(No Model.)

2 Sheets—Sheet 1.

J. M. CASE.

BOLT.

No. 370,726. Patented Sept. 27, 1887.

FIG. I.

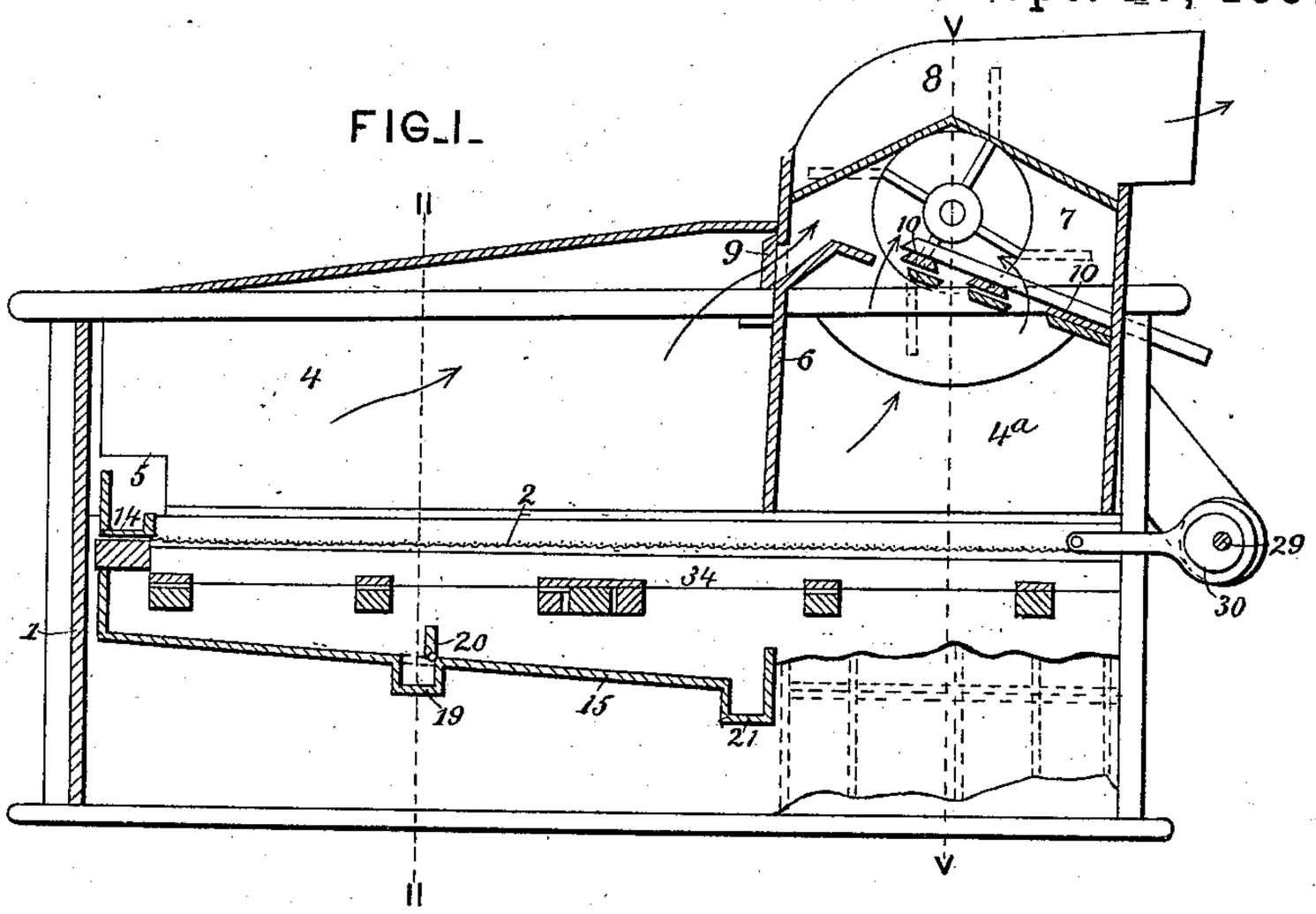
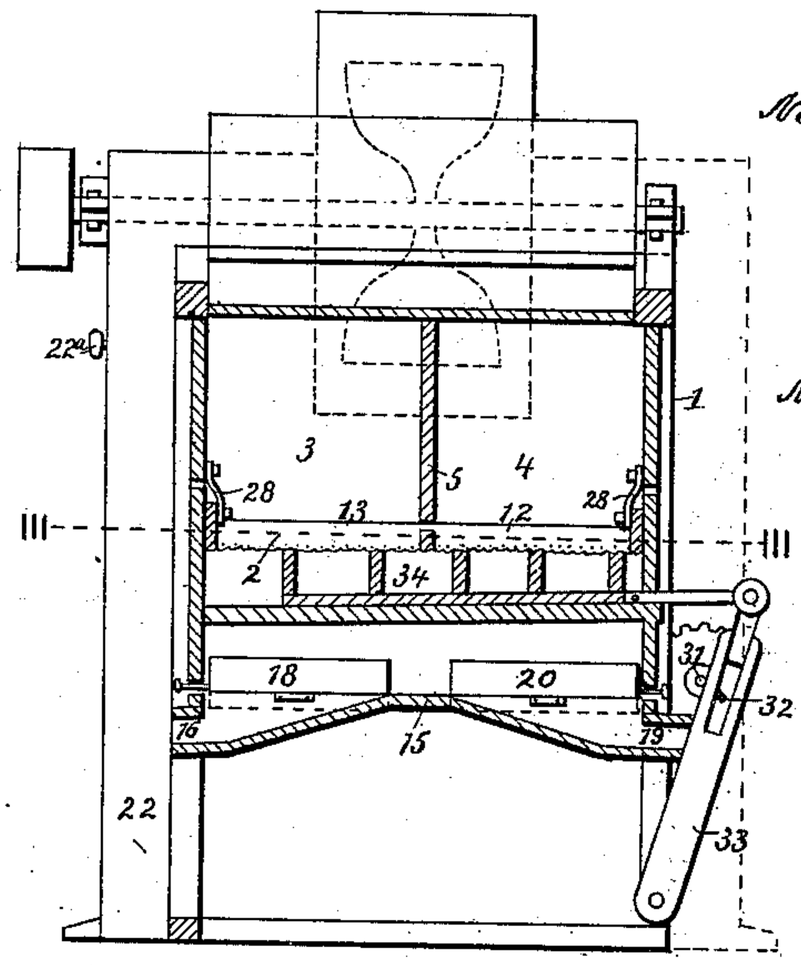
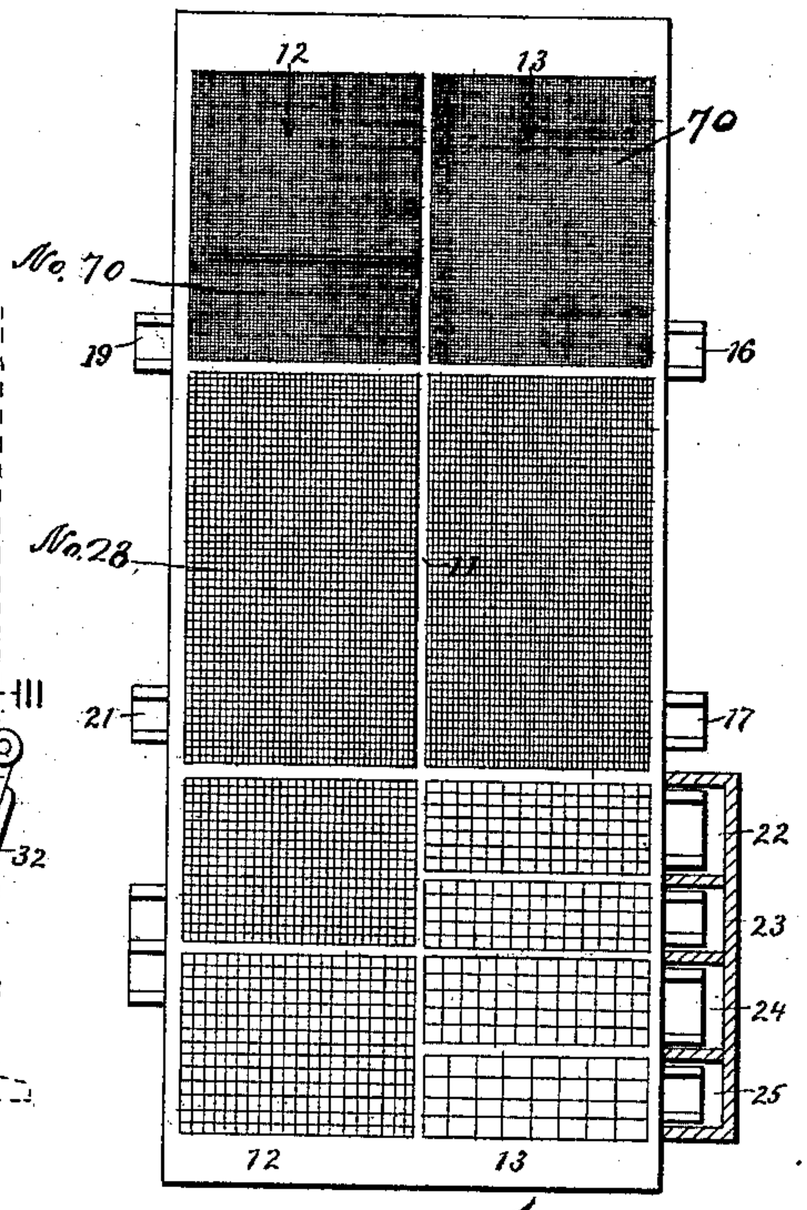


