

No. 672,068.

Patented Apr. 16, 1901.

W. A. POLLOCK.
DELINTING AND HULLING MACHINE.

(Application filed Feb. 27, 1900.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

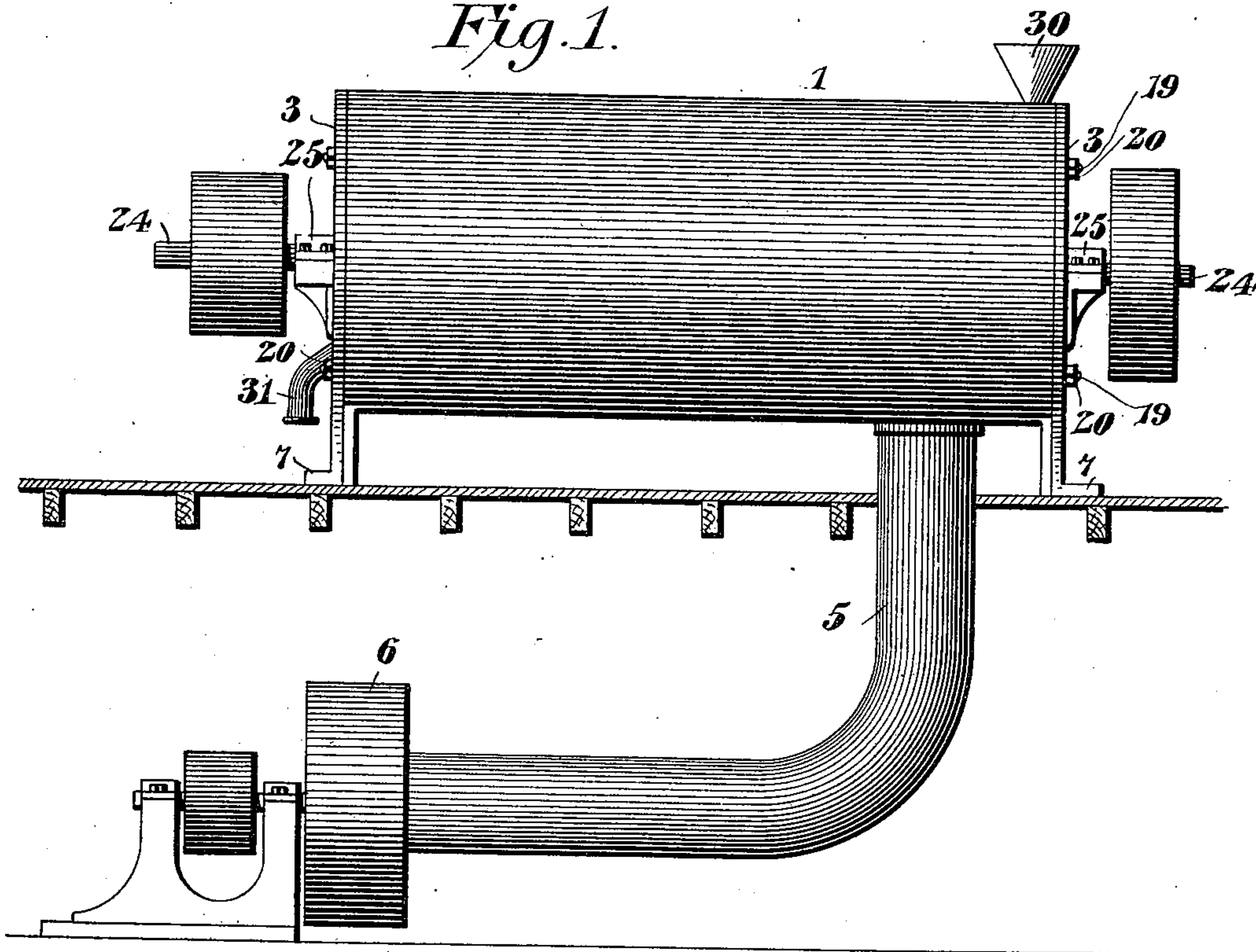


Fig. 6.

