



F. F. MEYER.  
WEIGHING MACHINE.

(Application filed June 16, 1899.)

(No Model.)

2 Sheets—Sheet 2.

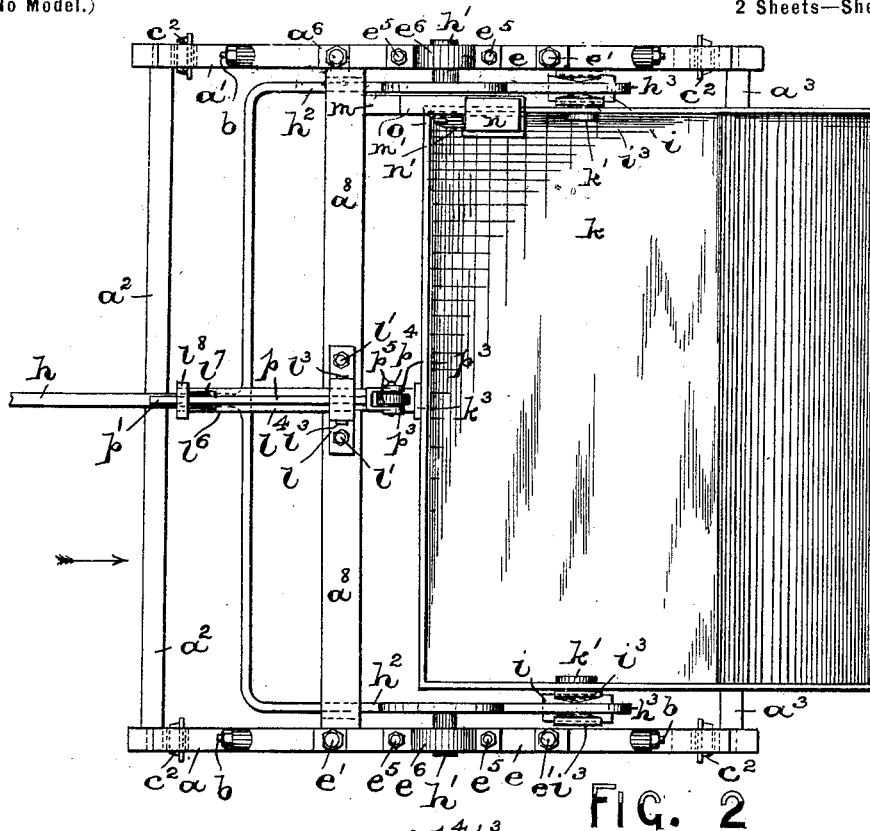


FIG. 2

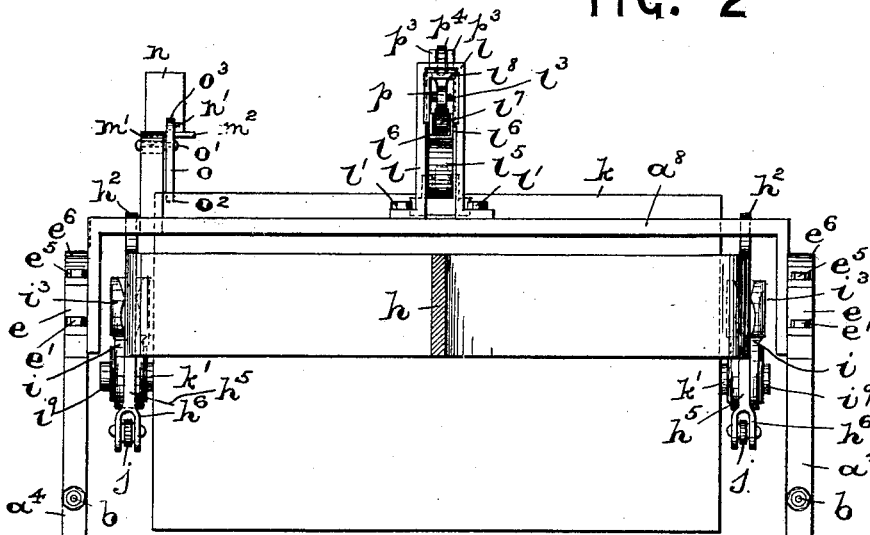


FIG. 3

WITNESSES:

*Walter H. Falmagne*  
*Mary J. Orsdell*

INVENTOR:

FREDERICK F. MEYER.

