No. 836,869. PATENTED NOV. 27, 1906.

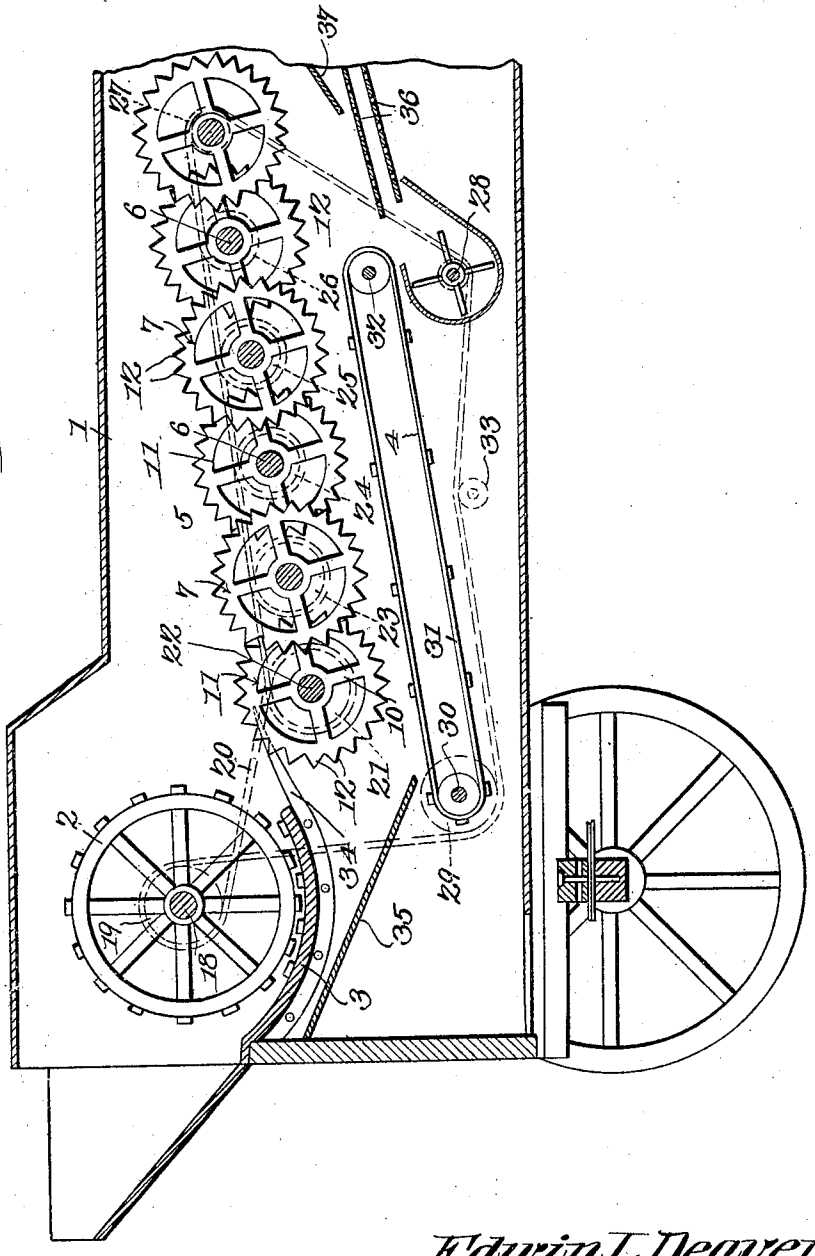
E. L. DEAVER.

GRAIN SEPARATING MACHINE.