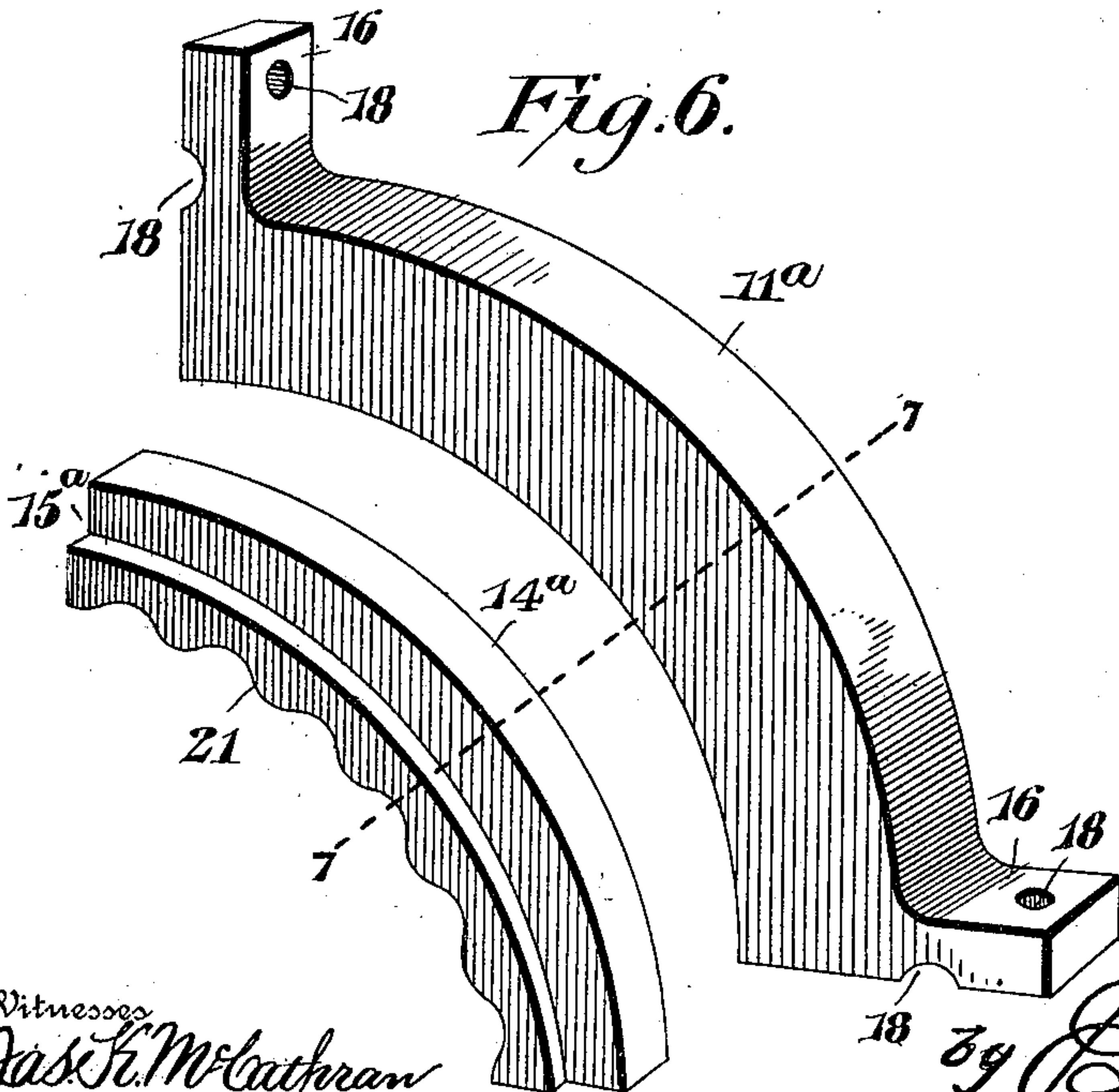
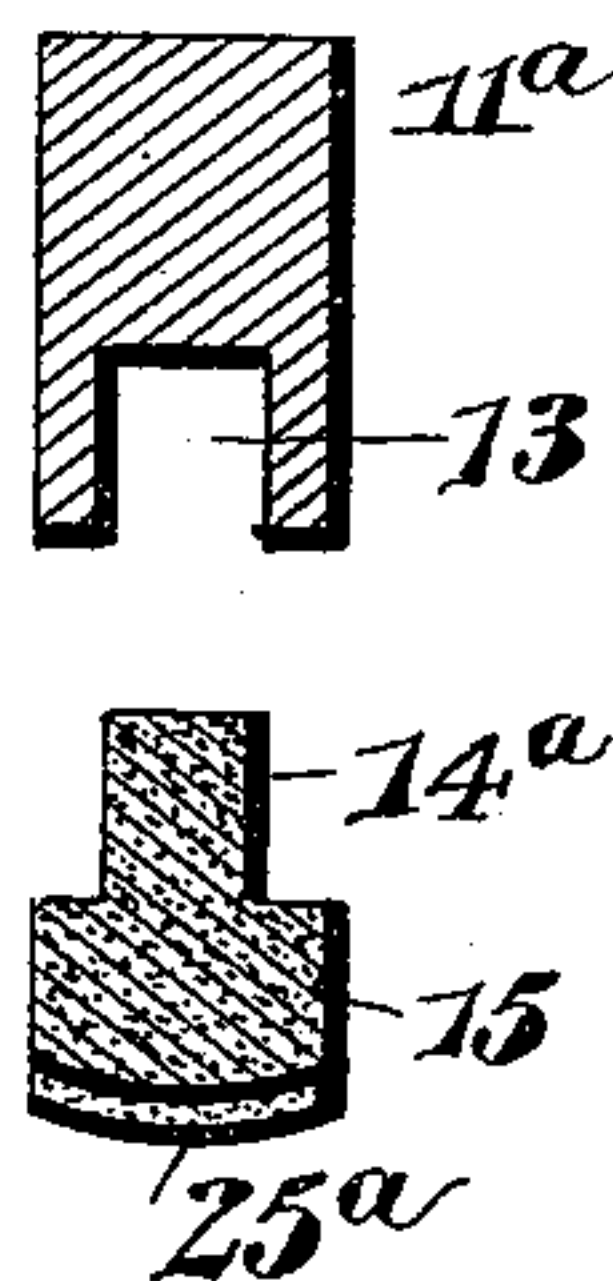


Fig. 7.



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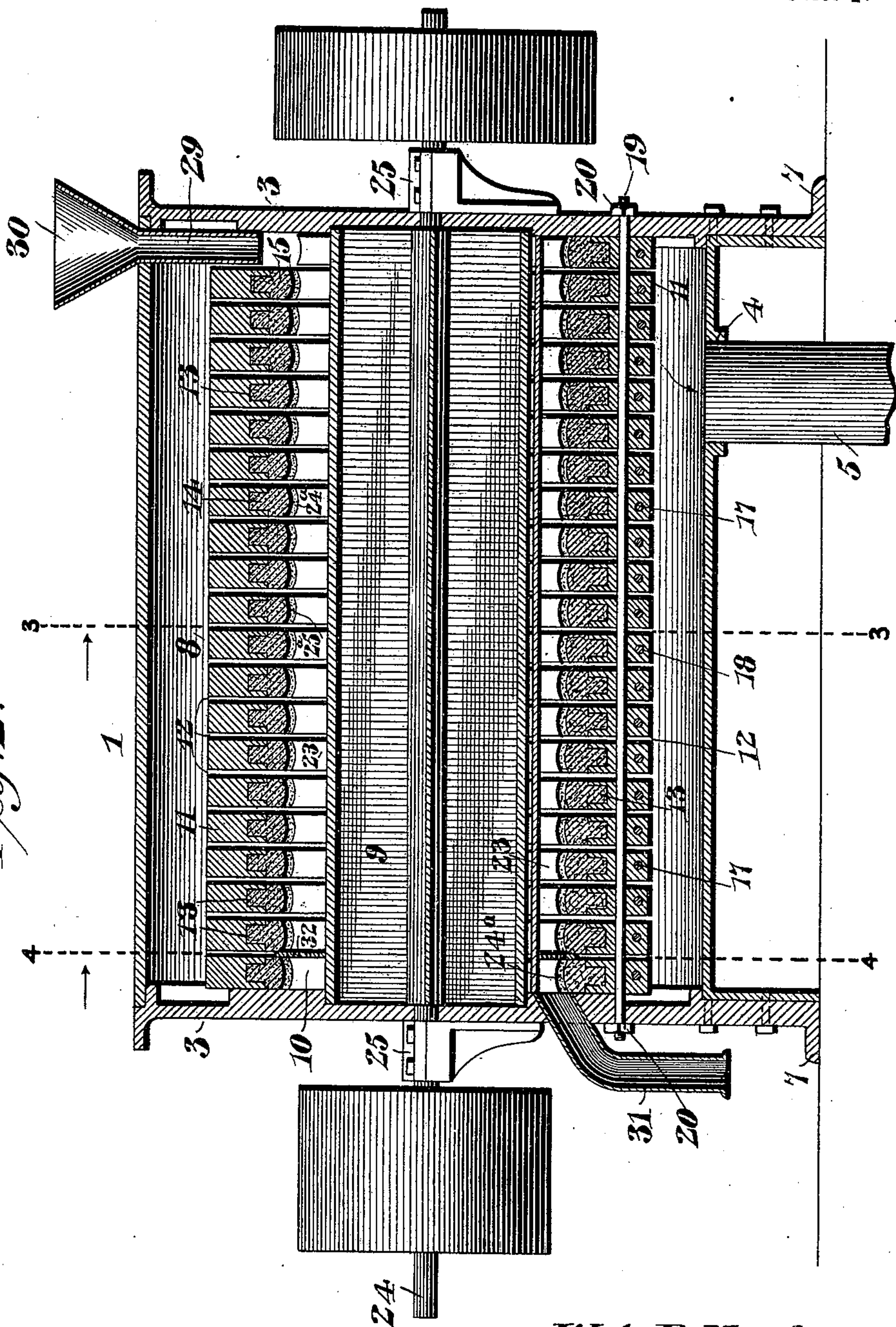
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4 Sheets- Sheet 2.

