No. 883,827. PATENTED APR. 7, 1908.

L. V. RATHBUN.

MEANS FOR FACILITATING THE ADJUSTMENT OF BALANCE WEIGHTS ON GYRATING MACHINES.

APPLICATION FILED MAR. 9, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

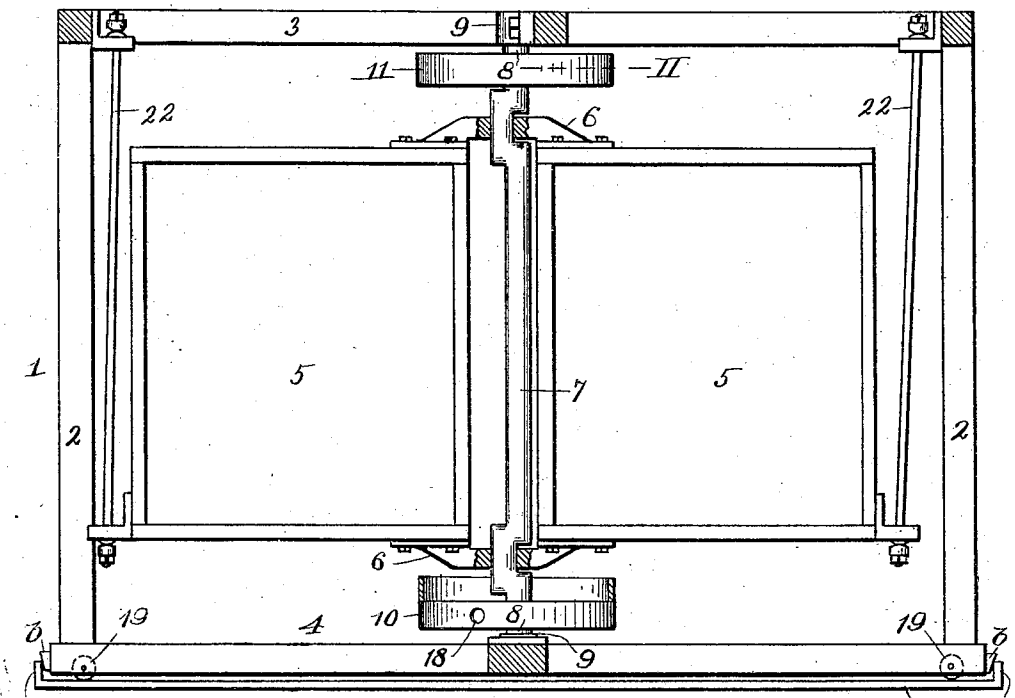
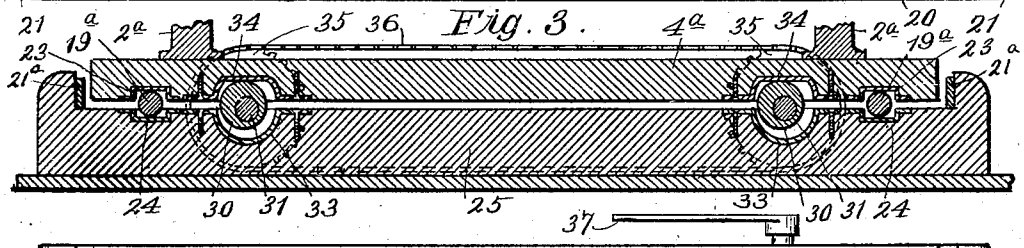
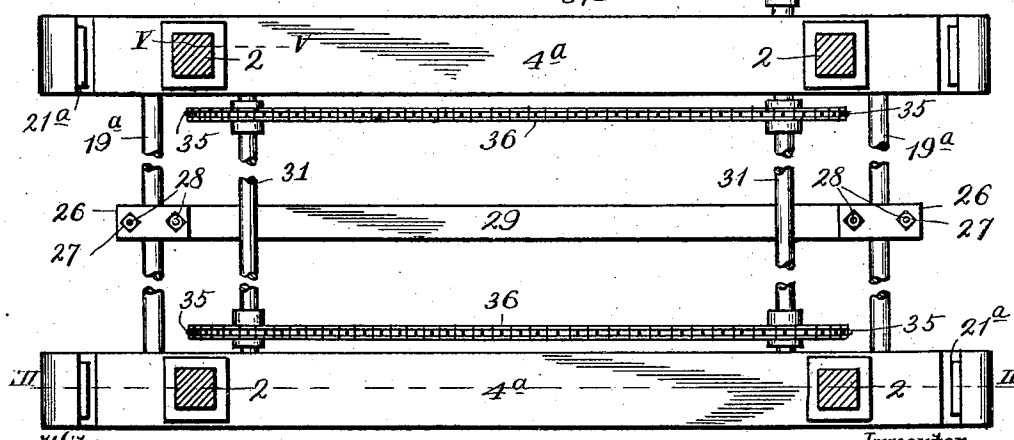