BY

*Fred C. Fraentzel*  
ATTORNEY

# UNITED STATES PATENT OFFICE.

FREDERICK F. MEYER, OF NEWARK, NEW JERSEY.

## WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 645,625, dated March 20, 1900.

Application filed June 16, 1899. Serial No. 720,742. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK F. MEYER, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Weighing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention has reference to improvements in weighing-machines; and the invention relates more particularly to that class of scales for automatically weighing various articles—such as coal, grain, sand, stone, or other substances—the general arrangement of the mechanism being such that after a bucket which is pivotally attached to one end of the weighing-beam is filled to the necessary extent the same will of its own weight become tilted and deposit the weighed goods into the body of a wagon, railway-car, or other vehicle, at the same time the mechanism connected with the weighing-machine being so arranged that the delivery-pocket is automatically closed to shut off the supply of goods into the weighing-bucket, and when the latter is emptied of its contents it will again cause the mechanism to open up the delivery-opening of the pocket to once more fill up the weighing-bucket.

My present invention therefore has for its primary object to provide a novel construction of automatic weighing machine or scale, the general arrangement of the mechanism being such that a simple and effective device for the purposes stated will be the result.

The invention therefore consists generally in the novel construction of automatic weighing-scale hereinafter set forth, and, furthermore, my present invention consists in such novel arrangements and combinations of the operating mechanism and the details of the construction thereof, all of which will be fully described in the accompanying specification and finally embodied in the clauses of the claim.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my novel construction of weighing-scale and a portion of the goods-delivery pocket, part of which is represented in section, and one arrangement of intermediately-placed operating mechanism, all made according to principles of my present invention. Fig. 2 is a top or plan view of the weighing-machine illustrated in said Fig. 1, except that the scale-beam is broken away; and Fig. 3 is an end view of the parts represented in said Fig. 2 when looking in the direction of the arrow in said figure. Fig. 4 is an end view of the hangers connected with the scale-beam and the weighing-bucket; and Fig. 5 is a vertical section of one of said hangers and a portion of one of the journals of the said bucket and a ball-bearing connected with said hanger, in which the end of the said journal is operatively arranged.

Similar letters of reference are employed in all of the said above-described views to indicate corresponding parts.

Referring to the said drawings, A represents a suitable frame consisting, essentially, of the lower frame-pieces  $a$  and  $a'$  and the connecting cross-pieces  $a^2$  and  $a^3$ , as indicated in Figs. 1 and 2 of the drawings. The said frame-pieces  $a$  and  $a'$  are each provided with the upwardly-extending stringer-pieces  $a^4$  and  $a^5$ , which are connected at the top by means of a horizontal bar or piece  $a^6$ . Braces  $a^7$  may be employed between the parts  $a$  and  $a'$  and  $a^4$  and  $a^5$ , and said stringer-pieces may be stiffened by means of a suitable arrangement of tie rods or bolts, as  $b$ . Of course it will be understood that this special construction of supporting-frame is not absolutely essential and that I may use any other desirable construction of frame in which the weighing mechanism of the machine can be supported.

When the frame A is employed, the pieces  $a$  and  $a'$  are preferably provided with suitably-constructed bearings  $c$  and pins  $c'$ , upon which I have rotatably arranged certain wheels or rollers  $c^2$ , preferably provided with flanges, so that the device can be run on tracks and can be shoved in a lateral direc-

