No. 786,019. PATENTED MAR. 28, 1905.

P. FLESHER.

GRAIN SEPARATOR.

APPLICATION FILED JUNE 9, 1904.

3 SHEETS—SHEET 1.

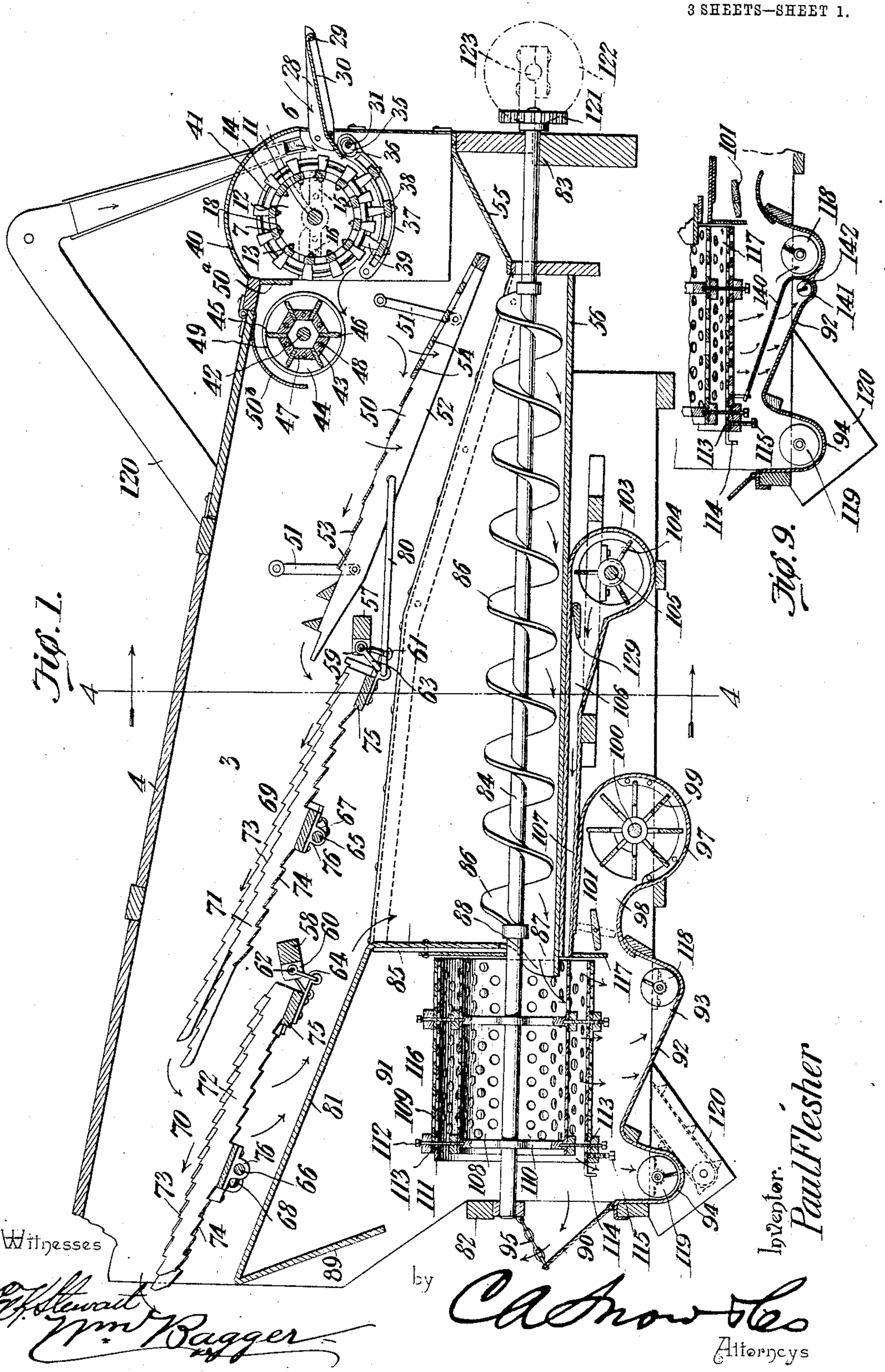

Fig. 1.

Fig. 9.

Witnesses

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3 SHEETS—SHEET 2.

Fig. 8.

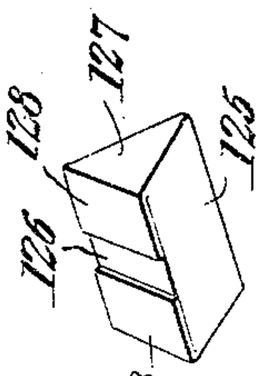


Fig. 2.

