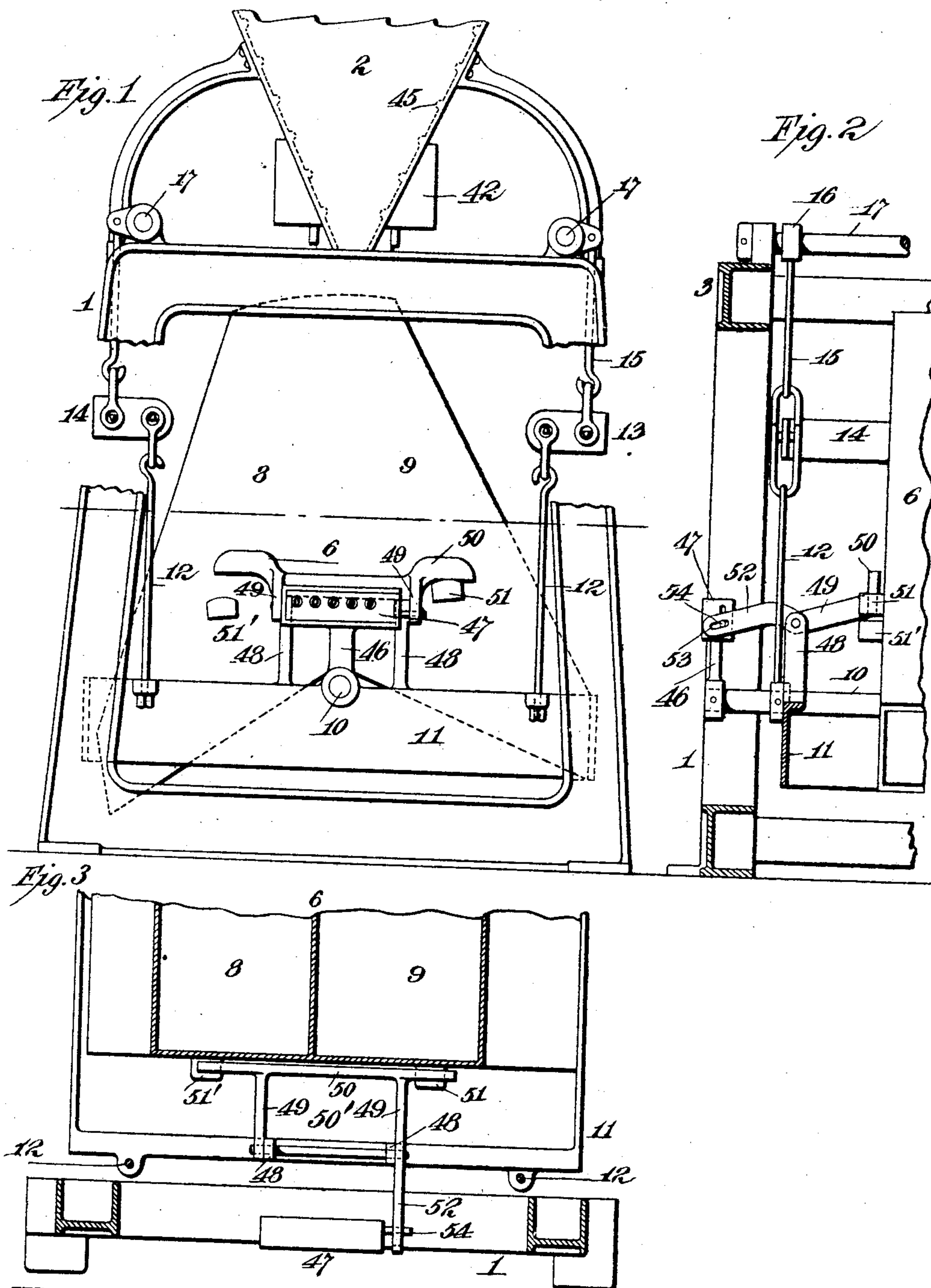


No. 864,290.

PATENTED AUG. 27, 1907.

E. CAMERON.  
WEIGHING MACHINE.  
APPLICATION FILED APR. 10, 1906.



Witnesses:

James F. Coleman  
John F. Fitch.

Inventor

Ewan Cameron  
By Dyer & Dyer

Attorneys.



