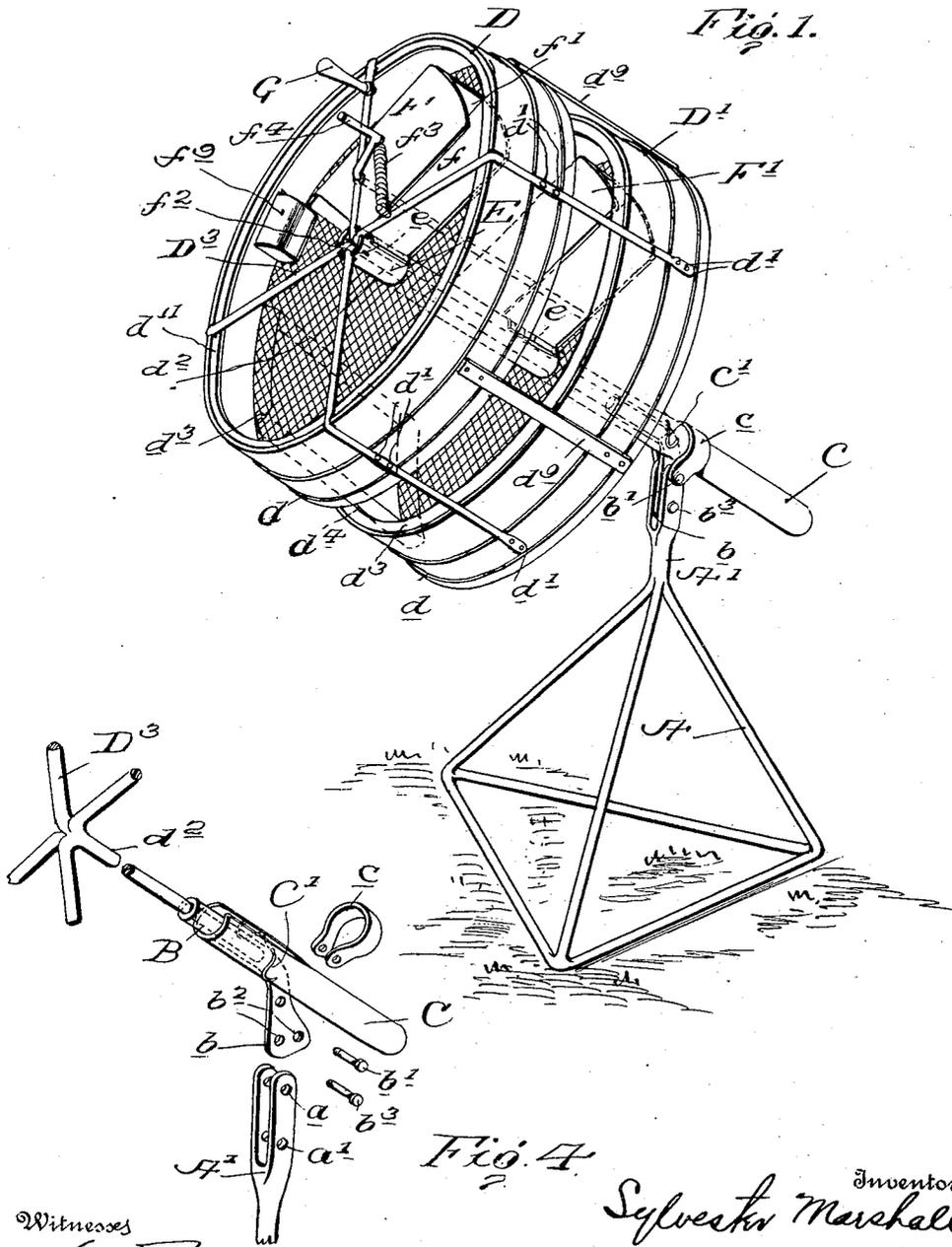


S. MARSHALL.
 GRADING OR SEPARATING MACHINE.
 APPLICATION FILED DEC. 15, 1915.

1,198,395.

