(No Model.)

E. W. SPEAR.

WEIGHING MACHINE.

No. 479,853. Patented Aug. 2, 1892.

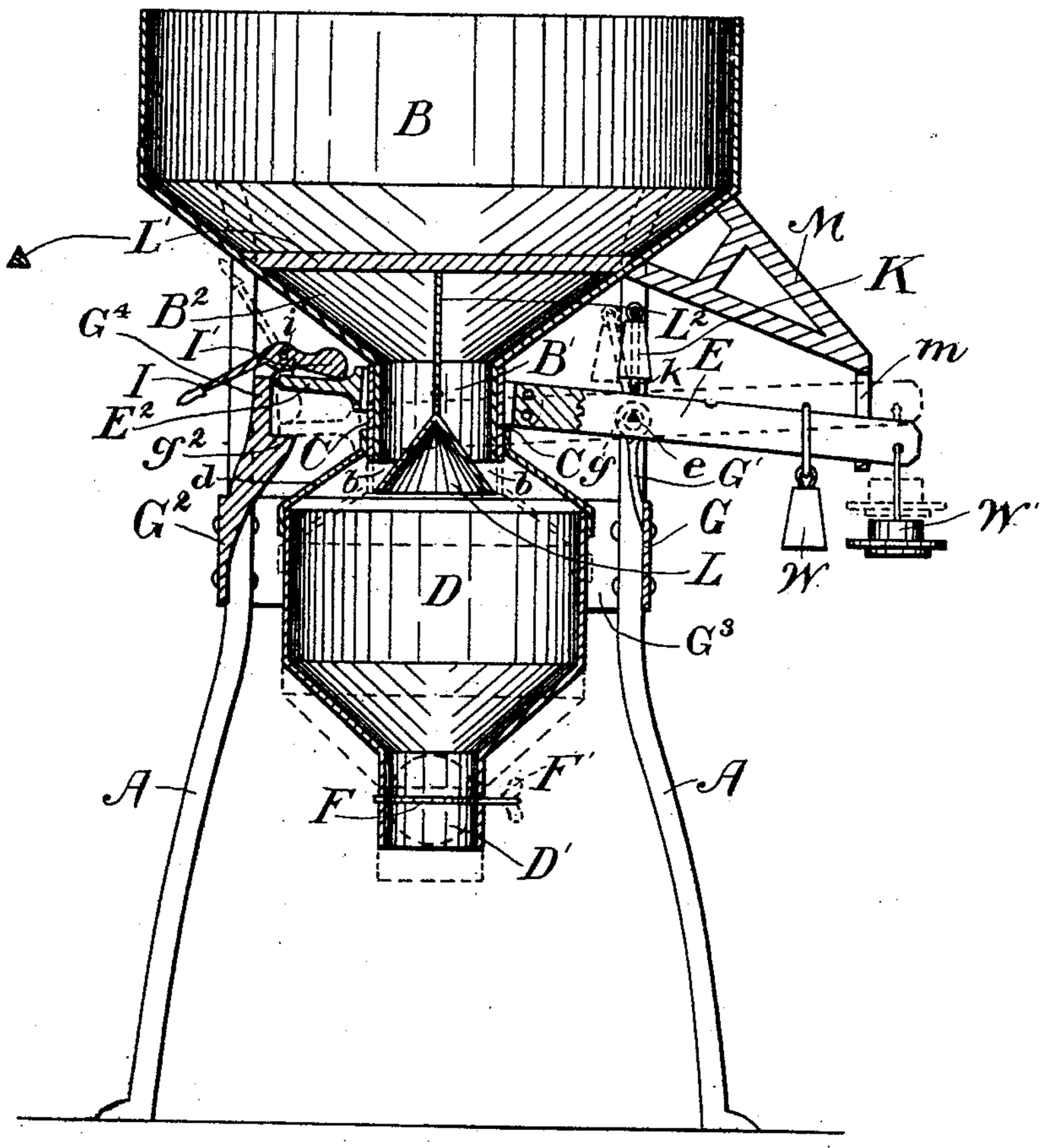

Fig. 1.

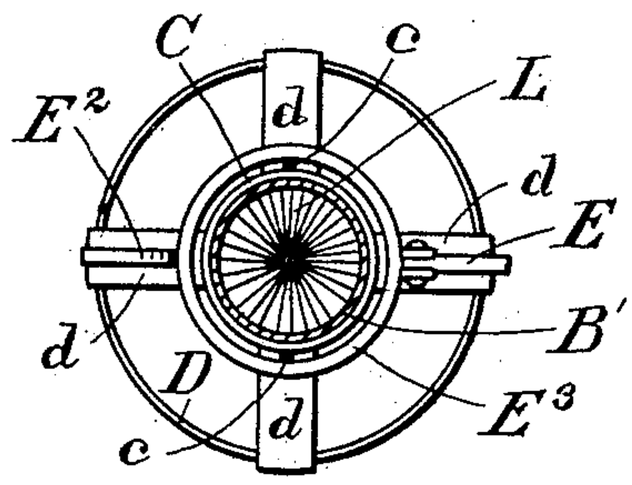

Fig. 2.

