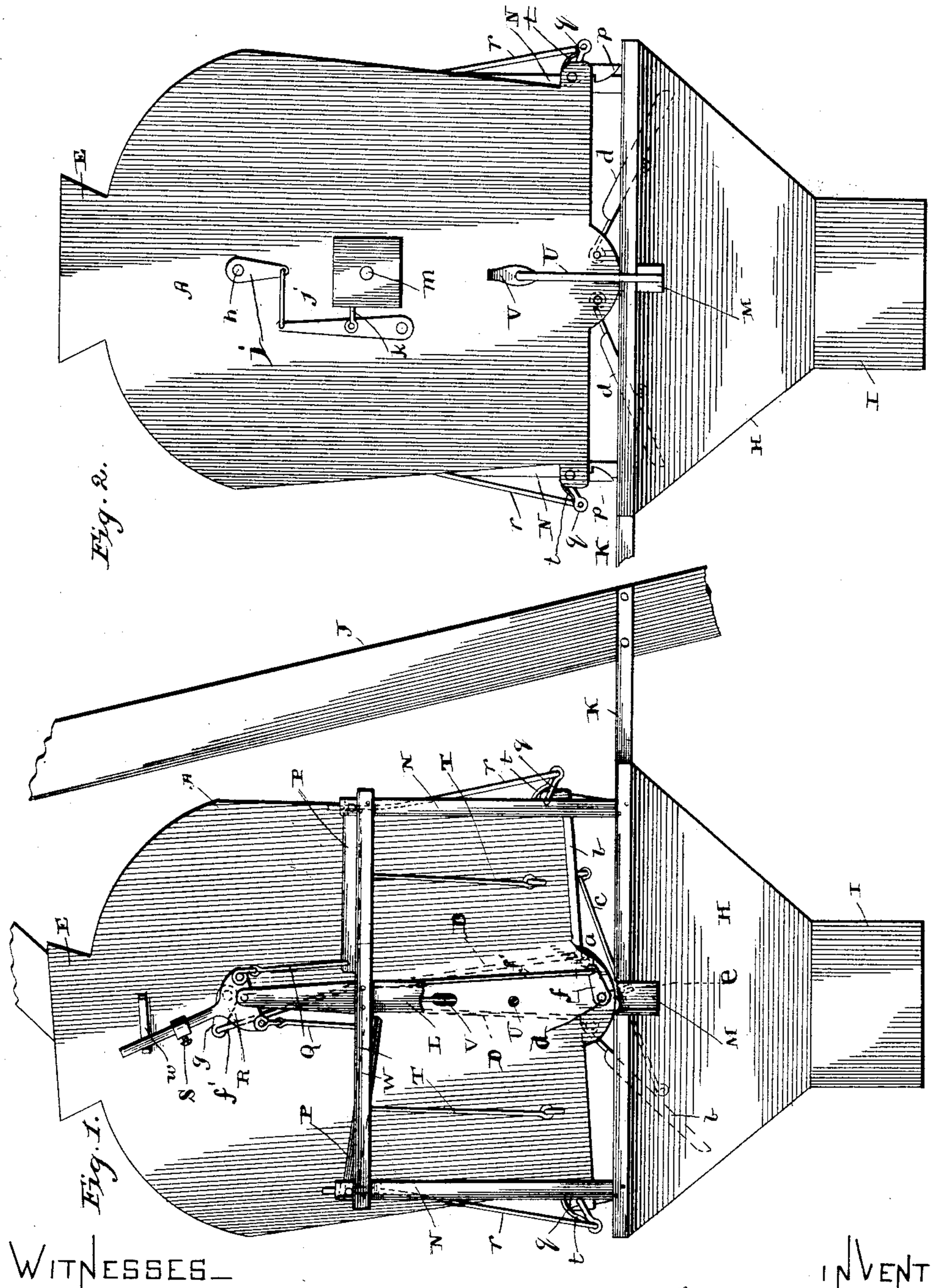
(No Model.) 2 Sheets—Sheet 1.

H. H. BOENKER.

OSCILLATING GRAIN METER.

No. 483,417. Patented Sept. 27, 1892.



