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F. L. KEENE, ADMINISTRATRIX.

PEA SEPARATOR.

APPLICATION FILED JUNE 27, 1914.

1,143,202.

Patented June 15, 1915.

3 SHEETS—SHEET 1.

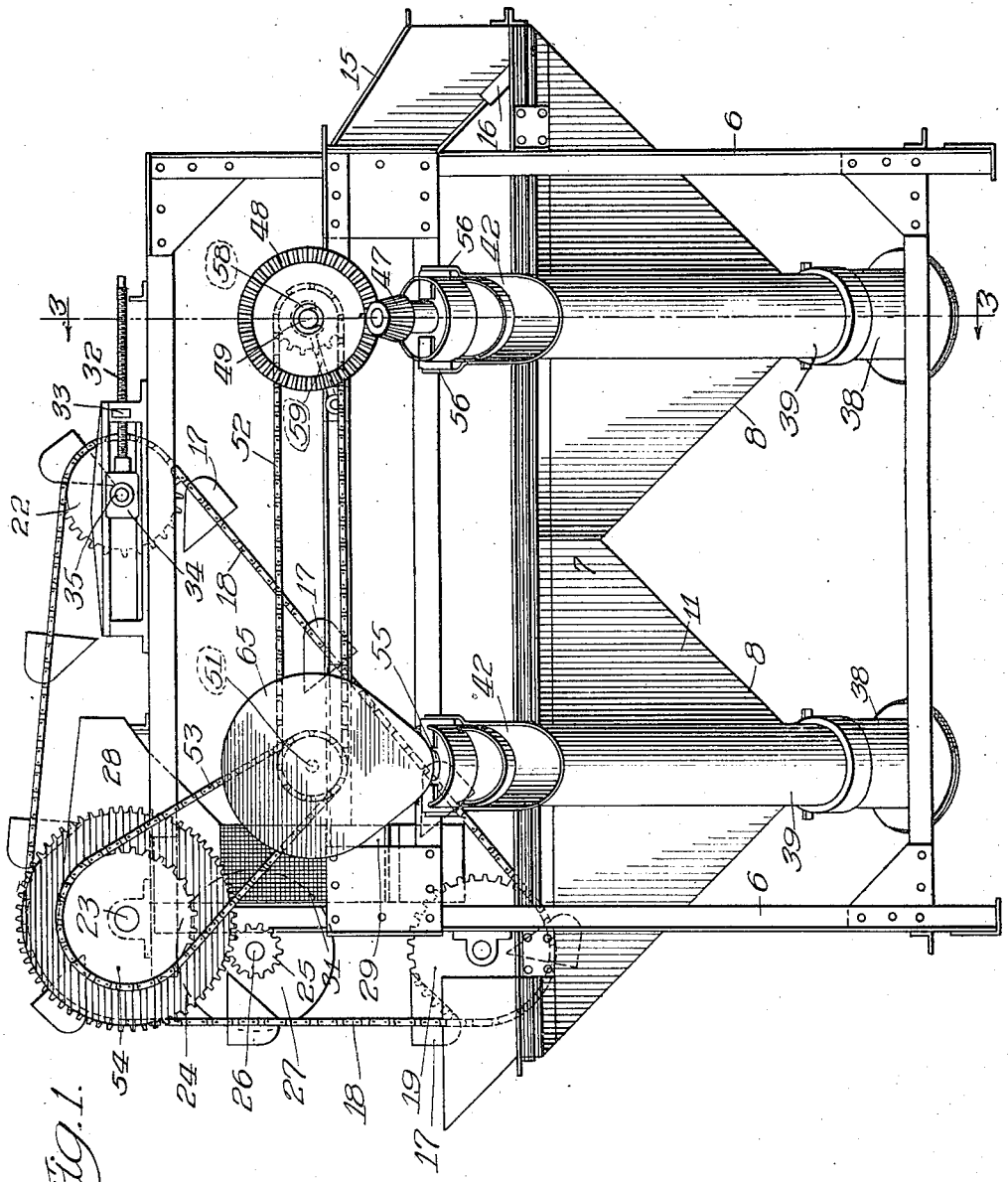


Fig. 1.