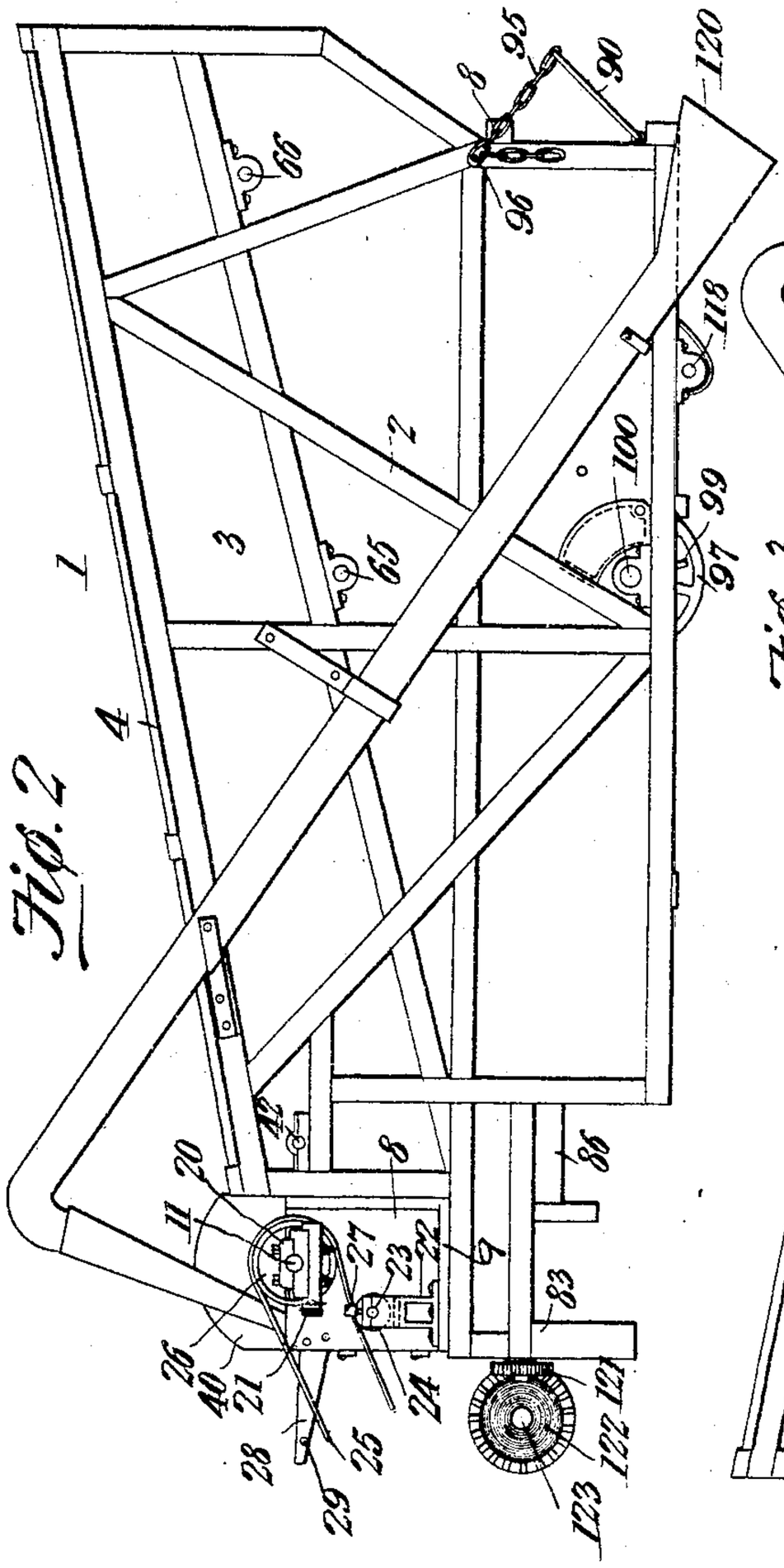
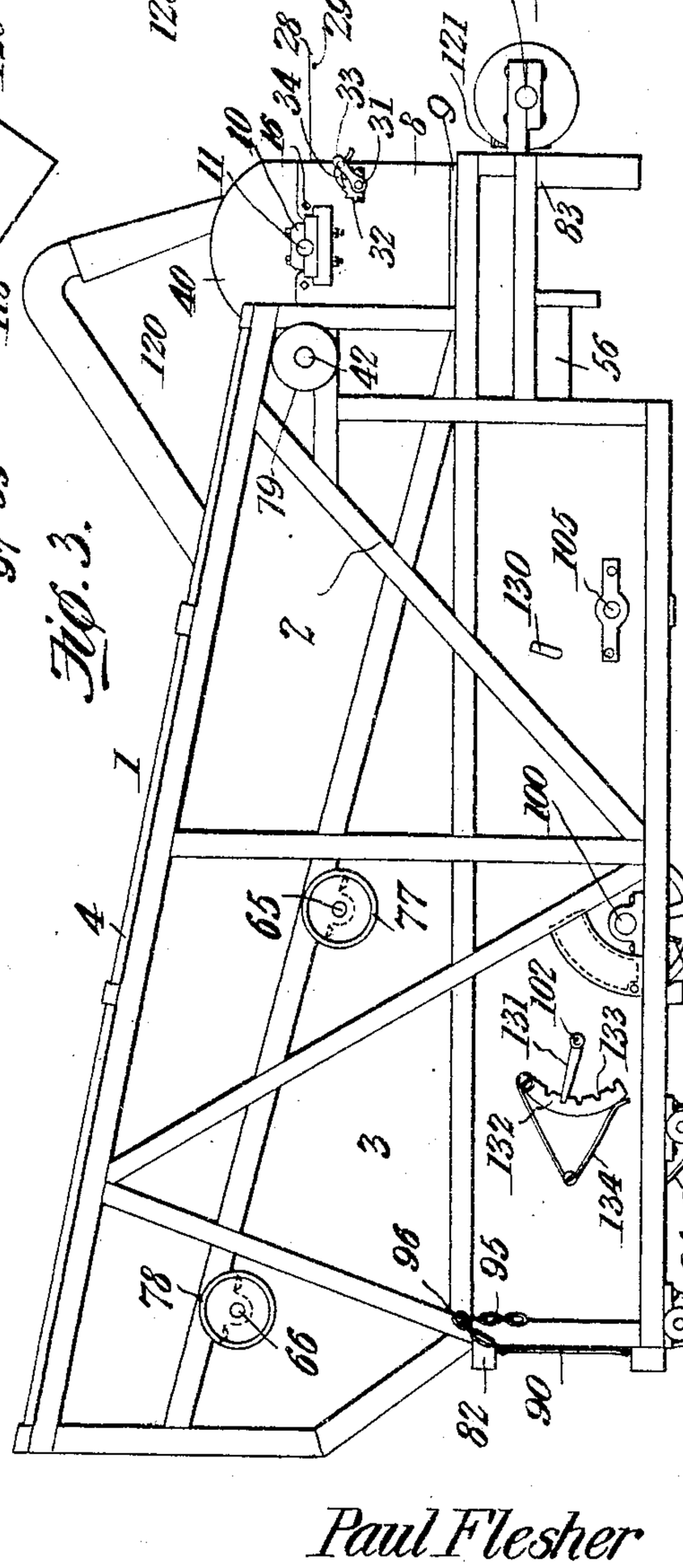


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 5.