tion beneath the several discharge-openings of the various pockets D, as will be clearly evident. Upon each side of said cross bars or pieces  $a^6$  hereinabove mentioned I have secured, by means of bolts  $e^2$  or in any other suitable manner, the brackets  $e$  and  $e'$ , (see the several figures of the drawings,) each bracket being preferably cut away, as at  $e^3$ , and provided with a shoe  $f$ , preferably made of tempered steel. Each shoe is also cut away, as at  $f'$ , to form supporting-points for the knife-edges  $h'$ , secured in the two arm portions  $h^2$  of a yoke formed at the one end of a scale-beam  $h$ , said beam  $h$  having movably arranged thereon at its other end a poise  $g$ , substantially as illustrated in Fig. 1. Said poise is preferably provided with a set-screw  $g'$  or other fastening means for fixing said poise in the proper positions upon the scale-beam during the process of weighing. Secured in position upon the brackets  $e$  and  $e'$  by means of bolts or screws  $e^5$  or in any other convenient manner are suitably-constructed guards or bands  $e^6$ , which help to retain the said fulcrumal supports or knife-edges  $h'$  in their proper and operative positions upon the shoes  $f$  and prevent displacement and inoperativeness of the several parts owing to the constant jarring caused by the filling and emptying of the weighing-bucket  $k$ . The said bucket is pivotally and operatively connected with the free ends  $h^3$  of the two arms  $h^2$  by means of the bearings or hangers  $i$ , the construction of which is more clearly illustrated in Figs. 4 and 5.

Each hanger or bearing is provided with the main body portion  $i'$ , which is provided at its lower surface with one or two perforated ears or lugs  $i^2$  and at its upper portions has a pair of upwardly-extending lugs or ears  $i^3$ , which are provided with suitably-formed openings  $i^4$ , in the upper parts of which may be secured a shoe  $i^5$ , as indicated in Fig. 1. Said supports or bearings are operatively suspended upon suitably-arranged fulcrumal supports or knife-edges  $h^4$  at or near the free ends of the arms  $h^2$  by having the ears or lugs  $i^3$  arranged on opposite sides of the said arm portions of the scale-beam, with the knife-edges of the fulcrumal supports  $h^4$  operatively arranged upon the hereinabove-mentioned shoes  $i^5$ .

On each side of the bucket  $k$  I have arranged in the desired positions certain journals  $k'$ , which extend into an opening  $i^6$  in the main body portion of each hanger and are provided with annular shoulders, as  $k^2$ , for retaining certain antifriction balls or rollers  $i^7$  in their operative positions upon the rolling surface of the journals  $k'$  and against certain cup-shaped retaining-plates  $i^8$  and caps  $i^9$  to form a ball-bearing, and thereby reduce the friction between the several parts to a minimum. The said plates  $i^8$  and the caps  $i^9$  are secured against the sides of the main body portions of the said hangers in any of the well-known manners. In the said perforated ears

or lugs  $i^2$  of each hanger is a pin  $i^{10}$ , and from each arm portion  $h^2$  of the scale-beam  $h$  there depends a post  $h^5$ , which is provided with a bifurcated end  $h^6$  and has a supporting-pin  $h^7$  in said bifurcated end. Operatively connected with the said pins  $i^{10}$  of each hanger  $i$  and the pins  $h^7$  in the bifurcated ends of each post  $h^5$  is a connecting bar or link  $j$ , as will be clearly understood from an inspection of Fig. 1. The function of said posts  $h^5$  and the rods  $j$  is for the purpose of steadying the bucket while it is being filled and also during its tilting operation. It will be noticed that the connection by means of the rods  $j$  is made between the hangers  $i$  and the arm portions  $h^2$  of the scale-beam, which is essential to avoid any distortion of the hangers which would interfere with the weight of the matter in the bucket. It will be seen from an inspection of Fig. 1 that the downward motions of the scale-beam yoke, the bearings connected therewith, and the steadying-rods  $j$  are all performed at the same time without changing their relative positions to each other. By this arrangement the hangers  $i$  will at all times hang properly without producing a swinging motion of the same, no matter how the bucket may be tilted, which would cause friction and constant wear of the knife-bearings  $h^4$  and soon render the device inoperative, and during the weighing operation there will be no undue strain on the scale-beam and on the knife-edges which might be the cause of registering an incorrect weight.

The bucket  $k$  is provided at the upper edge of its back with a bracket  $k^3$ , the end of which is made with perforated ears  $k^4$ , in which there is a pin  $k^5$ , having a roller or wheel  $k^6$  operatively arranged thereon, as and for the purposes to be hereinafter set forth more in detail.

