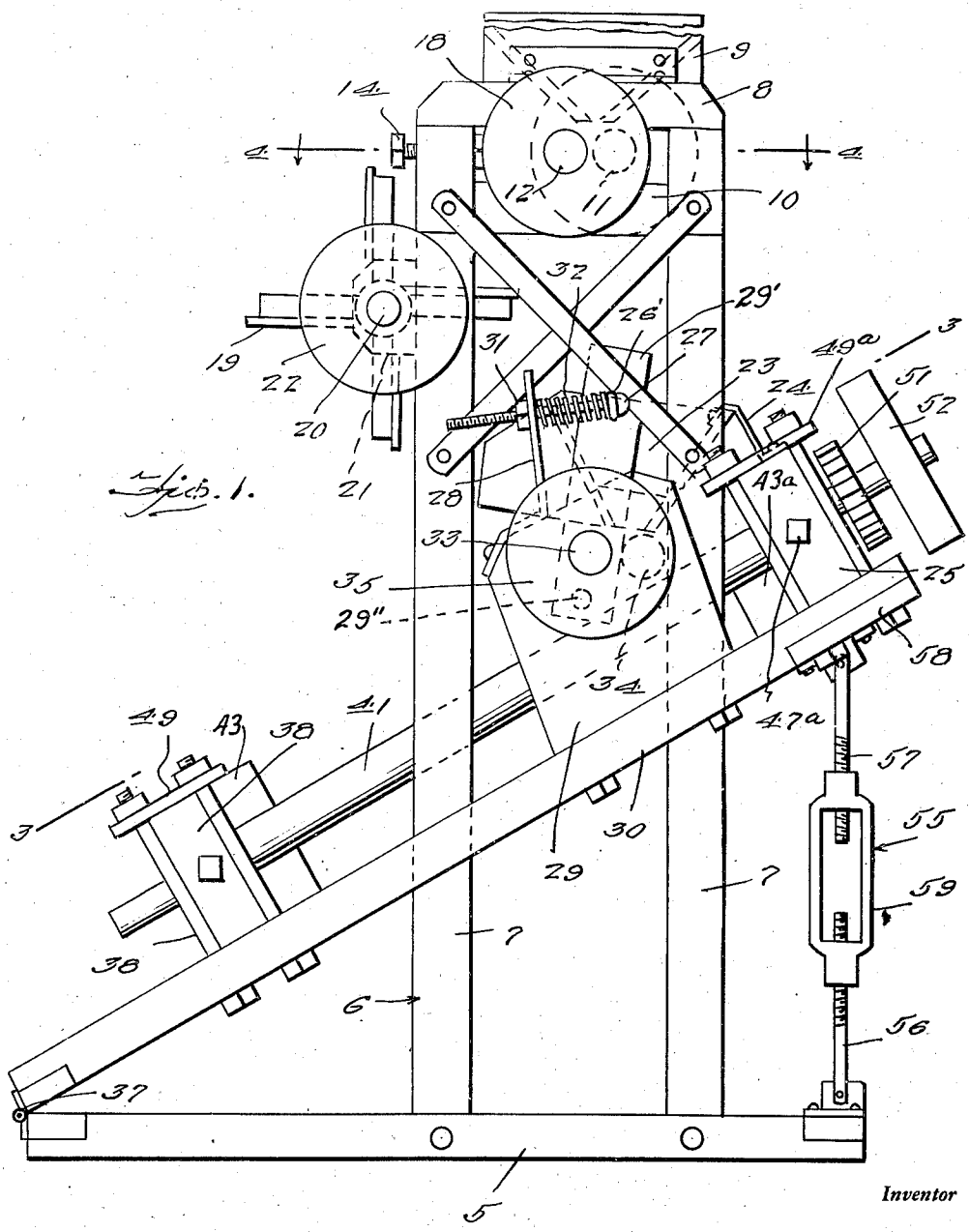
June 26, 1945. B. R. BRYAN 2,378,896

ROTARY GRADER AND SEPARATOR

Filed Jan. 13, 1943 4 Sheets-Sheet 1



