A. C. BRANTINGHAM.

SIFTER CONTROL AND DRIVING MECHANISM.

APPLICATION FILED JULY 24, 1907.

1,095,797. Patented May 5, 1914.

2 SHEETS—SHEET 1.

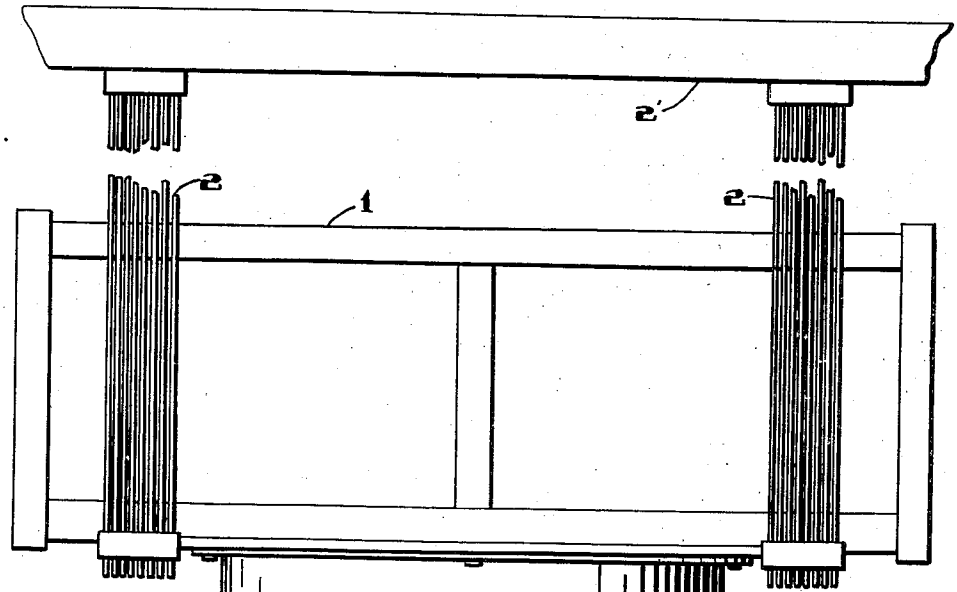