# UNITED STATES PATENT OFFICE

EWAN CAMERON, OF NEW YORK, N. Y., ASSIGNOR TO UNITED STATES RECORDING AUTOMATIC SCALES COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## WEIGHING-MACHINE.

No. 864,290.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed April 10, 1906. Serial No. 310,922.

*To all whom it may concern:*

Be it known that I, EWAN CAMERON, a citizen of the United States, and a resident of Brooklyn, New York city, have invented certain new and useful Improvements in Weighing-Machines, of which the following is a description.

This invention relates to improvements in machines for weighing material in bulk of the general type disclosed in my Patent No. 697,196, dated April 8th, 1902, and also in my co-pending applications for patents, No. 230,003, filed October 26th, 1904, and No. 276,848, filed September 2nd, 1905.

The present invention has for one of its objects an improvement in the mechanism for actuating the register.

The invention also has for an object the improvement in the hopper by means of which the wear on the walls thereof will be greatly reduced, and the life of the structure prolonged, and particularly when used in connection with materials which have an abrasive action upon metal of which the walls of the hopper are best constructed.

I attain these objects by the mechanism illustrated in the accompanying drawings, which show one way of carrying out my invention, and in which

Figure 1 is an end view of a weighing machine having a frame of the general type shown in my application No. 276,848. Fig. 2 is a side view of the registering mechanism, and Fig. 3 a plan view of the same.

In all the views, like parts are designated by the same reference characters.

In carrying out my invention, I provide a weighing machine which may be of any type desired, but preferably of the type shown in my patent, and two applications before referred to. This weighing machine is preferably formed with a frame such as 1, which may be similar to that illustrated in my co-pending application No. 276,848. This frame carries a hopper 2, which receives the material which is to be weighed. The receptacle 6 is divided into two compartments 8 and 9, by means of a vertical partition, and these compartments have outlets at the bottom, which may be alternately covered and uncovered by the sub-frame 11. The receptacle is supported upon a shaft 10, which is carried by the sub-frame 11, and it is so mounted that it can oscillate upon the shaft 10 as the compartments 8 and 9 are alternately filled, one compartment being closed by the opening in its bottom engaging with the sub-frame 11, and the other compartment opened by its open bottom being withdrawn from contact with the frame 11. The compartments are alternately filled by the material which discharges from the hopper 2, the separating edges of the partition between the two compartments being so arranged that the more elevated of the two compartments will receive the entire stream of

material which is being discharged from the hopper. The sub-frame 11 is hung from rods 12 and supplemental frames 13—14. These latter hang from rods 15, which are connected to short levers 16 which in turn are carried by shafts 17, such shafts 17 being mounted upon the cross pieces 3 of the frame 1. These shafts 17—17 carry levers which are connected together by a spring (not shown) and by means of which the receptacle 6 is supported.

Means is provided for preventing the oscillation of the receptacle 6 upon the shaft 10 until a predetermined weight of material has entered one of the compartments 8 or 9. This means forms no portion of the present invention, but it may be such as is illustrated in either of my co-pending applications 230,003 or 276,848.

In the drawings, (Fig. 1) 42 represents the weight of the deciding lever, which is connected to the latch. It is to be understood that any form of mechanism may be used for permitting the oscillation of the receptacle 6 when a predetermined weight of material has entered one of the compartments. The parts are so arranged, however, that as one of the compartments is being filled, the weight of the material therein will cause the entire receptacle together with the shaft 10 and subframe 11 to descend, until the latch is tripped and the receptacle permitted to oscillate upon the shaft 10.

The recording mechanism is as follows: The recorder 47, which may be of any form desired (that shown being of horizontal form and capable of registering up to 99,999) is carried upon a vertical support 46, which is connected to the shaft 10, outside the subframe 11.

It is to be understood that any form of recording apparatus may be employed, that illustrated in the drawings being solely for the purpose of illustrating the principles of the invention.

The registering mechanism is carried upon the sub-frame 11, so that it will descend as the receptacle is filled and descends. The receptacle and the registering mechanism descending together, the connecting mechanism between the two will also descend; therefore there will not be friction present which would be the case if the registering mechanism did not descend as the receptacle is filled. It is, therefore, not necessary to take into consideration any friction between the two parts, as there is no actual movement between the registering mechanism and the receptacle except the necessary movement to actuate the registering mechanism in order to register the weighing operations. This recorder is provided with an actuating finger 54 which projects from one side of the casing of the recorder.

