B. N. TRAUTMAN.

CRUSHER FOR SEED EXTRACTING MACHINES.

APPLICATION FILED APR. 12, 1920.

1,378,737.

Patented May 17, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

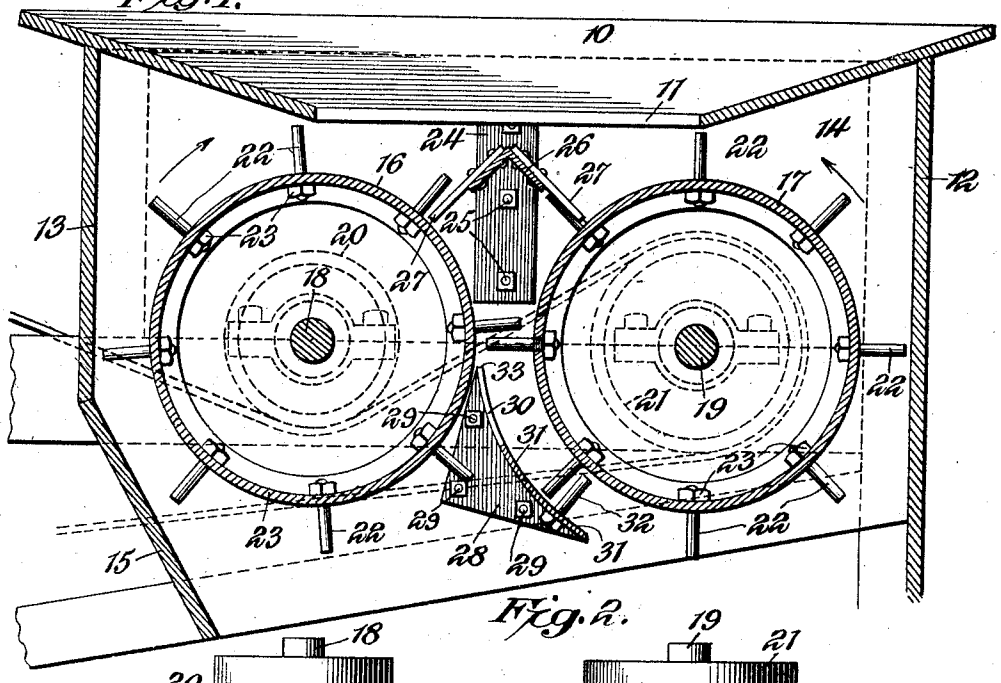
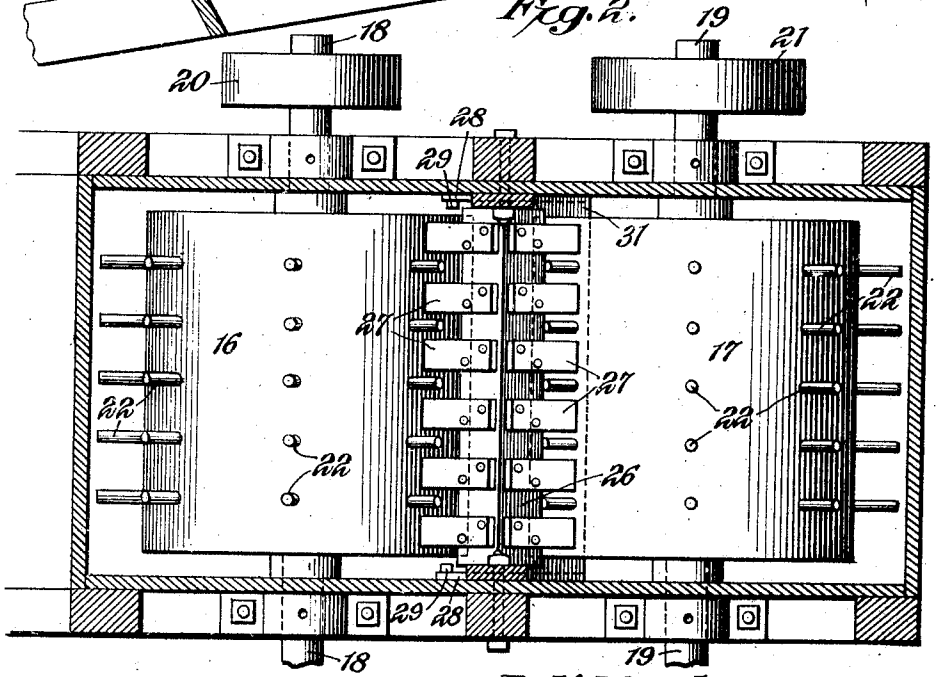


