

April 14, 1925.

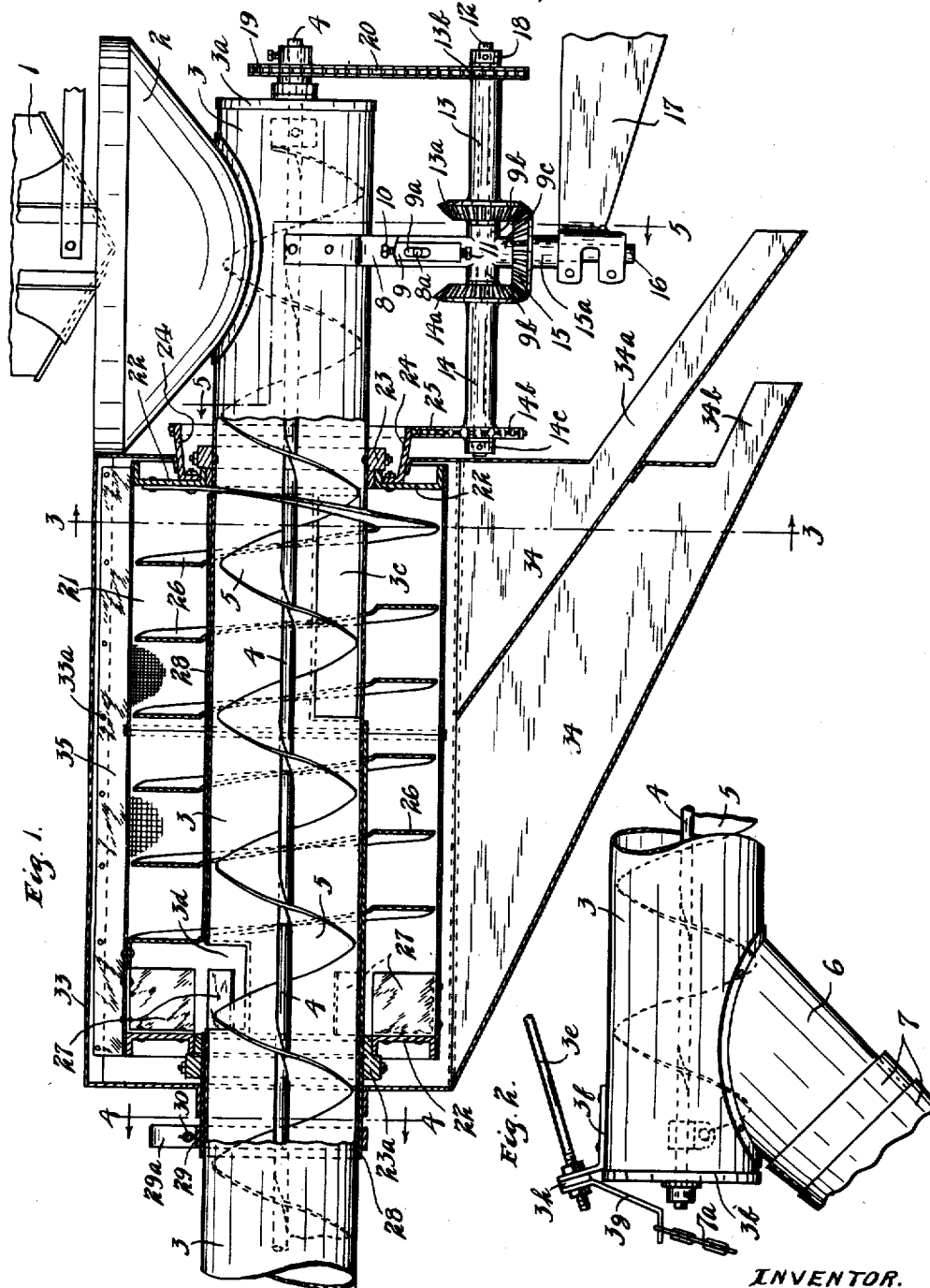
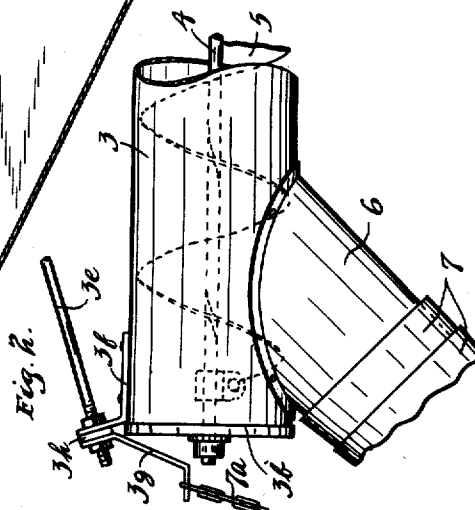
H. B. STINSON

