

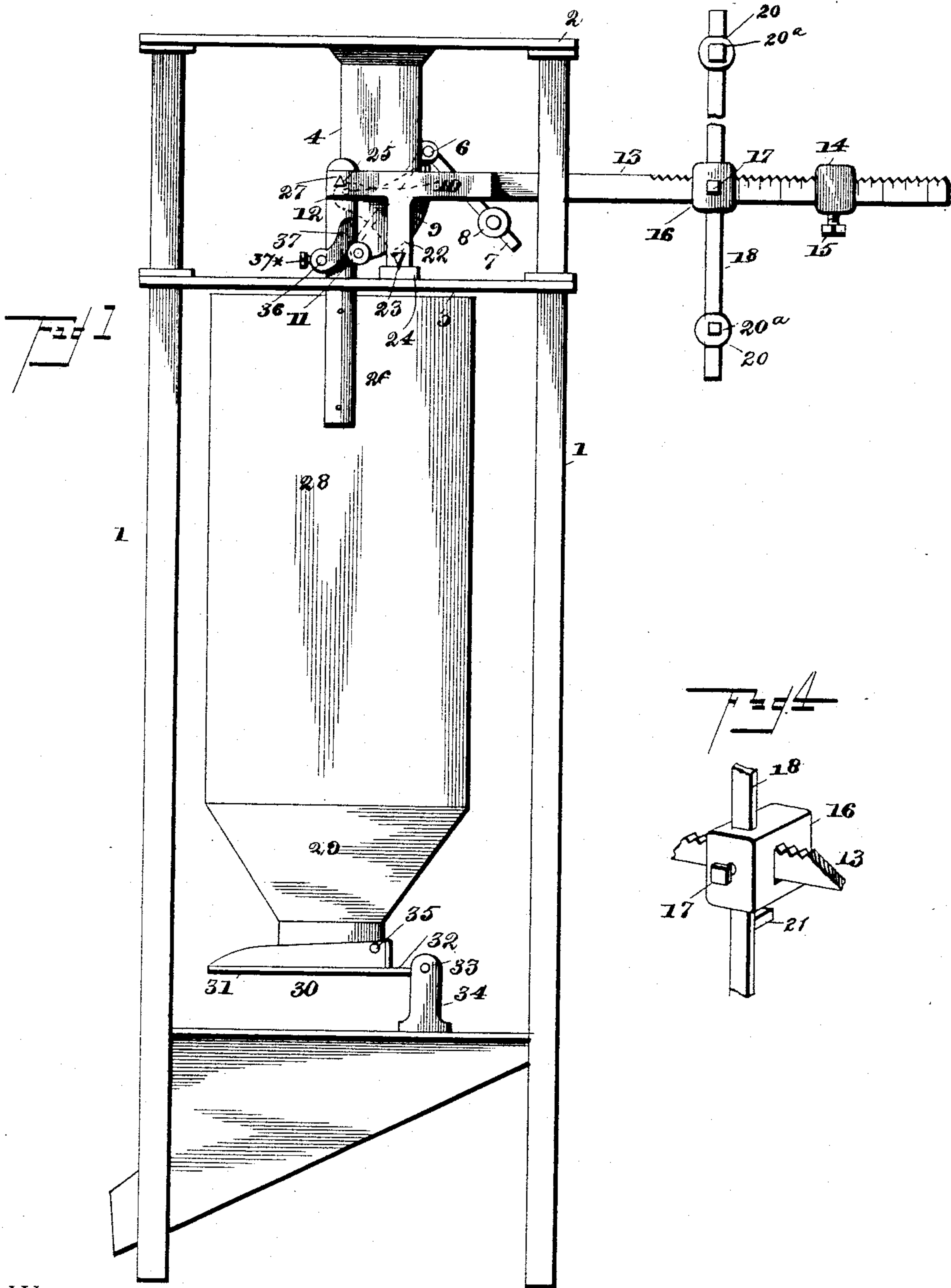
(No Model.)

3 Sheets—Sheet 1.

H. E. HAWK.  
AUTOMATIC GRAIN SCALES.

No. 440,355.

Patented Nov. 11, 1890.



