60 thereto, said plates having beveled edges to permit each plate to lap over the edge of the adjoining plate and form a comparatively close joint therewith. These plates are provided with a series of perforations, heretofore 65 described, and slide over a plate corresponding to the plate 39.

In other respects the construction and op-

eration of the machine embodying the modification shown in Figs. 8 and 9 would be substantially the same as heretofore described 70 with reference to Fig. 6.

I am aware that revolving perforated disks have been devised heretofore in connection with other devices for separating wheat from oats, but not in connection with a fixed back- 75 ing-plate or base of the same or greater diameter upon which the perforated plate bears and over whose surface it is revolved. In the machine which I have herein illustrated and described I have shown but a single disk; 80 but it will be understood that I may arrange several disks upon a single shaft, and thus increase the capacity of the machine without materially increasing its bulk.

While I have described the machine as a 85 separator for wheat and oats, it will be understood that it is equally adapted for the separation of other grains as well, the size of the holes in the disk and its thickness being modified according to the character of the ma- 90 terial to be separated. For instance, if it is desired to separate cockle from wheat I provide a disk of less thickness than for the separation of wheat and oats and make the holes considerably smaller to permit the cockle- 95 seed to fall into them, but not large enough to receive a grain of wheat when lying flat. It will also be understood that the plate and the revolving disk thereon may be arranged horizontally instead of at an incline and that 100 various means may be employed for driving the disk in place of the shaft, and other means may be employed for holding the disk down upon its base or backing-plate in place of the clamps which I have described, and I do not 105 wish to be confined to the use of the particular form of pressure-wheel shown herein, and in various other ways the details of construction may be modified without departing from my invention. 110

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

1. A separator, comprising a stationary inflexible plate or member, a movable member 115 rotating on said inflexible member and having a close sliding contact or joint therewith, said movable member being provided with a series of perforations forming with said inflexible member a series of pockets wherein 120 the fine material falls and is carried over said fixed member and a separation of the fine and coarse material effected, substantially as described.

2. A separator, comprising a stationary in- 125 flexible member having a discharge-opening, a revolving member operating upon said inflexible member and forming a close joint therewith, said revolving member being provided with a series of perforations forming 130 with said fixed member a series of pockets wherein the fine material is caught and carried over said stationary member to the discharge-opening therein, while the coarse material

slides over said pockets and is discharged over the edge of said revolving member, substantially as described.

3. A grain-separator, comprising an inclined stationary member of inflexible material, provided with a discharge-opening in its up side, a movable member also inclined and resting upon and operating over said stationary member and forming a close joint therewith, said movable member being provided with a series of perforations forming with said stationary member a series of pockets adapted to receive the short grains deposited upon said movable member and carry them over said stationary member to said discharge-opening, while the longer grains, when lying flat, being too long to enter said pockets will slide over the down side of said movable member, substantially as described.

4. A separator, comprising a frame, a fixed inflexible plate or backing mounted therein and having an inclined surface provided with a hole or opening in its up side, a perforated disk resting upon said plate, the perforations and said fixed plate forming a series of pockets, means for revolving said disk over said fixed plate, a feed-hopper provided on one side of said disk, a discharge-spout at the lower side of said disk to receive the coarse material and a second discharge-spout provided beneath the opening in said plate to receive the fine material from said pockets, substantially as described.

5. In a machine of the class described, the combination, with a frame, of a fixed inflexible plate mounted therein said plate being inclined and having a central shaft-opening and a larger opening near its circumference but otherwise imperforate, a perforated disk concentric with said plate, a shaft whereon said disk is mounted, means for driving said shaft, said disk resting upon and its perforations forming with said plate a series of pockets wherein the fine material falls and is carried around to said larger opening while the coarser material slides down over said disk to its discharge-opening, substantially as described.

6. In a machine of the class described, the combination, with a fixed inflexible backing-plate or base, arranged at an incline and having a hole or opening in its up side, of a disk provided with a series of perforations resting upon said fixed plate, means for revolving said disk, a feed-hopper provided on the down side of said disk, a scraper provided near said hopper to retard the material falling upon said disk, a discharge-spout for the coarse material provided on the lower side of said disk, and a second discharge-spout beneath the opening in said plate, substantially as described.

7. In a machine of the class described, the combination, with a fixed inflexible plate or base arranged at an incline and having an opening in its up side through which the wheat is discharged, of a disk provided with a series of perforations resting upon said plate, a

shaft whereon said disk is mounted, means for revolving said shaft, means for holding said disk in contact with the surface of said plate while permitting it to revolve freely over the same, said plate and the perforations in said disk forming a series of pockets of sufficient size to receive a grain of wheat but too small to allow an oat-grain to fall therein when lying flat, a feed-hopper provided on the down side of said disk and an oat-discharge opening provided near the lower side of said disk, substantially as described.

