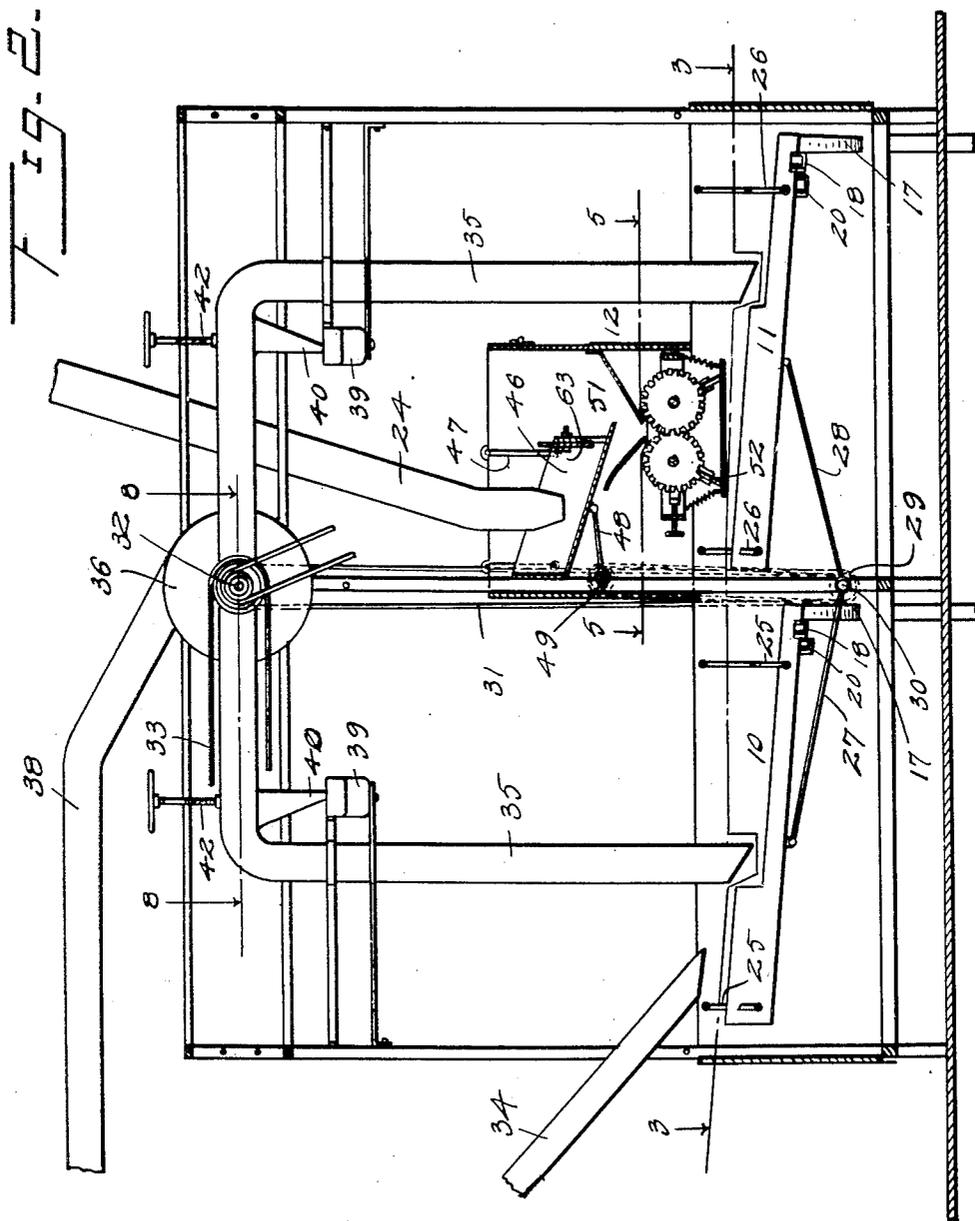


H. S. STANSBURY.
GRAIN CLEANING MACHINE.
APPLICATION FILED FEB. 3, 1921.

1,398,162.