Fig. 3.





Witnesses:
Wm. A. Single
R. E. Hamilton

Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 7.

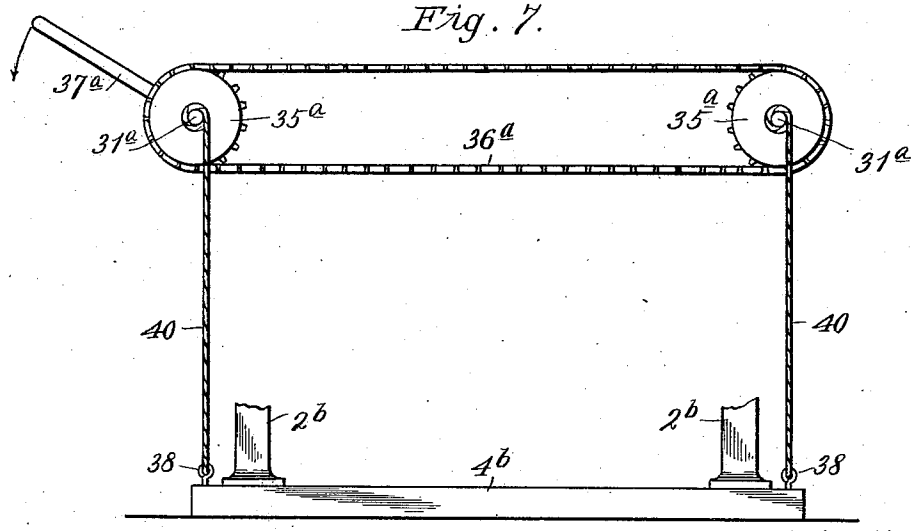


Fig. 8.

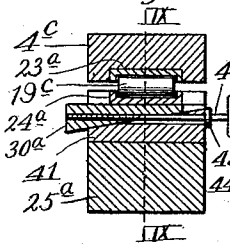


Fig. 9.

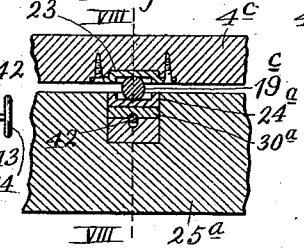


Fig. 10.

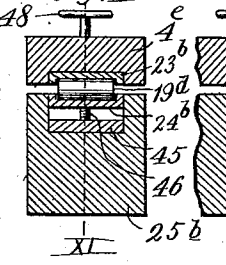


Fig. 11.

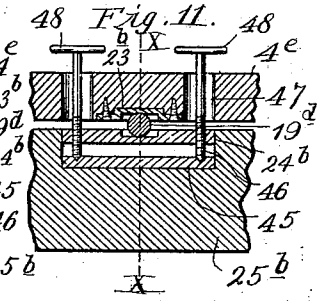


Fig. 5.

