(No Model.) 2 Sheets—Sheet 1.

F. H. RICHARDS.

AUTOMATIC WEIGHING MACHINE.

No. 548,849. Patented Oct. 29, 1895.

Fig. 1.

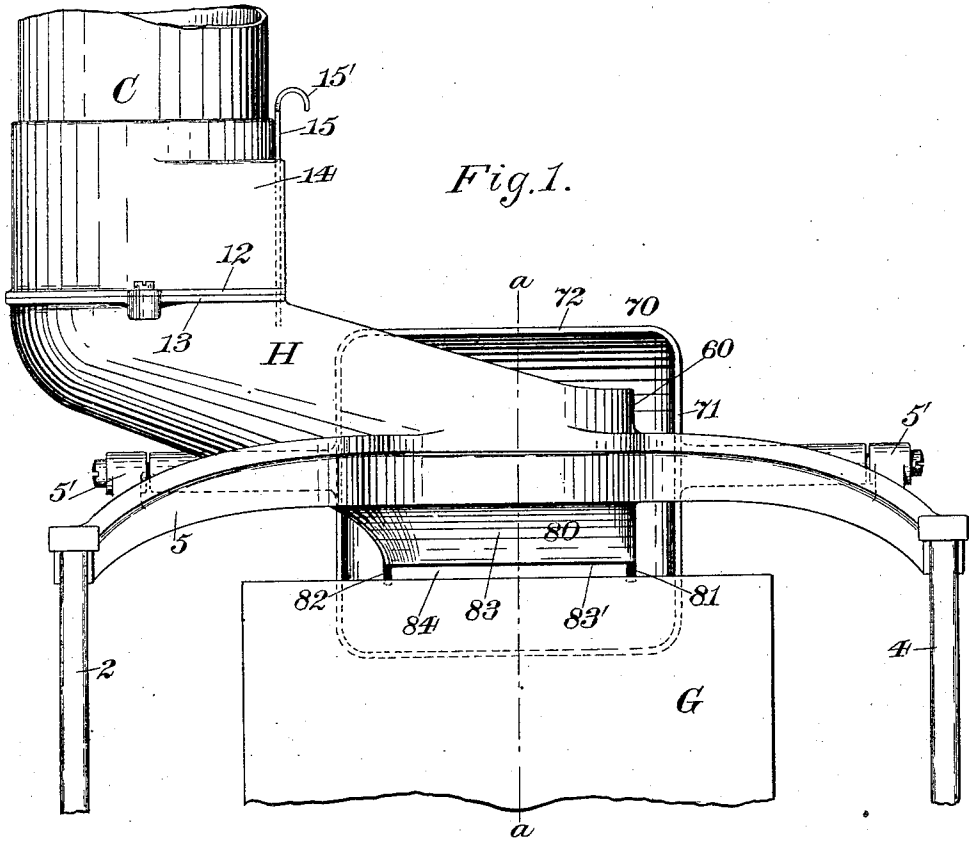
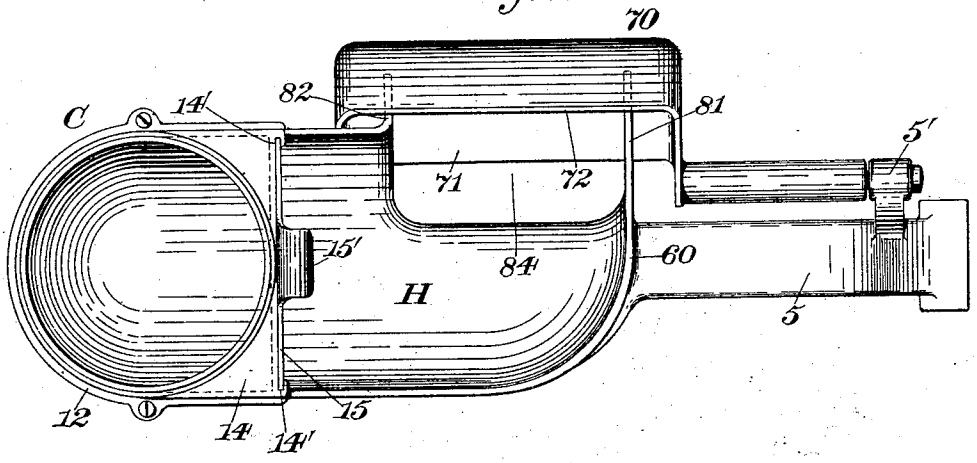


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

F. H. RICHARDS.

AUTOMATIC WEIGHING MACHINE.