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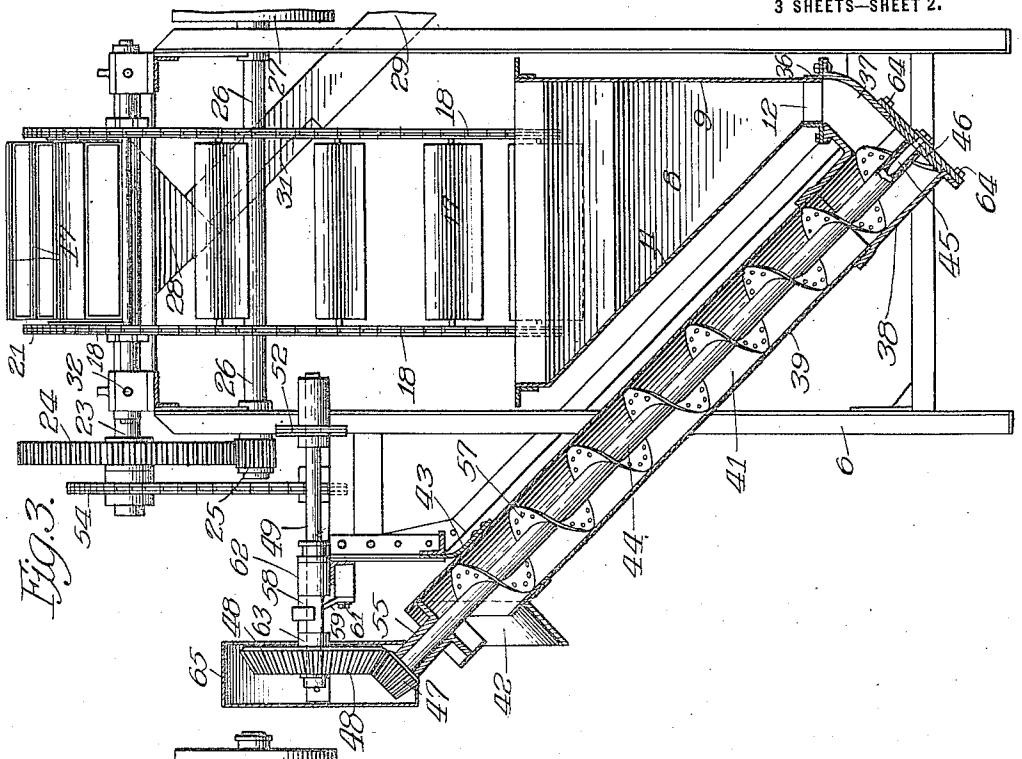


Fig. 3.

