

(No Model.)

4 Sheets—Sheet 1.

H. E. HAWK.
WEIGHING AND BAGGING MACHINE.

No. 472,455.

Patented Apr. 5, 1892.

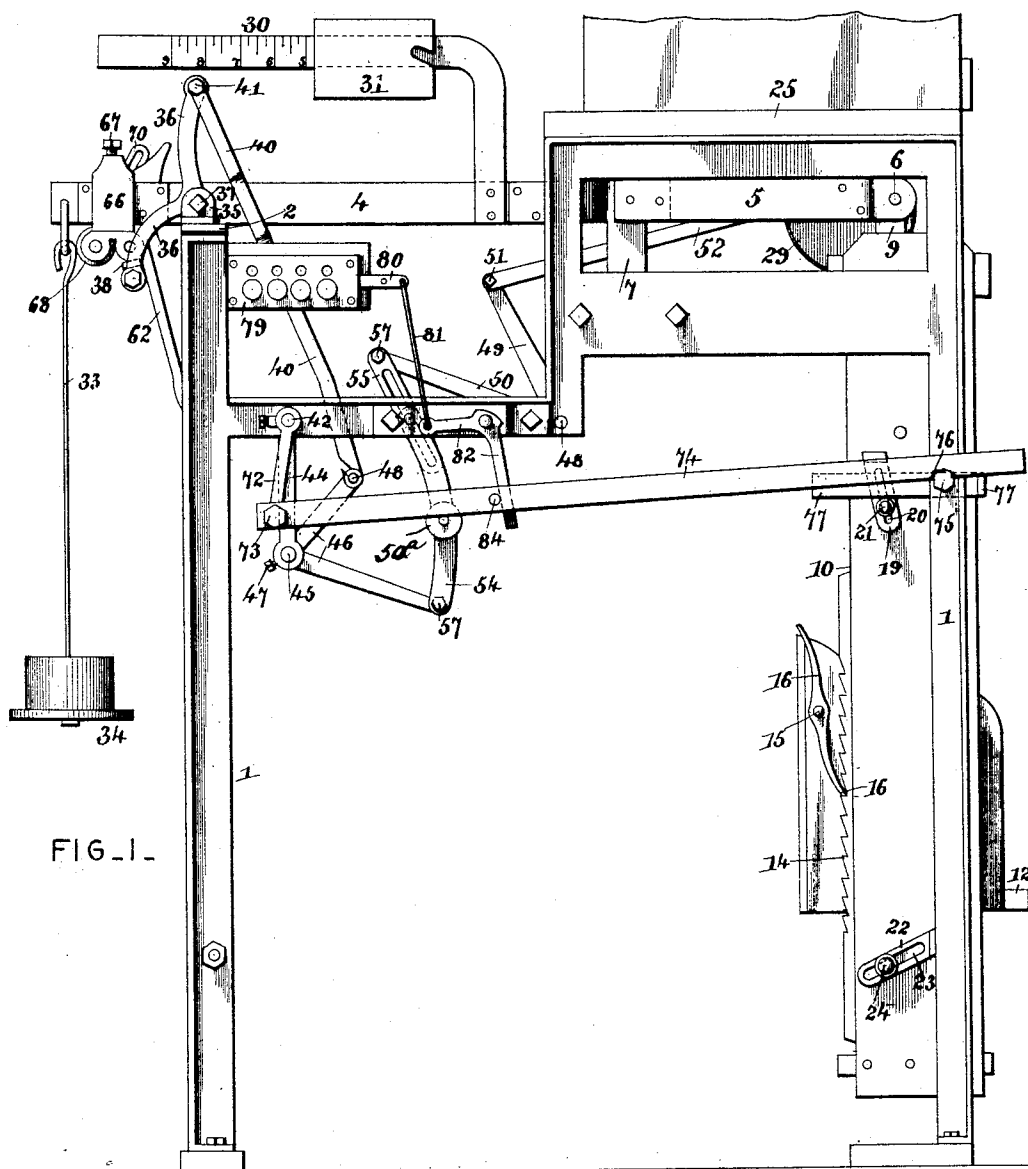


FIG. 1.

