Dec. 28, 1954 G. K. VAN STEYN 2,698,121

HYDROMETER FLOAT PRELOADER

Filed Dec. 24, 1952 3 Sheets-Sheet 1

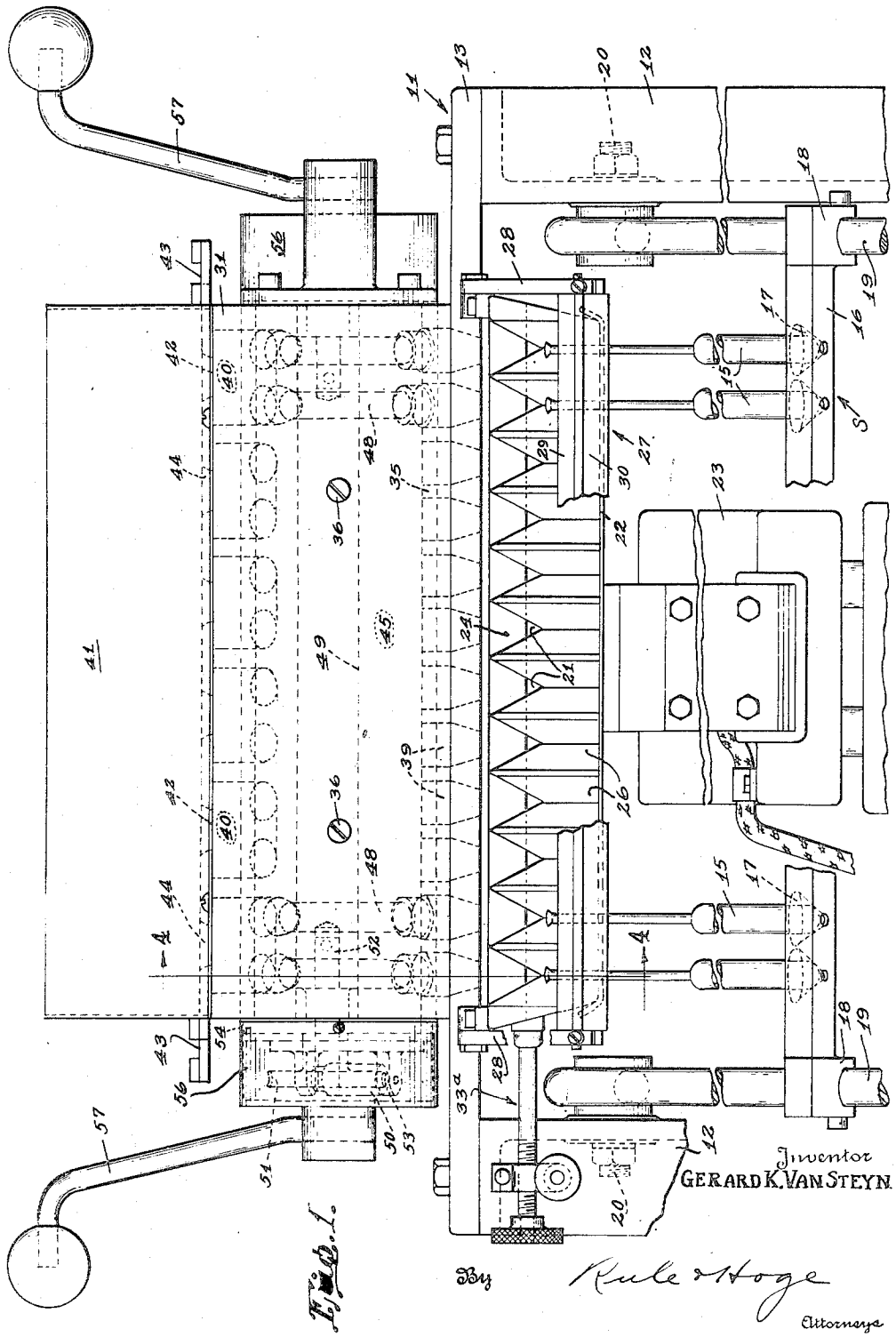

Fig. 1.