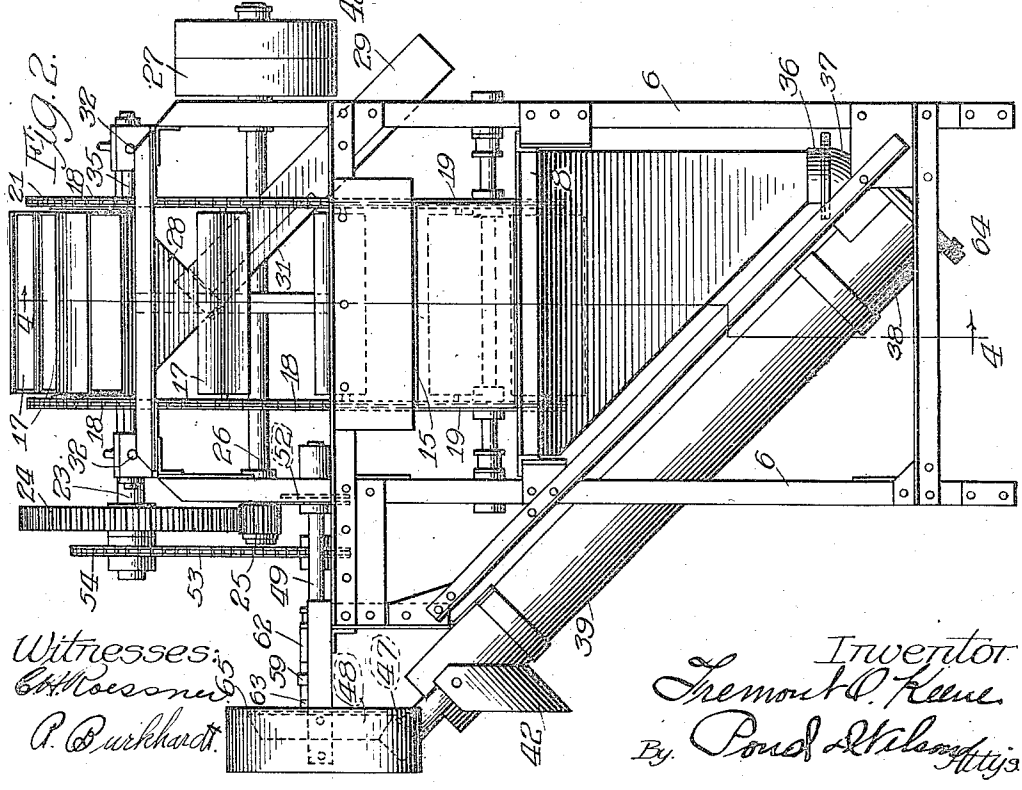


Fig. 2.

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3 SHEETS—SHEET 3.