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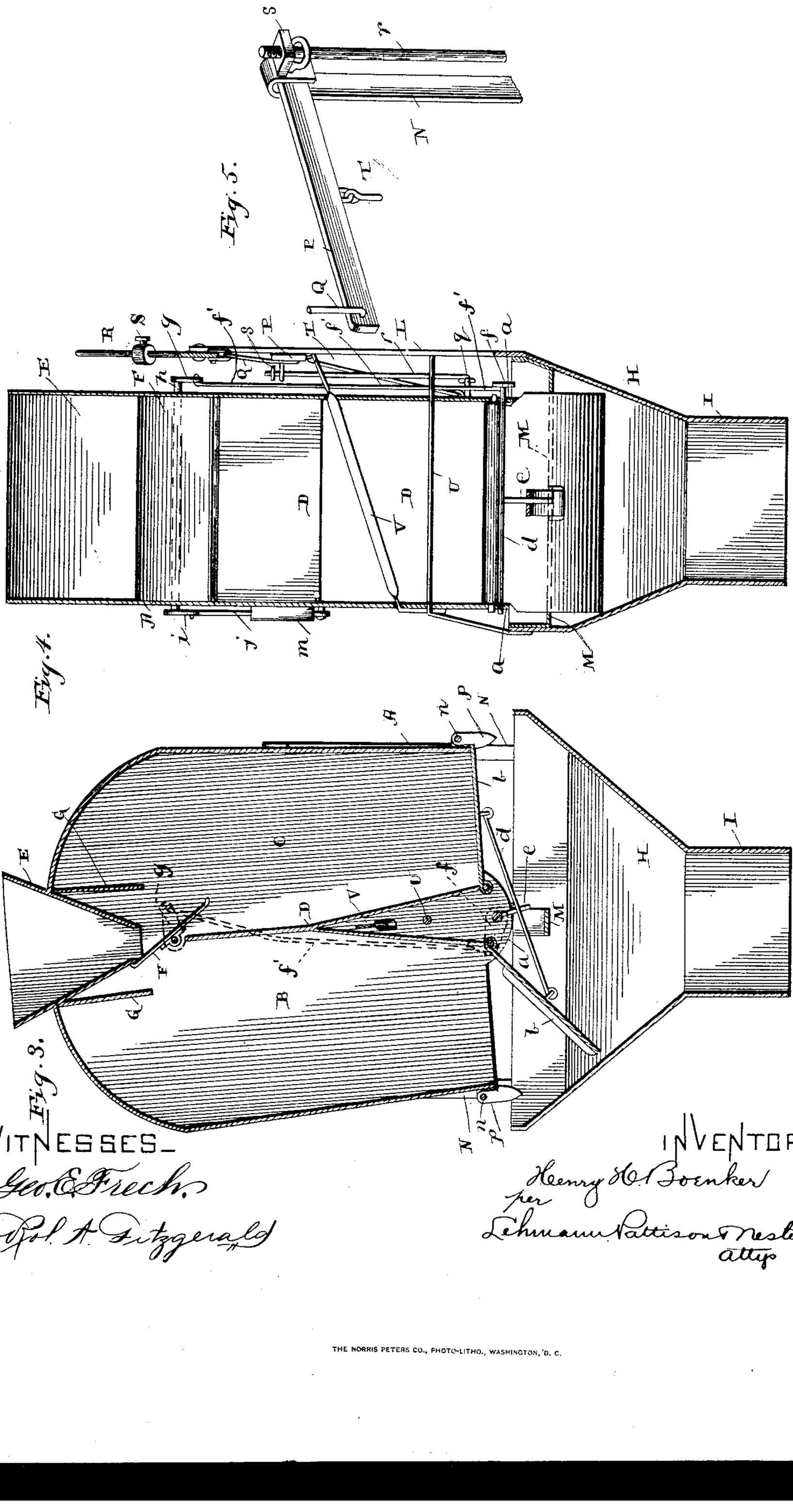

Fig. 5.

Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE.

HENRY H. BOENKER, OF ST. CHARLES, MISSOURI.

OSCILLATING GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 483,417, dated September 27, 1892.

Application filed February 10, 1892. Serial No. 421,010. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. BOENKER, of St. Charles, in the county of St. Charles and State of Missouri, have invented certain new and useful Improvements in a Combined Automatic Weighing and Measuring Machine; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in combined automatic weighing and measuring machines; and it consists in the construction, arrangement, and combination of parts, which will be more fully described hereinafter, and particularly referred to in this specification.