Witnesses:

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Inventor

Hale E. Hawk

By this Attorneys,

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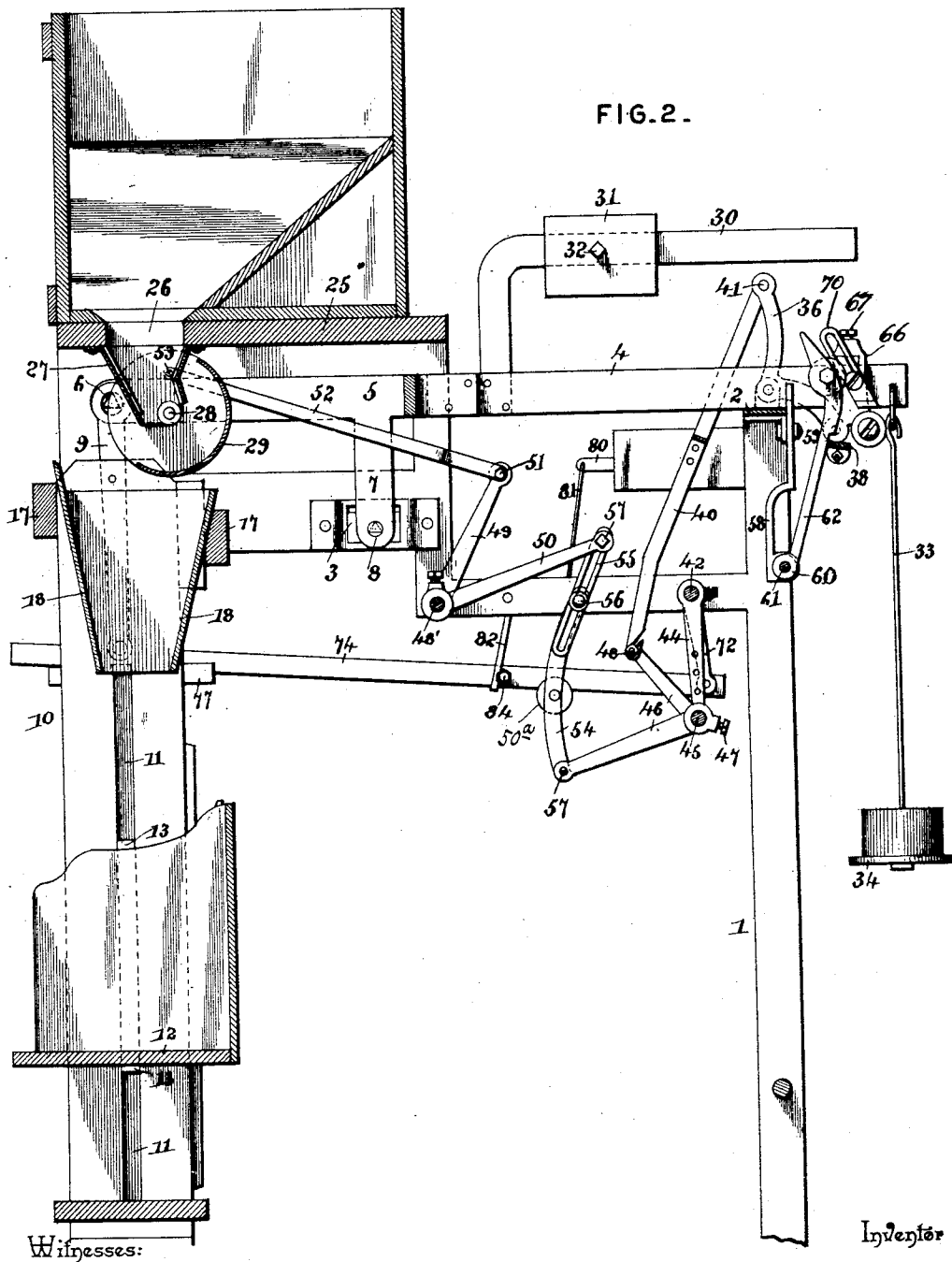
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4 Sheets—Sheet 2.

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(No Model.)

