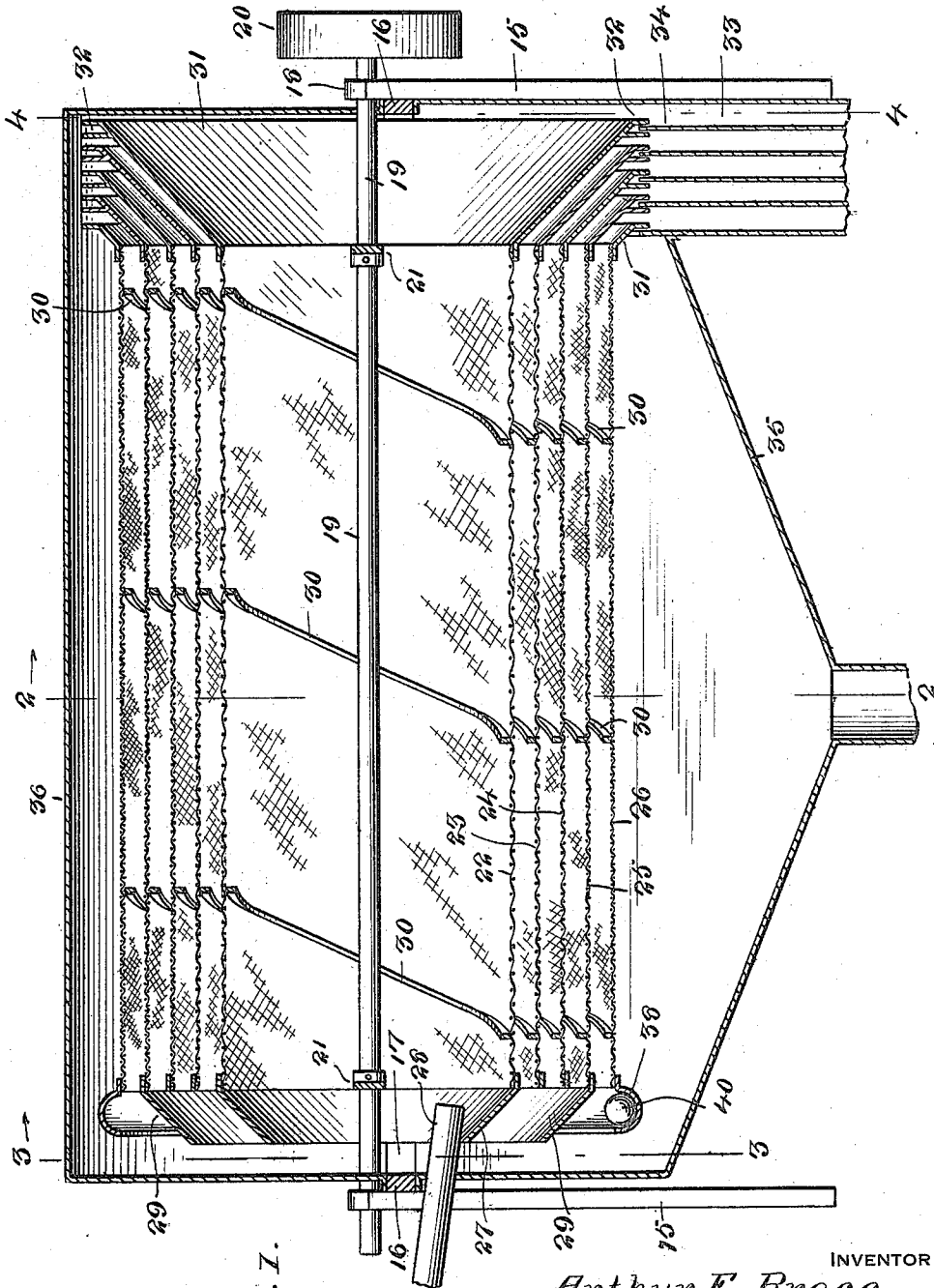


A. F. BRACE.
GRADER AND SEPARATOR.
APPLICATION FILED MAY 5, 1917.

1,236,256.

Patented Aug. 7, 1917.

3 SHEETS—SHEET 1.



WITNESSES

E. R. Ruffert.
E. W. Springer.

Fig. 1.