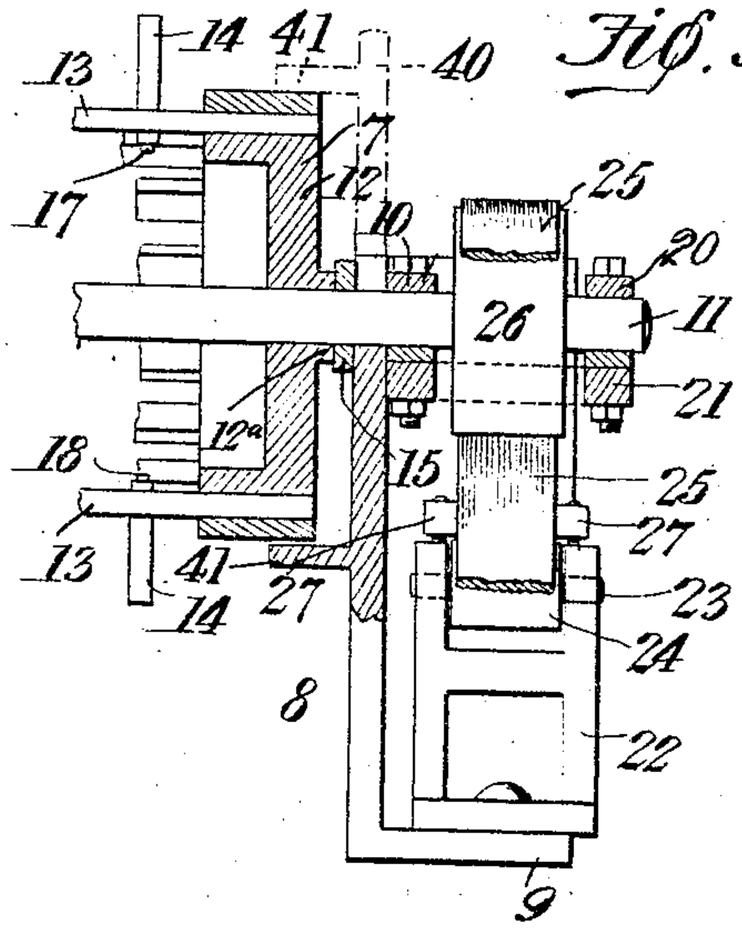
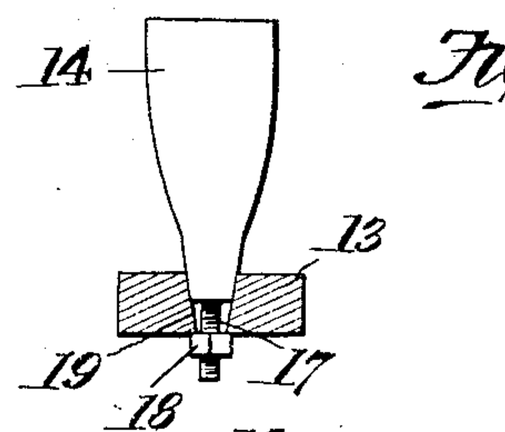


Fig. 6.



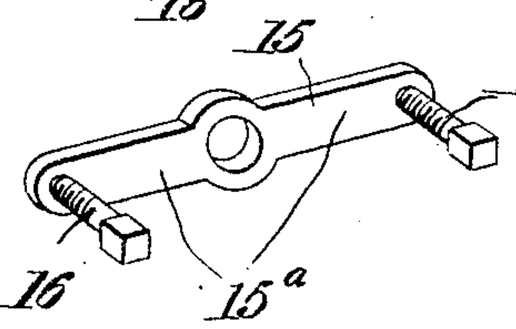
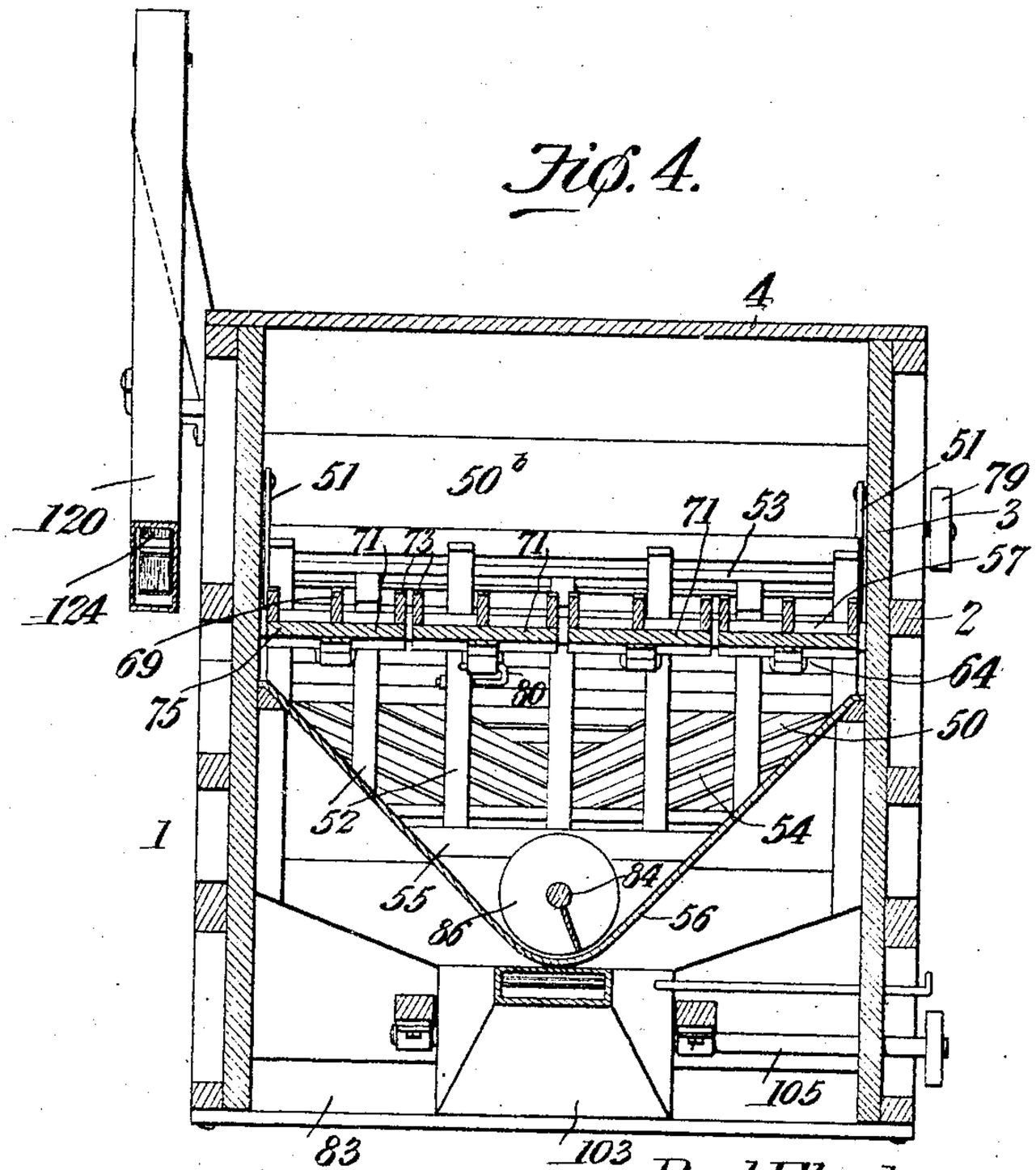