4 Sheets—Sheet 3.

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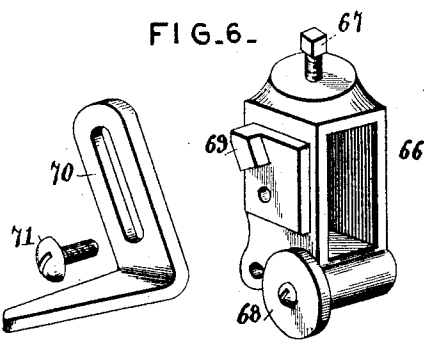
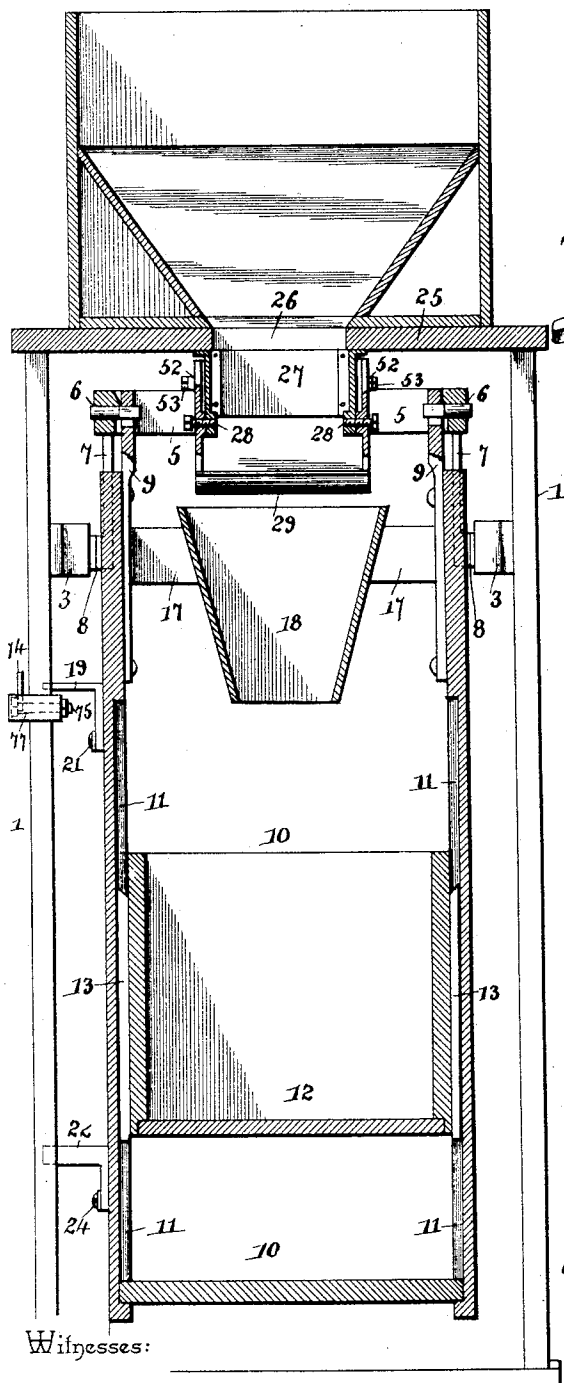


FIG. 3.

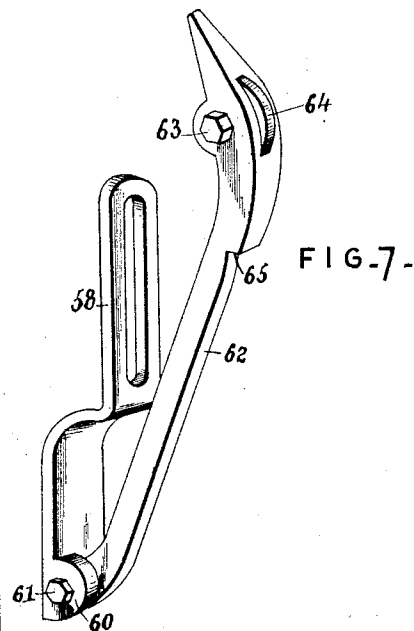


FIG. 7.

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4 Sheets—Sheet 4.

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FIG. 4.