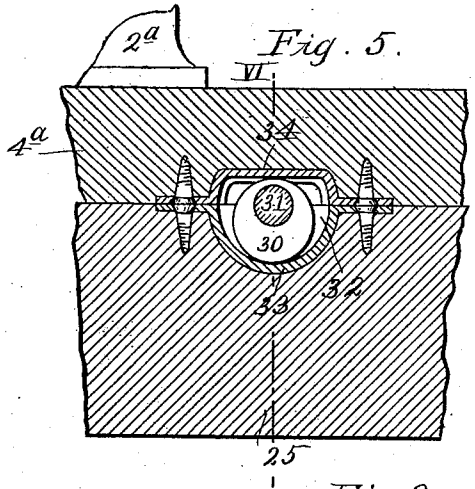
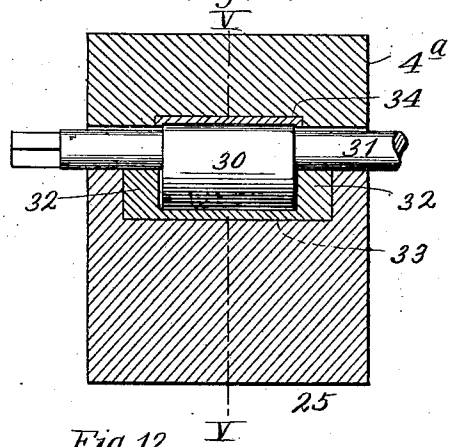


Fig. 6.



Witnesses:

Wm. C. Single.

R. E. Hamilton.

Fig. 2.

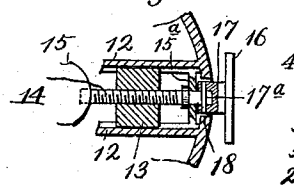
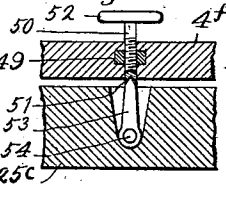


Fig. 12.



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UNITED STATES PATENT OFFICE.

LEWIS V. RATHBUN, OF KANSAS CITY, MISSOURI.

MEANS FOR FACILITATING THE ADJUSTMENT OF BALANCE-WEIGHTS ON GYRATING MACHINES.

No. 883,827. Specification of Letters Patent. Patented April 7, 1908.

Application filed March 9, 1906. Serial No. 305,148.

To all whom it may concern:

Be it known that I, LEWIS V. RATHBUN, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Means for Facilitating the Adjustment of Balance-Weights on Gyrating Machines, of which the following is a specification.

My invention relates to improvements in means for facilitating the adjustment of balance-weights on gyrating machines; my object being to provide means whereby said balance weights may be accurately and quickly adjusted to overcome the vibration common to gyrating machines such, for instance, as bolting-machines wherein a gyrating motion is imparted to the sieve-boxes during the process of separating and grading the stock. This vibration is communicated to the building containing the machines and if not corrected by proper adjustment of the balance-weights will, in time, affect the stability of the walls of the building.

In machines wherein the drive-shaft is journaled in a stationary frame it is all but impossible to properly adjust the balance-weights to overcome the vibration, owing to the rigidity of said frame. I overcome this difficulty by supporting the stationary frame in a manner to render it very sensitive to the vibration above referred to, so that it will be oscillated, reciprocated, or gyrated thereby and thus clearly indicate how the balance-weight or weights should be adjusted. The latter may then be easily adjusted until the frame comes to rest, when of course the machine will cease to vibrate.

Referring now to the accompanying drawings which illustrate the invention; Figure 1 represents a vertical sectional view of a gyrating-machine provided with my improvements. Fig. 2 is a broken horizontal section of the balance-wheel and weight taken on line II of Fig. 1. Fig. 3 is a vertical section taken on line III—III of Fig. 4, of the lower portion of a gyrating machine provided with a modified form of the invention. Fig. 4 is a broken sectional plan view of same. Fig. 5 is an enlarged broken vertical section taken on line V—V of Fig. 4. Fig. 6 is a transverse section taken on line VI—VI of Fig. 5. Fig. 7 is a broken side elevation of a modified form of the invention. Fig. 8 is a transverse section of another modification taken on line VIII—VIII of Fig. 9. Fig. 9 is a longitudinal section taken on line IX—IX of Fig. 8. Fig. 10 is a transverse section of another modification taken on line X of Fig. 11. Fig. 11 is a longitudinal section of same taken on line XI—XI of Fig. 10. Fig. 12 is a longitudinal section of another modification employed in carrying out the invention.