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

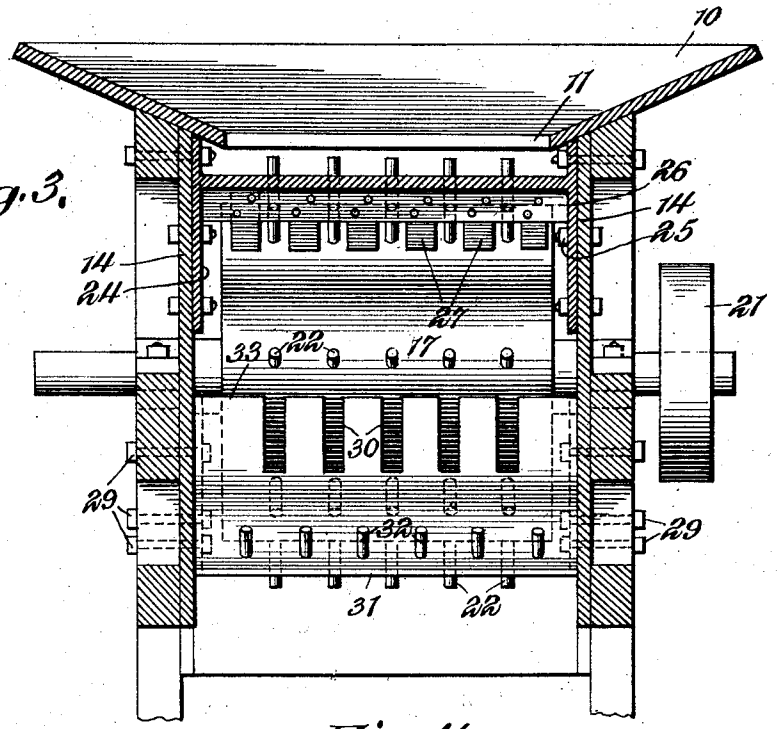


Fig. 4.

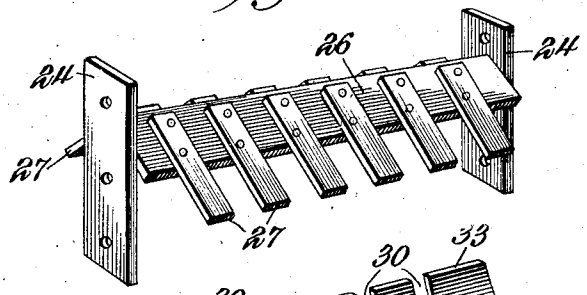
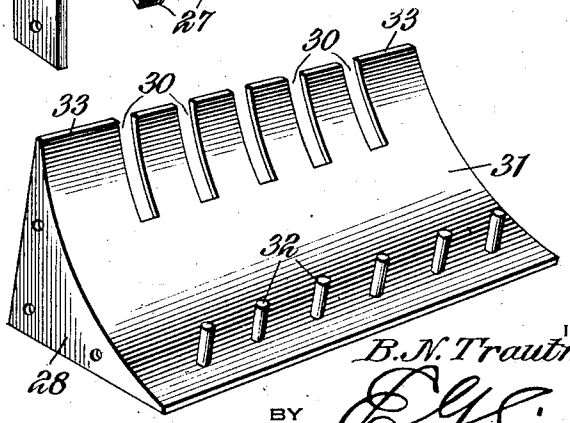


Fig. 5.



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CRUSHER FOR SEED-EXTRACTING MACHINES.

1,378,737. Specification of Letters Patent. Patented May 17, 1921.

Application filed April 12, 1920. Serial No. 373,332.

To all whom it may concern:

Be it known that I, BURL N. TRAUTMAN, a citizen of the United States, residing at Fort Collins, in the county of Larimer and State of Colorado, have invented a new and useful Crusher for Seed-Extracting Machines, of which the following is a specification.

This invention relates to crushers; particularly to crushers adapted for seed extracting machines.

The object of the invention is to provide a construction which will thoroughly crush all kinds of fruits and vegetables having seeds.

The present invention forms a part of a seed extracting machine and is to be used in connection with a vibrating riddle of the type disclosed in my Patent No. 1,266,641, dated May 21, 1918, or of any similar type. The claims in said patent were limited to the riddle. The present crusher represents an improvement on the crusher disclosed by said patent. For an improved type of riddle, reference should be made to an application filed of even date herewith, Serial No. 373,331.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing in the drawings, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings,

Figure 1 is a cross section through the crushing rolls and hopper of a crusher constructed in accordance with the present invention.