Patented Sept. 12, 1916.
 2 SHEETS—SHEET 1.



Witnesses
Wm. Murray
Albert Perkins

Inventor
Sylvester Marshall
 Attorney
Geo. W. Evans

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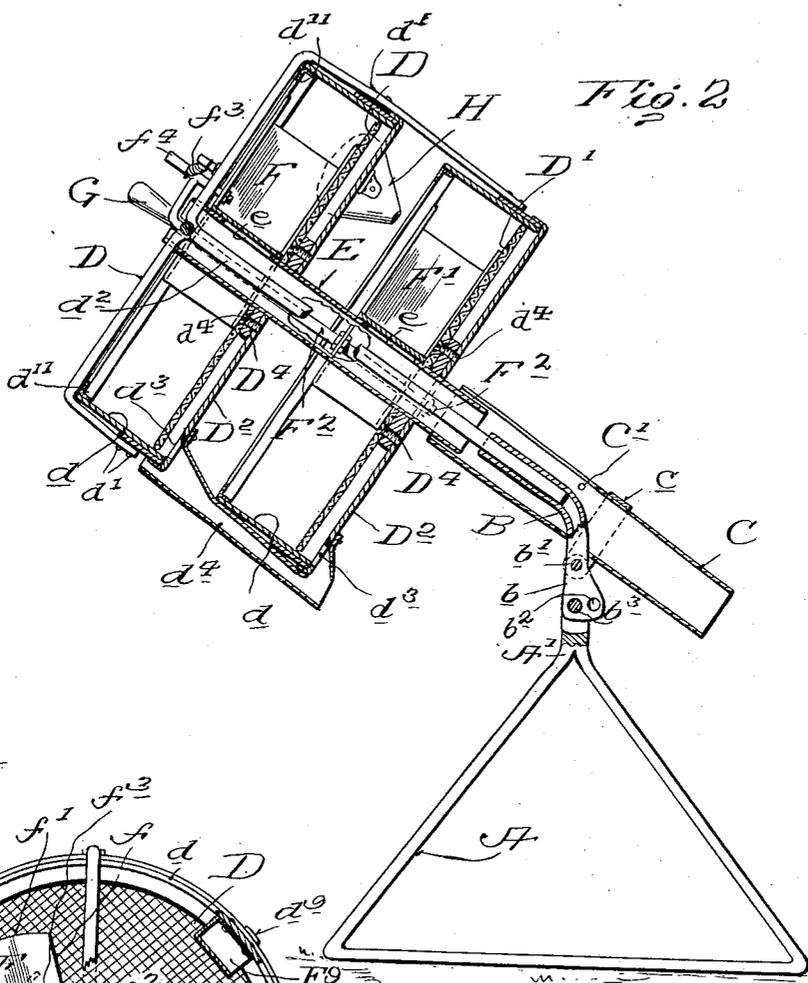


Fig. 2

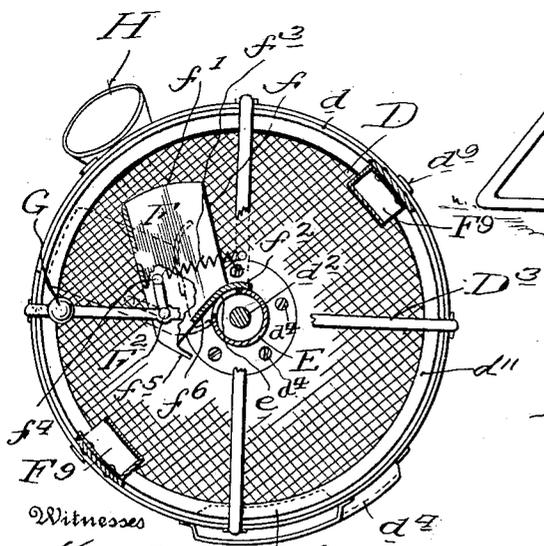


Fig. 3.

