A. C. BRANTINGHAM.

HEATER CONTROL MECHANISM.

APPLICATION FILED JAN. 26, 1914.

1,161,834.

Patented Nov. 30, 1915.

2 SHEETS—SHEET 1.

FIG. 1

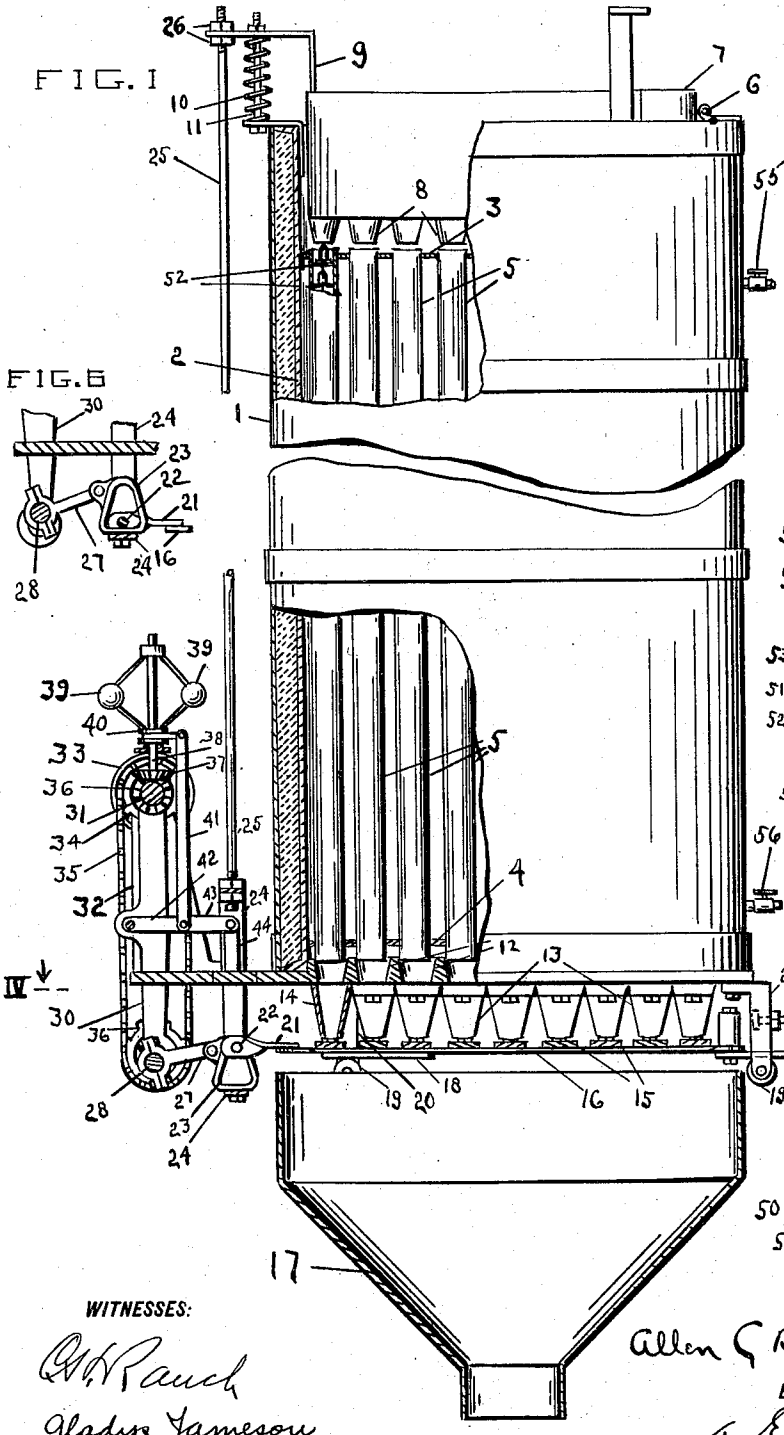


FIG. 6

FIG. 7

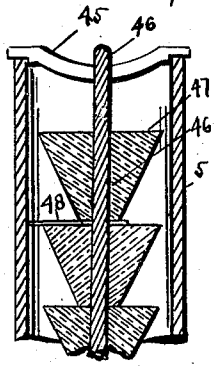
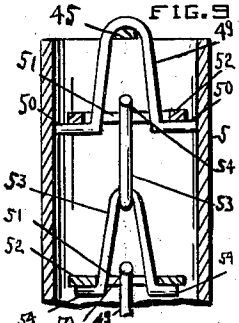