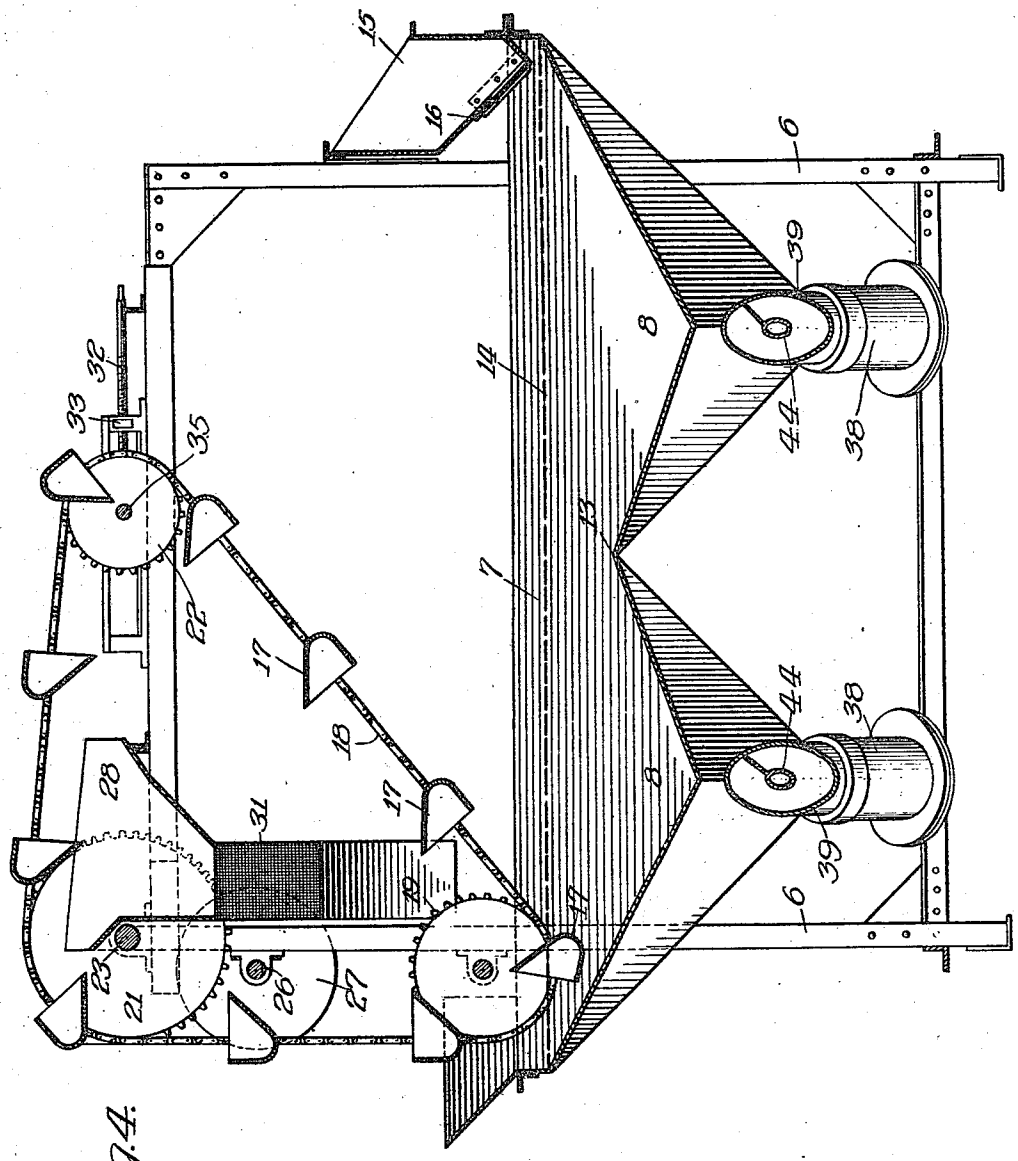


Fig. 4.

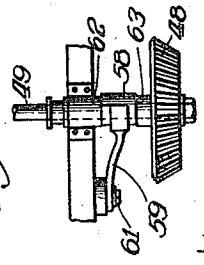


Fig. 5.

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UNITED STATES PATENT OFFICE.

FREMONT O. KEENE, OF FREEPORT, ILLINOIS; FLORENCE LITTLE KEENE, OF STEPHENSON COUNTY, ILLINOIS, ADMINISTRATRIX OF SAID FREMONT O. KEENE, DECEASED.

PEA-SEPARATOR.

1,143,202. Specification of Letters Patent. Patented June 15, 1915.

Application filed June 27, 1914. Serial No. 847,614.

To all whom it may concern:

Be it known that I, FREMONT O. KEENE, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Pea-Separators, of which the following is a specification.

This invention relates in general to devices or mechanisms for separating material into various grades, and has more particular reference to a machine for separating or grading shelled peas.

It is well known that the smallest and choicest peas are lighter than the larger and older peas, which have matured and become hard and solid. In canning factories it is desirable to separate the young tender peas from the older and harder peas so that they may be canned separately, the smaller peas constituting the choicest grades and the older peas being sold as seconds or at a cheaper price.

My present invention aims to provide a separator into which all grades of shelled peas may be poured promiscuously and which will automatically separate the peas into the different grades and deliver the peas of each grade at a different point.

One of the primary objects of this invention is the provision of a machine of this character which will be of simple and compact construction, which can be readily taken apart for purposes of cleaning so that the machine may be maintained in a sanitary condition, which can be operated with a small amount of power, and which will be efficient and accurate in its operation.

Other objects and advantages of this invention will be apparent to those skilled in the art as the same becomes better understood by reference to the following description when considered in connection with the accompanying drawings.

Referring to the drawings—Figure 1 is a front elevation of a pea separator embodying my invention; Fig. 2 is an end elevation thereof, looking toward the left in Fig. 1; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is a sectional view on the line 4—4 of Fig. 2, and Fig. 5 is a fragmentary view of one of the conveyer driving gears and the means for holding it in operative position.

From an observation of the drawings it will be apparent that the machine comprises a main frame composed of uprights 6 connected by suitable cross members at various points, the frame being adapted to carry the tank 7 and the various operating mechanisms, which will be later described.

The tank 7, preferably constructed of galvanized sheet metal and adapted to contain brine or other liquid of the desired specific gravity, is shaped as best shown in Figs. 1, 3 and 4 to provide a plurality of settling compartments 8, two being shown in the present instance although it will be obvious that the machine might be designed to provide more than two if desired.

Each of the settling chambers has a vertical rear wall 9 and an inclined front or bottom wall 11 which is shaped to provide a downwardly tapering compartment adapted to direct the peas, which are heavier than the liquid and settle therein, to the outlet opening 12 in the bottom of the compartment. From Figs. 1 and 4 it will be observed that the settling chambers are separated from each other below the line 13, where the upper edges of their front walls merge, and are in communication with each other above this line so that peas floating near the top of the brine can pass from the compartment shown at the right in Figs. 1 and 4 to the compartment at the left. The upper level of the brine or liquid in the tank is indicated in Fig. 4 by reference character 14.