The object of my invention is to provide a machine of the construction hereinafter shown and described, whereby an automatic weighing and measuring machine is produced.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention taken from the side carrying the scale beam or lever. Fig. 2 is a side elevation taken from the opposite side. Fig. 3 is a central vertical longitudinal sectional view. Fig. 4 is a central transverse vertical sectional view. Fig. 5 is a detail view of the upper end of one of the tripping-rods and the upper end of the standard which supports it.

A indicates a hopper, which is divided into the two side chambers B and C by means of a vertical partition D, which at its lower end is bifurcated or divided, as shown, to form a space between the lower ends of the weighing or measuring chambers B and C. At the upper end of the chambers B and C are the two inclined walls E, which have their lower ends a suitable distance above the upper end of the partition D to admit a valve F. This valve F is pivoted between its ends at a point below the lower ends of the walls E, and preferably midway between them, as illustrated. This valve extends entirely across the hopper A and is shifted for the purpose of guiding the grain which falls between the walls E into either of the weighing-chambers, as will appear farther on. Depending from the inner sides of the walls E, and preferably about midway of them, are the vertical short partitions G, which retard the flow of grain to the chamber C, thereby bringing pressure thereon, which assists in holding the valve in place, and this pressure on the lower end of the valve tends to hold the bottoms of the chambers up, thereby relieving the weight of the bottoms upon the holding-catches and reducing friction, as will be more fully described hereinafter. The supporting-frame for this hopper A and the operating mechanism, to be described hereinafter, consists of an outlet portion H, which has a depending mouth I to receive a bag, and this outlet portion H is designed to be attached to the end of a thrashing-machine elevator J by means of a brace K. Projecting from one side of this outlet portion H is a central standard L, which has a lower horizontal portion M, that extends across under the hopper A to the opposite side of the portion H, as shown. Also extending from the same side of this portion H a suitable distance from the said central standard are two other vertical standards N. These standards N have their upper ends bent inward and doubled upon themselves, as shown in Fig. 5, and in these bent portions the outer ends of the bars P are pivoted, which form a part of the weighing mechanism to be now described. The inner ends of these bars have connected to them the connecting rods or wires Q, which have their opposite ends connected to a scale beam or lever R at opposite sides of its pivotal point. This scale-lever is pivoted to the upper end of the central standard and is widened at its lower end to permit of the attachment of the connections at opposite sides of its pivotal point. This scale-lever has its upper end made small, as shown, and provided with a movable weight S, which is held in any desired position thereon by means of a set-screw.

Connections T are connected at their upper ends to the bars P between their ends, the lower ends of these connections being connected with the hopper A at opposite sides of its pivotal rod U. This rod U is connected at one end to the central standard of the supporting-frame and extends horizontally through the hopper to the opposite side of the outlet portion H, and is then bent downward and connected to the said outlet portion.

For the purpose of bracing the central stand-

ard in a vertical position a bar V has one end connected to the said standard near its upper end and passes between the lower divided end of the central partition D and has its opposite end connected with the pivotal bar at its vertical portion. The three standards, which form the supporting-frame, are further braced by a transverse bar W, which connects them near their upper ends.

At the center of the hopper A and at opposite sides of its lower end are the depending portions *a*, in which the two doors *b* for the chambers B and C are pivoted and at different points. These doors are separated from each other and braced and held so that they move together by means of a plate *c*, which has its ends loosely connected thereto; also, passing through these depending portions *a* and midway between the pivotal points of the doors is a rod *d*, which extends entirely across the lower end of the hopper. This rod *d* is made to oscillate, when the doors are alternately opened and closed, by means of a rod *e*, which is rigidly connected with the said rod *d* at its upper end and has its lower end loosely connected with the bar which braces the two doors together by having its lower end pass through a vertical opening made in the said brace. It will be noticed that the rod *e* is about the same length as the crank *a*, whereby the leverage of each upon the shaft *d* is equalized, thus requiring less power to turn the shaft than would be required if the doors were directly connected with the shaft *d* and the rod or lever *e* omitted, as will be readily understood. One end of this oscillating rod *d* is provided with a crank *f*, and this crank is connected by means of a rod with a crank *g*, carried by the rod *h*, which forms the pivotal point for the valve F. This valve F, before described, is rigidly connected with the rod *h* and moves therewith, and connected to the opposite end of this rod *h*, outside of the hopper A, is a second crank *i*. A rod *j* or other connection communicates motion from the crank *i* to a lever *k*, that operates a suitable register *m*. Through the medium of the parts thus described the movement of the doors *b* is made to operate the valve F, and through the medium of the rod *h*, to which the said valve is connected, the crank *i*, and rod *j* a register *m* is operated.

