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W. A. BREWSTER.
 ROTARY GRAIN SEPARATOR.
 APPLICATION FILED MAY 11, 1905.

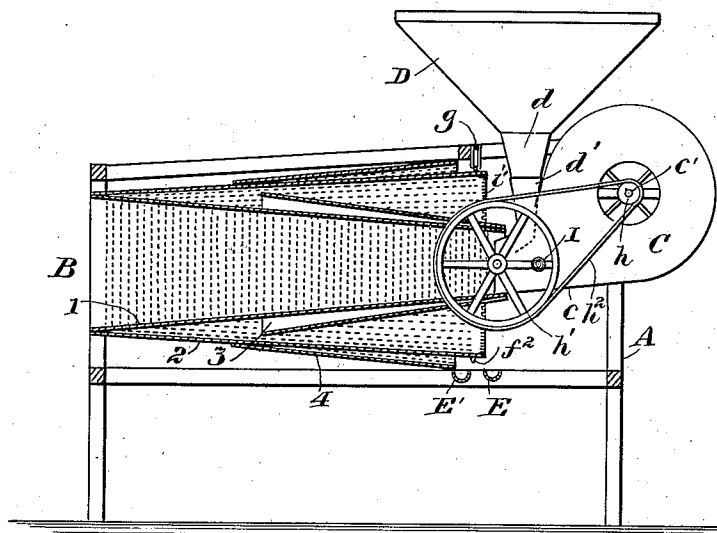


Fig. 1.

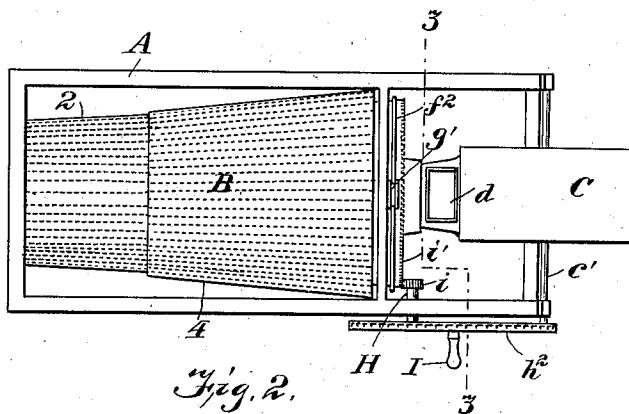


Fig. 2.

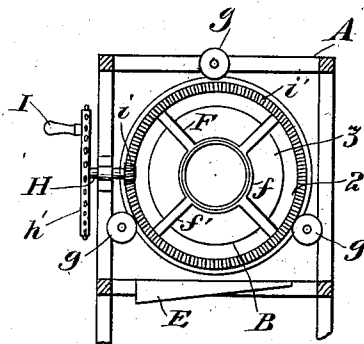


Fig. 3.

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WILLIAM A. BREWSTER, OF EDMONTON, CANADA.

ROTARY GRAIN-SEPARATOR.

No. 828,529.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed May 11, 1905. Serial No. 259,867.

To all whom it may concern:

Be it known that I, WILLIAM A. BREWSTER, a subject of the King of Great Britain, residing at Edmonton, in the Province of Alberta and Dominion of Canada, have invented certain new and useful Improvements in Rotary Grain-Separators, of which the following is a specification.

My invention relates to grain-separators of that class wherein the grain is agitated in a revoluble screen and at the same time it is graded and the chaff with the light grain and other refuse are blown out of the machine.

The object of my invention is to provide a simple construction of separator wherein the chaff, straw, and light grain are blown away from the large and small grain at an early stage of the separation, while the large good grain is collected and delivered at the other end of the machine from which the refuse emerges and the smaller grain is separated from the foul seeds and small particles of dirt, so as to be collected and delivered separately from the larger good grain.

My improved machine comprises a rotary screen or drum composed of a number of peculiarly-arranged conical members or sections which, in a way, are separate and distinct to treat the different materials and at the same time are combined to rotate as a unit. The rotary screen or drum consists of four sections or members, the majority being of foraminous material, such as wire screening or perforated metal. Of these conical sections two of them extend the full length of the screen, the two long conical members being arranged reversely to each other and united directly together at one end, the other ends being separated or spaced. Between the long conical members of the screen or drum I arrange a third conical member, somewhat shorter than either long member and having a different taper or conicity, so as to partly envelop the innermost section and to incline therefrom toward the surrounding long section. The fourth member or section is short, like the third-mentioned section, but is tapered oppositely thereto, and it operates to separate the smaller grain from the foul seeds and the small particles of dirt.