Witnesses:

*John Inman*  
*W. J. Duvall*  
By his Attorneys,

Inventor

*Hale E. Hawk*

*C. A. Snow & Co.*

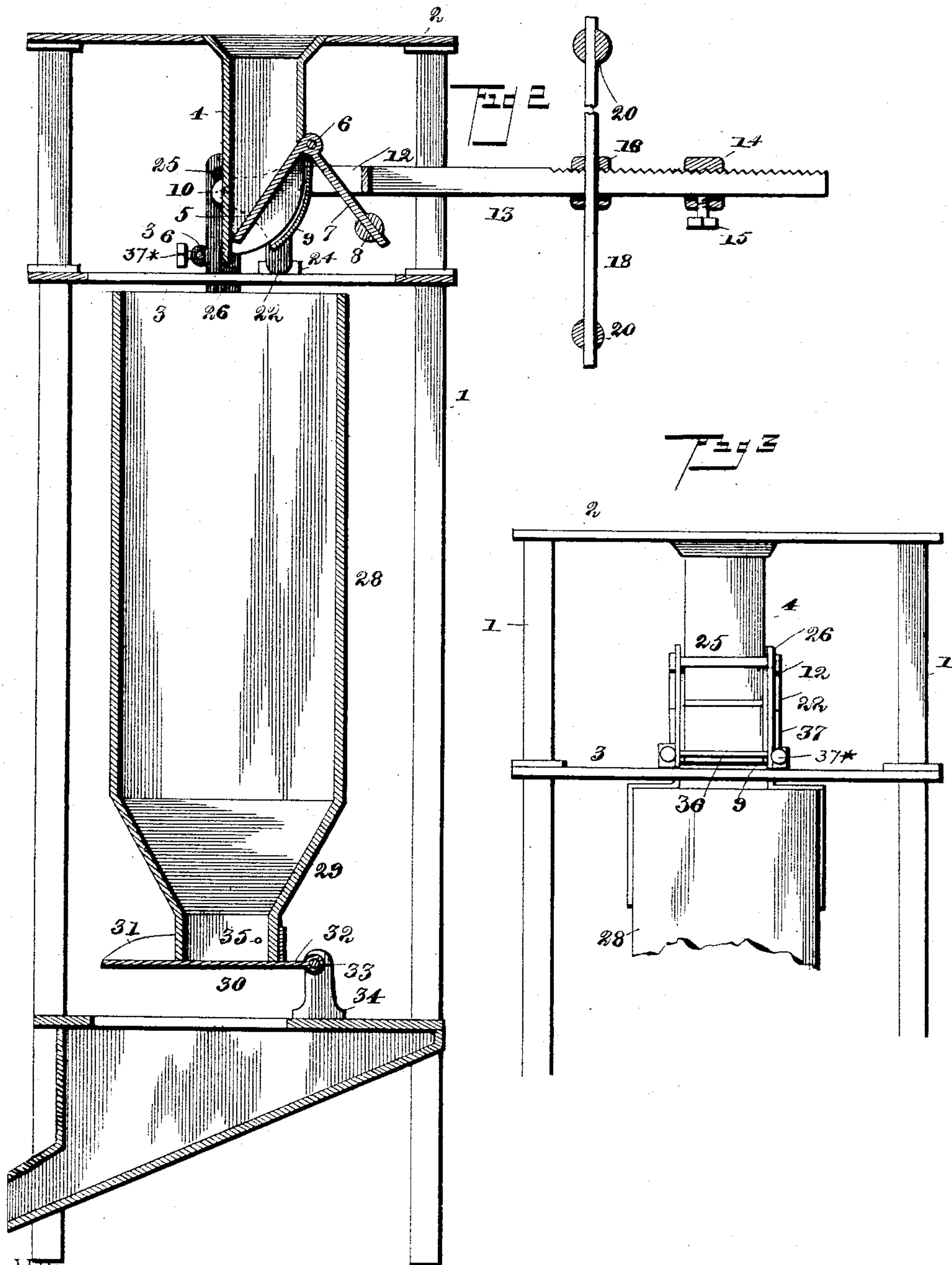
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3 Sheets—Sheet 2.

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AUTOMATIC GRAIN SCALES.

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Witnesses:

*John Emrie*  
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Fig. 5.

