

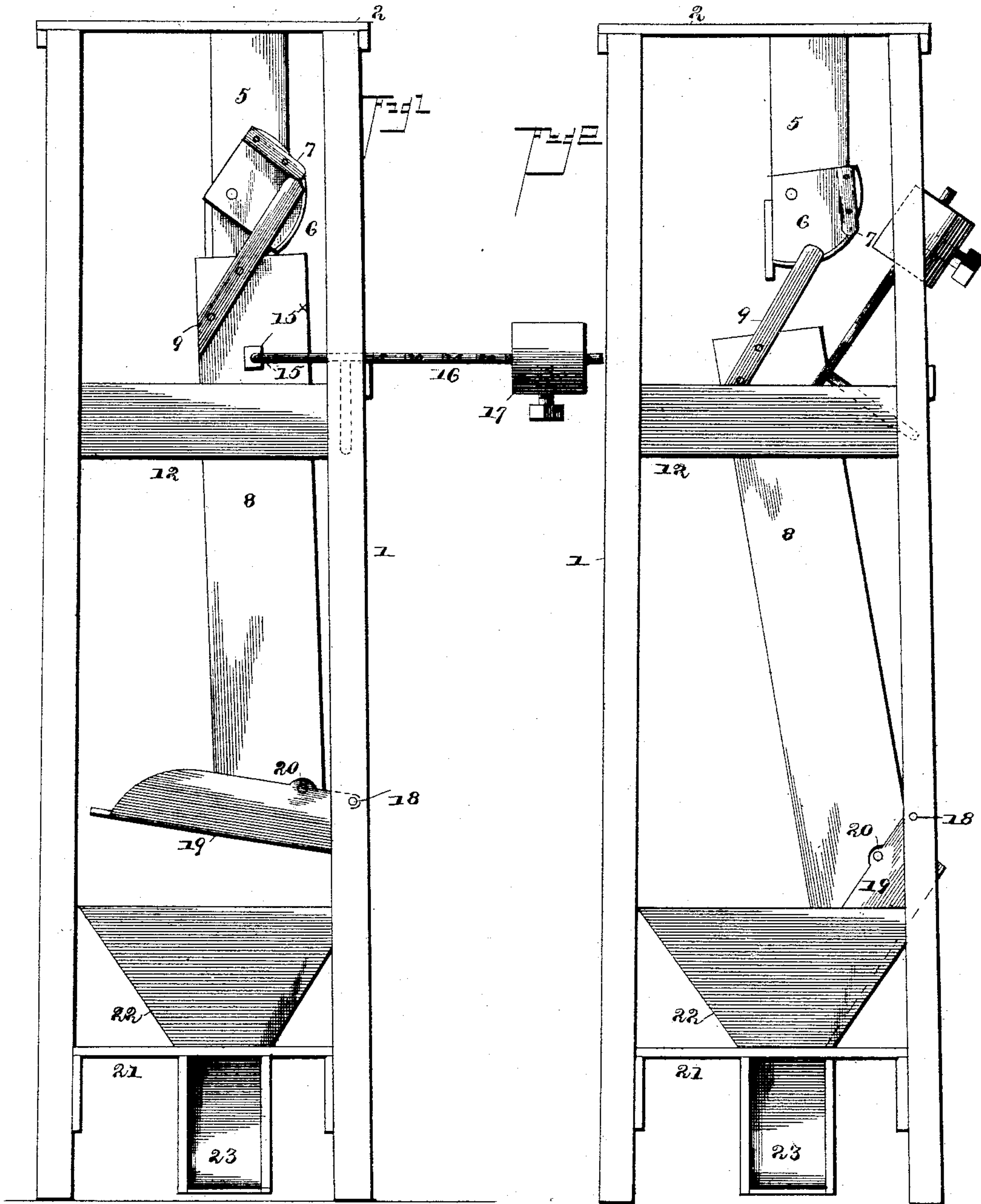
(No Model.)

2 Sheets—Sheet 1.

H. E. HAWK.
GRAIN METER.

No. 440,354.

Patented Nov. 11, 1890.



Witnesses:

John Amie
W. S. Duwall

Inventor

Hale E. Hawk.