The invention consists also in the construction and combination of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, wherein like characters of reference are

used to indicate corresponding parts in all the figures.

Figure 1 is a vertical central longitudinal sectional elevation through a grain-separator embodying my invention. Fig. 2 is a plan view thereof, and Fig. 3 is a vertical cross-section taken in the plane of the dotted line 3 3 of Fig. 2 looking in the direction of the arrow.

A designates a supporting-frame, which may be of any suitable or preferred construction, and within or upon this frame are mounted a revoluble screen or drum B, a blast-fan C, and a feed-hopper D.

The important part of my invention is the novel construction of the revoluble screen or drum, which, as shown more particularly by Fig. 1, consists of a plurality of conical members, each in the form of a frustum of a cone. I prefer to employ four conical members, (indicated at 1, 2, 3, and 4,) which are coupled or united one to the other in a way to rotate as a unit on a horizontal axis. The members 1 and 2 of the revoluble screen are made of any suitable foraminous material—such, for example, as wire mesh or perforated sheet metal; but the interstices or perforations in these two conical members are of different sizes for the purpose of effecting the proper separation of the large and small grain from each other and from the dirt, chaff, straw, and other refuse. The member 1 and the imperforate member 3 extend the full length of the screen, or substantially so, and these members are tapered or inclined oppositely to each other. The small end of the central conical member 1 is adjacent to the outlet from the feed-hopper D and the delivering-spout of the fan-casing C, whereas the large end of the conical member 2 is quite close to said hopper and the fan.

The large end of the conical member 1 and the small end of the conical member 2 are quite close together, and they are attached directly one to the other in any suitable way, and the conical member 2 is arranged to surround the member 1, from which the member 2 inclines or tapers toward the fan. The conical member 3 is considerably shorter than either of the members 1 2, and said member 3 is tapered at a different angle from said other members 1 and 2. The member 3 is placed between the members 1 and 2 so as to incline away from the member 1 and toward the member 2. Said member 3 tapers in the same general direction as the member 1, although at a different angle, and the small

end of the member 3 is substantially flush with the corresponding end of the member 1, whereby the members 1 and 3 are attached one to the other, and the member 3 is adapted to partly surround the member 1, said member 3 being free from contact with the inner surface of the longer member 2.

The member 4 is made of foraminous material and of larger diameter than either of the members 1, 2, and 3, said member 4 partly surrounding the member 2 and tapered at a different angle from said member 2. This member 4 is somewhat shorter than the member 2, and the small end thereof is attached to the member 2 quite close to the middle thereof. The members 2 and 4 operate to collect and deliver the large grain and the small grain, respectively; and for the purpose of separately discharging the grain from the machine I have provided the spouts E E', which are arranged below the delivery ends of the members 2 and 4, respectively, substantially as shown by Fig. 1. These spouts are represented as extending transversely across the frame at points below the inlet end to the screen B; but the particular method of arranging the screens is immaterial, so that it will be understood these spouts may be arranged in any suitable way.

The screen or drum B is mounted for rotation bodily within the frame A by any suitable or preferred means; but as one means for mounting the inner or receiving end of the screen I employ a spider F. (Shown more clearly by Fig. 3 of the drawings.) This spider has a circular hub *f*, radial arms *f'*, and a rim *f*², the whole being cast or otherwise made. The hub *f* of the spider receives and supports the small ends of the conical members 1 and 3, while the rim *f*² is attached to the conical member 2 and may be connected with the conical member 4. The rim forms a track-surface adapted for engagement by suitable carrying-rollers *g*, which are mounted on the frame in suitable ways and in positions to support the receiving end of the screen. The other or delivery end of the revoluble screen is mounted on the frame by any suitable means, thus leaving both ends of the screen open for the inlet of the grain to be cleaned and for the exit of the straw, chaff, and other refuse.

The fan-casing has a delivery-throat *c*, arranged to direct the blast of air into the receiving end of the central conical member 1 of the revoluble screen. The fan-shaft *c'* and the screen B are adapted to be driven by any suitable form of driving-gear; but, as shown more particularly by Fig. 2, this driving-gear consists of sprocket-gears *h* *h'* and chain *h*², the gear *h* being attached to the fan-shaft *c'*. The other gear *h'* is on a drive-shaft H, properly journaled on the frame A, and said shaft has a spur-gear *i*, which meshes with a gear *i'* on the rim of the spider

F. The shaft H is shown as having a hand-crank I for the operation of the driving-gear in a way to rotate the fan at the required speed and to also rotate the screen or drum B on its horizontal axis. I would have it understood, however, that I do not restrict myself to this special form of driving-gear, because I reserve the right to modify or change the same at will.