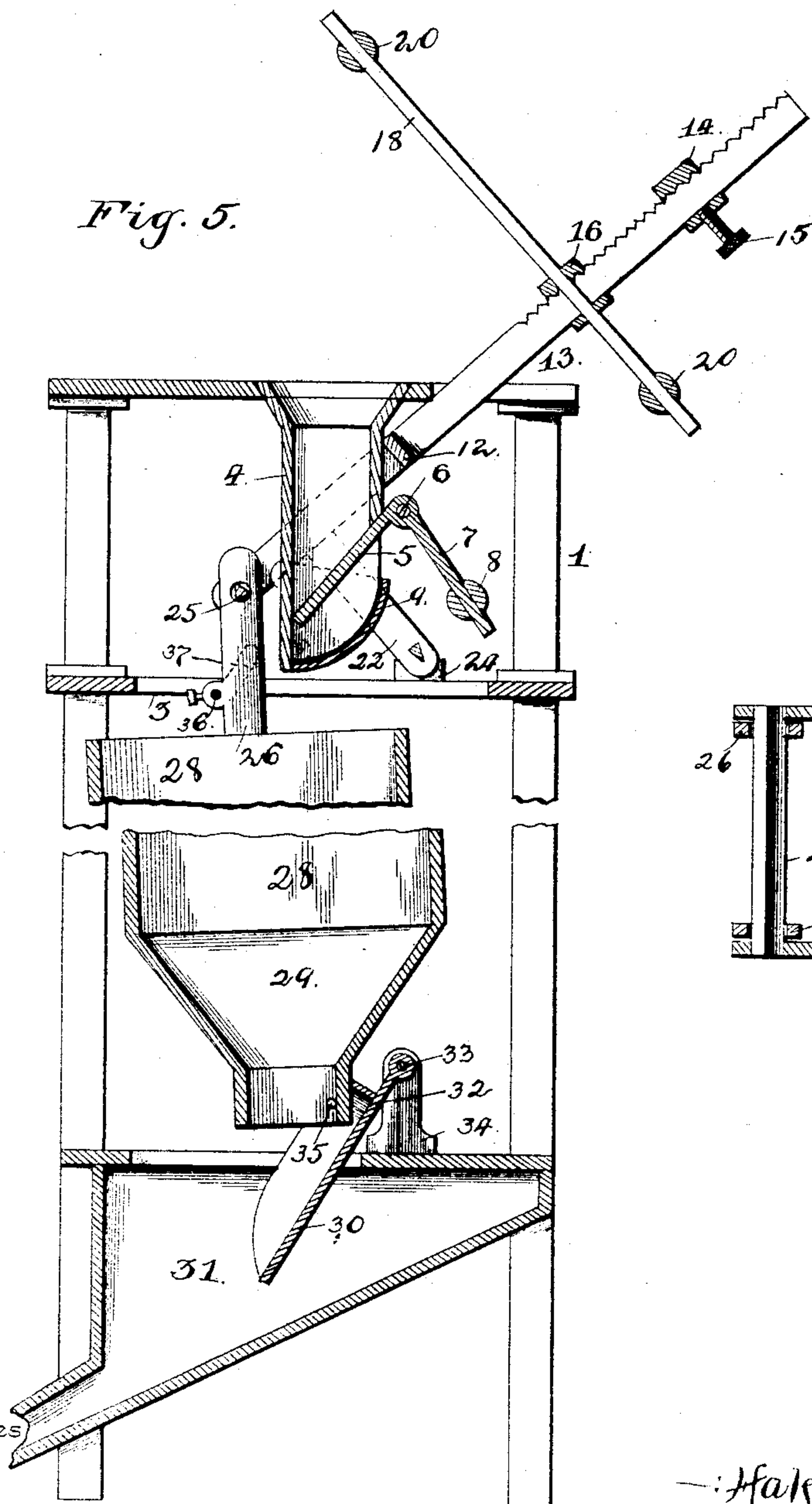
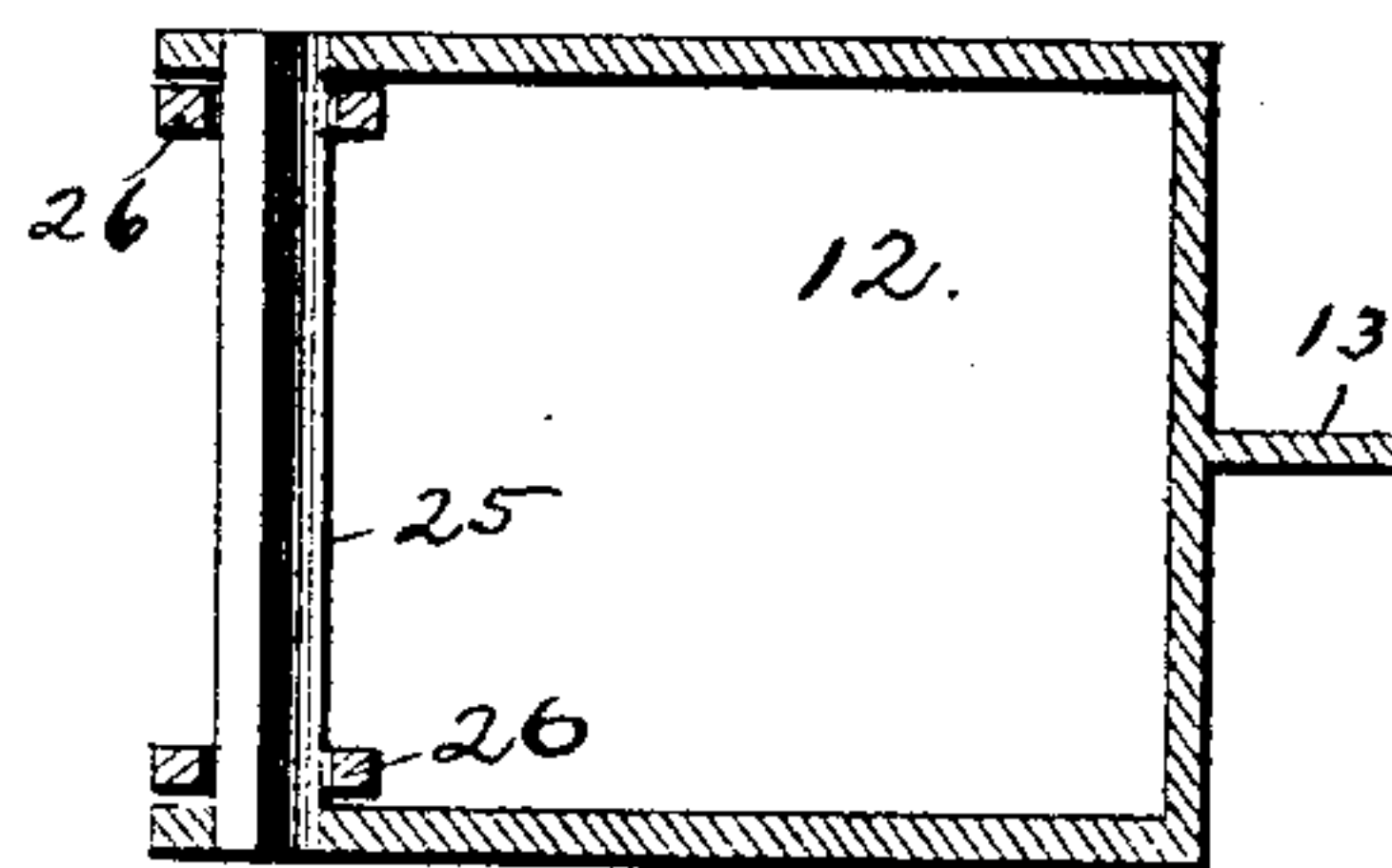


