(No Model.)

G. W. WAKEFIELD.

GRAIN WEIGHING MACHINE.

No. 481,084. Patented Aug. 16, 1892.

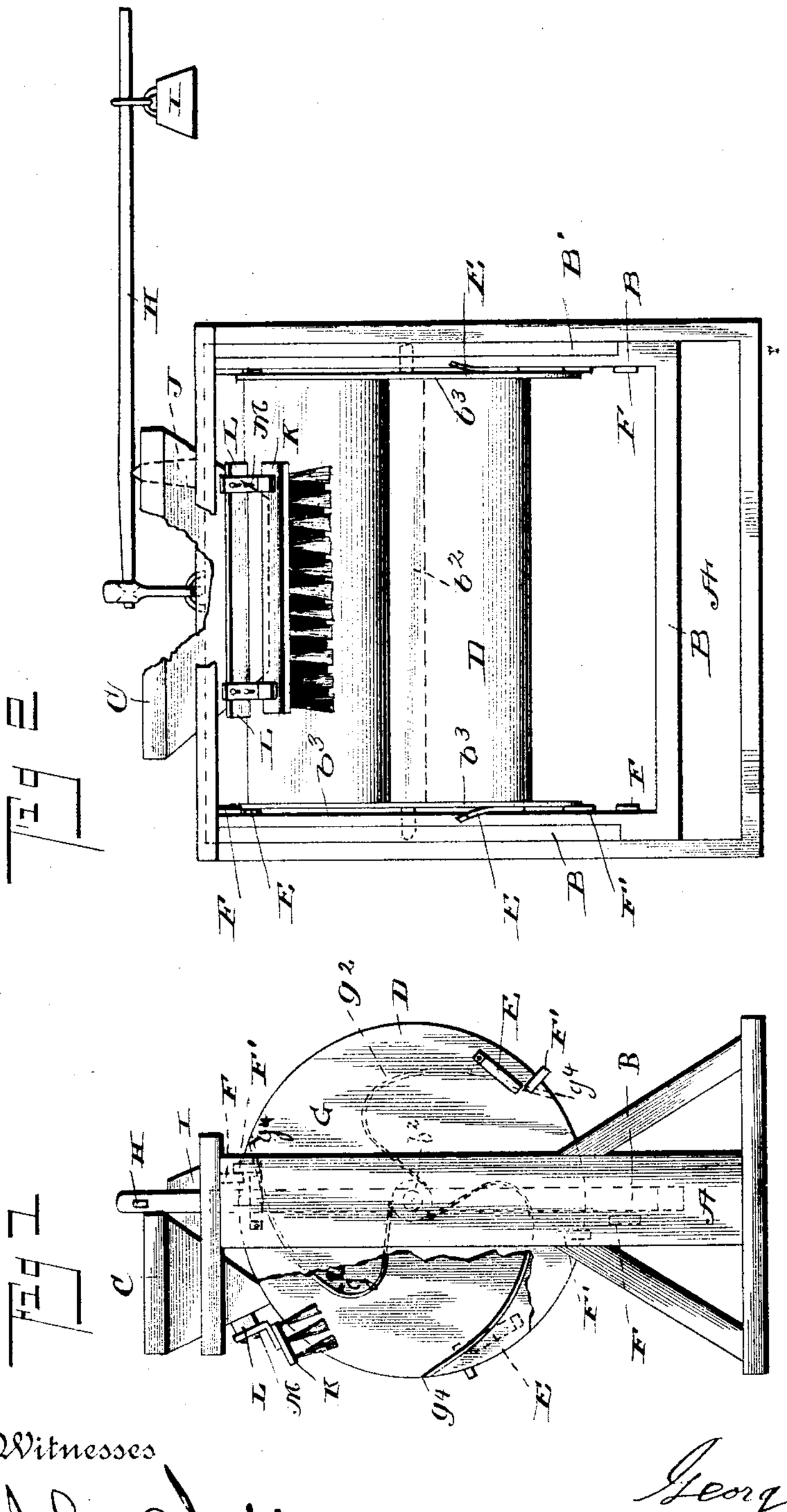

FIG. 1.

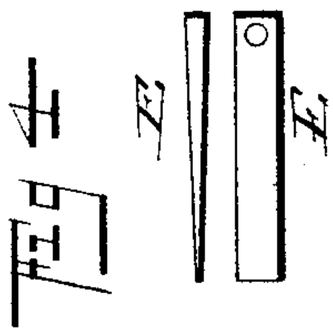

FIG. 4.

FIG. 2.

FIG. 7.