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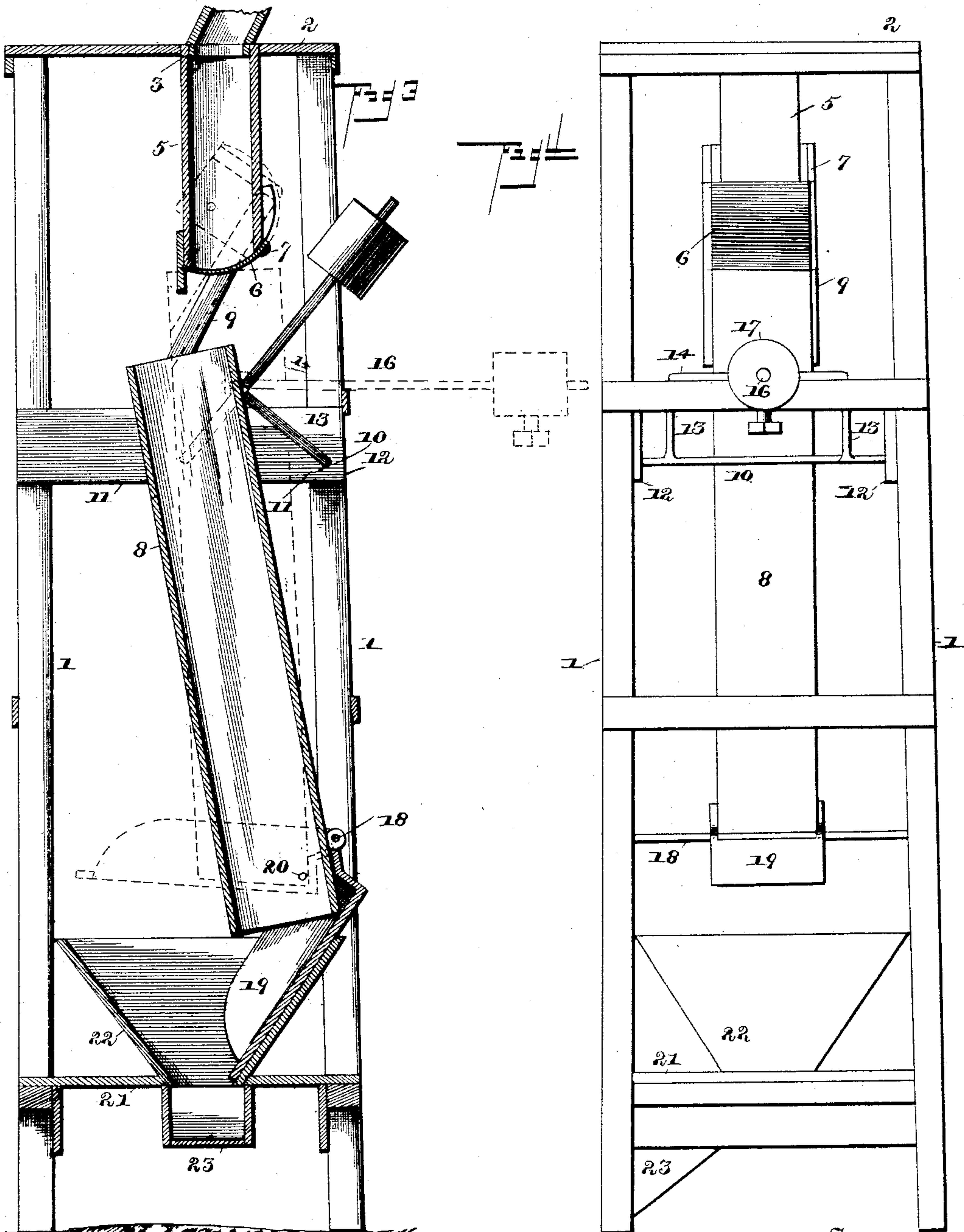
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UNITED STATES PATENT OFFICE.

HALE E. HAWK, OF BUCYRUS, OHIO.

GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 440,354, dated November 11, 1890.

Application filed November 30, 1889. Serial No. 332,133. (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 Delivery and Weighing Mechanism, of which the following is a specification.