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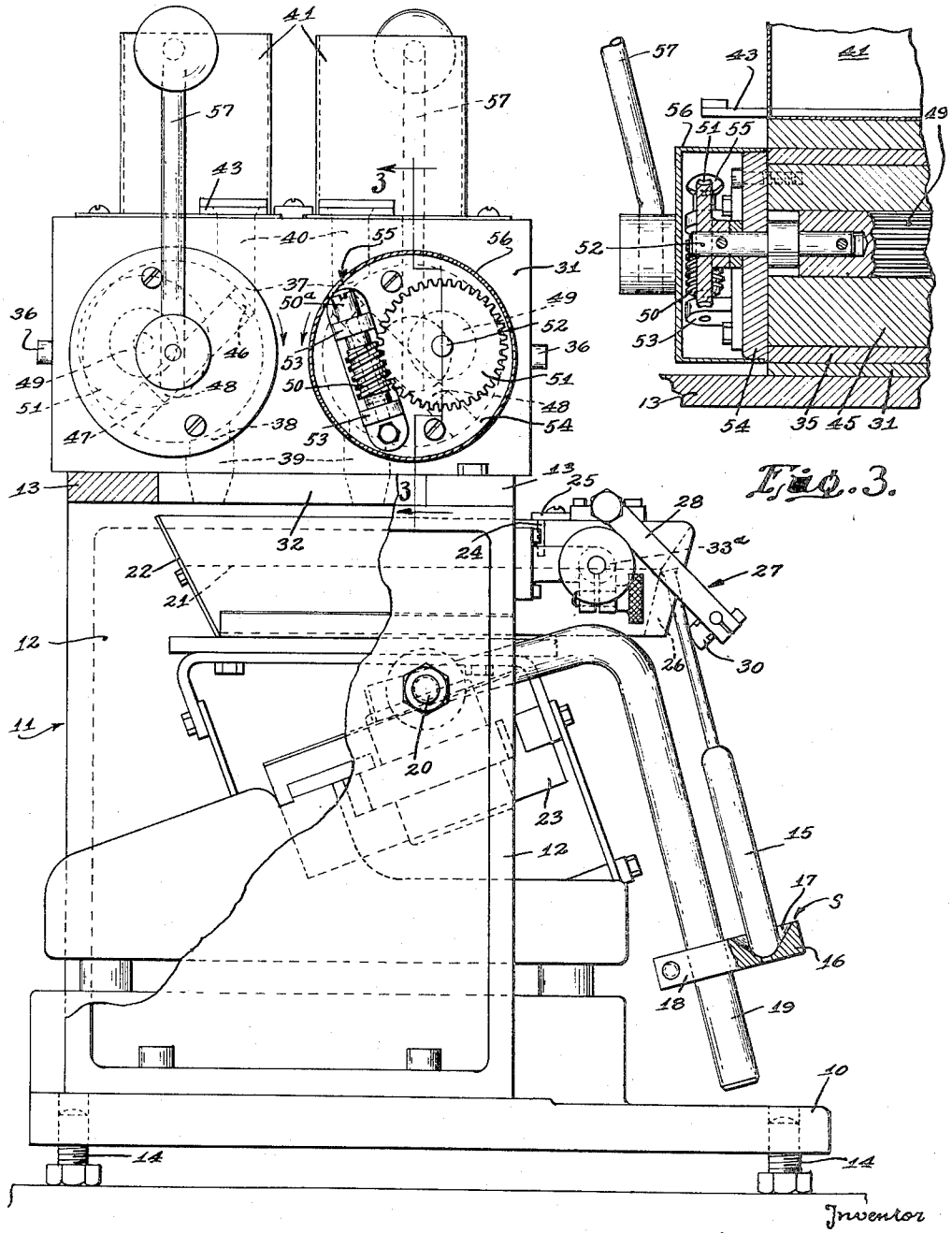

Fig. 2.

