(No Model.)

2 Sheets—Sheet 1.

W. HOWARD.

GRAIN METER.

No. 503,746. Patented Aug. 22, 1893.

Fig. 1.

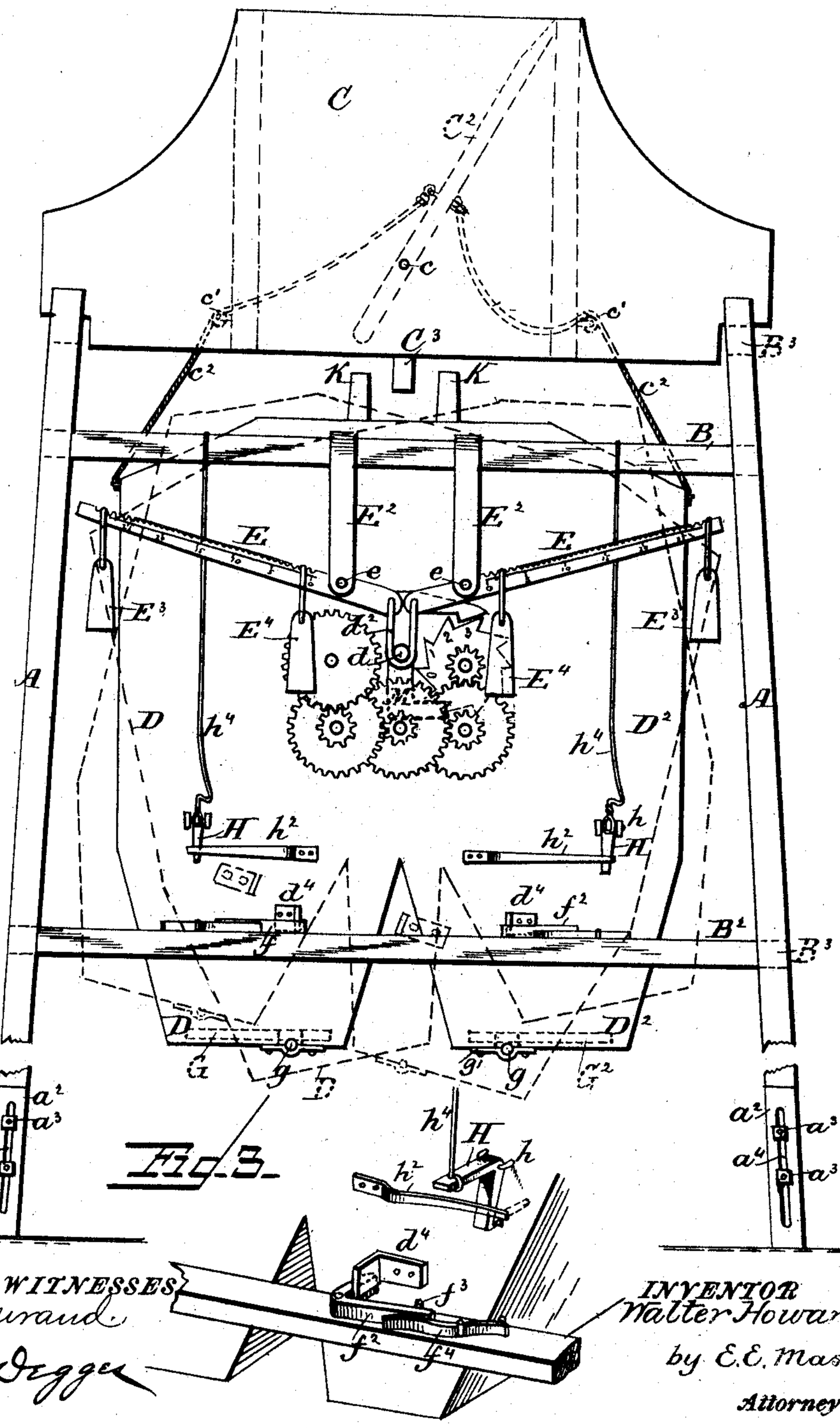

Fig. 3.

