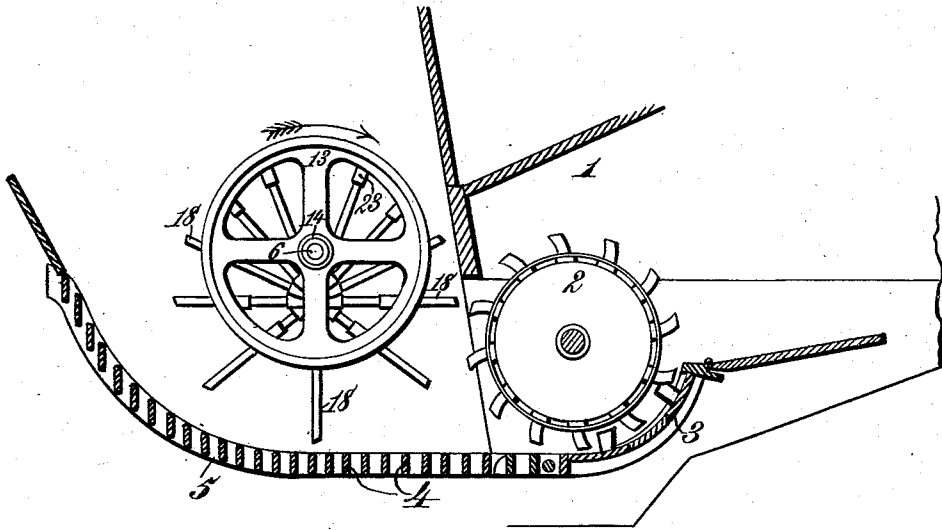


W. NEAL.  
THRASHING MACHINE.

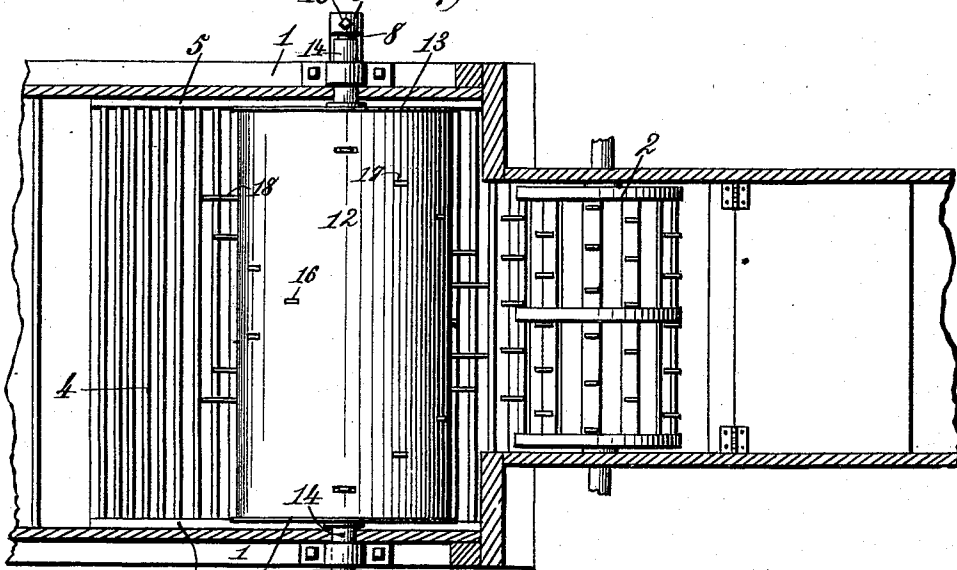
No. 524,264.

Patented Aug. 7, 1894.

*Fig. 1.*



*Fig. 2.*



Witnesses, *5 13*  
*Abel C. Pratt.*  
*A. B. Norris.*

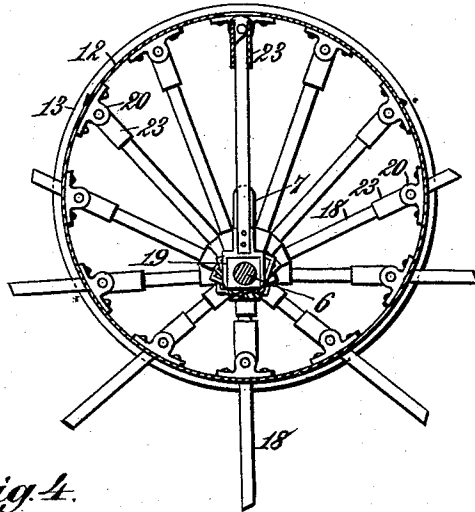
*Inventor:*  
*William Neal.*  
*By James L. Norris.*  
*Atty.*