FIG. 9



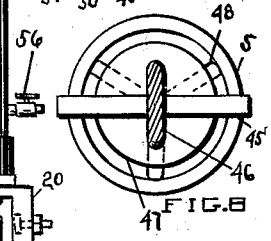


FIG. 8

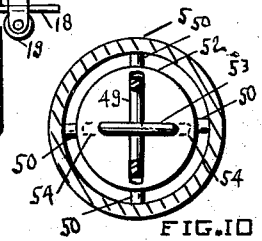


FIG. 10

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2 SHEETS—SHEET 2.

FIG. 2

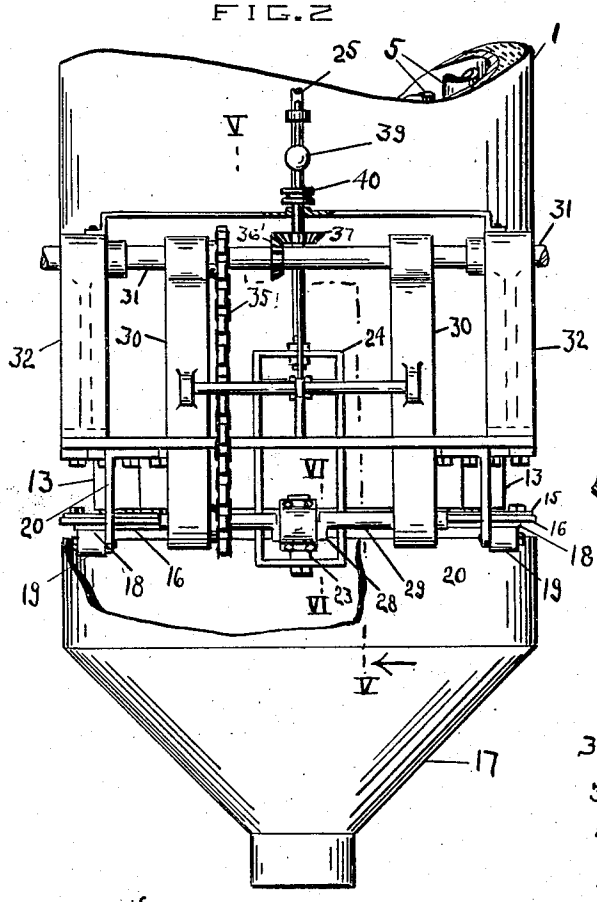


FIG. 3

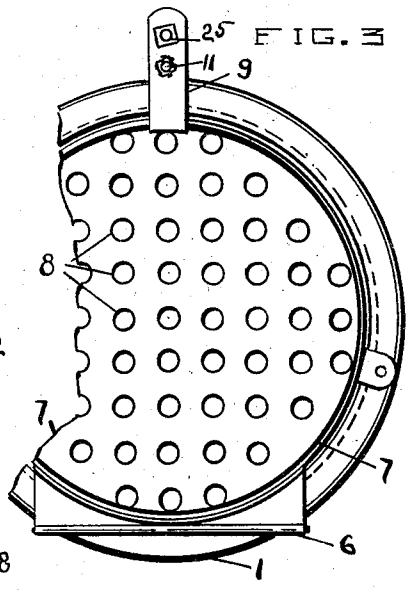


FIG. 5

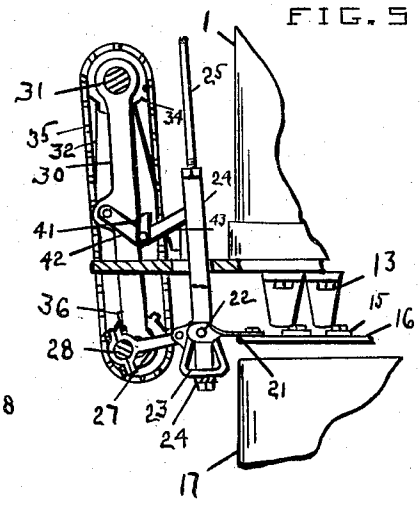
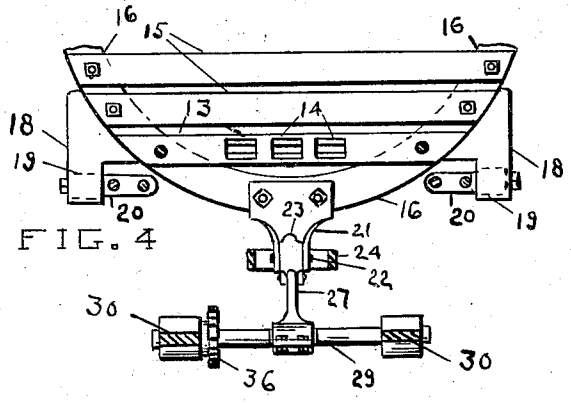