Fig. 3.

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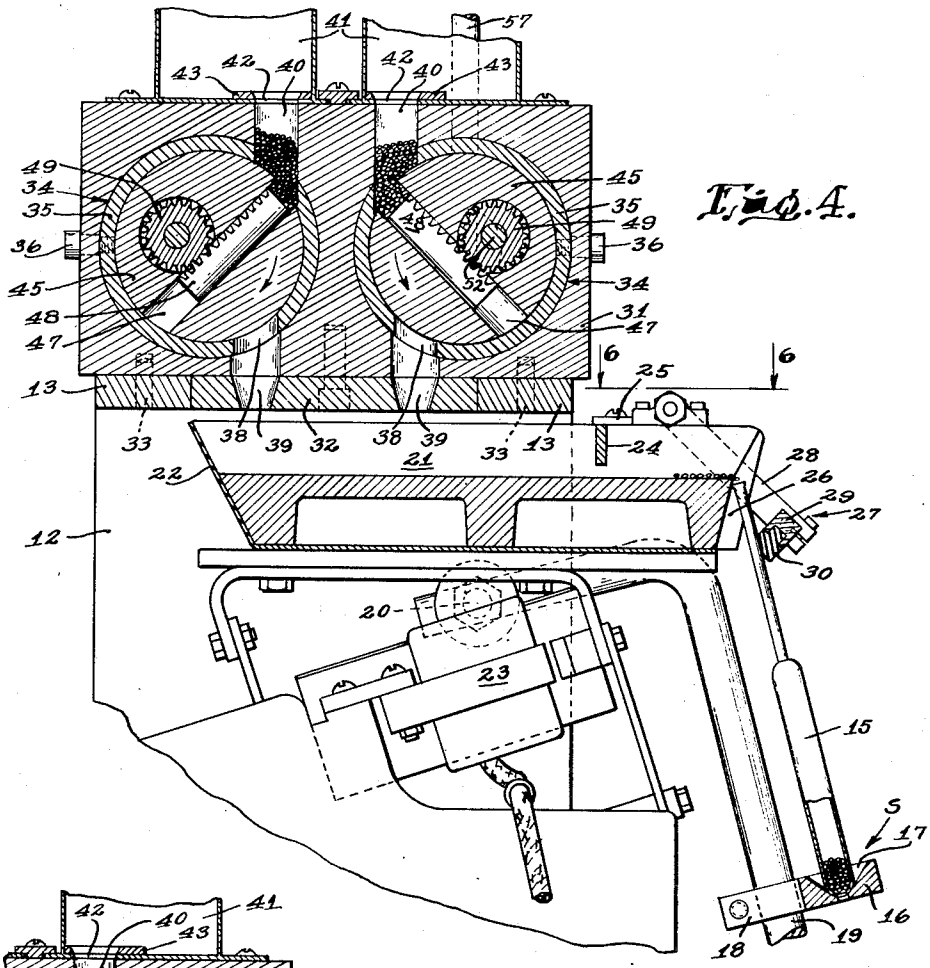

Fig. 4.

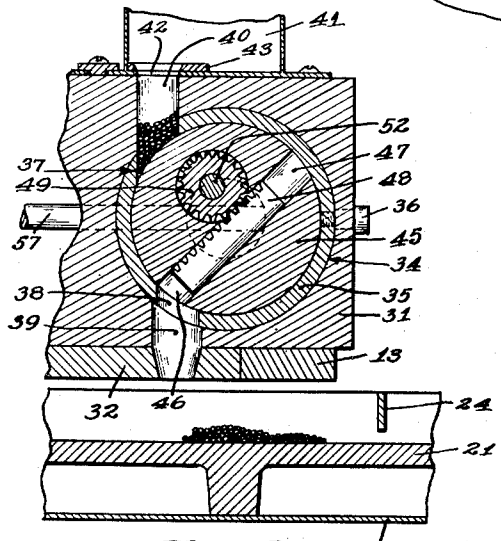

Fig. 5.