W. NEAL.  
THRASHING MACHINE.

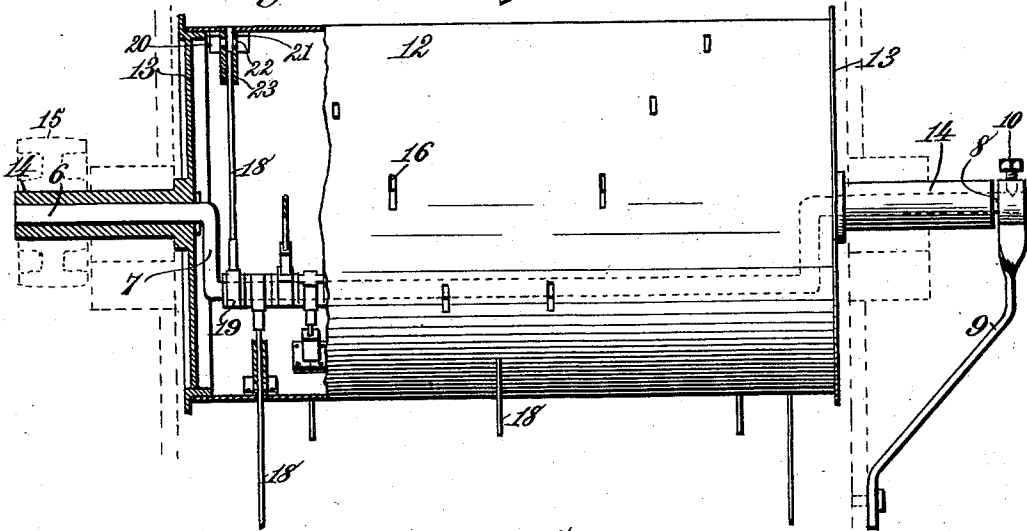
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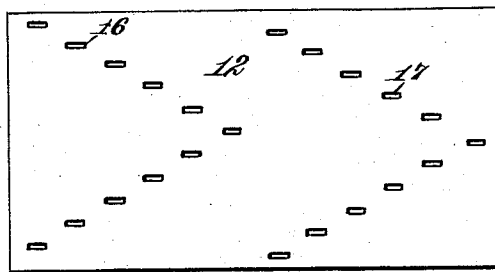
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



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 Atty.

# UNITED STATES PATENT OFFICE.

WILLIAM NEAL, OF WASHINGTON, IOWA, ASSIGNOR TO THE ADVANCE  
THRESHER COMPANY, OF BATTLE CREEK, MICHIGAN.

## THRASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 524,264, dated August 7, 1894.

Application filed April 12, 1894. Serial No. 507,292. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM NEAL, a citizen of the United States, residing at Washington, in the county of Washington and State of Iowa, have invented new and useful Improvements in Thrashing-Machines, of which the following is a specification.

This invention relates to that type of grain thrashing or separating machines wherein a curved grating extends rearwardly from the cylinder and concave, and forks or rakes are employed to move the straw rearwardly over the grating.

The object of the invention is to provide new and improved means whereby the straw is picked apart, disentangled, and more uniformly distributed and carried over the grating and spread substantially the full width of the separator to prevent clogging or slugging of the cylinder.

The invention also has for its object to provide novel, simple, and efficient means, whereby all the straw and loose grain are confined down on the grating and prevented from flying up over the same during the rapidly revolving motion of the thrashing cylinder.

The invention also has for its object to provide new and improved means whereby the grain which adheres to or is commingled with the straw, after the latter comes from the thrashing cylinder, is separated from such straw, and the surface upon which the separation takes place is maintained clean and free from accumulation of straw or chaff.

To accomplish all these objects my invention consists in the features of construction and the combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view, showing a portion of the separator frame and the finger cylinder or drum in end elevation. Fig. 2 is a sectional plan view of the same. Fig. 3 is a vertical sectional view through the finger cylinder or drum. Fig. 4 is a plan view of the same partly in section; and Fig. 5 is a diagram, showing the shell of the cylinder or drum spread out to more clearly illus-

trate the arrangement of the finger slots or openings therein.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a portion of the frame-work of a grain-thrashing or separating machine having thrashing devices composed, as here shown, of a toothed cylinder 2, and a toothed concave 3.