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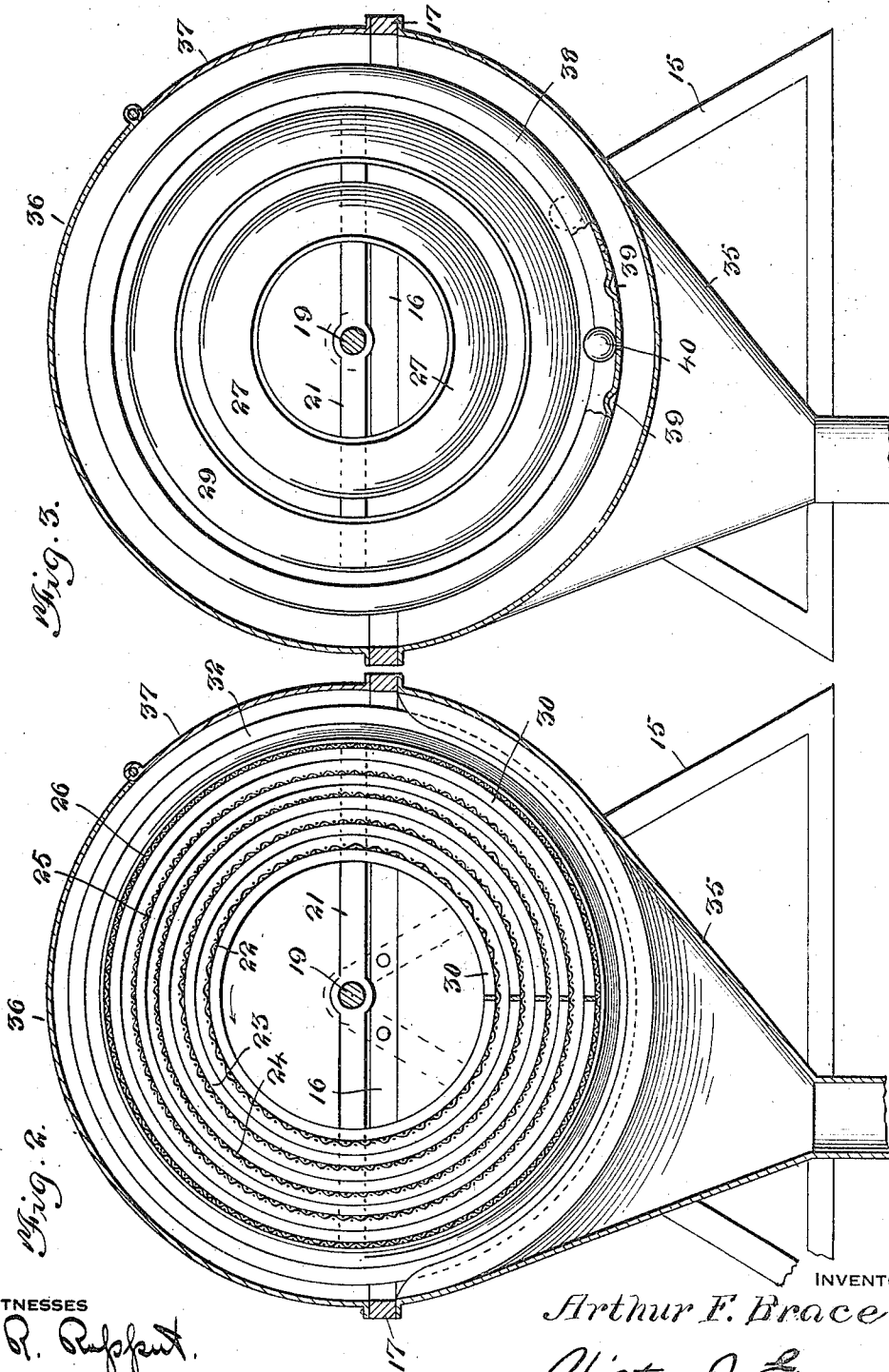
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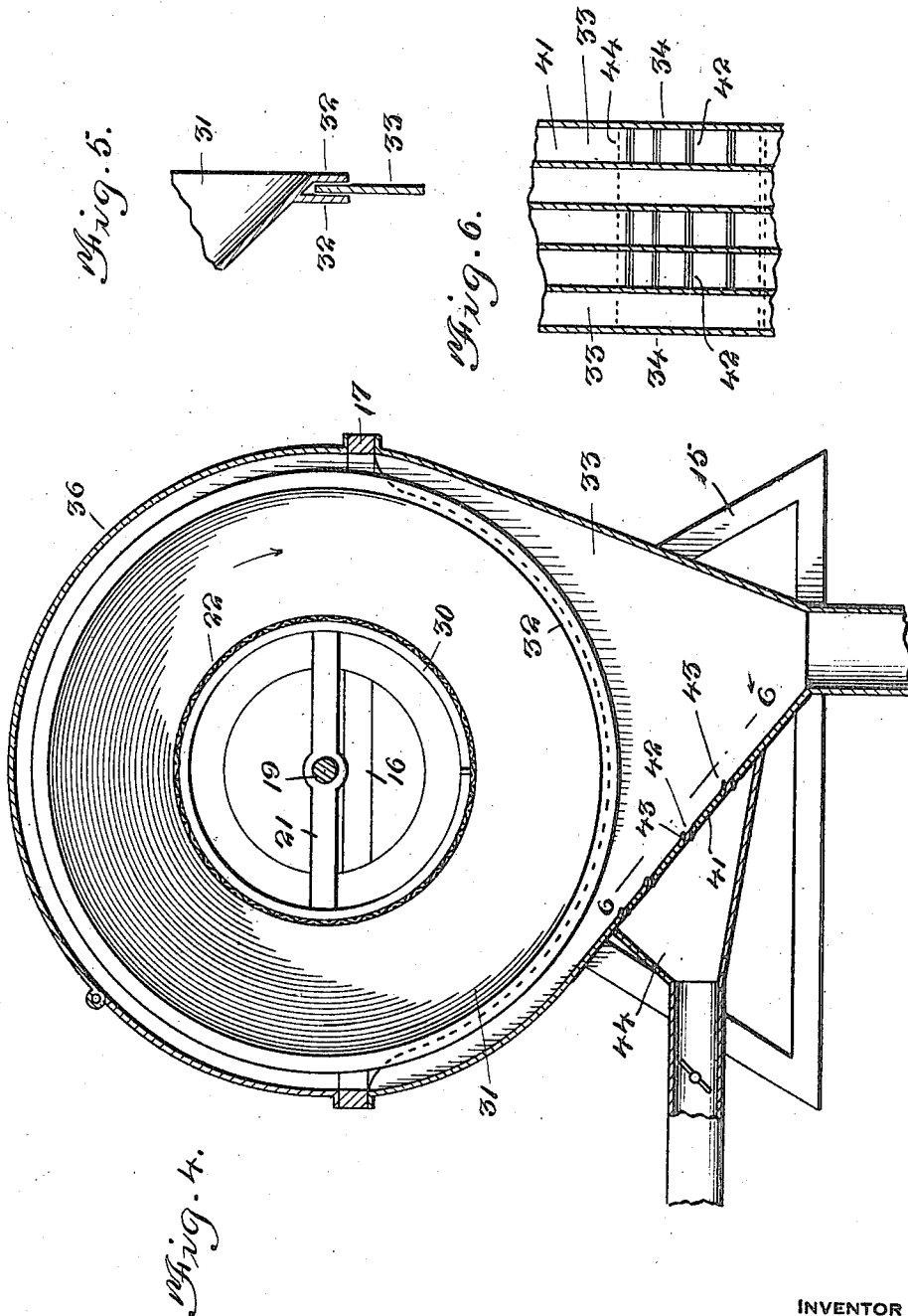
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GRADER AND SEPARATOR.