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Fig. 5.

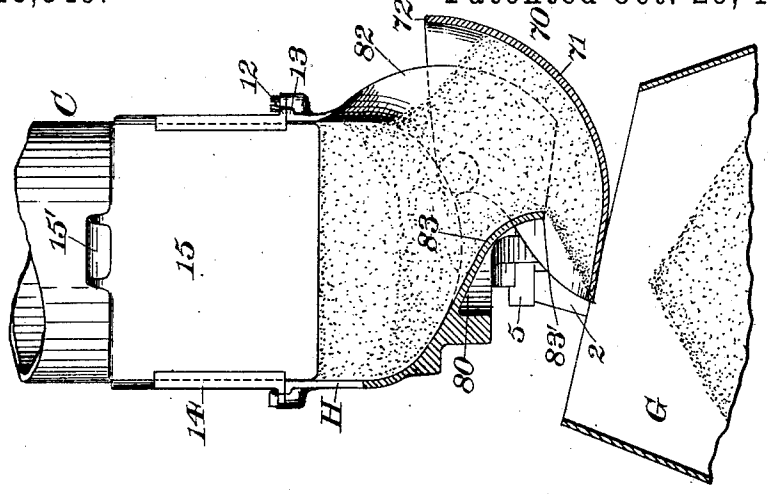


Fig. 4.

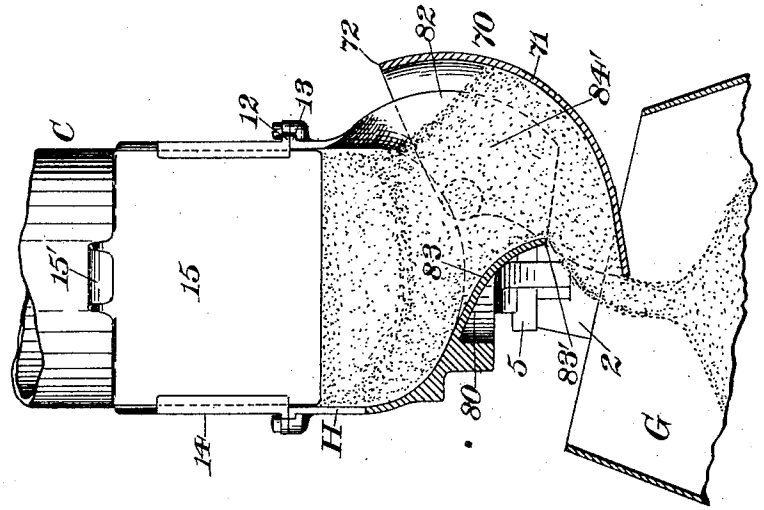
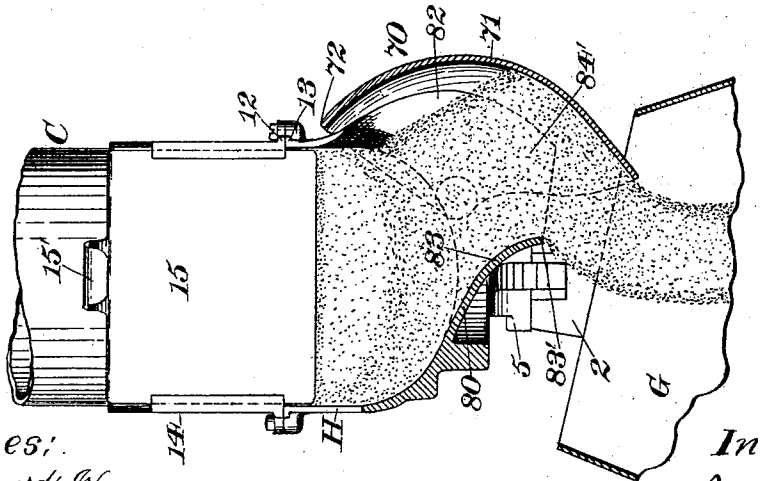


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

AUTOMATIC WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 548,849, dated October 29, 1895.