Fig. 2.



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Fig. 4.

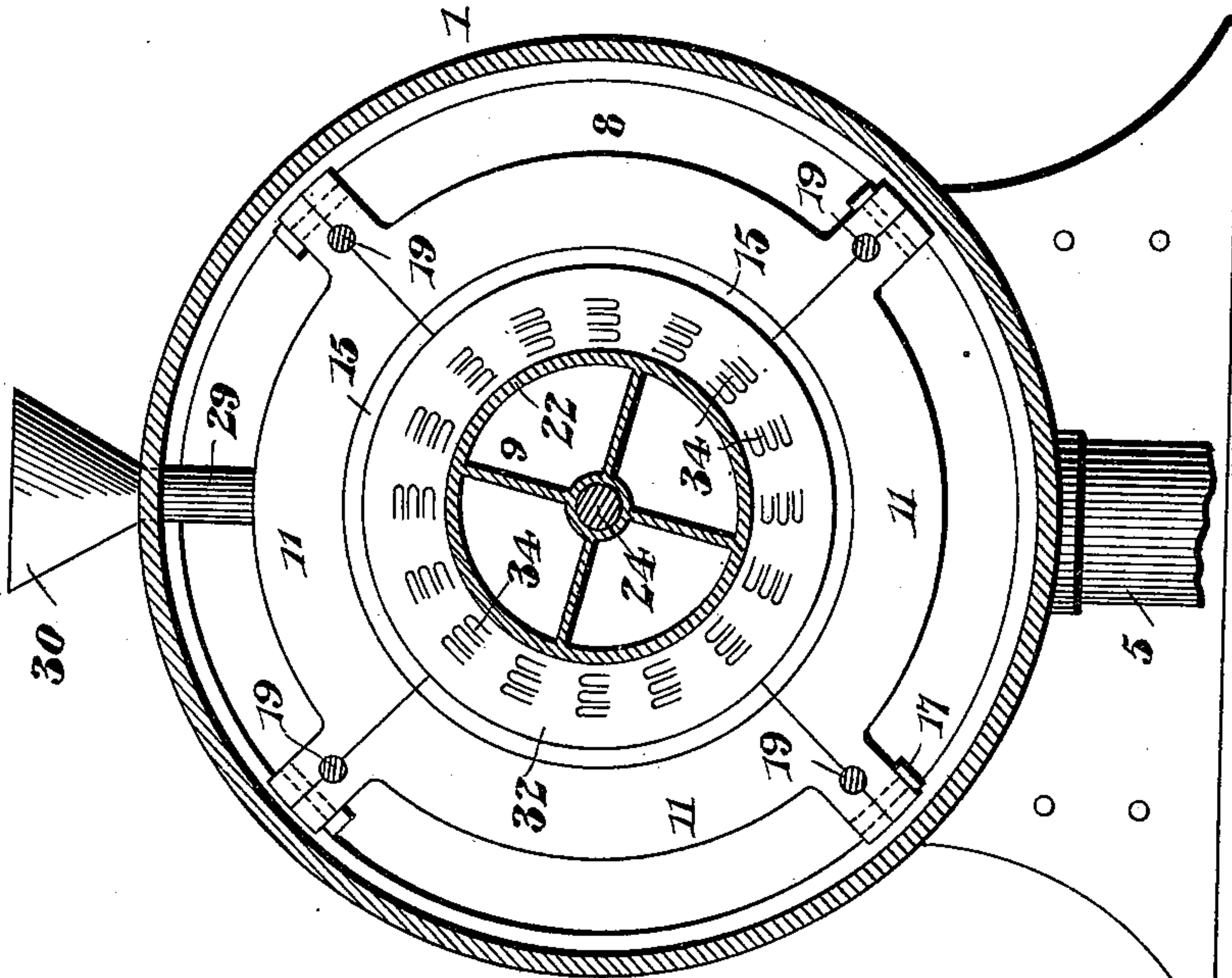
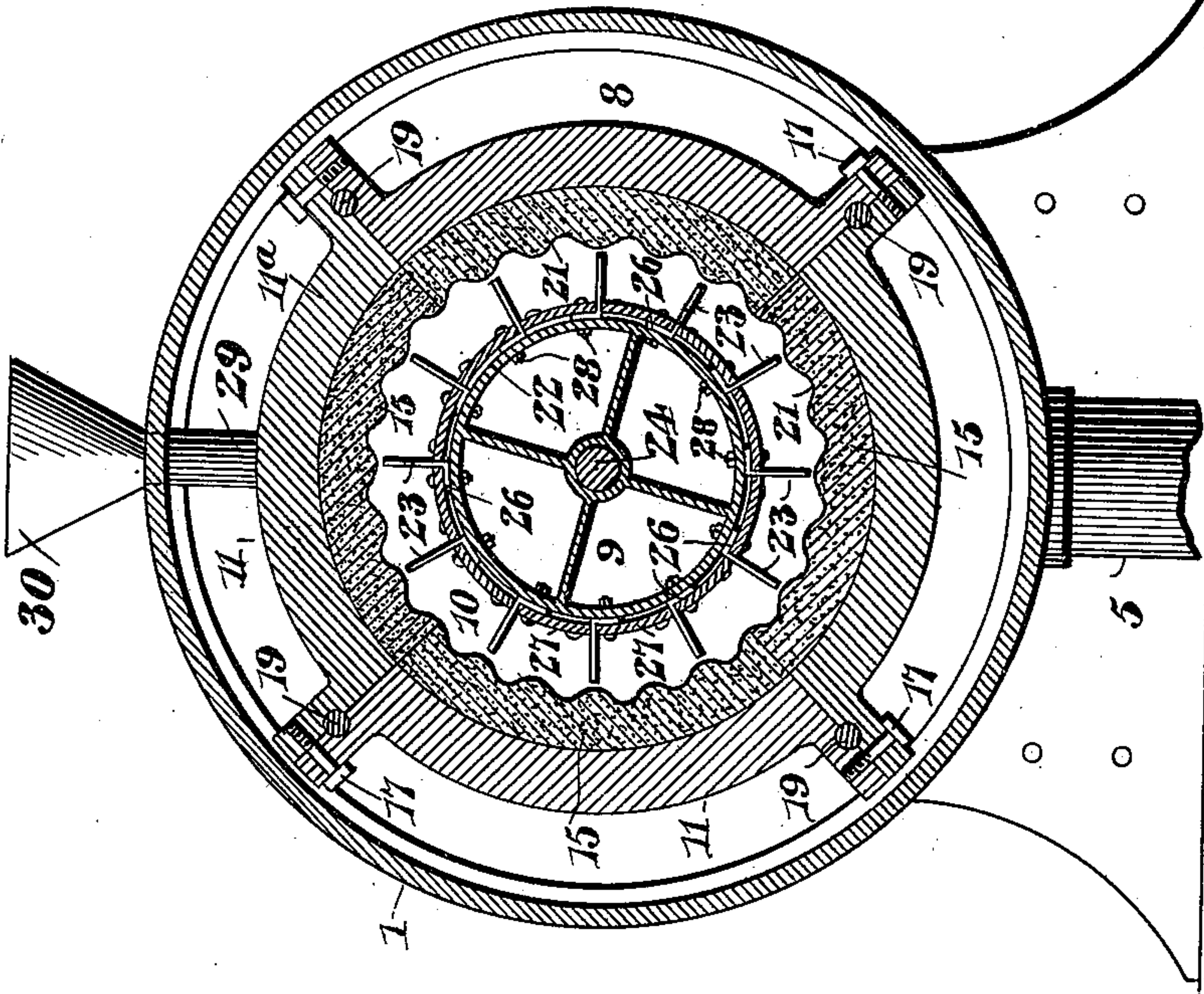