Fig. 7.

Fig. 4.



Witnesses

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No. 786,019. Patented March 28, 1905.

UNITED STATES PATENT OFFICE.

PAUL FLESHER, OF BRAMAN, OKLAHOMA TERRITORY, ASSIGNOR OF ONE-HALF TO PAUL HENRY ELGIN, OF BRAMAN, OKLAHOMA TERRITORY.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 786,019, dated March 28, 1905.

Application filed June 9, 1904. Serial No. 211,847.

To all whom it may concern:

Be it known that I, PAUL FLESHER, a citizen of the United States, residing at Braman, in the county of Kay and Territory of Oklahoma, have invented a new and useful Grain-Separator, of which the following is a specification.

This invention relates to threshing-machines and grain-separators.

The general object of the invention may be stated to be to provide a machine of the class referred to which shall possess superior advantages in point of simplicity, durability, and general efficiency. A special object of the invention is to provide or construct a machine which shall be, as far as possible, free from vibration, and I accordingly dispense with the shaking-screens usually employed for the purpose of accomplishing the separation of the grain from chaff, short straw, broken ears, and the like, which are separated from the mass of straw during the passage of the latter over the carrying means whereby it is conveyed to the tail end of the machine. For the said shaking-screens I substitute a rotary screen of improved construction and use in connection with such rotary screen a rotary feeding device, whereby the grain, chaff, &c., are carried through the length of the machine to the rotary screen, where the final separation is accomplished by suitably-directed blasts.

My invention then consists in the improved construction and arrangement of parts and in certain combinations of elements, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of my invention, it being, however, understood that I do not necessarily limit myself to the precise structural details therein exhibited, but reserve the right to such changes, alterations, and modifications as may be resorted to within the scope of my invention and without departing from the spirit or sacrificing any of the advantages of the same.

In said drawings, Figure 1 is a longitudinal vertical sectional view of a threshing-machine and grain-separator constructed in accordance with the principles of the invention. Figs. 2 and 3 are side elevations taken from opposite sides of the machine, said views being on a reduced scale. Fig. 4 is a transverse vertical sectional view taken on the line 4 4 in Fig. 1. Fig. 5 is a sectional detail view, enlarged, taken through one end of the cylinder and the adjacent side of the casing and related parts. Fig. 6 is a detail view showing the construction of one of the teeth. Fig. 7 is a perspective detail view showing one of the washers for taking up wear upon the ends of the cylinder. Fig. 8 is a perspective detail view showing one of the buckets used in the tailings-elevator of the machine. Fig. 9 is a sectional detail view illustrating a modification involving the use of an auxiliary separating mechanism.

The casing 1 of the machine is in the main of ordinary construction, comprising the framework 2, the sides 3 3, and the top or deck 4. The framework is supported upon sills 5 5, and trucks and transporting-wheels are provided; but these have not been shown in the drawings, as they are no part of the invention.

At the front end of the casing is the throat 6, in which the cylinder 7 is mounted. The throat or contracted portion is formed by metallic plates or castings 8 8, forming shoulders or offsets 9 9. These metallic plates or throat-plates are provided with boxes or bearings 10 10 for the shaft 11, which supports the cylinder 7. The latter is constructed in the usual manner of heads or ends 12, connected by longitudinal bars 13, in which the teeth 14 are mounted. Between the throat-plates 8 8 and the heads of the cylinder, each of which is provided with a centrally-disposed boss 12^a, and mounted upon the shaft 11 are interposed washer-plates 15, having oppositely-extending radial arms 15^a, which, by means of set-screws 16, extending either through the boxes or bearings 10 or directly through the throat-plates 8, may be forced in an inward direction, thus causing the washers to bear against the heads or ends of the cylin-

der, so as to take up slack or endwise movement of the latter which may be caused by wear. Owing to the fact of the washers being provided with radial arms to receive the pressure of the set-screws 16, a considerable pressure may be exerted and the pressure may be perfectly equalized on opposite sides of the axis of the cylinder, as will be readily understood.

The cylinder-teeth 14 are of tapering or trapezoidal shape and are provided with screw-threaded shanks 17 for the reception of nuts 18, whereby they may be connected with the cylinder, the bars of the latter being provided with tapering recesses 19, into which the teeth 14 may be wedged by tightening the nuts, thereby securing the said teeth in position with a great degree of firmness and rigidity. Another advantage of the peculiar shape of the teeth which has just been described is that the said teeth may be reversed. I am thus enabled when one side of the teeth has become worn to reverse the said teeth, forming new and effective operative faces, and thus greatly lengthening the life of the teeth. By the peculiar mode of attachment just described the said teeth may also be very conveniently reversed or when necessary replaced by new ones.