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ROTARY GRADER AND SEPARATOR

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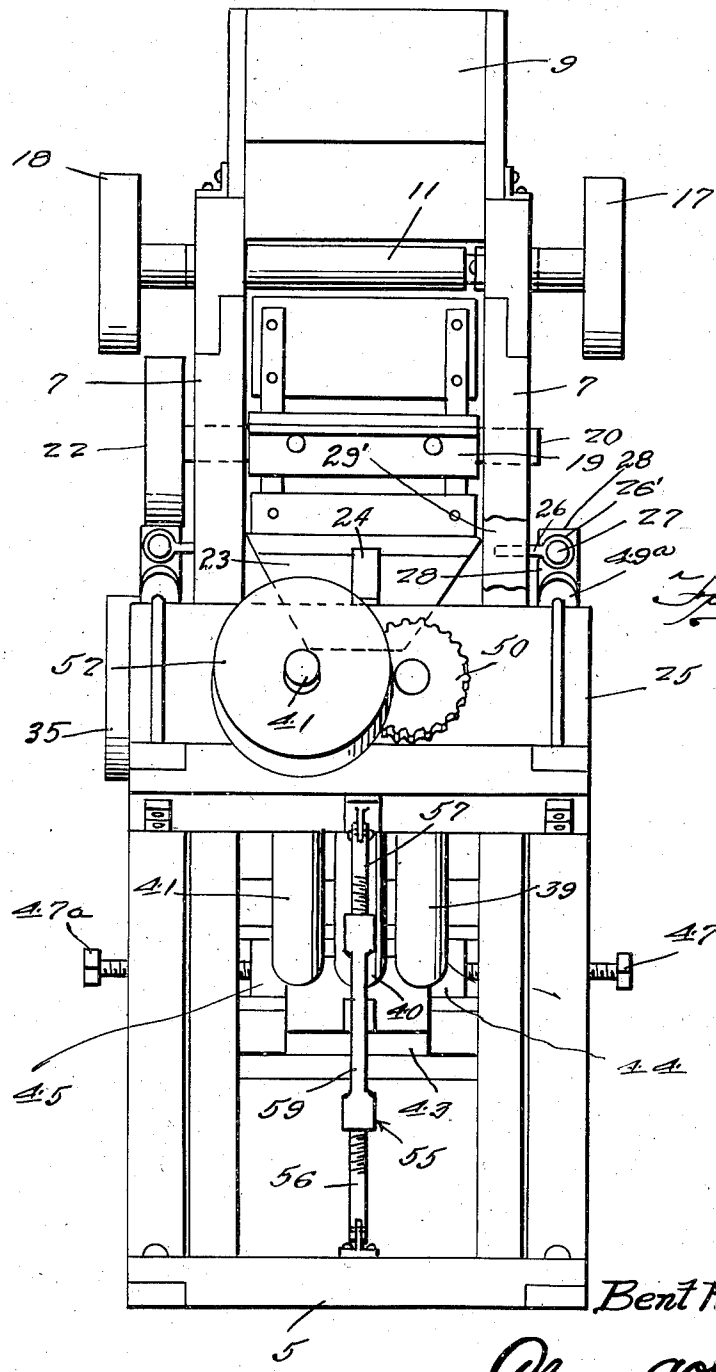


Fig. 2.

