Feb. 11, 1930. G. B. CRANDALL 1,746,766

POWDER MEASURING DEVICE

Filed Feb. 27, 1928

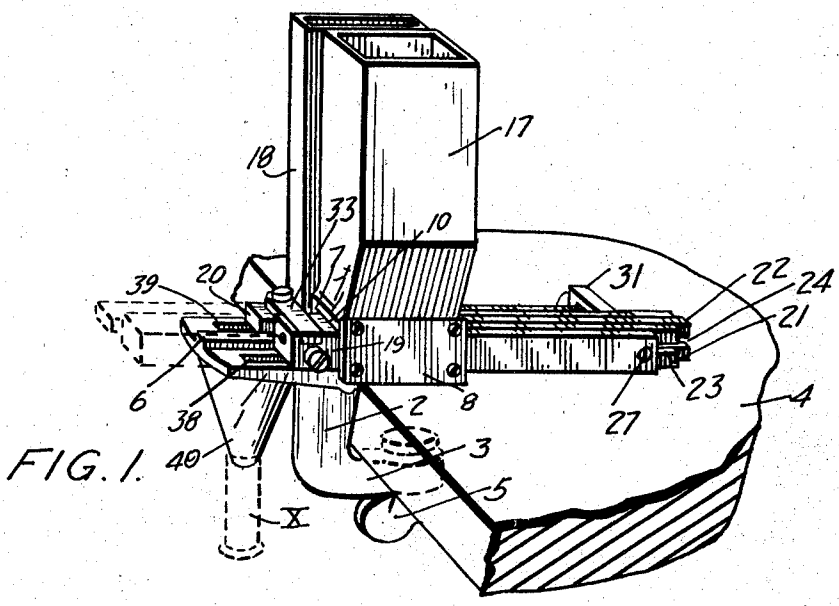


FIG. 1.

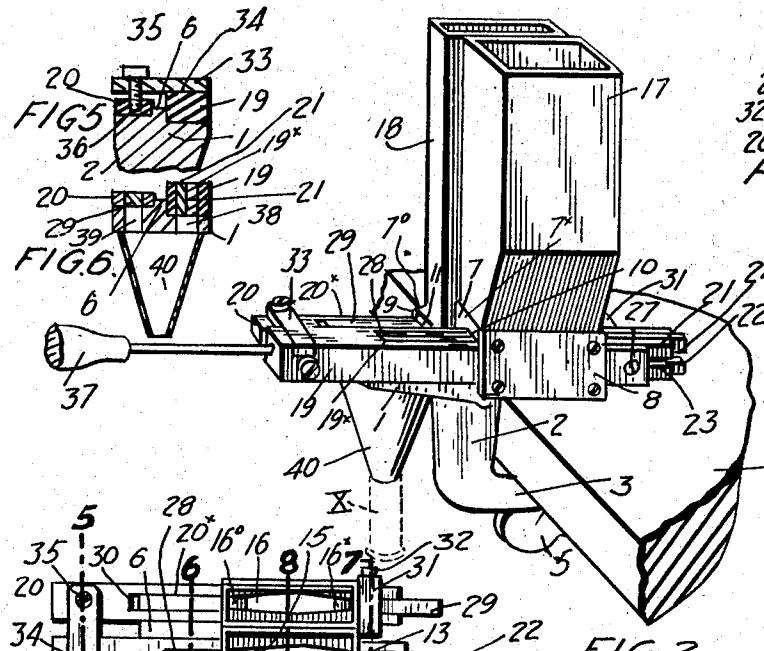


FIG. 2.