1,533,997

GRAIN CLEANING ATTACHMENT FOR THRASHING MACHINES

Filed May 31, 1924

2 Sheets-Sheet 1



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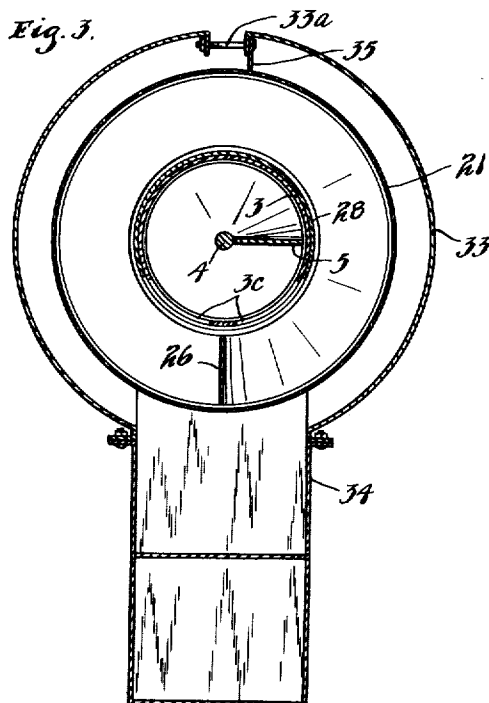
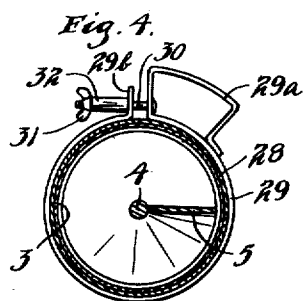
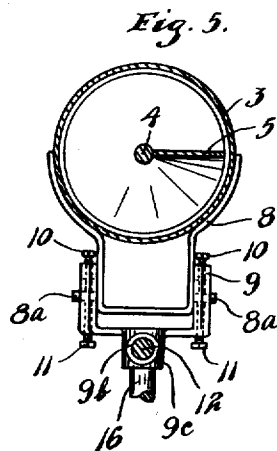
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UNITED STATES PATENT OFFICE.

HUGH B. STINSON, OF GLENWOOD, MINNESOTA, ASSIGNOR OF ONE-HALF TO ELVAN M. VOORHEES, OF PEORIA, ILLINOIS.

GRAIN-CLEANING ATTACHMENT FOR THRASHING MACHINES.

Application filed May 31, 1924. Serial No. 716,920.

To all whom it may concern:

Be it known that I, HUGH B. STINSON, a citizen of the United States, residing at Glenwood, in the county of Pope and State of Minnesota, have invented certain new and useful Improvements in Grain-Cleaning Attachments for Thrashing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a grain cleaning device and particularly to such a device constructed and arranged to be attached to a thrashing machine. While the grain is sieved and separated from chaff and other impurities to a great extent in the standard thrashing machine, yet a great many impurities, such as foreign seed, etc., are discharged from the thrashing machine with the grain. This results in the grain grower and seller being docked according to the amount of impurities in the grain. These dockage losses to grain growers have reached immense proportions in recent years. As is well known, practically all standard thrashing machines now have an automatic weighing device for the grain from which the grain is discharged into a swinging conductor having means for moving the grain therethrough to a discharge spout.

It is an object of this invention to provide a simple and efficient grain cleaning device in connection with the discharge conduit of the thrashing machine.

