

L. DE VOS & A. F. SANDERS.

GRAIN SEPARATOR.

APPLICATION FILED JUNE 10, 1912.

1,053,791.

Patented Feb. 18, 1913

3 SHEETS-SHEET 1.

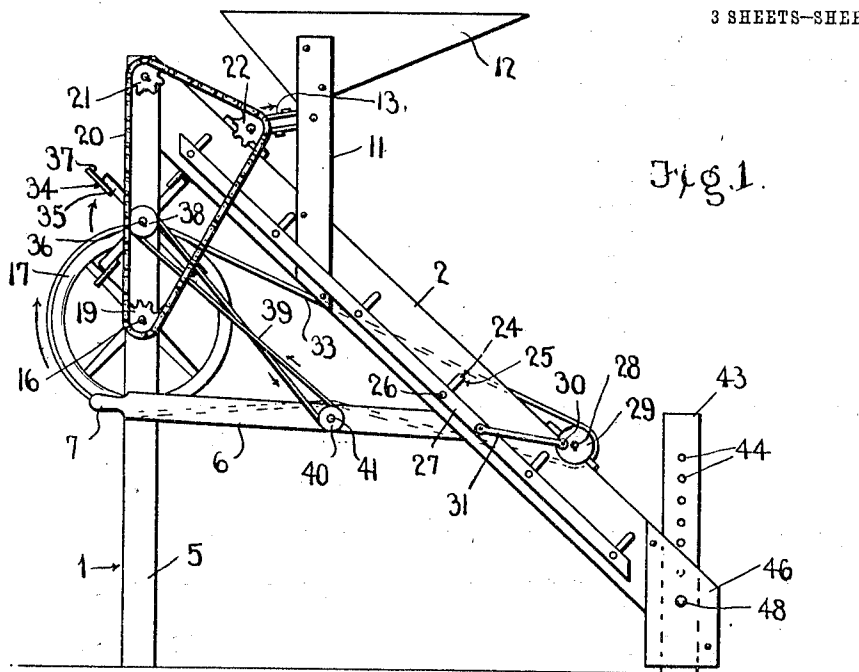


Fig. 1.

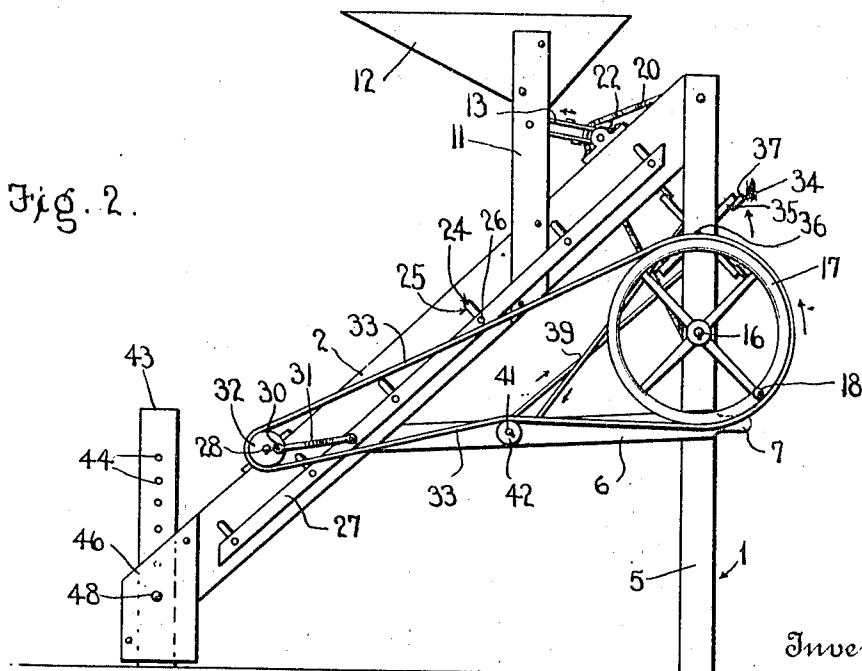


Fig. 2.