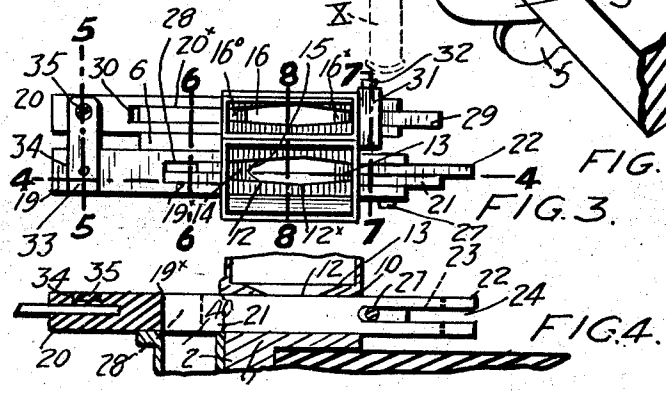


FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

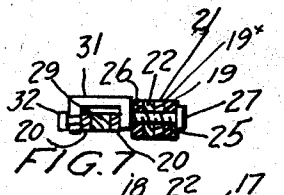


FIG. 7.

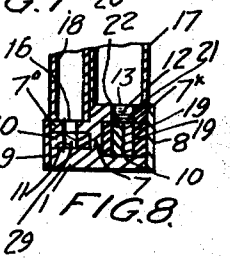


FIG. 8.

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UNITED STATES PATENT OFFICE

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POWDER-MEASURING DEVICE

Application filed February 27, 1928. Serial No. 257,355.

My invention relates to improvements in powder measuring devices, and the object of the invention is to devise a simple cheaply constructed measuring device which will operate by a direct thrust movement, in which certain and uniform filling of the measuring cup is insured, in which the inadvertent discharge into the cartridge of a partial charge is prevented, in which means are provided for measuring and discharging a priming charge into the cartridge prior to the discharge of the main charge thereinto and which is effected by the same operation of measuring and discharging the main charge, in which the measuring cup for both priming and main charges may be adjusted to the desired capacity, and in which the cut-off separating the charge in the cup from the main powder body is effected with maximum accuracy, and it consists essentially of the arrangement and construction of parts as hereinafter more particularly explained.

Fig. 1 is a perspective view of my device in the position which the parts assume for filling the measuring cups.

Fig. 2 is a similar view to Figure 1 showing the position the parts assume when discharging the charge into the cartridge.

Fig. 3 is a plan view of my device.

Fig. 4 is a sectional view on line 4—4 Figure 3.

Fig. 5 is a sectional view on line 5—5 Figure 3.

Fig. 6 is a sectional view on line 6—6 Figure 3.

Fig. 7 is a sectional view on line 7—7 Figure 3.

Fig. 8 is a sectional view on line 8—8 Figure 3.

In the drawing like characters of reference indicate corresponding parts in each figure.

1 indicates the base of my device provided with a depending portion 2 provided at its lower end with a lateral extension 3 extending beneath the base 1 and spaced therefrom to permit of the entrance of a table edge 4 or other supporting structure. 5 is a clamping screw by which my device is secured to the supporting structure. 6 is a rib formed on the upper face of the base 1 and extending longitudinally thereof, the inner portion of the rib being provided with an upward extension 7 having at its upper end a laterally extending portion 7^x and intermediate of its height with a laterally extending portion 7^0, the portions 7^x and 7^0 extending in opposite directions and spaced from the upper surface of the base 1 to form guideways for a purpose which will hereinafter appear.

8 and 9 are side plates, the plate 8 being secured adjacent its lower edge to the adjacent edge of the base 1 and adjacent its upper edge to the edge of the laterally extending portion 7^x. The plate 9 is secured to the remote edge of the base 1 adjacent its lower edge and adjacent its upper edge to the outer edge of the laterally extending portion 7^0.

By this means it will be seen two rectangular orifices 10 and 11 are formed forming slideways for the slidable members hereinafter described.

The portion 7^x is provided with a slotted opening 12 as will be clearly seen on reference to Figure 3, such opening preferably gradually widening out towards the centre of the slot as indicated at 12^x. The ends of the slot are formed with walls having downwardly and inwardly inclined faces 13 and 14 forming the inner ends of such walls into feather edges the outer one of which is cut into a V or cone shaped form as indicated at 15 so as to impart a shearing cut to the powder as will be hereinafter more fully explained.

The portion 7^0 is also provided with a longitudinal slot 16 which is similarly formed to the slot 12, but narrow in dimension, being also provided with inclined end walls 16^x and 16^0.