An auxiliary bearing 20 for the shaft of the cylinder is formed upon a bracket 21, which extends laterally from one of the throat-plates 8. Upon the shoulder or offset 9 of said throat-plate is supported a frame 22, having bearings for a shaft 23, carrying a horizontally-disposed idler 24, which is adapted to support the lower lead of the main driving-belt 25, which passes from the source of power over the driving-pulley 26, which is mounted upon the cylinder-shaft between the arms of the bracket 21, which latter is in the form of a yoke, one of the arms of which is secured to the throat-plate. The frame 22 also supports a pair of vertically-disposed idlers 27, which engage the sides of the driving-belt, thus preventing lateral displacement of the latter. The driving-belt is thus not only supported, but is prevented from lateral movement resulting from any cause whatever, such as the machine furnishing the power not working in perfect line. Lateral movement of the belt, it will be seen, is prevented by the vertically-disposed idlers, and the belt will thus be saved from frictional contact with the boxes of the cylinder-shaft, whereby it will become unduly worn.

The throat-plates 8 8 are provided at their upper front corners with forwardly-extending brackets 28, connected by cross-bars 29, serving to support an inclined feed-board 30.

The throat-plates 8 8 are provided near their upper front corners with bearings for a transversely-disposed shaft 31, which projects at one end and is provided upon said projecting end with a ratchet-wheel 32 and with a loose lever 33, having a pawl 34 engaging said ratchet and whereby the shaft may be turned in its bearings. Securely mounted upon the shaft 31, adjacent to the inner sides of the throat-plates, are eccentrically-disposed disks 35, engaging slots or openings 36 in the front ends of the side pieces 37 of the concave, which latter is composed of cross-bars 38, connecting the side pieces 37 at suitable intervals, said cross-bars being armed with teeth 39, which may be constructed and mounted in the same manner as the teeth 14 of the cylinder. The rear ends of the side pieces 37 of the concave are pivotally connected with the throat-plates. It will be seen that by properly manipulating the shaft 31 the front end of the concave may be raised or lowered relatively to the cylinder, thus regulating the size of the intake of the machine. The importance of this will be readily understood, inasmuch as grain of various kinds and various conditions requires to be fed at different rates of speed. Hence the desirability of controlling the size of the intake-opening.

The casing of the machine supports in rear of the throat in which the cylinder is mounted a hinged hood or cover 40, adapted to fold down over the cylinder and to rest upon the upper edges of the throat-plates. The latter and the sides of the cover are provided with interiorly-disposed flanges 41, which surround the heads or ends of the cylinder.

The sides of the frame of the machine are provided in rear of the cylinder with bearings for a shaft 42, carrying a beater 43. The latter is composed of metallic heads 44, provided with radially-disposed recesses 45 for the reception of the ends of the beater-rods 46, which are spaced apart by the segmental core-pieces 47. Tightening-rods 48 extend through the latter and through the beater-heads, which by means of said tightening-rods are drawn tightly in the direction of each other, so as to clamp the beater-rods and the spacing-segments between them, as will be readily understood. The sides of the machine-casing are provided with flanges 49, surrounding the heads of the beater for the purpose of preventing admission between said heads and the sides of the casing of straw or other material which by wrapping around the shaft 42 might interfere with the rotation of the beater.

Between the cylinder and the rotary beater is disposed a fender or deflecting-board 50^a, depending from the deck of the machine, and in rear of the rotary beater is a curved fender or deflecting-board 50^b, likewise depending from the deck of the machine, said fenders being for the purpose of deflecting material downwardly in the direction of the straw-carrier, which is now to be described.

50 designates a straw-rack which is suspended, by means of links 51, between the sides of the casing. The front end of this straw-rack extends underneath the beater and the thresh-

ing-cylinder, and said straw-rack is composed of a plurality of longitudinal frame-pieces 52, connected at their rear ends by a plurality of spaced inclined slats 53 and at their front ends by obliquely-disposed spaced slats 54, which as the straw drops thereupon will not only serve to feed the straw rearwardly, but also to scatter or diffuse the same, so as to occupy the entire width of the machine, thus loosening and disseminating the straw and enabling the separation of the grain to take place under the most favorable conditions. The front end of the casing has an inclined bottom plate 55, the lower edge of which is suitably connected with a trough 56, which extends longitudinally through the greater part of the machine and which constitutes the greater portion of the bottom of the casing. Into this trough the grain, chaff, and other material which is separated from the mass of the straw drop directly from the straw-rack and is thence conveyed, by means to be hereinafter described, to the rotary cleaning mechanism.

The sides of the casing of the machine are connected by suitably-disposed cross-bars 57 and 58, each provided with a plurality of brackets 59 and 60, supporting shafts 61 and 62. The shaft 61 supports a plurality of yokes 63, and the shaft 62 supports a plurality of similar yokes 64. The sides of the casing are provided in rear of the cross-pieces 57 and 58 with bearings for shafts 65 and 66, each having a plurality of cranks, (designated, respectively, 67 and 68,) and said cranks being in longitudinal alinement, respectively, with the yokes 63 and 64. These crank-shafts and yokes support the reciprocatory straw racks or carriers 69 and 70, each of which is composed of a plurality of sections 71 and 72. The sections or members 71 and 72, which enter into the make-up of the straw-carriers, are composed each of a plurality of toothed bars 73, connected by inclined spaced slats 74, which are connected with the lower edges of said toothed bars and which in turn are supported upon a transverse bottom bar 75. The bottom bars 75 of the several sections are connected pivotally with the depending yokes 63 and 64, and the under sides of said bars 75 are provided with boxes or bearings 76, journaled upon the cranks 67 68 of the shafts 65 66. The sections 71 72 of the straw-carriers 69 and 70 are disposed closely together and to the sides of the casing of the machine, but yet in such a manner that they may reciprocate freely without excessive frictional contact with each other and with the sides of the casing, as the case may be. It will be observed that alternate cranks upon the shafts 67 and 68 are disposed on opposite sides of the axes of said shafts, thus causing the sections of each carrier to be alternately oppositely reciprocated when the machine is in operation, the reciprocation partaking also of an oscillatory movement, whereby the straw passing over the carriers will be agitated while it is being fed rearwardly to the point of discharge at the tail end of the machine.