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4

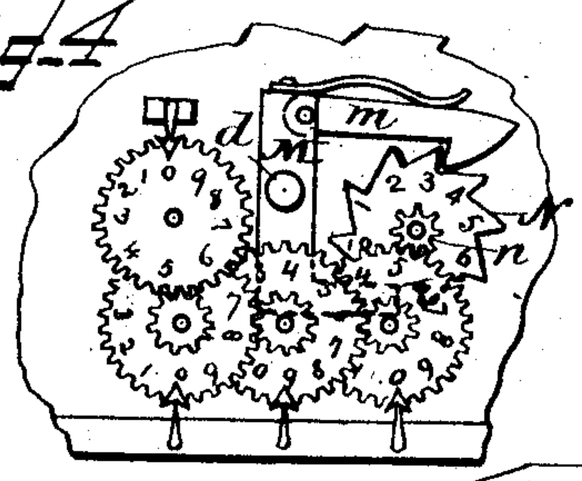


Fig. 2

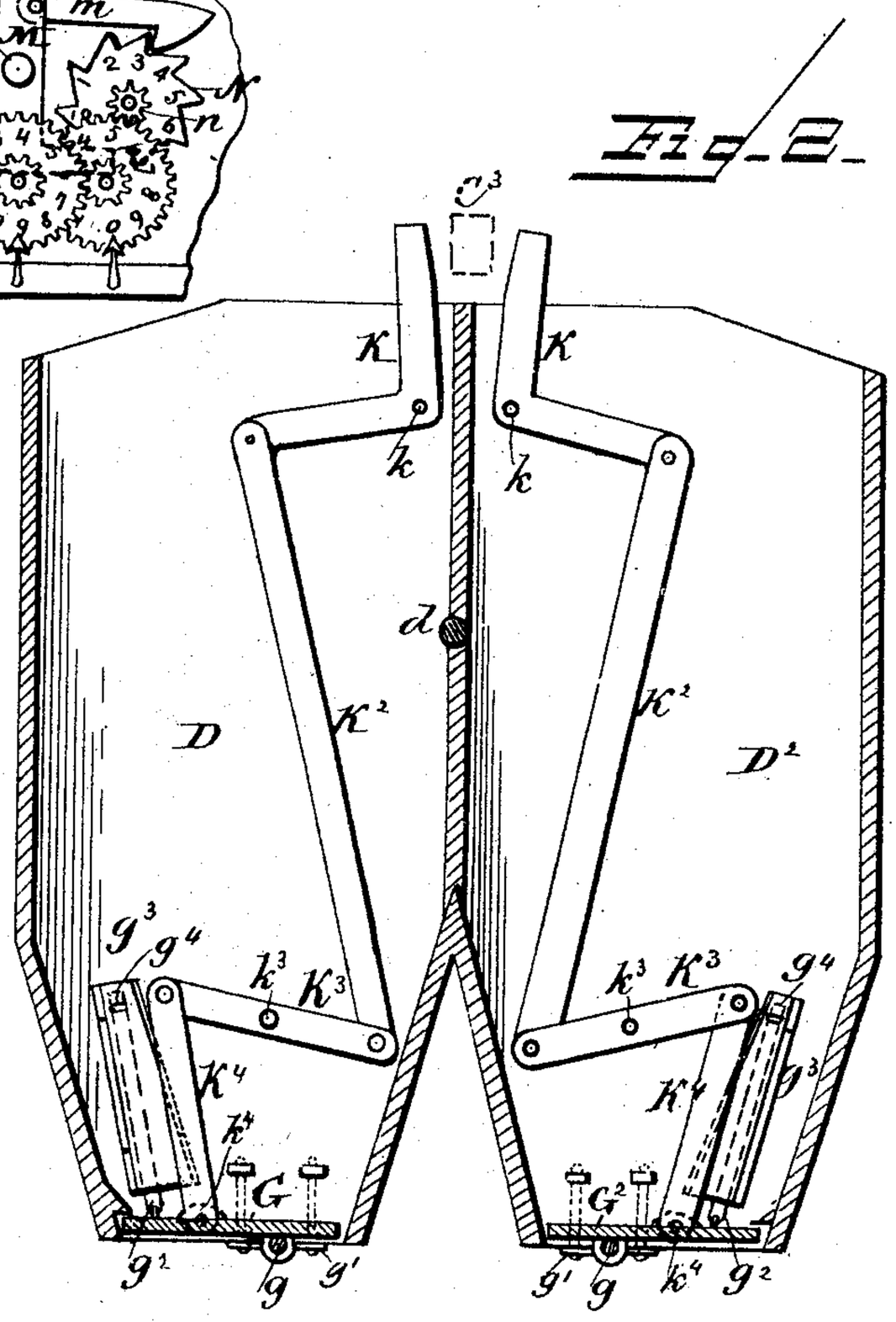


Fig. 7

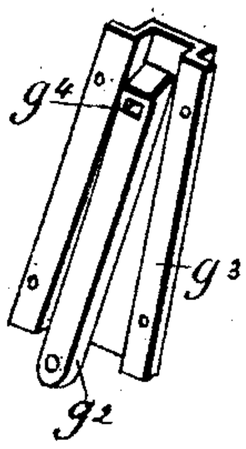


Fig. 6

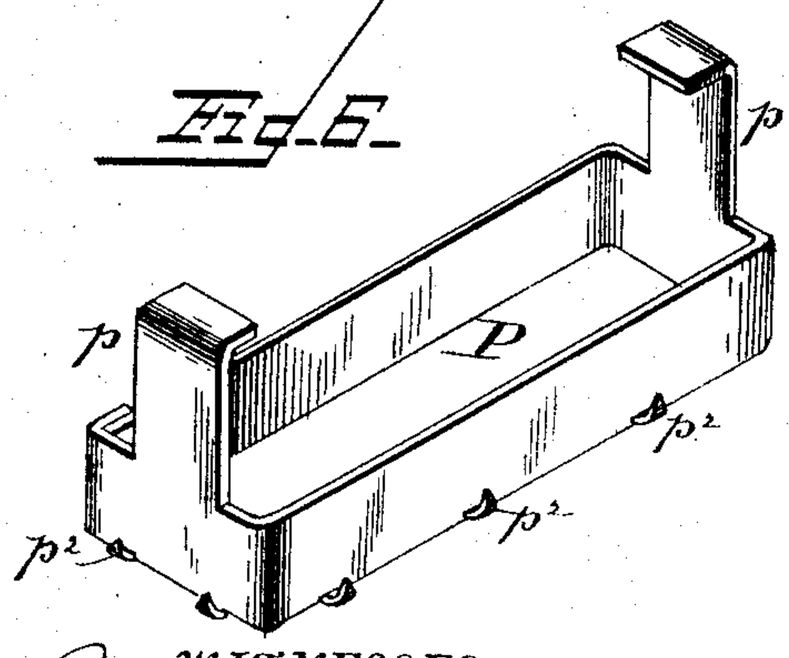
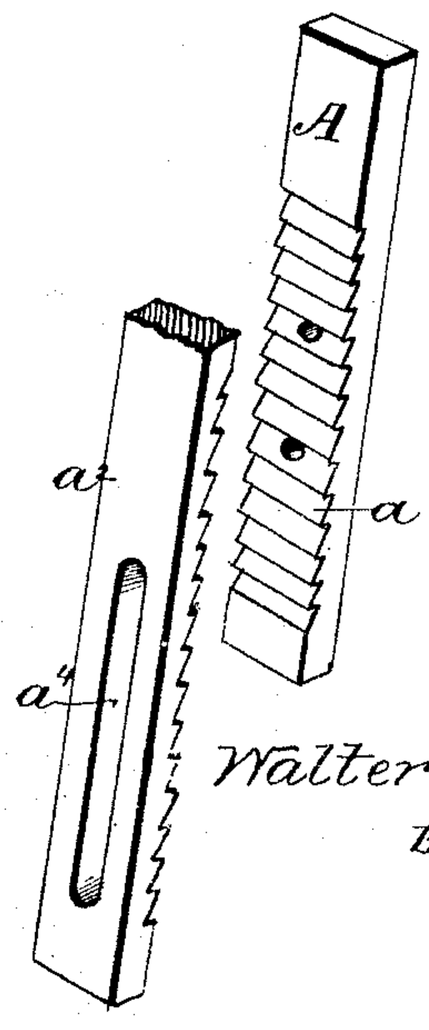


Fig. 5



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UNITED STATES PATENT OFFICE.

WALTER HOWARD, OF WASHINGTON, DISTRICT OF COLUMBIA.

GRAIN-METER.

SPECIFICATION forming part of Letters Patent No. 503,746, dated August 22, 1893.

Application filed March 17, 1893. Serial No. 466,489. (No model.)