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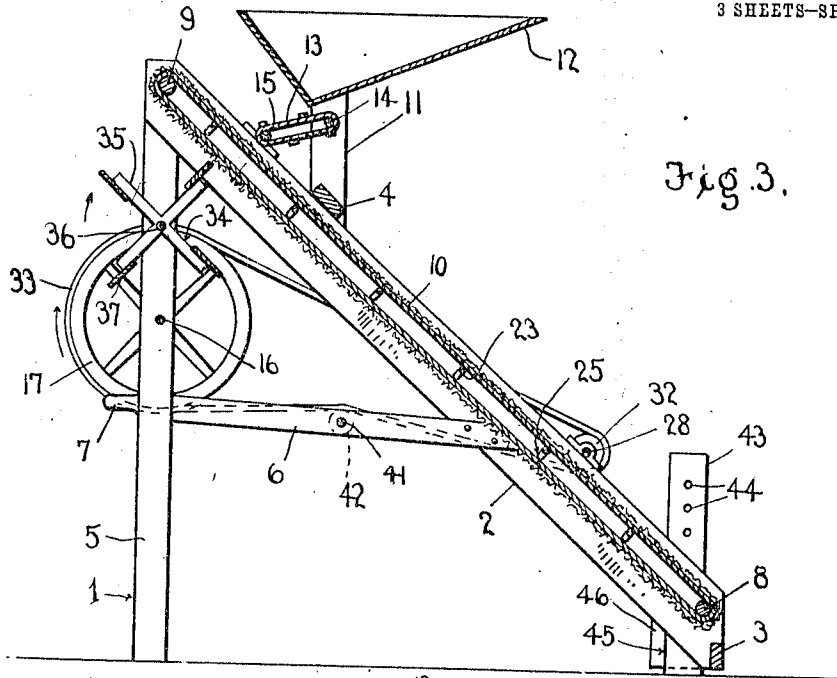
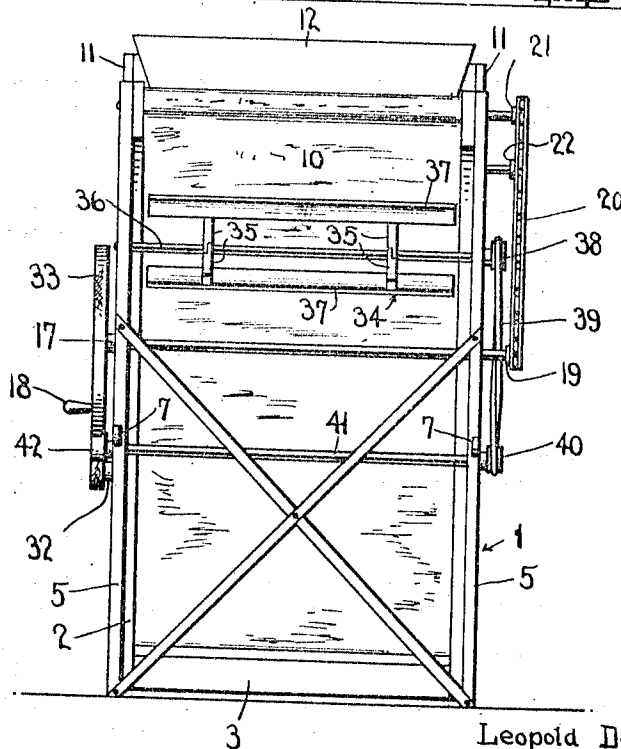


Fig. 3.

Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

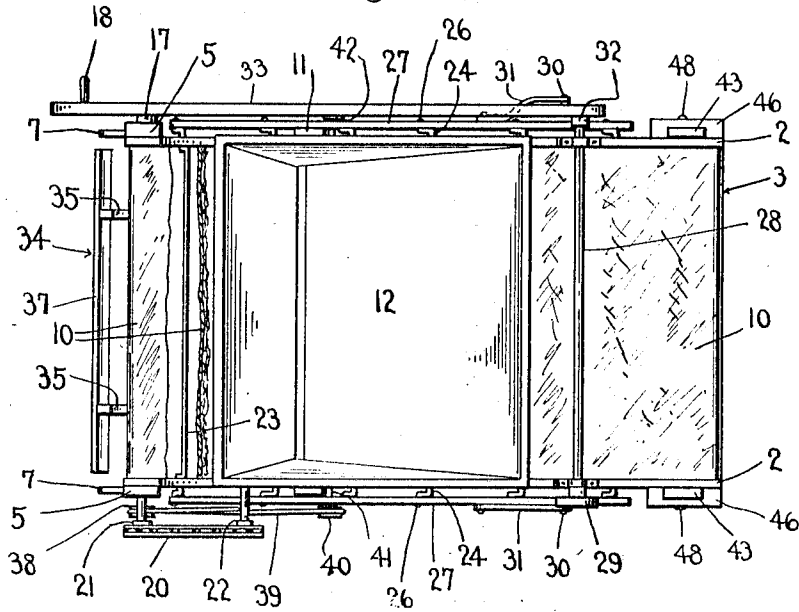
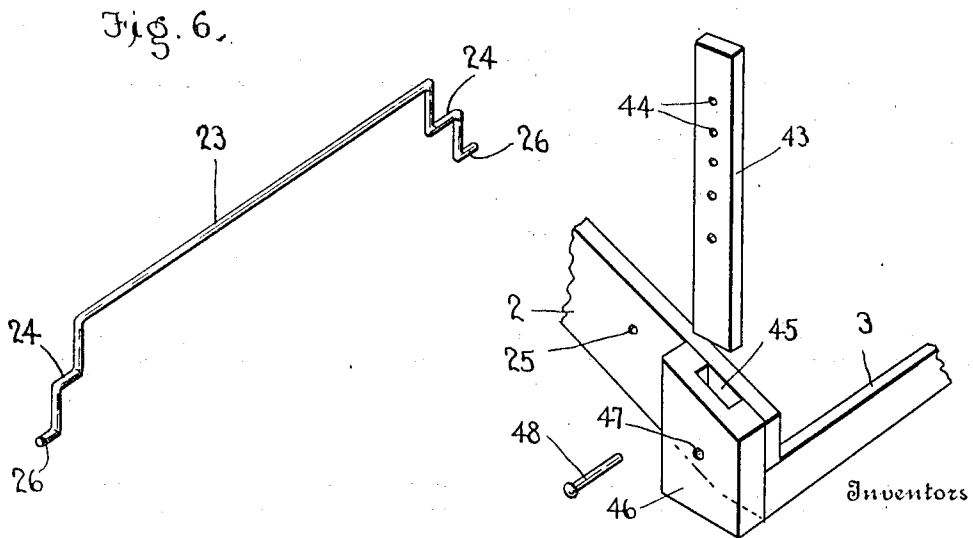


Fig. 7.



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UNITED STATES PATENT OFFICE.

LEOPOLD DE VOS AND ANTON F. SANDERS, OF MINNEOTA, MINNESOTA.

GRAIN-SEPARATOR.

Specification of Letters Patent.

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1,053,791.

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To all whom it may concern:

Be it known that we, LEOPOLD DE VOS and ANTON F. SANDERS, citizens of the United States, residing at Minneota, in the county of Lyon and State of Minnesota, have invented certain new and useful Improvements in Grain-Separators; and we do 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 improvements in grain separators, and particularly to separators for removing wild oats from cultivated oats.

The object of the invention is to provide a separator of this character which will be simple, strong, durable and inexpensive in construction, efficient and reliable in operation, and well adapted to the purpose for which it is designed.

Another and important object of the invention is in the provision of an apron the grain receiving end of which is adapted to be accurately elevated and given the desired inclination between the delivery end of the hopper and the beater of the machine.

With this and other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings: Figure 1 is a side view of one side of our improved separator; Fig. 2 is a similar view of the opposite side; Fig. 3 is a vertical longitudinal section of the separator; Fig. 4 is a rear end view thereof; Fig. 5 is a plan view with part of the upper stretch of the separating apron removed to more clearly illustrate the construction of the shakers for keeping the grain in motion while on the apron; Fig. 6 is a detail perspective view of one of the shakers. Fig. 7 is a fragmentary perspective view of the mechanism for adjusting the angle of the machine.