The grating which receives the straw and loose grain from the cylinder and concave is composed of separated bars 4, attached at their ends to side pieces 5, and this grating extends substantially horizontally in a rearward direction from the cylinder, and is curved upwardly in the arc of a circle, as clearly illustrated in Fig. 1.

A shaft 6, having a crank 7, is arranged in rear of the cylinder 2 at a suitable distance above the grating, and the opposite ends of this shaft extend through the side walls of the separator-frame, one end, 8, of the shaft being arranged in a bracket 9 secured to the side of the separator-frame and rigidly connected to the shaft by a set-screw 10 or other suitable device, in such manner that the crank-shaft is held in a stationary position.

A cylinder or drum is arranged to rotate on the crank-shaft, and this cylinder or drum is composed, as here shown, of a sheet metal shell 12, and heads 13 composed of flanged disks, to which the sheet metal shell is riveted, bolted, or otherwise rigidly secured.

The cylinder heads 13 are provided with hubs or sleeve bearings 14 journaled upon the shaft 6, and one of these hubs or sleeve bearings is supplied with a pulley 15, or any other suitable device, whereby the drum can be caused to rapidly rotate through the medium of some working part of the grain-separator.

The sheet metal shell of the cylinder or drum is provided with rows of slots or openings 16 and 17 arranged in lines which diverge from the central portion of the cylinder toward the opposite ends of the cylinder, as will be clearly understood with reference to Fig. 4. The diagram, Fig. 5, is intended to

indicate the shell of the cylinder spread out to clearly show the manner in which the slots or openings are arranged.

The crank portion 7, of the shaft 6, is provided with a gang of loosely mounted fingers or teeth 18 arranged in such order that they can be progressively projected and retracted in the slots or openings 16. The inner ends of the fingers or teeth 18 are mounted upon the crank portion 7 of the shaft 6 in any manner suitable for the conditions required, but I prefer to employ boxes 19, to which the fingers or teeth are rigidly attached.

The inside of the sheet-metal shell 12 of the cylinder or drum is provided with a series of brackets or supports arranged, respectively, in proper relation to the slots or openings 16 and 17. These brackets are each composed of two sections 20 and 21, provided, respectively, with laterally projecting pivot pins 22, which extend toward each other and engage opposite orifices in sleeves 23 which constitute tubular guides for the fingers or teeth 18. These tubular guides are pivoted between the two sections 20 and 21 of the brackets, in order to secure a very strong and durable construction, and the guides are pivoted so that they can swing in order to permit the proper movements of the fingers or teeth as they are projected and retracted during the rotation of the cylinder or drum on the crank-shaft.

The fingers or teeth 18 are designed to be entirely retracted within the cylinder or drum, for the purpose of enabling the fingers or teeth to effectually clear themselves of straw. It will be obvious that the complete retraction of the fingers or teeth within the cylinder could not be accomplished without the provision of proper guides for the free ends or extremities of the fingers or teeth, as there would otherwise be no support for such free ends of the fingers or teeth to maintain them in proper position relatively to the slots or openings 16 and 17. The pivoted tubular guides not only accommodate themselves to the movements of the fingers or teeth, but also properly support the free ends of the fingers or teeth when they are retracted, and produce a strong and durable construction which has been found very efficient and satisfactory in practical operation.

As the cylinder or drum is rotated, the fingers or teeth are progressively extended or projected in such manner that they operate on the straw to pick the same apart and disentangle it, and at the same time uniformly distribute it the full width of the separator, so that as the straw is carried over the grating to the usual devices in rear thereof, such straw is spread out, and by this means a uniform delivery of the straw is obtained, and clogging or slugging of the thrashing cylinder is entirely prevented.

The cylinder or drum is of a closed construction, except as to the slots or openings 17, and, consequently, by arranging this cyl-

inder or drum over the curved grating, the straw and loose grain are held down on the grating and prevented from flying up over the same during the rapidly revolving motion of the thrashing cylinder.

As shown in Fig. 2, the length of the cylinder or drum is considerably greater than the length of the thrashing cylinder, and, consequently, the straw is more effectually spread throughout the width of the separator, whereby the efficiency of the machine is materially improved.