Patented Nov. 22, 1921.

5 SHEETS—SHEET 2.



Inventor

H. S. Stansbury

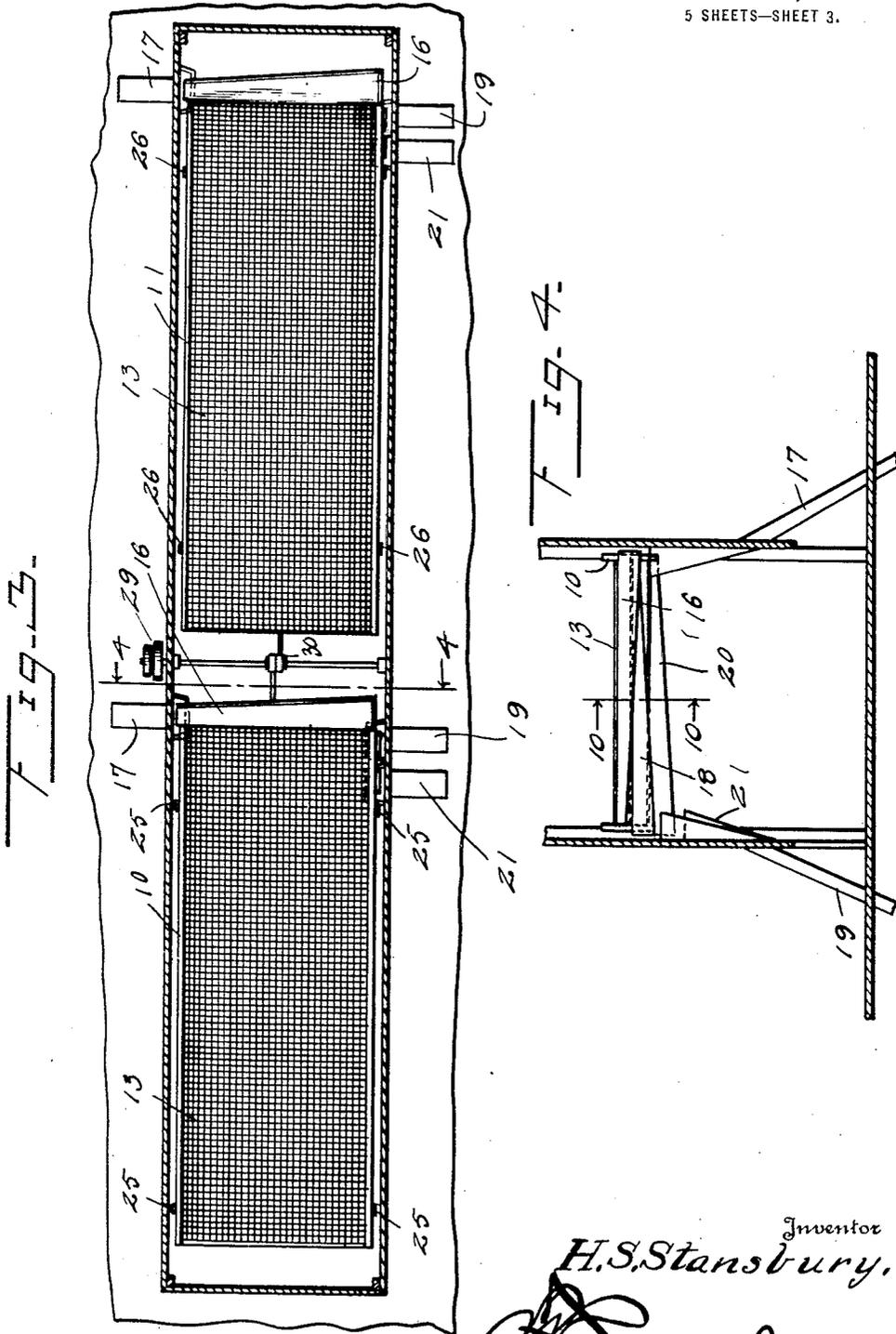
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Attorney

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Fig. 5.