To all whom it may concern:

Be it known that I, WALTER HOWARD, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Automatic Grain Meters and Registers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that class of grain meters that are provided with twin-bins adapted to be oscillated and alternately filled and emptied automatically; and the objects of my improvement are to provide a simple, reliable and comparatively inexpensive apparatus of this class. I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1, is a side view of a grain meter and register constructed in accordance with my invention. Fig. 2, is a longitudinal vertical section of the twin-bin of the apparatus. Fig. 3, is a perspective view of the lower portion of said twin-bin showing the latches attached thereto. Fig. 4, is a side view of the escapement-register of the apparatus. Fig. 5 is a perspective view of the lower portion of one of the legs of the apparatus with the adjustable extension therefor. Fig. 6, is a perspective view of a bag-retaining support to be used with the apparatus. Fig. 7 is a perspective view of the inner side of one of the door retaining straps and its guide-shield.

In said drawings A represents the uprights of the frame that are united together by the horizontal joists B and B^2, and also transversely by joists B^3 shown by dotted lines in Fig. 1. On top of the upper pair of joists B^3 is placed the grain spout or hopper C, within which is placed a grain directing board C^2 that is pivoted at *c* to the sides of said hopper. By these means the grain can be directed into either the bin D or the bin D^2 of the twin-bin receptacle. The latter is mounted loosely upon a shaft *d* that is rigidly attached at each end to metal straps d^2, the upper ends of which are pivoted to the inner ends of scale beams E. Said beams are pivoted at *e* to the lower ends of metal straps E^2, that have their upper ends resting upon, and attached to the upper horizontal joists B. The scale beams carry adjacent to their outer ends, weights E^3, the pair of which weights in the two sides of the machine is intended to balance the weight of the empty twin-bin, while the weights E^4 adjustably placed upon the scale beams are to counterbalance the weight of the grain intended to be placed and registered in either one of the bins. Said grain, for example, poured into the bin D, will first depress the inner ends of the scale beams and permit the twin bin to descend vertically as shown in full lines in Fig. 1 until it becomes unlatched or released from its latch *f*, and then under the impulse of the weight of grain therein, it will assume the position shown by dotted lines at D. The mate to the latch *f* is shown at f^2 in Fig. 3; it consists of a bell-crank lever placed horizontally upon, and pivoted to the lower joist B^2 of the frame. One arm of said latch *f* bears against a bracket-plate d^4 projecting from the side of the bin. When the twin-bin descends vertically, its bracket-plate slides down against the side of the latch and passes under it at the moment that the weight of grain causes the bin to be tilted. Each latch is retained in a normal position as shown in Fig. 3 by a pin f^3 driven vertically in the top of the joist B^2 along one side of the long arm of said latch, while a spring f^4 presses against its opposite side. The tilting of the twin-bin causes the grain directing board C^2 in the hopper C to be shifted from the inclined position shown in Fig. 1 to an oppositely inclined position. For that purpose cords c^2 have one of their ends secured to the board C^2 above its pivot *c*, and the other end to opposite sides of the bins D and D^2 after passing over the pulleys *c'*. The tilting of the bin also causes the door G in the bottom of the loaded bin to become opened, and the door G^2 in the empty bin to become closed. During the time that the twin-bin is being filled, and that it vertically descends or ascends, the doors G and G^2 are normally kept closed as shown in Fig. 2. For this purpose each door which is pivotally mounted upon a horizontal rod *g* received in bearings *g'* properly bolted to the bin, has hinged thereto near its outer edge a flat metal strap g^2 that is protected and loosely guided by a shield g^3 wider at the bottom than at the top and secured to the inner side of the bin. In the

