No. 749,022. PATENTED JAN. 5, 1904.

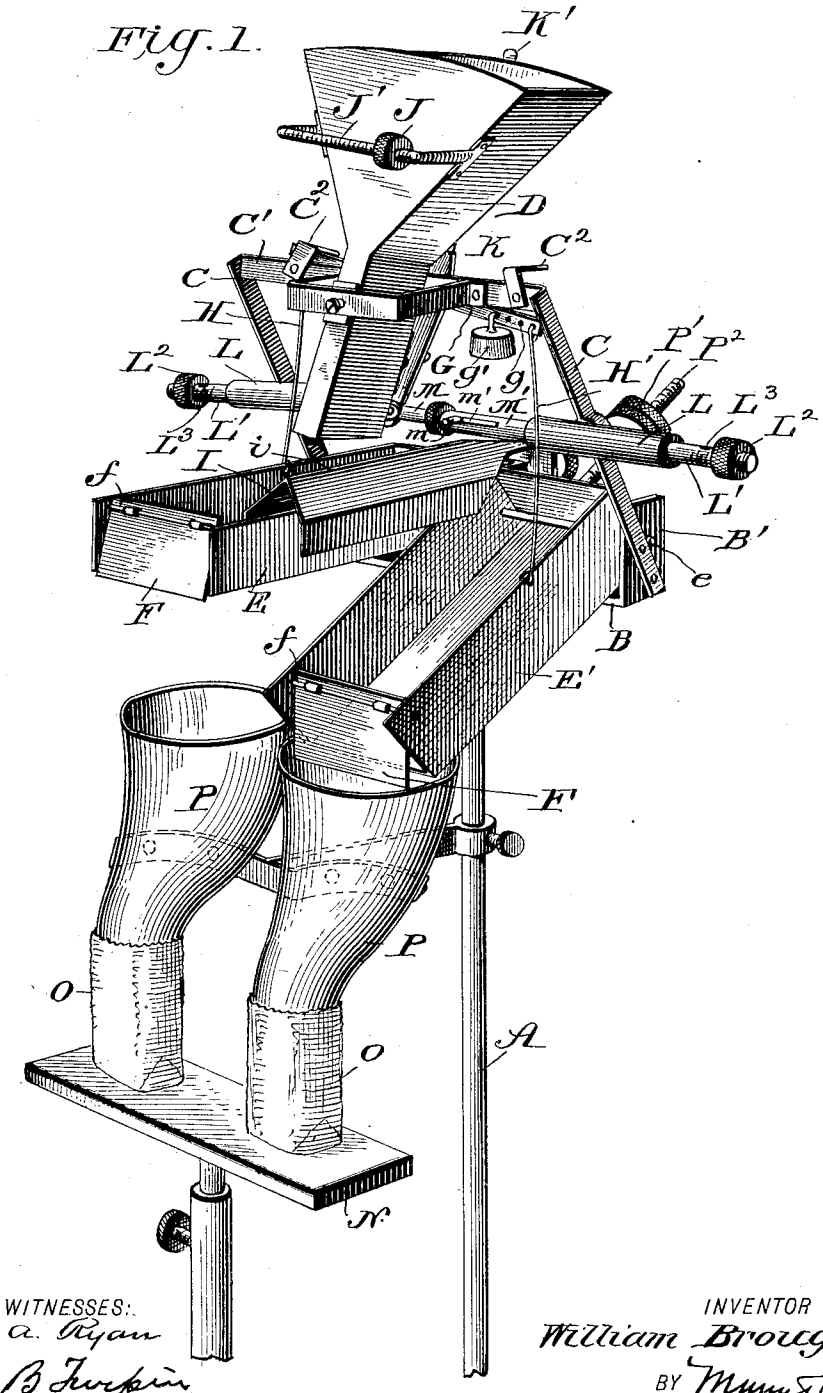
W. BROUGH.

AUTOMATIC WEIGHING MACHINE.