Fig. 6.



Witnesses

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# UNITED STATES PATENT OFFICE.

HALE E. HAWK, OF BUCYRUS, OHIO.

## AUTOMATIC GRAIN-SCALES.

SPECIFICATION forming part of Letters Patent No. 440,355, dated November 11, 1890.

Application filed February 11, 1890. Serial No. 340,002. (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 Automatic Grain-Scale, of which the following is a specification.

This invention has relation to grain weighing and delivery mechanism, and among the objects in view is to provide a mechanism of the class specified that is adapted to automatically and rapidly weigh and deliver predetermined quantities of grain.

A further object of the invention is to accomplish the above in a cheap and simple manner, and by means of a suitable system of adjustable weights and counterpoise so arranged as to exert a minimum amount of weight at the time that the scale is discharging, whereby a complete discharge takes place, and the hopper is not returned for a refilling until all of the grain has been exhausted therefrom.

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

I do not herein broadly claim the delivery-pan pivoted to the hopper and in rear of the same to a fixed standard, as such forms a part of the subject-matter of a companion application filed November 30, 1889, and bearing Serial No. 332,133.

Referring to the drawings, Figure 1 is a side elevation of a grain meter and delivering apparatus constructed in accordance with my invention. Fig. 2 is a central vertical section of the same. Fig. 3 is a front elevation. Fig. 4 is a detail in perspective. Fig. 5 is a longitudinal vertical section showing the parts in their position when in the act of dumping. Fig. 6 is a horizontal section to show the connection between the scale-beam and the straps of the hopper.