8. In a machine of the class described, the combination, with an inflexible base and a revolving perforated disk resting thereon, of a feed-hopper and a flexible feed-retarding device provided near said hopper, substantially as described.

9. In a machine of the class described, the combination, with an inflexible base and a perforated revolving disk arranged upon the same, of means for holding the edges of said disk down upon said plate, and adjustable pressure devices provided at intervals on the surface of said disk, for the purpose specified.

10. In a machine of the class described, the combination, with a fixed inclined plate or backing, and a revolving perforated disk resting upon the same, of clamps or guides provided at the edges of said disk, pressure-rolls provided on the surface of said disk and yielding shoes carried by said pressure-rolls and bearing upon said disk, for the purpose specified.

11. In a machine of the class described, the combination, with a fixed inclined plate and a perforated disk resting thereon, means for revolving said disk, said plate and the perforations in said disk forming pockets, a feed-hopper arranged on the down side of said disk, an adjustable scraper device and an apron provided on the down side of said disk below said scraper device, for the purpose specified.

12. In a machine of the class described, the combination, with an inclined inflexible plate or backing having a discharge-opening in its up side, of a perforated disk resting upon said plate, the perforations and said inclined plate forming a series of pockets to receive the wheat-kernels, means for revolving said disk, means for holding the same in engagement with said plate, a guard or casing provided on the lower side of said plate, a feed-hopper, a discharge-opening for the oat-grains provided in said guard, and a deflector resting upon said disk to guide the oat-grains to their discharge-opening while the wheat-grains are carried in said pockets to the upper side of said plate and discharged through the opening therein, substantially as described.

13. In a machine of the class described, the combination, with a fixed inflexible plate or backing arranged on an incline and having a discharge-opening in its up side, of a perforated disk also inclined and resting upon said plate, the perforations and said plate forming

a series of pockets to receive the small grains, means for revolving said disk, a feed-hopper through which the material to be separated is fed upon said disk, the small grains falling into said pockets to be carried around to said discharge-opening, and the large grains sliding down over said disk to a discharge-opening at the lower side thereof, substantially as described.

14. In a machine of the class described, the combination with an inflexible plate or backing having a discharge-opening, of a perforated disk resting upon said plate, the perforations and said plate forming a series of pockets to receive the short kernels of grain, such as wheat, means for revolving said disk, a feed-hopper through which the grain to be separated is deposited upon said disk, means for retarding and holding the grain flat thereon as it leaves said hopper, the long kernels, such as oats, being discharged over one side of said disk, while the short kernels are carried around in said pockets to said discharge-opening, substantially as described.

15. In a grain-separator, the combination, with a stationary inflexible plate or member arranged at an incline and having a discharge-opening, of a movable plate or member operating upon said stationary member and forming a close joint therewith, a feed-retarding device thereon, said movable member being provided with a series of perforations forming pockets adapted to receive the short kernels of grain, such as wheat, and carry them over said stationary member and discharge them through the opening therein, and said pockets being too small to receive the longer kernels of grain, such as oats, when lying flat, whereby they will slide over said pockets and be

discharged on the down side of said movable member, substantially as described.

16. In a machine of the class described, the combination, with a stationary inflexible plate arranged at an incline and having a flat uniform surface and provided with a radial opening in its up side, of a revolving disk resting upon said plate and forming a close grain and dirt tight joint therewith, said disk being provided with a series of perforations forming with said plate a series of pockets adapted to receive the short kernels of grain, such as wheat, but too small to receive the longer kernels, such as oats, when lying flat, whereby when mixed grains of different sizes are deposited upon the down side of said revolving disk the short kernels will fall into said pockets and be carried therein around to the discharge-opening in said stationary plate and the long kernels will slide over said pockets to a discharge therefor near the lower side of said disk, substantially as described.

17. In a machine of the class described, the combination, with a stationary inflexible backing-plate or base arranged at an incline, of a revolving disk supported on said base and having a series of perforations to receive the shorter kernels of grain, a feed-hopper and means provided near said hopper and adapted to bear upon said disk and retard the grain and hold the longer kernels flat thereon, for the purpose specified.

In witness whereof I have hereunto set my hand this 8th day of November, 1899.

CHARLES H. SCOTT.

In presence of—

RICHARD PAUL,
M. C. NOONAN.