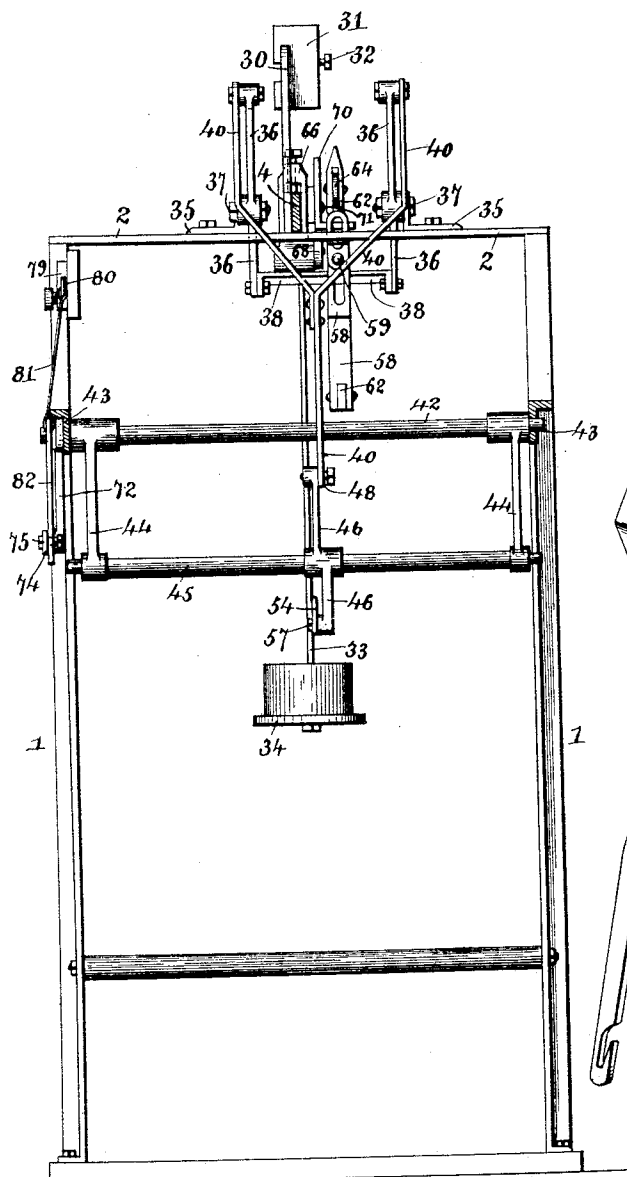
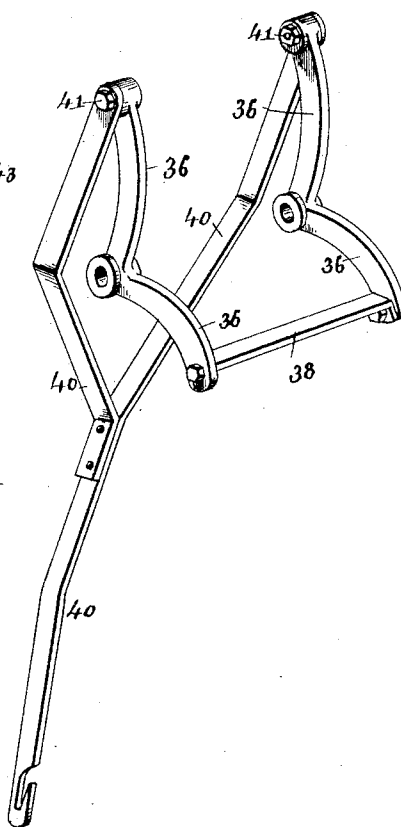


FIG. 5.



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UNITED STATES PATENT OFFICE.

HALE E. HAWK, OF BUCYRUS, OHIO.

WEIGHING AND BAGGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 472,455, dated April 5, 1892.

Application filed September 5, 1891. Serial No. 404,849. (No model.)

To all whom it may concern:

Be it known that I, HALE E. HAWK, a citizen of the United States, residing at Bucyrus, in the county of Crawford and State of Ohio, have invented a new and useful Weighing and Bagging Machine, of which the following is a specification.

This invention relates to a machine for weighing and bagging granular materials or stuffs, and the objects in view are to provide a machine of this class of cheap and simple construction, of accurate operation, automatic in its operation, and adapted for bags of various sizes, and to register automatically the number of bags.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a grain-scale constructed in accordance with my invention. Fig. 2 is a central vertical section of the same. Fig. 3 is a transverse vertical section through the hopper. Fig. 4 is a similar view looking in the opposite direction. Fig. 5 is a detail in perspective of the bifurcated connecting-rod 40. Fig. 6 is a detail in perspective of the adjustable sleeve. Fig. 7 is a detail in perspective of the gravity-latch.

Like numerals indicate like parts in all the figures of the drawings.

In practicing my invention I employ a suitable frame-work, preferably formed of light angle-iron and comprising opposite sides 1, connected at intervals and at proper points by tie-bolts, whereby the two sides are spaced apart and maintained in proper relation and the frame as a whole given rigidity. The frame is connected at its front by an upper transverse bar 2, thus specifically mentioned for the reason that it forms a support for certain mechanisms to be hereinafter described. Upon the inner sides and near the centers and upper ends of the side frames bearing-boxes 3 are located. 4 designates the scale-beam, and the same is located above the cross-bar 2, extending in front and in rear of the same, and at its rear end bolted to a rectangular yoke or bail 5, the branches of which diverge and terminate in bearings 6. At their angular portions the terminals of the bail

transversely opposite the point of connection with the scale-beam are provided with depending fulcrum-arms 7, which at their lower ends are laterally disposed to form bearing-trunnions 8, which latter are given a knife-edge bearing in the boxes 3. It will thus be seen that the scale-beam and bail are thus poised in the boxes.

