(No Model.)

H. J. GERHARDT & F. E. JAGERSON.

MOVEMENT FOR SHAKERS, &c.

No. 526,389. Patented Sept. 25, 1894.

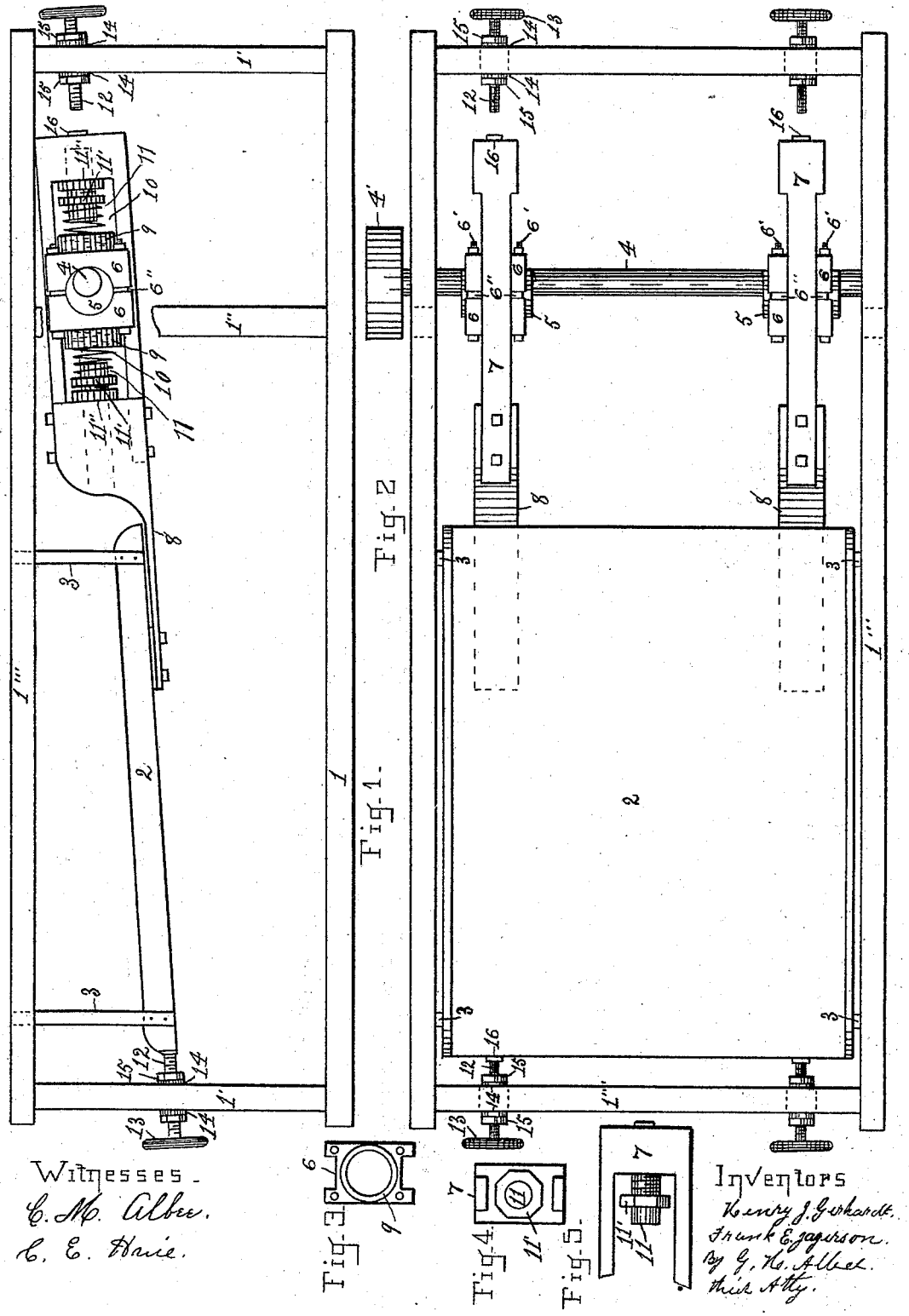

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

HENRY J. GERHARDT AND FRANK E. JAGERSON, OF NEENAH, WISCONSIN.