The peas to be separated are dumped into a hopper 15 at the right hand end of the machine from which they pass into the tank through an opening in the bottom of the hopper, the size of which may be controlled by an adjustable slide or gate 16 so that the peas are deposited lightly upon the surface of the brine in the tank. The heavier or poorer grade of peas will immediately sink in the first settling compartment and will pass downwardly through the opening 12 in the bottom thereof. The other peas will gradually travel toward the left hand end of the machine and those which are too heavy to float very long will gradually settle to the bottom of the other settling compartment, while the lighter and best grade of peas will float on the brine to the left hand end of the machine where they will be

collected and removed from the tank by a series of buckets 17 mounted on an endless chain conveyer 18 trained over the sprocket wheels 19, 21 and 22. The shaft 23 upon which the sprocket wheels 21 are mounted has fixedly secured thereon a gear wheel 24 which is driven from a spur gear 25 fixed on a drive shaft 26, the other end of which is equipped with a pulley 27 adapted to be driven by a belt from any suitable source of power. As the buckets are moved in succession into the tank and partially submerged in the liquid contained therein they induce a slight current on the surface only of the liquid sufficient to cause the approach of the floating peas so that they may be collected by the buckets and carried upwardly to a point where they are discharged into the hopper 28 located above the tank. A chute 29 (Fig. 3) delivers the peas outside the machine and a screen 31, disposed in the chute, permits the liquid to drain from the peas back into the tank. The tension of the chain 18 may be regulated by means of adjusting screws 32 (Fig. 1) threaded through stationary nuts 33 and connected with the bearing blocks 34 in which the shaft 35, carrying the sprocket wheels 22, is mounted.

Since the settling compartments and the mechanisms for removing the peas separated thereby are substantially alike in construction and operation a detailed description of one will be sufficient for an understanding of the invention. Referring now more particularly to Fig. 3 it will be observed that the opening 12 at the bottom of the compartment 8 is surrounded and reinforced by a flanged collar 36. The peas which settle downwardly through the opening 12 enter a conduit 37 extending laterally from and preferably formed integrally with a casting 38 which forms the lower end of a chamber into which the peas pass. The upper end of the conduit 37 is preferably flanged and is rigidly attached to the collar 36 by bolts or other suitable fastening means. A cylinder 39, of steel or sheet metal, forms a continuation of the casting 38 to provide an elongated tubular chamber 41 which extends upwardly beneath the settling compartment and preferably substantially parallel with the inclined lower wall 11 thereof, the upper end of the chamber being considerably higher than the level of the liquid in the tank, so that ample opportunity for the peas to drain off will be afforded before the peas are eventually delivered from the chamber through the discharge opening 42. The upper end of the cylinder 39 may be supported by a bracket 43 attached to the main frame of the machine or other suitable means of supporting the cylinder may be provided.

For the purpose of removing the peas from the chamber 41 I have provided a screw conveyer 44 which fits rotatably but snugly within the chamber, the lower end being journaled upon a pin 45 carried by a cap 46 closing the lower end of the chamber, the shaft of the screw being hollowed at its end to accommodate the pin 45 and rotate freely thereon. At its upper end the screw is equipped with a beveled pinion 47 adapted to mesh with and be driven by a beveled gear 48 splined on a shaft 49 which is driven as shown in Fig. 1 from its companion shaft 51 by means of a chain 52, the shaft 51 being driven by means of a chain 53 from a sprocket wheel 54 fixed on the shaft 23. The upper end of the worm shaft is journaled in a bearing 55 removably fitted within the upper end of the cylinder 39 and normally retained in position therein by yielding detents 56 carried by the cylinder. The screw blades are provided with perforations 57 to permit the liquid to drain back into the chamber 41 without permitting the peas to pass therethrough.