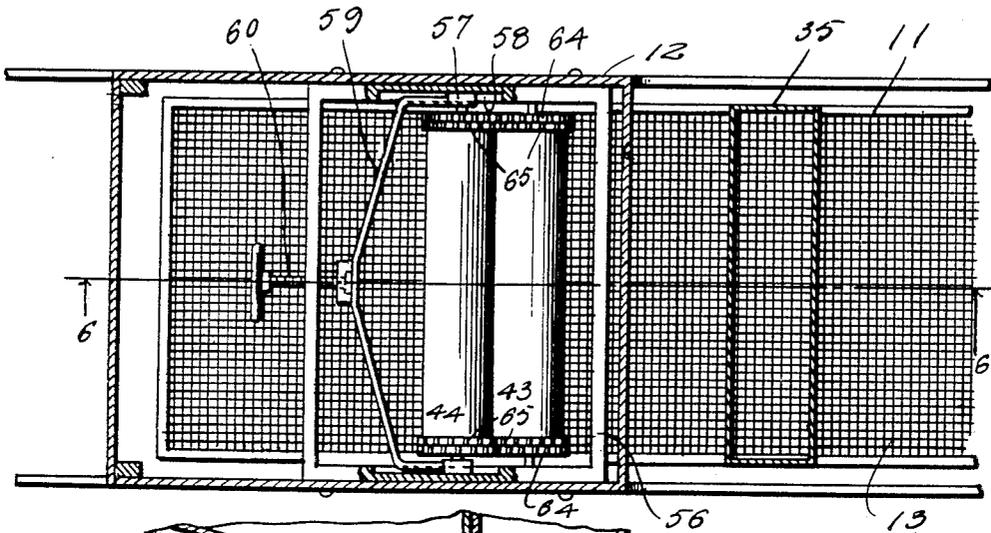


Fig. 6.

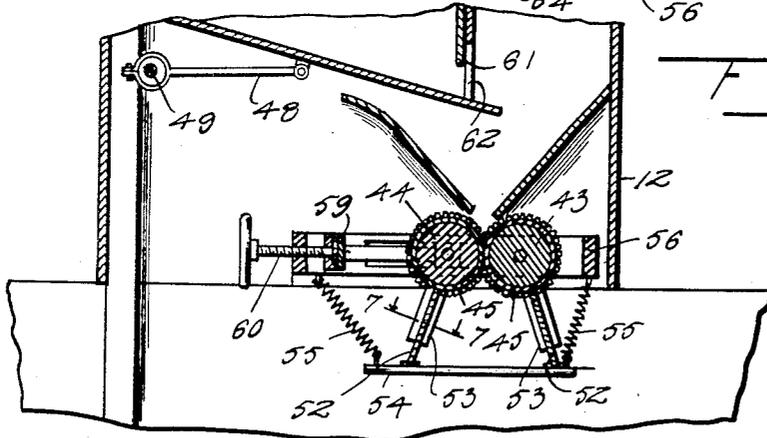


Fig. 7.



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5 SHEETS—SHEET 5.

Fig. 9.

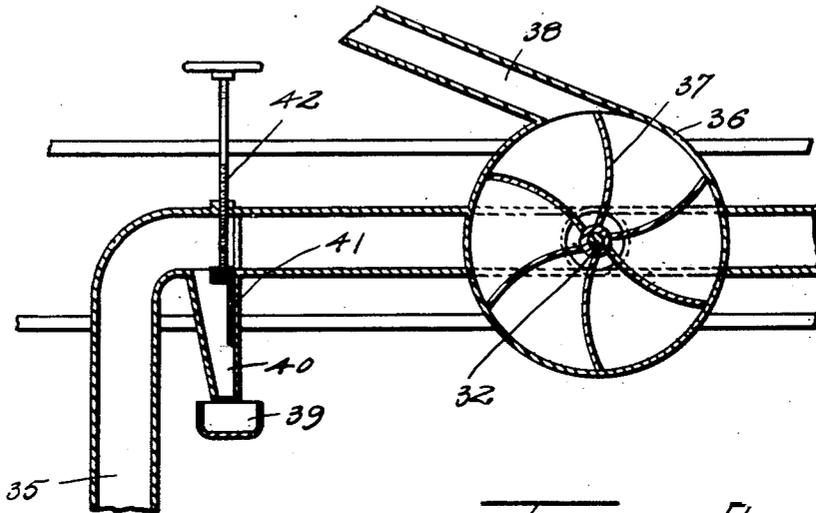


Fig. 10.