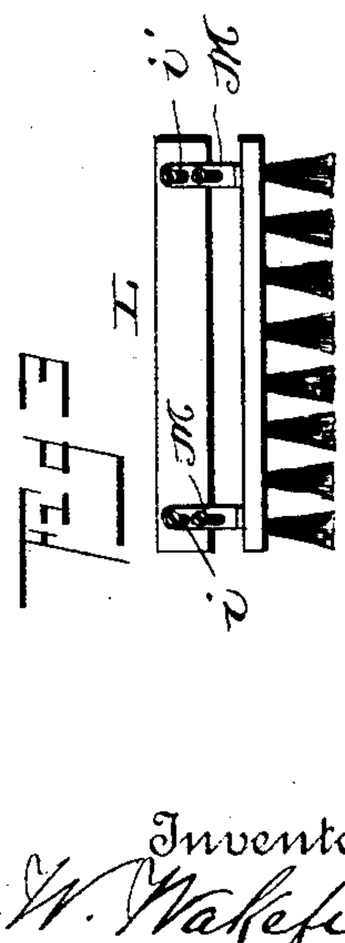

FIG. 3.

Witnesses

John Dimmie

Walter Allen

Inventor.

George W. Wakefield.

By his Attorneys

John J. Halsted & Son

UNITED STATES PATENT OFFICE.

GEORGE W. WAKEFIELD, OF WATERMAN, ILLINOIS.

GRAIN-WEIGHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 481,084, dated August 16, 1892.

Application filed November 6, 1889. Serial No. 329,418. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. WAKEFIELD, of Waterman, in the county of DeKalb and State of Illinois, have invented certain new and useful Improvements in Automatic Grain-Weighing Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My improvements relate to grain weighing and measuring apparatus; and they consist in certain specialties of construction, which will be made clear from the following description and claims.

In the drawings, Figure 1 represents a side view, partly in section, of my improved grain-weigher; Fig. 2, a front view of the same; Fig. 3, an elevation of the brush attachment, and Fig. 4 an edge view and plan of a metal spring.

The main frame A, which sustains all the parts, is made cheap, light, and portable, so that it may be placed wherever convenient, and it is preferably provided with a chain or with hooks or clamps, whereby it may be suspended from the roof of a railway-car just inside its door, or suspended from the elevator of a thrashing-machine over a wagon into which the grain is to be delivered.

B represents another square frame hung within the square frame A and arranged to slide vertically therein, each of its two ends being respectively placed in the space between a pair of vertical strips or cleats B′. This movable frame B is allowed a vertical movement up and down of, say, one to three inches, as may be found desirable, and it carries on and with it the revolving bucket-cylinder D, the axial-shaft bearings of which are in the ends of this frame B. This cylinder consists of the shaft b^2, two circular heads b^3, and three specially-formed buckets G.

C is the hopper, placed to deliver the grain about centrally of a bucket, as seen in Fig. 2, though it is evident that, if desired, its discharging-mouth may be long enough to extend farther from the center nearer to the sides of the heads.

E indicates flat metal springs on the outside of the heads b^3, slightly in advance of each bucket, and serving as brakes.

H is the usual scale-beam or lever; I, its weight, and J its fulcrum or support, which is on frame A.

F F are fixed stops on the uprights of frame A, and F′ stops on and projecting from the bucket-cylinder and arranged to come into contact with and to arrest the revolution of the cylinder when the latter is empty and raised; but these stops F F′ are such that when the cylinder shall be caused to descend by the weight of a filled bucket they shall each in its turn be freed from the upper fixed stop F, so as freely to revolve a limited distance and discharge the grain, the lower stop on the frame when such quick descent occurs temporarily engaging with one of the stops F, while this discharge is taking place and until the bucket is sufficiently lightened of its grain contents to permit the cylinder to rise again and disengage this lower stop.

The hopper is fastened to the top of the main frame, and the outer one of its inclined sides, as will be seen, is preferably made longer than its inner one, to allow the descending grain to be deflected slightly inward from a strictly vertical course, that it may fall upon the rear part g^2 of the bucket at an obtuse angle and ease the fall. Each of the three similar buckets is made curved at its bottom or lowest part g', and this lowest part is not directly over the axle, but purposely at a point about midway between the center and the periphery of the cylinder, so that as the grain falls from the hopper upon the part g^2 it necessarily drops therefrom some distance from the axis and at one side only of this axis or center, so that if the cylinder were not temporarily locked by the stops, as hereinafter stated, the force of the falling grain would by my construction merely tend to turn the cylinder on its axis, but not to carry the slide-frame B and the cylinder downward prematurely, and thus abruptly to overcome the action of the customary weighted beam, as is always apt to be the

case when the falling grain is allowed to drop at the axis or center of a rising and falling cylinder. It will now be seen that the shape and position of each bucket, in conjunction with the location or location and action of the hopper, are such that as the stream of grain falls from the hopper into the bucket it will not strike with sufficient force upon the then nearly horizontal and shallower part g^2 of the bucket to act as a weight, and that the frame B will not descend prematurely nor at any period until the mere dead-weight of the predetermined quantity of grain shall be sufficient to actuate the lever H, overcome weight I, and carry down frame B, and the cylinder to unlock the stops F F′ to permit the partial rotation of the cylinder and the emptying of the grain over the extreme edge g^4 of the bucket.