Fig. 3.



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4 Sheets—Sheet 4.

Fig. 5.

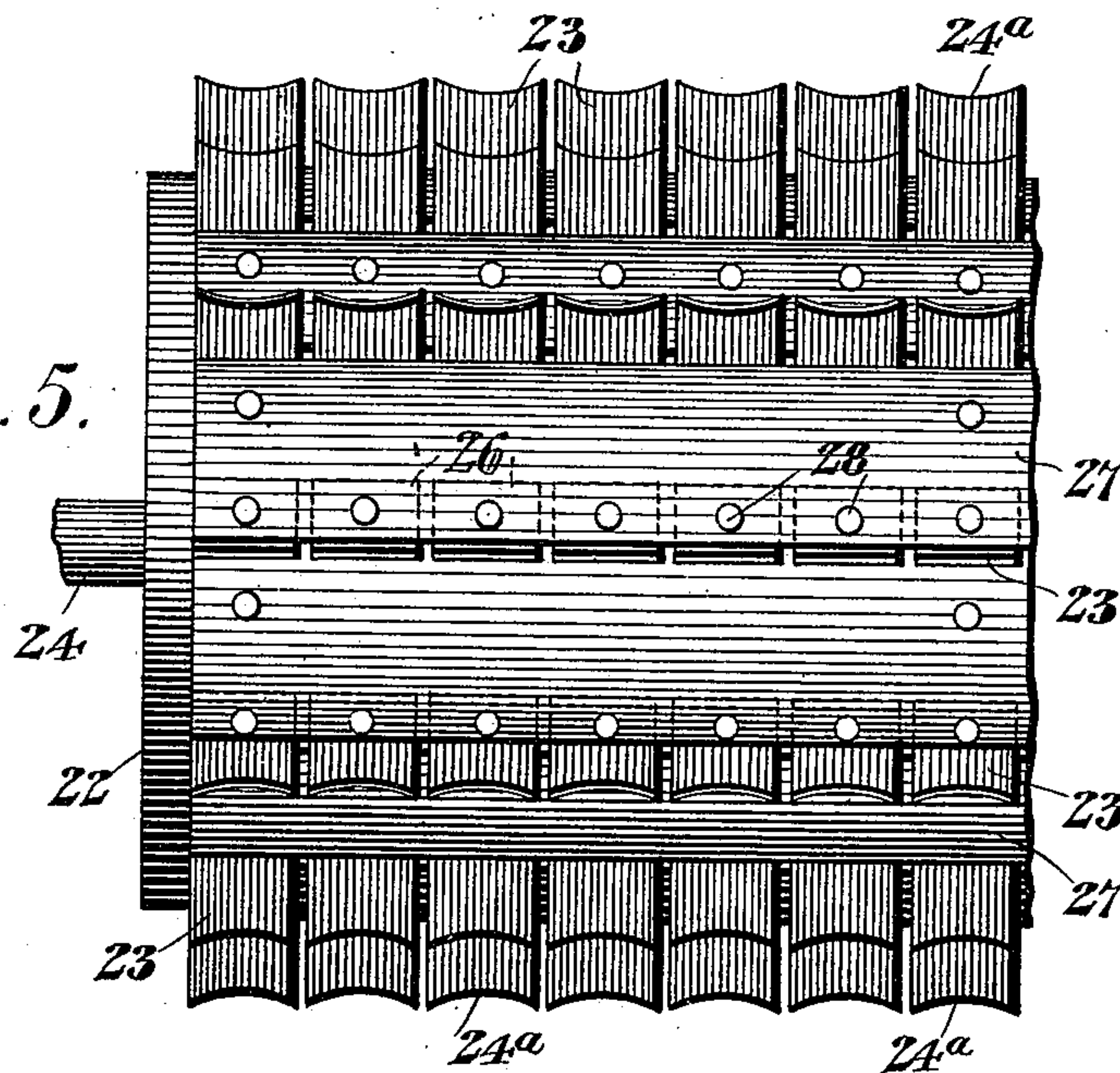


Fig. 8.