In the embodiment of the invention we provide an apron supporting frame 1 comprising parallel side bars 2 connected at their lower ends by a cross bar 3 and near their upper ends by a cross bar 4. The side bars 2 of the apron supporting frame are connected at their upper ends to supporting bars or legs 5 which are braced and further connected to the bars 2 by substantially horizontal brace bars 6 as shown. The brace

bars 6 are extended beyond their connection with the legs 5 and said extended ends of the bars are shaped to form handles 7 whereby this end of the separator may be readily carried.

Revolubly mounted in suitable bearings in the lower end of the side bars 2 is a lower apron supporting roller 8, while in the upper ends of the bars 2 is revolubly mounted an upper apron supporting and operating roller 9. Engaged with the rollers 8 and 9 is an endless apron 10 formed of flannel or other suitable woolen or hairy fabric, clipped sheep skin, or other material having a surface to which bearded grain such as wild oats will adhere.

Secured to the side bars 2 of the frame 1 near the upper end thereof, are upwardly projecting hopper supporting standards 11 to which is secured a feed hopper 12 having an inclined bottom provided at its lowest point with a discharge opening through which the grain is discharged onto a short endless conveyer or feed belt 13 which is engaged with a roller 14 revolubly mounted in the standards 11, and with a roller 15 revolubly mounted in suitable bearings on the upper edges of the side bars 2, said conveyer or feed belt being thus disposed immediately below the discharge opening in the hopper, whereby the grain discharged from the latter will fall onto the belt 13 which will convey and evenly distribute the grain onto the separating apron 10.

Revolubly mounted in suitable bearings in the legs or supporting bars 5 is a main drive shaft 16 on one end of which is fixedly mounted a combined hand wheel and drive pulley 17 to which any suitable power may be applied, said wheel being here shown as having a crank handle 18 whereby the same is operated by hand power. On the opposite end of the drive shaft 16 is fixedly mounted a sprocket gear 19 which is connected by a sprocket chain 20 to a sprocket gear 21 fixed on the adjacent end of the upper apron supporting and operating roller 9 and with a sprocket gear 22 on the adjacent end of the roller 15 of the conveyer or feed belt 13. By thus arranging the drive shaft and gearing for same to the apron and belt operated rollers these parts will be driven to operate the separating apron and conveyer belt in the proper direction.

In order to agitate the grain or to keep the same in motion while being carried down

onto the separating apron 10, we provide a shaking mechanism comprising a plurality of shaker bars 23 which extend across between the upper and lower stretches of the apron and have their ends bent at right angles and then offset in line with the bars to form short journals 24 which are revolvably engaged with bearing apertures 25 in the side bars 2 of the main frame. After the ends of the bars are bent to form the journals 24, said ends are again bent to form crank arms 26, the ends of which are loosely engaged with operating bars 27 whereby all the crank arms on each end of the shaker bars are connected and adapted to move in unison when the said operating bars 27 are reciprocated. The bars 27 are reciprocated to rock or actuate the shaker bars 23 by means of an operating mechanism comprising a shaft 28 which is revolvably mounted in suitable bearings on the upper edges of the side bars 2 of the main frame 1, and which has fixedly mounted on its ends crank disks 29 having eccentrically disposed wrist pins 30 to which are connected the lower ends of pitman rods 31, the opposite ends of which are pivotally connected to the operating bars 27, as shown. On one end of the shaft 28 is fixed a driving pulley 32 which is connected by an endless belt 33 with the operating wheel 17, whereby when the latter is turned to operate the separating mechanism, the movement thereof will be transmitted to the shaft 28 and the latter thus operated to actuate the shaker bars as hereinbefore described. The shaker bars 23 when thus operated will be rocked or swung in the arc of a circle and brought into forcible engagement with the lower side of the upper stretch of the separating apron 10 which revolves upwardly thereby shaking the same and causing the grain thereon to be bounced up and down and thoroughly agitated. By thus shaking the grain the cultivated oats will be thoroughly separated from the wild oats and will slide down the upper stretch of the apron and off the same at the lower end of the machine while the wild oats will adhere firmly to the woolly surface of the apron by the beards of which the wild oats are possessed. After the cultivated oats are discharged from the lower end of the upper stretch of the apron, the wild oats adhering to the woolly surface of the apron will be carried up and around by the upper stretch of the apron from the lower stretch of which the wild oats will hang pendant by their beards. In order to remove the wild oats thus clinging to the lower stretch of the apron, we provide a beater 34 in the form of a reel having radially projecting arms 35 fixedly mounted on a beater operating shaft 36 and connected at their outer ends by blades 37. The shaft 36 is revolvably mounted in suitable bearings in the upper portion of the