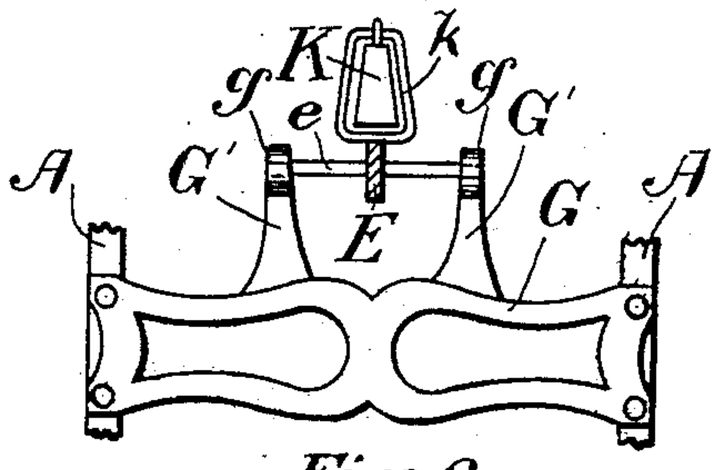

Fig. 3.

Witnesses
Albert E. Leech
S. H. Gilman.

Inventor
Ephriam W. Spear
by Wm. A. Downs
Atty.

UNITED STATES PATENT OFFICE.

EPHRIAM W. SPEAR, OF BOSTON, MASSACHUSETTS.

WEIGHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 479,853, dated August 2, 1892.

Application filed February 17, 1892. Serial No. 421,836. (No model.)

To all whom it may concern:

Be it known that I, EPHRIAM W. SPEAR, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Weighing-Machines, of which the following is a full specification.

My invention relates to machines for the same general purpose as that forming the subject-matter of my application for Letters Patent of the United States, Serial No. 414,213, filed December 7, 1891, for a machine for automatically weighing out given quantities of sugar, grain, and other material; and it consists in certain improvements in construction, as hereinafter described in detail, rendering said machine more perfect in its operation and better adapted for certain forms of work.

Referring to the accompanying drawings, Figure 1 shows my improved machine in upright longitudinal section through the central axis thereof. Fig. 2 is a horizontal sectional view through the spout of the supply-receptacle, taken just above the sleeve; and Fig. 3, shows in elevation one of the side pieces connecting the standard-legs, showing, also, the scale-beam fulcrumed to connections of said side piece.

B is the funnel-shaped supply-receptacle, rigidly supported on a standard consisting of the legs A, joined by side pieces G G′ G^2, bolted to said legs in the manner shown.

B^2 is the conical portion of the tunnel, and B′ the spout, which is open at the bottom. Directly below the spout B′ is rigidly held the separate bottom-forming piece L, which has no direct connection with the spout B′, but is held at some distance below, so as to leave between the bottom of the spout and the piece L a continuous opening *b* all around. The piece L is preferably cone-shaped, as shown, and is rigidly secured to a rod L^2, which is in turn fixed to the cross-piece L′, passing from side to side of the supply-receptacle. The cross-piece L′ is preferably triangular in cross-section with a sharp edge along the top, so as to avoid forming a lodging place for the sugar or other contents of the receptacle.

C is the movable outlet opening and closing sleeve, which fits over the outside of the spout B, and D is the movable receptacle hung from said sleeve in axial line therewith by means of the strips *d*, said movable receptacle being provided with the outlet-spout D′ at the bottom, controlled by the valve F, operated by the handle F′. The action of the sleeve C and the movable receptacle D are analogous to that of the similarly-lettered sleeve and movable receptacle shown and described in my above-named patent application, Serial No. 414,213.

E is the scale-beam, secured to the ring E^3, which is pivotally connected at *c c* with the sleeve C.

e is the fulcrum-piece, fixed to the scale-beam, the ends of the piece, *e* being triangular to form knife-edges having bearings in the sockets *g* at the top of the supports G′ arising from the side piece G (see Fig. 3) on each side of the beam.

The outer end of the beam E is guided in the slot *m*, formed in the bracket M, fixed to the supply-receptacle B B^2.

W W′ are the poises, which by their position or size, as the case may be, determine the quantity of material to be automatically weighed out.

The beam E has rigidly fixed thereto, directly over the fulcrum-piece *e*, the frame *k*, which is vertical when the parts are in the position indicated by the full lines in Fig. 1. In this frame *k* is hung the weight K, the purpose of which will presently be explained.

