

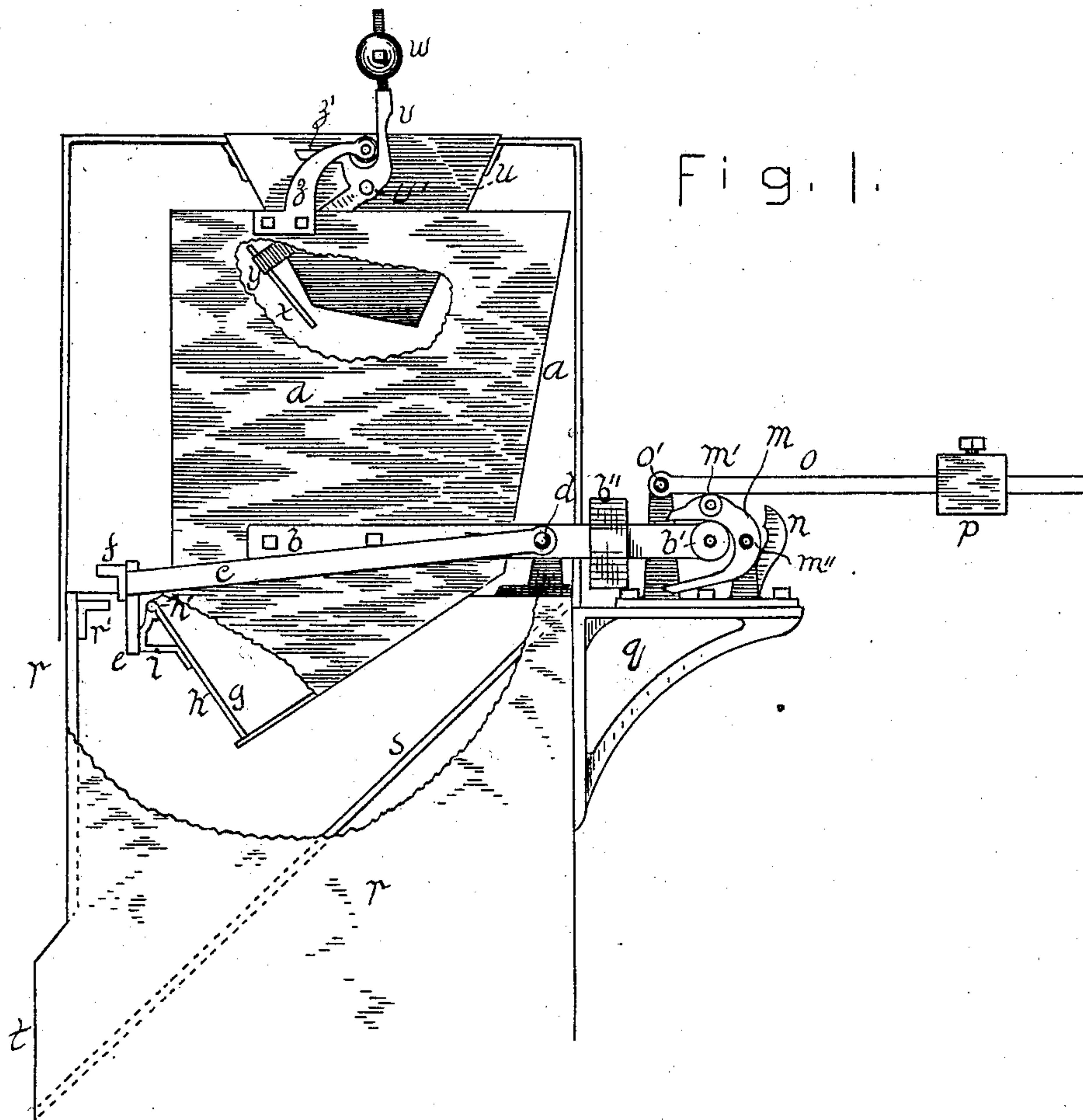
(No Model.)

