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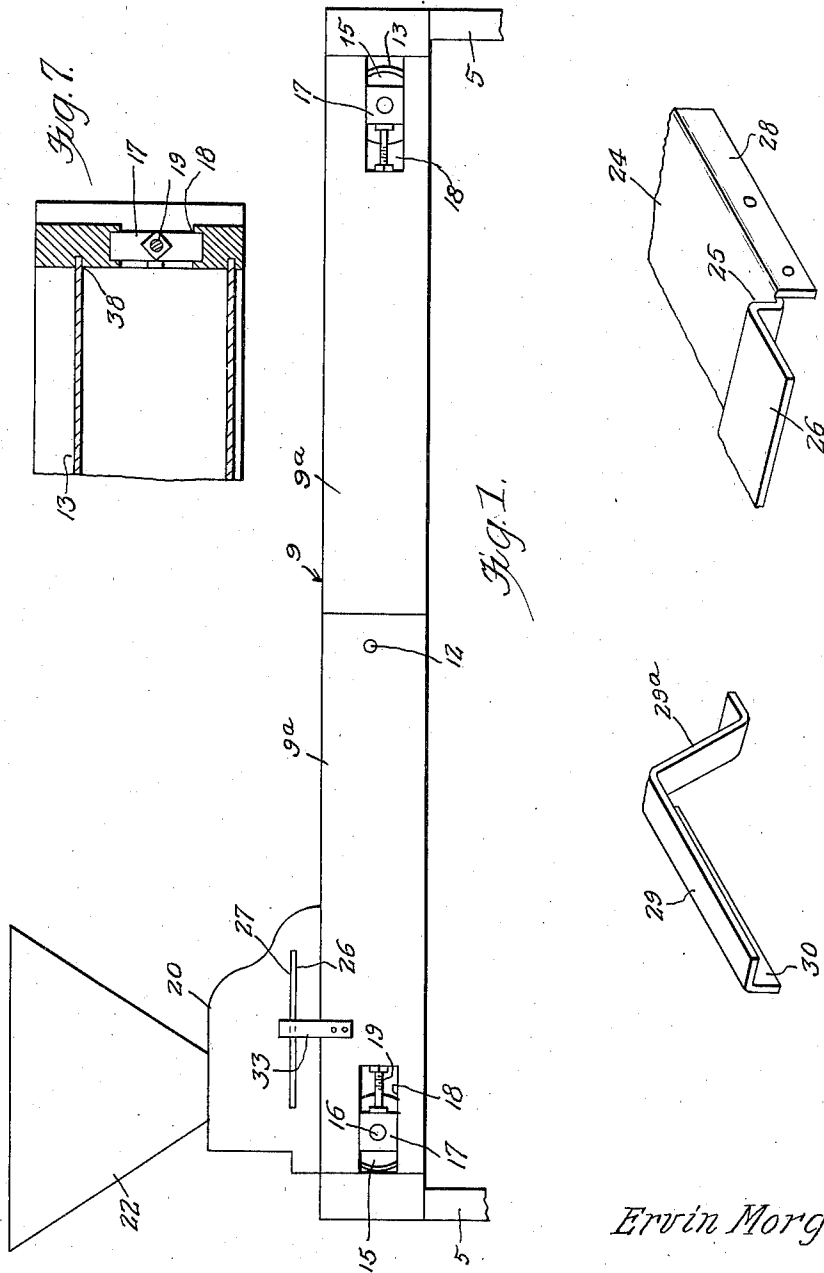
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2,139,199