FIG. III.

FIG. II.





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(No Model.) 2 Sheets—Sheet 2.

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FIG. IV.

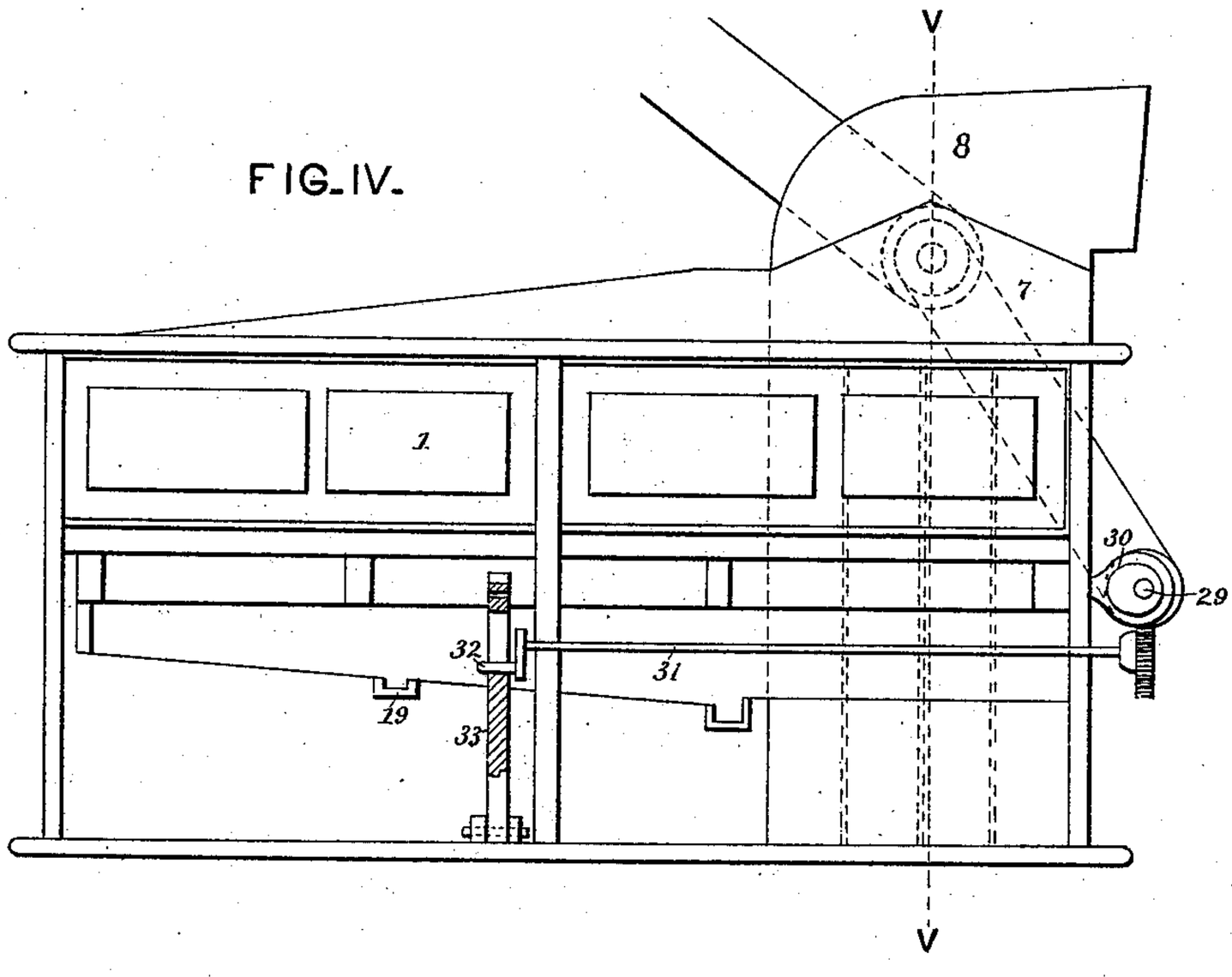
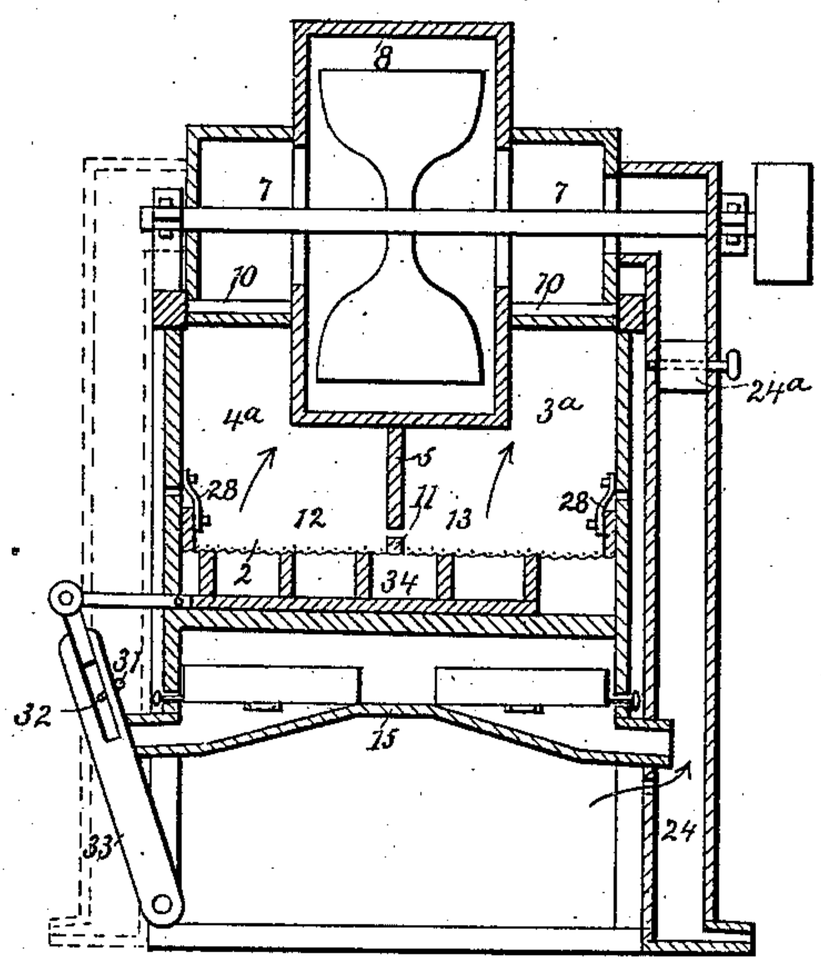