E^2 is a projection from the ring E^3 on the side of said ring opposite to the scale-beam E. The side piece G^2 has the upwardly-extending support G^4, in the top of which is fulcrumed at *i* the handle-lever I, the inner arm I′ of which is a weight overbalancing the weight of the arm I. The weight I′ rests constantly upon the projection E^2 of the scale-beam ring, being in its uppermost position when the scale-beam is in the position indicated by the full lines in Fig. 1, and when said scale-beam is in the position indicated by the dotted lines the lever I I′ automatically locks said beam in that position by holding down the projection E^2 against the shoulder g^2 on the support G^4.

As shown in Fig. 1, the machine is in position for weighing out a quantity of the material, the weights W W′ being properly adjusted to weigh the desired quantity. The outer end of the scale-beam E rests in this

position against the bottom of the slot *m*, and the material to be weighed flows out through the continuous outlet *b* between the open bottom of the spout B′ and the piece L, the valve F being closed. When exactly the given quantity of the sugar or other material has accumulated in the receptacle D, the weight of said receptacle and its contents overbalances the weights W W′, as arranged, and the receptacle D drops into the position indicated by the dotted lines in Fig. 1, drawing down the movable sleeve C till it closes the opening *b* by engaging with the piece L and tipping the scale-beam. The weighted arm I′ of the lever I follows downward the projection E^2 of the scale-beam ring and locks the machine in its position of rest—*i. e.*, with the movable receptacle D downward and the spout-outlet closed. The contents of the receptacle D may be dumped at leisure, and the machine is again started by pulling down the handle-lever I, allowing the weights W W′, which overbalance the empty receptacle and its connections to draw up the sleeve C, and thus open the outlet *b*.

It is of the greatest importance that when once the requisite quantity of the material to be weighed has accumulated in the receptacle D the scale-beam shall tip immediately with a quick sharp action, closing the outlet *b* suddenly and cutting off the flow; otherwise, if the action were slow, the flow would continue through the gradually-diminishing area of the outlet, and it would be impossible to weigh accurately. It is for this reason that I employ the weight K, hung in the frame *k*, which frame, being in a vertical position directly over the fulcrum *e* when the outlet *b* is open, exerts no influence in tipping the beam one way or the other; but when the weight of the material in the receptacle D begins to tip the scale-beam the frame *k*, being inclined over the inner side of the fulcrum, causes the weight K to quickly move the beam as far as it will go till the projection E^2 rests on the shoulder g^2.

While I prefer to have the piece L cone-shaped, so as to aid the flow of the material through the outlet *b*, I do not confine myself to this shape, as a plain flat disk would suffice.

I claim—

1. In an automatic weighing-machine, a stationary receptacle having a spout at the bottom, in combination with a separate bottom-forming piece rigidly held beneath said spout, whereby a continuous outlet is formed between said spout and said piece, a weight-operated scale-beam, a sleeve movable over said spout and outlet, and a movable receptacle connected to said sleeve, substantially as described.

2. In an automatic weighing-machine, a stationary receptacle having a spout B′ open at the bottom, in combination with a separate cone-shaped piece L, rigidly held beneath said spout, but not directly connected thereto, whereby a continuous outlet *b* is formed, a weight-operated scale-beam, a sleeve C, movable over said spout and outlet, pivotally connected to said beam, and a movable receptacle connected to said sleeve, all arranged and operating substantially as described.

3. In an automatic weighing-machine, a stationary receptacle having a spout provided with a suitable outlet, in combination with a movable receptacle, a sleeve connected to said movable receptacle and movable over said spout, a suitably-fulcrumed weight-operated scale-beam having its motion confined between certain limits, and an upwardly-extending frame secured to said scale-beam above the fulcrum thereof, provided with a weight hung within said frame, arranged and operating substantially as and for the purpose described.

4. In an automatic weighing-machine, a stationary receptacle provided with a spout having a suitable outlet, in combination with a movable receptacle, a sleeve connected to said movable receptacle and movable over said spout, a suitably-mounted weight-operated scale-beam having a connection pivoted to said sleeve and provided with a projection opposite said scale-beam, and an operating handle-lever engaging with said projection, substantially as and for the purpose described.

5. In an automatic weighing-machine, a stationary receptacle provided with a spout having a suitable outlet, in combination with a movable receptacle, a sleeve connected to said movable receptacle and movable over said spout, a suitably-mounted weight-operated scale-beam and connection E E^3, provided with the projection E^2 and pivotally connected to the sleeve, and a handle-lever I, provided with the weighted arm I′, overbalancing the handle-arm of the lever, said weighted arm engaging with said projection, whereby the scale-beam is automatically locked with the spout-outlet closed, substantially as described.

In witness whereof I have hereunto set my hand.

EPHRIAM W. SPEAR.

Witnesses:
WM. B. H. DOWSE,
ALBERT E. LEACH.