1 designates the frame of a gyrating machine of the sifter type, and consists of supporting posts 2 united at their upper and lower ends with bridge-trees 3 and 4, respectively.

5 designates sieve-boxes provided with bearings 6 mounted upon a drive-shaft 7 whereby a gyratory motion is imparted to said sieve-box.

8 designates the ends of shaft 7 which are journaled in bearings 9.

10 designates a combined drive-pulley and balance-wheel, and 11 designates a balance-wheel both of which are fixed upon the crank-shaft. Said wheels are provided with guides 12 between which balance-weights 13 are slidably mounted. Each balance-weight is either adjusted toward or away from the center of its respective balance-wheel by a screw 14, journaled in the balance-wheel-hub 15 and a cross-bar 15^a, and provided with a square outer terminal to receive a hand-wheel 16 having a hub 17 provided with a socket for engaging the square terminal of the screw so that the latter may be rotated in either direction and thus shift the weight inwardly or outwardly. Hub 17 is temporarily secured to the screw by a transverse pin 17^a. The periphery of each balance-wheel has an opening 18 for the passage of hub 17 so that the hand-wheel may be removed from the screw after the weight has been properly adjusted.

Frame 1 is mounted upon rollers 19 arranged to travel back and forth upon a track 20, having upturned ends 21 arranged in the path of the bridge-trees 4 to prevent undue movement of frame 1.

22 designates flexible rods for suspending the sieve-boxes from frame 1. After the balance-weights have been properly adjusted the frame may be secured from accidental movement by inserting wedges *b* between the ends of the bridge-trees and the upturned ends of the track 20.

In the modification, Fig. 3 and 4, 2^a designates the supporting posts and 4^a the bridge-

trees of the frame, which latter is temporarily raised and mounted upon rollers 19^a so that it may move to and fro while the balance-weights are being adjusted. Rollers 19^a reach from one bridge-tree to another and operate in bearings 23 24 arranged in the underside of the bridge-trees and the upper sides of sills 25, respectively. Sills 25 are provided with resilient buffers 21^a arranged in the path of the bridge-trees to limit the movement of the frame. The movement of the frame is further controlled by shoes 26 which are drawn into frictional contact with the rollers by adjusting nuts 27 engaging bolts 28 extending upwardly from a longitudinal beam 29. Ordinarily the bridge-trees rest upon the sills but when it is desired to insert or remove the rollers the frame is raised bodily by eccentrics 30 mounted upon transverse shafts 31, journaled in bearings 32, secured to the sills and provided with cups 33 to receive the eccentrics. Bearings 32 prevent lateral movement of the eccentrics while the bridge-trees 4^a are prevented from moving laterally upon the eccentrics by flanges depending from inverted cups 34 arranged in said bridge-trees. Shafts 31 are provided with fixed sprocket-wheels 35 connected by endless sprocket-chains 36, so that when one of the shafts is turned through the instrumentality of a hand-lever 37 all of the eccentrics will be simultaneously raised or lowered and thus keep the frame level.

Referring now to the modification, Fig. 7, 2^b designates the posts of the frame which rests upon the bridge-trees 4^b provided with eye-bolts 38. 40 designates cables attached at their opposite terminals to the eye-bolts and shafts 31^a upon which latter they are adapted to be wound in order to lift the machine bodily from the floor. Shafts 31^a are provided with fixed sprocket-wheels 35^a connected by an endless sprocket-chain 36^a so that when a hand-lever 37^a engaging one of the shafts, is lowered said shafts will be simultaneously rotated and thus wind the cables thereon. By thus elevating the frame it will be free to swing to and fro until the balance-weights have been properly adjusted.