Application filed May 31, 1895. Serial No. 551,078. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Automatic Weighing-Machines, of which the following is a specification.

This invention relates to weighing-machines, the object being to provide an improved valve mechanism especially intended for use in connection with machines for weighing materials of a slow-running or bulky nature—such as breakfast-foods, rolled oats, and the like—for securing a continuous unbroken flow of the supply-stream to the bucket or other load-carrying receptacle of the machine, and for preventing blocking or clogging and wedging of lumps or large particles carried by the stream between the valve and the feed-spout.

This invention is in the nature of an improvement on the improved weighing-machine described and claimed in my application, Serial No. 542,799, filed March 22, 1895.

In the drawings accompanying and forming part of this specification, Figure 1 is a front elevation of the upper portions of a weighing-machine embodying my present improvements. Fig. 2 is a plan of the same. Figs. 3, 4, and 5 are end elevations as seen from the left in Fig. 1 and showing the peculiar action of the valve during its closing operation, portions of these figures being in section, which is taken in line *a a*, Fig. 1. Fig. 3 illustrates the valve in a position for permitting the flow of the full supply-stream. Fig. 4 shows the valve as having reduced the volume of the supply-stream, and Fig. 5 shows the valve as having entirely cut off the supply-stream.

Similar characters designate like parts in all the figures of the drawings.

For convenience in illustrating the nature and operation of the present improvements these are shown applied to the improved weighing-machine described and claimed in my concurrently-pending application, Serial No. 541,087, filed March 9, 1895. Said improvements, however, are readily applicable to other forms of weighing-machines.

The operative parts of a weighing-machine are usually carried by a framework comprising two side frames connected by a top plate or beam. The upper portions of these side frames are shown at 2 and 4 and the connecting top plate or beam at 5.

The top plate 5 is illustrated as carrying a transfer-chute H, the latter being preferably circular in cross-section and shown as inclined to better facilitate the free flow of the supply-stream from the supply-spout. The transfer-chute H is shown as terminating in a relatively-short vertically-disposed feed-spout 80. The transfer-chute H, the feed-spout 80, and the top plate 5, I prefer to cast integral, so that the present improvements may be readily applied to weighing-machines that cannot as now constructed successfully weigh materials of a slow-running or bulky nature.

The supply-spout, which is adapted for containing the mass of material to be weighed, is shown at C and as having formed at its lower end an annular flange 12, resting on and secured to a complementary annular flange 13, formed on the transfer-chute H and at the receiving or upper end thereof to thereby maintain these parts in fixed relation with each other and to secure a tight and waste-proof joint at the connecting-point.

By reason of the interposition of the transfer-chute between the supply-spout C and the feed-spout 80 (the valve controlling the stream as it issues from said feed-spout) the force of the descending stream is broken, so that it cannot thereby be projected directly on the valve, thereby minimizing the possibility of derangement of the valve and its supporting and actuating means.

The bucket G is of the "single-chambered" type or class and is shown suspended with its receiving mouth or end under the feed-spout 80 for the purpose of receiving the supply-stream from said feed-spout.

The feed-spout 80 is in the nature of a conduit and is shown in the preferred form thereof comprising three walls—two side walls 81 and 82 and a connecting front wall 83—the absence of the rear wall of said spout forming a relatively-large opening 84, approximately the width of the supply-stream and of a height to permit the unimpeded flow of said supply-stream through such opening, for a purpose to be hereinafter described, which

opening extends above the lower edge of the usual supply-stream opening of said feed-spout. It is obvious that a circular feed-spout may be substituted for that shown so long as the opening formed therein is of a width approximately equaling the width of the feed-spout, so that the supply-stream may flow freely and unimpeded through said opening.

The valve for the spout 80 is shown at 70 and is substantially similar in all material respects to the improved valve described and claimed in Letters Patent No. 535,727, granted to me March 12, 1895. Said valve is shown as pivoted for oscillatory movement within the arms or brackets 5′, depending from the top plate or beam 5, and is shown as having its axis passing through the supply-stream. Any suitable mechanism may be employed for actuating the valve. For example, that described and claimed in the Letters Patent first hereinbefore referred to may be used.