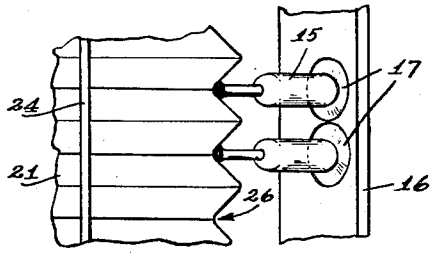

Fig. 6.

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HYDROMETER FLOAT PRELOADER

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Application December 24, 1952, Serial No. 327,717

13 Claims. (Cl. 226—72)

The present invention is an apparatus for preloading hydrometer floats with lead shot and wax pellets.

It is common practice to manually deposit in narrow neck, or stem, hydrometer floats, the required quantity of lead shot and wax pellets, to serve as ballast. Following precise balancing in a specific gravity solution, the hydrometer float is placed in heated sand to melt the wax. Subsequent cooling and setting of this wax secures the shot in place.

An object of my invention is the provision of semi-automatic apparatus which is capable of delivering accurately measured quantities or charges of shot and wax pellets, in that order, to a plurality of hydrometer floats, simultaneously.

It is also an object to provide means for independently regulably controlling the quantity of shot and wax pellets delivered.

A further object is the provision of simple and effective adjustable means for supporting a plurality of hydrometer floats in position to receive the ballast from the delivery means.

Other objects will be in part apparent and in part pointed out hereinafter.

In the accompanying drawings which form a part of this specification:

Fig. 1 is a fragmentary front elevational view of the apparatus;

Fig. 2 is an end elevational view with parts broken away and shown in section;

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 2;

Fig. 4 is a sectional elevational view taken substantially along the line 4—4 of Fig. 1, the measuring and dispensing means being shown in loading positions;

Fig. 5 is a detail sectional view of the lead shot feeder in discharging position; and

Fig. 6 is a fragmentary plan view taken substantially at the line 6—6 of Fig. 4.

My invention, in the illustrated embodiment thereof, generally comprises means for supporting a plurality of hydrometer floats with the open upper ends of the stem portions releasably, but firmly, held in proper relationship to the discharge end of a corresponding number of slightly inclined troughs into which measured charges of lead and wax pellets are deposited and from which such pellets are discharged seriatim, the lead pellets being discharged ahead of the wax pellets. These pellets constitute the ballast for the floats. The troughs are substantially V-shape in cross section to thereby facilitate, incident to vibration of such troughs, the rearrangement of a pile of the pellets into a relatively narrow stream and ultimately substantially into a single row for seriatim feeding to the floats. Feeding means for the pellets is positioned over the troughs and is so constructed that variable measured quantities, or charges of pellets, may be delivered to said troughs in such manner that the lead pellets are fed to the floats in advance of the wax pellets. The floats are then balanced in a specific gravity solution and finally heated to melt the wax so that when cooled, it will hold the lead pellets in place.

It is apparent that my apparatus, with, or without minor changes, or adjustments, may be utilized in the delivery of measured charges of other granular material to receptacles other than hydrometer floats.

Specifically my apparatus (Figs. 1 and 2) comprises a base 10, supporting a frame 11 composed of a pair of upright end walls 12, secured to said base and interconnected at their upper ends by a pair of longitudinal

side rails 13. Screws 14 at the corners of the base provide means for adjusting the angle of inclination of the troughs, as will be apparent.