FIG. 4



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UNITED STATES PATENT OFFICE.

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HEATER CONTROL MECHANISM.

1,161,834. Specification of Letters Patent. Patented Nov. 30, 1915.

Application filed January 26, 1914. Serial No. 814,327.

To all whom it may concern:

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

This invention relates to a treating device for material.

This invention has utility when embodied in a heater for cereals, as wheat, with features of automatic control for handling a stream of the cereal.

Referring to the drawings: Figure 1 is a side elevation with parts broken away of an embodiment of the invention in a grain heater; Fig. 2 is a fragmentary elevation of features of the automatic controlling mechanism as seen from the left of Fig. 1; Fig. 3 is a fragmentary plan view of the device of Fig. 1; Fig. 4 is a fragmentary section on the line IV—IV Fig. 1, looking in the direction of the arrow; Fig. 5 is a section on the line V—V Fig. 2, looking in the direction of the arrow, showing the parts in trip or dump position; Fig. 6 is a view on the line VI—VI Fig. 2, looking in the direction of the arrow, with the parts adjusted for minimum throw in driving as controlled by the material receiving hopper; Fig. 7 is a fragmentary section of one of the heater ways showing a type of baffle therefor; Fig. 8 is a plan view of the way and baffle of Fig. 7; Fig. 9 is a fragmentary section of a way showing a link type of baffle; and Fig. 10 is a transverse section through such way and baffle.

The jacketed treating device or heater 1 comprises the drum section 2 having diaphragms 3, 4, therein connected by the ways or tubes 5. The space between the ways 5, the diaphragms 3, 4 and the drum 2 forms a chamber for a heating medium as steam so that the travel of material through the ways 5 may result in a treatment of such material in bringing the material to a desired temperature or for drying such material.

Mounted upon the upper portion of the heater 1 is the hinge 6 carrying the receiving hopper or basket 7 having openings 8 therethrough disposed in registering relation with the ways 5. This hopper 7 is provided with arm 9 yieldably poised by the spring 10 guided on the bolt 11 to thereby yieldably maintain the hopper 7 in such adjusted position as may be determined by the setting of nuts on the bolt 11.

The material received in the hopper 7 passing through the openings 8 and into the ways 5 is delivered from the ways 5 to the openings 12 in line with the fixed chutes or hoppers 13 having compartments 14 registering with each of the ways 5. These compartments 14 are grouped in series for discharging over the slats 15 forming a slotted platform carried by the receiving platform member 16. Below these receiving slats 15 is the outlet hopper 17 into which the material passing between the slats 15 is discharged. The receiving platform member 16 is provided with track extensions 18 coacting with rollers 19 carried by brackets 20 mounted on the heater 1, so that this platform member is free for reciprocation to move the slats 15 laterally of the series of hoppers 13 to permit spill from said hoppers 13 through the slots between the slats 15 either by direct flow or in its reciprocation to crowd the material off the slats 15. This reciprocable platform member 16 has the extension or bracket 21 carrying the pin 22 passing through the A-slot 23 of the yoke 24 engaged by the rod 25 extending to the upper hopper arm 9 as to which it is held in adjusted relation by the nuts 26. Accordingly as material accumulates in the hopper 7 to overcome the resistance of the spring 10, the rod 25 may settle down to bring the pin 22 into engaging relation with each of the sides of the A-slot 23, while as the load becomes lighter in the hopper 7, the spring 10 may force the rod 25 upward so that the pin 22 may have considerable play as between the sides of the A-slot 23. This A-slot member 23 is engaged by the link 27 mounted on the crank 28 of the shaft 29 swung by bearing brackets 30 from the shaft 31, which shaft 31 is mounted on the heater 1 by the brackets 32. The shaft 31 may be driven continuously by the belt pulley 33, and through the sprocket 34 on the shaft 31 drive the sprocket chain 35 passing about the sprocket wheel 36 on the shaft 29 to thereby cause the crank 28 through this link 27 to oscillate the A-slot member 23 and thus reciprocate the slotted platform member 15, 16. The extent of these reciprocations is automatically varied by the position of the A-slot member 23 as

controlled by the material supplied in the hopper 7.