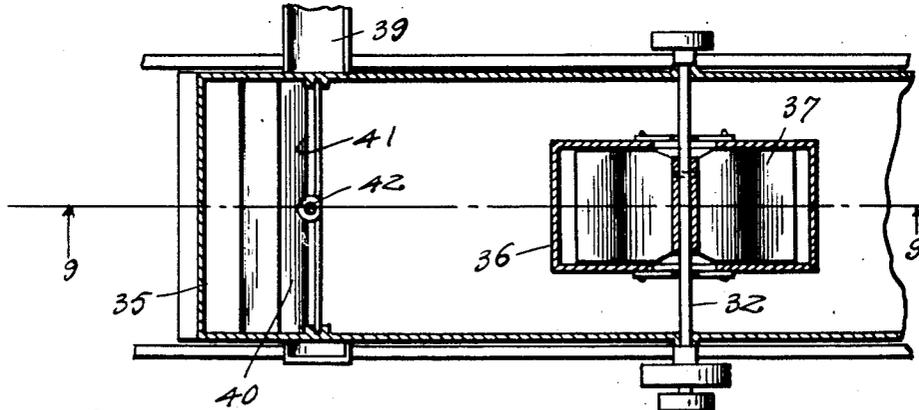
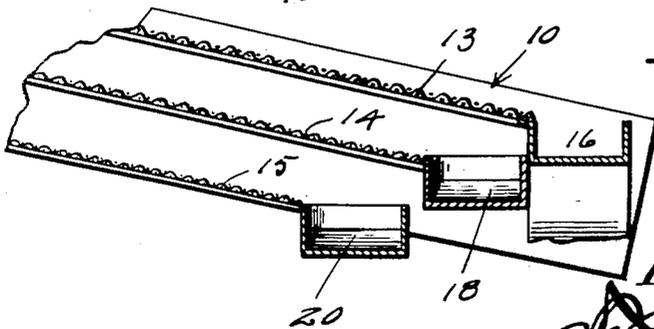


Fig. 11.



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UNITED STATES PATENT OFFICE.

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GRAIN-CLEANING MACHINE.

1,398,162.

Specification of Letters Patent.

Patented Nov. 22, 1921.

Application filed February 3, 1921. Serial No. 442,129.

To all whom it may concern:

Be it known that I, HARRY S. STANSBURY, a citizen of the United States, residing at Ashland, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in a Grain-Cleaning Machine; and I do hereby 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.

The object of the invention is to provide a comparatively simple and efficient means and method of treatment whereby trash, dust and other foreign materials may be removed from grain, such as wheat or the like preparatory to milling the same and preparatory in fact to the weighing or measuring of the grain at the time of its acceptance from the farmer or producer as a basis of compensation for the same, and for separating the cracked and undersized grains from the standard grains to the end that the same may be used as a by-product for poultry feed and the like; but more especially the object in view is to provide an efficient means and method whereby garlic may be eliminated from the grain under such conditions as to leave no odor thereof, and which if permitted to remain even in minute proportions in the grain detracts very materially from the commercial value thereof by reason of being objectionable to the consumer, as it is found in practice that whereas the larger stems or portions of the garlic may readily be eliminated by the use of ordinary riddles or screens, the removal of smaller particles thereof of a size less than or no greater than the grain is usually extremely difficult or impossible, and it is therefore the object of the invention to treat such particles of garlic in such a way as to render them readily and completely removable from the grain or product; and with these and further objects in view as will appear hereinafter the invention consists in a construction, combination and relation of parts of which a preferred embodiment is shown in the accompanying drawing, wherein:

Figure 1 is a side view of the machine.

