K. J. ENSMINGER.

FLOUR SIFTER.

APPLICATION FILED JULY 22, 1914.

1,125,500. Patented Jan. 19, 1915.

FIG. 1

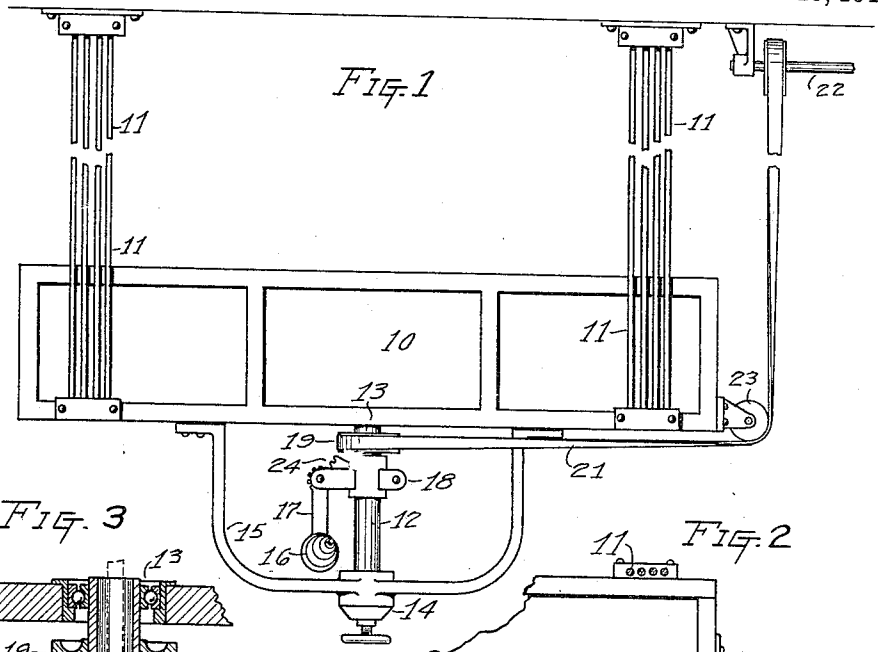


FIG. 3

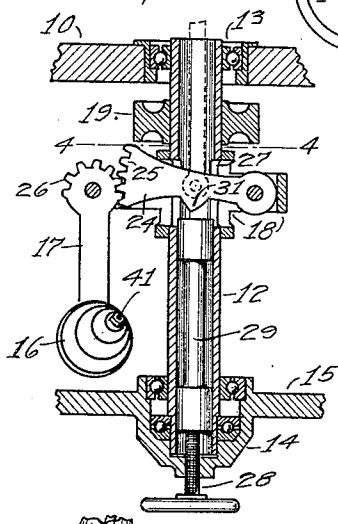


FIG. 2

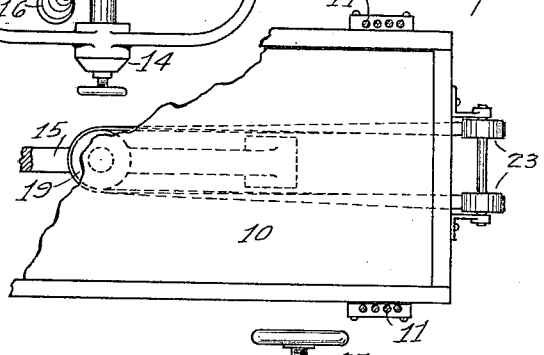


FIG. 5

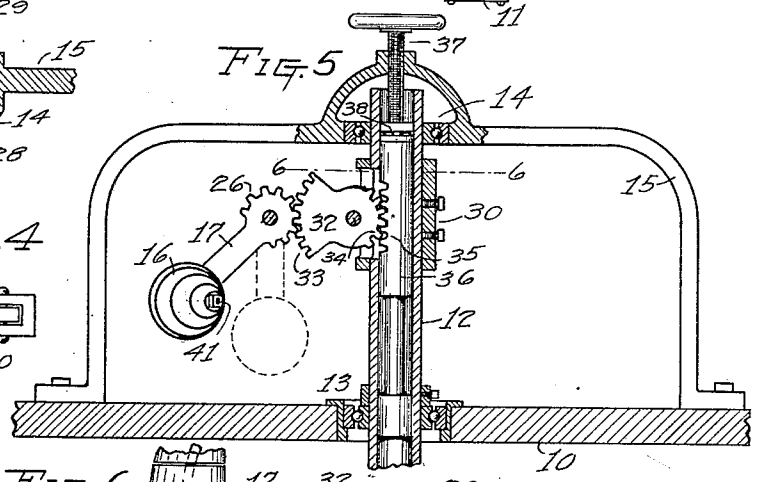


FIG. 4

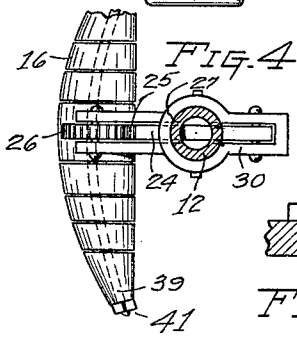
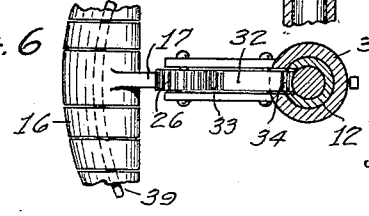


FIG. 6



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FLOUR-SIFTER.

1,125,500. Specification of Letters Patent. Patented Jan. 19, 1915.

Application filed July 22, 1914. Serial No. 852,495.

To all whom it may concern:

Be it known that I, KOSSUTH J. ENSMINGER, residing at Hamersville, Brown county, State of Ohio, have invented certain new and useful Improvements in Flour-Sifters, of which the following is a clear, full, and exact description, attention being called to the drawing which accompanies this application and forms a part thereof.

There are devices for grading and sifting flour where the operation is performed by sieves which have a gyratory movement. The sieves are contained in a frame or sifter-box which is supported so as to permit this mode of operation. The movement is obtained by various means, one of them being by the centrifugal action of a weight supported on the sifter-box and revolving in the plane in which it is intended to gyrate the sieves, the sifter-box being yieldingly supported so as to be free to follow this action of the weight.

My invention relates to a type of flour sifters which are operated in this manner, that is by weights, and consists of the particular construction of the means for obtaining this operation, a leading feature of this construction being the ability for adjusting the extent of the gyratory motion and possibility for performing the requisite manipulation without interrupting the operation of the sifter.