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ROTARY GRADER AND SEPARATOR

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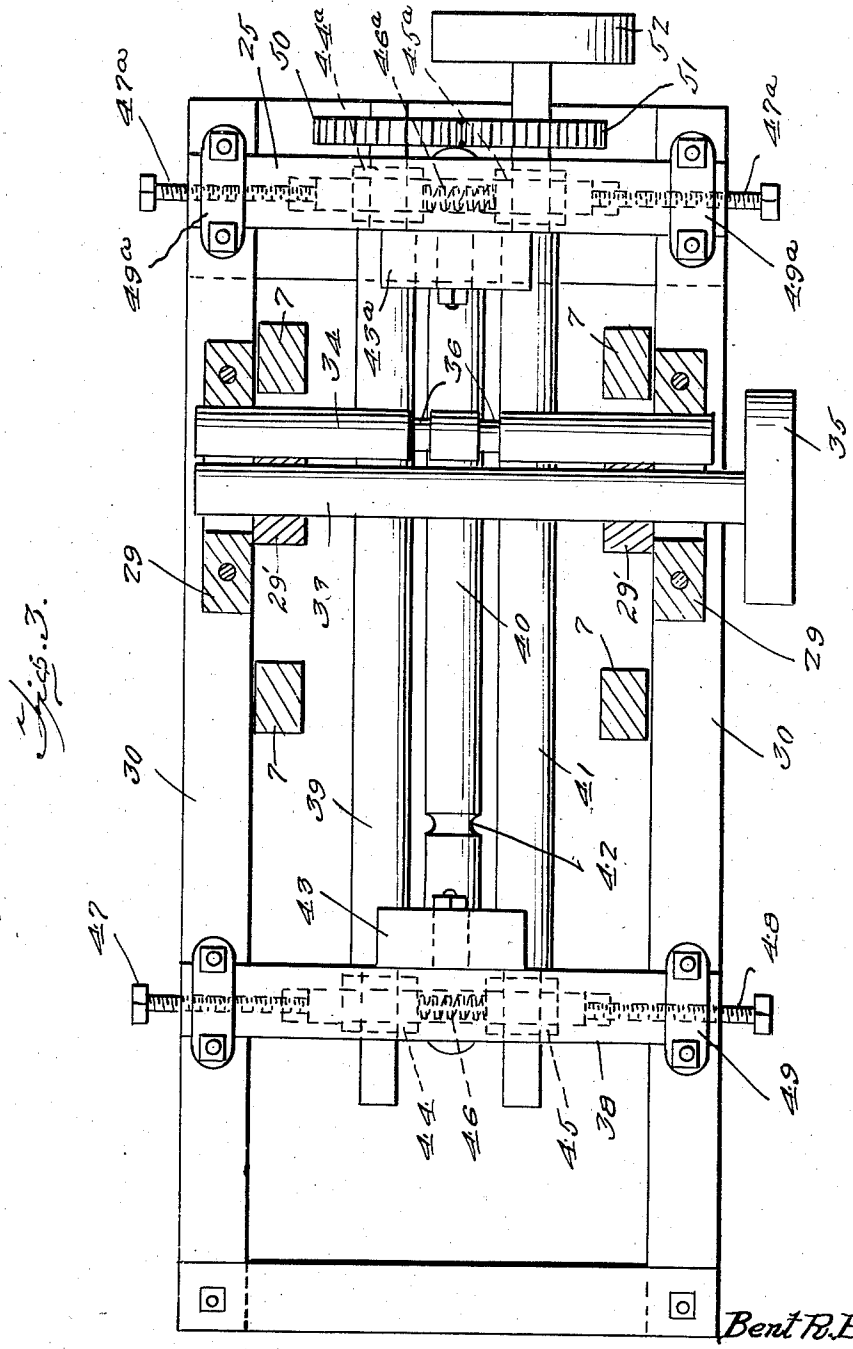


Fig. 3.

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Fig. 4.

