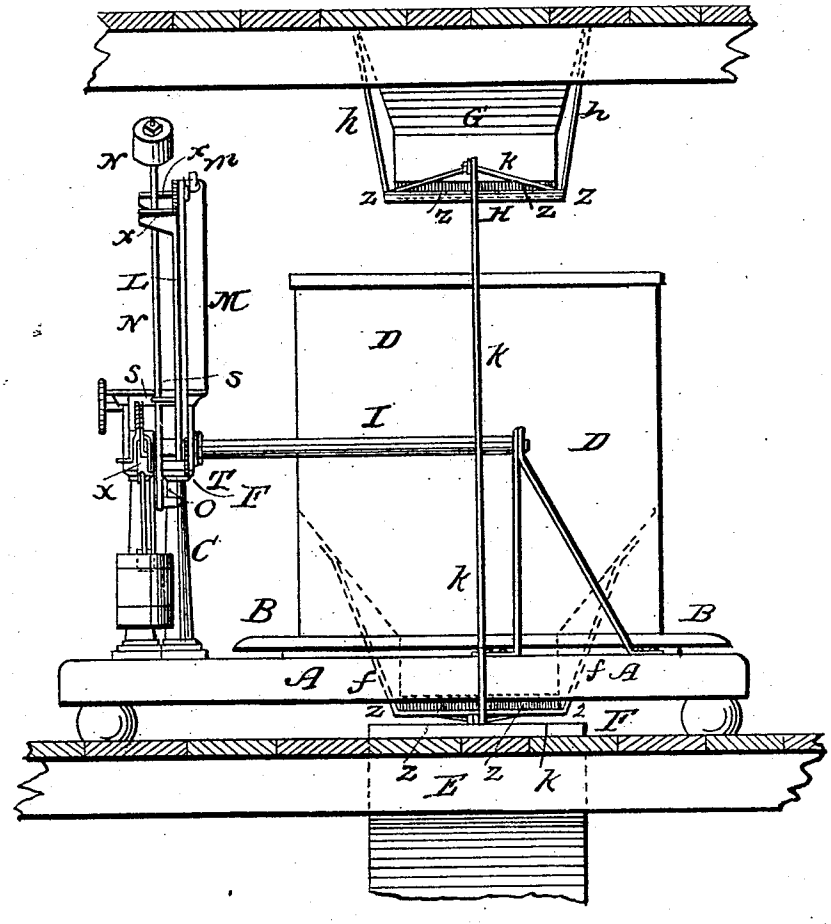
2 Sheets—Sheet 1.

LETTELIER & WHITE.

Grain Scales.

No. 89,154. Patented April 20, 1869.

Fig. 1



Witnesses
Geo. H. Read
C. H. Bishop

Inventors
J. G. Lettelier
F. White
by Pindle & Co

N. PETERS, Photo-Lithographer, Washington, D. C.

2. Sheets—Sheet 2.

LETTELIER & WHITE

Grain Scales.

No. 89,154. Patented April 20, 1869.