I will now describe my means for sweeping from the face of the buckets the excess of grain beyond the required weight of measurement. After the bucket has received the exact quantity of grain that has previously been determined it is important that not another kernel be added to that quantity, because if ounces and fractions of ounces were being continually added to the quantity already weighed the seller would often sustain a loss that would amount to more than his profit were the grain correctly weighed. It is therefore very necessary that each bucket should contain the exact weight of grain—no more nor no less—and in order to secure such exact weight I employ a brush or brushes, which I arrange as follows, viz: When a loaded bucket starts to empty itself, it is of course succeeded by another bucket, the face g^2 of which is instantly brought under the steady stream of falling grain, some of which would escape being weighed were not means provided to prevent it from falling into that body of grain which has been already weighed. I therefore fasten a long brush K or two or more short brushes by means of boards L and brackets M to the inclined face of the hopper, these boards being secured by screws to the hopper and having slotted holes l' therein to permit the vertical adjustment of the whole brush. As the cylinder revolves any grain that may perchance drop upon the inclined part g^2 of the bucket after the brush comes into contact with such inclined part g^2 is by means of the brush or brushes brushed into the next adjacent empty bucket and this is repeated as long as the weighing continues. Without these brushes so placed the stream of grain flowing into the hopper could not be continuous, but would have to be cut off immediately after the filling of each bucket to prevent more or less grain from being mixed with that already weighed.

It will be evident that the operator can adjust the brush or the weight on the scale-beam as need be in order that the weight of grain actually discharged from the buckets shall have the precise predetermined weight, and that when the machine is ready for operation the small quantity of grain (if any) dropping into a bucket after it commences to revolve can be readily ascertained, experimentally, and allowed for, so as to actually deliver the desired weight; but the proximity of the ends of the bristles of the brush to the part g of the bucket, coupled with the quickness with which the cylinder commences to revolve, permits in any case but a very small dropping before the brush comes into action to sweep the excess over the surface g and into the next bucket.

The operation of the machine is as follows: Suppose a car is to be loaded and that the grain is stored in an elevator. The machine is placed in a convenient position, or suspended in the car, or over a thrashing-machine elevator, and the grain-spout turned so that the grain will run into the hopper. When hung in the car, it may be so hung that it will deliver from the buckets toward the side or toward either end of the car, as may be desired. Suppose each bucket G will hold, say, three hundred pounds. To set the scale-beam H, that amount of grain is first weighed upon a small scale and poured into the hopper while the weight L is out at the far end of the beam and the grain goes at once into the bucket below the hopper. The stops F F′, near the top of the frame, are still locked, because the weight I, until properly adjusted for three hundred pounds, overbalances that amount and the stops at the bottom are not locked. Now the three hundred pounds of grain are in the bucket just below the hopper and the cylinder is locked in position, because the weight, as stated, and as shown in Fig. 2, is out nearly to the end of the scale-beam. I next move the weight toward the fulcrum, and when it is exactly balanced by the grain the frame B will descend, and of course carry the cylinder with it, thus throwing the upper stops out of lock and at the same time the cylinder will revolve quickly, bringing the filled bucket to the bottom, where it becomes automatically locked, because of the descent of the frame and cylinder and of the lower stops F F′, and is emptied instantly. The moment, however, that the grain is out of the bucket the frame B and the cylinder D move upward, because of the action of the weight upon the beam, and the cylinder is instantly locked again by the upper stops F F′, while from the spout the next bucket, which has now come under the hopper, is filled and its contents in turn similarly weighed and automatically dumped, as before. The buckets may, if desired, dump into a spout and thence into a car or boat, or they may dump into bags or elsewhere, as convenient. The office of the springs E is to provide easy brakes for each of the buckets as they are successively about to strike the lower stops. They are therefore preferably fastened to the

circular head of the cylinder and squeeze in between the heads and frame just before the lower stops strike, and thus lighten the shock.

I do not claim, broadly, rotary buckets arranged to rise and fall; but

I claim—

1. In an automatic grain-weighing machine having a revoluble bucket-cylinder on a horizontal axis and operated by the weight of the grain falling into the buckets, a flexible brush projecting downward into the bucket and serving to brush from a portion of its bed or bottom the excess of grain, if any, beyond the predetermined weight and to carry it over into the next bucket, all as set forth.

2. In a grain-weigher adapted to be supplied by a continuous stream of grain, the combination, with a revoluble cylinder having a series of buckets whose shallower portion has substantially the curved form shown, of an adjustable flexible brush projecting into the inside of the buckets, as shown and described, and serving when the cylinder commences to revolve to hold back and sweep over the excess of grain, if any, from the shallower part of the bed of the bucket into the next adjacent bucket, all as set forth.

GEORGE W. WAKEFIELD.

Witnesses:
CHARLES E. WEAVER,
JOHN M. RAYMOND.