APPLICATION FILED AUG. 4, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

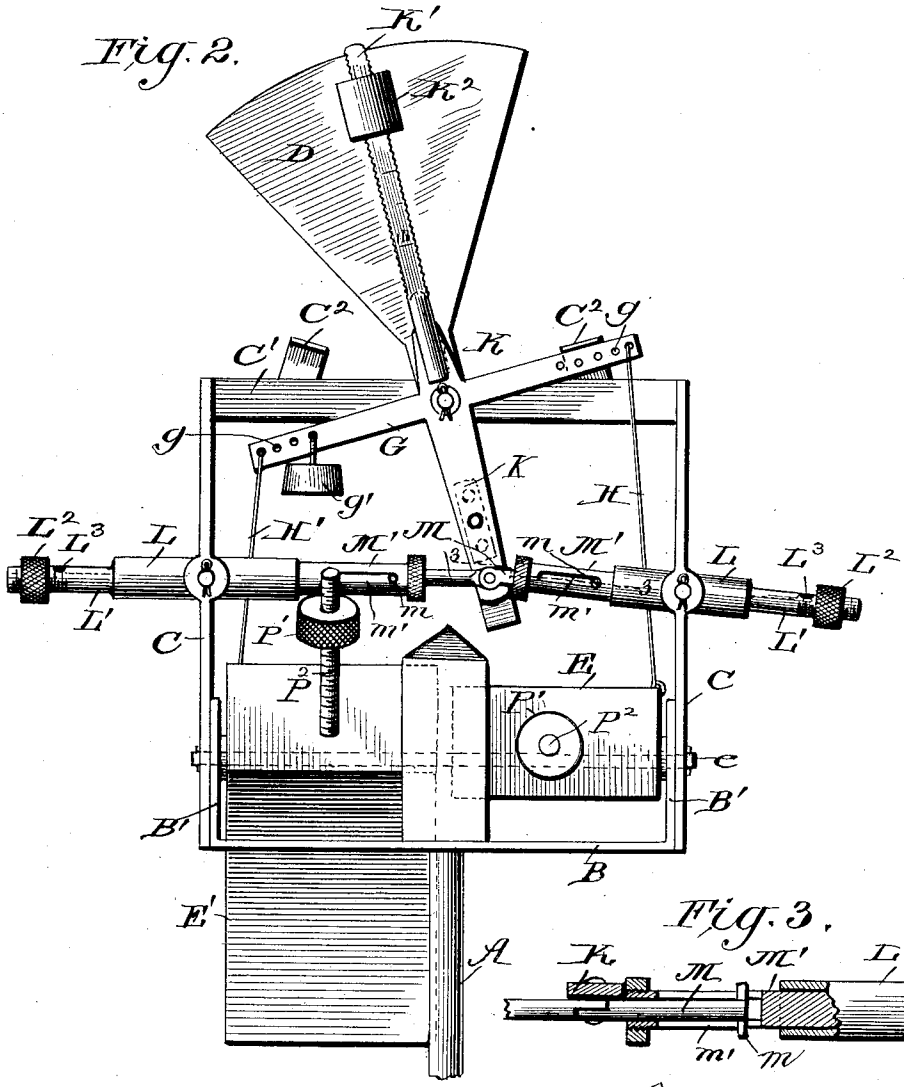
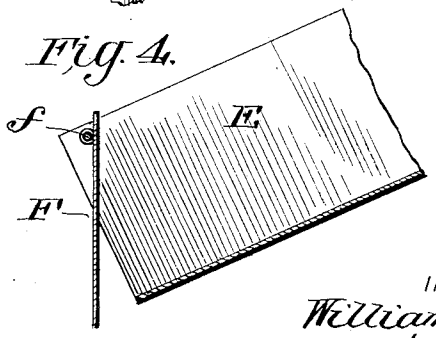


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM BROUGH, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF TO ARTHUR L. HORNER, OF BALTIMORE, MARYLAND.

AUTOMATIC WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 749,022, dated January 5, 1904.

Application filed August 4, 1902. Serial No. 118,254. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BROUGH, a citizen of the United States, residing in Baltimore, in the State of Maryland, have made certain new and useful Improvements in Automatic Weighing-Machines, of which the following is a specification.

My invention is an improvement in automatic weighing-machines, and is especially designed for use in weighing granular or pulverulent or powdered substances and may be employed to advantage in the weighing of coffee, sugar, tea, or the like; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of a machine embodying my invention. Fig. 2 is a rear elevation of the upper portion of the machine. Fig. 3 is a detail section on about line 3 3 of Fig. 2, and Fig. 4 is a detail sectional view of the dumping end of one of the scale-pans.

In carrying out my invention I employ a suitable framing comprising a standard A, supporting at its upper end a cross-bar B, having at its ends uprights B′, to which are secured the lower ends of inclined standards C, whose upper ends are connected by the cross-bar C′, as shown in Figs. 1 and 2 of the drawings. This cross-bar C′ is provided on opposite sides of its center with the rearwardly-projecting lugs C^2, which form stops for the main beam as the latter rocks in the operation of the device, as presently described.

To the main frame and preferably in connection with the cross-bar C′, I pivot the rocking hopper D at a point above its lower or discharge end, so its said end may rock laterally to discharge into one or the other of the so-called "scale-pans" presently described. These scale-pans E and E′ are pivoted at one end concentrically at *e*, preferably on a rod extending through the said pans near one end thereof and supported in the uprights B′ of the cross-bar B, so the said pans will lie between the said uprights and will operate side by side in the use of the machine. The scale-pans rise and fall at their ends opposite the pivot *e* and are provided at such ends with the gravity-gates F, which are pivoted at their upper ends at *f* to their respective scale-pans, so their lower ends may swing out by gravity when the pans drop to the position occupied by the pan E′ in Fig. 1 and permit the free discharge of the contents and will when the pans are in the position occupied by the pan E in Fig. 1 close the outer ends of the scale-pans, as shown.