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

The frame-work of the apparatus comprises four posts 1, the upper ends of which support a platform 2, and said posts are connected below the platform by cross-bars 3, forming a rectangular frame. The platform 2 is provided with a depending chute 4, which

may be of any suitable length, the lower end of which has its side walls cut away or curved, and within said chute, near its bottom, there is mounted an inclined break-board 5, the upper end of which is pivoted upon a transverse rod 6, and from said board and outside of the chute there depends an inclined arm 7, upon which is mounted an adjustable weight 8, the weight of which about equals that of the board. The grain, passing down the chute, will of course throw the board to about a vertical position, and will serve as a break to the intermittent falling of grain—as, for instance, when delivered by an endless carrier provided with grain-conveying cups or buckets—whereby large quantities of grain are discharged in rapid succession into the chute. By the provision of this break-board the mechanism hereinafter described is not in any way influenced by such successive discharges but a steady stream will fall from the mouth of the chute regardless of the manner in which the grain is received at the upper end thereof.

9 represents a quadrant-shaped cut-off, the upper end of which is pivoted, as at 10, at the lower end of the chute, the bottom of the cut-off, therefore, being curved and inclined and adapted to fall by gravity and close the mouth of the chute were no means provided for maintaining the same in an open position at one side of the mouth. The side walls of the cut-off are each provided with an exteriorly-mounted friction-roller 11.

12 represents a U-shaped yoke or bail, which embraces loosely the lower end of the chute, the rear portion of the bail being extended to form or provided with a horizontal scale-beam 13, which projects laterally from between the rear standards or posts 1, and is graduated in the usual manner and provided with a movable weight 14, carrying a set-screw 15, designed to impinge upon the beam. Between the weight and the bail there is also mounted a sleeve 16, provided with a set-screw 21, by which said sleeve may be adjusted upon any portion of the beam 13. A rod 18 is passed vertically through a suitable opening formed in the sleeve 16, and the ends of the rod project above and below the sleeve, and are each provided with a counterpoise 20, adjustable upon the rod by set-screws 20<sup>a</sup>.



The rod is vertically movable in the poise and adjustable by the set-screw 17.

From each of the opposite terminals of the U-shaped yoke or bail there depends, and at a right angle thereto, an arm or branch 22, each of which near its lowest end is provided upon its exterior with a beveled lug or what might be termed a "knife-bearing" lug 23, the lower contracted edge of which takes bearing upon a bearing-block 24. This bearing serves as the fulcrum for the scale-beam, as will be most readily understood. The free ends or terminals of the bail or yoke are provided with knife-bearings 25, and upon the same there is loosely suspended a pair of depending straps or hangers 26, the upper ends of which are provided with bearing-blocks 27, which receive the contracted ends of the knife-bearing lugs. The lower ends of the hangers 26 embrace and are rigidly secured to the hopper 28, which by reason of the mechanism described is suspended within the frame and adapted for vertical movement therein. The lower end of the hopper is contracted to form a neck 29, the mouth of which is normally closed by a delivery pan or cut-off 30, the front or delivering end of which is extended considerably beyond the wall of the hopper, as at 31, and the rear end of which is projected beyond the opposite wall of the hopper, as at 32, and pivoted, as at 33, in a pair of bearing-ears 34. The sides of the pan are pivoted, as at 35, to the lower or extreme portion of the neck of the hopper.

The hangers 26 are connected together above the mouth of the hopper by a transverse connecting-rod 36, which rod projects at each side of the hangers and has mounted thereon a pair of cams 37, the inner faces of which are curved or cam-shaped and are in line with and adapted to actuate or bear upon the friction-rollers 11. These cams are adjustable, so as to vary the effect upon the rollers, by means of set-bolts 37<sup>x</sup>, which pass through the rear ends of the cams and impinge upon the rod 36, and by this means the quadrant-shaped cut-off 9 may be opened or swung away from the mouth of the chute to a greater or lesser degree. The counterpoise 20 is adjusted upon the scale-beam 13, so as to nearly counterbalance the beam 13 when the movable hopper 28 is discharging.