Witnesses
Wm. M. Mumay
Albert Popkiss

334

Inventor
Sylvester Marshall
Geo. H. Evans

Attorney

UNITED STATES PATENT OFFICE.

SYLVESTER MARSHALL, OF ATHENS, OHIO.

GRADING OR SEPARATING MACHINE.

1,198,395.

Specification of Letters Patent. Patented Sept. 12, 1916.

Application filed December 15, 1915. Serial No. 66,958.

To all whom it may concern:

Be it known that I, SYLVESTER MARSHALL, a citizen of the United States, residing at Athens, in the county of Athens and State of Ohio, have invented certain new and useful Improvements in Grading or Separating Machines, of which the following is a specification.

My invention relates to machines for separating the largest grains of wheat and the like from the smaller inferior grains.

The objects of the invention are to provide a simple and efficient machine for separating or grading out the largest grains for seed purposes. Also to provide a machine of this character with an ordinary circular sieve set with its axis at an angle of about 45°; the mesh of the sieve being larger than the largest grains to be treated so that as the mass of grain is elevated on the inclined sieve during the slow rotation thereof all of the smaller grains, and cockle, cheat, grit and the like will readily fall through the sieve, while, owing to the inclination of the sieve, the largest and best grains only will remain therein. Also to provide means for carrying off the smaller inferior material which comprises from 30% to 50% of the whole amount by providing the sieve below its reticulated bottom with a solid bottom having a marginal outlet. Also to provide the axis of the sieve with means for changing the inclination thereof. Also to provide duplicate connected sieves having a common inclined axis and an offtake leading from the marginal outlets. Also to provide the two screens with a common axially arranged discharge tube for the largest and best grains. Also to provide means for lifting the seed grains and discharging them into said axial outlet; also to provide for lifting some of the mass of grain and allowing same to run down the inclined sieve. Also to provide a bag holder at the lower end of said axial outlet. These objects I accomplish by the construction shown in the accompanying drawing, in which:

Figure 1 is a perspective of my improved grader or separator. Fig. 2 is a longitudinal vertical section through the machine. Fig. 3 is a sectional plan of one of the sieves with its discharge bucket in its two positions. Fig. 4 is a detail of the connection between the base and the sieve axis.

A designates a suitable base, such as the

tripod shown, provided with a bifurcated upper end A', having upper and lower apertures *a a'*.

B designates an inclined tubular axis or bearing having on its lower side a depending lug *b*, pivoted by a bolt or pin *b'*, within the bifurcation A' and provided below its pivotal point with a plurality of apertures *b²* adapted to register with the aperture *a'* for the passage of a pin or bolt *b³*. By this means the angle of the axis or journal B and of the sieves carried thereby may be changed.

C designates a discharge spout or tube secured by a clamp *c* to the bolt or pin *b'*. To this spout C is secured a bag holder in the form of a double hook C' upon which a bag may be suspended to receive the grain or the like.

D D' designate the two sieves, which in practice may be ordinary No. 6 sand sieves, which have about six meshes to the inch, and have the usual wood rims *d*. Across the upper screen D extends a four-armed spider D³ the outer ends of which are bent down across the outer sides of the rims *d* of both sieves to which they are secured by bolts or screws *d'*. At the center of the sieves the inner ends of the spider merge into a shaft *d²* which extends centrally through both sieves and into the tubular bearing or axis B, in which it rotates. The sieves D D' are also connected together by the bars *d⁹* secured at their ends to the sieve rims, said rims also having inwardly extending annular flanges *d¹¹* to prevent overflow of the material being treated.

The sieves D D' have solid or imperforate metal bottoms D² below their reticulated bottoms and these bottoms D² D² have peripheral outlets *d³ d³* opening into a discharge spout *d⁴* secured to the outer sides of the sieve rims *d*, so that every time the sieves make a complete revolution and the outlets *d³* reach their lowermost positions the material which has fallen through the sieves upon the bottoms D² will run out into spout *d⁴* and fall into any suitable receptacle placed therebelow.