Fig. 1

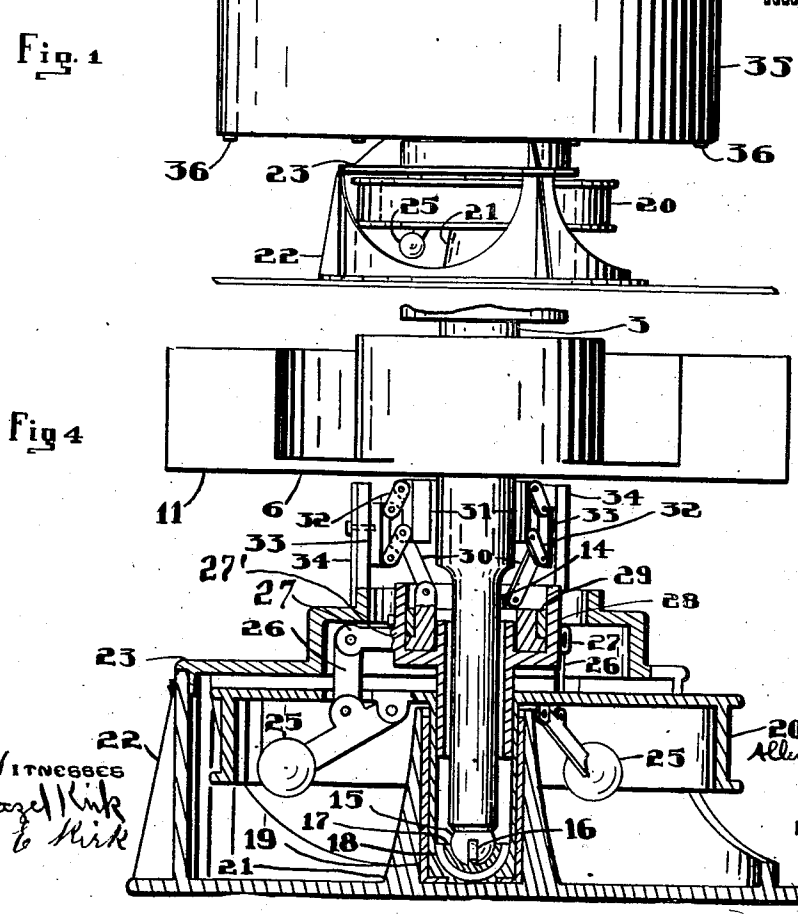


Fig 4

Witnesses
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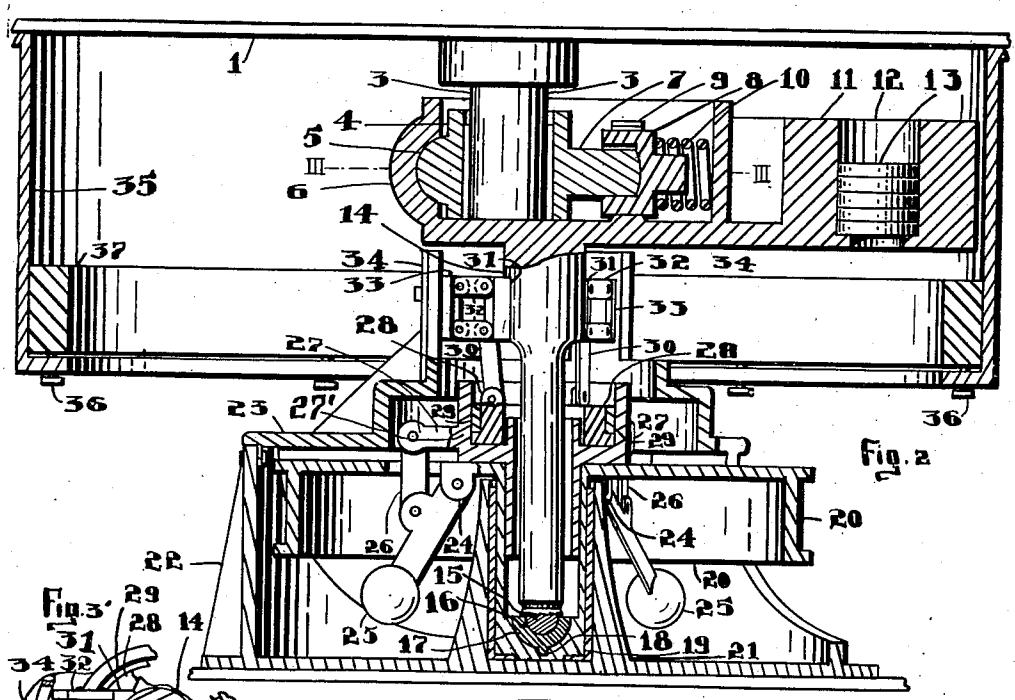