2 Sheets—Sheet 1.

C. J. HARTLEY.
AUTOMATIC GRAIN SCALE.

No. 379,954.

Patented Mar. 27, 1888.



ATTEST.
Henry Metz.
W. W. Graham.

INVENTOR:
C. J. HARTLEY,
By L. P. Graham,
his attorney.

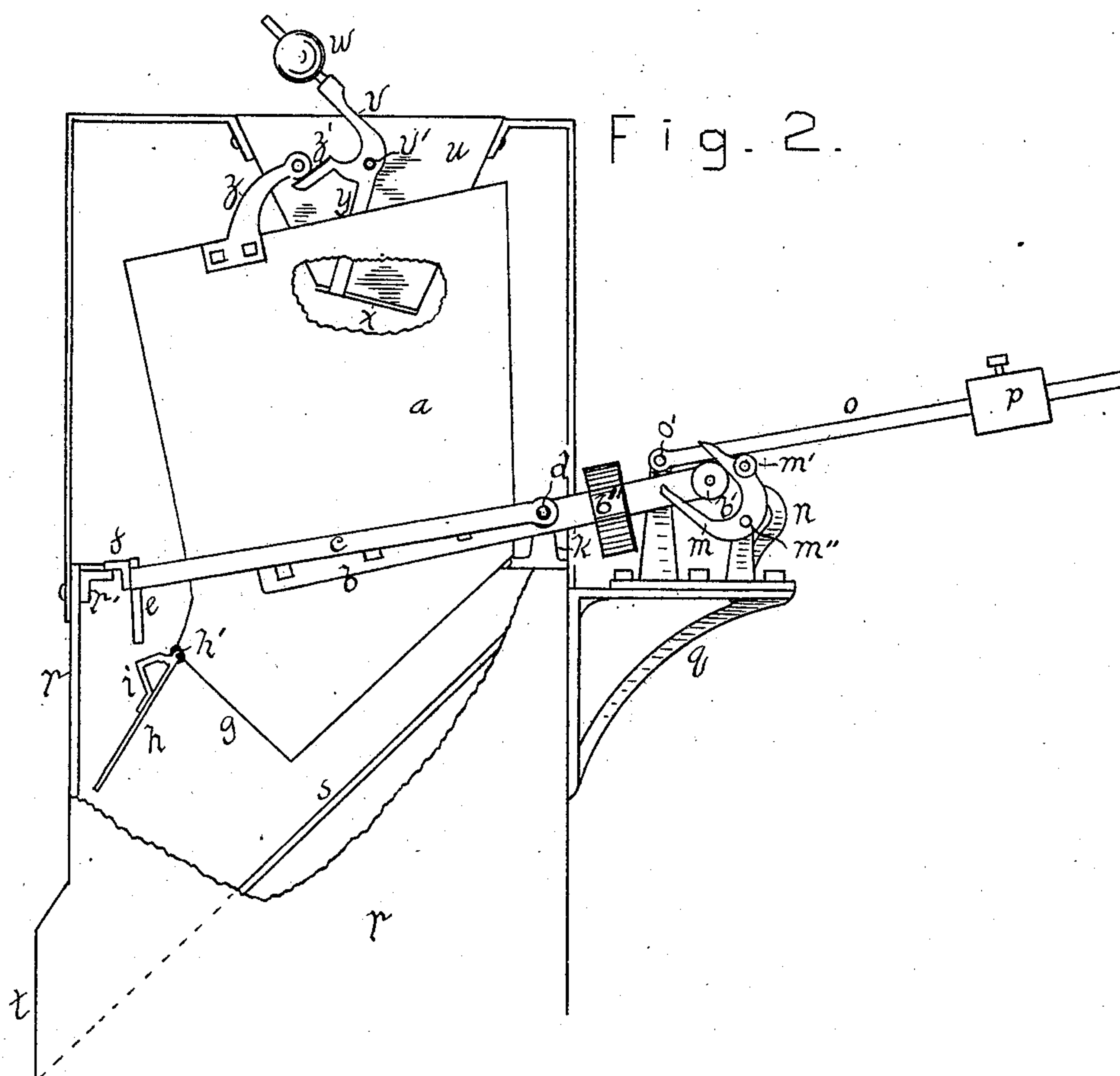
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UNITED STATES PATENT OFFICE.