The rear ends of the sections composing the front carrier 69 are caused to overlap the front ends of the sections composing the rear carrier 70, thus causing the straw and other material to be subjected to a drop when passing from the forward to the rear carrier, the straw being thereby loosened or torn asunder, so as to permit the ready separation therefrom of grain and all substance which is heavier than the straw itself, all such material passing between the slats of the carriers and into the trough 56, which constitutes the bottom of the casing, as hereinbefore described.

The crank-shafts 65 and 66 are provided at their projecting ends with pulleys 77 78, connected by belting with suitable driving means, whereby they will be driven in the proper direction at the desired rate of speed. The beater-shaft 42 likewise carries a driven pulley 79. Motion is transmitted from one of the sections 71 of the front straw-carrier 69 to the straw-rack 50 by means of a suitable pitman connection 80, thus causing the said straw-rack to be vibrated upon its supporting means when the machine is in operation.

In the rear end of the casing underneath the rear straw-carrier 70 is placed a downwardly and forwardly inclined bottom board or grain-board 81, which is connected with and discharges into the rear end of the trough 56. This grain-board extends entirely to the tail end of the machine and may serve as a support for the straw-stacking mechanism. With regard to said mechanism it may be stated that any well-known approved form of stacking mechanism may be employed in connection with the invention; but inasmuch as it does not form any part of the present invention it has been omitted from the drawings.

It will be seen from the foregoing that when the threshed material leaves the cylinder and concave it is deposited upon the vibratory straw-rack 15 and passes from thence over the straw-carriers 69 and 70. During the entire period of passage through the machine the straw is subjected to agitation, and the separating process whereby the grain is separated from the straw will thus continue throughout the length of the machine, all the grain and other material thus separated being conveyed directly into the trough 56, which constitutes the greater part of the bottom of the machine. During the entire process of separation the threshed material is confined within a closed space and is not subjected to the disturbing influence of an air-blast, with the exception of such currents of air as may be necessarily set in motion by the action of the threshing-cylinder and of the beater, which, however, to some extent neutralize each other, the beater serving merely to shake up and disintegrate the mat or mass of threshed ma-

terial discharged from between the cylinder and the concave. I find that in this manner a most thorough separation may be effected and that without loss of grain, which is frequently blown out with the straw at the tail end of machines in which the moving mass of straw is subjected to the influence of air-blasts.

At the tail end of the machine is a cross-bar 82, and at the front end of the machine is a cross-bar or sill 83, said cross-bars affording bearings for a longitudinally-disposed shaft 84, which is supported a short distance above the bottom of the trough 56 and which extends through the front and rear walls of the latter, which are connected, respectively, with the lower edges of the inclined board 55 and of the grain-board 81. The rear wall of the trough is designated 85. Within the trough 56 the shaft 84 carries a worm or spiral carrier 86, which when the shaft is rotated in a forward direction serves to convey the contents of the trough in a rearward direction, the rear wall 85 having a discharge-opening 87, provided with a rearwardly-extending chute 88. The rear wall 85, the grain-board 81, an inclined plate or deflector 89, depending from the rear edge of said grain-board, and a tail-board connected hingedly with the rear part of the frame of the machine and capable of folding up against the cross-bar 82 combine to form a closure or a chamber 91, the bottom of which may be said to be formed by a plate 92, having two transverse grooves or gutters 93 and 94 disposed, respectively, at the front and at the rear ends of said plate. The hinged tail-board 90 is provided at its edges with chains 95, capable of being connected detachably with hooks 96 upon the sides of the casing of the machine, thus enabling the tail-board to be supported either in a shut or in a partly-open position, whereby it serves as a deflector, as will be presently understood. A fan-casing 97, disposed in front of the bottom plate 92, has an exit-spout 98, the lower edge of which is connected with the front edge of the said bottom plate, over which the blast set up by a fan 99, mounted upon a shaft 100 within said casing, will thus be directed. In the exit-spout 98 of the fan-casing is disposed a valve or damper 101, which is mounted upon a shaft 102, that extends through one side of the casing, to enable said damper to be adjusted and regulated.

The frame of the machine supports under the forward end of the trough 56 a fan-casing 103, containing a fan 104, mounted upon a shaft 105. The exit-spout 106 of the fan-casing 103 is funnel-shaped or contracted, and it terminates in a comparatively narrow flat discharge-tube 107, which extends rearwardly under the bottom of the trough 56 and has its discharge-opening directly below the discharge-chute 88 of said trough.

The shaft 84 carries in rear of the rear partition-wall 85 of the trough 56 a rotary sieve or separator, which is composed of two foraminous cylindrical members—namely, the inner cylinder 108 and the outer cylinder 109—which are preferably concentric with each other and which are suitably supported upon arms 110, radiating from the shaft 84. These cylinders are preferably constructed of perforated sheet metal, which in consideration of the wear to which they will be exposed should be sufficiently stout. Adjacent to and mounted in contact with the inner surface of the outer cylinder 109 is a regulating-cylinder 111, which is foraminated, like the said outer cylinder 109, the perforations in the latter and in the said regulating-cylinder being disposed normally in registry with each other. Guiding means, such as pins 112 upon one of the cylinders extending through longitudinal slots 113 in the other cylinder, may be provided, and the inner or regulating cylinder is provided with a suitably-disposed handle 114 at its rear end, whereby it is made capable of longitudinal adjustment. Means, such as a suitably-disposed set-screw 115, may be provided for the purpose of retaining the cylinders 109 and 111 in proper relation to each other after the desired adjustment has been effected. It will be readily seen that by proper adjustment of the regulating-cylinder the perforations in the latter and in the outer cylinder may be brought partially out of alinement, thereby reducing the size of the openings through which material may be permitted to escape, and consequently adapting the cylinder—or "sieve," as it may be properly termed—for use in connection with the various kinds of grains and seeds. This is an important advantage of the present invention, inasmuch as by this extremely-simple adjusting means the machine may be fitted to operate successfully not only upon the various kinds of grains—such as wheat, rye, oats, barley, and the like—but with equal efficiency upon millet and other seeds. It will be readily understood that while the adjusting cylinder or sieve has been described as being disposed in contact with the inner side of the outer cylindrical sieve the conditions may without departure from the principles of the invention be reversed, the movable or adjustable cylinder being disposed adjacent to and in contact with the exterior surface of the outer sieve or cylinder.