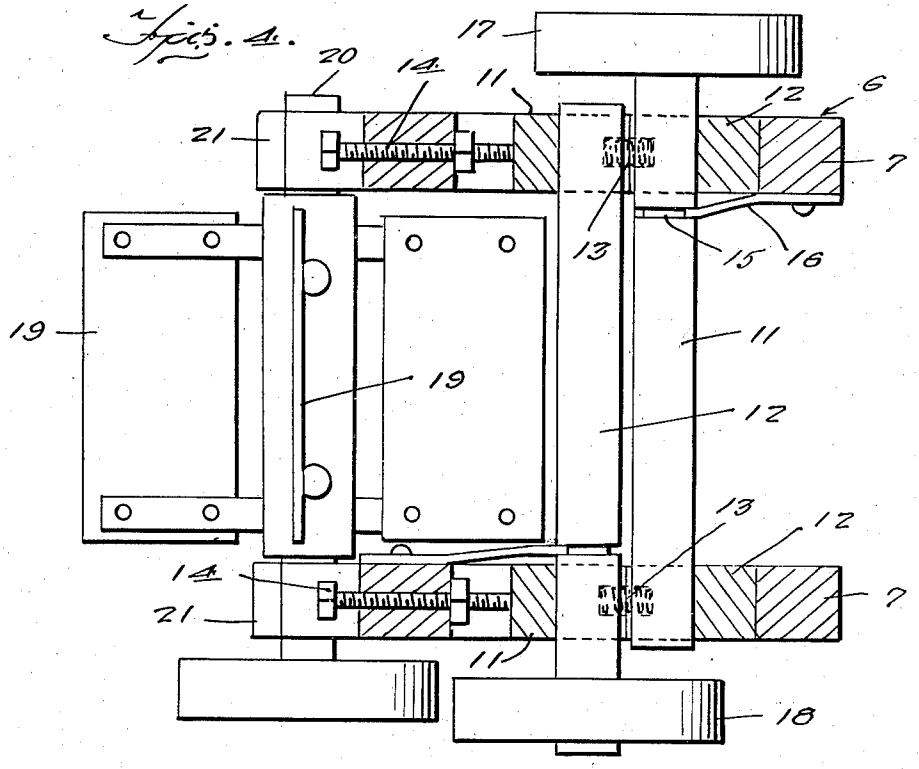
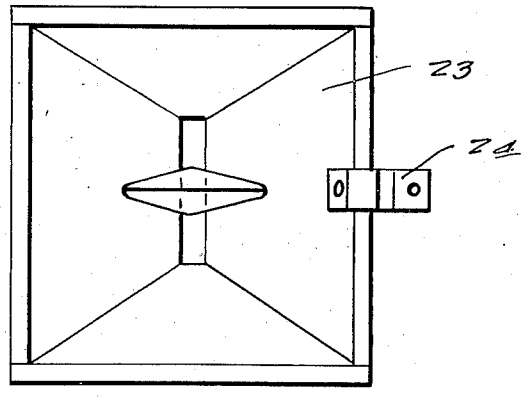


Fig. 5



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2,378,896

UNITED STATES PATENT OFFICE

2,378,896

ROTARY GRADER AND SEPARATOR

Bent R. Bryan, Nephi, Utah, assignor of ten per cent to Lisle Bigler, Nephi, Utah

Application January 13, 1943, Serial No. 472,260

2 Claims. (Cl. 209—12)

This invention relates to new and useful improvements in graders and separators and more particularly to an apparatus especially adapted for grading and separating grains, gravel and other material, while at the same time cleaning the same.

The principal object of the present invention is to provide a simple and inexpensive apparatus for separating and grading materials with but a minimum amount of human attention.

Other objects and advantages of the invention will become apparent to the reader of the following description.

In the drawings:

Figure 1 represents a side elevational view of the apparatus.

Figure 2 is a rear elevational view of the apparatus.

Figure 3 is a sectional view on the line 3—3 of Figure 1.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a top plan view of the hopper.

Referring to the drawings wherein like numerals designate like parts, it can be seen that the apparatus includes a base 5 from which rises a frame generally referred to by numeral 6 and which consists of four corner posts 7 having bridge members at the upper ends thereof for supporting a hopper 9.

Under each of the bridge members 8 is a cross member 10 and between the same are rolls 11 and 12. These rolls 11, 12 have their end portions disposed in bearing blocks 11', 12' in each side of the frame 6, and these bearing blocks are normally urged apart by compression springs 13. A threaded member or screw shaft 14 is employed for each of the bearing blocks 11 in order that the bearing blocks 11' can be adjusted with respect to the bearing blocks 12' and thus regulate the space between the rolls 11, 12.

Each of the rolls 11, 12 has a circumferential groove 15 for receiving one end of a corresponding arm 16, these arms being suitably secured to certain of the posts 7. These arms 16 prevent longitudinal movement of the rolls.

A pulley 17 is provided at one end of the roll 11 to permit rotation of the roll 11, while the other roll 12 is driven by a pulley 18.

A paddle wheel fan 19 is mounted by a shaft 20 on brackets 21 supported by certain of the posts 7 and this wheel is driven by a pulley 22. This wheel is located at an offset position under the rolls 11, 12 so as to blow away loose particles of material.