The rocking hopper D is connected on opposite sides of its pivot with the pans E and E′, preferably by means of a main beam G, secured between its ends in connection with the hopper D and having its opposite arms connected by rods or links H and H′, respectively, with the pans E and E′, so the movements of the pans down and up as they are filled and emptied will operate to positively move the rocking hopper to cause it to first discharge into one pan until the latter moves down by the weight of its contents to dumping position and then be shifted to discharge into the other pan, as will be understood from Fig. 1, in which the pan E′ has been moved down to dump its contents and the hopper has been shifted so its discharge end will be over the pan E in position to discharge into such pan. It will be understood that in the operation of the invention the material may be fed in a steady stream to the hopper and the latter shift from side to side to discharge first into one pan and then into the other, the pans discharging alternately to suitable receptacles, as will be understood from Fig. 1.

A shed I in the form of a plate bent to taper at its crown *i*, with its opposite wings overlapping the pans E and E′ at their adjacent edges, is suitably secured to the main frame and is arranged below the discharge of the hopper to direct the material discharged from said hopper into one or the other of the pans during the shifting of the hopper, and so prevent any wasting of the material between the pans at such time. By preference this shed I is secured at its rear end to the main frame and extends thence forward with its front end free, as shown in Fig. 1.

The main beam G has its opposite arms stopped in their upper positions by the lugs C^2, and this main beam may have its arms

perforated at g to receive weights g' when it is desired to weigh different quantities of material at the same time. Thus if it is desired to weigh one pound of material in the pan E and a half-pound in the pan E' the weight g' may be arranged on the arm of lever G, to which the pan E' is connected, as shown in Fig. 1, and be of proper weight or suitably adjusted along said arm to secure the desired weighing of the respective quantities by the pans E and E'. This also may be secured by a proper adjustment of a weight J on a rod J', extended alongside the body of the hopper; but this weight J is usually employed to adjust for slight variations in the weights of the scale-pans and in order to properly balance the scales.

In order to adjust the scale to weigh different amounts, I provide in connection with the hopper a rod K', extending upwardly above the pivot of the hopper and having upon it an adjustable weight K^2, which may be set up or down, according to the weight of the material to be discharged by the scale-pans, it being understood that the greater the amount to be weighed the higher the adjustment of the weight K' on its rod. In the operation of the described construction it will be noticed that the scale-pans and their contents operate to positively shift the rocking hopper so it will discharge to one pan, and then, after the desired quantity has been delivered to such pan, to the other pan, the hopper rocking to shift its discharge to position to deliver to first one pan and then to the other, as will be understood from the preceding description.

The dropping of the pans and the rocking of the hopper from side to side may produce an objectionable jar, and to avoid this I provide a cushion to receive and counteract the jar or shock, and this cushion is preferably a pneumatic one applied to the rocking hopper, preferably by means of an arm K, depending from the main beam and connected at its lower end with the air-cushion, as shown in Figs. 1 and 2. I also prefer to so connect the air-cushion with the rocking hopper that the cushion does not operate on the initial movement of the hopper, but is brought into play as the hopper passes its central position in one or the other direction. This is important, as it avoids any interference with the weighing operation, which might tend to produce inaccuracy in results, and only brings the cushioning into action as the hopper passes its central position and thence toward the end of the stroke, when the momentum of the descending scale-pan is sufficient to secure the full extent of movement of the rocking hopper against the resistance of the cushion.

As shown, I employ two air-cylinders L, secured to the standards C. The cylinders L are provided at their outer ends with tubular extensions L', threaded to receive nuts L^2, which may be adjusted over the vent L^3 to regulate the discharge of air from the cylinder as the piston moves outward. The piston-rod projects from the inner end of the cylinder L and is connected with the depending arm K and is preferably made in sections M and M', which have a limited sliding movement upon each other, secured in the present instance by telescoping the section M in the section M' and by slotting the section M' longitudinally at m' to receive a pin m on the section M. By this construction, as will be understood from Figs. 1 and 2, the rod M may slide upon the section M' during the initial movement of the hopper, but will positively engage with section M' and operate to move the piston in the air-cylinder as the rocking hopper approaches the end of its movement.

A vertically-adjustable platform N is arranged to support the bags or cartons O to be filled, funnels P being suitably supported in connection with the standard A to receive the material discharged by the pans E and E' and deliver the same to the bags. The funnels are also adjustable, and they and the support for the bags O may be moved to any desired position up or down to adapt the machine for larger or smaller bags.