MOVEMENT FOR SHAKERS, &c.

SPECIFICATION forming part of Letters Patent No. 526,389, dated September 25, 1894.

Application filed June 19, 1893. Serial No. 478,067. (No model.)

To all whom it may concern:

Be it known that we, HENRY J. GERHARDT and FRANK E. JAGERSON, citizens of the United States, residing at Neenah, in the county of Winnebago and State of Wisconsin, have invented a new and useful Improvement in Movements for Shakers, &c., of which the following is a specification.

Our device consists of springs arranged upon opposite sides of, and in combination with an eccentric for giving to the body which is moved by said eccentric, a rebound, or a reactionary movement, and its object is to give to the frame of a sieve, a shaker, or other similar article, a quick rebounding movement for the purpose of controlling the movement of any substances which may be subject to the action of said shaking device for separating the lighter from the heavier articles, or the parts having different forms from each other.

Figure 1 is a side view of a frame having a grain shaker suspended from its top, which is arranged for receiving a reciprocating movement from eccentrics which are supplied with our improvement. Fig. 2 is a top view of said frame, the shaker, eccentrics and spring devices. Fig. 3 is a plan of the outer side of one of the eccentric half boxes. Fig. 4 is an end view of the inside end of one of the eccentric box straps, having a spring adjusting bolt therein, and Fig. 5, a side view of said eccentric box strap ends.

Similar figures of reference indicate like parts in the several views.

Our improvement is adapted for many uses among which are various forms of flour making machinery, separators for grain and other articles, and for the purpose of illustrating the device a grain shaker is shown which is suspended within a frame composed of sills 1, upright pieces 1′, 1″, and top pieces 1‴.

2, indicates the shaker; 3, flexible straps upon which the shaker is suspended; 4, a shaft; 4′, a pulley; 5, eccentrics; 6, eccentric boxes; 7, eccentric box straps; 8, flexible connections between the eccentrics and shaker; 9, a cup upon the outer side of the eccentric boxes; 10, springs at each side of the eccentric boxes and within the straps 7; 11, bolts which are tapped into the outer end of the eccentric box straps and inner end of the flexible connection pieces 8, collars upon and integral with the bolts 11; 11″, jam nuts upon the bolts 11; 12, adjustable stop bolts; 13, a hand wheel for turning said bolts; 14, washers upon said bolts; 15, jam nuts upon the bolts 12; 16, bumpers for receiving the impact of the throw of the eccentrics.

The shaker being suspended from the frame by the flexible straps 3 is free to swing lengthwise of said frame a distance limited by the throw of the eccentrics. No claim is made to this particular construction of shaker, and it may have for a covering for its bed a smooth board, a canvas, or a finer wire cloth. It is particularly designed for that class of flour mill machinery known as scalpers and graders and is for making cleaner and more perfect separation of grain from its impurities, such as separating all round seeds of weeds, or of imperfect grain that may be mixed with a large body of grain, and we have found by trial that it makes perfect separation of wild peas from wheat, oats, barley, or any grain that has a different form from the peas.

The shaker frame is provided with a shaft 4 which may be journaled in boxes secured to the central upright piece 1″, and made to revolve by means of a belt connecting the pulley 4′ with any available motor. The shaft is provided with eccentrics 5, eccentric boxes 6, eccentric box straps 7 and flexible connections 8 for giving to the shaker a reciprocating movement. The eccentric boxes consist of two similar half boxes, fitted to the circle of the eccentrics and bolted together with bolts 6′, a piece of packing, 6″, being inserted between the half boxes for properly adjusting the boxes to the eccentrics. Each half box has upon its outer side a circular cup 9, for receiving one end of a coiled wire spring, 10. These springs need not be as shown but may be of any form or material adapted for use with the eccentric boxes, and may be arranged in any convenient manner for receiving different degrees of compression. In the present case the inner ends both of the eccentric box strap 7, and of the connection 8, are provided with a bolt, 11, which is tapped into said parts, each bolt having a collar, 11′, integral with it and between which collars and the cups aforesaid a spring is arranged for giving to the shaker at each throw of the eccentrics a rebound. Whenever said throw is