CHARLES J. HARTLEY, OF DECATUR, ILLINOIS.

AUTOMATIC GRAIN-SCALE.

SPECIFICATION forming part of Letters Patent No. 379,954, dated March 27, 1888.

Application filed September 24, 1887. Serial No. 250,559. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. HARTLEY, of the city of Decatur, county of Macon, and State of Illinois, have invented certain new and useful Improvements in Automatic Grain-Scales, of which the following is a specification.

My invention is designed to provide means for automatically weighing a continuous flow of grain; and it consists in certain combinations, sub-combinations, details of construction, and relative arrangement of parts, as hereinafter set forth in detail and specifically claimed.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side elevation of my device in condition to receive grain into the weighing-receptacle, and Fig. 2 is a similar view showing the parts in condition to discharge grain from the weighing-receptacle.

In both figures parts of casings are represented as broken in order to expose the operation of essential parts that would otherwise be hidden from view.

The weighing-receptacle *a* is supported on either side by a bar, *b*, that pivots at *d* on a bracket, *k*, attached to the stationary frame *r*. An extension of bar *b* is provided at *b'* with an anti-friction roller. Pivoted at *m''* on a bracket supported from the stationary frame is a yoke, *m*, that embraces the anti-friction roller *b'*. On the upper part of the yoke is an anti-friction roller, *m'*, on which scale-beam *o* rests. The scale-beam is pivoted at *o'* and provided with sliding weight *p*. Bracket *q*, secured to the stationary frame, provides supports for the pivots of the yoke *m* and the scale-beam. A swinging frame, *c*, pivots at *d* and carries at its outer end the lock-bar *e* and the trip projection *f*. The stationary frame has the chute-incline *s*, terminating in discharge-outlet *t*, and also has the trip-block *r'*. The bottom of the weighing-receptacle is formed of two inclined surfaces, the one nearer the pivot permanent, the other swinging.

The swinging surface *h* forms a door or valve to close discharge-opening *g*, and it is hinged at *h'* and provided with cam projection *i*, that co-operates with the lock-bar to hold the door closed while the weighing-receptacle is filling. The grain passes into the weighing-receptacle

through the stationary hopper *u*. A yoke, *v*, pivots on the hopper at *v'* and carries an upward-extension supporting-weight, *w*, a lower extension, *y*, attached to door *x*, and a lateral extension, *z*, that co-operates with the trip-arm *z* of the weighing-receptacle. A stop, *n*, on bracket *q* limits the rocking motion of the yoke *m*. A counterpoise, *b''*, slightly overbalances the empty weighing-receptacle.

As shown in Fig. 1, the bars *b* and scale-beam *o* are horizontal, the weighing-receptacle is vertical, or nearly so, the roller *m'* of the yoke is vertically coincident with roller *b'*, the door *h* is held closed by the pressure of the lock-bar *e* against cam projection *i*, and the door of the hopper is held open by pressure of arm *z* against yoke *v*.

When a quantity of grain sufficient to raise the weight of the scale-beam is accumulated in receptacle *a*, the result will be as follows: The receptacle and the frame *c* will descend together until the arm *z* has tripped extension *z'* and permitted the weight *w* to close the door of the hopper, when projection *f* will strike the stop-block *r'* and permit the cam projection *i* of door *h* to swing clear of lock-bar *e*. The door *h* then will swing open by inherent gravity, pressure of grain, and momentum combined, permitting the grain to escape from the machine and leaving all the parts momentarily in the position shown in Fig. 2.