The cylinders which constitute the cylindrical sieve, which latter as an entirety is designated 116, are open at their front and rear ends, the front or receiving ends being guarded by a circular plate 117, suitably connected with the rear wall 85 of the trough 56 and which is open for the passage of the discharge-chute 88 and for the blast-tube 107, the function of said plate 117 being simply to prevent grain from being spilled over the front edge of the cylindrical screen. The rear end of

the latter is open to the discharge of grain, &c., and it terminates within a short distance of the tail-board or deflector 90.

If desired, the sieve-cylinder 116 may within the scope of the invention be composed of a greater number of foraminous cylindrical members than herein described and illustrated; but ordinarily the construction herein shown and described will be found ample and efficient for the purposes of the invention.

The bottom plate 92 of the chamber 91, within which the rotary sieve is located, is provided, as herein described, with transverse grooves or gutters 93 and 94, and in each of these is disposed a conveyer-screw, that at the front end being designated 118 and the one at the rear end 119. The latter is the tailings-screw, and the trough 94, in which it is mounted, is disposed to discharge into the lower end of an elevator 120, whereby the tailings are returned to the feed end of the machine. The spiral conveyer 118 in the trough 93 discharges the clean grain at one side of the machine-casing, where it is disposed of in the usual manner.

The longitudinal shaft 84, carrying the rotary sieve, may be driven by means of miter-gearing, or, as shown in the drawings, by means of a pinion 121 and a crown-gear 122 from a counter-shaft 123, supported in brackets at the front end of the machine, said counter-shaft being driven, if desired, directly from the cylinder-carrying shaft. The tailings-elevator and other working parts of the device, such as the fans, may be driven by means of pulleys and belting, either direct from the cylinder-carrying shaft or in any suitable approved manner, whereby the various parts shall be operated in the desired direction and at the proper rate of speed. Regarding the construction of the tailings-elevator, the latter does not materially differ from the well-known tailings-elevators of ordinary construction, with the exception that I employ a carrying-bucket 124, struck up or stamped from a single piece of metal and comprising the bottom piece 125 and back piece 126, the former having extensions forming the end members 127, which are bent to form lips 128, extending in rear of and supporting the rear side members 126. These buckets may be suitably riveted to or otherwise connected with the belt or chain forming the endless conveyer of the elevator.

In the funnel-shaped portion 106 of the discharge-spout of the fan-casing 103 is disposed a regulating valve or chamber 129, having a handle 130 extending through one side of the casing and enabling said valve or damper to be properly adjusted to increase or diminish the force of the blast escaping through the discharge-tube of the fan-casing. The shaft 102 of the damper 101, disposed in the discharge-spout of the fan-casing 97, extends through one side of the casing and carries a radiating arm 131. Pivotally connected with the side of the casing at a short distance from the protruding end of the shaft 102 is a segment-bar 132, provided with a plurality of notches 133, any one of which is adapted for the reception of the pointed end of the arm 131, in the direction of which the free end of the segment-bar 132 is forced by the action of a suitably-disposed spring 134. It will be noticed that by grasping the free end of the segment-bar and retracting the latter against the tension of the spring 134 the handle 131 may be turned, thereby partially rotating the shaft 102, carrying the damper 101, and thereby regulating the blast of the fan 99. By simply letting go of the free end of the segment-bar 132 the latter will be brought into contact with the free end of the arm 131, which latter will naturally engage one of the notches 133 and be thereby retained in the position to which it has been adjusted.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains. When grain is fed to the cylinder of the machine, it is operated upon by the cylinder and the concave in the usual manner. The threshed mass discharged between the cylinder and concave is operated upon by the beater, whereby it is disintegrated and thrown upon the straw-rack underneath, the major portion of the grain escaping at this point through the interstices between the slats of which the straw-rack is composed. By the vibratory motion of the straw-rack the mass of straw is fed rearwardly until it drops upon the lower end of the front carrier 69, from which it passes to the rear carrier 70. By the reciprocatory and oscillatory movement of the sections composing said carriers the mass of material passing over the same will be still further disintegrated and torn asunder and the passage of grain through the interstices between the slats composing the bodies of the sections of said carriers will be thus facilitated. The grain, chaff, and other material is all deflected into the trough 56 and is carried by the spiral conveyer in the latter in a rearward direction through the discharge-opening and rear wall of the trough and over the chute 88 into the interior of the rotary sieve. As the material passes over the discharge end of the chute 88 it is subjected to the blast issuing through the discharge-spout 107 of the fan-casing 103, and chaff, straw, and like material will thus be blown through the inner member of the rotary-sieve cylinder and out over the tail-board at the tail end of the machine. Any grain which may be thus blown out through the rotary sieve will gravitate in the direction of the tailings-trough, some passing directly into said trough and others striking the tail-board, which has been previously properly adjusted and which

serves to guide any material impinging thereon into the tailings-spout. The grain which passes through the sieve falls upon the portion of the bottom plate 92 which is intermediate the grain-trough and the tailings-trough and which is inclined in the direction of the former into which the tail end of the grain is thus directed to be discharged by the spiral carrier 118 through one side of the machine-casing. The tailings will pass from the trough 94 to the tailings-elevator and be conveyed to the feed end of the machine to be once more passed through the latter for thorough and effective separation.