17 and 18 are powder containing chutes, the chute 17 containing the powder forming the main charges and the chute 18 containing the powder forming the priming charges. The chutes 17 and 18 are carried respectively upon the portions 7^x and 7^0 extending upwardly therefrom so as to feed the powder respectively into the orifices 12 and 16. 19 and 20 are slide bars slidably fitting within the orifices 10 and 11. The slide bar 19 is longitudinally slotted as indicated at 19^x and the slide bar 20 is also longitudinally slotted as

indicated at 20×. 21 and 22 are bars fitting into the slot 19× side by side parallel one with the other. The bars 21 and 22 are provided with longitudinally extending slots 23 and 24. 25 and 26 are orifices formed in that portion of the slide bar 19 forming the side walls of the slot 19×. 27 is a securing screw which is threaded through the orifices 25 and 26 and passes through the slots 23 and 24 drawing the side walls of the slot 19× and the bars 21 and 22 together so as to clamp them in position and prevent longitudinal movement.

By moving the bar 22 longitudinally an orifice 28 is formed in the slot 19×, such orifice forming the measuring cup for the main charge. The bar 22 may be withdrawn to any extent desired in order to regulate the size of the cup and therefore the quantity of powder fed.

If it is desired to further increase the charge the slide bar 21 may be also moved longitudinally to increase the size of the orifice 28.

29 is a bar fitting the slot 20× of the slide bar 20. The bar 29 may be also moved longitudinally to form an orifice 30 forming the cup for the priming charge. The bar 29 is clamped in position by a clamping member 31 which by means of a set screw 32 forces the side walls of the slot 20× and the bar 20 together to frictionally engage the bar 29 and hold it in position.

In order that the bars 19 and 20 may move in unison I provide a cross bar 33 which preferably fits within a recess 34 in the bar 19 and extends over the bar 20.

35 is a screw extending through the cross member 33 into an orifice 36 formed in the bar 20. 37 is a handle by which the device may be operated. 38 and 39 are discharge slots formed in the base 1 in the path of the bars 19 and 20 and over which the orifices 28 and 30 pass when the slide bars 19 and 20 are drawn outward. 40 is a conical discharge spout depending from the overhanging portion of the base 1 and into which the charges passing from the orifices 38 and 39 are fed.

In order to load the cartridge the cartridge X is placed in the position indicated by dotted lines in Figures 1 and 2 so that the open upper end thereof engages the discharge mouth of the spout 40. The slide bars 19 and 20 are thrust inward manually by means of the handle 37 carrying the orifices 28 and 30 longitudinally beneath the slotted discharge openings 12 and 16 so that the powder contained in the chutes 17 and 18 drops by gravity into the orifices 28 and 30 which together with the upper face of the base 1 form the receiving cup for the charge. The bars 19 and 20 are then drawn in the opposite direction, the feather edges of the walls 14 and 16° serving to accurately cut off the charge at the upper edge of each cup so as to insure that the cup is fully filled, the wall 14 being preferably in V or conical form as indicated at 15 so as to provide a shearing cut which tends to increase the accuracy of the division between the separated charge and the main body of powder. The slide bars 19 and 20 being therefore drawn in an outward direction carry the cups 28 and 30 over the slotted openings 38 and 39, the cup 30 reaching the slotted opening 39 first so as to deposit its charge into the discharge spout 40 ahead of the main charge contained in the cup 28 so that such priming charge is passed to the bottom of the cartridge and then the main charge contained in the cup 28 is discharge through the slot 38 so as to pass to the discharge spout 40 and into the cartridge onto the top of the priming charge already deposited in the cartridge. This operation is repeated for each cartridge by a direct backward and forward thrusting movement of the handle 37.