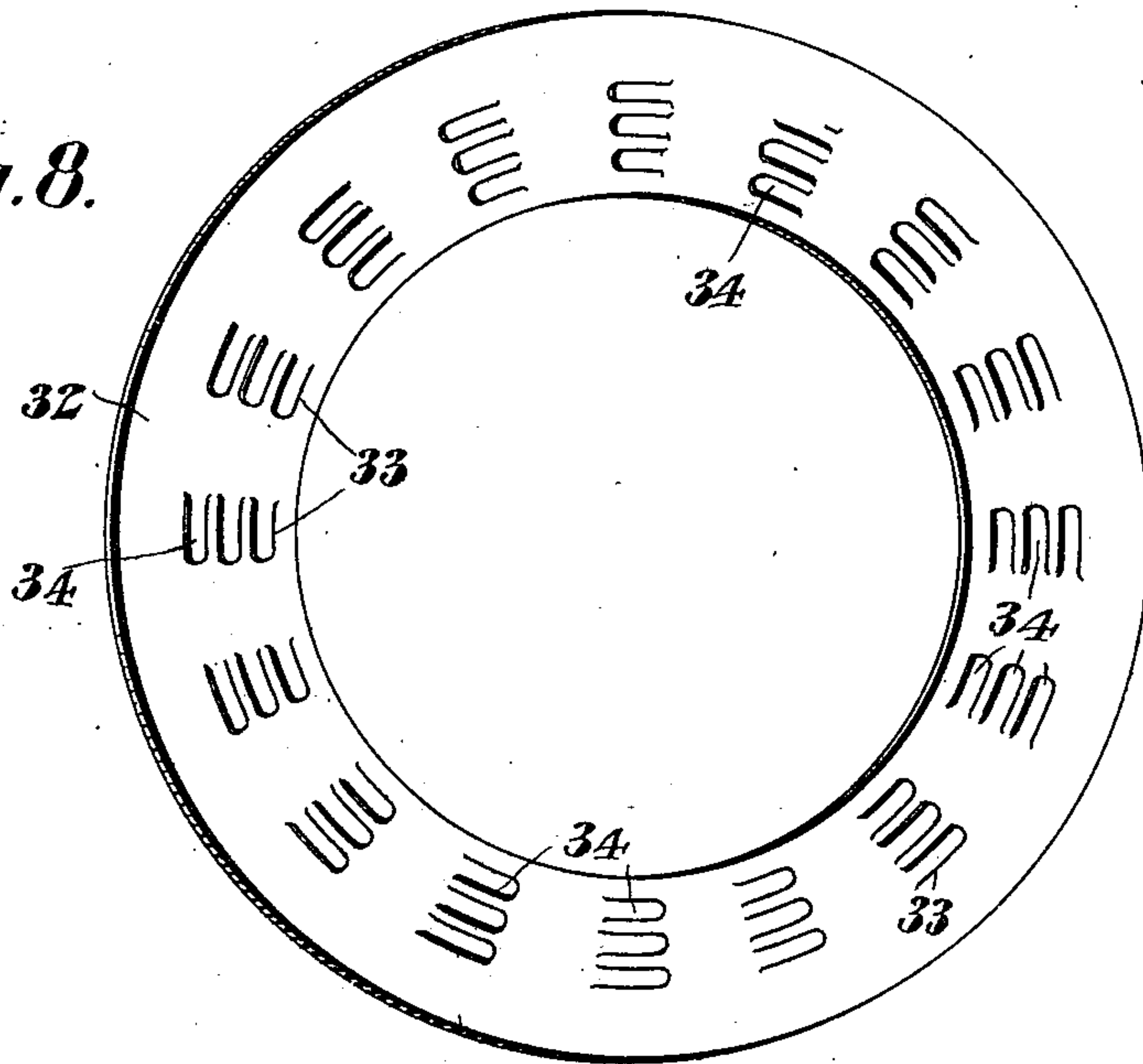
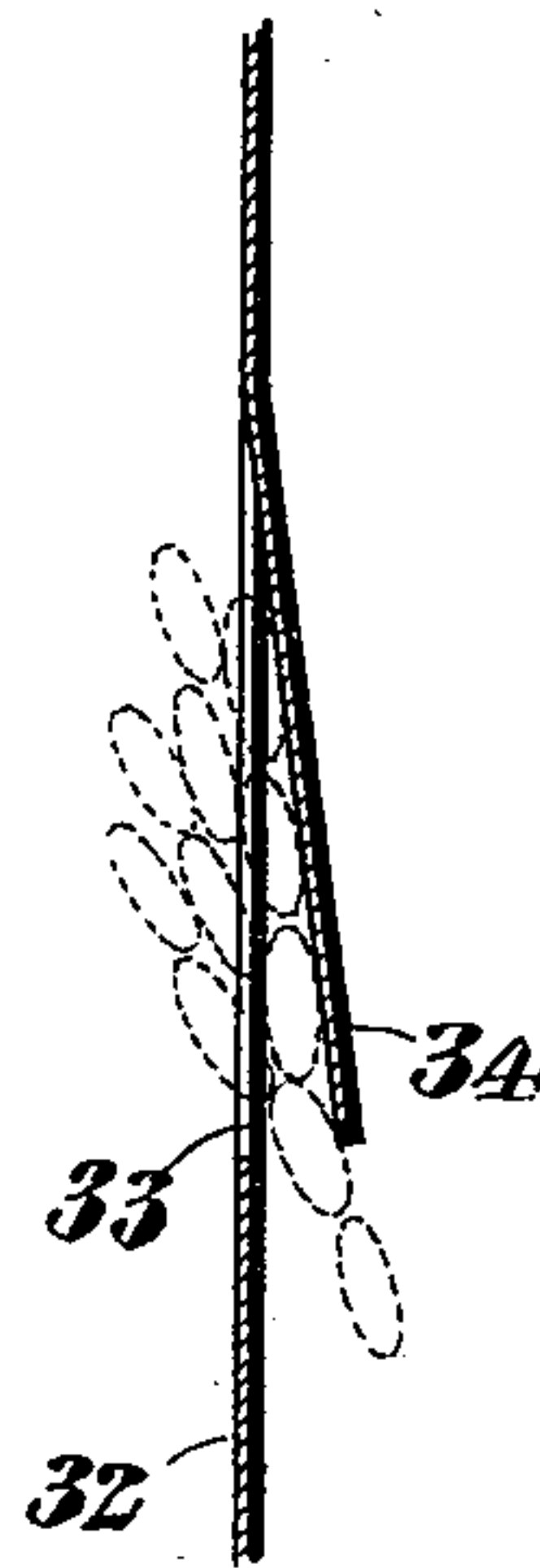


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM A. POLLOCK, OF NEW ORLEANS, LOUISIANA, ASSIGNOR OF
THREE-FOURTHS TO JOSEPH BREWER, WILLIAM ADRON RAGS-
DALE, ALEXANDER ARTHUR HART, AND WILLIAM WORDSWORTH
WEISS, OF SAME PLACE.

DELINTING AND HULLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 672,068, dated April 16, 1901.

Application filed February 27, 1900. Serial No. 6,714. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. POLLOCK, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and useful Delinting and Hulling Machine, of which the following is a specification.

This invention relates to that class of machines commonly known as "delinting-machines," which are especially designed for delinting cotton-seed; and it has for one object to provide a new and useful machine of this character having positive and reliable means not only for separating lint or fiber from cotton-seed, but also adapting the machine for thoroughly cleaning or hulling rice, oats, buckwheat, or other seed.

To this end the invention primarily contemplates a novel construction of delinting and hulling machine which in its use as a delinter subjects the cotton-seed to such a scouring action as to insure the complete removal of all adhering lint or fiber before the discharge thereof without cracking, mashing, or damaging the seed in any respect, while at the same time insuring the complete separation and removal of dust, trash, and other like foreign matter which might be intermingled with the seed when introduced into the machine. As a hulling-machine the same operation provides for completely hulling and cleaning the seed by reason of the uninterrupted and extensive scouring and beating action to which the seed are subjected in their travel from the feed to the discharging end of the machine.