Referring in detail to the modification shown in Figs. 8 and 9, 4^c designates a bridge-tree provided with bearings 23^a which engage rollers 19^c, the latter being arranged to travel upon bearings 24^a adjustably supported by wedges 30^a slidably arranged upon inclines 41 fixed to sills 25^a. Each wedge is adjusted by a screw 42 journaled in a boss 43 and provided with a hand-wheel 44 which affords a convenient grip when adjusting the screw. By turning said screw in one direction it is obvious that the wedge will be drawn towards the upper portion of the incline and thus raise the bridge-trees out of contact with the sills so that the frame may move to and fro upon the rollers 19^c. By turning the screw in the opposite direction the wedge will be pushed toward the lower end of the incline and thus permit the bridge-trees to move downwardly and rest upon the sills.

Referring to the modification, Figs. 10 and 11, 4^e designates the bridge-trees provided with bearings 23^b which engage rollers 19^d mounted in bearings 24^b which normally rest upon plates 45. 46 designates a pair of screws extending through threaded perforations in each of the bearings 24^b and having lower conical terminals fitted in conical recesses in plates 45. Said screws extend upwardly through openings 47 in the bridge-trees and are provided with hand-wheels 48. By turning said hand-wheels in one direction it is obvious that bearings 24^b and the rollers carried thereby will be moved upwardly and thus raise the bridge-trees from the sills, and by turning said screws in the opposite direction the bridge-trees will be permitted to move downwardly until they rest upon said sills.

In the modification, Fig. 12, 4^f represents the bridge-trees which normally rest upon sills 25^c and are provided with embedded nuts 49. 50 designates screws extending through the bridge-trees and the nuts and having **V**-shaped sockets 51 at their lower ends and hand-wheels 52 at their upper ends. 53 designates crank-arms fixed to shafts 54 and having their upper **V**-shaped ends engaging sockets 51, thus when the screws are turned in one direction the bridge-trees will be moved upwardly from the sills so that the machine will be supported by the screws and the crank-arms, which latter oscillate as the machine moves to and fro.

While I have shown that type of machine wherein the sieve-boxes and the drive-shaft are supported by the same frame, the invention may, of course, be applied to that class of machines wherein the sieve-boxes are supported independently of the frame containing the drive-shaft, in which instance said frame containing the drive-shaft need only be arranged to move to and fro during the adjustment of the balance-weights.

Having thus described my invention, what I claim and desire to secure by Letters-Patent, is:—

1. In a gyrating machine provided with a drive-shaft, a balance-wheel mounted upon said shaft, balance-weights carried by said wheel, and a frame in which the drive-shaft is mounted, in combination with means for movably supporting said frame temporarily so that it may be affected by the vibration of the machine, and means for raising and lowering said frame.

2. A gyrating machine provided with a drive-shaft, a balance-wheel mounted upon said shaft, balance-weights carried by said wheel, and a frame in which the drive-shaft

is mounted, in combination with rollers for supporting said frame so that the latter will be caused to reciprocate by the vibration of the machine, and stops for limiting the reciprocating movements of the frame.

3. A gyrating machine provided with a drive-shaft, a balance-wheel mounted upon said shaft, balance-weights carried by said wheel, and a frame in which the drive-shaft is mounted, in combination with rollers for supporting said frame so that the latter will be caused to reciprocate by the vibration of the machine, resilient stops for limiting the reciprocating movements of the frame, and means for applying friction to the rollers to retard their movements.

4. A gyrating machine provided with a normally-stationary frame, a drive-shaft, a balance wheel mounted upon said shaft, and balance weights carried by said wheel, in combination with means for temporarily raising said frame, for the purpose described.

5. A gyrating machine provided with a normally-stationary frame, a drive-shaft, a balance wheel mounted upon said shaft, and balance weights carried by said wheel, in combination with means for temporarily raising said frame, and antifriction bearings for supporting said frame while in a raised position.

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

LEWIS V. RATHBUN.

Witnesses:

LESLIE E. BAIRD,

F. G. FISCHER.