APPLICATION FILED APR. 22, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

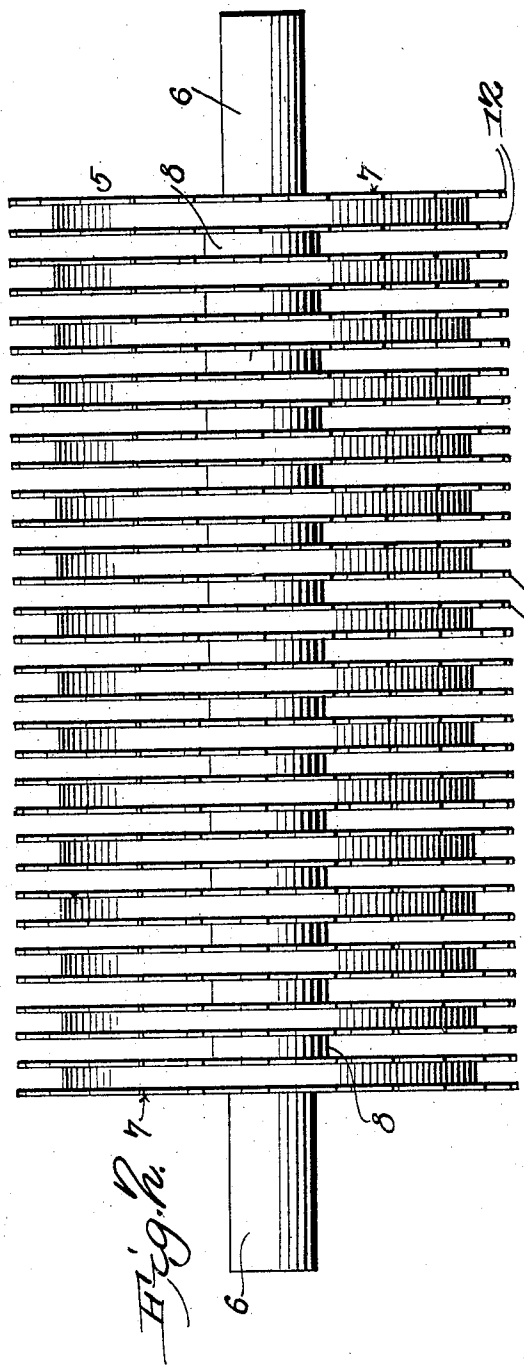

Fig. 2.

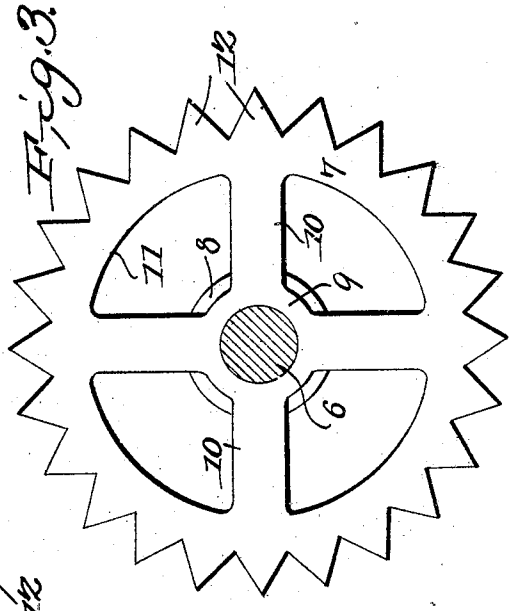

Fig. 3.

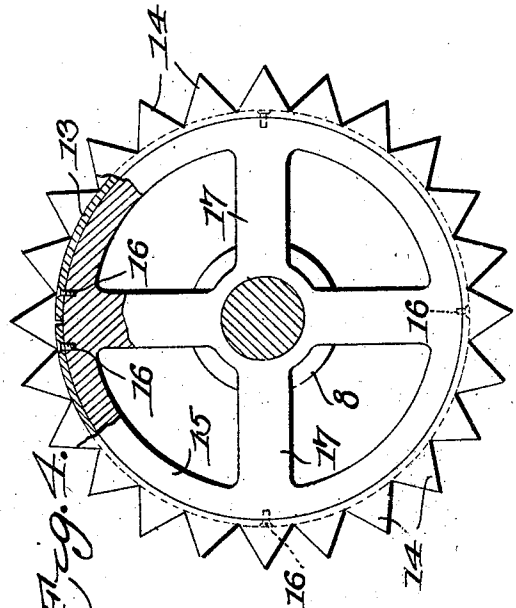

Fig. 4.

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GRAIN-SEPARATING MACHINE.

No. 836,869. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed April 22, 1905. Serial No. 256,948.

To all whom it may concern:

Be it known that I, EDWIN L. DEAVER, a citizen of the United States, residing at El Reno, in the county of Canadian and Territory of Oklahoma, have invented a new and useful Grain-Separating Machine, of which the following is a specification.

This invention relates to grain-separating machines.

The object of the invention is to provide a machine which will in a novel, rapid, and certain manner separate from the straw all grain contained therein after leaving the threshing-cylinder, conserve the grain for return to the riddles or sieves, and discharge the threshed grain from the apparatus.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a separator for a threshing-machine, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, Figure 1 is a view in sectional elevation of a portion of the separating-machine, exhibiting the same equipped with the separating mechanism of this invention. Fig. 2 is a view in elevation of one of the separating-cylinders. Fig. 3 is a sectional detail view exhibiting one of the elements of the separating-cylinder illustrated in Fig. 2. Fig. 4 is a view similar to Fig. 3 of a slightly-modified form of the separating-cylinder.

Referring to the drawings, 1 designates the frame or trunk of an ordinary threshing-machine; 2, a threshing-cylinder; 3, a concave, and 4 an endless conveyer for catching the grain separated from the straw by the separating-cylinders and conveying it to suitable riddles or sieves. (Not shown.)

The parts above enumerated may be of the usual or any preferred construction and operated in the ordinary manner common to such elements, and therefore need no further description.

The present invention resides in a novel form of separating-cylinder which is adapted to be combined with a threshing-machine of any character without requiring any extensive change in its structural arrangement.

The separating-cylinders are designated generally 5, and of these there are shown in this instance six combined with the separating-machine, although this number may be increased or diminished if found necessary or desirable. As each cylinder is a counterpart of the other, a description of one will serve for both. The cylinder comprises a shaft 6, a series of separating elements 7, carried thereby and disposed at right angles to the longitudinal axis thereof, and spacers 8, mounted on the shaft between the elements to hold them properly spaced.