Fig. 2 is a top plan view showing the hopper removed.

Fig. 3 is a cross section at right angles to the section of Fig. 1.

Fig. 4 is a detail perspective view of the crusher comb.

Fig. 5 is a similar view of the tooth-cleaning means.

The numeral 10 denotes a hopper member which may be of any preferred form, the drawings showing a shallow rectangular hopper, but a hopper of the structure described in my patent above referred to may be used instead. This hopper is provided with a discharge opening 11 of any desirable shape. Vertical end walls 12 and 13, and side walls 14, form a crushing chamber below the hopper top 10 and a slanting wall 15 is joined with the wall to aid in delivering the crushed material upon the vibrating riddle below (not shown).

Crushing rolls 16 and 17, mounted upon shafts 18 and 19, are arranged within the crushing chamber referred to. A pulley 20 is secured to the shaft 18 and a larger pulley 21 is fixed to shaft 19. The same driving means will be connected to both pulleys, resulting in an unequal angular velocity imparted to the crushing rolls. The horizontal axes of the two rolls are each disposed directly below one of the edges defining the opening 11, this disposition being clearly illustrated in Fig. 1.

Each roll is provided with a series of removable teeth 22. These teeth are preferably cylindrical pins having heads 23 adapted to be engaged by a wrench and having screw threaded portions engaged with tapped bores at desired points in the rolls. The rolls are hollow as indicated and the various teeth may be removed by working from either end of said roll. This removability is desirable when crushing large melons, as watermelons.

A crusher comb is provided immediately below the hopper opening 11 to coöperate with the teeth of the rolls to aid in crushing the fruit or vegetables. This comb comprises a framework including uprights 24 secured by elements 25 to the sides 14 of the crushing chamber and a horizontal member shaped like an inverted V carrying the series of spaced downwardly inclined flat bars 27.

A tooth-cleaning element is mounted between the rolls directly below the crusher comb just described, this cleaning element comprising end walls 28 secured by means 29 to the sides of the crushing compartment and a curved face 31. The curvature of the face 31 is such that its arc is concentric with, though of greater radius than, the periphery of the roll 17. The spacing of the curved face 31 from the roll 17 is such that the teeth of said roll do not quite touch said curved face as the roll is revolved.

Teeth 32 precisely the same as the teeth 22 of the rolls are provided short of the lower end of the concaved face 31, the teeth 32 being arranged in one or more rows extending lengthwise of the cleaning element. The teeth 32 are removable so that when watermelons or the like are crushed there will be no interference with the feed down to the riddle below. The teeth 32 are so set that they will not interfere with the arcuate movement of any of the teeth 22 but will clean the roll teeth as they move downwardly. This will be seen from Fig. 1 of the accompanying drawings. The upper portion of the cleaner element is provided with a series of spaced slots 30 corresponding in number to the number of teeth on the roll 16, such slots being cleaning slots for coöperating with the teeth of said roll in the same manner as do the teeth 32. These slots are provided on the concaved face 31 and are of sufficient length to pass the rotating teeth of roll 16 without interference, though operating to clear said teeth of any vegetable matter adhering thereto. The upper edge 33 of the cleaner element is located very close to the periphery of roll 16 so that the roll, as well as the base of the teeth which it carries, will be kept clean.

The crusher comb shown apart from the crusher in Fig. 4 is removable so that many different varieties and sizes of fruits and vegetables may be crushed to effect extraction of their seeds. For certain large melons probably the comb should be removed, but for smaller fruits and vegetables the comb has been found to be very efficacious in breaking up the pulp and is considered to be an important part of my invention.

The rolls are rotated in opposite directions so as to draw the fruits or vegetables between them, and the different speeds at which the rolls are revolved insure a perfect crushing of the material as well as a quick and certain feed of the same. The disposition of the parts of the hopper relative to the crushing rolls is such that none of the material will be thrown out by the rolls, but all parts of the crushed fruits or vegetables will be dropped upon the vibratory riddle below where the actual seed extraction takes place. The cleaning element acts to remove all the material from the teeth of the rolls as fast as the crushing has taken place; thus the rolls do not carry the material around with them in their revolution and therefore do not become clogged however fast the feed of the vegetables or fruits may be. The curved face 31 acts to guide the crushed material down to the vibrating riddle below and delivers the material on the proper part of the riddle. The material falls in a stream beneath roll 17 and not beneath the space between the two rolls.