FIG. V.



Attest:
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UNITED STATES PATENT OFFICE.

JOHN M. CASE, OF COLUMBUS, OHIO, ASSIGNOR TO THE CASE MANUFACTURING COMPANY, OF SAME PLACE.

BOLT.

SPECIFICATION forming part of Letters Patent No. 370,726, dated September 27, 1887.

Application filed March 3, 1886. Serial No. 193,882. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. CASE, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Improvement in Bolts, of which the following is a full, clear, and exact description.

The subject of the present invention is a machine for carrying out my improved process of manufacturing cornmeal and buckwheat flour, for which application for Letters Patent was filed on or about the 6th day of January, 1886, Serial No. 187,811.

The invention consists in certain features of novelty, hereinafter fully described, with reference to the accompanying drawings, forming a part of this specification, and more particularly pointed out in the claim.

Of the drawings, Figure I is a vertical longitudinal section of the improved machine. Fig. II is a vertical transverse section thereof on the line II II, Fig. I. Fig. III is a view showing in plan the riddle and the troughs for carrying off the material falling through the several sections of the sieve, and in horizontal section the vertical aspirating-spouts. Fig. IV is a side elevation of the complete machine. Fig. V is a vertical transverse section on the line V V, Figs. I and IV.

1 represents the external shell or casing of the machine, which is divided horizontally by a riddle, 2, into two compartments. The upper one of these compartments is divided into two compartments, 3 4, by means of a central longitudinal partition, 5, while each of these longitudinal compartments is divided into two compartments, 3 and 3^a and 4 and 4^a, respectively, by a vertical transverse partition, 6.

7 is an air-trunk located in the upper part of the casing and directly over the end compartments, 3^a 4^a, said trunk having communication with the eye of a fan, 8, suitably supported by the casing 1. This air-trunk has communication with all of the compartments in the upper part of the casing, whereby the dust and other light impurities are drawn off therefrom, its communication with the compartments 3 4 being under control of valves 9 and its communication with the compartments 3^a 4^a being under control of valves 10. By thus providing a separate valve for regulating the amount of air which is exhausted from each compartment it is possible to secure the best results, as will appear hereinafter. The riddle 2, like the upper part of the case, is divided longitudinally by a partition, 11, into two sections, 12 13, the former of which will be denominated the "first-break" and the latter the "finishing" section. These sections 12 and 13 are clothed with bolting material whose meshes gradually increase in size from the end onto which the material is delivered by the hopper or feed trough 14 to the tail. It is of course impossible to specify just the number of bolting material which should be employed on the several sections of the sieve, as this must depend upon the material being worked and should be varied accordingly. For the purpose of my present invention, however, it may be clothed substantially as indicated in Fig. III of the drawings.

The material which passes through the sieve falls upon a cant-board, 15, which is inclined from the center of the machine toward both sides, being substantially of inverted **V** shape, whereby the material being treated by the two sections 12 and 13 is kept separate. This cant-board is provided with a sunken trough directly beneath the terminus of each section of bolting material, so that the various grades of material separated thereby may be kept separate. For example, at the terminus of the first section of the first-break section, 12, (which is represented as being clothed with No. 70 cloth,) the cant-board is provided with a sunken trough, whereby the material which falls through said section (which is first-break flour) may be carried off. If, however, it should be desired not to keep this first-break flour separate and to mix it with the material which passes through the next section, (which is represented as being clothed with No. 28 bolting-cloth,) this may be done by closing up the sunken trough 16 and permitting the first-break flour to mix and pass off with the first-break meal through the sunken trough 17 at the terminus of the said second section. This may be accomplished by simply forming a sunken trough in the cant-board 15 and hinging to one side thereof (the side adjacent the tail end of

the bolt) a trap-door or valve, 18. When this trap-door occupies a vertical position, as shown in full lines, the material which passes through the two sections will be kept separate; but when it is placed in a horizontal position, as shown in dotted lines in Figs. I and II, the other result will be accomplished.

The sunken trough 19, formed in the cant-board under the first section of the finishing-section 13, may be provided with a trap-door or valve, 20, similar to 16, for the purpose of mixing, if desired, the material (pearl flour) which passes through said first section with that which falls onto the cant-board under the second section and discharging the whole through the sunken trough 21. Likewise the cant-board under each of the other sections of the sieve is provided with a sunken trough for carrying off the material which falls thereon. It is the object of the sieve to separate all the material into four grades—*i. e.*, flour, meal, grits, and bran—and to still further separate the grits according to its specific gravity, as will appear hereinafter.

It is obvious that while the flour and meal are still mixed with the material, the suction to which it is subjected should not be so violent as when nothing but coarse grits and bran are being treated. For this reason the upper portion of the casing is partitioned off, as already described, the flour and meal sections being located directly beneath the air-compartments 3 4, the current of air exhausted therefrom being under control of the valves 9. After the material has passed over the flour and meal sections and the flour and meal thereby drawn off, it passes onto the grits-section, which is directly beneath the compartments 3^a and 4^a, the amount of air being under control of the valves 10. Thus the material may be subjected to a gentle suction while under the compartments 3 4 and a stronger one while under the compartments 3^a and 4^a.

