

(No Model.)

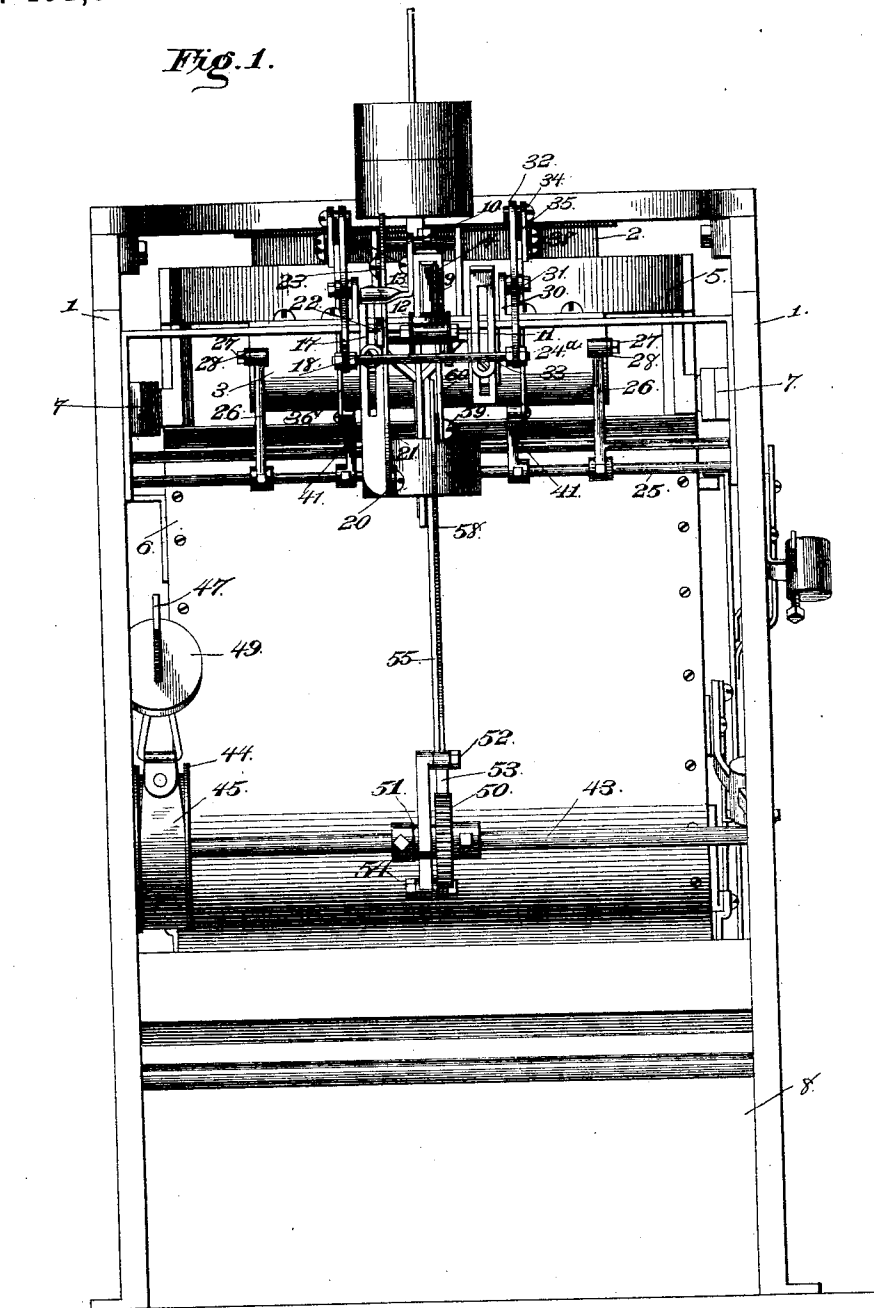
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H. E. HAWK.
GRAIN METER.

No. 461,385.

Patented Oct. 13, 1891.

Fig. 1.



Witnesses:

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W. J. Duwall

By his Attorneys,

C. A. Snow & Co.

Inventor

Hale E. Hawk

(No Model.)

3 Sheets—Sheet 2.

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Fig. 2.