The cylinder or drum is designed to rotate in the direction of the arrow, Fig. 1, and, as the side of the drum nearest the thrashing cylinder descends, the fingers or teeth 18 are progressively extended or projected, and conversely, as the side of the cylinder farthest from the thrashing cylinder rises, the fingers or teeth are retracted, and, during the rotation of the cylinder or drum, the fingers or teeth are withdrawn wholly inside the cylinder or drum, so that they effectually clear themselves of straw. The extent of projection of the fingers or teeth is controlled by the degree of eccentricity of the crank-shaft relatively to the axis of the cylinder or drum.

As the straw is carried rearward over the grating, the loose grain can pass therethrough and be received by any suitable means. By the improved construction the straw will be carried rearward evenly and uniformly without liability of being broken to any great extent; and, further, it will be free from bunching and knotting, while a perfect separation of the grain from the straw is obtained.

It has been proposed to use, in combination with a grating extending rearward from the cylinder and concave, a cylindrical drum rotating on a crank-shaft, having fingers or teeth projected and retracted through parts of the drum as the latter rotates; but the prior construction proved inefficient, unsatisfactory, and objectionable, in that the free ends or points of the fingers or teeth could not be retracted wholly within the drum, or below the surface thereof, and, therefore, they did not clear themselves of straw; and, further the ranks or rows of fingers or teeth were in right lines coincident with the axis of the drum, which arrangement failed to properly disentangle and straighten the straw, and uniformly carry the same rearward over the grating.

By my present invention, the defects alluded to are entirely avoided, the construction is strong and durable, the fingers or teeth are properly supported and guided when retracted entirely within the cylinder or drum, and, as the fingers or teeth of each rank or row are progressively projected, they act in a superior manner to disentangle and separate or distribute the straw. They also uniformly move the straw rearward, and they tend to straighten the same, thus materially improving the machine and rendering it more efficient and useful.

Having thus described my invention, what I claim is—

1. The combination with a crank-shaft, and a cylinder or drum rotating independent of the crank-shaft, of finger or teeth-guides independently pivotally connected at their outer ends with the interior of the cylinder or drum and all extending inwardly therefrom toward the crank-shaft, and fingers or teeth projected and retracted by the crank-shaft as the cylinder or drum rotates and supported and guided by the pivoted finger or teeth-guides, substantially as described.

2. The combination with a crank-shaft, a cylinder or drum having a series of slots or openings, and fingers or teeth loosely mounted on the crank-shaft and projected and retracted thereby, of swinging guides independently pivoted at their outer ends to the inside of the cylinder or drum and having their inner end portions extended inward toward the crank-shaft, for supporting and guiding the fingers or teeth as they are projected and retracted, substantially as described.

3. The combination of a rotating cylinder or drum having ranks or rows of slots or openings arranged in lines which diverge from the central portion toward the opposite ends thereof, fingers or teeth movable lengthwise in said slots or openings, means for projecting and retracting the fingers or teeth as the cylinder or drum rotates, and a curved grating arranged beneath the cylinder or drum, substantially as and for the purpose described.

4. The combination of a rotating cylinder or drum having brackets secured to its inner side, finger or teeth-guides pivoted to the brackets, fingers or teeth movable lengthwise in the pivoted guides, and means for project-

ing and retracting the fingers or teeth as the cylinder or drum rotates, substantially as described.

5. The combination of a rotating cylinder or drum having brackets secured to its inside, tubular guides pivoted to the brackets, fingers or teeth movable lengthwise in the tubular guides, and a crank-shaft for projecting and retracting the fingers or teeth as the cylinder or drum rotates, substantially as described.

6. The combination of a rotating cylinder or drum having rows of slots or openings arranged in lines which diverge from the central portion toward the ends thereof, finger or teeth-guides pivoted to the inside of the cylinder or drum, fingers or teeth movable lengthwise in the pivoted guides, and means for projecting and retracting the fingers or teeth as the cylinder or drum rotates, substantially as described.

7. The combination of a rotating cylinder or drum, brackets secured to the inside thereof, and each composed of two sections having laterally projecting pivots, finger or teeth-guides having pivot-bearings with which said pivots engage, fingers or teeth movable lengthwise in the guides, and means for projecting and retracting the fingers or teeth as the cylinder or drum rotates, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

WILLIAM NEAL. [L. S.]

Witnesses:

A. S. FOLGER,  
N. W. MCELROY.