A rest, or support S, for a plurality of hydrometer floats 15 (Figs. 1, 3, 4, and 6) comprises a horizontal bar 16 provided with a longitudinal series of upwardly facing recesses 17 in which the base, or bulb portions, of the floats seat. This bar is secured by clamps 18 to and is vertically adjustable upon, a pair of brackets 19. Each of these brackets may be substantially inverted L-shape and is connected to a hinge pin 20 carried by one of the end walls 12 of the frame 11. Thus, the float rest, or support, can be adjusted to compensate for differences in the dimensions of the floats, or other articles involved. The importance of such adjustment provisions is apparent when one considers that a difference in the diameter and length of the floats may well require both a change in the elevation of the recessed bar 16 and adjustment of the angular position of the brackets 19 to insure accurate location of the open neck of the floats in relation to the troughs 21, which direct the granular material (lead and wax pellets in this instance) into said neck openings. As will be apparent, the troughs 21 in part support the floats.

These troughs 21 (Figs. 1, 4, and 6) which correspond in number to that of the recesses 17 in the supporting bar 16, and the maximum number of floats which can be preloaded in one operation, are arranged side by side in a longitudinal series lengthwise of the frame. These troughs, which may well be cast, or otherwise formed, as a unit, are mounted in a shell 22 (Figs. 2 and 4) which closes one end of each trough and leaves the other, or discharge end, open. This set of troughs is mounted upon a conventional "Syntron" vibrator 23 which in turn is attached to the base 10. This vibrator, which is electrically operated, is obtainable on the open market. A padded screw 33a at one end of the frame 11 functions as means for damping the trough vibrations. At a point in proximity to the discharge end, the troughs are provided with a series of aligned transverse slots which open upwardly to receive a baffle strip 24. Clamps 25 removably secure this strip in place. The lower edge of this strip is positioned quite close to the bottom of the troughs and functions to reduce, if necessary, the mass of pellets moving to the discharge end, so that when these pellets approach said discharge point, they will be in a comparatively narrow stream and may be delivered seriatim to the floats. This is especially important where the float stems are of small diameter, as shown.

The forward, or discharge end of each trough is formed with a re-entrant portion, or recess 26 (Figs. 4 and 6) extending generally vertically. This recess, which has converging side walls merging at a line coincident with the bottom of the corresponding trough automatically centers the float stem relative to the proper trough. Thus, if the rest for the floats is properly adjusted, said floats very easily assume the necessary positions for loading, when placed upon said rest and tilted toward the troughs and released.

As insurance against any displacement during the preloading operation, such as might occur due to vibration of the troughs, there is provided a clamp 27, the weight of which is adequate to hold the floats in the desired position. This clamp (Figs. 1 and 4) is illustrated as being U-shape with the end arms 28 pivoted to the ends of the trough unit. The cross bar 29 which connects these end arms, carries a soft cushion or pad 30, for contact with the float necks. This clamp is manually operable to secure, or release the floats.

As pointed out heretofore, this apparatus is intended to deliver measured charges, or quantities, of lead shot, or pellets and wax pellets, to the hydrometer floats. Moreover, it is necessary, or at least desirable, that the lead pellets be delivered to the floats ahead of the wax pellets, since the latter merely serve as a binder, incident to being heated to the necessary degree and then cooled. Accordingly, two separate feeders, or dispensers are utilized, these being positioned side by side and extending lengthwise over the trough unit.

Structurally, the feeding mechanism comprises a dispenser housing **31** (Figs. 2 and 4) resting upon the side rails **13** of the frame and having a depending portion **32** (separate from, or integral with the housing as desired), snugly fitting between said rails, whereby to lend stability to the structure. Dowel pins **33** separably connect the side rails and housing **31**. This housing is formed with a pair of parallel bores **34**, each of which has a lining cylinder **35** therein, removably secured in place by screws **36**, or the like.

Each cylinder **35** is provided with a longitudinal series of inlet ports, or openings **37**, facing upwardly and with a similar series of outlet ports, or openings **38**, the latter in register with discharge openings **39** which face downwardly over the troughs. Pairs of the inlet ports **37** (Figs. 1 and 4) open upwardly into recesses **40**, which in turn communicate with the corresponding hopper **41**, through bottom outlets **42** in the latter. A slide valve **43** provided with spaced openings **44** (Fig. 1) is operable to control delivery of material to the recesses **40**.