In some cases it is desired to save mustard-seeds and other fine seeds which may have become mixed with the wheat. In such cases a sieve 140, sufficiently fine to permit the mustard and other fine seeds to pass therethrough, is suspended below the rotary sieve, and a receiving-trough 141, having a rotary spiral feed-screw 142, is provided for the purpose of discharging such fine seeds at one side of the machine. When this modified construction is resorted to, the wheat will pass over the sieve 140 direct to the feed-screw 118, and the fine seeds will pass through the sieve to the feed-screw 142 to be discharged at the side of the machine, as will be readily understood.

Having thus described my invention, I claim—

1. A casing, throat-plates supported upon said casing and having shoulders or offsets, a yoke connected with one of said throat-plates, journal-boxes supported upon said yoke and upon the throat-plates, a cylinder-carrying shaft journaled in said boxes, a frame supported upon the shoulder of one of the throat-plates having the shaft-supporting yoke, a pulley upon said shaft between the arms of the yoke, a driving-belt engaging said pulley, an idler journaled in the frame supported upon the shoulder of the throat-plate and supporting the lower lead of the driving-belt, and vertically-disposed idlers supported by said frame and engaging the sides of the belt.

2. In a threshing-machine, a casing having a trough-shaped bottom, a downwardly and rearwardly inclined deflector at the front end of the casing, a downwardly and forwardly inclined stationary grain-board at the rear end of the casing, straw carrying and agitating means within the casing above the trough-shaped bottom and above the inclined grain-board, and grain-conveying means in the trough-shaped bottom.

3. In a threshing-machine, a casing having a trough-shaped bottom, a downwardly and rearwardly inclined deflector at the front end of the casing, a downwardly and forwardly inclined grain-board at the rear end of the casing, straw carrying and agitating means disposed longitudinally within the casing, grain-conveying means in the trough-shaped bottom of the casing, a partition coöperating with the grain-board and with the sides of the casing to form an auxiliary chamber at the rear end of the casing beneath the grain-board, and grain-separating means within said chamber adapted to receive the discharge from the grain-conveyer.

4. In a machine of the class described, a casing having a trough-shaped bottom, an inclined grain-board and a partition coöperating with the sides of the casing to form an auxiliary chamber at the rear end of the casing, a longitudinally-disposed driven shaft extending through the casing and the auxiliary chamber, a screw-flange upon said shaft disposed in the trough-shaped bottom of the casing, and a cylindrical separating-screen mounted upon said shaft within the auxiliary chamber.

5. In a machine of the class described, a casing containing a main chamber and an auxiliary chamber, said main chamber having a trough-shaped bottom and said auxiliary chamber having a downwardly and forwardly inclined top constituting a grain-board and adapted to discharge into the main chamber, straw agitating and feeding mechanism disposed within the main chamber and above the grain-board, a longitudinally-disposed driven shaft extending through the main and auxiliary chambers, a screw conveyer upon said shaft within the main chamber, and a cylindrical separating-screen upon said shaft within the auxiliary chamber.

6. In a machine of the class described, a casing containing a main chamber and an auxiliary chamber, said main chamber having a trough-shaped bottom and said auxiliary chamber having an inclined top constituting a grain-board and discharging into the main chamber, a longitudinally-disposed shaft extending through the main and auxiliary chambers, a screw conveyer upon said shaft within the main chamber, a cylindrical separating-screen upon said shaft within the auxiliary chamber, and means for setting up a blast of air and for discharging the same into the auxiliary chamber.

7. In a machine of the class described, a casing containing a main chamber and an auxiliary chamber, said main chamber being provided with a trough-shaped bottom and said auxiliary chamber being provided with an inclined top constituting a grain-board and discharging into the main chamber, straw feeding and agitating means within the main chamber, means for conveying the grain from the bottom of the main chamber into the auxiliary chamber, grain-separating means arranged within said auxiliary chamber, and means disposed below the bottom of the main chamber for setting up a blast of air and for discharging the same into the auxiliary or separating chamber.

8. In a machine of the class described, a casing containing a main chamber and an auxiliary chamber, said main chamber being pro-

vided with a trough-shaped bottom and said auxiliary chamber being provided with an inclined top constituting a grain-board and discharging into the main chamber, straw feeding and agitating means within the main chamber, a longitudinally-disposed shaft extending through the main and auxiliary chambers, a screw conveyer upon said shaft within the main chamber, a spout or chute forming a continuation of the bottom of the main chamber and extending through an aperture in the partition-wall into the auxiliary chamber, a cylindrical separating-screen supported upon the longitudinal shaft within the auxiliary chamber and receiving the material discharged over said chute or spout, and means disposed below the bottom of the main casing for setting up a blast of air and for discharging the same into the cylindrical separating-screen beneath said chute or spout.

9. A casing containing an inclosed chamber having a trough-shaped bottom, threshing means at the front end of said chamber, a straw-discharge opening at the rear end of the same, an inclined grain-board extending forwardly and downwardly from the straw-discharge and connected at its lower front end with the trough-shaped bottom, carrying and separating means within said chamber, a conveyer in the trough-shaped bottom of said chamber, for conveying material contained in the latter to a discharge-opening in the rear wall, a chute extending rearwardly from said discharge-opening, a cylindrical sieve mounted for rotation in rear of the discharge-opening and adapted to receive material discharged over the chute, means for setting up a current of air and for discharging the same below the chute, longitudinally through the cylindrical sieve, and an adjustable tail-board constituting a deflector in rear of the discharge end of the cylinder-sieve.

10. In a machine of the class described, a cylindrical sieve mounted for rotation, a spiral conveyer upon the extended axis of the cylinder for discharging threshed values into the front end of said sieve, means for setting up a current of air and for discharging the same longitudinally through the sieve, an adjustable tail-board constituting a deflector, a tailings-spout at the lower edge of said tail-board, a forwardly and downwardly inclined bottom plate disposed below the sieve, a grain-spout at the lower end of said bottom plate, means for setting up a current of air and for directing the same rearwardly between the rotary sieve and the bottom plate, and means for directing and regulating said air-current.

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

PAUL FLESHER.

Witnesses:
RALPH SHANHOLTZER,
J. W. SILVY.