From this description it will be seen that I have devised a device by which the uniform filling of the measuring cups are insured by reason of the long travel of each of the cups beneath the respective bodies of powder contained in the chutes 17 and 18, in which the feeding of a partial or incomplete charge of powder inadvertently into the cartridge is prevented by reason of each measuring cup and its charge being carried into a clearly visible position to the operator before either of the cups are emptied into the discharge spout to pass into the cartridge, in which I have provided means for depositing a priming charge in the cartridge prior to the feeding of the main charge by means which are operated simultaneously and in unison so that the priming charge is fed into the cartridge ahead of the main charge, in which the measuring cups may be adjusted so as to alter their capacity to feed any desired amount of powder into the cartridge, and in which the separation of each charge from the main body of powder is effected with utmost accuracy, by reason of the received powder being distributed vertically instead of horizontally and thereby allowing for a very short cut-off.

Hitherto the practice has been to form a long horizontal comparatively shallow groove into which the powder is fed for measuring the longitudinal edge of the groove forming the cut-off which is therefore necessarily long.

In my device the measuring chamber is formed an orifice which is deep in relation to its horizontal area and one of the upper edges of the orifice forms the cut-off which is thereby rendered short instead of long as in the case of the groove construction.

What I claim as my invention is:—

1. A powder measuring device comprising a base member adapted to be carried on a suitable support, a powder containing chute supported above the base member and pro-

vided with a discharge slot at the bottom, a slide bar slidable between the base member and the discharge slot of the chute and provided with a longitudinal slot extending between its upper and lower face, a plurality of bars clamped between the side walls of the slot adapted to assume any position longitudinally.

2. A powder measuring device comprising a base member adapted to be carried on a suitable support and forming an overhanging portion having a pair of discharge slots, a spout depending from such overhanging portion and into which both of such discharge slots are adapted to lead, a pair of powder containing chutes supported above the base member and each provided with a discharge slot at the bottom, a slide bar slidable between the base member and each discharge slot of the chute, each bar having a powder receiving orifice located one in advance of the other whereby the charge fed from one chute into the receiving orifice of one bar is first discharged through one of such discharge openings of the base prior to the discharge of the powder from the receiving orifice of the other slide bar to the other discharge orifice of the base.

3. In a powder measuring device, the combination with a vertical chute containing the powder supply, of a plate portion forming the bottom of the chute having a slot extending transversely of the chute, a slideway located beneath the chute, a slide bar slidable therein and having a powder receiving orifice adapted to travel longitudinally of the discharge slot when receiving its charge and to be drawn longitudinally outward clear of the slideway to open the bottom thereof to discharge, and a cut-off wall forming one end of the discharge slot and inclined downward towards a feather edge having such edge formed into an inwardly extending V-recess.

4. In a powder measuring device, a main support forming a table, a slide bar guideway carried by the support, having a longitudinal slot in its top wall, a table top forming the bottom wall of the guideway, a chute extending upward from the guideway top wall forming the bottom of the chute, a slide bar having a powder receiving orifice extending vertically therethrough and adapted to move over the surface of the table longitudinally of the slot from a position beneath the chute to a visible position clear of the chute before discharge.

5. In a powder measuring device, a pair of parallel slide bar guideways having a longitudinal slot in the top wall of each, a chute extending above each slot, a table support forming the bottom wall of the guideways and extending outward from one end thereof, slide bars having powder receiving orifices the lower end of which are normally closed by the table top and movable longitudinally of the slots clear of the guideways onto the extended portion of the table, means for coupling the bars together so that the powder receiving orifices move in unison to an exposed position.

6. In a powder measuring device, a bar device having a pair of powder receiving orifices, a table support upon which the bar device is slidably carried, guides for the bar device having slots extending longitudinally of the top wall of the guide and of the bar device, a chute extending upwardly from each slot, an extension of the table support extending outward from one end of the guideway and on to which the bar device is drawn to expose the powder receiving orifices before discharge.

7. In a powder measuring device, a pair of slide bar guideways having a longitudinal slot in the top wall, a chute extending above each slot, a support forming the bottom wall of the guideways and extending outward from one end thereof, slide bars having powder receiving orifices arranged one in advance of the other the lower ends of which are normally closed by the table top and movable longitudinally of the slots clear of the guideways onto the extended portion of the table before discharge and to travel past the edge of such table extension to discharge the powder successively from the powder receiving orifices.

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