The form of the recorder is such that its mechanism will be actuated, and one number counted, upon the



finger 54 being first elevated and then depressed. This finger is actuated by means of a frame 50', which comprises a cross-piece 50 and arms 49—49. This frame 50' actuates a lever 52. The arms 49—49 are  
 5 pivoted to the vertical standards 48, which in turn are carried by the subframe 11. The supports 48—48 are shown as carrying the arms 49—49, by means of a horizontal bearing. This insures the support of the cross-piece 50 in a position always parallel to that  
 10 member of the subframe 11 which carries the supports 48. The lever 52, which preferably is a continuation of one of the arms 49, is provided with a slot 53 within which the finger 54 engages. This is for the purpose of permitting the lever 52 to elevate and depress the  
 15 finger without the latter binding within the opening in the lever. The extremities of the cross-piece 50, where they extend beyond the arms 49—49, are elevated as shown in Fig. 1. These elevated extremities are adapted to be alternately engaged by lugs  
 20 51—51', which are carried by the receptacle 6. These lugs 51—51' are each located upon the same horizontal plane, measured when the receptacle 6 is perfectly upright. As the receptacle normally rests at an angle as shown in Fig. 1, the lugs are so located that the  
 25 higher one of the two will engage with one extremity of the cross-piece 50, and hold it at the highest point of elevation.

The frame 50' is sufficiently heavy to entirely counterbalance the lever 52 and actuate the counting mechanism when permitted to do so, by having its support  
 30 (one of the lugs 51—51') withdrawn. One very good way of making the frame 50' is to form it of cast iron with the cross-piece 50, arms 49—49, and lever 52 integral. By this means a very rigid structure is produced which will not be distorted, and movement im-  
 35 parted to one extremity or the other of the cross-piece 50 will result in an accurate movement of the slotted end of the lever 52. The frame, however, may be made of wrought iron in a single piece, or of a plurality  
 40 of pieces joined together. The operation of this part of the invention is as follows: Upon one of the compartments in the receptacle, (for instance the compartment 9) being filled, such compartment will be in an elevated position above the other. When the requi-  
 45 site weight of material has entered the compartment, and the latch is released, the receptacle will be overbalanced and as the compartment 9 is full, and the compartment 8 is empty, it will quickly turn upon the shaft 10, so that the compartment 9 will occupy the  
 50 position assumed by the compartment 8 in the drawing. This movement will lower the lug 51, and with it the cross-piece 50, elevating the lever 52, and finger 54. When the receptacle is at a perfectly horizontal po-  
 55 sition, with both lugs 51 and 51' upon the same horizontal plane, both lugs will engage with the frame 50'. At this point, the finger 54 will have been elevated to the highest position necessary to actuate the counting mechanism. Upon the continued movement of the  
 60 receptacle upon the shaft 10, the lug 51 will continue to descend, but the cross-piece 50 at this time resting also upon the lug 51', the cross-piece 50 will not descend any further, but on the contrary, will begin to be elevated by the upward movement of the lug 51'. This will cause a depression of the lever 52, and with  
 65 it a lowering of the finger 54, which will complete the

movement of the counting mechanism and add one to the number already counted. The stream of material from the hopper 2 will then fall into the receptacle 8, which upon being filled, will release the latch and permit the receptacle to oscillate in the opposite di-  
 70 rection. As the location of the lugs 51—51' is symmetrical on both sides of the center line of the receptacle and the cross-piece 50 is horizontal, it naturally follows that upon a reverse movement of the receptacle the cross-piece 50 will be first lowered, and then raised,  
 75 resulting in the raising and lowering of the finger 54 with each oscillation of the receptacle. It will be seen that the vertical movement of the frame 50' is equal to one-half of the distance between horizontal planes of the two lugs, when the receptacle is in an inclined  
 80 position, or is equal to the distance between the higher lug, when the receptacle is in an inclined position, and a horizontal line drawn through the two lugs when the receptacle is exactly vertical. This movement, there-  
 85 fore, of the frame 50' should be sufficient to actuate the finger 54, first elevating it and then depressing it. It is better, however, to make this movement considerably more than is necessary to properly actuate the finger 54. This is for the purpose of always insuring  
 90 the proper movement of the finger 54.