What is claimed is:—

1. In a crusher for seed extracting machines, a pair of rolls having teeth, cleaning means for both the rolls and the teeth thereof mounted between and below the rolls, said cleaning means being so shaped as to deflect crushed material from one of the rolls and deliver the same in a stream beneath the other roll.

2. In a crusher, a hopper, a compartment beneath the hopper, a discharge opening between the hopper and the compartment, a pair of like crushing rolls mounted within the compartment, said rolls being toothed and spaced apart medially of the opening, a cleaner for the teeth, and a crusher comb above the cleaner and between the rolls.

3. In a crusher, a hopper, a pair of spaced rolls mounted below the hopper, said rolls having teeth, a stationary cleaning element mounted below the axes of said rolls but between the same, said cleaning element having a concaved face, said face carrying teeth for cleaning the teeth of one of the rolls and having slots for cleaning the teeth of the other roll.

4. In a crusher, a pair of toothed rolls of like dimensions mounted to rotate on horizontal axes, said rolls having spaced rows of teeth projecting from the peripheries thereof, a cleaning element fixed with respect to the axes of said rolls and located between the same, said cleaning element having slots through which the teeth of one roll pass and having a row of teeth through which the teeth of the other roll pass, said cleaning element running longitudinally with the rolls.

5. In a crusher, a pair of toothed rolls mounted to revolve on horizontal axes, and a cleaning element for said rolls and teeth mounted below the plane of the axes of said rolls, said cleaning element having a concaved face set concentric with the periphery of one of the rolls, said face carrying removable teeth thereon similar to the teeth of the rolls, the teeth of the cleaning element coöperating with the teeth of the roll with which the element is concentric to clean the same, the upper portion of said face having slots within which the teeth of the other roll pass, said upper portion lying close to though not quite touching the periphery of said other roll.

6. In a crusher, a hopper, a crushing compartment located beneath the hopper, an opening between the hopper and compartment, a pair of crushing rolls having teeth mounted in the compartment directly below said opening, a stationary crusher comb mounted between the rolls adapted to cooperate with the teeth of each roll to aid in the crushing operation, and a cleaning ele-

ment mounted between the rolls but below the crusher comb for cleaning the rolls and the teeth thereof.

7. In a crusher, a pair of toothed rolls, said rolls being revoluble to draw down the material fed to them and being spaced apart a distance greater than the length of their teeth, a stationary crusher comb set between the rolls and above the axes therewith, said comb coöperating with the roll teeth to crush the material.

8. In a crusher, a pair of toothed rolls, said rolls being revoluble to draw down the material fed to them and being spaced apart, a compartment surrounding said rolls, a crusher comb removably mounted between said rolls and above the axes thereof, said comb having teeth-like bars spaced apart and coöperating with the roll teeth to crush the material.

9. In a crusher, a pair of toothed rolls, said teeth being arranged in rows and in staggered relation, a stationary crusher comb removably mounted between the rolls but above the axes thereof, said comb including a frame and a series of teeth-like bars inclined downwardly on each side of the frame and spaced apart, said bars cooperating with the roll teeth when the rolls are revolved to crush the material.

10. In a crusher, a hopper, a compartment located beneath the hopper, a pair of toothed rollers mounted within the compartment beneath the discharging portion of the hopper, a removable crusher comb set between the rolls above the axes thereof but beneath the discharging portion of the hopper, said crusher comb comprising a frame secured to the sides of the compartment, and two sets of depending teeth-like bars spaced apart, said bars extending in directions radially of the respective rolls, the teeth of the rolls passing between the bars of said comb.

11. In a crusher, a hopper, a compartment beneath the hopper, a discharge opening between the hopper and the compartment, a pair of like crushing rolls set within the compartment, said rolls being spaced apart and having teeth, and an element for cleaning said rolls and teeth of crushed material, said element being located directly beneath the space between the rolls and having a concaved face which is arranged concentrically with one of said rolls and is so disposed as to deflect crushed material from the rolls toward one end of the machine.

12. In a crusher, a pair of toothed rolls, said rolls being revoluble to draw down the material fed to them and being spaced apart a distance greater than the length of their teeth, a stationary crusher comb set between the rolls and above the axes therewith, said comb coöperating with the roll teeth to crush the material, and having two sets of teeth which extend in directions radially of the respective rolls.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

BURL N. TRAUTMAN.