It is a further object of the invention to provide such a grain cleaning or screening device in combination with a discharge conduit, which conduit has an opening in its lower side adjacent its inner end through which the grain is discharged onto the grain cleaning screen and an opening at its top portion adjacent its outer end, said screen having means for raising the grain and discharging the same back into the discharge conduit so that it is discharged, as usual, after being cleaned.

It is more specifically an object of the invention to provide a grain cleaning attachment for such a discharge conduit in the form of a rotary screen journaled on the conduit, together with means for progressing the grain longitudinally of the

screen, said grain being received through an opening in the bottom of the conduit adjacent one end of the screen and being raised by paddles on the rotary screen and discharged into an opening into the top of the conduit adjacent the other end of the screen.

It is still another object of the invention to provide such a device as above described, together with a member rotatable about said conduit adapted to cover or uncover said openings therethrough.

It is also an object to provide means for rotating a rotary screen mounted on the discharge conduit from the same driving means that drives the grain moving means in said conduit arranged so that the rotary screen can swing with the discharge conduit.

These and other object and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to the same parts throughout the different views, and in which,

Fig. 1 is a view partly in side elevation and partly in vertical longitudinal section of the device;

Fig. 2 is a view in side elevation of the discharge end of the discharge conduit;

Fig. 3 is a view in vertical section taken on the line 3—3 of Fig. 1, as indicated by the arrows;

Fig. 4 is a view in vertical section taken on the line 4—4 of Fig. 1, as indicated by the arrows; and

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 1, as indicated by the arrows a portion of the structure being omitted.

Referring to the drawings, a portion of the equipment of a standard thrashing machine is illustrated showing the hopper 1 forming a part of the grain weighing apparatus. From this hopper 1 the grain is periodically discharged into the hopper 2 and said grain passes from the hopper 2 through the open bottom thereof into the trough or conduit 3 to which the hopper 2 is secured. For the purposes of this invention, the grain could be discharged periodically or continuously into hopper 2 from any grain discharging means on a thrashing machine or on a grain elevating or han-

dling means in an elevator or grain warehouse. While any desired form of grain discharge conveyor may be used, in the embodiment of the invention illustrated, a conduit 3 is shown as of cylindrical form and has its inner end closed by a cap 3^a and its outer end closed by the cap 3^b, said caps carrying suitable hubs in which is journaled a shaft 4 extending axially of said conduit and carrying the helical blade 5 constituting with said conduit 3 a conveyor for moving the grain outwardly. The grain at the outer end of the conduit is discharged through a spout 6 which usually has extensible sections 7 thereon. The outer end of the conduit 3 is supported by a rod 3^c extending to the top of the grain elevator, which is attached to the side of the standard thrashing machine. The rod 3^c passes through an angle bracket 3^d riveted to the conduit 3 and through another angle bracket 3^e projecting downwardly and outwardly at the end of said conduit, which latter bracket supports a chain 7^a extending downwardly and adapted to be connected to the lower end of the discharge sections 7. The end of rod 3^c is threaded and clamped to the brackets 3^d and 3^e by suitable clamping nuts, a spacing member 3^f being inserted between said brackets. The conduit 3 is carried in a fork or yoke bracket 8 having spaced arms riveted or otherwise suitably secured to said conduit and having parallel sides at its U-shaped bottom portion slidable in grooves in a fork bracket 9. The bracket 9 has slots 9^a in the sides thereof and the bracket 8 has laterally projecting pins 8^a rigidly secured thereto projecting through said slots. The bracket 9 also has at each side top screws 10 and bottom screws 11 disposed in tapped holes therein adapted to engage the pins 8^a so that the bracket 8 is adjustably held in position in said bracket 9. The bracket 9 has a T-shaped bearing at its lower portion comprising horizontal arms 9^b and a vertical arm 9^c. A shaft 12 extends through the horizontal arms 9^b and carries at each side thereof the sleeves 13 and 14 having at their inner ends beveled gears 13^a and 14^a, respectively. The beveled gears 13^a and 14^a mesh with a beveled gear 15 disposed substantially horizontally and having a sleeve 15^a secured on a shaft 16, which shaft has a bearing in the arm 9^c and also in a bracket 17 extending from the leg of the grain elevator on the thrashing machine. The sleeve 13 also carries a sprocket wheel 13^b at its outer end and said sleeve is held in position on the shaft 12 by a collar 18 pinned to said shaft and engaging the end of said sleeve. The sprocket wheel 13^b is connected by a chain 20 to a sprocket wheel 19 having a hub secured by a suitable set screw to shaft 4, the chain 20 passing over said sprockets and forming a driv-

