

F. F. LANDIS.  
SEPARATING GRATE FOR THRESHING MACHINES.  
APPLICATION FILED APR. 25, 1902.

959,561.

Patented May 31, 1910.

2 SHEETS—SHEET 1.

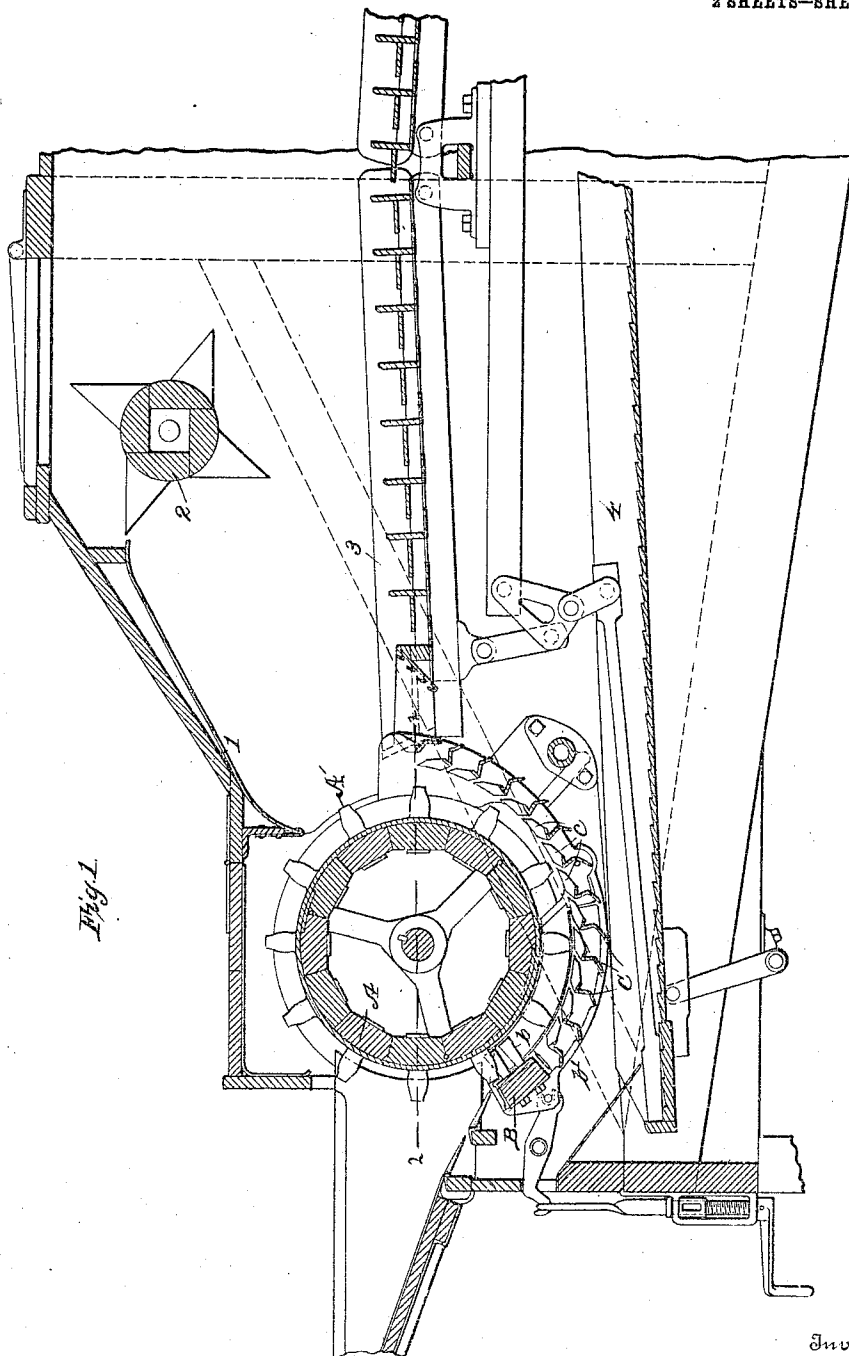


Fig. 1

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Witnesses

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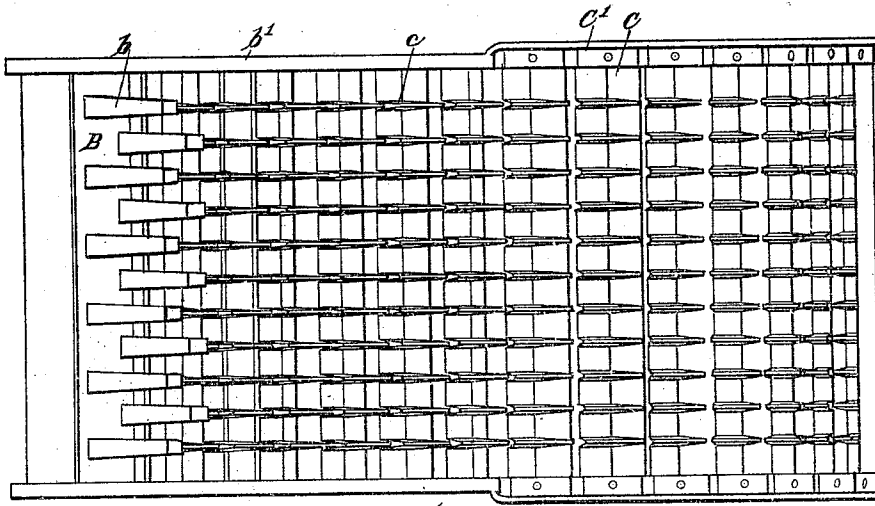


Fig. 2.

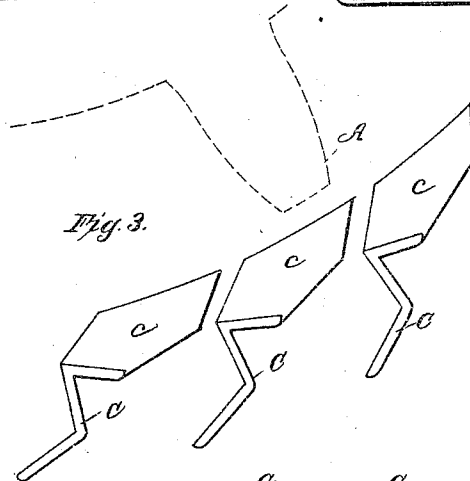


Fig. 3.

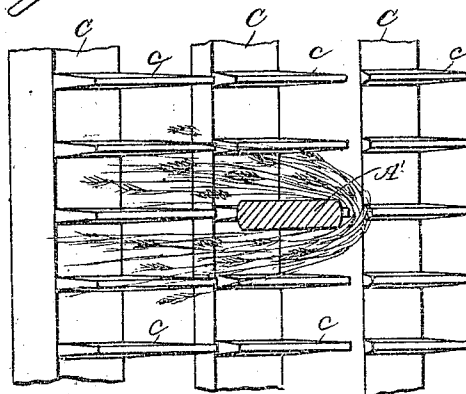


Fig. 4.

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# UNITED STATES PATENT OFFICE.

FRANK F. LANDIS, OF WAYNESBORO, PENNSYLVANIA.

SEPARATING-GRATE FOR THRESHING-MACHINES.

959,561.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed April 25, 1902. Serial No. 104,688.

*To all whom it may concern:*

Be it known that I, FRANK F. LANDIS, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Separating-Grates for Threshing-Machines, of which the following is a specification.

My said invention relates to certain improvements in grain threshing and separating machines, the object whereof is to reduce the number of parts usually employed in such a machine, reduce the power usually required for operating it, and increase the capacity and efficiency of said machine.

It consists chiefly in an improved construction of a separating grate for use adjacent to and in coöperation with the threshing cylinder whereby the grain may be separated from the straw immediately after the threshing operation, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts: Figure 1 is a longitudinal section through the front end of a threshing machine provided with my improved separating grate, Fig. 2 a plan view of the separating grate and concave as seen when looking downwardly from the dotted line 2—2 in Fig. 1, Fig. 3 a detail view similar to a portion of Fig. 1, on an enlarged scale, and Fig. 4 a detail view similar to a portion of Fig. 2, on an enlarged scale, one of the cylinder teeth being shown in section, with the grain straw indicated as it is carried over the grate.

The machine in its general construction is not widely different from the threshing machines shown in several patents heretofore granted to me, except the separating grate, and it may be of the general construction shown, or of any approved or suitable construction, as will be readily understood. The cylinder A also is or may be of the construction shown, or any approved construction, mounted in a suitable manner, and provided with teeth A'.

The concave bars B are of suitable form and bear the concave teeth b. Said bars are mounted in the curved concave supports b', supported on the frame of the machine. I have shown but one of said bars, but, as will

be readily understood, there may be as many as the character of the work requires.