In order that the machine may be thoroughly cleaned and scalded each night so that it may be maintained in a thoroughly sanitary condition I have so mounted the screw conveyer 44 that it may be removed longitudinally from the chamber 41. With this end in view the beveled gear 48 is splined on the shaft 49 so that it may be slid inwardly on said shaft out of alinement with the screw conveyer, thereby permitting the conveyer to be lifted out of the upper end of the cylinder 39. To normally hold the gear 48 in coöperative relation with the spur gear 47 I have provided a block 58 (Figs. 3 and 5) shaped to fit down over the shaft 49 and carried by an arm 59 pivoted to the main frame of the machine by a bolt 61. The block 58 is adapted to fit between the outer end of the bearing 62 and the inner end of the hub 63 of gear 48 so as to prevent inward movement of the gear on its shaft when the machine is in operation. Should it become desirable to drain the tank of the chamber 41 this may be accomplished by simply moving the cap 46 from the lower end of the chamber, this cap being held in position by bolts 64 or other suitable fastening means. If preferred the lower end of the chamber might be equipped with a faucet through which the brine could be drained off. It will be observed, from an inspection of Fig. 3, that the lower end of the screw conveyer is disposed laterally with respect to the opening 12 into the settling compartment so that the brine in the settling compartment will not be agitated by operation of the screw. If the screw were disposed directly beneath the opening 12 operation of the screw would agitate the brine and establish up-currents in the settling compartment which would interfere with the quiet settling of the peas and ma-

terially detract from the accuracy and efficiency of the machine. By disposing a chamber 41 at one side of the opening 12 and providing an inclined conduit, down which the peas will pass into the chamber, the operation of the screw will not cause any agitation of the brine in the settling compartment with the result that the peas will settle gradually and easily to the bottom of the compartment and pass outwardly through the opening 12 into the chamber 41 from which they are continuously removed and delivered outside the machine by the screw conveyer. In order to protect the operators against injury from the beveled gears a removable gear casing 65, of any preferred construction, may be employed if desired.

It is believed that my invention and its mode of operation will be fully understood from the foregoing without further description, and while I have shown and described one preferred embodiment of the invention it will be obvious that various changes in the structural details disclosed may be resorted to without departing from the spirit of this invention or sacrificing any of its material advantages.

I claim:

1. In a pea separator, the combination of a tank adapted to contain brine or the like and shaped to provide a plurality of settling compartments having inclined side walls, said tank being adapted to receive a supply of peas at one end thereof, means for inducing a slight current in the surface only of the liquid and for gathering the peas floating at the opposite end of said tank, and means for delivering the peas, which are collected in said settling compartments, outside the machine.

2. In a pea separator, the combination of a tank provided with a plurality of settling compartments, shaped to contain brine or the like and maintain the brine in a quiescent condition, means operating adjacent one end of the tank for inducing a slight surface current only in the tank and adapted to gather the peas floating on the brine, chambers adapted to receive the peas from each settling compartment, and means for delivering the peas from said chambers.

3. In a pea separator, the combination of a tank, adapted to contain brine or the like and shaped to provide a substantially funnel-shaped settling compartment extending upwardly in proximity to the surface of the liquid, a chamber communicating with the bottom of said compartment, a conveyer operating in said chamber to deliver the peas therefrom, said conveyer being positioned laterally of the opening between the chamber and the settling compartment so that the operation of the conveyer will not agitate the liquid in said settling compartment, and means for gathering and removing from the tank the peas which float past said settling compartment.

4. In a pea separator, the combination of a tank adapted to contain brine or the like, said tank being formed to provide a plurality of funnel shaped settling compartments extending upwardly nearly to the surface of the liquid, a chamber communicating with the bottom of each of said settling compartments to receive the peas which settle in said compartments, screw conveyers disposed in said chambers, means for actuating said conveyers to deliver the peas from the chamber, said conveyers being so positioned as not to agitate the liquid in the settling compartments, and means for attracting and removing from the tank the peas which float past said settling compartments.

5. In a pea separator, the combination of a tank adapted to contain brine or the like, and shaped to provide a plurality of downwardly tapering settling compartments, means for inducing a surface current only in the liquid above the compartments, a chamber communicating with the lower end of each of said compartments, and continuously operating means disposed in said chambers for delivering the peas from the chambers without agitating the liquid in said settling compartments.