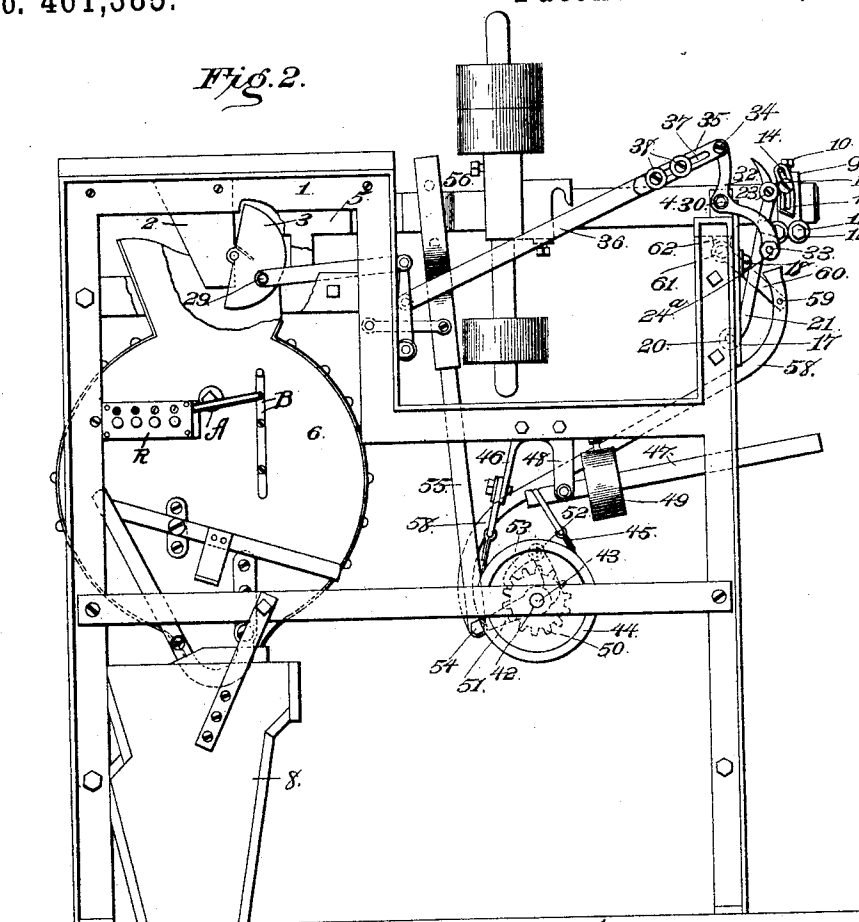
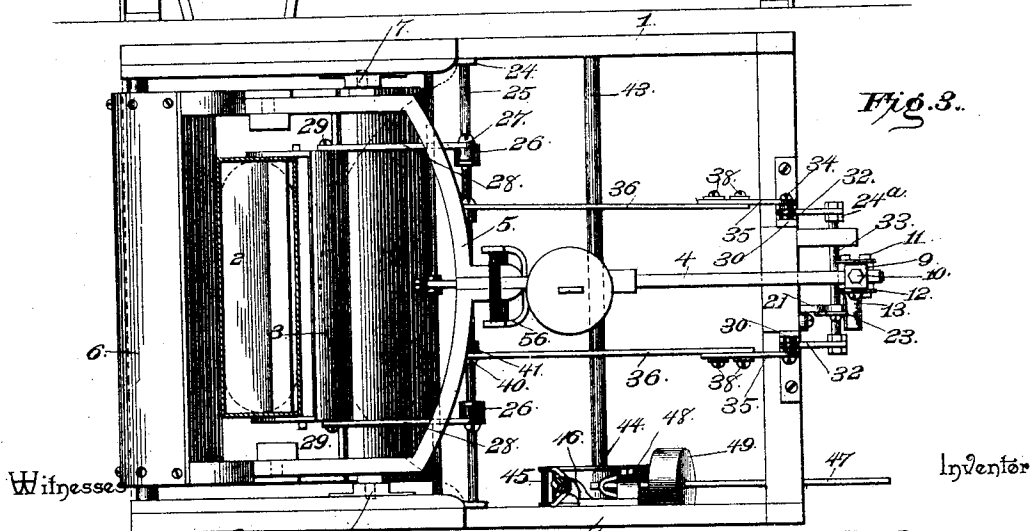


Fig. 3.



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(No Model.)