Fig. 2

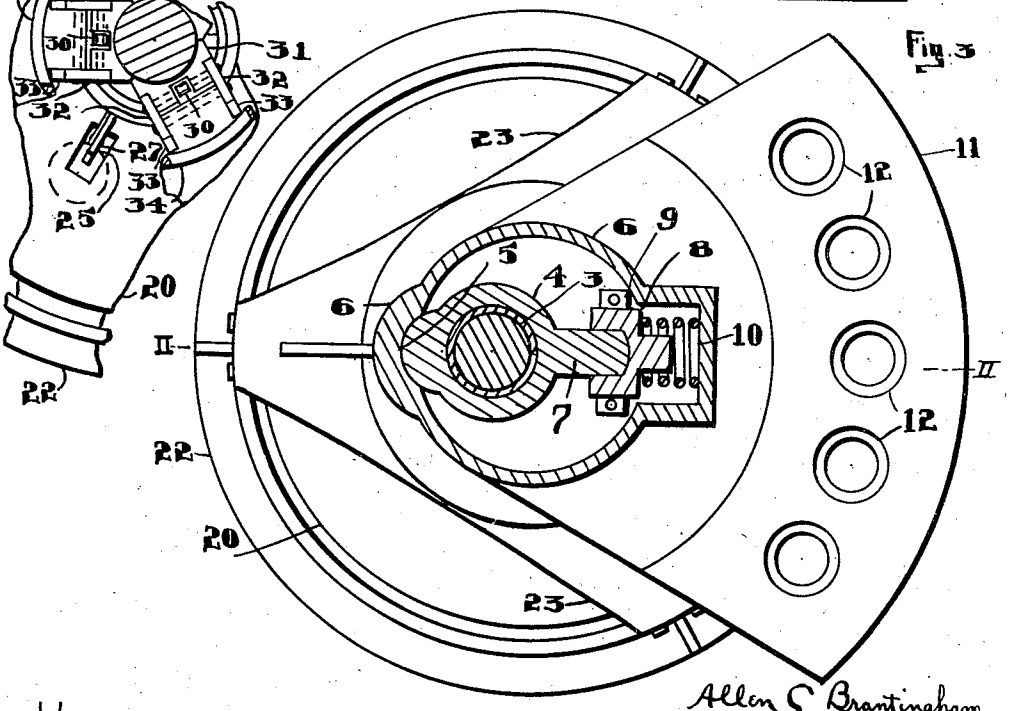


Fig. 3

Fig. 3'

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UNITED STATES PATENT OFFICE.

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SIFTER CONTROL AND DRIVING MECHANISM.

1,095,797. Specification of Letters Patent. Patented May 5, 1914.

Application filed July 24, 1907. Serial No. 385,308.

To all whom it may concern:

Be it known that I, ALLEN C. BRANTINGHAM, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Sifter Control and Driving Mechanism, of which the following is a specification.

This invention relates to the controlling and driving on an orbitally movable body.

This invention has utility when embodied in a self-balancing sifter. In such adaptation, the control may serve to rigidly hold the sifter drive and compel orbital movement of the sifter at low speeds. At greater speeds, the drive or gyrator may be gradually released to permit the sifter box and the gyrator to locate their center of gyration and freely rotate thereon. The "low box" construction is balanced against the tilting action of a single fly wheel drive by the placing of a weight to bring the center of gravity of the sifter to a plane nearer the plane of the center of gravity of the gyrator.

Referring to the drawings: Figure 1 is an elevation showing an embodiment of the invention in a self-balancing or gyratory sifter of the "low box" type; Fig. 2 is a vertical section on the line II—II Fig. 3 showing a gyrator and balancing means for the sifter; Fig. 3 is a sectional view looking down on the line III—III Fig. 2; Fig. 3′ is a fragmentary section looking downward from below the flywheel; Fig. 4 is a vertical section similar to Fig. 2 showing a different view of the fly weight wheel and with the control fly weights moved to release position.

The container for the substance to be treated, or "low box" 1, is supported for gyration by the rods 2. These holding means or rods 2 are suspended from the building 2′.

Fixed centrally to the underside of the box or body 1 is a stud or pin 3 rotatably engaged by a block or sleeve 4, which has a spherical portion or knuckle 5 rockably fitting in a socket of a member 6. That portion of the block 4 remote from the knuckle 5 has an extension 7 entering a pocket of a plunger 8. The plunger 8 is reciprocable in a guide 9, and by means of compression spring 10 serves to yieldably hold the convexity or knuckle 5 into the concavity in member 6.

The rotatable member 6 has a segmental weighted extension 11 comprising the gyrator fly weight, provided with the pockets 12 into which may be introduced the weights 13 to permit adjustment of the gyrator fly weight or wheel. The gyrator is the device which brings about the orbital travel of the box 1, and includes the orbitally driven bearing or block 4, and as herein disclosed, further comprises the weighted extension 11 diametrically disposed relatively to the block 4.