The measuring and dispensing means, with respect to each feeding unit, comprises a movable member **45** of cylindrical form, mounted for oscillation in the cylinder, or bore, said member provided with a plurality of pockets **46** opening through the periphery. Obviously, there is a pocket for each of the troughs. In order that the capacity of each pocket may be regulably predetermined as required by the charge of material to be delivered, it assumes the form of a generally diametrically extending bore **47** and a rod **48** adjustable axially in this bore. The rod forms a bottom for the pocket.

Simultaneous adjustment of all of these rods **48**, to thereby change the pocket capacity, is obtained by means of an elongated gear, or pinion **49**, extending lengthwise of the movable member **45** and meshing with rack teeth on one side of each bottom forming rod. Rotation of the gear, or pinion, shifts the rods axially as a group and thereby alters the pocket capacity.

Rotation of the pinion **49** (Fig. 3) is obtained by means of a worm **50** and meshing worm gear **51** at one end of the pinion, the worm gear being secured to a short shaft **52** which is attached to one end of the pinion and the worm being mounted in brackets **53**. These brackets are carried by a retaining plate **54** (Figs. 1 and 3) which secures the previously mentioned movable dispensing member in place. One end of the worm **50** (Fig. 2) has a kerfed extension **50a** in register with an opening **55** in a cover **56** for said worm and worm gear. By inserting a screw driver, or the like, through the opening, and into engagement with the kerfed extension, the worm may be rotated to effect the desired change in the pocket capacity. Handles, or cranks **57**, are provided to oscillate the dispensing member and bring the pockets into register with the inlet and discharge openings alternately.

Referring to Fig. 4, the hopper and dispenser at the right-hand side deliver charges of lead shot or pellets. The other unit dispenses wax pellets, in accordance with the illustrated embodiment of my invention.

It will be understood that through adjustment of the screws in the base **10**, the angle of inclination of the set of troughs may be regulably controlled as required by the specific material being handled and other factors. The position of the troughs as shown, is prior to adjustment of them to the desired angle.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. A hydrometer float preloader comprising, means for supporting a float with its open end facing upwardly, an elongated delivery trough having an open discharge end in register and in contact with the open end of said float, said trough being V-shaped in cross section and declined toward the discharge end, means for delivering a measured quantity of pellets to said trough, and means for vibrating said trough and float to thereby accelerate movement of the pellets therealong to the discharge end and to the bottom end of the float.

2. A hydrometer float preloader comprising, means for supporting a float with its open end facing upwardly, an elongated delivery trough having an open discharge end in register and in contact with the open end of said float, said trough being declined toward the discharge end and shaped in cross section to arrange pellets deposited therein substantially in a narrow stream extending along the trough, means for vibrating the trough to effect delivery of the pellets seriatim to the float and to the bottom end of said float, and means for delivering a measured quantity of pellets to said trough.

3. A hydrometer float preloader comprising, means for supporting a float with its open end facing upwardly and with its axis inclined, an inclined delivery trough having an open discharge end in register with the open end of said float, means for vibrating the trough, said trough being shaped in cross section to arrange pellets deposited therein substantially in a narrow stream extending along the trough, means for delivering a measured quantity of pellets to said trough, and releasable clamping means for holding the float in preloading position and in contact with the vibrating trough whereby vibration of the latter causes vibration of the float.

4. A hydrometer float preloader comprising, means for supporting a float with its open end facing upwardly, an inclined delivery trough having an open discharge end in register with the open end of said float, said trough being shaped in cross section to arrange pellets deposited therein substantially in a narrow stream extending along the trough, a feeder for lead pellets, a feeder for wax pellets, the feeder for lead pellets positioned to deliver pellets to the trough in advance of the point of delivery of the wax pellets to said trough, and means for regulably controlling the quantity of each kind of pellets delivered to the trough.