3 Sheets—Sheet 3.

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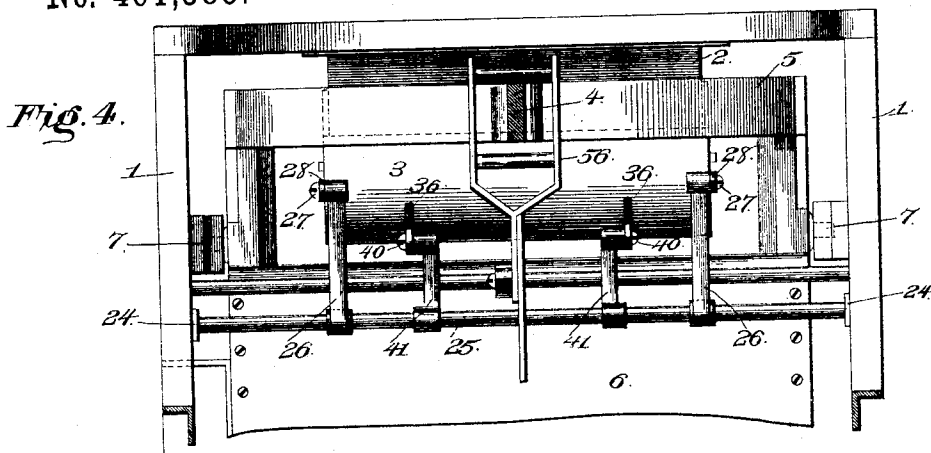


Fig. 5.

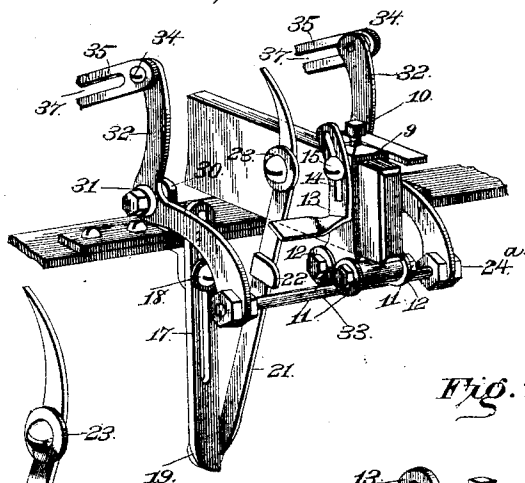
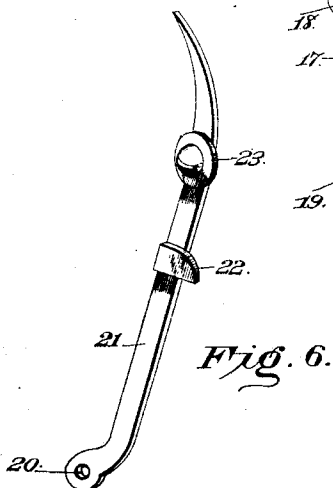
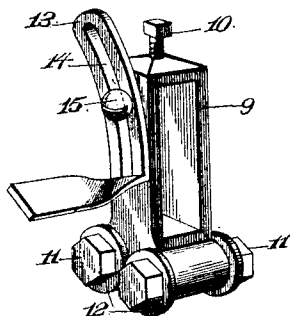


Fig. 7.



Witnesses:

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Inventor

UNITED STATES PATENT OFFICE.

HALE E. HAWK, OF BUCYRUS, OHIO, ASSIGNOR OF ONE-HALF TO MEMIN J. MONNETTE, OF SAME PLACE.

GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 461,385, dated October 13, 1891.

Application filed January 14, 1891. Serial No. 377,702. (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 Grain-Scale, of which the following is a specification.

This invention has relation to grain-scales, and has special reference to an improvement upon the construction shown, described, and claimed in the pending application filed October 1, 1890, and bearing Serial No. 366,744.

The objects of the present improvement are to reduce to a minimum friction of the parts controlling the valve, to increase the positiveness of the operation of the valve, and, furthermore, to avoid influencing the scale-beam by the operation of the valve and its mechanism and yet control said mechanism by the operation of the beam.

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 front elevation of a grain-scale constructed in accordance with my invention. Fig. 2 is a side elevation. Fig. 3 is a top plan view. Fig. 4 is a transverse section looking toward the hopper and taken in front of the valve-operating rock-shaft. Fig. 5 is a detail in perspective of the bell-crank-valve-operating stirrup or bail and adjacent parts. Fig. 6 is a detail in perspective of the catch for the same. Fig. 7 is a detail in perspective of the yoke and its trip.