limited this rebound, or reactionary movement of the shaker is increased, and it may be increased or diminished, partly by means of the position of the stop which limits the reciprocation of the shaker, and partly by the degree of compression which is given to said springs. At each extremity of the throw of the eccentrics the springs 10 are compressed and their sudden recoil gives to the shaker a quick rebounding movement, it being similar to the motion which a hand sieve receives when its reciprocation is suddenly arrested, and this effect in connection with the effect produced by the stops 12, (which stops are more fully described in the following lines,) produces the desired shaking motion for making the aforesaid separations. The degree of said compression can be controlled by the turning of the bolts out, or into the part into which they are tapped. Each bolt is provided with a jam nut, 11″, for retaining it in the desired position.

In the uprights 1′, of the frame at the ends of the shaker, stops are arranged for limiting the reciprocating movement of it. These stops consist of a threaded bolt, 12, having the hand wheel 13, washers 14 and jam nuts 15. By turning said bolts they can be adjusted nearer to, or farther from the shaker, for permitting the shaker to strike them with any desired force, or so that one end will strike and the other not, or so that neither end will strike them. By thus adjusting said stops for limiting the reciprocating movement of the shaker, a rebounding movement can be given to it when it reaches the limit of its throw, in one, or in both directions, and material which is being acted upon by it can be made to travel up, or down the shaker, to either side of it, slow or fast, more evenly than without said spring arrangement, and it can be driven at one half the speed at which it would require to be driven to produce equal results without said device. For use upon shaking sieves, such as purifiers, it combines the useful results of tension springs, spring hangers and eccentrics.

In Figs. 1 and 2 the collars 11′ and jam nuts 11″, are shown as having a circular exterior, but in Figs. 4 and 5 the collar is shown to be octagonal. Both the collar and nut may be of any outward form which may be found most convenient for the adjustment of the bolts 11.

A piece of hard but slightly elastic material, 16, should be inserted between the end of each bolt 12, and the shaker and eccentric strap for receiving the impact of the eccentric movement. This piece being elastic will serve the same purpose as a tension spring for aiding in giving a rebound to the shaker.

The shaker is shown as being arranged in an inclined position and as having its movement toward the left limited by the stops 12 at that end. Arranged thus, we have found that wheat and wild peas, or two substances having a marked difference in their form being let fall upon the shaker bed at a point intermediate its ends, the bed being comparatively smooth and being rapidly reciprocated, the springs at the side of the eccentric boxes nearest said end will be compressed, and suddenly recoiling will produce a rebounding movement to the shaker which causes the wheat to travel upward to, and off at the right, while the peas will separate from it and roll downward and off at the left of the shaker. If the springs 10 are but slightly flexible the rebounding movement of the shaker will be more pronounced than if they are exceedingly so, and if the stops 12 are arranged for limiting the throw of the shaker early in its movement, that too will effect a like result, whereby the shaker may be easily and quickly adjusted for the desired movement for the work in hand.

It may be remarked that the hopper, or a like receptacle may be arranged over the shaker at any point in its length which may be found desirable in using the shaker for different kinds of material.

Having described our invention and the manner of its application, what we claim, and desire to secure by Letters Patent, is—

In a movement for shakers, &c., the combination with a shaker having a table consisting of a plain surface arranged in a slightly inclined position and being suspended with flexible straps from points above the same, of a device for imparting thereto a series of short, quickly repeated reciprocating movements, consisting of an eccentric arranged for revolution within two half boxes, an eccentric box strap inclosing said boxes, and a spring interposed between each half box and the extremities of said strap, each spring being provided with means for increasing or diminishing its resilient force independently of said force in its companion spring, and stops arranged in the path of said movement of the shaker for limiting the extent of its reciprocation at each extremity of said eccentric's throw, and means for adjusting said stops nearer to, or farther from the shaker, whereby a rebounding movement of greater or less force may be given to said shaker at one end thereof, independently of the force of said rebound at its opposite end, substantially as set forth.

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