From an inspection of Figs. 1, 2, and 3 of the drawings it will be seen that I have secured to the sides of the frame A, hereinabove mentioned, a connecting-piece  $a^8$ , which is securely attached at its free ends to the said frame A in any well-known manner. Centrally disposed upon the upper surface of this connecting-piece  $a^8$ , so as to be in approximate alinement with the bracket  $k^3$ , is a bearing-bracket  $l$ , secured to said piece  $a^8$  by means of bolts or screws  $l'$  and being provided with a pair of supporting-pins  $l^2$  and  $l^3$ . At or near one end of said cross-piece  $a^8$  there is a bracket  $m$ , which is provided with an upwardly-extending arm portion  $m'$  and a shelf  $m^2$ , on which may be arranged an indicator or registering device  $n$ . Pivotaly arranged on a pin  $o'$ , connected with the said arm portion of said bracket  $m$  and having its lower end  $o^2$  normally in holding engagement with the inner edge of the back of the bucket  $k$ , is a pawl or dog  $o$ , which retains the bucket  $k$  in its proper position between the yoke portion of the scale-beam while being filled with the goods to be weighed. Connected with the upper end  $o^3$  of the said pawl or dog  $o$  is

a rod  $n'$ , which extends into the register  $n$  and actuates the registering mechanism thereof every time that the bucket  $k$  turns on the hangers  $i$  in the manner to be hereinafter

fully set forth.

Pivotally secured upon the lower supporting-pin  $l^2$  of the bracket  $l$  is an arm or lever  $l^4$ , having a weighted portion  $l^5$ , which is in constant engagement or operative contact with the surface of the wheel or roller  $l^6$ , the forwardly-extending portion or end  $l^6$  having a wheel or roller  $l^7$  rotatively connected therewith and its extreme free end being provided with a loop  $l^8$ , which forms a guide for the free end  $p'$  of a second arm or lever  $p$ , pivotally arranged on the upper supporting-pin  $l^3$ , connected with the bearing-bracket  $l$ . The opposite end  $p^2$  is preferably bent to extend in an upward direction, said end being provided with a pair of perforated ears or lugs  $p^3$ , in which there are a pin  $p^4$  and a roller or wheel  $p^5$ , which can be brought in an operative position beneath the gate  $d$ , connected with the pocket  $D$ , as clearly illustrated in Fig. 1 of the drawings. The free end of said arm  $p^4$  is also preferably counterweighted, as at  $p^6$ ; but said weight is not absolutely necessary, since said arm  $p$  is made long enough and is of such sufficient weight that in conjunction with the other parts of the mechanism the gate  $d$  will be tightly closed when the weighing-bucket  $k$  is tilted. The said pockets  $D$ , of which there may be any desirable number placed in a row, are of the usual construction, and each pocket has a discharge-opening or mouth  $d'$ . Pivotally secured between a pair of suitably-constructed brackets  $d^2$ , attached to the underside of each pocket  $D$ , is the gate  $d$ , which has a pair of the usual sides  $d^3$ , one of which sides may be provided with an eye  $d^4$ , as indicated in dotted outline, for the fastening of the hook end  $d^6$  of a fastening-rod  $d^5$  therein to hold the gate  $d$  closed against the mouth or discharge-opening of the pocket  $D$  when not delivering the goods in said pocket into the bucket of the weighing-machine, as will be clearly understood from an inspection of Fig. 1. Of course it will be evident that I may use in connection with each pocket  $D$  for the closing of the discharge-opening in the pocket any other suitable fastening means for retaining the said gate  $d$  in its closed position.

The operation of the weighing-machine for weighing coal, sand, or any other material is as follows: Suppose the several parts of the weighing machine to be in their normal positions. (Indicated in Fig. 1 of the drawings.) The machine is pushed beneath the pocket  $D$ , from which the goods to be weighed are to be taken, until the roller or wheel  $p^5$ , connected with the arm or lever  $p$ , is directly beneath the gate  $d$  of the pocket. The poise on the scale-beam having been properly fixed according to the weight desired for each filling of the bucket  $k$ , the gate  $d$  is now opened and caused to stand in the position indicated in