GRADING MACHINE

Filed Nov. 1, 1935

3 Sheets-Sheet 1



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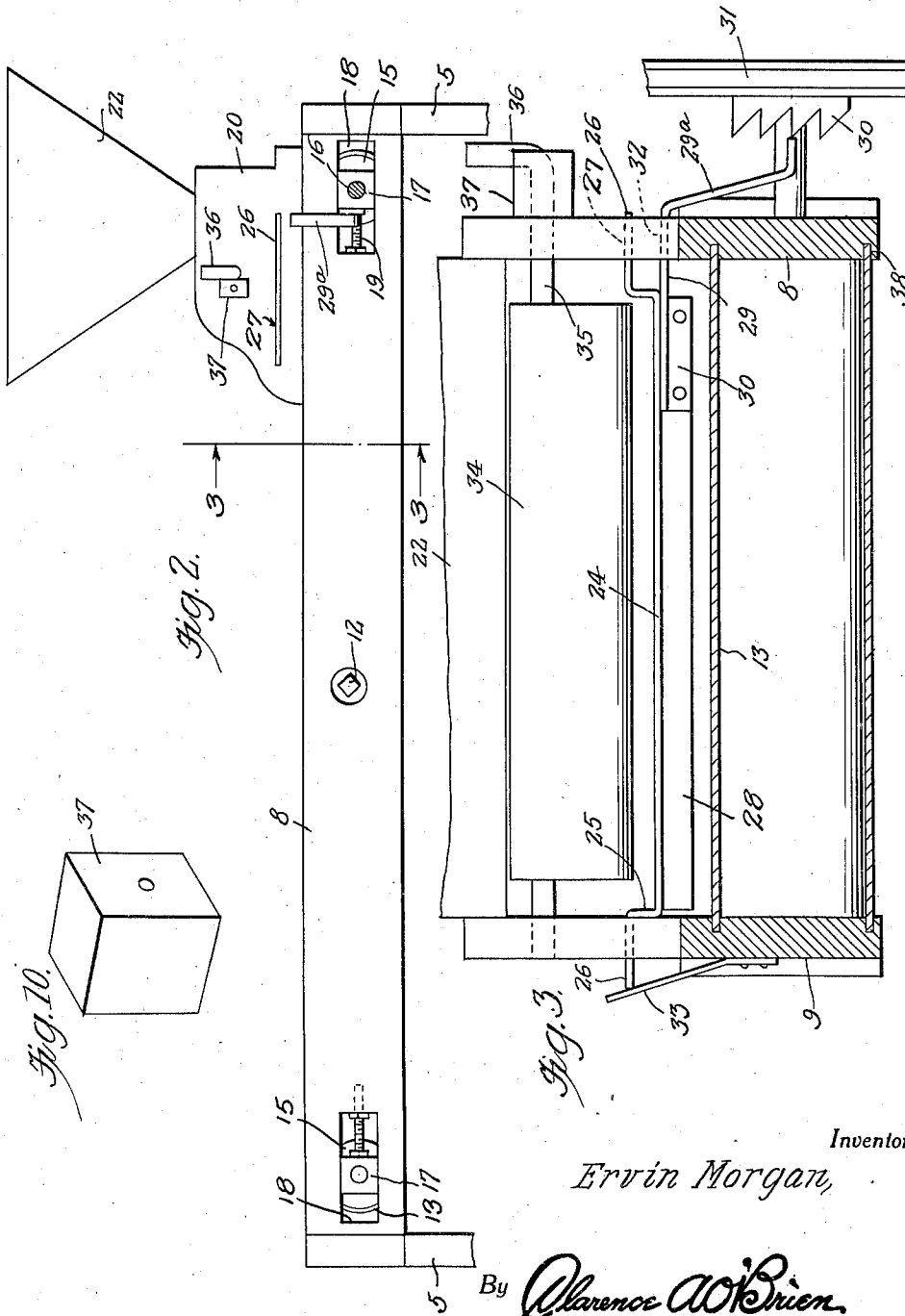
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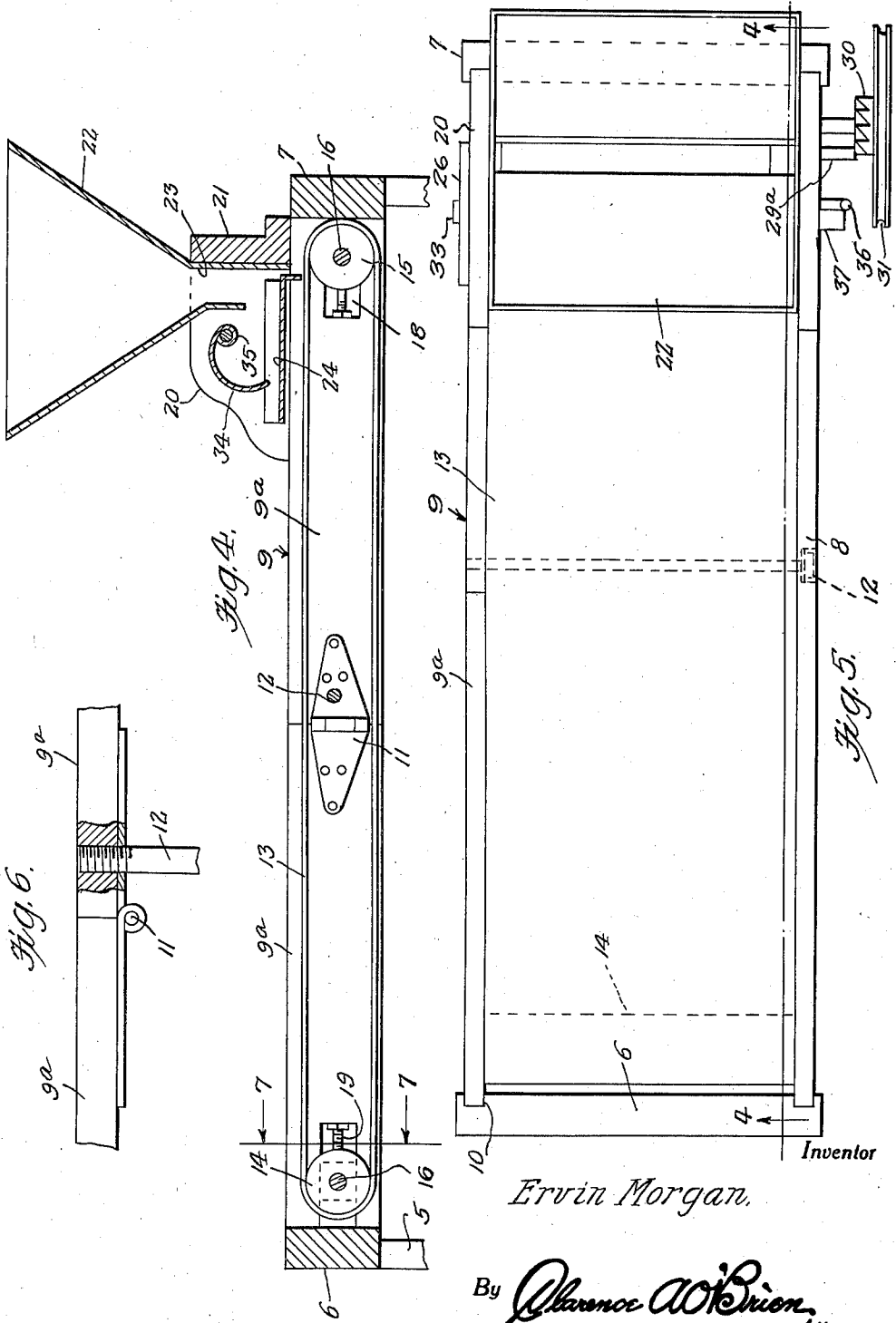
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# UNITED STATES PATENT OFFICE