During the descent of the receptacle the bearing *m'* has been constantly shifting toward the weight, and the motion of the receptacle has been accelerated thereby; but a more potent means for effecting such acceleration has been provided in the peculiar proportion and relative arrangement of the yoke that causes the weight to be constantly shifted from roller *b'* to bearing *m'*. This peculiarity will be comprehended after a reference to the drawings, Fig. 1 showing the weight applied to the roller *b'* as directly as if roller *m'* did not intervene, and Fig. 2 showing the weight resting almost entirely on the bearing of the yoke. The necessity for an acceleration of the motion of the descending receptacle arises from the work to be done after the flow of grain has ceased. To weigh accurately the flow of grain must be arrested at the instant the scale-beam breaks its balance, and without special provision the

loaded receptacle, barely overbalanced, cannot be relied on to perform the subsequent motions necessary to insure a discharge of its contents. The pressure of the grain on door *h*, exerted through cam projection *i* on lock-bar *e*, develops a considerable amount of friction that must be overcome before the grain can escape; and it will be apparent that if the scale-beam *o* were a continuation of bar *b* the momentum of the receptacle would not ordinarily be sufficient to force the cam from contact with the lock-bar at the time projection *f* strikes stop-block *r'*. The angle of oscillation prior to the arrest of frame *c* is about three degrees—too small to seriously affect the relation of weight and power in an ordinary lever, but quite sufficient to develop the result herein set forth.

The small degree of oscillation lessens the momentum and consequent jar in all the parts—a matter of economical and vital importance in a machine having reciprocating motion and requiring nice adjustment. The initial motion of the weighing-receptacle is exerted on the nicely-balanced weight-yoke *v*, and in the reverse operation the arm *z* is not burdened with the weight of the hopper-valve until roller *m'* is in position to impart a material degree of the weight of the scale-beam to roller *b'*.

The operation of the device is a continued oscillation from the condition set forth in one figure of the drawings to that set forth in the other. The empty hopper is closed before the filled receptacle is opened, and the empty receptacle is closed before the filled hopper is opened, the words "filled" and "empty" being applied to the hopper in a comparative sense.

The supporting-bars *b* are levers of the first class. The scale-beam is a lever of the second class. The yoke is practically a point of con-

tact between the roller *b'* and the scale-beam when in the position shown in Fig. 1; but in the position shown in Fig. 2 it supports the scale-beam very nearly clear of the roller *b'*.

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

1. In grain-scales, in combination, the pivoted frame *b*, carrying the weighing-receptacle and extending beyond its pivot, the yoke *m*, resting on the frame, and the scale-beam *o*, resting on the yoke, as and for the purpose set forth.

2. In grain-scales, in combination, the pivoted frame *b*, carrying the weighing-receptacle and extending beyond its pivot, the yoke *m*, resting on the frame, the scale-beam resting on the yoke, the hinged door *h*, provided with cam projection *i* and adapted to close the discharge-opening *g* of the weighing-receptacle, and the lock-frame *c*, having bar *e* and a trip projection, as and for the purpose set forth.

3. In grain-scales, in combination, the pivoted receptacle *a*, the hinged door *h*, provided with cam projection *i* and adapted to close the discharge-opening *g* of the receptacle *a*, and the lock-frame *c*, having bar *e* and a trip projection, as and for the purpose set forth.

4. In grain-scales, in combination, the pivoted weighing-receptacle *a*, the hinged door *h*, provided with cam projection *i* and adapted to close the discharge-opening *g* of the weighing-receptacle, the lock-frame *c*, having bar *e* and a trip projection, the stationary hopper *u* over the receptacle, the yoke *v*, the arms *y*, carrying door *x*, the upwardly-poised weight *w*, and the trip-arm *z* on the receptacle, as and for the purpose set forth.

CHARLES J. HARTLEY.

In presence of—

JOHN B. PRESTLEY,
WALTER C. KEELER.