supporting legs or bars 5, and on one end of said shaft is fixedly mounted a drive pulley 38 which is connected by a cross belt 39 with a pulley 40 on the adjacent end of a beater operating shaft 41 which is revolvably mounted in the brace bars 6 of the main frame and which has fixed on its upper end a drive pulley 42 which is engaged by the lower stretch of the operating belt 33 which drives the shaft 28 of the shaker. The beater 34, when thus arranged and connected with the operating mechanism, will be rapidly revolved to bring the blades 37 thereof into engagement with the wild oats hanging down from the lower stretch of the separator apron when said oats have been brought around by the apron 10 to a position to be engaged by the blades of the beater.

To regulate the angle or inclination of the apron supporting frame 1 and the separating apron mounted therein, we provide an adjustable supporting mechanism for the lower end of said frame, said mechanism comprising short vertically disposed bars or standards 43 having therein vertical series of bolt holes 44. The bars or standards 43 have a sliding engagement with guide passages 45 formed in the inner sides of guide blocks 46 which are secured to the lower ends of the side bars 2 of the frame 1, as shown. In the blocks 46 and the lower ends of the side bars 2 are alined bolt holes 47 with which and with the bolt holes 44 in the standards 43 are engaged supporting bolts or pins 48. By providing the standards 43 with a series of bolt holes 44 it will be seen that the lower end of the frame 1 may be raised or lowered to bring the bolt holes 47 into register with any of the holes 44, whereby when the pin or bolt 48 is engaged with said holes the lower end of the frame will be supported at the desired inclination. By raising and lowering the lower delivery end of the supporting frame 1 the upper receiving end of the endless conveyer can be accurately adjusted in respect to the delivery end of the hopper and the beater which is positioned below the conveyer, said beater being arranged substantially opposite said hopper, whereby the machine is rendered practical and efficient for the purposes for which it is intended.

By providing a separating mechanism constructed as herein shown and described, it will be seen that oats or other forms of bearded grain may be quickly and thoroughly separated from non-bearded grain.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the

principle or sacrificing any of the advantages of the invention as claimed.

Having thus described our invention, what we claim is:

5 1. In a separator of the character described, a separating frame, a separating apron operatively mounted in said frame and having a surface adapted to catch and retain bearded grain, thereby separating
10 the same from smooth non-bearded grain, a feed hopper, a feeding and distributing mechanism to receive the grain from said hopper and evenly distribute it to said apron, a plurality of shakers to engage said
15 apron whereby the grain thereon is kept in motion, a beater to remove the bearded grain adhering to said apron, and means for accurately adjusting the elevation and inclination of the feeding and distributing
20 mechanism with respect to the hopper and beater.

25 2. In a separator the combination with an endless traveling, feeding and distributing mechanism for grain, a separating apron of a beater mounted below the said apron and adapted to revolubly coöperate therewith, said beater being arranged substantially opposite the grain receiving por-

tion of the mechanism, and means for accurately adjusting the latter with respect
30 to the beater, whereby the bearded grain adhering to the mechanism is removed during the travel of the grain.

3. In a separator, the combination with a frame having upright supports, a frame the
35 upper end of which is movably secured to the same, an endless traveling, feeding and distributing mechanism carried by the frame upon which grain is adapted to be deposited, a separating apron, a beater revolubly mounted in said supports below the
40 apron but out of contact therewith, means for depositing grain upon the apron, and standards carried by the lower end of the apron carrying frame and adapted to ad-
45 justably support the same in respect to the beater and grain depositing portion of the machine.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

LEOPOLD DE VOS.

ANTON F. SANDERS.

Witnesses:

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CHARLES L. DE REU.