Fast to the shaft 31 is the bevel gear 36' in mesh with bevel gear 37 on the upright shaft 38, which carries the flyball governor 39 having the collar 40 engaging the link 41 of the toggle links 42, 43, between the fixed bracket 44 on the heater 1 and the swinging brackets 30 carrying the shaft 29. With the shaft 31 driven at normal speed, this speed regulated device or fly ball governor 39 will, through its collar 40, hold toggle 42, 43, in such position that the link 27 may drive the platform slats 15 back and forth under the series of hoppers 13, as controlled by the basket 7. However, should the mill be shut down or the drive cease for any cause, the speed controlling device or governor 39 will act as an automatic dump and immediately break the toggle 42, 43 (Fig. 5) and thereby swing the brackets 30 and the shaft 29 toward the heater 1 to force the slats 15 into such position that there may be material flow from the heater 1. This is an automatic emergency control especially desirable, as in usual stream control of material in mills there is a drive for the elevator, and if the shaft 31 is driven in connection with the general run of machinery in the mill, stopping of the elevator would of course stop the material supply to the heater and should the simultaneous stoppage of the drive of shaft 31 occur at a point leaving the slats 15 in material holding position, there might be excessive heating of the material in the heating device, even to the destruction or material injury of such grain. With this governor acting on the flow interrupter slats 15, no such condition can arise for at once upon stopping of the shaft 31 the dumping of the heater occurs by shifting of the slats 15. The device is self setting for upon starting the mill the governor 39 at once picks up the toggle 42, 43 to bring the slats 15 into material holding position.

The ways 5 are provided with baffles or means for effecting a rolling or agitation of the grain to better insure uniform heating in the intermittent travel of the grain through the ways. The cross bar 45 over the ways 5 may carry flexible wire cable 46 having strung thereon the platform providing elements or glass beads 47 positively held in alined relation and centrally of the ways 5 by series of three armed centering means 48 strung on the cable 46 between the platform elements or beads 47. By making the platforms 47 of glass there is a cheap wear resisting material. In providing the stem 46 of flexible material the beads may be strung thereon and the baffle readily removed from the heater or placed in position therein even though the heater may be placed close to overhead structures, as ceiling or roof. This is a point of material advantage in permitting the desired placing of the device in many mills.

Instead of the continuous cable 46 in a built up baffle, there may be provided a series of U-shaped links or members, the U-shaped member 49 being provided with centering extension means or arms 50. This link 49 may be assembled through the cross-shaped opening 51 within the platform or disk 52, while the link 53 may be staggered or oppositely assembled therethrough by springing in the shorter arms 54 which may seat upon the opposite side of the disk 52 from the arms 50. These links assembled the platforms 52 may be in staggered relation to form a flexible continuous baffle, which baffle is flexible for insertion into the way 5 and removable therefrom but is positively held centered therein by the staggered series of arms 50 which have such relation as to the disks 52 as to firmly engage the ways 5. The material flow in its intermittent travel through the ways 5 lands upon the platforms or disks 52, is rolled thereover to present different material to the walls of the ways 5 and thus insure a uniform heating of the grain in its passage through the heater.

In the device of the disclosure there is accordingly provided an automatic treating device having heater control mechanisms caring for such stream of material as the demands of the mill may present for uniform heating up to the capacity of the treating device. The extent of the heating may be varied by controlling the steam supply through the valve 55 and the condensation passing from the valve 56. The variations in material supply at once effect the flow rate through the heater through the automatic adjustment of the reciprocation of the platform slats 15 as controlled by the A-slot member 23, the loading down with material increasing the flow and accordingly increasing the flow rate. In addition to this automatically adjustable flow connection there is the self dumping scheme as controlled by the governor 39 precluding retention of the material in the hopper for overloading or burning in the event of shutting down of any of the driving devices in the mill.