Hangers 9 depend from the knife-bearings 6 at the front end of the bail and are securely bolted to the upper ends of a depending pendulous open frame 10, the opposite sides of which are provided with vertical grooves or ways 11. A platform 12 is located in the frame 10 and is provided at its opposite sides with cleats 13, which take and are adapted to move vertically in the ways 11, just mentioned. The rear edge of one of the side walls of the frame 10 is provided with upwardly-disposed ratchet-teeth 14, formed by a rack-bar secured to the frame, and the corresponding side of the platform has pivoted thereto, as at 15, a pawl 16, which when not otherwise influenced automatically and by gravity engages at its lower end with an adjacent tooth of the rack-bar. By this means it will be seen that the platform may be raised and lowered any desired distance and there locked automatically against further downward movement. Cross-bars 17, located at the upper end of the frame 10, serve to support a conical spout 18. An L-shaped trip-lug 19, having a slot 20, is adjustably connected by a screw 21 to the side of the frame 10 for a purpose hereinafter specified, and a similarly-shaped lug 22, having a slot 23, is adjustably connected by a screw 24 to the side of the frame 10 and, riding against the inner side of one of the vertical posts of the general frame-work, serves to prevent any swinging or vibrations of the frame-work 10 during the operation of the machine, as hereinafter described.

A platform 25 surmounts the general frame-work immediately over the frame 10, and an opening 26 therein communicates with the reduced spout 27, secured to the under side of said platform 25, said spout terminating immediately above the spout 18 of the frame 10. Pivoted to the spout 27 at one side of its mouth or opening by means of a bolt 28 is a rotary cut-off or valve 29.

30 designates an inverted-L-shaped poise-beam, which is secured to and extends above rearwardly and parallel with the weighing-beam 4, and said poise-beam has mounted adjustably thereon a poise or weight 31, which may be secured at any point along the beam by an ordinary set-bolt 32. From the rear end of the beam 4 depends a rod 33, and the same terminates in a weight-support 34, designed to support one or more weights that may be placed thereon in accordance with the quantities of materials to be successively weighed.

A pair of lugs or ears 35, supported upon the cross-bar 2 of the frame-work, form bearings for a pair of bell-crank levers 36, said bell-cranks being fulcrumed by bolts 37 upon the ears. The rear ends of the bell-cranks 36 are connected by a cross-bar 38, and from the front end of said bell-cranks loosely depend the terminals of a Y-shaped or bifurcated rod 40, the upper ends of which are pivoted, as at 41, to the bell-cranks. A rock-shaft 42 is journaled in bearings 43, formed at the inner sides of the opposite side frames, and from said shaft, near its bearings, depend rock-arms 44, connected by a transverse bar 45. Upon the center of this bar a bell-crank 46 is adjustably mounted by a set-bolt 47, and to the upper branch of said bell-crank 46 is pivoted, as at 48, the lower end of the Y-shaped or bifurcated rod 40. A second rock-shaft 48' is journaled in front of and slightly above the rock-shaft 42, and from the same extends a pair of diverging rock-arms 49 and 50, said rock-arms being adjustable by bolts, whereby their angle of divergence may be altered. The upper rock-arm 49 is pivotally connected, as at 51, to the rear ends of a pair of straps or pitmen 52, the front ends of which diverge and are eccentrically and pivotally connected, as at 53, to the rotary cut-off or valve. A curved sectional connecting-bar composed of lower and upper sections 54 and 55, one of which is slotted and adjustably connected by a bolt 56 to the other, have their ends pivotally connected, as at 57, to the extremities of the bell-crank 50 and the lower branch of the bell-crank 46.

58 designates a depending slotted standard adjustably connected by a bolt 59 to the cross-bar 2 of the general frame-work and at one side of the weighing-beam 4. At the lower end of the standard perforated bearing-lugs 60 are formed, and a bolt 61 passing there-through serves as a means of pivotal connection between the bracket and a loose gravity-latch 62, which extends upwardly at its free end between the cross-bar 38, that connects the bell-crank 36 and the cross-bar 2 of the frame-work. Near its upper end the latch is rearwardly curved and is provided with a slot or opening, in which is journaled upon a pin or bolt 63 a small friction wheel or disk 64. Immediately below this wheel or disk the latch is also provided with an engaging notch or shoulder 65.

A sleeve 66 is mounted upon the rear end of the beam 4 and is adjustable thereon by a bolt 67, and the lower end of said sleeve is provided with a friction-wheel 68, the periphery of which projects below the bottom of the sleeve. An inclined lug 69 is formed upon one side of the sleeve and loosely receives an L-shaped trip 70, which is slotted for the purpose, projects laterally from the sleeve, and is made adjustable by a set-screw 71, which passes through the slot of the trip into the lug and whose head overlaps the edges of the slot in the trip.