A further object of the invention is to associate with the machine improved means for permitting of the discharge of only such seed as may have been thoroughly cleaned.

With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and relation of parts hereinafter more fully described, illustrated, and claimed.

The fundamental features of the invention are necessarily susceptible to a wide range of modification without departing from the

spirit or scope thereof; but the preferred embodiment of the several instrumentalities constituting the machine is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a delinting and hulling machine embodying the present invention. Fig. 2 is a vertical longitudinal sectional view thereof. Fig. 3 is a vertical transverse sectional view on the line 3 3 of Fig. 2. Fig. 4 is a similar view on the line 4 4 of Fig. 2. Fig. 5 is a detail elevation of a portion of the agitator-drum. Fig. 6 is a detail in perspective showing one of the sections of an abrasive-element holder with the corresponding section of the abrasive element adapted to be fitted therein. Fig. 7 is a detail cross-sectional view on the line 7 7 of Fig. 6. Fig. 8 is a detail in perspective of the guard-plate for the discharge of cleaned seed. Fig. 9 is a detail sectional view of a portion of the guard-plate.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

In carrying out the invention the operative parts of the machine which effect the scouring action are housed within an external case or housing 1, preferably of a cylindrical form and consisting of an imperforate cylindrical body and the end plates or heads 3, capping the open ends of the cylindrical body and serving to completely close in the interior space thereof, whereby the same will constitute a chamber for the reception of fiber, dust, trash, and all foreign matter which is eliminated or removed from the seed during the scouring operation, and to provide for the continuous disposal of such fiber and foreign matter as may be forced into the open space of the external case or housing 1 the latter preferably has connected with the bottom portion thereof, as at 4, one end of a suction-pipe 5, leading to a suitably-operated suction-fan 6, which is of a sufficient capacity to provide for the complete removal of the fiber, &c., and thereby provide means for maintaining the interior of the machine perfectly free and open, so that there will be a complete and thorough separation of the fiber and trash

from the seed and the choking of any of the working spaces of the machine is entirely obviated. The external case or housing 1 is preferably mounted upon suitable supports 5 7, and although preferably of a cylindrical form is not necessarily so, inasmuch as the machine only requires that the said external case or housing be of a sufficient size to accommodate therein the scouring and agitating elements, besides providing a chamber or receptacle for the fiber and foreign substances working out of the seed. In the present invention the external case or housing 1 is designed to accommodate therein an interior 10 scouring-shell 8 and an agitator-drum 9, arranged one within the other, with a uniform working space 10 between the same to accommodate the material or seed to be treated and to secure the necessary agitation and scouring of the seed. It is essential in carrying out the invention that a relative rotation be maintained between the said interior scouring-shell 8 and the agitator-drum, so that the rotation of either of these elements of the machine would effect the desired result. However, for the purposes of this application there is illustrated the preferred embodiment of the invention—that is, to have the scouring-shell held stationary within the external case or 30 housing and the agitator-drum mounted for rotation, whereby the same may be rotated at a very high speed inside of the scouring-shell to secure the necessary agitation or beating up of the seed under treatment and the pressing thereof against and over the scouring-surfaces of the abrasive elements to be presently referred to.

Referring particularly to the preferable construction of the interior scouring-shell, it is to be noted that this shell is of a general cylindrical shape and is arranged to extend longitudinally within the case or housing from end to end thereof, and in order that every part of the scouring-shell may be individually accessible for purposes of repair or adjustment the said shell is of a sectional form, and essentially consists of a horizontally-aligned series of circular holders 11 for the abrasive elements forming the scouring-surface. The entire series of circular holders 11, which in effect form the main cylindrical body of the scouring-shell, are arranged side by side and are spaced at regular distances apart to leave therebetween intervening discharge spaces or interstices 12 in communication with the open space of the external case surrounding the scouring-shell, whereby fiber and other trash worked from the seed can readily escape into the said open chamber of the external case and thence be drawn out of the same through the suction discharge-pipe 5. There is of course any desired number of the holders 11 for the abrasive elements, and these holders, which are of a circular or ring form, are individually provided 65 with an inner peripheral groove 13, receiving therein a correspondingly-shaped retaining-

tongue 14, formed on the exterior periphery of an abrasive ring 15, preferably formed of emery-stone or equivalent abrasive substance 70 and also preferably of a general rectangular shape in cross-section, so it will be seen that each of the circular holders 11, forming a part of the scouring-shell, supports within the circle thereof a circular abrasive element or 75 ring 15, forming the outer wall of the uniform working space 10 between the scouring-shell and the agitator-drum 9. It is also preferable in the construction of the scouring-shell to not only have the individual holders 80 and abrasive elements separate and independent of each other in their spaced relation, but also to form each holder and the ring associated therewith of a plurality of matching sections, the sections of each holder 85 being designated by the reference-numeral 11^a and the corresponding sections of the abrasive element or ring 15 being designated by the reference-numeral 15^a, as may be best seen from Fig. 6 of the drawings. By reason 90 of this sectional formation of the holder 11 and the abrasive ring held thereby the several sections may be readily removed and taken apart for purposes of repair or adjustment without disturbing any other part of 95 the machine, and as a preferred form of expedient for holding the sections of each holder together, and thereby clamping the sections of the abrasive ring in place, the several sections of each holder for the abrasive elements 100 are provided at their contiguous or meeting ends with the offstanding lugs 16, which receive the fastening screws or bolts 17 and are provided with bolt-holes 18, which are clamped over and receive the supporting-rods 105 19, extending longitudinally of the case or housing 1 and bolted at their extremities, as at 20, in the end heads or plates 3 of the said case or housing. A circular series of the supporting-rods 19 are employed, as shown in Fig. 110 3 of the drawings, there being the same number of such rods as there are lugs 16 projecting from the holders 11 for the abrasive elements, so as to provide means for supporting the several holders of the scouring-shell in 115 proper relative relation within the case or housing, while at the same time not interfering with the individual removal of any holder and abrasive element or the removal of the entire series of holders constituting the scouring-shell. 120

The cylindrical scouring-shell 8, constructed as described, is rendered more positive in its function of removing the lint or hulls from the seed being treated by providing each of 125 the abrasive elements or rings 15 with a corrugated or scalloped working face or inner peripheral edge 21, which corrugated or scalloped working face not only increases the area of the active surface of the ring, but also 130 has a retarding effect upon the seed that materially assists in the removal therefrom of all clinging matter.

As already explained, there is a relative ro-

tation maintained between the scouring-shell 8 and the agitator-drum 9, and in the preferable form of the invention this drum is designed to be rotated at a very rapid rate within the scouring-shell, and essentially consists of the cylindrical body 22 and a multiplicity of radially-disposed resilient wings or blades 23, projecting from the periphery of the drum-body 22. The agitator-drum body 22 is of a length coextensive with the machine case or housing 1 and is mounted upon a longitudinal drive-shaft 24, journaled in suitable bearings 25 at the end of the case or housing and adapted to have suitable belt connections therewith to provide for rotating the drum within the scouring-shell at a sufficiently rapid speed to insure the thorough scouring of the seed being treated.