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

In this instance I employ the opposite side frames 1, the depending stationary chute 2, the eccentrically-pivoted cut-off or valve 3, having the semi-cylindrical bottom, the scale-beam 4, terminating at its rear end in the yoke or bail 5, in which is hung the movable hopper 6, said beam being fulcrumed, as at 7, upon the opposite side frames. I also employ the same mechanism for closing and opening the valves or cut-offs in the lower end of the movable hopper, and also in the delivery-hopper 8 below the same, and said

mechanism forming no part of my present invention requires no specific mention.

A rectangular sleeve 9 is fitted over the free end of the scale-beam, and is made adjustable thereupon by means of a set-screw 10. The lower end of the sleeve is bifurcated to form a saddle, and in said bifurcations there are mounted bolts 11, which project beyond the opposite sides of the saddle and are there provided with anti-friction disks or rollers 12. 13 designates an L-shaped catch, the upper end of which is provided with an elongated slot 14, through which is passed a set-screw 15 into the side of the sleeve 9.

17 designates a vertically-slotted bracket secured by a set-screw 18 to an inverted-L-shaped lug located upon the underside of the front cross-bar of the frame-work. To the lower end of said bracket, which is provided with a rearwardly-disposed perforated bearing-lug 19, there is pivoted, as at 20, an upwardly and rearwardly disposed beveled latch-bar 21, provided near its middle with a shoulder 22 and near its upper end or at about the point of beginning of its bevel with a friction disk or roller 23, the periphery of which projects beyond the face of the latch. Bearings 24 are located in the opposite side frames 1 immediately in front of and a slight distance below the valve or cut-off, as before stated, pivoted to the opposite sides of the chute, and in said bearings there is journaled loosely a rock-shaft 25, provided near its opposite ends or opposite the ends of the cut-off with a pair of adjustable rock-arms 26, the free ends of which have pivoted thereto, as at 27, a pair of connecting rods or straps 28, eccentrically pivoted, as at 29, to the opposite end walls of the valve or cut-off.

A pair of L-shaped ears 30 are secured to the front cross-bar of the frame-work, one ear being located at each side of the scale-beam and a slight distance therefrom, and in each of said ears there is pivoted or fulcrumed, as at 31, a bell-crank lever 32, the front branches or members of which are connected by a locking-bar 33, nutted, as shown at 24^a, at each side of each of the levers. The opposite or rear branches of the bell-cranks are connected pivotally by bolts 34 to the sections 35 of a

pair of connecting-rods 36. The sections mentioned are longitudinally slotted, as at 37, and through the same and the remaining members or sections of the connecting-rods are passed set-bolts 38, so that the connecting-rods 36 may be lengthened or shortened, as may be desired. The rear ends of the connecting-rods are pivoted, as at 40, to the free ends of a pair of rock-arms 41, adjustably mounted upon the rock-shaft heretofore mentioned. The rock-arms last mentioned are preferably considerably shorter than the rock-arms previously described and connected with the cut-off or valve, so that any oscillating movement upon the part of the short rock-arms will be transmitted in an increased degree to the longer rock-arms, and consequently the cut-off or valve is given a greater sweep.

42 designates the bearings for the brake-shaft 43, upon which is mounted the brake disk or drum 44, the periphery of which is surrounded by the brake-strap 45, having its terminals connected one to a fixed bracket 46 and the other to a brake-lever 47, pivoted, as at 48, to said bracket and carrying a weight 49. There is also mounted upon said shaft a ratchet-wheel 50, which is fixed to the shaft, and at one side of the same and loosely upon the shaft a bell-crank lever 51. To one branch of the bell-crank there is pivoted, as at 52, a gravity-pawl 53, the working end of which automatically engages with the teeth of the ratchet. The opposite member of the bell-crank lever is provided with a bearing-bolt 54, upon which is loosely pivoted the lower end of the connecting-rod 55, the upper end of which is bifurcated to form a yoke 56, which embraces and is loosely connected to the scale-beam 4 immediately in front of its bail, and there is also pivoted upon the bolt of the bell-crank a curved push-bar 58, which extends to and slightly beyond the front of the frame-work and immediately under the transverse locking-bar of the valve-operating bail and below its end is loosely connected by a bolt 59 to a connecting-strap 60, which at its upper end is connected, as at 61, to a depending lug 62, secured to the under side of the front bar of the frame-work.