In the following specification and claims is found a full description of my invention, also of its manner of use, its operation, its parts and their construction, this latter being fully illustrated in the accompanying drawing, in which:

Figure 1. is a side-elevation of a flour-sifter embodying the features of my invention. Fig. 2. is part of a top-view of it. Fig. 3. is an enlarged vertical section of a part of Fig. 1, and illustrates the mechanism of my invention. Fig. 4. is a horizontal section on line 4—4 of Fig. 3. Fig. 5. is a view similar to Fig. 3, illustrates a modified construction of my invention. Fig. 6 is a horizontal section on line 6—6 of Fig. 5.

In the drawing numeral 10 indicates the sifter-box, usually rectangular, which contains the sieves. Conduits whereby the material is spouted to and from these sieves are not shown. This sifter-box is suspended in any manner suitable for the purpose, as for instance by hangers, one at or near each of the four corners, these hangers consisting usually of a number of wooden rods 11. Positioned so as to extend vertically from the box, preferably from the center thereof, there is a shaft 12 being held at one of its ends in a bearing 13 provided on the box, its other end being supported in a bearing 14 which forms part of a bracket 15, connected to the box.

16 is a weight provided at one end of an arm 17, the other end of which is hingedly connected to a bracket 18 rigidly attached to shaft 12.

19 is a pulley mounted upon this shaft to rotate it with said bracket 18 and weight 16 thereon. It is driven by a belt 21 moved by another pulley mounted upon a shaft 22.