ing means for the shaft 4 and conveyor 5. The parts thus far described with the exception of the sleeve 14 and its parts, constitute part of the standard equipment of the modern thrashing machine.

In accordance with the present invention, the conduit 3 is formed with a pair of elongated substantially rectangular openings 3^c adjacent its inner end and is also formed with a substantially rectangular opening of considerably less length 3^d spaced at its top portion, said opening 3^d being spaced outwardly some distance from the openings 3^c. A rotary screen 21 is provided carried by the end plates or heads 22 and these end plates 22 are journaled on collars or rings 23 and 23^a bolted or riveted, respectively, adjacent the inner end of conduit 3 and a sleeve 28 rotatably mounted on conduit 3. The rings 23 and 23^a are thus disposed at the inner and outer sides, respectively, of the openings 3^c and 3^d. The end plate 22 at the inner end of the screen 21 has a frusto-conical shell 24 bolted thereto which projects outwardly about the conduit 3 and has at its exterior side adjacent its edge sprocket teeth over which passes a chain 25 also passing over and driven by a sprocket 14^b secured on the outer end of sleeve 14. The sleeve 14 is held in position by a collar 14^c pinned to the end of the shaft 12. It is thus seen that the screen 21 is rotated from the shaft 16, said latter shaft being connected to a suitable driving shaft on the thrashing machine in the usual manner. The screen 21 is surrounded by and rigidly connected to a helical blade 26 forming a conveyor for the material on said screen, which blade is secured at one end to the inner head 22 and at its outer end to the body of screen 21. The screen 21 has secured therein at its outer end a series of substantially radially disposed blades 27, said blades having laterally extending flanges secured, respectively, to the outer head 22 and to the body of screen 21 by suitable rivets. The sleeve 28 is provided with an opening at its inner end adapted to be moved out of and into alignment with the openings 3^c and conduit 3 and said sleeve also has an opening adjacent its outer end adapted to be moved into and out of alignment with the opening 3^d. Said sleeve 28 has secured thereto a band 29 having one end bent outwardly, circumferentially and inwardly to form a handle 29^a, one end of which is connected by a bolt 30 to the other out-turned end 29^b of said band, the ends of said band being suitably drawn together by a wing nut 31 threaded on the bolt 30 and passing through the sleeve 32 on said bolt. The sleeve 28 may thus be turned by the handle 29^a to cover or uncover the openings 3^c and 3^d in the conduit 3.

It will be noted that the screen 21 is composed of a plurality of longitudinal sections

represented as being of a different size of mesh. Said screen is surrounded by a housing 33 substantially cylindrical at its upper portion and composed of sections having
 5 returned ends connected at their upper sides by a headed and nutted bolt 33^a and having out-turned flanges at their lower sides connected to similar out-turned flanges on chute 34 by suitable headed and nutted
 10 bolts. The chute 34 is divided to form two or more spouts 34^a and 34^b, the lower sides of these spouts being disposed, respectively, under the sections of screen 21, the number of spouts corresponding to the number of
 15 sections. A strip 35 of stiff flexible material such as leather is secured by the bolts 33^a and projects downwardly into scraping contact with the exterior of screen 21 to form a cleaning means therefor.