By preference I provide the scale-pans E and E' with rods P^2, projecting rearwardly from them and threaded to receive the weights P', so the latter can be readily adjusted along their rods. These weights, it will be understood, may be utilized in regulating the amount of material necessary to dump the pans, and by adjusting them variably they may aid in the weighing of different amounts of material in the different pans.

While the hopper is shown as having its upper end flared for convenience in delivering material thereto, it will be understood that this form of hopper may be varied without departing from some of the principles of my invention.

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

1. An automatic weighing-machine substantially as herein described comprising a suitable framing, a pair of pivoted scale-pans provided at their discharge ends with gravity-gates, a rocking hopper having its discharge end movable to discharge alternately into the different pans, connections between the pans and the rocking hopper whereby the pans may positively adjust the hopper to its different positions, a shed below the hopper and overlapping the adjacent edges of the pans whereby to prevent waste of material as the hopper is shifted from one position to the other, and air-cushioning devices having a sliding connection with the rocking hopper whereby the hopper may move independently of the air-cushion during its initial movement and the air-cushion will be brought into play subsequently.

2. The combination with the dumping scale-pans arranged side by side and pivoted at one

end and discharging at their other ends, and a hopper which discharges alternately into said pans, of a shed below the hopper and overlapping the adjacent edges of the pans whereby to prevent loss of material between the pans in the shifting of the devices.

3. An automatic weighing-scale comprising the scale-pans pivoted at one end and dropping at their other ends, the rocking hopper arranged to discharge alternately into said pans, and connections between the pans and the hopper whereby the pans may positively operate the hopper substantially as set forth.

4. The combination with the pivoted hoppers arranged side by side and pivoted at one end and having a main beam extending on opposite sides of the pivot, of the scale-pans, and connections between the scale-pans and the main beam whereby the movements of the pans may positively operate the rocking hopper substantially as set forth.

5. The combination of the rocking hopper, the scale-pans arranged side by side, pivoted at one end, and discharging at their opposite ends, connections between the scale-pans and the hopper whereby the movements of the pans may positively operate the hopper, and the shed arranged below the hopper and between the same and the pans and having portions overlapping the adjacent edges of the pans whereby to avoid loss of material as the hopper shifts from one position to the other substantially as set forth.

6. The combination in an automatic weighing-machine of the pivoted scale-pans arranged to dump at one end, the rocking hopper discharging alternately to said pans, connections between the pans and the hopper, an air-cylinder and the piston-rod thereof connected with the hopper and made in sections having a limited sliding movement upon each other substantially as set forth.

7. The combination with the hopper of an air-cushioning device connected therewith and having a piston-rod made in sections having a limited sliding movement along each other substantially as set forth.

8. The combination with the hopper and a yielding cushion therefor, of a connection between the hopper and cushion and composed of rod-sections in alinement with each other and having a limited sliding movement whereby to cushion the movement of the hopper toward the end of its movement without retarding the initial movement of the hopper substantially as set forth.

9. The combination with the hopper and the main beam connected therewith and having the opposite outwardly-extending arms and the depending arm, of the scale-pans connected with the outwardly-extending arms whereby to positively operate the hopper, and the cushioning devices connected with the depending arm substantially as set forth.

10. The combination of a pair of dumping scale-pans arranged side by side, pivoted at one end and discharging at their opposite ends and gravity-operating gates at the opposite or discharge ends of the said pans substantially as set forth.

11. The combination in a weighing-machine, of the dumping scale-pans arranged side by side, and pivoted at one end and arranged to swing vertically at their opposite or discharge ends, the rocking hopper discharging to said scale-pans, and connections between the rocking hopper and the pivoted scale-pans, whereby the latter may positively operate the rocking hopper, substantially as set forth.

12. A machine substantially as described comprising a pair of dumping scale-pans arranged side by side, pivoted at one end, and provided at their opposite or discharge ends with gravity-operating gates, and an adjustable hopper movable whereby it may discharge alternately to said pans and connections between the pans and the hopper whereby the movements of the pans may automatically move the hopper substantially as set forth.

13. The combination with the frame having the stops C^2 of the hopper pivoted to the frame between said stops and provided with a main beam arranged to engage said stops, the dumping scale-pans and connections between said pans and the main beam substantially as set forth.

14. The combination in a weighing-machine, of the two scale-pans arranged side by side and pivoted at one end whereby their opposite ends may rise and fall vertically, the movable ends of the pans being adjacent to each other, the hopper discharging alternately to the said pans, and connections between the pans and the hopper, substantially as set forth.

15. The combination with the pans and the hopper of the cylinders arranged on opposite sides of the hopper and the rods between the cylinders and the hopper and including sections having a limited sliding movement whereby to cushion the jar of the hopper without retarding the initial movement thereof.

WILLIAM BROUGH.

Witnesses:
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PERRY B. TURPIN.