The locking mechanism for the doors consists of the rods *n*, which are pivoted at opposite lower outer corners of the hopper A, and each carries a latch *p*, which catches under and supports the doors alternately. One end of each of these rods *n* is bent to form a crank *q*, which extends outward therefrom, and connected to the outer ends of these cranks are the vertical rods *r*. The upper ends of these rods pass through loops at the inner sides of the upper bent ends of the outside standards of the supporting-frame, as shown in Fig. 5. Each of these rods *r* has its upper end screw-threaded and provided with nuts *s*, which engage the said loops, and thereby stop the descent of the rods and cause the rods *n* to partially turn, and thus throw the latches outward from under the doors. The latches are held normally inward by means of springs *t*, which have one end connected to the hopper and their opposite ends resting upon the upper sides of the cranks of the rods *n*.

The operation of the invention is as follows: Grain passes into the chamber, which has its door closed, owing to the position of the valve F, which guides it therein. The weight is adjusted upon the scale-lever to weigh any desired amount. When this amount is in the said chamber, the hopper A, being pivoted between the chambers, tilts, and this tilting causes a pull upon the tripping-rods, which thereby operate the rods *n*, to which they are connected, which throws the latch outward and allows the door to fall. The falling of the door operates the valve through the mechanism before described and reverses it, so that it will guide the grain to the opposite chamber. The weight of the grain upon the closed door causes the other door to swing shut and it is caught by its catch. Thus the grain is guided alternately into the chambers B and C, which are at opposite sides of the hopper A.

If it is desired to measure the chambers full each time, the weight is adjusted upon the scale-lever so that it will not tilt until the grain has run the chamber full and part into the mouth of the hopper. Then when the hopper tilts the valve F is turned, which cuts the grain off, leaving the chamber even full and guides the surplus grain into the opposite chamber.

Owing to the adjustable nuts upon the upper ends of the tripping-rods, as shown in Fig. 5, the doors can be made to open when the hopper has tilted the slightest amount; or the hopper can be allowed to tilt considerably before they are tripped by adjusting the nuts, as will be readily seen.

For the purpose of limiting the sidewise-movement of the upper end of the scale-lever a U-shaped stop *w* is secured to the hopper and which is in the path traveled by the scale-lever. In this manner the scale-lever is stopped at the same distance from the center of gravity at each side thereof.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A pivoted hopper having a chamber at each side of its pivotal point, a weighing mechanism connected with the said hopper, doors for the lower ends of the chambers, a valve pivoted between its ends between the upper ends of the chambers, a rod passing under the hopper, a brace connecting the doors, a connection between the rod and the brace, and a connection between the rod and the valve, whereby the valve is operated by the movement of the doors, the parts combined substantially as set forth.

2. A weighing-machine comprising a piv-

oted hopper having a chamber at each side thereof, a weighing mechanism connected with the hopper, a shaft extending through the upper end of the hopper between the said chambers, a valve connected between its ends to the said rod, a crank at one end of the said valve-rod, doors for the lower ends of the chambers, a brace connecting the doors, a shaft journaled above the said brace, carrying a depending arm which has its lower end connected with the brace and whereby more leverage is obtained, a crank at one end of the rod, and a connection between this crank and the crank of the said valve-rod, substantially as specified.

3. A weighing-machine comprising a pivoted hopper having a chamber at each side thereof, doors for the lower ends of the chambers, a tilting valve at the upper ends of the chambers, a connection between the doors and the valve for operating the latter, a holding and tripping mechanism for the doors, a scale-lever pivoted at its lower end and carrying an adjustable weight at its upper end, bars pivotally supported at their outer ends, connections between the inner ends of the bars and opposite sides of the pivotal point of the scale-lever, and a connection connected with the said bars between their ends and at their opposite ends to the hopper at opposite sides of its pivotal point, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY H. BOENKER.

Witnesses:
J. H. GRUER,
H. E. VOGELSMEIER.