Figure 2 is a longitudinal sectional view of the same.

Figure 3 is a horizontal section on the plane indicated by the line 3—3 of Fig. 2.

Figure 4 is a transverse section on the plane indicated by the line 4—4 of Fig. 3.

Figure 5 is a detail horizontal section on the plane indicated by the line 5—5 of Fig. 2.

Figure 6 is a detail enlarged section of the crushing mechanism.

Figure 7 is a detail view on the plane indicated by the line 7—7 of Fig. 6.

Figure 8 is a detail horizontal section on the plane indicated by the line 8—8 of Fig. 2.

Figure 9 is a section on the plane indicated by the line 9—9 of Fig. 8.

Figure 10 is a detail section on the plane indicated by the line 10—10 of Fig. 4.

The apparatus consists essentially of primary and secondary riddles 10 and 11 to the action of which the grain is successively subjected and an intermediate crushing mechanism 12 to which the material of the first grade is subjected upon leaving the primary riddle and before being subjected to the secondary riddle, the function of the crushing mechanism being to crush or mash the stems or fibers of garlic which have passed through the first riddle and simultaneously cause the evaporation of the juice or moisture of such stems or fibers while rendering the solid portions thereof subject to the eliminative screening action of the secondary riddle to the end that a complete removal thereof may be effected in the passage through said second riddle, the evaporation of the moisture or juices serving to remove the odor which therefore does not subsequently serve to contaminate or depreciate the value of the product.

In the construction illustrated and which may be regarded as typical of a grain cleaning mechanism adapted for carrying out the object of the invention, the riddles are of similar and in fact practically identical construction, each having a plurality of graded screens of which three are shown in the drawing, respectively designated as 13, 14 and 15, arranged in superposed relation with the upper screen 13 of such a mesh as to permit the grain to pass therethrough while separating therefrom the larger particles of trash, the husks, hulls, etc., which are deposited at the lower end of the said screen, the riddle being arranged at a downward inclination from its receiving toward its delivery end, in a transverse conveyer trough 16 and thence conveyed to a suitable discharge

spout 17. The intermediate screen 14 is of smaller mesh than the screen 13 and is designed to prevent the passage of the grain of normal or commercial size from passing therethrough while permitting the passage of split grain, dust and fine dirt together with undersized grains and the like, the commercial grain being conveyed by said screen to the transverse conveyer trough 18 by which it is delivered into the discharge spout 19. The third or lowermost screen 15 which is of still smaller mesh than the intermediate screen, while permitting the escape of the dust, carries the grains which are of undersize and the split grains, etc., to the transverse conveyer trough 20 by which they are delivered to the discharge spout 21. The material delivered from the spout 21 may be used for poultry feed and in the ordinary practice is returnable to the farmer or producer while the grain delivered by the spout 19 and which represents the marketable product in size and grade is retained and subjected to further treatment as hereinafter specified.

In the construction illustrated the discharge from the spout 19 is conveyed by a suitable elevator mechanism 22 of any preferred form to a bin or hopper 23 from which it is adapted to be fed as the process proceeds by a delivery or feed spout 24 to the crushing mechanism. The riddles are supported by swinging hangers 25 and 26 for vibratory movement communicated thereto through pitmen or rods 27 and 28 from a crank disk 29 carried by a shaft 30 which receives its motion through a belt 31 or the equivalent thereof from a drive shaft 32 which may be driven by any suitable power or motor through the belt 33.

Supplemental to the grain cleaning and grading means consisting as above described of the riddles, to the primary member of which the grain is fed by the supply spout 34, there may be used a suction cleaning mechanism for removing chaff, straw and the like and consisting for example of an air drum 35, having branches located with their inlet ends adjacent to the primary and secondary riddles and in communication with the casing 36 of a rotary fan 37 having an outlet spout 38, a suitable settling pocket 39 being provided for each branch of the drum with a spout 40 leading thereto and controlled by a gate 41 having an operating means consisting for example of the feed screw 42. The fan in the construction illustrated is shown mounted upon the drive shaft 32.