6. In a pea separator, the combination of a tank adapted to contain brine or the like and having a downwardly and rearwardly inclined bottom wall, a chamber communicating with the lower end of said compartment into which the peas settle from the compartment, and a screw conveyer positioned beneath said inclined compartment wall and extending into said chamber for removing the peas from said chamber, the lower end of said conveyer being positioned laterally of the opening in the bottom of said settling compartment so that the liquid in said compartment will not be agitated by operation of the conveyer.

7. In a pea separator, the combination of a tank adapted to contain brine or the like and shaped to provide a settling compartment having a downwardly and rearwardly inclined bottom wall, a chamber communicating with the bottom of said compartment through an inclined passageway, a screw conveyer disposed in said chamber and extending upwardly substantially parallel with said inclined wall of the compartment, and means for continuously operating said conveyer to remove the peas from said chamber without agitating the liquid in said compartment.

8. In a pea separator, the combination of a tank shaped to provide a plurality of settling compartments, means for delivering separately the different grades of peas which

settle in each of said compartments and without agitating the liquid in said compartments, and means for collecting and delivering the lighter peas which float in said tank.

9. In a pea separator, the combination of a tank adapted to contain brine or the like, having an inclined lower wall, a chamber communicating with the bottom of said tank through an inclined passageway, a removable conveyer disposed in said chamber for delivering the peas therefrom, means for removably supporting the lower end of said conveyer in said chamber, and means outside the chamber for operating said conveyer.

10. In a pea separator, the combination of a tank adapted to contain brine or the like and forming a settling compartment having an inclined lower wall, a chamber provided with a laterally extending conduit communicating with the bottom of said compartment, a bearing pin mounted concentrically in the lower end of said chamber, a screw conveyer extending into said chamber and rotatably engaged with said pin, and means for rotating said conveyer to deliver the peas from said chamber.

11. In a pea separator, the combination of a tank adapted to contain brine or the like and shaped to provide a settling compartment, a chamber communicating with the bottom of said compartment to receive the peas therefrom, a screw conveyer extending into said chamber and inclined upwardly beneath said compartment, and means for rotating said conveyer, said rotating means being adapted to be moved out of alinement with the conveyer to permit longitudinal removal of the conveyer from said chamber.

12. In a pea separator, the combination of a settling compartment, a chamber communicating therewith to receive the peas therefrom, a screw conveyer extending into said chamber, means including a gear for rotating said conveyer, and means for normally holding said gear in coöperative relation with the conveyer, said holding means being movable into inoperative position to permit displacement of the gear so that the conveyer may be longitudinally removed from the chamber.

13. In a pea separator, the combination of a plurality of separating compartments constructed to contain liquid in a quiescent condition, means for maintaining a relatively small depth of liquid above said compartments, one of the compartments being adapted to receive a supply of peas, means for creating a surface current only in the liquid from the pea-receiving compartment to the settling compartment adjacent thereto and for gathering peas from the surface of the liquid, and means for delivering separately the peas which settle in the several compartments out side of the machine.

14. In a pea separator, the combination of a plurality of settling compartments constructed to contain liquid in a quiescent condition, means for maintaining a relatively small deptl of liquid above said compartments, means for gathering and removing the peas which float over said compartments, and movable conveying means for delivering the peas which settle in the compartments out side the machine without agitating the liquid in the compartments.

15. In a pea separator, the combination of a plurality of downwardly tapering settling compartments constructed to contain liquid in a quiescent condition, means for maintaining a relatively small depth of liquid above said compartments, means for gathering and removing the peas which float over said compartments, and movable conveying means for delivering the peas which settle in the compartments out side the machine without agitating the liquid in the compartments.

16. In a pea separating machine, the combination of a downwardly tapering settling compartment constructed to contain liquid in a quiescent condition, and having an opening at the lower end thereof through which peas may pass, a compartment having conveying means therein, and a conduit connecting the said opening with the last named compartment and extending laterally from said opening whereby said conveying means will not agitate the liquid in the settling compartments.

17. In a pea separator, the combination of a settling compartment constructed to contain liquid in a quiescent condition and having an opening at its lower end through which peas may pass, a conduit leading downwardly and laterally from said opening, and movable conveving means to which said conduit leads, whereby said conveying means will not agitate the liquid in the settling compartments.

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