20 In operation, the grain is discharged from the grain elevator into the hopper 2 and moved therethrough by the conveyor 5 to the discharge spouts 6 and 7. When it is desired to clean the grain, the sleeve 28 is
 25 rotated by means of a handle 29^a to uncover the openings 3^c and 3^d and the sleeve clamped in this position by manipulation of a thumb nut 31. As the grain is now progressed in the conduit 3, the same will drop
 30 through the opening 3^c into screen 21. The screen 21 will be rotated by a chain 25 through the gears 4^a and from the shaft 16 and the grain discharged therein will be moved longitudinally thereof by the helical
 35 conveyor 26. As the grain is thus traversed longitudinally of the screen, the dirt and impurities therein and the small foreign seeds will be discharged through the screen and will drop into the spouts 34^a and 34^b
 40 from whence they will pass into any suitable receptacle placed under said chutes. When the grain reaches the outer end of screen 21 it is pushed between the paddles 27 and as these paddles rotate with the screen the
 45 grain will be lifted up and discharged back into the conduit 3 through the opening 3^d. The clean grain will then be progressed on outward through the conduit 3 and discharged as usual. The cleaning operation
 50 can be suspended at any time by again moving the sleeve 28 to cover the openings 3^c and 3^d. The member 25 will act to scrape any material catching in the screen therefrom so that the screen will be kept in clean
 55 and operative condition. The conduit 3 with the screen 21 and the other parts, are all swingable about the axis of shaft 16 and in the standard machine this shaft is driven by a rotatable gear not shown. It may
 60 sometimes be necessary to adjust the bracket 9 by means of the screws 11 to properly tension the chains 20 and 25.

From the above description it is seen that applicant has provided a very simple and
 65 efficient grain cleaning device adapted to be

attached to any grain elevator whether attached to a standard thrashing machine or used in a grain storage or grain warehouse, such as an elevator. The device can be attached to the leg of any grain elevator now
 70 being used as part of the equipment of the common standard thrashing machine or placed thereon when the machines are first made. The device is easily made and attached to the standard thrashing machine
 75 and constitutes a valuable accessory therefor. The grain is efficiently cleaned and the growers are saved a great deal of money in the elimination of dockage discount or charges. The device does not in any way
 80 interfere with the swinging movement of the conduit 3 and is driven by the same mechanism that drives the conveyor for conduit 3. It will thus be seen that the device will have a high degree of utility.

85 It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of applicant's invention, which, generally
 90 stated, consists in a device capable of carrying out the objects above set forth, such as shown and described and defined in the appended claims.

What is claimed is:

95 1. The combination with the grain discharge conduit of a thrashing machine and the grain moving means therein, said conduit having an opening in its lower side adjacent its inner end and an opening in its
 100 upper side outwardly of said first mentioned opening, a screen beneath said conduit, means for progressing grain falling through said first mentioned opening along said screen, and means for raising grain so moved
 105 along said screen and dropping it into said last mentioned opening.

2. The structure set forth in claim 1, and a revoluble member on said conduit adapted to cover and uncover said openings in said
 110 conduit.

3. The combination with the grain discharge conduit of a thrashing machine and the grain moving means therein, said conduit having an opening in the lower side adjacent its inner end and an opening in its
 115 upper side disposed outwardly of said first mentioned opening, of a screen surrounding said conduit, means for progressing grain falling through said first mentioned
 120 opening along said screen, and means in said screen for raising said grain and dropping it into said last mentioned opening.

4. The structure set forth in claim 3, a common means for driving said grain moving means in said conduit, and the means for progressing grain along said screen.

5. The combination with the grain discharge conduit of a thrashing machine and the grain moving means therein, said con-
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duit having an opening in the lower side adjacent its inner end and an opening in its upper side disposed outwardly of said first mentioned opening, a rotary screen revoluble about said conduit having a plurality of longitudinal sections of different sized mesh, a conveyor for moving grain falling through said first mentioned opening longitudinally of said screen and radially disposed members at one end of said screen for raising said grain and dropping the same into said last mentioned opening, and discharge chutes disposed, respectively under the sections of said screen.

6. A grain cleaning device comprising a conduit, means for moving grain there-through, said conduit having an opening in its lower side adjacent one end and an opening in its upper side disposed outwardly of said first mentioned opening, a screen movable beneath said conduit adapted to receive grain in said conduit through said first mentioned opening, means for moving said grain along said screen, and means for raising said grain and discharging the same into said conduit through said last mentioned opening.