The crushing mechanism consists essentially of the rolls or drums 43 and 44 having yielding faces of rubber or like material as shown at 45 and adapted to be held in such relation that while the grain such as wheat will pass therebetween without being crushed

or broken, the stems or fibers of garlic or any like vegetation which are less resistant to pressure than the grains of wheat or the like will be crushed or mashed, while the heat incident to the pressure of the rolls and which in operation will reach quite a considerable degree, will serve to evaporate the moisture due to the juices of the stems or fibers thus crushed and the fibrous portions of the stems which pass between the rollers and are then deposited upon the uppermost screen of the secondary riddle are in a shape to be readily separated from the grain which drops through the uppermost screen of large mesh and passes to the intermediate screen whereby it is conveyed to the transverse trough 18 and discharged in a perfectly clean condition. The crushed stems and any other loose fibrous matter or trash which has not been eliminated during the first riddling operation will be removed by the uppermost screen of the secondary riddle 11 and conveyed to the waste discharge spout 17 while the finer particles with the dust will pass through the intermediate screen and will be received by the lowermost fine mesh screen and conveyed through the trough 20 to the dust outlet 21.

In presenting the grain to the crushing rolls it is preferable to discharge the same from the feed spout 24 upon a distributing trough 46 suspended by hangers 47 and subject to vibration through a link or pitmen 48 connected with a crank disk 49 receiving motion through the belt 31 operating upon a pulley 50, or any equivalent means, said shaking spout 46 discharging into a hopper 51.

Scrapers 52 are preferably arranged in contact with the surfaces of the crushing rolls or drums, the same consisting of plates fitted in suitable guides 53 and engaged by a bar 54 which is supported by springs 55 so that the scrapers exert a yielding pressure upon the rolls to remove any particles which tend to adhere thereto. Also preferably while the drum or roller 43 is mounted in fixed bearings in the frame 56, the drum 44 is mounted in movable bearings 57 fitted in guides 58 and connected by a yoke 59 to which is attached a feed screw 60 serving as a means of varying the pressure between the rolls. The feed spout 46 is also preferably provided with a feed regulating gate 61 actuable to vary the area of the outlet indicated at 62 and adapted to be secured in place by any suitable fastening means such as that indicated at 63. Also preferably the terminals of the rolls or drums are provided with intermeshing gears arranged in pairs as shown at 64 and 65, the teeth in the pair of gears arranged at each end of each roll being disposed in staggered relation, so as to insure a uniform and absolutely synchronous rotary movement of the cooperating rolls regardless

of any strains which may be applied thereto tending to cause separation or relative displacement.

Having thus described the invention, what I claim is:—

1. A grain cleaning apparatus having primary and secondary riddles and an intermediate crushing mechanism to the action of the later of which the grain is subjected subsequent to treatment by the primary and prior to treatment by the secondary riddle, said crushing mechanism having cooperative yielding faced drums or rolls and means for communicating motion thereto, a hopper for directing material to the contacting surfaces of said rolls, and a vibratory feed spout for discharging material into the hopper.

2. A grain cleaning apparatus having primary and secondary riddles and an intermediate crushing mechanism to the action of the latter of which the grain is subjected subsequent to treatment by the primary and prior to treatment by the secondary riddle, said crushing mechanism having cooperative yielding faced drums or rolls and means for

communicating motion thereto, a hopper for directing material to the contacting surfaces of said rolls, and a vibratory feed spout for discharging material into the hopper, said feed spout being provided with discharge regulating means.

3. A grain cleaning apparatus including a supporting structure, primary and secondary riddles carried by said structure, a frame carried by said structure, drums mounted in said frame, and receiving grain from the primary riddle and delivering the same to the secondary riddle, means for rotating said drums, springs connected to said frames, a bar supported by said springs, scrapers supported in contact with the peripheries of the drums by said bar, and guides carried by the supporting structure and slidably receiving the scrapers.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY S. STANSBURY.

Witnesses:

BENNETT S. JONES,
E. WADELICH.