The sieves and their metal bottoms have central openings and between the imperforate and to the reticulated bottoms are secured centrally apertured spacing blocks D⁴ to give rigidity and strength thereto.

F⁹ are fixed lifting cups at opposite sides

of the sieve rims to lift the material and then discharge it at the upper part of the inclined sieves.

E designates a central discharge tube secured at its upper end to the central part of spider D^3 and extending down through both spacing blocks D^4 of the two sieves $D D'$ into the upper end of the discharge spout or tube C before referred to. The discharge tube E is provided within both screens with outlets e , through which the perfect or seed grain is discharged.

F F' are buckets mounted at their inner ends upon a common shaft F^2 extending through both sieves and journaled at its upper end in one of the arms of spider D^3 , the lower end of the shaft being journaled in the lower sieve bottom D^2 . These buckets F F' are open at their forward sides f and outer ends f' , while at their inner ends they are provided with shut-offs f^2 for the outlets e of the discharge tube E. Normally these shut-offs f^2 are held over the outlets e by a spring f^3 connected at one end to the spider D^3 and at the other end to the handle part f^4 of the shaft F^2 . Beyond the shaft handle f^4 an operating handle G is secured to the spider arm so that while rotating the sieves to the right by handle G the operator may pull on handle f^4 with one finger or the thumb and so throw the buckets F F' outwardly, which will bring their outer open ends f' against the inner sides of the screen rims, move their shut-offs f^2 away from the outlets e and throw inwardly the inner ends f^5 of the rear walls f^6 of the buckets until they rest against the discharge tube E alongside of the rear edges of the openings e . In this position as the sieves are turned to the right the buckets F F' will gather the perfect grains when they reach their lowermost positions and discharge same into outlets e when said buckets reach their uppermost positions.

H is a funnel for supplying the lower sieve with material to be treated.

When the No. 6 sieves are set at an angle of 45° wheat may be effectively graded, but it is manifest that by proper adjustment and properly meshed sieves various materials may be separated or graded. So also the number of sieves may be changed and they may be rotated by any suitable means.

In practice the sieves are rotated to the right at about twenty times a minute and at this speed with the angle of 45° the grain will be lifted and spread out toward the left side of the sieves and form a V-shaped mass in the angle at the lower part of the sieves. As the sieves continue to rotate some of the grain will be carried up by the buckets F F' and cups F^9 and discharged upon the upper part of the sieves. The largest and most perfect grains will not fall through, even though smaller than the mesh

of the sieves, but will gradually run down the inclined surface and force out the smaller grains. This will be kept up until the operator sees that he has just the quality of grain that he desires to retain for seed-
ing purposes. Then the bucket shaft handle f^4 will be pressed toward operating handle G, whereupon the buckets F F' will gather up the grain and discharge it through the outlets e , whence it passes to the tube E and discharge chute C.

My machine will remove all of the cockle from the portion graded out for seed and then the other or smaller grain may be run through the machine again with the sieves set at a greater angle to separate most of the cockle remaining therein.

By having the mesh of the sieves larger than the greatest transverse diameter of the largest grains to be graded it follows that the inferior grains will more readily fall through, while such largest grains will slide down by gravity over the sieve and any underlying grains without falling through except to a very slight extent. Moreover, owing to such a large mesh, the grain separated for seed purposes may all be discharged through the sieve or sieves by simply turning same down to a horizontal position and vibrating said sieve or sieves a few times.

What I claim is:

1. A grader or separator comprising, an inclined, rotary sieve formed of a circular rim, and a flat reticulated bottom the mesh of which is larger than the greatest transverse diameter of the largest grains or particles of the material to be graded, and means for adjusting the sieve from an inclined to a horizontal position; whereby the sieve when rotated in an inclined position will allow all but the largest granular material to pass through and when turned down to a horizontal position will allow the remaining material to run through.

2. A grader or separator comprising a suitable base or support, and a rotary inclined sieve mounted centrally on the base or support and provided above its bottom with an axially arranged outlet, and means for lifting the graded material and discharging it directly into said outlet.