The operation of my invention is as follows: Taking the parts in the position they are seen when the weight of the grain has counterbalanced the weight upon the scale-beam and the machine is in the act of discharging, after such discharge has been entirely completed the scale-beam falls and the hopper is elevated. The falling of the scale-beam causes a rocking of the valve-operating bail or stirrup by reason of the said beam coming in contact with the locking-bar of said stirrup, so that said stirrup is depressed at its front end until the beam rests upon the front cross-bar. As the bail or stirrup is tilted its locking-bar comes in contact with the front beveled face of the latch and rides over the same and the anti-friction disk, and

is maintained by the yoke of the beam some distance below the shoulder of the latch. The tilting of the stirrup serves to draw upon the connecting-rods and rock or oscillate the short rock-arms and the rock-shaft, which motion is imparted to the longer rock-arms, and from them by the connecting-rods to the cut-off, which is thus oscillated so as to be withdrawn from under the chute and permit the grain to flow from said chute into the movable hopper. When the hopper has received a sufficient quantity of grain to but slightly raise the scale-beam, the weight of the latter is removed from the locking-bar of the bail or stirrup, and the weight of the valve or cut-off drawing upon its connecting-rods serves to oscillate the rock-shaft and elevate through the connecting-rods described the bail or stirrup until the locking-bar of the latter comes against and is engaged by the shoulder of the latch. When the parts are in this position, the cut-off has been nearly closed and grain from the same passes into the movable hopper only by overflowing the edge of the cut-off. As the hopper becomes sufficiently weighted to counterbalance the weighted scale-beam, said scale-beam is elevated and its L-shaped trip comes in contact with the anti-friction roller or disk located upon and extending from the beveled face of the latch, so that said latch is pressed to the rear, and the weight of the grain in the cut-off serves to immediately and positively close the same against any further escape of the grain therefrom to the hopper. After the grain has been discharged from the movable hopper and the beam descends it will be seen that said beam, through the medium of the connecting-rod loosely embracing the same, rocks the bell-crank of the brake-shaft, and as its gravity-pawl has previously engaged a tooth when said beam is raised the bell-crank, brake-shaft, and ratchet are partially rotated in unison, as is also the brake-disk, any too sudden rotation being prevented by the brake-strap. As the beam is elevated by the weight of the grain and the same rises it also elevates or pushes forward its push-bar, which is thrown into the position lately occupied by the locking-bar and still occupied by the locking-bar if there be obstructions to the closing of the valve or cut-off, such as straw and other foreign matter, which occasionally get into the stuff being weighed. In such instances the sudden pushing of the push-bar to the front brings the front end of the same into contact with the locking-bar of the bail or stirrup, and thus forces the same up, and consequently the valve is closed.

From the above description it will be seen that, although the opening and closing of the valve is accomplished by the movements of the scale-beam, yet the latter is not influenced by the valve-controlling mechanism or the weight of stuff contained in the valve or cut-off. It will also be seen that there are

but four points of the scale-beam at which any friction of the parts can take place—namely, at its fulcrum-points and the points of pivot of the movable hopper to the rear end of the scale-beam. Thus the friction of parts is reduced to a minimum and nothing but the weight of the grain itself can influence and raise the scale-beam. In this manner an exact measurement can be obtained. It will be observed that the several parts are all adjustable, so that a proper working may be obtained. The connecting-straps between the valve-operating rock-shaft and the stirrup may be adjusted to regulate the flow of grain.

In Fig. 2 I have shown how a register may be attached to my grain-weigher. The construction of this register is of the simplest character, and as it forms no part of my invention no detailed illustration will be given. The units wheel or disk is provided with an operating-arm A, which sets the register R in motion. This arm is struck by the bracket-piece B when the hopper 6 descends, so as to cause the units wheel or disk of the register to turn one degree.

The main object of the attachment of the improvements before noted to the scale-beam is to provide a cut-off in which the flow can be diminished to a very small degree at the will or desire of the operator to suit the kind of material, and all this with but a single valve.

The latch 21 takes the influence from the beam at its critical period and holds it till the beam with weights moves again before it trips.

I do not herein broadly claim the connections between the free end of the scale-beam and the cut-off, the rod 58, and the mechanism for opening and closing the gate at the lower end of the receptacle, as such is embraced in the subject-matter of a pending application filed by me October 1, 1890, and bearing Serial Nos. 366,744 and 351,177.