Eccentric to the normal seating position of the pin 3 in the member 6, this member has, as herein shown, an integral shaft or stem 14, provided with a spherically convex end 15 having a grooved way 16 rockably engaged by a tongue on an opposing hemi-spherically concave block 17. This block 17 is provided on its hemi-spherically convex portion with a rib 18 rockably fitting in a groove in a hemi-spherically concave step 19, which step carries and as shown is integral with the axially fixed driver 20. The rib 18 is at right angles to the tongue on the opposite side of the block 17. The rockable block 17 is slidable in the block 19 in the unbalanced operation of stem 14. A bearing 21, by its central socket, holds the member or step 19 in position. This bearing also serves as a floor anchor for the construction. There is accordingly afforded a flexible driving connection between the pulley 20 and the gyrator shaft 14. Spaced about the pulley 20 and its bearing 19 are the standards 22 carrying a frame 23.

The driver 20 has on the web thereof the lugs 24, to which are pivotally connected the control fly weights 25 engaging the links 26 attached to the lugs 27 of a rotatable collar 27′ spaced from the shaft 14, and having a bearing reciprocable in the member 19. A non-rotatable reciprocable collar 28 is held in this rotatable collar 27′ by a ring 29. This collar 28 is connected through the links 30 with the blocks 31 forming a sectional bearing for the shaft 14. These bearing sections 31 are pivoted by the links 32 to the blocks 33 fixed to the upright ears 34 on the frame 23. The portion of the stem 14 engaged by the sectional bearing 31 constitutes a bearing.

Fixed to the lower side of the body 1 and extending below the fly wheel 11, is a cylindrical flange, extension or petticoat 35, having the bolts 36, whereby an annular balancing means or weight 37 may be moved axially of the gyrator to adjust the balancing of the container and preclude an unequal or tilting action of the container by causing the center of gravity of the non-rotatable

gyratory masses to approach the center of gravity of the gyrator. The petticoat 35 rigidly holds the weight 37 relatively to the container or body 1.

Operation: At rest, the parts may assume the relation shown in Fig. 2. The weight of the box 1, at rest, will seek to assume a central position as to the bearing 21, which tendency is opposed by the yielding action of the spring 10. As permitted by the spring 10 and the spherical bearing 5, the gyrator has such jointed connection with the body 1 as to permit of a relative movement out of alinement of the gyrator stem 14 and the stud 3, while owing to the spherical bearing 15, 17, 19, the gyrator may move out of alinement as to the bearing 21, without a binding action. By this construction, no lateral pull of the belt driving the pulley 20 is transmitted to the gyrator, and accordingly in operation, the gyrator is left to assume a position at the true center of gyration when released by the bearing 31. The rotation of the driver 20 is transmitted through the connection 19, 18, 17, 16, to start the gyrator, which at a slow speed is held by the bearing 31 in an axially fixed position concentric to the bearing 21. The stud 3 is yieldably held to an eccentric position to the stem 14 of the gyrator, and this rotation compels the movement of the body 1 in a circle approaching its normal orbit. The stem 3 and the fly weight 11 are positioned on opposite sides of the stem 14, and this latter is very close to the center of gyration of the masses, *i. e.*, the axis about which the machine will seek to run at the higher speeds in the self-balancing operation. Accordingly as the sifter gets under way, owing to the development of this self-balancing feature, the strain laterally upon the bearings of the shaft 14 becomes less, and simultaneously the momentum due to the increased rotative speed causes the fly weights 25 to move outward, thus through the links 26 lifting the lugs 27 and the collar 27′ to which they are fixed, which through the collar 28, and the links 30, push up the bearing sections 31. This action is so modified by the restraining links 32 that the bearing sections 31 move away from the shaft 14, leaving the gyrator with a driving engagement at the step 15 and the stud 3. Thus released by this travel regulator, the gyrator is free to assume its true center of gyration and the orbit of the body 1 so released may be modified accordingly. The weights 13 and 37 may be so manipulated as to bring this center of gyration to very closely approximate the axis of the pulley 20 and result in the gyrator having no oscillation, but only rotation. When the speed is reduced to approach that point at which the mechanism is not self-balancing, the weights 25 lower and bring the bearing sections 31 to laterally engage the shaft 14. These weights and sections so interact as to constitute a speed controlled holding means for the stem 14. The machine is self-balancing, and free to so act, at all speeds above the critical speed, while below such speed, the control is automatic and certain, making impossible any wild and destructive lunges owing to the limited lateral movement in the normal orbit which keeps down the momentum.