said Fig. 1. Immediately the goods to be weighed will pass from the pocket  $D$  into the bucket  $k$ , and as soon as the bucket is sufficiently filled to counterbalance the poise connected with the scale-beam the yoke portion of the beam will oscillate on its fulcrumal support  $h'$  and the two arm portions  $h^2$  will at once move in the direction of the arrow  $x$  in Fig. 1. At the same time the dog or pawl  $o$  will become released from its holding engagement with the inner surface of the back edge of the bucket  $k$ , and the said bucket being hung in such a manner between the hangers  $i$  that the load contained within said bucket will throw said bucket out of balance the bucket will immediately begin to turn in the ball-bearings connected with said hangers  $i$ , and the goods are at once deposited into the wagon, boat, or other vehicle placed beneath the said bucket  $k$ . As soon as the bucket  $k$  has thus been emptied of its contents it will immediately return to its initial position and the dog or pawl will again assume the position indicated in Fig. 1, at the same time, owing to the arrangement of the rod  $n'$ , connected with said pawl or dog, registering the fact that the bucket has made one turn on its journal-pins upon the registering device  $n$ . During the movement of said bucket  $k$  from its normal position (indicated in Fig. 1) to its tilted position in emptying its contents the weighted end of the lever  $l^4$  will cause a downward movement of its forwardly-extending portion or end  $l^6$ , and the wheel or roller  $l^7$ , connected therewith, will permit the long portion  $p'$  of the lever or arm  $p$  to move in a downward direction, thereby causing its roller or wheel  $p^5$  at the opposite end to close the gate  $d$ , connected with the mouth of the pocket  $D$ , to shut off the supply of goods from said pocket  $D$  into the bucket  $k$ . As soon as the bucket returns to its initial position (indicated in Fig. 1) these several parts will likewise assume their normally-inoperative position, and the gate  $d$  will again assume its open position to permit the passing of a fresh supply of goods into the bucket  $k$  to be automatically weighed and then discharged from said bucket.

From an inspection of Fig. 1 it will be seen that the mechanism of the weighing-machine is independent from the movable parts of the gates connected with the respective pockets  $D$ , and when one pocket  $D$  has been emptied of its contents the weighing-machine can be moved under the next pocket to receive the goods therefrom and weigh them out, and so on any number of pockets can be emptied of their contents and the goods received in the bucket to be automatically weighed.

The advantages of my invention are evident from the above description, and it will be seen that I have devised a simple and operative construction of weighing-machine.

I am fully aware that changes may be made in the several arrangements and combinations of parts without departing from the scope of

my present invention. Hence I do not limit my invention to the exact arrangements and combinations of the several parts as described in the specification and illustrated in the drawings, nor do I confine myself to the exact details of the construction thereof.

Having thus described my invention, what I claim is—

1. In a weighing-machine, the combination, with a scale-beam, having a yoke portion, and a frame in which said beam is fulcrumed, of knife-bearings extending from the sides of said yoke portion, hangers suspended from said knife-bearings, a receiving-bucket journaled in said hangers, means rigidly connected with said yoke portion and with said hangers to prevent swinging of the same on said knife-bearings, and means connected with said frame for retaining said bucket in its upright position when empty, but permitting said bucket to swing on its journals when sufficiently filled, substantially as and for the purposes set forth.

2. In a weighing-machine, the combination, with a scale-beam, having a yoke portion, and a frame in which said beam is fulcrumed, of knife-bearings extending from the sides of said yoke portion, hangers suspended from said knife-bearings, a receiving-bucket journaled in said hangers, means rigidly connected with said yoke portion and with said hangers to prevent swinging of the same on said knife-bearings, and a pawl or dog pivotally connected with said frame, said pawl having its lower end normally in sliding and holding engagement with the inner edge of said bucket, for retaining said bucket in its upright position when empty, but permitting said bucket to swing on its journals, when sufficiently filled, substantially as and for the purposes set forth.

3. In a weighing-machine, the combination, with a scale-beam, having a yoke portion, and a frame, of a pair of bearings in which said beam is fulcrumed, a pair of hangers pivotally connected with the arm portions of said yoke portion of said beam, a downwardly-extending post on each arm portion, perforated ears or lugs on said hangers, and connecting rods or links between said downwardly-extending posts and said lugs or ears, a receiving-bucket journaled in said hangers, and means connected with said frame for retaining said bucket in its upright position when empty, but permitting said bucket to swing on its journals when sufficiently filled, substantially as and for the purposes set forth.