At a substantial distance under the rolls 11, 12 is a second hopper 23 which is supported at one end by a bracket 24 secured to the top of a bearing assembly 25. Risers 29 are secured to the beams 30 to which the lower ends of a pair of arms 29' are pivoted as at 29''. The shank portion 26 of screw eyes 26' project laterally outwardly from the respective arms 29' for receiving the adjusting screws 27 threaded through brackets 28 extending upwardly from the risers 29. A nut 31 is threaded on each screw against the brackets to regulate the tension of a coil spring 32 interposed between the bracket and the screw eyes. A shaft 33 is journaled in the arms 29' beneath the hopper 23 and is rotated by a pulley 25 on one end of the shaft. A stationary shaft 34 is supported in the risers 29 in spaced parallel relation to the shaft 33. The shaft 33 is adjusted relative to the shaft 34 through the medium of the screws 27. The stationary shaft 34 has circumferential grooves 36 so as to pass all material.

The beams 30 are hingedly secured at their lower ends as at 37 to one end of the base 5 and are bridged adjacent their lower ends by a bearing assembly 38.

Three shafts, namely, shafts 39, 40 and 41 have their upper and lower ends disposed through the bearing assemblies 25, 38 and as can be seen in Figure 3, the intermediate roll 40 has circumferential grooves 42 therein for passing coarse material.

It is preferable that the lower end of the roll 40 terminate in a block 43, while the lower ends of the rolls 39, and 41 are reduced and disposed through bearing blocks 44, 45 slidably mounted in the assembly 38, these blocks being held apart by compression springs 46 and adapted to be brought together by threaded shafts 47, 48, respectively, feedable through the ends of the assembly 38. The assembly 38 is held to the beams 30 by suitable clamp units 49.

The upper ends of the rolls 39, 41 are disposed likewise through bearing blocks 44a, 45a slidably mounted in the upper bearing assembly 25. The blocks 44a and 45a are held apart by a compression spring 46a, but can be brought together by adjusting screws or screw shafts 47a, 47a. The assembly 25 is held on the beams 30 by suitable clamps 49a.

The rolls 39, 41 are geared together by gears 50, 51 and the roll 41 at its upper end is equipped with a drive pulley 52. As can be seen in Figure 3, the intermediate roll 40 is stationary and has its upper end supported in a block 43a on the assembly 25.

Numeral 55 denotes means for adjusting the beams 30 and the structure supported thereon, and this consists of a threaded member 56 pivotally secured at its lower end to the base 5 and a threaded pivotal member 57 depending from a cross connecting member 58 on the beams 30. These members 56, 57 are threadedly disposed through the end portions of a hand rotatable frame 59 and this structure goes together to form a turnbuckle adjustment for elevating or lowering the rear end of the structure supported by the beams 30.

Obviously, it is the intention that the fine material will pass between the rolls throughout their entire lengths while the coarse material will pass through the grooves 42.

It may be found desirable that the rolls revolve very slowly so as to uniformly distribute the wear evenly on the rolls and also to assist in maintaining a continuous flow of the material. Further, the complementary rolls are intended to revolve away from each other, this action of course preventing crushing action of the material.

Thus it can be seen, that in a compact structure, a number of operations can take place in arriving at a finished product, with only limited floor space.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having described the invention, what is claimed as new is:

1. A grader and separator apparatus including an upper hopper having spaced parallel feeding rolls thereunder and a blower mounted below and toward one side of the rolls adapted to subject material passing through the rolls to a draft of air for removing light material, a catch hopper under the feeding rolls, distributing rolls under the second-mentioned hopper, inclined rolls under the second-mentioned rolls said inclined rolls being disposed in spaced parallel relation to each other to provide a grading slot therebetween, means for rotating the last-mentioned rolls, a pivoted frame supporting said catch hopper and said second- and third-mentioned rolls, and means for vertically adjusting one end of said frame.

2. A grader and separator apparatus including an upper hopper having spaced parallel feeding rolls thereunder and a blower mounted below and toward one side of the rolls adapted to subject material passing through the rolls to a draft of air for removing light material, a catch hopper under the feeding rolls, distributing rolls under the second-mentioned hopper, inclined rolls transversely under the separating rolls said inclined rolls being disposed in spaced parallel relation to each other to provide a grading slot therebetween, means for rotating the rolls, independent means for adjusting the rolls of the respective sets relative to each other, a pivoted frame supporting said catch hopper and said second- and third-mentioned rolls, and means for vertically adjusting one end of the frame.

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