One end of the rock-shaft 42 projects beyond its bearing and is there provided with a crank-arm 72, which depends in alignment with the rock-arms 44 of said shaft, and pivotally connected, as at 73, by means of a bolt to the free or lower end of the crank-arm is a valve-opening rod 74, which extends forwardly and rests upon a pin 75, extending laterally from the general frame-work. This rod is notched upon its under side, as at 76, and when drawn forward so as to open the valve engages automatically with the said pin. Pivotally mounted upon the pin 75 is an L-shaped trip-lever 77, one end of which extends into the path of the L-shaped trip-lug 19, while the opposite end is outwardly disposed and takes under the free end of the valve-operating rod 74, so that a downward movement upon the part of the lug causes a tipping of the trip-lever, and elevating the opposite end thereof would, if the rod 74 were in engagement with the pin, serve to elevate said rod out of such engagement, all for a purpose hereinafter apparent.

79 designates a register of ordinary construction and whose disks are operated by the vibrations in a vertical direction of a lever 80, that extends from the same. This lever has its free end connected by a wire 81 with one branch of a bell-crank lever 82, which is pivoted or fulcrumed upon the side of the general frame-work of the machine and has its lower end or branch downwardly disposed in the path of a laterally-disposed pin 84, extending inwardly from the valve-operating rod 74.

This completes the construction of the machine, and the operation thereof is as follows: Suitable weights are placed upon the weight-platform, which weights agree with the amounts of materials to be successively weighed, and previous to such application of the weights the poise 31 is adjusted upon the poise-beam so as to exactly counterbalance the weight of a bag placed upon the platform 12, the platform itself and the platform-supporting frame, together with the attachments thereto. The machine is now ready for weighing, and the mouth of the bag is placed around the lower end of the spout 18, after which the platform is adjusted to the length of the bag. The operator now grasps the front end of the valve-operating rod 74, drawing the same toward him or to the front, and as he does so the

pin 84 projecting therefrom actuates the bell-crank 82 and draws down the lever controlling the register, so that the latter registers one unit. The forward movement upon the part 5 of the bar 74 serves to swing to the front the crank-arm 72, and thus rock or partially rotate the shaft 42, with its arms and connecting-rod 45. Such movement upon the part of the rod 45 through the medium of the rock-arms 49 10 and 50 and their connections, before described, serves to oscillate or partially rotate the rotary cut-off or valve and permit of the escape over the edge of the same of the material being weighed. This material passes down 15 through the chutes 27 and 18 into the bag and continues to do so until a sufficient quantity has entered the bag to counterbalance the weights upon the weight-supporting platform. When this has been done, the bail and 20 scale-beam are tilted, the latter downwardly and the former upwardly, and with the beam descends the platform-supporting frame, the platform, and the bag. During such descent the frame is held steady by the before-described guide-lug 22, riding against one of the 25 front standards of the general frame-work, and as said frame descends its trip-lug 19, acting upon the tail of the trip-lever 77, causes the latter to tilt, trip, and elevate from engagement with the pin 75 the notch of the 30 valve-opening rod 74. As soon as the trip-lever is liberated a weight 50^a, which is secured to the adjustable connecting-rod between the rock-arm 50 and the lower branch 35 of the bell-crank 46, causes a descent of said rock-arm and bell-crank, and they, being rigid upon their shafts, rotate or swing the same, the shaft 45 swinging to the rear. The partial rotation thus given the rock-shaft 48 40 causes the pitmen to draw upon and oscillate the rotary cut-off or valve, thereby closing the same and maintaining it in such position during the entire time that the scale-beam is elevated and the bag-supporting platform depressed. It will be noticed that when the 45 scale-beam is in its lowered position it bears at its friction-disk of its saddle or sleeve upon the cross-bar 38, that connects the bell-cranks 36, consequently depressing said bell-cranks 50 at their lower ends until the cross-bar is engaged by the shoulder of the gravity-latch 62. When in this position, the valve is opened, so as to permit of the free passage of the material. Now as the material begins to exceed 55 or slightly elevates the scale-beam the trip 70 thereof, affixed to the sleeve or saddle, comes in contact with the friction-wheel of the gravity-latch and acting upon the same swings the upper end of said latch to the rear sufficiently to release the connecting-bar of the 60 bell-cranks from engagement with the latch, and the weight 50^a, influencing the bell-cranks 36 through the medium of the Y-shaped or bifurcated connecting-rod, tilts them slightly 65 until their connecting-bar arrives up under and in contact with the saddle of the scale-beam. Such movement is permissible independent of

the rod 74 by reason of the fact that the bar 45 is loosely journaled in the bearing at the lower ends of the rock-arms 44. Such movement, through the medium of the various connections heretofore described, causes a very slight partial rotation of the cut-off or valve, and hence just previous to the time of actual cut-off the flow of the material is greatly reduced, and in fact amounts to very little, so 75 that the instant a complete counterbalancing of the weights is caused by the weight of the material in the bag and the valve-operating-rod is liberated by the descent of the bag-supporting frame, a total cut-off takes place. 80

From the foregoing description, in connection with the accompanying drawings, it will be seen that I provide a machine of great simplicity, accuracy, and convenience, which machine is so constructed as to automatically 85 register the number of bags filled, automatically partially cuts off the supply when the material nearly counterbalances the weights governing the amount, and finally automatically completes said cut-off immediately and 90 at the instant the material entirely counterbalances the said governing weights; and, furthermore, that after the removal of the filled bag the parts automatically resume their 95 former position with the exception of the opening of the valve, which is accomplished by hand through the medium of the rod 74 and at any time the attendant desires.