The radially-disposed wings or blades 23, which are mounted upon the exterior of the drum-body 22, are preferably constructed of flat strips of steel or equivalent spring metal and of a width corresponding to the width of the abrasive elements or rings 15, with which they are associated, although the width of these parts may be proportioned to suit the requirement of any particular machine being built, and the said wings or blades 23 are made in lengths nearly equal to the width of the working space 10 between the scouring-shell and the drum-body, so that the outer ends of the wings or blades will work in very close proximity to the inner working faces of the abrasive elements or rings, the space between the said outer ends of the wings or blades and the working faces of the rings ordinarily being not more than one thirty-second of an inch, thus insuring not only the scouring of the seed, but the working of the fiber and other trash through the discharging spaces or interstices 12 of the scouring-shell.

In order to secure the best possible results, it has been found quite advantageous to arrange the multiplicity of wings or blades 23 in the specific way shown in the drawings, and it will be observed that the said wings or blades are arranged in regular longitudinal rows extending from end to end of the drum-body. There are the same number of resilient wings or blades in each longitudinal row as there are abrasive elements or rings 15 in the scouring-shell, and the said wings or blades of each longitudinal row are disposed edgewise in precise longitudinal alinement and are regularly spaced apart at distances equaling the discharge spaces or interstices 12 of the scouring-shell, as plainly shown in Fig. 2 of the drawings, and by reason of the longitudinal alinement of the wings or blades edgewise it will be observed that the said wings or blades will be rotated flatwise, so as to present their non-abrasive flat faces to the seed in the working space 10. While the wings or blades 23 are arranged in regular longitudinal rows, the individual wings or blades are also grouped in regular circular series, each circular series or group being as-

sociated with an abrasive element or ring 15 and working inside of the circle thereof, and to insure the thorough scouring of the seed the outer ends of the wings or blades are preferably concaved, as indicated at 24^a, conforming to the corresponding convexity 25^a of the working faces of the abrasive elements or rings 21.

The resilient wings or blades 23 may be held upon the drum-body 22 in any approved manner; but this may be conveniently accomplished by constructing the same at their inner ends with angularly-disposed foot-flanges 26, fitting upon the outer periphery of the drum-body 22 and held thereto by clamping-strips 27, fitting in the spaces between the longitudinal rows of the wings or blades, which may be fastened to the drum-body through the medium of suitable fastening-bolts 28, fastened through said strips and the drum-body. In this construction the clamping-strips 27 also act in the capacity of spacing-blocks to maintain the proper separation between the longitudinal rows of wings or blades, although it will be understood that any other mechanical expedient may be resorted to for holding the wings or blades and the drum-body in their proper working relation.

The seed to be treated is introduced into the inner end of the scouring-shell through a feed-spout 29, fitting in the top of the machine case or housing 1 at one end thereof and leading from the hopper 30. The said spout 29 is so arranged as to introduce the undelinted or uncleaned seed into the scouring-shell at one extreme end thereof, and at the opposite extreme end of the scouring-shell is arranged a discharge-spout 31, which is fitted in an opening at one end of the machine case or housing 1, which opening is in communication with the interior scouring-shell to permit of the discharge of cleaned seed, and at this point it will be observed that an important feature of the invention is to make provision for guarding against the escape of undelinted or uncleaned seed, while at the same time permitting of the cleaned seed being readily worked out through the discharge-pipe 31. To secure this result, there is employed a guard-plate 32 for the discharge of cleaned seed. This guard-plate is in the form of a thin metal disk which is interposed in the space between the last two abrasive elements or rings 15, contiguous to the discharge end of the machine case or housing, and the said plate or disk is provided throughout its entire area with series of radially-alined seed-openings 33. The radially-alined openings 33 of the several series are also concentrically arranged and of an oblong formation, being partially covered at one side by the spring valve flaps or tongues 34, cut out from the body of the plate or disk 32 to form the openings 33 and bent slightly at one side of the plane of the plate or disk to leave said openings 33 partly open for the entrance of cleaned seed,

which is crowded through the seed-openings against the resilient valve flaps or tongues 34. The said resilient valve flaps or tongues 34 are all disposed in the same relation and project from the same side of the guard plate or disk 32—that is, toward the discharge end of the machine case or housing 1—and it will be observed that as the cleaned seed is crowded into the openings 33 the same will be forced against the valve flaps or tongues 34, so as to open such flaps sufficiently to permit the seed to pass entirely through the openings to the space at the opposite side of the guard-plate or disk, from which space the same will readily pass into the discharge-spout 31. The undelinted or unhulled seed will be of a size which will prevent it passing through the seed-openings 33. So, consequently, nothing but cleaned seed can find escape into the space communicating with the discharge-spout 31.

While the guard-plate 32 has been described as being useful to guard against the escape of undelinted or uncleaned seed, it will be understood that the said plate need not be utilized in connection with the operation of delinting cotton-seed, inasmuch as the same is especially designed for use in the machine when cleaning rice and grain.

In the operation of the machine the undelinted or uncleaned seed is introduced by the feed-spout 29 into the scouring-shell at one end thereof, and the rapidly-rotating agitator-drum 9 will carry the resilient wings or blades flatwise through the working space 10, thereby not only agitating the seed so as to separate dirt, sand, and other trash therefrom and force the same through the discharge spaces or interstices 12 of the scouring-shell, but also pressing and rolling the seed against the inner working faces 21 of the abrasive elements or rings 15, thereby subjecting the seed to a thorough scouring action. By reason of the resiliency or flexibility of the flat wings or blades 23 the latter will yield sufficiently under any choking tendency to obviate the cracking, mashing, or damaging of the seed in any respect, and the retarding influence of the corrugations or scallops of the abrasive elements or rings 15 will insure the thorough elimination of the fiber or hulls from the seed, according to the nature of the seed being treated. In connection with the foregoing operation it should be observed that the wings or blades 23 act primarily in the capacity of what might be properly termed “non-abrasive pressure-blades,” to yieldingly press the seed in firm contact with the inner abrasive surface of the scouring-shell. It is only incidental to the use of the blades 23 that the same provide means for agitating the material to insure the working out of the dirt and other trash, as it is not the purpose of the present invention to have the blades provide for a beating action, such as is involved in machines designed solely for the cleaning of grain. On the contrary, the pressure-blades 23 during the operation of the machine come

in contact with the seed or grain and yieldingly press the same against the abrasive surface of the scouring-shell, while at the same time being sufficiently resilient or yielding, so as not to crack or injure the seed in any respect. It should be further observed that the guard-plate 32 for discharging the seed also acts as a retarding medium, which causes the seed to crowd the working space 10 of the machine, and it is only by reason of the crowding forward of the material by the feeding in of a fresh supply of seed that the cleaned seed will be caused to work through the seed-openings 33 past the valve flaps or tongues 34 covering the seed-openings, it being noted that the said valve flaps or tongues are disposed in the direction of rotation of the drum, so that the circular series of wings or blades 23, working at the side of the plate or disk 32 opposite the said valve flaps or tongues, will cause the cleaned seed to be carried through the seed-openings and into the space communicating with the discharge-spout 31. As hereinbefore explained, such fiber and other trash as may be worked through the discharge spaces or interstices 12 of the shell is instantly sucked therefrom by the action of the suction-fan 6.