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

1. A device for treating material embodying a plurality of ways controlling mechanism for material flow through said ways including a reciprocable member receiving treated material, continuous driving means for the member, and means for varying the reciprocations of said member.

2. A device for treating material embodying a plurality of ways controlling mechanism for material flow through said ways including a reciprocable member receiving

treated material, continuous driving means therefor, and automatic means for varying the reciprocations of said member.

3. A device for treating material embodying a plurality of ways controlling mechanism for material flow through said ways including a reciprocable member receiving treated material, continuous driving means therefor, and flow controlled means for varying the reciprocations of said member.

4. A device for treating material embodying a plurality of ways controlling mechanism for material flow through said ways including a reciprocable treated material receiving member, and adjustable driving means therefor.

5. A device for treating material embodying a plurality of ways controlling mechanism for material flow through said ways including a reciprocable treated material receiving member, and automatically adjustable driving means therefor.

6. A device for treating material embodying a plurality of ways controlling mechanism for material flow through said ways including a reciprocable treated material receiving member, driving means for the member, and material flow actuated adjusting means for varying the driving action of the means on the member.

7. A device for treating material embodying a plurality of ways controlling mechanism for material flow through said ways including a reciprocable treated material receiving member, driving means, and an adjustable throw connection between the driving means and member.

8. A device for treating material embodying controlling mechanism for material flow including a reciprocable material receiving member, driving means, and an adjustable slot connection between the driving means and member.

9. A device for treating material embodying controlling mechanism for material flow including a reciprocable member, driving means, an adjustable slot connection between the driving means and member, and material flow actuated means for adjusting the connection.

10. A device for treating material embodying a material flow interrupter, driving means for the interrupter, a disconnecting device for the interrupter, and an actuator for the disconnecting device controlled by the driving means.

11. A device for treating material embodying a material flow interrupter, driving means for the interrupter, a shifting device for the interrupter, and a governor for actuating the shifting device.

12. A device for treating material embodying a material flow interrupter, driving means for the interrupter, a trip device for the interrupter, and a fly-ball governor for actuating the trip device.

13. A grain heater baffle embodying a series of stationary platforms flat on the upper sides thereof, and means for suspending the platforms in a series.

14. A grain heater embodying a plurality of ways, and baffles for said ways embodying a series of stationary platforms flat on the upper sides thereof, said platforms being centrally disposed in said ways.

15. A grain heater comprising a way, and a baffle in said way embodying a series of platforms and a succession of centering means for the platform slidably into the way with the baffle.

16. A grain heater comprising a way, and a baffle in said way embodying a series of platforms and flexible connecting mounting means therefor.

17. A grain heater comprising a way, and a baffle in said way embodying a series of platforms, and flexible connecting mounting means therefor, there being centering means for said platforms.

18. A grain heater comprising a way, and a baffle in said way embodying a series of disks and links connecting said disks.

19. A grain heater baffle embodying a series of disks, and links connecting said disks, said links providing centering means for the disks.

20. A grain heater baffle embodying a series of disks, and pairs of oppositely extending U-shaped links connecting said disks.

21. A grain heater jointed baffle having a series of centering means therealong.

22. A grain heater baffle comprising a series of connectible and disconnectible sections there being centering means projecting from said sections.

In witness whereof I hereunto set my hand in the presence of two witnesses.

ALLEN C. BRANTINGHAM.

Witnesses:
GEO. E. KIRK,
GLADYS JAMESON.

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

Corrections in Letters Patent No. 1,161,834.

It is hereby certified that in Letters Patent No. 1,161,834, granted November 30, 1915, upon the application of Allen C. Brantingham, of Toledo, Ohio, for an improvement in "Heater Control Mechanisms," errors appear in the printed specification requiring correction as follows: Page 2, lines 121 and 128, claims 1 and 2, after the word "ways" insert a comma; page 3, lines 5, 12, 18, 24, and 32, claims 3–7, after the word "ways" insert a comma; same page, lines 2 and 9, claims 2–3, strike out the word "therefor" and insert the words *for the member;* same page, line 79, claim 15, for the word "slidably" read *slidable;* and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of January, A. D., 1916.

[SEAL.] J. T. NEWTON,

Cl. 34—34 *Acting Commissioner of Patents.*