1,236,256.

Specification of Letters Patent.

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Application filed May 5, 1917. Serial No. 166,635.

To all whom it may concern:

Be it known that I, ARTHUR F. BRACE, a citizen of the United States, residing at Waterford, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Graders and Separators, of which the following is a specification.

This invention relates to grading and separating machines of the rotary type.

One object of the invention is to produce a simple and improved construction whereby a plurality of screens of cylindrical or other suitable form are arranged concentrically within one another, means being provided whereby the several screens or sieves are mounted for rotation about a common axis.

A further object of the invention is to produce a simple and improved construction whereby the tailings discharged over the several sieves as well as the fine product passing through the last sieve in the series will be delivered to separate receiving hoppers.

A further object of the invention is to produce a simple and improved means whereby the sieve structure will be vibrated or shaken when in operation, sufficiently to keep the several sieves clean and free from material clogging the same.

A further object of the invention is to provide the several sieves with internal spirally disposed ribs whereby the material passing through the machine will be assisted in its movement toward the discharge or delivery end.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawing has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the claims may be resorted to when desired.

In the drawing,—

Figure 1 is a longitudinal sectional view of a machine constructed in accordance with the invention.

Figs. 2, 3 and 4 are sectional views taken

on the lines 2—2, 3—3 and 4—4 respectively in Fig. 1.

Fig. 5 is a sectional detail view showing a portion of the discharge end of one of the sieves together with a portion of the wall of a receiving hopper.

Fig. 6 is a sectional detail view taken on the line 6—6 in Fig. 4.

Corresponding parts in the several figures are denoted by like characters of reference.

The frame structure of the machine includes suitable supporting members 15 on which are secured the end members 16 of a rectangular frame, the side members of which are indicated at 17. The end members 16 are provided with bearings 18 wherein a shaft 19 is mounted for rotation, said shaft having been shown as being equipped with a band wheel or pulley 20 adapted to receive motion from any suitable source of power.