upper portion of each strap g^2 there is a perforation g^4 to receive one end of a nearly Z shaped bell-crank lever H that is pivoted to the outer surface of the bin as shown at h in Fig. 3. The lower arm of the lever H passes through a perforation in the side of the bin and enters into engagement with the perforation g^4 of the door retaining strap; and is normally kept in engagement by a spring h^2 having one end secured to the side of the bin and the opposite end pressing against the lever H. The upper arm of said lever is connected with the upper joist B by a cord h^4 that is normally somewhat slack but is subjected to tension as soon as the bin begins to descend. It then tilts the lever H and releases the door retaining strap g^2, and permits the door of the loaded bin to swing open. The tilting downward of the bin D causes the door G^2 of the bin D^2 to become closed. For this purpose a beam C^3 is secured to the bottom of the hopper C centrally thereof, as an abutment for the closing levers to bear against, when tilted toward said beam. The upper lever K is in the form of a bell crank lever and is pivoted at k to the inner side of the bin. The upper arm of said lever projects above the top of the bin and its lower arm is connected by means of a rod K^2 with one end of a straight lever K^3 that is pivoted at k^3 to the inner surface of the bin. The opposite end of said lever is pivoted to the upper end of a rod K^4 that has its lower end pivoted at k^4 to the door of the bin. When the door has been fully lifted the perforation g^4 in the upper end of the strap g^2 carried by said door, will have reached opposite the point of the latching lever H and become retained by the latter. The operation is automatically repeated at every oscillation of each bin. To register said oscillations, and consequently the amount of grain passed through the apparatus, a spring-pawl m is pivoted to the upper end of an L shaped leg M that is secured to the stationary shaft d. Said pawl m, in connection with the toe of the leg M act as an escapement upon a ratchet wheel N to revolve the latter while said wheel is oscillated between said parts of the escapement, by the tilting motion of the bin that carries the bearings of its shaft; the pawl acting upon the upper teeth of the wheel alternately with the toe of the leg upon the lower teeth thereof. Upon the shaft of the ratchet wheel N is mounted a pinion n by which motion is given to the train of gears of a register of usual construction.

To have the apparatus stand perfectly vertical on any kind of ground, the lower portion of each of its uprights A is provided on one side with ratchet teeth a, and a prop a^2 provided with corresponding ratchet teeth inversely inclined is made to engage with the teeth a, being retained into engagement by means of bolts a^3 passing through perforations in the uprights A and through a slot a^4 in the prop a^2.

To conveniently suspend and retain bags with their mouths open under each bin of the apparatus, a bag holder P, Fig. 6, is to be suspended from the frame or from the joists B^2 thereof. The bag holder consists of a rectangular spout or frame of sheet metal having extending up from its upper edge two springy hooked arms p the upper hooked portion of which is adapted to rest upon the joists B^2. Around the bottom edge of said spout is a series of turned-up hooks p^2 adapted to engage with the material of which the mouth of the bag is made and retain it well open while being filled.

This grain meter can be built of three sizes, one size suitable for thrashing machines, one size suitable to receive at once a wagon load, and a still larger size suitable for grain elevators.

Having now fully described my invention, I claim—

1. In a grain meter the combination of a frame having longitudinally adjustable standards, joists uniting them, metal straps E^2 suspended from said joists, scale beams suspended from said straps, metal straps d^2 suspended from, and uniting said beams, a twin-bin suspended from the straps d^2, and two weights upon each scale beam substantially as described.

2. In a grain meter the combination of a frame having longitudinally adjustable standards, joists uniting them, metal straps E^2 suspended from said joists, scale beams suspended in pairs from said straps, and a twin-bin suspended from said beams, with a hopper resting on the standards, a grain directing board pivoted within said hopper, and cords having one end secured to the directing board and the other end to the tilting bin, substantially as described.

3. In a grain meter the combination of a frame having standards, joists uniting them, metal straps suspended from said joists, scale beams suspended in pairs from said straps, a twin-bin suspended from said beams, a door pivoted to the bottom of each bin, a metal strap g^2 attached to said door and having a perforation in its upper end, a bell-crank lever H pivoted to the bin and having a pointed end in engagement with the strap g^2, and a cord h^4 having one end secured to the lever H and the other end to the frame of the meter, substantially as described.

4. In a grain meter the combination of a frame having standards, joists uniting them, metal straps suspended from said joists, scale beams suspended in pairs from said straps, a twin-bin suspended from said beams, a hopper resting on the standards, and a beam C^3 under said hopper, a bell-crank lever K pivoted to the bin on each side of the beam C^3, and rods uniting the lever K to the door of each bin substantially as described.

5. In a grain meter the combination of a frame having standards, joists uniting them, metal straps suspended from said joists, scale

beams suspended in pairs from said straps, a twin-bin suspended from said beams, an angular spring-latch f^2 pivoted to the lower joist of the frame, and a bracket plate d^4 secured to each bin substantially as described.

6. In a grain meter the combination of a frame having standards, joists uniting them, and a tilting twin-bin suspended on scale beams between said joists, with a bag holder resting upon the lower joists B^2 of the frame, substantially as described.

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

WALTER HOWARD.

Witnesses:
E. E. MASSON,
A. B. DEGGES.