This invention has relation to grain delivery and weighing mechanism, and among the objects in view are to simplify the construction, reduce the cost of manufacture, and obviate as much as possible the friction of the parts, and to provide a combined weighing and delivering apparatus designed to operate automatically and with the utmost accuracy.

With these general objects in view the invention consists in certain features of construction hereinafter specified, and particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 is a side elevation of an apparatus constructed in accordance with my invention. Fig. 2 is a similar view in the act of delivering the grain. Fig. 3 is a vertical section. Fig. 4 is a rear elevation.

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

In the present instance I have illustrated my invention in connection with an ordinary supporting-tower; but it will be apparent that the invention hereinafter described may be located in a suitable shaft of a granary.

1 represents four opposite vertical posts arranged in a square, the upper ends of which support a platform 2, the posts being connected at intervals by suitable braces and tie-bars, as is usual in towers, and the platform 2 being provided with an opening 3 at about its center.

5 represents a stationary chute, which may be of any suitable length, and the same communicated at its upper end with the opening 3 and depends from the platform 2. The lower end of the chute is provided with a pivoted cut-off 6, the same being in the shape of a sector and provided at its opposite sides with shoulders 7. The cut-off is so pivoted at the lower end of the chute as to automatically close by gravity.

8 represents a vertically-movable grain-chute located under the stationary chute 5

and having its upper end communicating with the same. At opposite sides of the chute 8 and near its upper end are secured arms 9, projecting above the chute and taking under the shoulder 7.

10 represents a rock-shaft journaled in opposite bearings 11, formed in transverse braces 12, connecting the opposite pairs of posts 1, and from said rock-shaft there projects upwardly a pair of rock-arms 13, one occurring near each end of the shaft.

14 represents a U-shaped bail, the terminals of which are provided with eyes 15^x to receive trunnions 15, projecting from the opposite sides of the movable chute 8, said bail being mounted upon the rock-arms at about its middle. The opposite end of the bail is provided with an outwardly-disposed scale beam 16, upon which is mounted an adjustable weight 17.

18 represents a bearing-rod journaled in a pair of the posts 1 opposite the lower end of the chute 8 when the latter is raised, and mounted for pivotal movement upon the rod is a grain-delivery pan 19, the opposite side walls of which are pivoted, as at 20, to the side walls of the movable chute near the lower end of the latter.

Upon suitable cross-bars 21, near the lower end of the tower, there is mounted a hopper 22, provided with an inclined spout 23, the hopper being located under the delivery-pan. The weight is adjusted at such a degree upon the scale-beam as to raise the movable chute and also to include the weight of the quantity of grain to be weighed at a time. This elevation of the chute 8, as before stated, raises the arms 9 so that their upper ends take under the inclined shoulders 7 at the sides of the cut-off 6 and tilt said cut-off to the rear, so as to afford a free communication or passage between the stationary chute and the movable chute, the delivery-pan being consequently raised and closing the lower end of the chute. The grain, now pouring through the opening and the two chutes, falls upon the delivery-pan until a sufficient quantity has been deposited thereupon to overcome the weight, when the pan swings downwardly and delivers the grain into the delivery-hopper 22, and from thence is conducted by the spout 23

to any suitable point, or may be deposited in bags, cars, the holds of vessels, &c. When the grain is sufficient to counterbalance the weight and the delivery-pan is swung down upon its fulcrum, which is the rod 18, by reason of its pivotal connection with the movable chute, said chute is also drawn downwardly and the arms 9 out of contact with the shoulders 7, whereby the cut-off 6 closes the lower end of the stationary chute, and hence stops the flow of grain, said cut-off falling by gravity, and therefore being automatic in its operation. After the grain has been delivered from the delivery-pan into the hopper, the weight acts to return the parts to their normal position and the operation is repeated. The grain of course accumulates upon the cut-off 6 while the delivery-pan is performing its function of delivering, so that when the parts are returned to their normal position by the weight, and after delivery of the grain from the pan, a large quantity of grain will be accumulated and ready for delivery from the cut-off at the lower end of the stationary chute.