On reference to Fig. 5 it will be noticed that when the valve is closed it supports a bank of material and that this bank is unconfined and is formed in the feed-spout 80. It will be obvious that when the valve is opened for permitting a flow of the supply-stream to the bucket this bank of unconfined material will be agitated by the valve-opening movement, which agitation shakes and loosens said valve-supported and feed-spout-formed bank of material as well as the adjacent portions of the material lying or resting in the transfer-chute H, so that a free flow of the stream is positively assured.

On reference to Fig. 2 it will be observed that the feed-spout is shown located at one side of the longitudinal center or transversely of the transfer-chute H and as relatively remote from said transfer-chute, so that when the supply-stream strikes the wall 60 of the transfer-chute H it is thereby given a turn which causes a transverse or lateral flow of the supply-stream. By means of this transverse location of the feed-spout 80 relatively to the transfer-chute H the valve-supported and spout-formed bank of material extends well up into the supply-chute and is free of a packing-load, so that the mass of material lying or resting in the transfer-chute is given an agitation transversely of the normal flow of the supply-stream, thereby better insuring the breaking up and flow of the supply-stream by loosening the entire mass lying or resting in the transfer-chute H.

As hereinbefore stated, the feed-spout 80 is in the nature of a three-walled conduit. It will be apparent, then, that a space is left for the free unimpeded flow of the supply-stream, which opening should be, as hereinbefore stated, of a width approximating that of the supply-stream or the feed-spout 80. This opening or free space, in addition to performing an important function with respect to the formation of a valve-supported and spout-forming bank of material, prevents blocking or clogging of lumps or large particles between the valve and the walls of the feed-spout, a serious obstacle generally present in weighing-machines. On the closing of the valve to cut off the supply-stream the bulk of the valve-supported mass is shifted rearwardly away from the lower edge 83′ of the forward wall of the feed-spout and into the open space 84′. As a further preventive to blocking or clogging at the stream-controlling point, the valve-plate is shown at 71 of relatively deep or concave form, which concavity when the valve is closed (see Fig. 5) will be approximately in alignment with the rearward opening in the feed-spout and in which lumps or large particles will lie on the closure of the valve and which will be expelled therefrom on the valve-opening movement by the force of the descending stream.

On reference to Fig. 3, which shows the valve in a position for permitting the flow of the full supply-stream to the bucket, it will be seen that said valve stands substantially in a vertical plane, (its normal position,) and that said valve practically forms the rear wall of the feed-spout. This is important, as when the valve is in such position it permits a nearly straight obstructionless descent of the supply-stream to the bucket. When the stream is cut off, the valve movement is substantially with and follows the direction of flow of the supply-stream, thereby requiring but a minimum application of power to actuate the valve, while securing at the same time a perfect control of the supply-stream. The rear wall 72 of the valve should, when the valve is closed, extend sufficiently high to prevent overflow of the material.

The supply-spout C is shown as having an enlarged portion or flange 14, in which there is shown formed a guideway 14′ for the reception of a stream-regulator. A stream-regulator is shown at 15 in the nature of a sliding valve or plate carried by the supply-spout and as having a finger-piece 15′ by which said valve or plate may be readily raised or lowered for the purpose of regulating the supply-stream as this issues from the supply-spout C.

The present improvements have demonstrated in actual practice peculiar ability for securing an absolutely-perfect control of the supply-stream at all points of its flow and for preventing blocking or clogging of the materials of the most sluggish nature at the valve, the valve on its opening movement insuring a free flow of the stream, a feature much desired in weighing slow-running and bulky materials.

Having thus described my invention, I claim—

1. In a weighing-machine, the combination with a supply-spout adapted for containing a mass of material; of a transfer-chute adapted for receiving the material in a stream from said supply-spout; a feed-spout located relatively remote laterally from the supply-spout, and adapted for receiving the stream of ma-

terial from the transfer-chute, and having an opening formed in said feed-spout and having said opening of a height for permitting the unimpeded flow therethrough of the supply-stream; and a stream-controlling valve for said feed-spout, and having said valve adapted when closed, for supporting a bank of material unconfined throughout its entire mass and formed in the feed-spout, and also having said valve adapted, when opened, for agitating said unconfined valve-supported and feed-spout-formed bank of material to loosen the same and the adjacent portions of the mass lying in the transfer-chute to thereby cause a free flow of the supply-stream, substantially as specified.