What is claimed and it is desired to secure by Letters Patent is:

1. The combination with a body supported for gyration, of a gyrator for the body, and steadying means for restraining abnormal movement of the gyrator, said means embodying a speed controlled device to release the means from the gyrator.

2. A body supported for gyration, in combination with a gyrator for the body, and steadying means for the gyrator restraining abnormal throw of the body at low speeds, said means embodying speed actuated elements operable to release the means from the gyrator at normal speeds.

3. The combination of a body supported for gyration, a gyrator for the body including a rotatable member, a driver for the gyrator, and automatically actuated steadying means for the member operable to laterally free the member at normal speeds, said means including mechanism restraining the body to normal travel at other than normal speeds.

4. A body supported for gyration, a gyrator for the body having a shaft, in combination with a lateral bearing for the shaft, said bearing movable toward and from the shaft, and mechanism including a fly weight for moving the bearing whereby the lateral bearing may hold the body to regular gyration or permit variation in gyration.

5. The combination with a body supported for gyration, a gyrator for the body having a shaft, of a sectional lateral bearing for the shaft, said bearing movable toward and from the shaft, and mechanism controlled by the rate of rotation of the gyrator, for moving the bearing whereby the lateral bearing may hold the body to regular gyration or permit variation in gyration.

6. A gyratory body fixed against rotation, supporting means therefor, a gyrator for the body including in combination a rotatable member having a concave seat, a convex member coacting therewith to permit relative movement of the body and gyrator out of vertical parallelism of their axes and yielding means seating the members.

7. In combination a body, an eccentrically weighted gyrator for the body, and annular balancing means rigid with the body.

8. A body, a gyrator for the body including a fly weight, in combination with annu-

lar balancing means adjustable axially of the gyrator, causing the center of gravity of the body to approach the center of gravity of the fly weight.

9. In a sifter, the combination of a body supported for gyration, a member engaging the body and having a bearing capable of being held or freed, a lateral bearing movable to hold or free said first bearing, and a fly weight device to move the movable lateral bearing into holding or freeing position to respectively limit the sifter to regular gyration or permit of variation in gyration.

10. The combination with a body supported for gyration, and a gyrator for the body, of a regulator for restraining abnormal gyration of the body, said regulator embodying a revoluble automatically adjustable radially movable fly weight.

11. In combination, a suspended body, a bearing member arranged centrally thereof, a weight mounted to produce a gyratory movement, a laterally movable rotatable stem set eccentrically to and engaging said bearing member, a step bearing for the stem whereby the weight of the stem and gyratory weight are supported, a fixedly mounted driver surrounding the axis of rotation of the stem, and a bearing in which said driver is mounted.

12. In combination, a suspended body, a bearing member arranged centrally thereof, a weight to produce a gyratory movement, a laterally movable rotatable stem set eccentrically to said bearing member, a step bearing for the stem whereby the weight of the stem and gyrator weight are supported, a driver having a central opening through which said stem extends but free of contact therewith, and a bearing in which said driver is mounted.

13. In combination, a suspended structure arranged to have a gyratory movement, a stationary bearing, a driver mounted thereby, said driver having a central opening, laterally movable rotatable means including a cranked shaft engaging the suspended structure, said rotatable means extending through the opening in the driver, and a step bearing for said rotatable means.

14. In combination, a suspended structure arranged to have a gyratory movement, a stationary bearing, a driver mounted thereby, said driver having a central opening, laterally movable rotatable means including a shaft for actuating the suspended structure, said rotatable means extending through the opening in the driver, and a step bearing for said rotatable means embodying a slidable block.

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

ALLEN C. BRANTINGHAM.

Witnesses:
C. H. RAUCH,
GEO. E. KIRK.