Having described my invention, what I 100 claim is—

1. In a machine of the class described, the combination, with the frame-work, the scale-beam fulcrumed thereon, the frame-support loosely suspended from the front end of the 105 beam, a spout located above the frame, and a cut-off located under the spout, of a reciprocating rod, connections between the same and cut-off, whereby the latter may be opened by a movement of the rod, devices for engaging 110 the rod when the same is thus moved, a trip mounted on the frame for tripping said devices and releasing the rod when the frame descends, and means for retracting the rod and closing the cut-off when said rod is thus 115 released, substantially as specified.

2. In a machine of the class described, the combination, with the frame-work, the scale-beam fulcrumed thereon, and the loosely-suspended frame, of a register secured to the 120 frame-work, a lever extending from the register and adapted to operate the same when depressed, a spout located above the suspended frame, a cut-off therein, a reciprocating rod located at one side of the frame-work, 125 connections between the same and cut-off, whereby a forward movement of the rod causes an opening of the cut-off, a pin located on the frame-work for engaging a notch in the rod, a trip located on the suspended frame 130 and adapted to disengage the rod from the pin when said frame is lowered, a pin extending from the rod, a bell-cranked lever pivoted to the frame-work and extending into the

path of the pin, and connections between said bell-crank lever and the lever of the register, substantially as specified.

3. In a machine of the class described, the combination, with the frame-work, the fulcrumed scale-beam, the spout, and the cut-off, of a reciprocating bar for operating the cut-off, a pin extending therefrom, a register, a lever for operating the same, and devices connected with the lever and adapted to be struck by the pin on the rod at each reciprocation of the latter, substantially as specified.

4. In a machine of the class described, the combination, with the frame-work, of the scale-beam fulcrumed therein, the platform-carrying frame loosely hung upon one end of the beam, and an inverted-L-shaped poise-beam carrying an adjustable poise mounted upon the scale-beam near the opposite end thereof, substantially as specified.

5. In a machine of the class described, the combination, with the frame-work, the scale-beam fulcrumed therein, and a rotary cut-off pivoted above the front end of said beam, of a rock-shaft journaled in the frame-work and having depending rock-arms connected by a rod, a central rock-arm extending from the rod, a crank-arm also mounted on the shaft, a reciprocating rod connected with the crank-arm and adapted to operate the rock-shaft, an intermediate rock-shaft located between the first-mentioned rock-shaft and the cut-off, upper and lower rock-arms extending therefrom, straps loosely connecting the upper rock-arm with the cut-off, and a connecting device between the lower rock-arm and that of the rock-arm upon the rock-arm-connecting rod, substantially as specified.

6. In a machine of the class described, the combination, with the frame-work, the scale-beam fulcrumed therein, and a rotary cut-off pivoted above the front end of said beam, of a rock-shaft journaled in the frame-work and having depending rock-arms connected by a rod, a central rock-arm extending from the rod, a crank-arm also mounted on the shaft, a reciprocating rod connected with the crank-arm and adapted to operate the rock-shaft, an intermediate rock-shaft located between the first-mentioned rock-shaft and the cut-off, upper and lower rock-arms extending therefrom, straps loosely connecting the upper rock-arm with the cut-off, and an adjustable connecting device between the lower rock-arm and that of the rock-arm upon the rock-arm-connecting rod, substantially as specified.

7. In a machine of the class described, the combination, with the frame-work, the fulcrumed scale-beam, the rock-shaft having the inner and outer depending rock-arms, a rod for operating the shaft, connected to the outer rock-arm or crank, and a rod connecting the inner rock-arms, of a spout, a pivoted cut-off or valve, and weighted connections between the valve and the rock-arm-connecting rod, substantially as specified.

8. In a machine of the class described, the

combination, with the frame-work, the fulcrumed scale-beam, the spout, the rotary cut-off pivoted thereto, and means for opening said cut-off, of a bell-cranked bail pivoted upon the frame-work, connections between the same and the cut-off, whereby a movement of the bail is communicated to the cut-off, a gravity-latch pivoted to the frame-work and having a shoulder below which said bell-cranked bail is depressed by the weight of the scale-beam, and a trip carried by the beam and adapted to strike and throw off said latch by a rising of the beam, whereby the cut-off is closed proportionate to the elevation of the scale-beam, substantially as specified.