Supported on the shaft 19, as by radial arms 21 or in any convenient manner are a plurality of sieves which have been shown as being of cylindrical shape although such is not necessarily the case, it being understood that sieves of any desired configuration may be used. It is also to be understood that the number of the sieves may be varied. In the drawings five sieves indicated respectively by 22, 23, 24, 25 and 26 have been shown. It is also to be understood that the sieves may be constructed in any desired manner and of any desired material including foraminous or perforated sheet metal, woven wire fabric, or textile material of any kind. The innermost sieve 22 is of relatively coarse mesh, the mesh of successive screens being gradually finer, the outermost sieve 26 being the finest of all. The mesh of the several screens as well as the material of which the screens are constructed will obviously be governed by the nature of the material which is to be graded and separated, and the desired degree of fineness of the several grades. The number of sieves may also be varied according to the number of grades that it may be desired to produce.

The innermost sieve 22 has an intake funnel 27 over which material may be fed to the sieve as by means of a feed spout 28. One or more of the remaining sieves may likewise be equipped with intake funnels, one of such funnels 29 having been shown applied to the sieve 25, thus enabling ma-

terial to be fed direct to the sieve 25. It would also be possible to feed material simultaneously to two or more of the sieves if for any reason it could be desired to do so.

5 Each of the sieves is equipped with an internal spirally disposed rib 30, the purpose of which is to assist in feeding material from the receiving end in the direction of the discharge end of the sieve.

10 Each of the sieves is provided at the discharge end thereof with a discharge funnel 31, said funnel being provided with circumferential flanges 32. Receiving hoppers 33 are provided, one for each sieve, said hoppers being formed in part of walls or partition members 34, the upper end portions of which engage between the flanges 32 of the several sieves, the construction being such that the tailings discharged over the
20 end of each sieve will pass to one of the receiving hoppers from which it may be conveyed to a storage place. The upper ends of the walls of the receiving hoppers should preferably extend half way around the circumference of the discharge funnels of the
25 respective screens.

The frame of the machine supports a receiving hopper 35 for the fine material passing through the outermost sieve 26, said
30 hopper being preferably extended around the lower half of the outermost sieve. A housing 36 having a door 37 protects the upper half of the outermost sieve. The outermost sieve is also provided at its intake end with a circumferential trough 38
35 having a plurality of bumps or projections 39, said trough containing a ball 40 which as the sieve structure is being rotated will jump over the bumps or projections, striking the trough and imparting to the entire
40 structure a sufficient vibratory motion to keep the sieves clean and free from clogging material.

The inclined front walls 41 of some of the receiving hoppers 33 have been shown
45 as being provided with slots 42 the side walls of which are bent to produce lips 43 over which material discharged in the direction of the wall 41 will gravitate to the exit of the hopper. Connected with the
50 slotted wall portion 41 is a valved duct 44 which communicates with a fan or other instrumentality whereby suction will be produced for the purpose of removing from
55 the material passing through the hopper any objectionable light material.

From the foregoing description taken in connection with the drawings hereto annexed the operation and advantages of this
60 invention will be readily understood by

those skilled in the art to which it appertains. The machine will be found useful for grading and separating many different materials, ranging from coal, gravel, sand and the like to milled products of all kinds. 65 By varying the number of sieves any desired number of grades may be produced, ranging from extremely coarse to extremely fine. The use of one or more sieves may be omitted when desired by feeding material 70 direct to any intermediate or to the outermost sieve as may be desired. The construction of the machine is simple and inexpensive and the use thereof is highly economical, especially as compared with 75 shaking screens of any type. It is found that the machine is of very great capacity. The objectionable vibration caused by shaking screens is also entirely avoided.

What is claimed, is:— 80

1. In a grader and separator, a shaft supported for rotation and a plurality of concentrically disposed sieves carried thereby, each of said sieves having a discharge funnel provided with spaced circumferential 85 flanges, in combination with a receiving hopper having wall portions constituting partitions that extend between the circumferential flanges of the several sieves.

2. In a grader and separator, a shaft supported for rotation and a plurality of concentrically disposed sieves carried thereby, each of said sieves having a discharge funnel provided with spaced circumferential 90 flanges, in combination with a receiving hopper having wall portions constituting partitions that extend between the circumferential flanges of the several sieves, and a hopper arranged to receive the material discharged through the outermost sieve. 100

3. In a grader and separator, a shaft supported for rotation, a plurality of sieves carried thereby, some of said sieves including the innermost one being provided with funnel-shaped intakes at their receiving 105 ends, means whereby material may be fed over said intakes, funnel-shaped outlets at the discharge ends of the several sieves, and hoppers arranged to receive material discharged over each of the several sieves, some 110 of said hoppers having inclined slotted walls and suction ducts connected therewith.

4. In a grader and separator, a shaft supported for rotation, a concentrically disposed sieve carried thereby, a circumferential 115 trough carried by the sieve and having a plurality of obstructions and a rolling striking element in the trough.

In testimony whereof I affix my signature.

ARTHUR F. BRACE.