The operation of my invention, it is believed, will be apparent from the above description, but may be briefly stated as follows: The grain first passes into the chute 4, where the fall of the same is broken by the break-board in the manner before described. The movable hopper, being empty, will of course be in an elevated position, the cams 37 pressing against the rollers 11 and opening the cut-off 9, which will permit a steady stream of grain to fall into the hopper 28. When the weight of the grain is sufficient to overcome or counterbalance the weight 14 and the poise, which it will be understood has been previously set to the desired degree on the scale-

beam, said hopper will descend, and the cut-off 9, being uninfluenced any further by the cams acting upon the rollers, will automatically close by gravity, thus shutting off the supply of grain to the movable hopper. As the hopper descends by reason of its being pivoted, as at 35 and 33, the delivery-pan 30 will be inclined, so as to deliver grain into any receptacle placed under the same, which may be bins, bags, the holds of vessels, cars, &c. When the grain in the hopper 28 raises the scale-beam, the hopper lowers and the said beam rises until it nearly assumes a vertical position. The poise 20, together with its rod 18, has been previously set or adjusted so that the upper poise passes beyond the fulcrum of the scale-beam, when the beam is thus elevated, and the two poises act as a counterbalance and nearly evenly balance the beam in its elevated position until the very last grain is discharged, when the parts resume their position, the counterpoises being so adjusted as to return the parts, and the cams 37 will again open the cut-off and the operation of refilling commence.

Having thus described my invention, I claim—

1. In a combined grain meter and delivery apparatus, the combination, with a scale-beam 13, of a fulcrum for the beam, a movable hopper 28, pivotally connected to the inner end of the beam, a weight 14, mounted on the beam, an adjustable sleeve 16, and a vertical rod 18, mounted in the same and provided at its opposite ends with counterpoises, substantially as specified.

2. The combination, with a discharge-chute, of a cut-off 9 of quadrant shape, pivoted within the chute and adapted to close by gravity, and provided with opposite friction-rollers, the scale-beam 13, terminating at its inner end in a yoke and having depending fulcrum-arms provided with knife-bearing lugs, a movable hopper 28 below the cut-off and having an opposite knife-bearing pivoted within the ends of the bail, and the cams 37, having set-screws for adjusting the same, substantially as specified.

3. The stationary chute 4, the break-board 5, mounted in the chute and terminating outside of the same in an inclined arm, and a weight mounted on the arm, the scale-beam 13, carrying the weight 14, the sleeve 16, having the screw 17, and the vertical rod 18, mounted in the sleeve 16, and the counterpoise 20, adjustably mounted on the rod, said beam terminating at its front end in the bail or yoke 12; having the fulcrum-arms 22, provided with knife-edges 23, the cut-off 9, pivoted to the chute and provided with the opposite friction-rollers 11, the movable hopper 28, having straps 26, which at their upper ends are provided with knife-bearing pivotal connection with the scale-beam, the connecting-bar 36, the opposite cams 37, mounted thereon and adapted to operate upon the friction-roller, and the bottom 30, pivoted, as at



35, to the sides of the hopper, extending beyond the front edges of the same, as at 31, and in rear thereof, as at 32, which latter portion is pivoted, as at 33, to the ears 34, substantially as specified.

4. The stationary chute 4, the break-board 5, mounted in the chute and terminating outside of the same in an inclined arm, and a weight mounted on the arm, the scale-beam 10 13, carrying the weight 14, said beam terminating at its front end in the bail or yoke 12, having the fulcrum-arms 22, provided with knife-edges 23, the cut-off 9, pivoted to the chute and provided with the opposite friction-rollers 11, the movable hopper 28, having 15 straps 26, which at their upper ends are provided with knife-bearing pivotal connection with the scale-beam, the connecting-bar 36, the opposite cams 37, mounted thereon and 20 adapted to operate upon the friction-roller, and the bottom 30, pivoted, as at 35, to the sides of the hopper, which latter portion is pivoted, as at 33, substantially as specified.

5. In a grain-meter, the combination, with 25 the receiving-chute 4, having cut-off 9, the

vertically-movable hopper 28, the pivoted pan 30 at the bottom of the hopper, and the scale-beam 13, from which the hopper is suspended by the common knife-edge connection, of the adjustable weight 14 on the beam and the adjustable counterpoise 18, substantially as set forth. 30

6. In a grain-meter, the combination, with the receiving-chute 4, having cut-off 9, the vertically-movable hopper 28, adapted to hold 35 the cut-off open, the pivoted pan 30 at the bottom of the hopper, and the scale-beam 13, from which the hopper is suspended by the common knife-edge connection, of the adjustable weight 14 on the beam, the rollers on 40 the cut-off, and the adjustable cams on the hopper to act on the rollers, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 45 presence of two witnesses.

HALE E. HAWK.

Witnesses:

E. H. McCOMB,  
G. E. WALTER.