The separating grate C which constitutes the leading feature of my invention is made up of a series of angle bars which extend transversely of the direction in which the straw moves through the machine after being threshed, which bars have a series of webs c on their upper edges extending transversely of said bars and in line with the direction of the travel of said straw. The main portion of said grate comprises a number of said angle bars supported on curved end pieces C', which are supported on the frame of the machine in any approved manner. Said main portion extends to the inner end of the concave supports b', and said grate is continued to the concave bars B by being formed in short sections, corresponding in size to said bars B, which sections are mounted in said supports b' in the same manner as are the concave bars. By this means, as will be readily seen, the concave may be extended, where the character of the work requires, by removing one of the short sections of the grate and substituting therefor an additional concave bar. Said bars may be arranged in continuous order, or a section of said grate may be interposed between two of said concave bars, which arrangement, for some characters of work, will be found advantageous. The webs c on each angle bar are preferably of the form shown, being narrow at the top edge, and extend forward from the upper edge of the bar upon which they are mounted to a point near the next bar. The webs on the several bars are arranged in line with each other, forming what is practically a continuous web with interstices at intervals. The top edge of each web is preferably slightly concave longitudinally so that the upper or top surface of the grate, which supports the straw, compels it to move in a circular path, whereby the centrifugal action will be imparted to the grain, chaff and other particles to throw them free from the straw and into the separating grate. The surface of the said grate is thus made up of narrow ribs a short distance apart, extending in the direction of the travel of the straw, and conforming to or nearly to the contour of the cylinder, the rear end being formed on a somewhat larger curve

so that the space between the cylinder and the grate widens somewhat toward the point where the straw is discharged from the teeth of the cylinder, which permits the straw to clear freely from the ends of the cylinder teeth and over the rear and upper end of said grate. Said webs or ribs are preferably but a short distance from the points of the cylinder teeth and are arranged so that there will be one of said ribs to each circumferential row of teeth on the cylinder and preferably directly in line with the path of said row of teeth so that each of said teeth will follow immediately above said ribs in operation, as indicated in Fig. 4. The transverse angle bars C are so arranged that the front faces stand at such an angle to the direction of the motion of the grain as will deflect said grain downwardly out of the path of the straw. The front face of the lower wing of said bar serves to arrest any straws the ends of which may strike said face and prevents them from passing through with the grain. Said lower wing, however, will not prevent the grain from passing through as it is deflected by the upper wing at an angle substantially parallel with said lower wing and opposite from that in which it is traveling when it strikes said deflecting surface.

The deflector 1, the picker 2, the straw-bottom 3, the grain-bottom 4, and other parts of the machine perform their usual and well-known functions and require no description herein.

The operation of the machine, in so far as it is modified by the use of the grate above described, is as follows: The straw in passing through between the cylinder and the concave doubles around the teeth of said cylinder as indicated in Fig. 4, and is carried along over the surface of the grate, the straw spreading out between the rows of webs *c*, permitting the grain and chaff to be freed therefrom by centrifugal force and thrown against the deflecting surfaces of the transverse bars C, and directed onto the grain-bottom 4 beneath. The edges of the webs *c* being narrow offer but very slight resistance to the travel of the straw, and, being arranged directly in the path of the cylinder teeth, permit said straw to open or loosen up in its passage over the grate so that the centrifugal force will not only free the chaff and grain therefrom but will drive the unthreshed portions or heads against the transverse bars D with considerable force, which will operate to beat out considerable grain from such portions or heads, commonly known as "tailings" and thus effect a more perfect separation than would otherwise be possible. The surface of the grate, offering as it does so little resistance or friction, materially reduces the power required to operate the machine, while the transverse bars C of the

grain and chaff separating grate are allowed to be set at any angle required to deflect the grain away from the straw without in any way retarding the straw or offering any resistance to its progress.

It will be understood, of course, that while the particular construction of grate shown is regarded as very efficient and desirable, yet it may be changed in various details without departing from the spirit of my invention, which consists more particularly in a separating grate for threshing machines having what is practically two surfaces composed of sets of bars, one extending in the direction of the travel of the straw and adapted to support said straw and guide it in the desired direction without offering undue resistance or friction, and the other set of which serve to arrest and deflect out of the path of the straw the grain chaff and heavy particles thrown from the straw by the motion of the cylinder, or centrifugal force, said first set of bars being interposed between the threshing cylinder and the second set of bars for the purpose of supporting the body of straw out of contact therewith.