Having described my invention, what I claim is—

1. In a grain-scale, the combination, with the frame-work, the fulcrumed scale-beam, the hopper loosely suspended therefrom, the chute, and the cut-off pivoted to the hopper, of the rock-shaft 25, journaled in the frame-work and provided with two opposite pairs of rock-arms at each side of the scale-beam, rods connecting a pair of these rock-arms with the cut-off, a bail or stirrup pivoted upon the frame-work and located in the path of and adapted to be depressed by the scale-beam, and rods connecting the bail or stirrup with the pair of rock-arms, substantially as specified.

2. In a grain-scale, the combination, with the frame-work, the fulcrumed beam, the loosely-suspended hopper, the chute, and the pivoted valve or cut-off, of the rock-shaft 25, journaled in the frame-work, short rock-arms 41, extending from the shaft, and long rock-

arms 26, extending from the shaft, rods connecting the long arms with the sides of the cut-off, the pivoted bail or stirrup located in the path of and adapted to be depressed by the beam, and rods connecting the bail or stirrup with the short rock-arms, substantially as specified.

3. In a grain-scale, the combination, with the frame-work, of the fulcrumed scale-beam, the loosely-suspended hopper, the chute, the cut-off, the rock-shaft provided with the opposite pairs of rock-arms, rods connecting a pair of the arms with the ends of the cut-off, a pair of bell-cranks pivoted upon the frame-work at each side of the scale-beam, a bolt connecting the outer ends of the bell-cranks, and adjustable rods connecting the inner ends of the bell-cranks with the ends of the remaining pair of rock-arms, substantially as specified.

4. In a grain-scale, the combination, with the frame-work, the fulcrumed scale-beam, the chute, the valve pivoted to the side of the same, and the hopper loosely suspended from the scale-beam, of a bail or stirrup pivoted upon the frame-work and in the path of the scale-beam, a latch pivoted to the frame-work and having a shoulder located above the bail when the latter is depressed by the beam and adapted to engage said bail, a projection or roller located above the shoulder, a trip projecting from the side of the beam and adapted to strike the projection, and rods connecting the bail with the cut-off, substantially as specified.

5. In a grain-scale, the combination, with the frame-work, of the fulcrumed scale-beam, the cut-off, the chute to which the cut-off is pivoted, the loosely-suspended hopper, the opposite bell-cranks pivoted on opposite sides of the beam, rods connecting the inner members of the bell-cranks to the cut-off, a bolt connecting the inner branches of the bell-cranks and located in the path of the scale-beam, a bracket slotted and adjustably connected to the front bar of the frame-work, a latch having an upper beveled face terminating in a cam-disk and below the same provided with a shoulder and pivoted at its lower end to the bracket, and a trip adjustably connected to the scale-beam and adapted to strike the cam-lug of the latch, substantially as specified.

6. In a grain-scale, the combination, with the frame-work and a register rigidly secured thereto, said register having an operating-arm A, of the loosely-suspended vertically-movable hopper and the fulcrumed scale-beam from which said hopper is suspended, said hopper being provided with a bracket-piece B, which is normally above the plane of the operating-arm A, but when the hopper descends strikes said arm to set the register in motion.

7. In a grain-scale, the combination, with the fulcrumed scale-beam and the hopper loosely suspended therefrom, of the chute which discharges into the hopper, the cut-off

between the chute and the hopper, operating devices for the cut-off, located in the path of the scale-beam, so as to be actuated thereby, said devices being adjustably connected with the cut-off to move the same from an open to a closed position, and a catch adjustably mounted on the frame-work and adapted to lock the operating devices for the cut-off during a certain period of the operation of weighing, as set forth.

8. In a grain-scale, the combination, with the fulcrumed scale-beam and the hopper loosely suspended therefrom, of the chute which discharges into the hopper, the cut-off between the chute and the hopper, operating devices for the cut-off, located in the path of

the scale-beam, so as to be actuated thereby, said devices being adjustably connected with the cut-off to move the same from an open to a closed position, a catch adjustably mounted on the frame-work and adapted to lock the operating devices for the cut-off during a certain period of the operation of weighing, and a trip located on the scale-beam to release the catch, as set forth.

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

HALE E. HAWK.

Witnesses:

J. L. LEONARD,
JAS. S. REAGER.