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## GRADING MACHINE

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Application November 1, 1935, Serial No. 47,375

1 Claim. (Cl. 209—125)

This invention relates to a grading or sorting machine, and has as its object the provision of a machine of this character embodying an efficient and simple structure, and which is especially adapted for sorting or grading various kinds of small seeds such as for example peas, beans, corn, cucumbers and the like.

The invention together with its objects and advantages will be best understood from a study of the following description taken in connection with the accompanying drawings wherein:

Figure 1 is a side elevational view of the machine.

Figure 2 is an elevational view of the opposite side of the machine with certain parts removed and other parts shown in section.

Figure 3 is a transverse sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a longitudinal sectional view through the machine, the section being taken approximately on the line 4—4 of Figure 5 but with the belt being shown in edge view and the rollers in end view.

Figure 5 is a top plan view of the machine.

Figure 6 is a fragmentary plan view with parts in section of one side of the frame of the machine.

Figure 7 is a fragmentary detail sectional view showing the adjustable bearing for the roller of the endless belt, the section being taken on line 7—7 of Figure 4.

Figure 8 is a fragmentary perspective view of an agitator or reciprocating plate.

Figure 9 is a perspective view of an arm forming a part of the means for reciprocating the aforementioned plate.

Figure 10 is a perspective view of a stop block.

Referring to the drawings by reference numerals it will be seen that the machine comprises an elongated frame supported adjacent each of the four corners thereof by legs 5 and including end members 6, 7 and side members 8 and 9. The side members 8 and 9 have ends fitting in grooves 10 provided on the inner faces of the end members 6 and 7 as shown in Figure 5.

The side member 8 is of one single length while the side member 9 comprises a pair of complementary sections 9a, being divided transversely intermediate its ends to provide said sections. The sections 9a are hingedly connected together through the medium of a hinge 11 and the sides 8 and 9 are held together through the medium of a tie bolt 12, as shown, one leaf of the hinge 11 being apertured to accommodate an end of the bolt 12 as shown in Figure 4.

Suitably mounted in the frame is an endless

conveyer comprising an endless belt 13 trained over rollers 14, 15 mounted on shafts 16 whose ends are journaled in bearing blocks 17.

Bearing blocks 17 are mounted in elongated slots 18 provided in the respective opposite ends of the respective side members 8 and 9 and are secured at the desired adjustment through the medium of suitable adjusting bolt devices 19, for taking up slack in the endless belt or apron 13.

Mounted on the frame adjacent the end 7 thereof is a casing having sides 20 and an end 21. Supported by this casing is a hopper 22 having a discharge neck 23 that extends into and is suitably mounted in the aforesaid casing.