It is to be understood that the oscillatory movement of the receptacle is extremely rapid, and the movement of the frame 50' is merely caused by the overbalancing of the lever 52 and counting mechanism by  
 95 the weight of the frame 50'. It is therefore desirable to allow for a sufficient movement of the frame 50' in a downward direction so that when the ascending lug 51 or 51' engages with the frame 50' and begins to lift it, the finger 54 will have been elevated to the ex-  
 100 treme point desired to actuate the counting mechanism. This counting mechanism is very simple, and utilizes a form of register which is found to be eminently satisfactory for the purpose. It transforms the semi-rotary movement of the receptacle into the rec-  
 105 tilinear motion required for the finger 54, and permits the latter to be given the requisite up and down movements necessary to actuate the counting mechanism.

The second part of the invention relates to means for reducing wear caused by the abrasion of material entering and passing through the hopper 2. This hop-  
 110 per is preferably made of cast iron for cheapness and strength, but with certain materials, such, for instance, as copper pyrites, and other ores, the abrasion upon the walls of the receptacle is enormous, and soon re-  
 115 sults in the entire destruction of the hopper. In order to reduce this wear, and if possible to entirely eliminate it, I provide means for interposing a lining of the material which is being weighed between the moving mass of material and the walls of the hopper. This  
 120 lining may be attained in various ways, but the way I prefer is to provide the walls of the hopper with a series of horizontal ribs 45 which may be placed the requisite distance apart. These ribs serve as a means  
 125 for supporting a layer of the material which constitutes a lining for the walls of the hopper. The spaces between the ribs constitute pockets within which a sufficient quantity of the material will lie, so as to constitute a sufficient lining for the walls of the hopper. The size, location and number of these ribs will be  
 130 determined in accordance with the size of the hopper,



the angle of the walls thereof and the kind of material which is being used. In use, upon the material being introduced into the hopper, it will form in a layer between each of the ribs 45, and thoroughly cover the walls of the hopper with a lining of sufficient thickness to prevent contact of the walls with the moving material. This arrangement results in a great practical saving and makes it possible to weigh materials in bulk, which otherwise could not be profitably handled.

It is to be understood that the invention can be applied to any form of weighing machine which is adapted to handle materials in bulk, irrespective of the character of the material or amount which is being handled.

In accordance with the provisions of the patent statutes, I have described the principle of my invention, and the ways which I now consider to be the best for practicing the invention, but I desire it understood that such means are merely illustrative and the invention may be carried out by means other than those shown.

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

1. In a weighing machine, the combination of a receptacle, means for supporting the receptacle to permit it to oscillate, a recorder carried by the same means as the receptacle and adapted to descend with the receptacle as a compartment is filled, the said recorder having an actuat-

ing finger which must be given two motions in order to actuate the mechanism, a lever engaging with the finger and actuated by the oscillation of the receptacle, and means for giving the lever a double motion with each oscillation of the receptacle.

2. In a weighing machine, the combination with a receptacle and a counting mechanism, lugs on the receptacle, a frame mounted in rigid bearings and adapted to engage with one or other of the lugs, and connections between the frame and the counting mechanism whereby upon the receptacle being oscillated the frame will first be lowered by engagement with one lug and then elevated by engagement with the other, and the actuating mechanism of the counting device given a double movement.

3. In a weighing machine, the combination with an oscillating receptacle carrying lugs thereon, of a frame having a cross piece adapted to engage with one or both of the lugs as depends upon the position of the receptacle, arms carrying the cross piece and engaging with bearings, a lever formed of a continuation of one of the arms and having a slot in one end, and a counting mechanism having an actuating finger that engages with the slot.

4. In a weighing machine, the combination of a receptacle, means for supporting the receptacle to permit it to oscillate, a recorder carried by the same means as the receptacle and adapted to descend but not to oscillate with the receptacle as a compartment is filled, and connections between the receptacle and the recorder for actuating the recorder as the receptacle is oscillated.

This specification signed and witnessed this seventh day of April, 1906.

EWAN CAMERON.

Witnesses:

AUG. LONG,

JNO. ROBT. TAYLOR.