From the construction herein described it will be obvious that I have provided a most simple and convenient apparatus for automatically weighing and delivering grain, said apparatus being at once recognized as both extremely accurate, quick of operation, and self-operating. When the pan is in the act of delivering into the hopper 22, the scale-beam will be raised to such a point that the weight will be suspended nearly over the rock-shaft, and hence exert little if any power calculated to return the pan until entirely empty.

The relative arrangement of the chutes, hopper, and delivery-pan are such that when the pan is in the act of delivering the grain a straight unobstructed passage is afforded from the movable chute to the spout 23.

One very important element of the difference between this invention and others that have preceded it resides in the longitudinally-movable chute, which by its movement is adapted to actuate the gravity cut-off, and thereby enabling a single weight to accomplish all the purpose. Most devices use at least two weights to effect all the desired operations.

The free end of the pivoted delivery-pan, it will be observed, extends considerably beyond the adjacent wall of the hopper, and by so doing the loose particles of grain may readily pass from the hopper when in the act of delivering said grain, serving to exert considerable weight and influence upon the pan to keep it open by reason of the same being located remote or such a distance from the pivot-point of the pan.

Having described my invention, what I claim is—

1. In an apparatus of the class described, the combination, with a stationary chute, a gravity cut-off pivoted at the lower end of the same, and a movable chute located below the

stationary chute and provided with means for actuating the cut-off, of a scale-beam secured to the movable chute at one end and provided with a movable weight at the other end, a fulcrum for the beam, and a delivery-pan pivoted at the lower end of the movable chute and having its rear end fulcrumed on a fixed bearing, substantially as specified.

2. In an apparatus of the class described, a stationary chute, a cut-off pivoted to the lower end of said chute and adapted to drop by gravity and close the mouth of the same, and provided with opposite shoulders, of a movable chute arranged below the stationary chute and provided with arms extending from the upper end of the same and adapted to be brought into contact with the shoulders of the cut-off, a rock-shaft journaled at one side of the movable chute and having rock-arms, a bail mounted on the rock-arms and of a U shape and forming journals for the movable chute, and provided at its rear end with a scale-beam and an adjustable weight mounted on the same, a rod located opposite the lower end of the movable chute, a delivery-pan fulcrumed upon the rod, and pivots connecting the sides of the pan with the sides of the chute, substantially as specified.

3. The combination, with the stationary chute 5, the pivoted gravity cut-off 6, having the shoulder 7 secured to the lower end of the same, and the movable chute 8, having arms 9 for operating under the shoulders and raising the cut-off, of the rock-shaft 10, mounted in bearings 11, and the transverse braces 12, in which they are formed, the rock-arms 13, the U-shaped bail 14, mounted on the arms and terminating in eyes 15^x for the trunnions 15, and provided at its opposite end with the scale-beam 16, the adjustable weight 17, mounted thereon, the fulcrum-rod 18, located at the lower end of the movable chute, the grain-delivery pan 19, fulcrumed upon the rod and pivoted, as at 20, to the lower end of the chute, and the delivery-hopper 22, located below the pan and having the spout 23, substantially as specified.

4. The combination, with the movable chute and a counterbalancing scale-beam and weight for the same, of a delivery-pan, pivoted at opposite sides of the chute at its lower end and fulcrumed independent of the chute in a fixed bearing, substantially as specified.

5. The combination, with the movable chute and a counterbalancing scale-beam and weight for the same, of a delivery-pan, pivoted at the lower end of the chute and independently thereof, fulcrumed upon a fixed bearing, and having its bottom projected at its delivery end beyond the side of the chute, substantially as specified.

6. In an apparatus of the class described, the combination of the stationary chute 5, the gravity cut-off 6 at the discharge end of the same, the longitudinally-movable chute 8, which communicates with the stationary chute and is adapted to actuate the same, a

scale-beam connected to the movable chute
and provided with a movable weight, and a
pivoted delivery-pan 19, closing the lower
end of the movable chute and pivoted thereto
5 and upon a fixed bearing in rear thereof, the
scale-beam with its weight serving as the
sole weight for the apparatus, 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:

E. G. SIGGERS,

J. H. SIGGERS.