Suitably mounted within the aforesaid casing and for reciprocating movement transversely of the endless apron or belt 13 is an agitator plate 24.

Plate 24 at its opposite ends has upturned flanges 25 merging into lateral extensions 26 that are accommodated in suitable slots 27 provided therefor in the sides 20.

The plate 24 on one side edge is also provided with a pendant flange 28 and an actuator arm 29 is provided with a flange 30 which is bolted or otherwise secured to the flange 28 of the plate 24 at one end of the latter.

The arm 29 has a downwardly offset end 29a that is suitably formed at its terminal to engage a ratchet wheel 30 provided on one side of a pulley wheel 31 fixedly mounted on one end of the roller shaft 16 as best shown in Figure 3. In this figure it will also be noted that arm 29 works through a suitable slot 32 provided therefor in the adjacent side 20 of the aforementioned casing.

The flange extension 26 on the end of the plate 24 farthest remote from arm 29 is in bearing engagement with a leaf spring 33 anchored at one end to the adjacent side 9 of the frame. Spring 33 thus serves to normally urge the arm 29a into engagement with the ratchet wheel 30 and cooperates therewith to the end that during a driving of the belt 13, plate 24 will be caused to reciprocate back and forth transversely of the belt 13 for agitating the seed discharging thereon from the hopper 22. In this connection of course it will be understood that any suitable drive means may be connected with the pulley 31 for driving the endless belt or apron 13.

A feed control plate 34, substantially semi-cylindrical in cross section is pivotally mounted above the plate 24 between the sides 20 of the casing, through the medium of a rod 35 whose ends are journaled in the sides 20. On one end

thereof the rod 35 is provided with a handle 36 that is adapted to abut a stop block 37 suitably mounted on an adjacent side 20 of the aforesaid casing for limiting downward swinging movement of the feed adjuster plate 34 (see Figures 2 and 4).

The operation and utility of the invention will be more apparent from the following: The seed is placed into the hopper 22 and feeds by gravity on to the plate 24. As the plate 24 reciprocates the seed thereon will be agitated and seed of a proper size will work forwardly through the space between the plate 24 and the lower edge of the feed adjuster 34 to drop on to the endless belt 13 whereby the seed is carried to the end of the device the farthest remote from the hopper 22 and there gathered and put into a suitable receptacle. Obviously by positioning the feed plate 34 relatively to the plate 24 only seed of a predetermined size will discharge from the plate 24 onto the endless belt 13. Thus in this way the seed may be easily and expeditiously graded by a single operation. In the event of seed larger than the space between the plate 24 and the lower edge of the plate 34 gathering behind the plate 34, said accumulation of comparatively large seed will be accommodated in the concavity of the plate 34 and may be removed at intervals by the operator.

It will be further noted that to prevent any of the seed falling off of the belt 13 at the sides thereof, the runs of the belt operate in suitable grooves 38 provided on the inner sides of the sides 8 and 9 as best shown in Figure 3.

Also to remove the belt 13 all that is necessary is to loosen the tie bolt 12 whereupon the side 9 may be removed by folding the same at the hinge 11 to withdraw the free ends of the respective sections 9a of the side 9 out of the grooves 10 in the ends 6 and 7 of the frame. Access may then be readily had to the belt 13 which may be easily slid sidewise off the rollers 14, 15 and a

new belt quickly substituted therefor, after which the side 9 can be quickly moved into place.

Having thus described my invention, what I claim as new is:

The herein described grading machine comprising essentially a frame, an endless belt mounted in the frame, a drive pulley adjacent one end of the belt for driving the same, a casing mounted on the frame adjacent the drive pulley and having sides in which are slots and also having an end, a hopper supported by said casing above the conveyor and having a discharge opening in the bottom thereof facing in the direction of the movement of the belt, an agitator plate between said opening and the belt and extending substantially the width of the belt, said agitator plate having flanges at its ends and also having on said flanges end portions movable through said slots of the casing sides, a leaf spring carried by one side of the frame and opposed to the outer end of one of said end portions, a ratchet wheel carried at the inner side of said pulley, an arm fixed to the agitator plate and having a portion disposed in the path of the ratchet wheel teeth, a transverse shaft disposed above and spaced from the agitator plate and journaled in the sides of said casing and having at one end a bent portion comprising an arm at the outer side of the casing side, an arcuate plate extending substantially the width of the agitator plate and having one of its longitudinal edges fixedly secured to said shaft with the concave portion of said arcuate plate facing toward the discharge opening of the hopper and the free longitudinal edge thereof spaced from the agitator plate, said arcuate plate being substantially semi-cylindrical to provide a substantially large concavity, and a stop carried on the outer side of one of the casing sides and disposed to contact said arm to limit the downward swing of the free edge of the arcuate plate.

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