The form of separating element, as shown in Figs. 3 and 4, is constructed, preferably, of cast metal, such as malleable cast-iron, and comprises a hub 9, radial arms 10, a rim 11, and apexiform or pointed teeth 12 projecting therefrom, each rim being provided with two sets of teeth appropriately spaced apart, as shown in Fig. 2, the distance between the two sets of teeth being approximately equal to the width of the spacers 8. Instead of having the separating elements made as above described they may be constructed with a metallic band 13, having two sets of teeth 14, as described, and secured to the rim 15 of a wheel, which is made of wood, preferably of built-up stock—that is to say, of thin sheets of wood glued together with the grain disposed in opposite directions, as is common in ordinary chair-seats. This form of wheel will be found exceedingly light and durable and may be employed with advantage in many cases. Instead of making the band 13 and the teeth 14 of cast metal they may be made of heavy sheet metal and the band be secured to the rim of the wheel in any suitable manner, as by bolts or screws 16. For the purpose of lightness the wood of the wheel is cut out to form spokes 17. The cylinder that will be next to the concave will be provided with, say, sixteen of the wheels or separating elements, and the next one with seventeen, and the next with sixteen, and so on throughout the series, and the sets of wheels are intercurrently disposed relatively to each other, as clearly shown in Fig. 1, thereby to insure positive treatment of all the straw and the separation therefrom of any grain that may have been retained in passing through the threshing-cylinder.

Another feature of the invention resides in causing a progressive increase in speed, preferably at a regular ratio from the first separating-cylinder or that next to the concave throughout the entire series. By preference the first separating-cylinder will be driven at about two hundred and fifty revolutions per

minute, the second two hundred and seventy-five, and the third three hundred, and so on, increasing progressively twenty-five revolutions per minute for each succeeding cylinder. By effecting a progressive increase in the speed of rotation of the separating-cylinders the cylinder running at the slower rate of speed acts to retard the straw, while the one running at a higher rate of speed operates to pull the straw apart. Hence the tendency is to thin the straw all the way through the machine. Further, if the straw has a tendency to bank upon the first separating-cylinder it will be quickly removed by the second, and if the same condition prevails with this cylinder the straw will be quickly removed by the third, and so on, so that, in effect, there will always only be a thin layer of straw across the entire series of separating elements, and this will insure the proper treatment of the entire mass of straw and the separation of any contained grain therefrom.

To drive the series of separating-cylinders, there is combined with the shaft 18 of the threshing-cylinder a pulley 19, around which passes an endless belt or rope 20, to and around a pulley 21 on the shaft 22 of the separating-cylinder, thence around pulleys 23, 24, 25, 26, and 27 on the shafts of the succeeding cylinders, thence around a pulley on a fan-shaft 28, thence around a pulley 29 on one of the shafts 30 of the endless conveyer 4, the other shaft 31 of which is journaled over the fan-shaft. It will be seen by this arrangement that one rope is used for driving the entire operating mechanism of the apparatus, thereby reducing the number of parts to a minimum and practically eliminating danger of breakage in operation. In order to cause the rope 20 to impinge all the pulleys with which it coacts, there is provided an adjustable idler 33, which operates in the usual manner to take up the slack of the rope. Of course it will be understood that, if preferred, sprocket-wheels may be substituted for the pulleys and sprocket-chains for the rope 20, and as this will be readily understood detailed illustration of such obvious change is omitted.

The concave 3 is provided with a plurality of bars or fingers 34, which are adapted to project between the separating elements of the first cylinder that operate as conveyers to direct the flow of grain from the threshing-cylinder onto the first separating-cylinder.

Beneath the concave is arranged an inclined chute 35, which will direct any grain that falls through the concave or from the threshing-cylinder onto the endless conveyer 31 and from the latter be discharged upon sieves 36, disposed, as usual, at the discharge end of the conveyer, there being a return pan or chute 37 disposed above the sieves, which operates to direct thereto any grain that escapes from the last of the separating-cylinders.

It will be seen from the foregoing description that although the improvements of this invention are simple in character they will be thoroughly efficient for the purposes designed and may be constructed and applied to an ordinary threshing-machine without any objectionable change in the construction and arrangement of its parts.

Having thus described the invention, what is claimed is—

1. In a separating-machine the combination with a rotatable shaft; of independently-removable wheels secured upon the shaft, means for spacing the wheels apart, and parallel series of apexiform teeth disposed upon the periphery of each wheel.

2. In a separating-machine the combination with a shaft; of a plurality of wheels secured thereon, means upon the shaft for spacing the wheels apart, a band secured upon the periphery of each wheel, and parallel series of teeth integral with the band and extending therefrom.

3. As a new article of manufacture a separating-cylinder for threshing-machines comprising a shaft, a plurality of flat-sided wheels independently secured thereon at right angles to its longitudinal axis, means for spacing the wheels apart, and a band secured to the periphery of and surrounding each wheel, said band having parallel series of teeth extending from its edges.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EDWIN L. DEAVER.

Witnesses:
H. C. BRADFORD,
J. O. CHAMNESS.