9. In a machine of the class described, the combination, with the frame-work, the fulcrumed scale-beam, the spout, the pivoted rotary cut-off, and means for opening the cut-off, of a bell-cranked bail pivoted upon the frame-work and extending under and in the path of the scale-beam and adapted to be depressed by the latter, an adjustable bracket depending from the frame-work, a gravity-latch pivoted at its lower end in the lower end of the adjustable bracket and having its upper end slotted and provided with a wheel and below the same with a shoulder, connections between the bell-cranked bail and cut-off, whereby a rocking of the bail will be communicated to the cut-off, an adjustable saddle or sleeve mounted on the scale-beam and provided with a lug, a trip slotted to receive the lug and arranged in the path of the wheel of the latch, and a screw for adjusting the trip upon the lever, substantially as specified.

10. In a machine of the class described, the combination, with the frame-work, the fulcrumed scale-beam, the spout, the pivoted rotary cut-off located thereunder, the bell-cranked bail mounted upon the frame-work and extending under and in the path of the weighted end of the beam, a latch for engaging the bell-crank bail when depressed by the beam, and a trip carried by the beam for disengaging the latch when said beam is elevated, of a rock-shaft journaled in the frame-work below the bail and terminating at one end in a crank-arm, a rod for operating the crank-arm and rock-shaft, rock-arms depending from the rock-shaft, a rod loosely journaled in the ends of the rock-arms, a bell-crank lever fixed upon the rod, a bifurcated rod connecting the bell-crank lever with the branches of the bell-crank bail, a forward rock-shaft, a pair of upper and lower bell-cranks thereon, an adjustable connection carrying a weight connecting the lower bell-crank of the pair with the lower branch of the bell-crank of the rock-arm-connecting rod, and straps pivotally connecting the upper bell-crank of the pair with the pivoted cut-off at one side of the pivot of the latter, substantially as specified.

11. In a machine of the class described, the combination, with the frame-work, the fulcrumed scale-beam, the pivoted rotary cut-off,

the spout above the same, the bell-cranked bail mounted on the frame-work and extending under and in the path of the weighted end of the beam, a gravity-latch for engaging the bell-crank bail when depressed by the beam, and a trip carried by the beam and adapted to disengage the latch from the bail when the beam is elevated, of a rear rock-shaft journaled in the frame-work below the bail and terminating at one end in a crank-arm, a rod connected to and adapted to operate the crank-arm and rock-shaft, a pair of rock-arms depending from the rock-shaft, a rod loosely journaled therein, a bell-crank lever fixed upon the rod, a bifurcated or Y-shaped rod connecting the upper branch of the bell-crank lever with the forward branches of the bell-crank bail, a forward rock-shaft, a pair of upper and lower bell-crank arms thereon, a connection connecting the lower bell-crank of the pair with the lower branches of the bell-crank of the rock-arm-connecting rod, and straps pivotally connecting the upper bell-crank of the pair eccentrically with the pivoted cut-off, substantially as specified.

12. In a machine of the class described, the combination, with the frame-work, the fulcrumed scale-beam terminating at its front end in a bail, a platform-carrying frame supported by the bail, a slotted L-shaped trip located upon the frame, and a screw for adjusting the same, of a spout, a rotary cut-off pivoted thereto above the frame, a reciprocating rod for opening the cut-off and provided with a notch for engaging a pin upon the frame-work when thus reciprocated, an L-shaped lever or trip pivoted upon the frame-work and having one end extending under the rod and

the other under the trip of the frame, substantially as specified.

13. In a machine of the class described, the combination, with the frame-work comprising vertical standards, the fulcrumed scale-beam terminating at the front end in a bail, and a frame depending from the bail, of an L-shaped adjustable guide having a slot and a screw adjustably connecting the same to the side of the frame, whereby it is adapted to ride against the face of a standard of the frame-work during the vertical reciprocations of the frame, substantially as specified.

14. In a machine of the class described, the combination, with the frame-work, the scale-beam fulcrumed thereon, and the loosely-suspended frame, of a register secured to the frame-work, a lever extending from the register and adapted to operate the same when depressed, a spout located above the suspended frame, a cut-off therein, a reciprocating rod located at one side of the frame-work, connections between the same and cut-off, whereby a forward movement of the rod causes an opening of the cut-off, a pin located on the frame-work for engaging a notch in the rod, and a trip located on the suspended frame and adapted to disengage the rod from the pin when said frame is lowered, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HALE E. HAWK.

Witnesses:

EARL H. KISOR,
H. P. EATON: