H. BERDAN.

Grain and Straw Separator.

No. 5,322. Patented Oct. 9, 1847.

Fig. 1,

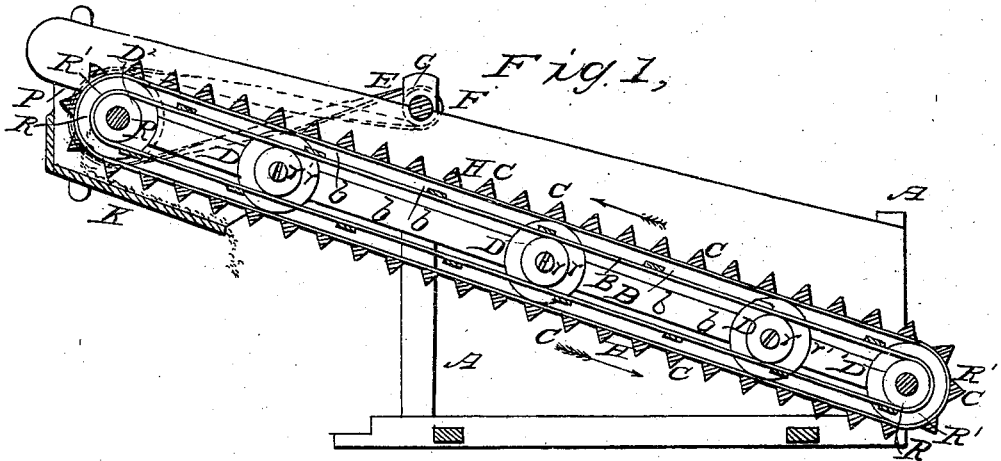


Fig. 2,

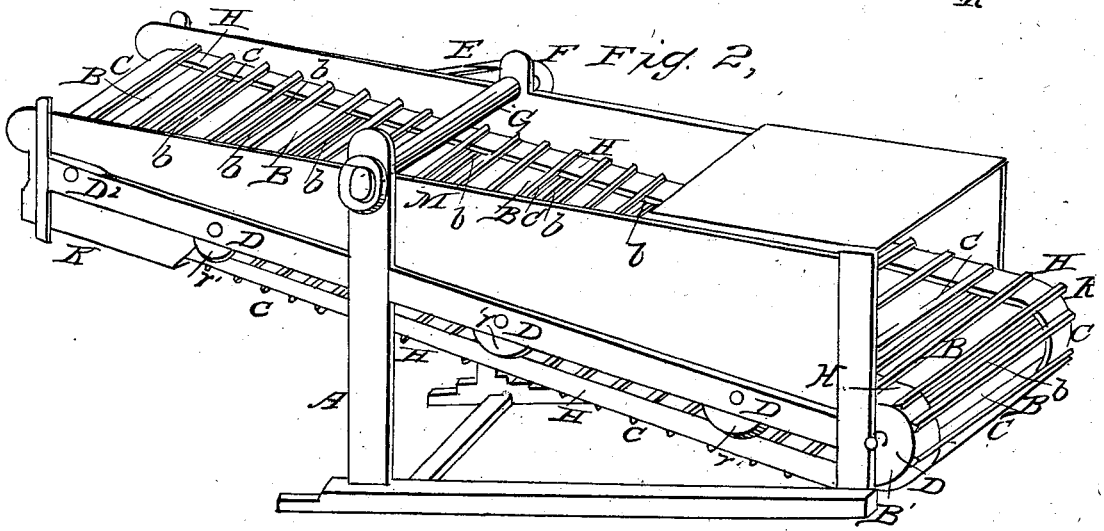
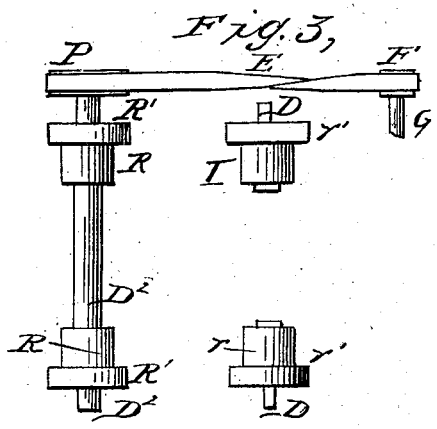


Fig. 3,



UNITED STATES PATENT OFFICE.

HIRAM BERDAN, OF PLYMOUTH, MICHIGAN.

GRAIN AND STRAW SEPARATOR.

Specification of Letters Patent No. 5,322, dated October 9, 1847.

To all whom it may concern:

Be it known that I, HIRAM BERDAN, of Plymouth, in the county of Wayne and State of Michigan, have invented a new and useful Improved Double Endless Straw and Grain Conveyer, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1, is a vertical longitudinal section. Fig. 2, is a perspective view of the machine. Fig. 3, is a plan showing some of the upper rollers and the crossed band.

The nature of my invention and improvement consists in combining an open and a close endless belt, revolving at different velocities, the one inside the other, by which the grain is separated from the straw after being threshed in a common threshing machine, and the straw conveyed from the machine and the grain conducted to a fan or other place.

Similar letters refer to corresponding parts in the figures.

This conveyer consists of a suitable frame A, in which are arranged two parallel endless flexible conveyers B, C, for conveying the straw and grain—the one revolving within the other at different velocities—the inner one B, for conveying the grain being made close in the usual manner, being an endless belt of canvas, stretched over rollers R, R, and *r r* turning on axles in boxes inserted into the frame, in such manner as to cause the endless conveyers to revolve over the said rollers at an angle of 10 or 15 degrees with a horizontal plane, the axles D, of the side rollers or supporting rollers *r*, *r'*, being made short and inserted into the sides of the frame, on the under side thereof, and the axles D', D^2, of the end rollers R, R, R', R', extending entirely through the frame, being made to turn in suitable boxes, and the upper one D^2 having a pulley P on it, around which a crossed band E is placed, leading to a pulley F, on the driving shaft G. On the aforesaid axles D' D^2 are the large pulleys, or rollers, R' R' aforesaid around which are passed parallel endless bands H, of leather, connected together by a number of parallel transverse slats C, placed at such distances apart as to leave spaces between them sufficiently large, to allow the grain to pass through to the close conveyer B, and at the same time to prevent the straw from passing through, which is carried off at the upper end of the machine by the revolving of said belts of parallel slats C, which are made to revolve at an increased speed, over that of the close conveyer B, for the purpose of throwing off the masses of straw more rapidly by reason of the increased diameter of the said rollers R' R', and to prevent the choking of the machine.

The rollers R, R, R' R' are fixed to the axles D' D^2. The intermediate rollers *r r'* are made of different diameters and turn loosely on short studs D. The larger ones sustain the the endless bands H H. The smaller ones support the endless canvas conveyers B. These rollers may be connected or separate. The inner or close endless belt or conveyer B, is likewise provided with parallel transverse slats *b* for conveying the grain to the upper end of the frame to an inclined spout K, into which it is discharged, turning at a reduced speed to prevent waste of the grain.

The trough or box K is formed beneath the upper ends of the conveyers, into which the grain is discharged by the close conveyer B, and by which the grain is conveyed wherever desired, either to a winnowing machine, or to a receiver, or other suitable place. The inside conveyer passing around smaller rollers than the outside conveyer, produces sufficient space between the two conveyers for the reception of the grain which lodges against the slats of the inside conveyer—and also prevents the machine from choking by an accumulation of short straw, chaff, and grain, between the conveyers, as will be more particularly explained hereafter.

Operation: The band extending from the threshing machine or other propelling power being passed around the pulley M of the conveyer and the threshing machine put in motion the two endless conveyers B, C, are caused to revolve in the same direction at different degrees of speed, caused by the different diameters of the rollers, the smaller rollers carrying the band B, and the larger rollers carrying the belts H—the crossed band E giving motion to the said rollers R, R, R', R'. The straw and grain having passed through the threshing machine are received upon the endless conveyers B, C, at the lowest end of the frame and are conveyed to the upper end of the frame, where the complete separation of the straw and grain takes place—the straw passing off over the parallel slats C and the latter being

discharged by the endless canvas B, into the inclined trough K which conveys it to a fan, or receiver, or other place,—the outside or open conveyer which carries and discharges the straw being made to revolve at a greater speed than the inside conveyer on account of its having a greater bulk of material to be conveyed and discharged, and thrown off at the discharging end by the increased velocity of the slats; while the slower motion of the inside or close conveyer that carries the grain is well adapted for conveying the same (which is of smaller bulk) gently into the conveying trough placed below the conveyer, without the danger of its being thrown off beyond the upper edge of the conducting trough.

The reason why the belts B and C of the conveyer and separator are made to run with unequal velocities is this. It will be seen that there is no way of keeping the inside belt B off from the outside belt C when it runs back on the under side—consequently the short straws and chaff that would work through the spaces between the slats C on the upper side, when emptied on the slats C on the under side, would remain confined between the belts B, C, with the exception of that small quantity which would fall between the slats C; and thus in a very few minutes, the whole space between the belts B, C would be filled up; but as this improved machine is constructed the inside belt B carries the chaff, wheat, short straws &c. that descend between the slats C to the upper end of the conveyer where they are emptied on the slats C passing through the spaces between them. If both belts had the same velocity it would keep the straw and chaff between the belts until they would be clogged; but revolving at different velocities the slats C which move faster than the slats *b* cause the short straw, grain, &c., to pass through the spaces between the said slats C in running back on the under side and thus keep the machine from clogging. I at first essayed to produce the desired result with large outside pulleys and with inside pulleys just enough smaller as to prevent the endless bands interfering the one with the other, and the movement of the belts was so nearly equal that they clogged very soon.

My arrangement of outside and inside slats moving at unequal velocities possesses another advantage inasmuch as it tends to draw the accumulated straw out from between the slats C on the upper side, so as to leave the spaces between them open all the while it operates to allow the wheat or grain to pass through to the close conveyer B,—which might otherwise be carried off with the straw.

What I claim as my invention and desire to secure by Letters Patent is—

The combination of an open and close endless belt; revolving the one inside the other, at different velocities, for separating the grain from the straw, after being threshed, the said conveyers operating in the manner and for the purpose described by which the straw and grain are separated more effectually and more rapidly than by any other description of grain and straw separator in use, the straw being shaken and thrown from the machine, while the grain is delivered quietly into the conducting spout without waste by reason of the peculiar arrangement and operation of the conveyers as aforesaid, while the spaces between the slats are kept open and free for the grain to pass through to the close conveyer and the space between the conveyers prevented from clogging.

HIRAM BERDAN.

Witnesses:

A. A. WILDER,

SAML. T. DOUGLASS.