It will be understood that the term "angle-bar", as used in the specification and claims, means a bar formed on an angle, substantially as shown, and according to the common definition of the term.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination, in a threshing machine separator, with the cylinder thereof, of the separating grate located beneath and in position to cooperate with the teeth of said cylinder, said grate comprising angle-bars extending transversely of the machine with the two wings of each bar arranged to serve as deflectors for the grain and straw and provided on their top edges with short webs projecting at substantially right angles with said bars and in line with the course of the straw, substantially as set forth.

2. A separating grate for threshing machines comprising angle-bars extending transversely of the course of the straw and set with one face to deflect the grain downwardly and provided on their upper edges with short webs projecting in line with the course of the straw, the top edges of said webs being at an elevation above the top edges of their respective angle-bars, substantially as set forth.

3. A separating grate for threshing machines comprising bars with a plurality of faces set at different angles to the course of the straw and arranged to extend across the course of the straw and having short webs thereon which extend in line with the course of the straw, one of the faces of each of the bars being arranged in the path of the flying grain at an angle to deflect said grain away

from the direction of said straw, substantially as set forth.

4. In a threshing machine, the combination, of the cylinder, the concave, and the separating mechanism embodying a separating grate extending rearwardly from said concave and curved substantially concentric with said cylinder comprising angle-bars extending across the machine each of said bars having a series of transverse webs arranged along its top edge, the webs of one bar being in line with those of the next adjacent bars, substantially as set forth.

5. A concaved separating grate for threshing machines arranged to be in close proximity to the outer ends of the teeth of the threshing cylinder, said grate being composed of a series of transverse downwardly-deflecting grate-bars with a series of webs on each successively arranged to form practically continuous webs with interstices between the ends of said short webs, said webs being arranged approximately under and in line with the travel of the outer ends of the teeth of the threshing cylinder and adapted to receive the straw as it is stripped by centrifugal force from the ends of said teeth, substantially as set forth.

6. A separating grate for threshing machines comprising a set of bars extending across the travel of the straw and formed with a plurality of deflecting faces arranged at an angle to each other to deflect the flying grain downwardly away from the straw and a series of webs on the upper edges of said bars extending in line with the travel of the straw and adapted to support said straw above said bars and afford a smooth surface for said straw to travel over, substantially as set forth.

7. In a threshing machine, the combination of the cylinder, the concave, and the separating mechanism embodying a separating grate comprising a series of transverse bars arranged at an angle to deflect the grain downward away from the straw and in near proximity to said cylinder rearwardly from said concave, and a series of webs on the top surface of each of said bars extending in line with the course of the straw and those on one bar in line with those of the other bars in a curved direction from beneath to the rear of said cylinder, substantially as set forth.

8. In a threshing machine, the combination of the cylinder, the concave, and the separating mechanism embodying a separating grate comprising transverse bars and longitudinally extending webs on the top sides thereof, said webs being arranged in line those of one bar with those of the other bars and on the lines of travel of the several circumferential rows of teeth on the cylinder, substantially as set forth.

9. In a threshing machine, the combination of the cylinder, the concave, and the separating mechanism embodying a separating grate comprising transverse angular shaped bars with webs on their top edges which extend transversely of said bars and are arranged those on one bar in line with those on adjacent bars with a short space between them, and in line with the teeth on the cylinder, substantially as set forth.

10. In a threshing machine, the combination of the cylinder, the concave, and the separating mechanism comprising a separating grate having angle-bars a short distance apart and extending in a direction across the machine, and short webs extending from the top edge of each bar rearwardly in the direction of the course of the straw to near the front edge of the next bar and above the surface of said bar, substantially as set forth.

11. A separating grate for threshing machines, comprising a top part made up of a succession of short bars or ribs extending in the direction of the travel of the straw, and an under part beneath said top part made up of angle-bar deflectors extending transversely to the travel of the straw, substantially as set forth.

12. A separating grate for threshing machines, comprising parts with straw supporting surfaces extending in the direction of the travel of the straw, and transverse parts with grain separating or deflecting surfaces adjacent to but beneath said straw supporting surfaces, substantially as set forth.

In witness whereof, I, have hereunto set my hand and seal at Waynesboro, Pennsylvania, this 10th day of March, A. D. nineteen hundred and two.

FRANK F. LANDIS. [L. S.]

Witnesses:

M. F. NEWMAN,  
ALF N. RUSSELL.