It will be understood that the invention is not restricted to any particular number of abrasive elements or rings 15 in the scouring-shell, nor to the number of wings or blades of the agitator, nor to the relative widths and sizes of these elements, as such features of the machine are susceptible to a variety of modifications without affecting the operation, although it may be noted that by increasing the number of abrasive elements or rings and beater wings or blades coöperating therewith the capacity of the machine is increased, and vice versa. I will therefore have it understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a machine of the class described, the outer case, a scouring-shell arranged within the case and having a plurality of abrasive elements spaced apart to leave discharge spaces or interstices communicating with the vacant portion of the case, an imperforate agitator-drum arranged within the shell and having upon its periphery a plurality of non-abrasive resilient flat pressure-blades disposed flatwise with reference to the plane of rotation, and arranged in individual series corresponding to the individual abrasive elements, and means for maintaining a relative rotation between the scouring-shell and the agitator.

2. In a machine of the class described, the outer case, a scouring-shell arranged within the case and having an inner abrasive surface and discharge spaces or interstices in-

interrupting said surface at regular spaced intervals, an imperforate agitator-drum located inside of the shell and having upon its periphery a plurality of non-abrasive flat pressure-blades disposed flatwise with reference to the plane of rotation, and also spaced apart in individual series to correspond to said discharge spaces or interstices, and means for maintaining a relative rotation between the scouring-shell and the agitator.

3. In a machine of the class described, the combination of the scouring-shell comprising an aligned series of abrasive rings spaced apart to leave intervening discharge spaces or interstices of less extent than the ordinary sizes of the seed being treated, and an imperforate agitator-drum working within the scouring-shell and provided upon its periphery with a plurality of non-abrasive resilient flat pressure-blades disposed flatwise with reference to the plane of rotation and also spaced apart in individual series corresponding to the individual abrasive rings, substantially as set forth.

4. In a machine of the class described, the outer case, an inner cylindrical scouring-shell comprising a longitudinally-aligned series of circular holders and abrasive rings detachably fitted to said holders, means for supporting the holders and their abrasive rings spaced from the outer wall of the case, an imperforate agitator-drum located inside of the scouring-shell, and provided upon its periphery with a plurality of non-abrasive yielding pressure-blades working flatwise against the material, and means for maintaining a relative rotation between the scouring-shell and the agitator.

5. In a machine of the class described, the outer case, an inner cylindrical scouring-shell comprising a longitudinally-aligned series of circular holders, and abrasive rings detachably fitted to said holders, the individual holders and the abrasive rings associated therewith consisting of matching sections detachably held together, an agitator located inside of the scouring-shell, and means for maintaining a relative rotation between the scouring-shell and the agitator, substantially as set forth.

6. In a machine of the class described, the outer case, a series of supporting-rods arranged longitudinally of the case, an inner cylindrical scouring-shell comprising a longitudinally-aligned series of circular holders arranged in spaced relation, and abrasive rings removably fitted to the holders, each circular holder and abrasive ring carried thereby consisting of matching sections, and a holder having lug portions detachably embracing the supporting-rods, and an agitator arranged inside of the scouring-shell, substantially as set forth.

7. In a machine of the class described, a scouring-shell having a plurality of longitudinally-aligned abrasive rings arranged side by side, and an imperforate agitator-drum

arranged within the scouring-shell and provided on its periphery with a plurality of resilient wings or blades extending across the space between the drum and the shell, there being a circular series of said resilient wings or blades for each ring.

8. In a machine of the class described, a scouring-shell having a plurality of longitudinally-aligned abrasive rings arranged side by side, and an imperforate agitator-drum arranged inside of the shell and provided upon its periphery with a series of resilient flat wings or blades arranged to present their flat faces to the material and having their outer edges working in close proximity to the abrasive rings, there being a circular series of said wings or blades for each ring.

9. In a machine of the class described, a scouring-shell having a series of individual abrasive rings arranged side by side, and an imperforate agitator-drum working within the shell and having on its periphery a multiplicity of resilient flat wings or blades having a rigid connection with the drum and projecting radially therefrom, said flat wings or blades being arranged edgewise in longitudinal rows and also grouped in separate circular series to correspond to the series of individual abrasive rings.

10. In a machine of the class described, the scouring-shell having abrasive rings provided with transversely-convexed and circumferentially-scalloped working faces, and an agitator-drum carrying a plurality of resilient flat pressure-blades projecting from the periphery thereof and disposed flatwise with reference to the plane of rotation, said pressure-blades having their outer free ends working in close proximity to the working faces of said rings and concaved to conform to the convexity thereof, substantially as set forth.

11. In a machine of the class described, the scouring-shell comprising a series of abrasive rings arranged in spaced relation, an agitator having a multiplicity of pressure-blades arranged in similar spaced relation and disposed flatwise with reference to the plane of rotation, and a guard-plate having grain or seed discharge openings, and interposed between a pair of abrasive rings contiguous to the discharge end of the scouring-shell.

12. In a machine of the class described, the outer case having a seed-inlet at one end, and a discharge-outlet at the other end, an inner scouring-shell, an agitator arranged within the scouring-shell and forming therewith an intervening uniform working space, and a seed-guard arranged within said working space between the agitator and the scouring-shell, and provided with a plurality of resilient valves.

13. In a machine of the class described, the outer case, an inner scouring-shell, an agitator arranged within and cooperating with the said scouring-shell, and a guard-plate interposed within the working space between the shell and the agitator and provided with

a multiplicity of seed-openings, and resilient valves partly covering the seed-openings at one side.

14. In a machine of the class described, the
5 scouring-shell comprising a series of abrasive rings arranged in spaced relation, an agitator arranged within the scouring-shell and having a multiplicity of wings or blades arranged in similar spaced relation, and a guard-plate
10 interposed between a pair of the abrasive rings contiguous to the discharge end of the scouring-shell, and essentially consisting of

a disk provided with a series of radially-aligned seed-openings, and resilient valve flaps or tongues partly covering the seed-openings 15 at one side.

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

WILLIAM A. POLLOCK.

Witnesses:

WILLIAM A. RAGSDALE,
JOSEPH D. BREWER.