3. A grader or separator comprising a suitable base or support, a rotary inclined sieve mounted centrally on the base or support, and provided with an axially arranged outlet, and a movable bucket mounted in the sieve and adapted at its inner end to open and close said outlet for the purpose described.

4. A grader or separator comprising an inclined rotary sieve having a centrally arranged outlet, and a bucket pivoted within the sieve to swing at its outer end toward and from the rim of the sieve and at its in-

ner end into and out of register with the said outlet for the purpose described.

5 A grader or separator comprising an inclined rotary circular sieve provided with a central tubular outlet having a discharge opening in its side, and a bucket pivoted in the sieve to swing at its outer end against the sieve rim and having at the forward side of its inner end a shut-off to control said discharge opening and also provided at 10 the inner end of its rear wall with an extension to engage the outlet tube at the rear side of its opening to direct the graded material therein.

15 6. A grader or separator comprising an inclined rotary circular sieve provided with a frame or spider, and a central discharge tube having an outlet in one side, an operating handle on the spider, a handled shaft mounted in the spider near said operating handle, a bucket secured at its inner end to said shaft and having a shut-off at its inner end to close said outlet opening, and a spring holding the shut-off normally over 20 said outlet; the inner end of the rear wall of the bucket adapted to engage the outlet tube in rear of its outlet opening when the operator swings the outer end of the bucket toward the rim of the screen.

30 7. A grader or separator comprising an inclined, rotary, circular sieve provided with an auxiliary bottom spaced from its sieve; a peripheral outlet from the auxiliary bottom, a central tubular outlet from the sieve, and a manually operated swinging bucket 35 controlling said central tubular outlet.

8. A grader or separator comprising an inclined, rotary sieve formed of a circular imperforate rim, and a flat reticulated bottom having a central tubular outlet, and a manually controlled spring pressed bucket 40 between the rim and outlet and controlling said outlet.

9. A grader or separator comprising a plurality of parallel connected sieves, each 45 having a circular rim, an inner reticulated flat bottom and an outer imperforate bottom, a central discharge tube extending through said sieves and having an opening above the reticulated bottom of each sieve; 50 peripheral outlets being provided for the imperforate bottoms, a rock shaft extending through both sieves, discharge buckets mounted on said shafts and at their inner

ends controlling the outlets in said central 55 tube.

10. A grader or separator comprising a plurality of parallel connected sieves set at an incline and provided with imperforate bottoms below their sieve bottoms; discharge outlets at the peripheries of the imperforate bottoms, a spout connecting the said peripheral outlets, a central discharge tube extending through the sieves and having outlet openings, spring pressed buckets 60 in the sieves controlling the openings in the central tube, a manually actuated connecting shaft for the said buckets, and an outlet chute below the sieves into which said central discharge tube leads. 65

11. A grader or separator comprising a base or support, a vertically rocking bearing pivoted to said support, a rotary sieve having a central axis mounted at its lower end in said bearing, a central discharge tube 70 concentric with said axis, an outlet chute mounted on the vertically rocking bearing and into which the lower end of said central discharge tube leads, and a manually controlled bucket in the sieve controlling said 80 central discharge tube.

12. A grader or separator comprising a rotary sieve formed of a circular rim and a flat reticulated bottom, means for holding said sieve at an inclination and means for 85 adjusting the sieve from an inclined position to a horizontal position.

13. A grader or separator comprising a plurality of parallel connected sieves set at an incline and provided with imperforate 90 bottoms below their sieve bottoms; discharge outlets at the peripheries of the imperforate bottoms, a spout connecting the said peripheral outlets, a central discharge tube extending through the sieves and having 95 outlet openings, spring pressed buckets in the sieves controlling the openings in the central tube, fixed cups on the inner walls of the sieve rims, a manually actuated connecting shaft for the said buckets, and an 100 outlet chute below the sieves into which said central discharge tube leads.

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

SYLVESTER MARSHALL.

Witnesses:

JOHN J. WOOLLEY,
C. M. GILL.