Guide pulleys 23 are provided to change the direction of the belt as required. Inasmuch as weight 16 is spaced from the center of rotation, centrifugal action is generated during rotation, the effect of which action is imparted to this center of rotation which is shaft 12 and from this latter it is transmitted to box 10 on which shaft 12 is mounted. This effect as to box 10 is a tendency to follow the weight, which it does to the extent permitted by the resistance of the hangers on which it is supported. The material of the hangers is of a character possessing a certain degree of elasticity which, while opposing the centrifugal action of the weight, permits the box at the same time to follow it to a certain extent. Between these opposing actions results the gyratory motion of the sifter-box utilized to actuate it and the sieves therein. As rotation continues, weight 16 gradually rises, observe Fig. 5, the effect of centrifugal action is increased and the radius of gyration becomes larger in proportion until the maximum effect is reached when arm 17 has assumed a position in which it is horizontal or nearly so.

The extent of gyratory actuation of the sieves need not necessarily be the same in all cases or at all times and it has been found that best results are obtained if the actuation is adjusted to best suit the particular kind of work to be done at the time and while separating stock of various kinds, as for instance, while grading flour, sifting bran, middlings, etc. Therefore I have provided means for adjusting the action of weight 16, for the purpose of gyrating box 10, by controlling its position with reference to the center of rotation that is its distance

therefrom and so that said box may be actuated to any extent between extremes and as is suitable in any particular case. Referring now more particularly to Figs. 3 and 4, these means consist of a lever 24 carried on shaft 12 with a pivotal connection. Bracket 18 may be used for this connection and lever 24 is provided at its free end with gear-teeth 25 fitted to mesh into similar teeth 26 at the connected end of arm 17. Shaft 12 is hollow and also transversely slotted at 27 to admit positioning of lever 24 on it in the manner shown. Obviously as weight 16 rises during rotation, lever 24 is acted upon by arm 17 and correspondingly lowered owing to the engaged gear-teeth 25 and 26 on these parts and since the weight cannot rise without moving said lever on account of the positive engagement between the gear-teeth, I use the movement of this lever as a means for controlling the position of the weight. For such purpose I provide an adjusting screw 28 which is seated in bearing 14 below the lower end of shaft 12 and which is used, preferably by means of an interposed rod 29 contained in hollow shaft 12, to control the position of lever 24. To obtain accuracy, contact as to this latter is limited to a projection 31. As will be understood such contact between this projection 31 and the upper end of rod 29 prevents the weight from rising any farther and thereby limits the effect of its action.

In Fig. 5 an arrangement is shown in which shaft 12 is mounted above box 10 and projects from the upper side thereof, whereas, as shown and described before, it projects from the under side. The mounting and manner of holding the shaft is substantially the same except that bracket 15 is on top of the box. Shaft 12 is preferably extended through this latter and finds a bearing 13 in one of the sides of the box the same as shown in Fig. 1. Driving pulley 19, not shown in Fig. 5, may be mounted in any suitable position, preferably below the box as shown in Fig. 1. A lever 32 takes the place of lever 24, shown in Figs. 1 and 3 and is supported on a bracket 30 mounted on shaft 12 in place of bracket 18. Lever 32 has gear-teeth 33 at one end which teeth mesh with teeth 26 on arm 17. On its other end it has gear-teeth 34 which engage similar teeth 35 in a rod 36 fitted into hollow shaft 12. In this case as weight 16 rises, rod 36 rises also and adjustment is had by controlling the movement of rod 36. This is done by means of an adjusting screw 37 mounted above the upper end of hollow shaft 12 and extending into the same. Weight 16 is limited to any particular position as soon as contact is had between the upper end of rod 36 and the lower end of adjusting screw 37. A plate 38 having contact by means of balls with the upper end of rod 36, is interposed, to reduce the friction at the point of contact.