2. In a weighing-machine, the combination with a supply-spout adapted for containing a mass of material; of a transfer-chute adapted for receiving the material in a stream from said supply-spout; a feed-spout located relatively remote laterally from the supply-spout and transversely of the transfer-chute, and adapted for receiving the stream of material from said transfer-chute, said feed-spout comprising a pair of side walls joined by a connecting wall at one end thereof for forming an opening in said feed-spout of a width approximating the width of the feed-spout, and having said opening of a height to permit the unimpeded flow therethrough of the supply-stream; and a stream-controlling valve for said feed-spout, and having said valve adapted, when closed, to support a bank of material formed in the feed-spout and unconfined throughout its entire mass, and having also said valve-supported and feed-spout-formed bank of material extending into the transfer-chute and transversely of said chute, and also having said valve adapted when opened, to agitate said bank of material to loosen the same and the adjacent portions of the mass resting in the supply-chute to thereby cause a free flow of the supply-stream, substantially as specified.

3. In a weighing-machine, the combination with a supply-spout adapted for containing a mass of material; of a transfer-chute adapted for receiving the material in a stream from said supply-spout; a feed-spout located relatively remote laterally of the supply-spout, and having said feed-spout comprising a pair of side walls and a connecting front wall for forming a relatively-wide opening at the rear of the rear-feed, and of a height for permiting the unimpeded flow through said opening of the supply-stream; and a stream-controlling valve for said feed-spout and having said valve adapted when closed to support a bank of material unobstructed through its entire mass and formed in the feed-spout, and having said valve adapted when opened, to agitate said bank of material and the adjacent portions of the mass resting in the transfer-chute to loosen the same to thereby cause a free flow of the supply-stream, and having also said valve adapted to serve as the rear wall of the supply-chute, whereby, when the valve is opened, the supply-stream will be permitted to descend substantially in a straight line, and having said valve also adapted to cut off the supply-stream by a movement substantially with and following said supply-stream, substantially as specified.

4. In a weighing-machine, the combination with a supply-spout having an annular flange formed at its lower end; of a transfer-chute also having a complementary annular flange formed at its upper end; fastening means passing through said flanges for connecting the said supply-spout to the transfer-chute to thereby form a waste-proof joint; a stream-regulator carried by the supply-spout; a feed-spout adapted for receiving the supply-stream from the transfer-chute, and having a relatively-wide opening therein and of a height to permit the unimpeded flow of the supply-stream; and a stream-controlling valve for said feed-spout, and having said valve adapted when closed, to support a bank of unconfined material formed in the feed-spout, and having said valve also adapted when opened, to agitate said bank of material and the adjacent portions of the mass resting in the supply-chute to thereby cause a free flow of the supply-stream, substantially as specified.

5. In a weighing-machine, the combination with a feed-spout having a supply-stream opening, and a second opening in the rear thereof extending above said supply-stream opening; of a concave valve in position and adapted for controlling the supply-stream, and having said concavity when the valve is closed approximately in alignment with the rear opening in the feed-spout thereby forming a space of relatively-large area, whereby when the valve is closing relatively-large lumps in the mass will be shifted rearwardly of the valve into said space, substantially as specified.

6. In a weighing-machine, the combination with a feed-spout having a supply-stream opening, and a second opening in the rear thereof extending above said supply-stream opening; of a valve in position and adapted for controlling the supply-stream, and having said valve adapted when opened to stand approximately in a vertical position to thereby permit a substantially-vertical descent of the supply-stream through the supply-stream opening in said feed-spout, and adapted also to cut off said supply-stream by a movement substantially with and following the supply-stream to thereby shift rearwardly into alignment with said rear opening in the feed-spout any lumps that may be in the mass, whereby wedging of such lumps between the valve and the feed-spout will be prevented, substantially as specified.

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