The feed-hopper D is provided with a spout *d*, which is arranged to deliver the grain directly into the boot *d'* of the fan-casing and thence to the small end of the conical member 1 of the screen.

In the operation of the separator the grain is supplied by the spout *d* of the hopper and the spout of the fan-casing into the screen or drum and in the path of the air-blast delivered by the fan into said screen or drum, whereby the straw, chaff, and other light refuse are blown directly through the conical member 1 and out of the screen at an early stage in the operation. The grain slides along the member 1 and passes through the perforations therein, the good grain falling upon the member 3, by which it is delivered to the member 2. The perforations of this member 2 are of such size as to retain the large good grain and make said member 2 deliver the good grain to the spout E. The fowl seeds and smaller grain pass through the perforations of the member 2, and the smaller grain is delivered by the member 4 to the spout E'.

Changes in the form, size, proportion, and minor details in construction may be made without departing from the spirit of the invention or sacrificing any of the advantages thereof, and I therefore reserve the right to make such alterations and modifications as fairly fall within the scope of my invention.

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

1. In a grain-separator, a revoluble screen or drum comprising two inner conical members of unequal lengths and tapering in the same direction, and two outer conical members also of unequal lengths and tapering in an opposite direction to the taper of both inner members, said outer members being adapted to individually discharge their contents and at different points.

2. In a grain-separator, a revoluble screen or drum comprising a plurality of members, each of which is conical, two of said members being tapered in one direction and the two remaining members being tapered in an opposite direction to that of the first-named members, the two last-named members being adapted to individually discharge their contents at different points.

3. In a grain-separator, a revoluble screen or drum comprising a plurality of conical members one around the other, two of said

members extending for substantially the same length and said members being tapered in opposite directions to each other, and a third member disposed between the aforesaid members and tapering toward the outer member.

4. In a grain-separator, a revoluble screen or drum comprising a plurality of conical members one around the other, two of said members being tapered reversely to each other and extending for substantially the same length, and a shorter member partially enveloping the outer long member and inclined at a different angle to, but in the same general direction as, said outer member, said short and long outer members being adapted to discharge their contents at different points.

5. In a grain-separator, a screen-drum comprising a plurality of conical members, two of which extend for substantially the same length and are inclined reversely to each other, a third member lying between the two mentioned members, and a fourth member partly enveloping said members.

6. In a grain-separator, a screen-drum comprising a plurality of conical members, two of which extend for substantially the full length of the drum and are inclined reversely to each other, a third member lying between the two mentioned members, and a fourth member partly enveloping said members, and separate spouts into which two of said members are adapted to discharge their contents.

7. In a grain-separator, a rotary separating drum or screen comprising a plurality of conical members, two of which are united at one end and two at the other end, and a spider connecting all the members at one end of the drum or screen.

8. In a grain-separator, a rotary separating drum or screen comprising four conical members, two of which extend for substantially the same length and are united at one end, a third united to one of the longer members at the opposite end, and a fourth member united to one of the larger members.

9. In a grain-separator, a screen-drum comprising, four conical members, two of which extend for substantially the same length and are united at one end, a third united to one of the longer members of the

opposite end, and a fourth member united to one of the longer members, and a spider uniting all the members at one end of the screen or drum.

10. In a grain-separator, a screen-drum comprising, four conical members, two of which extend for substantially the same length and are united at one end, a third united to one of the longer members at the opposite end, and a fourth member united to one of the longer members, and a spider uniting all the members at one end of the drum or screen, and separate spouts into which certain of the members are adapted to discharge their contents.

11. In a grain-separator, a screen-drum comprising, four conical members, two of which extend for substantially the same length and are united at one end, a third united to one of the longer members at the opposite end, and a fourth member united to one of the longer members, and means for directing grain into one of the longer members.

12. In a grain-separator, a screen-drum comprising four conical members, two of which extend for substantially the same length and are united at one end, a third united to one of the longer members at the opposite end, and a fourth member united to one of the larger members, means for feeding grain into one of the larger members, and means for directing a blast of air into said larger member.

13. In a grain-separator, a screen-drum comprising four conical members, two of which extend for substantially the same length and are united at one end, a third united to one of the longer members at the opposite end, and a fourth member united to one of the larger members, means for feeding grain into one of the longer members, means for directing a blast of air into said longer member, and a driving mechanism for rotating the screen and for operating the blast mechanism.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses:

WILLIAM A. BREWSTER.

Witnesses:

ALBERT F. EWING,
B. F. MORRIS.