That portion of the first-break section which is beneath the compartments 3^a and 4^a is divided into any desired number of separate sections, (four being shown,) each of which is clothed with bolting material somewhat coarser in mesh than the adjacent section toward the head of the bolt. By this means the grits formed by the first break are separated according to size and specific gravity. These grits fall onto the cant-board beneath, and each grade is conveyed by a separate spout into a separate vertical air-trunk, which communicates with the eye of the fan. These air-trunks are numbered in the drawings 22, 23, 24, and 25, respectively, each being provided with a separate valve, (only two of which, 22^a and 24^a, are seen in the drawings,) by means of which the strength of current passing therethrough may be regulated and controlled separately. By thus separating the grits I am enabled to subject each grade to the strongest exhaust which can be exerted upon it, whereas if the grits were all treated together the strength of exhaust would have to be regulated according to the specific gravity of the finest particles of grits being treated. The material falling into the air-trunks 22, 23, and 24, after being subjected to the exhaust, as above described, is conveyed by a common pneumatic tube to the second-break rolls for reduction. That falling into the trunk 25 being the coarsest, is returned by a separate tube to the first-break rolls. The number of grades into which these grits are separated may of course be altered without departing from my invention. The material coming from the second-break rolls is delivered onto the finishing-section 13 of the sieve, and is there separated into three grades, as before—*i. e.*, flour, meal, and grits—the latter being again separated into two or more grades, if desired, and sent either to the aspirating-trunk 22 or returned to the second-break rolls.

The sieve 2 is suspended by straps 28 or otherwise, and is suitably shaken by an eccentric secured to the shaft 29, through the medium of a link, 30, having an eye which embraces said eccentric, as shown.

31 is a shaft secured to the side of the casing and driven by worm or other gearing from the shaft 30, and 32 an eccentric wrist-pin carried by said shaft 31.

33 is a vibrating arm pivoted at bottom and provided near its upper end with a slot within which said wrist-pin 32 fits, whereby it is vibrated at each revolution of the shaft 30.

34 is a frame mounted to slide beneath the sieve 2 and provided with brushes whereby the under side of said sieve is kept clean.

35 is a link pivotally connected at one extremity to said sieve and pivotally connected at the other (being passed through a slot in the casing) to the upper extremity of the vibrating arm, whence the said cleaner derives its motion.

I will now follow the material through the mill. Coming from a suitable hopper, it passes to the first-break rolls, whence it is conveyed, preferably by pneumatic tubes, to the feed-trough 14 at the head of the first-break section 12 of the sieve 2. From this trough it is sifted onto the first or finest section of this first-break section, which is represented as being covered with No. 70 bolting-cloth. The material passing through this section is denominated "break-flour." It may be kept separate or mixed with that passing through the next section, (which is represented as being covered with No. 28 bolting-cloth,) as already described. The material passing through this second section is denominated "break-meal." While passing over these two sections of the sieve, the material is subjected to a gentle exhaust, under control of one of the valves, 9, as aforesaid. From this second section the material passes toward the tail of the sieve onto the grits-section, where it is separated into different grades, as already described, the bran and germs being carried over the tail of the sieve. All the parts of the grain which are valuable in the manufacture of a high-grade product

are thus separated out by a single break and a single passage over the first-break section of the sieve. All the grits while upon the sieve 2 are subjected to a common exhaust, under control of the valves 10, somewhat stronger than that produced in the compartment 3. As each grade of the grits is separated, it falls into a separate aspirating-spout, where it is subjected to an exhaust as strong as may be produced without sucking up the valuable particles. From the first of these aspirating-spouts it passes by a common conveyer to the second-break rolls for further reduction, and from the last of said spouts, the grits therein being coarsest, it is returned to the first-break rolls. From the second-break rolls the material passes to the feed-trough 14 at the head of the finishing-section 13, whence it falls onto the first or flour section, which is represented as being covered with No. 70 bolting-cloth. The material which passes through this cloth is the highest grade, and is denominated "pearl flour." It travels down the sieve toward the tail thereof, as before, and is separated into "pearl meal" and grits, as before stated. The grits may be returned directly to the second-break rolls for further reduction, or sent to one or other of the aspirating-spouts on the first-break side of the sieve for further purification, or the grits may fall directly into aspirating-spouts (shown in dotted lines in Figs. 2 and 5) and then pass to the rolls in a manner similar to that already described for aspirating the material on the other side of the machine.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

The combination, with a sieve divided longitudinally into two sections and transversely into two or more sections, of a cant-board beneath, inclined toward both sides of the machine so as to keep separate the material falling through the longitudinal sections, a trough in the cant-board at the terminus of each transverse section of the screen, a separate vertical air-trunk into which the material falling into each trough is delivered, means for drawing off the material at the bottom of each of said air-trunks, a main air-trunk located above the screen with which all the air-trunks on the opposite sides of the machine communicate, longitudinal and transverse partitions above the screen for dividing the space into compartments corresponding with the divisions of the screen, all of said compartments having communication with the main air-trunk, and a fan for exhausting the air from said trunk, substantially as set forth.

JOHN M. CASE.

Witnesses:
F. F. DONNELLY,
C. N. SHOUGH.