4. The combination, with a hinged or pivoted gate of a goods-containing pocket, of an automatic weighing-machine, consisting, essentially, of a scale-beam, having a yoke portion, and a frame in which said beam is fulcrumed, a receiving-bucket journaled in said yoke portion of said beam, means connected with said frame, for retaining said bucket in its upright position when empty, but permitting said bucket to swing on its journals when

sufficiently filled, and mechanism connected with said frame, constructed and arranged to automatically close the gate of said goods-containing pocket when the bucket is tilted, consisting, essentially of a bracket connected with said bucket, a roller or wheel arranged in said bracket, and a system of levers or arms  $l^1$  and  $p$  pivoted on pins in a bearing-bracket connected with the frame in which the scale-beam is fulcrumed, and a roller or wheel on said arm or lever  $p$  arranged to actuate and close the said gate of the goods-containing pocket, substantially as and for the purposes set forth.

5. The combination, with a hinged or pivoted gate of a goods-containing pocket, of an automatic weighing-machine, consisting, essentially, of a scale-beam, having a yoke portion, and a frame, a pair of bearings on said frame, in which said beam is fulcrumed, a pair of hangers pivotally connected with the arm portions of said yoke portion of said beam, a receiving-bucket journaled in said hangers, means connected with said frame, for retaining said bucket in its upright position when empty, but permitting said bucket to swing on its journals when sufficiently filled, and mechanism connected with said frame, constructed and arranged to automatically close the gate of said goods-containing pocket when the bucket is tilted, consisting, essentially, of a bracket connected with said bucket, a roller or wheel arranged in said bracket, and a system of levers or arms  $l^1$  and  $p$  pivoted on pins in a bearing-bracket connected with the frame in which the scale-beam is fulcrumed, and a roller or wheel on said arm or lever  $p$  arranged to actuate and close the said gate, substantially as and for the purposes set forth.

6. The combination, with a hinged or pivoted gate of a goods-containing pocket, of an automatic weighing-machine, consisting, essentially, of a scale-beam, having a yoke portion, and a frame, a pair of bearings on said frame, in which said beam is fulcrumed, knife-bearings extending from the sides of said yoke portion, a pair of hangers suspended from said knife-bearings, ball-bearings in each hanger, a receiving-bucket having journal-pins operatively arranged in said ball-bearings, a pawl or dog pivotally connected with said frame, said pawl or dog having its lower end normally in holding but sliding engagement with the inner edge of the back of said bucket for retaining said bucket in its upright position when empty, but permitting said bucket to swing on its journals when sufficiently filled, means rigidly connected with said yoke portion and with said hangers to prevent swinging of the same on said knife-bearings, and mechanism connected with said frame, constructed and arranged to automatically close the gate of said goods-containing pocket when the bucket is tilted, substantially as and for the purposes set forth.

7. The combination, with a hinged or pivoted gate of a goods-containing pocket, of an

automatic weighing-machine, consisting, essentially, of a scale-beam, having a yoke portion, and a frame, a pair of bearings on said frame, in which said beam is fulcrumed, a  
5 pair of hangers pivotally connected with the arm portions of said yoke portion of said beam, ball-bearings in each hanger, a receiving-bucket having journal-pins operatively arranged in said ball-bearings, means connected  
o with said frame, for retaining said bucket in its upright position when empty, but permitting said bucket to swing on its journals when sufficiently filled, and mechanism connected with said frame, constructed and arranged to  
5 automatically close the gate of said goods-containing pocket when the bucket is tilted, con-

sisting, essentially, of a bracket connected with said bucket, a roller or wheel arranged in said bracket, and a system of levers or arms  
l<sup>4</sup> and *p* pivoted on pins in a bearing-bracket 20 connected with the frame in which the scale-beam is fulcrumed, and a roller or wheel on said arm or lever *p* arranged to actuate and close the said gate, substantially as and for the purposes set forth. 25

In testimony that I claim the invention set forth above I have hereunto set my hand this 12th day of June, 1899.

FREDERICK F. MEYER.

Witnesses;

E. C. MEYER,

FREDK. C. FRAENTZEL.