7. In a thrashing machine, a grain discharge conduit, a grain moving means therein, a support for said conduit revoluble about a vertical axis, a driving shaft revoluble about said axis substantially horizontal shafts driven therefrom, means for driving said grain moving means from one of said horizontal shafts, a rotary screen journaled on said conduit, a driving member on said screen, driving means connecting said driving member and the other horizontal shaft, a conveyor carried by said screen, said conduit having an opening at its lower side at

one end of said screen, and an opening at its upper side at the other end of said screen, and means in one end of said screen for lifting grain and dropping the same into said last mentioned opening.

8. The combination with the grain discharge conduit of a thrashing machine and the grain moving means therein, said conduit having an opening in the lower side adjacent its inner end and an opening in its upper side disposed outwardly of said first mentioned opening, a rotary screen journaled on said conduit, means for rotating said screen, a helical conveyor on said screen, and a plurality of radially disposed paddles in one end of said screen movable over said last mentioned opening and arranged to lift grain and discharge the same into said opening.

9. The structure set forth in claim 8, and a sleeve rotatable on said conduit having openings adapted to be moved into and out of alinement with said openings in said conduit to cover and uncover the same.

10. The combination with the grain discharge conveyor of a thrashing machine, of a screen supported adjacent said conveyor arranged to receive grain therefrom, and means for returning the cleaned grain to said conveyor.

11. The combination with a grain discharge conveyor of a thrashing machine, of a grain cleaning means supported adjacent said conveyor, said conveyor having means for discharging grain into said cleaning means, and means for returning the cleaned grain to said conveyor at a point outwardly of said last mentioned means.

In testimony whereof I affix my signature.
HUGH B. STINSON.

duit having an opening in the lower side adjacent its inner end and an opening in its upper side disposed outwardly of said first mentioned opening, a rotary screen revoluble about said conduit having a plurality of longitudinal sections of different sized mesh, a conveyor for moving grain falling through said first mentioned opening longitudinally of said screen and radially disposed members at one end of said screen for raising said grain and dropping the same into said last mentioned opening, and discharge chutes disposed, respectively under the sections of said screen.

6. A grain cleaning device comprising a conduit, means for moving grain there-through, said conduit having an opening in its lower side adjacent one end and an opening in its upper side disposed outwardly of said first mentioned opening, a screen movable beneath said conduit adapted to receive grain in said conduit through said first mentioned opening, means for moving said grain along said screen, and means for raising said grain and discharging the same into said conduit through said last mentioned opening.

7. In a thrashing machine, a grain discharge conduit, a grain moving means therein, a support for said conduit revoluble about a vertical axis, a driving shaft revoluble about said axis substantially horizontal shafts driven therefrom, means for driving said grain moving means from one of said horizontal shafts, a rotary screen journaled on said conduit, a driving member on said screen, driving means connecting said driving member and the other horizontal shaft, a conveyor carried by said screen, said conduit having an opening at its lower side at

one end of said screen, and an opening at its upper side at the other end of said screen, and means in one end of said screen for lifting grain and dropping the same into said last mentioned opening.

8. The combination with the grain discharge conduit of a thrashing machine and the grain moving means therein, said conduit having an opening in the lower side adjacent its inner end and an opening in its upper side disposed outwardly of said first mentioned opening, a rotary screen journaled on said conduit, means for rotating said screen, a helical conveyor on said screen, and a plurality of radially disposed paddles in one end of said screen movable over said last mentioned opening and arranged to lift grain and discharge the same into said opening.

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Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,533,997, granted April 14, 1925, upon the application of Hugh B. Stinson, of Glenwood, Minnesota, for an improvement in "Grain-Cleaning Attachments for Thrashing Machines," an error appears in the printed specification requiring correction as follows: Page 4, after line 78 insert the following as claim 12:

12. *A grain discharging conduit for a thrashing machine having a grain cleaning means co-operating with and disposed between the ends of said conduit constructed and arranged to clean the grain passing through said conduit;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of July, A. D. 1925.

[SEAL.]

WM. A. KINNAN,
Acting Commissioner of Patents.

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