5. A hydrometer float preloader comprising, means for supporting a float with its open end facing upwardly, an inclined delivery trough having an open discharge end in register with the open end of said float, said trough being shaped in cross section to arrange pellets deposited therein substantially in a narrow stream extending along the trough, a feeder for lead pellets, a feeder for wax pellets, the feeder for lead pellets arranged to deliver pellets to the trough in advance of the point of delivery of the wax pellets, and means for regulably controlling the quantity of each kind of pellets delivered, each said feeder comprising a hopper having a bottom outlet, a dispenser having a pocket to receive a charge of pellets from its hopper by way of said bottom outlet, and means for actuating the dispenser to effect gravity discharge of the pellets from the pocket into said trough.

6. In apparatus of the character decribed, a series of V-shaped troughs arranged in parallel relationship and each declined slightly toward a discharge end, means for supporting a plurality of hollow articles each with an open upper end positioned at the discharge end of a trough and in contact therewith, feeding means for delivering measured quantities of granular material to said troughs inwardly from the discharge end, and means for vibrating said troughs and hollow articles to thereby cause movement of the material along the troughs to the discharge end into said hollow articles and to the bottom of the latter.

7. In apparatus of the character described, a series of V-shaped troughs arranged in parallel relationship and each declined slightly toward a discharge end, means for supporting a plurality of hollow articles each with an open upper end positioned at the discharge end of a trough and in contact therewith, feeding means for delivering measured quantities of granular material to said troughs inwardly from the discharge end, means for vibrating said troughs and hollow articles to thereby cause movement of the material along the troughs to the discharge end into said hollow articles and to the bottom of the latter, and means for releasably securing the articles in position to receive material from said troughs.

8. The structure defined in claim 6 wherein the feeding means comprises a housing having material inlet and discharge openings individual to said troughs and a movable pocketed member in the housing to receive measured charges of material through said inlet openings and deposit such material in the troughs by way of the discharge openings.

9. The structure defined in claim 6 wherein the feeding means comprises a housing having material inlet and discharge openings individual to said troughs and a movable pocketed member in the housing to receive measured charges of material through said inlet openings and deposit such material in the troughs by way of the discharge openings, and means for moving said member about a horizontal axis to thereby alternately register the pockets with the inlet and discharge openings.

10. In apparatus of the character described, troughs arranged side by side in a longitudinal series, said troughs being declined in a common plane toward a discharge end, each trough having a re-entrant portion at its discharge end, means for supporting hollow articles each with an open upper end positioned in one of said re-entrant portions and in contact with the trough, means for depositing measured amounts of granular material in said troughs and means for vibrating the troughs.

11. The structure defined in claim 10 wherein the material depositing means comprises a pair of hoppers arranged side by side above said troughs, each hopper having bottom outlet openings in register with and individual to the troughs, a dispenser positioned beneath each hopper and composed of a housing having a horizontal bore extending lengthwise of the series of troughs, each said bore having a pair of circumferentially spaced inlet and discharge openings beneath each of the bottom outlet openings, and individual to the troughs, a movable cylindrical member in said bore provided with pockets in its periphery individual to said pairs of openings, and means for oscillating said member to alternately register the pockets with the inlet and discharge openings.

12. The structure recited in claim 1, together with means for adjusting the float support vertically whereby to accommodate floats of different length.

13. Mechanism for segregating and dispensing measured quantities of granular material comprising a hopper having a bottom outlet opening, a dispenser housing arranged beneath said hopper and having a horizontal bore, the latter having an inlet in register with said outlet opening and a discharge opening facing downwardly, a movable member in said bore having a pocket, means for moving said member to alternately register the pocket with the inlet and discharge openings, said movable member being a cylindrical body mounted for oscillation in said bore and in which the pocket is formed as a radial bore opening through the periphery of said body, a rod positioned in said radial bore to form a bottom for the pocket, said rod having gear teeth along one side thereof, a pinion in mesh with said teeth and means for imparting rotary motion to said pinion whereby to move the rod axially and thereby adjust the capacity of said pocket.

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