In either of the forms shown, an additional weight may be used. In the form shown in Fig. 1, it may be applied above box 10, the same as shown in Fig. 5, shaft 12 being extended through the box and terminating above the same. In the form shown in Fig. 5, it may be applied below the box, the same as shown in Fig. 1. One adjusting screw, the same as shown, would be used in either case. To extend its action to the added weight, and in the form shown in Fig. 5, rod 36 would be extended to permit engagement with a lever 32 to be added. In the form shown in Figs. 1 and 3, lever 24 would be connected with the lever 24 to be added by a link so that both levers move as one, said link being indicated in dotted lines in Fig. 3.

Bearings 13 and 14 may be ball-bearings as shown. Weight 16 is in shape of a pointed ovoid with its axis curved to approximate parallelism with the path of rotation, the object being to reduce resistance of air. The weight consists of sections shaped accordingly and removably mounted upon rods 39 which project laterally in opposite direction from arm 17, the sections being held upon said rods by nuts 41. The weights between their flat sides may be solid or more or less recessed or hollow so that by interchanging hollow or solid weight-sections, the mass of the weight may be increased or decreased to adjust the effect of its centrifugal action as may be necessary.

As will be readily understood, adjustment of the gyratory action of the sifter may be had by manipulating the adjusting screws, screw 28 in the one form, and screw 37 in the other form, and this may be done while the sifter is in action and without interrupting its operation.

Obviously the invention is applicable to devices operated in a similar manner and irrespective of the particular kind of material handled.

Having described my invention, I claim as new:

1. In a sifter, the combination of a sifter-box yieldingly supported, a shaft-bearing provided in the center of one of its horizontal sides, a bracket connected to one of these sides and containing a shaft-bearing vertically spaced from the other shaft-bearing, a shaft mounted in these bearings, means to rotate the same, a radially arranged bracket connected to this shaft, an arm hingedly connected to this bracket, a weight rigidly attached to the free end of this arm and adapted to assume positions differently spaced from the shaft and as controlled by the effect of centrifugal action developed during rotation, an adjusting screw and means operatively positioned be-

tween it and the hingedly connected end of the arm for positively limiting the same and the weight connected thereto to any one of these positions while rotation continues.

2. In a sifter, the combination of a sifter-box yieldingly supported, a shaft mounted thereon, means to rotate the same, a bracket laterally projecting from it, a weight, an arm to one end of which this weight is rigidly attached and which at its other end is hingedly connected to the bracket, a lever in operative connection with the hingedly connected end of this arm so as to be moved when the arm moves while the weight on it assumes different positions as it is affected by centrifugal action developed during rotation and means to control the movement of this lever so as to limit the weight to any one of the positions it assumes while rotation continues.

3. In a sifter, the combination of a sifter-box yieldingly supported, a shaft mounted thereon, means to rotate the same, a sectional weight hingedly connected and adapted to rotate with said shaft to develop centrifugal action and means to adjust the distance at which the weight revolves about the shaft.

4. In a sifter, the combination of a sifter-box yieldingly supported, a shaft mounted thereon, means to rotate the same, a weight in form of a pointed ovoid hingedly connected to this shaft and adapted to rotate therewith, the major axis of this weight being curved substantially concentric with the axis of rotation and means to adjust the distance at which the weight revolves about the shaft.

5. In a sifter, the combination of a sifter-box yieldingly supported, a hollow slotted shaft mounted thereon, means to rotate the same, a bracket laterally projecting from it, a weight, an arm to one end of which this weight is rigidly attached and which at its other end is hingedly connected to the bracket, a lever pivotally mounted on said bracket and so positioned as to extend into the hollow shaft through the slotted part thereof and in operative connection with the hingedly connected end of this arm so as to move when the arm moves while the weight assumes different positions as it is affected by centrifugal action developed during rotation, a rod slidably fitted into the hollow shaft and adapted to operatively co-act with the lever mentioned, and an adjusting screw mounted opposite the end of the hollow shaft and extending into the same and in endwise engagement with the sliding rod to control the position of the same.

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

KOSSUTH J. ENSMINGER.

Witnesses:
C. SPENGEL,
A. JOHNSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."