Fig. 2

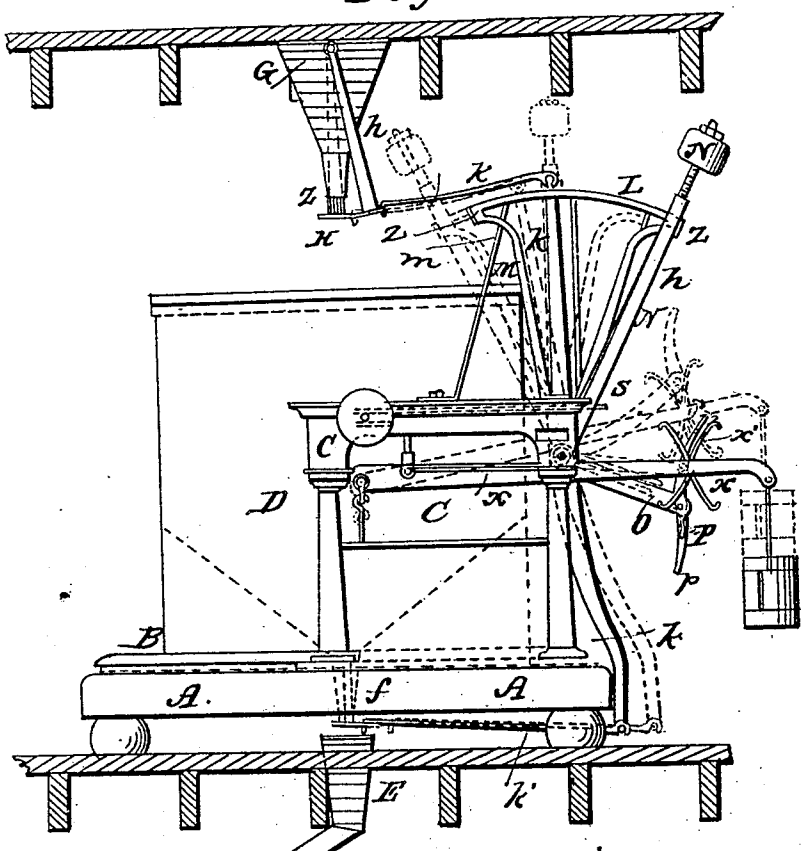


Fig. 3

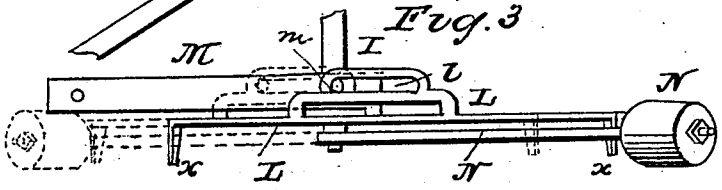


Fig. 4

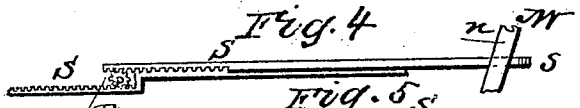
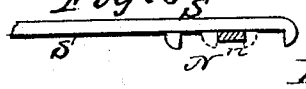


Fig. 5



Witnesses
Geo. H. Read
C. H. Bishop.

Inventors
J. G. Lettelier
F. White
by Prindle & Co

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

J. G. LETTELIER AND F. WHITE, OF BLOOMINGTON, ILLINOIS.

IMPROVEMENT IN AUTOMATIC WEIGHING-MACHINE.

Specification forming part of Letters Patent No. **89,154**, dated April 20, 1869.

To all whom it may concern:

Be it known that we, J. G. LETTELIER and F. WHITE, of Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Automatic Scales for Weighing Grain and other Substances; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is a front elevation. Fig. 3 is an enlarged view of the upper side of the weighted and segmental arms. Fig. 4 is an enlarged front or edge view of a double rack and pinion for locking the automatic devices. Fig. 5 is a broken top view of the same.

Letters of like name and kind refer to like parts in each of the figures.

The object of this invention is to furnish suitable means whereby grain, flour, &c., may be weighed automatically while being run from one bin or reservoir into another below; and it consists in a pair of platform-scales of usual form and construction, upon which is secured a receiving-hopper with a suitable opening, closed by a gate at its bottom, for the discharge of its contents, and with a similar opening and gate at the bottom of the receiving-spout above, both of which are opened and closed automatically by means of suitable mechanism in order that a charge of the desired weight may be alternately received and discharged from said hopper.

It further consists in the employment of a shaft to which are secured arms connected with and operating the aforesaid gates, and which is, in turn, operated through a segmental arm by means of a weighted arm, connected by suitable mechanism with the beam of the scale, so that as said beam rises or falls the gates are opened or closed; and also in the use of a double rack and pinion, by means of which the automatic portions of the device are locked so as to prevent their operation, while at the same time the receiving, weighing, and discharging mechanism, are left free to be operated by hand.

It also consists in the employment of a line of bristles, arranged vertically around the edge of the openings in the lower ends of the receiving and discharging spouts, for the purpose of enabling the gates to close tightly without being liable to injury in case that cobs, sticks, &c., are caught between the edges of said gate and spout.

In the annexed drawings, A represents the horizontal frame, B the platform, and C C the vertical frame, of a pair of scales of the usual form and construction, except that the weighing-beam is extended to about one-third more than the usual length.

Resting upon and secured to the platform B is a hopper, D, for holding the article to be weighed, the interior of which, near the bottom, is inclined downward and inward, as indicated by the dotted lines in Figs. 1 and 2, producing a narrow rectangular opening, through which the charge passes into a spout, E, below. This opening is closed when desired by a gate, F, suspended by two links, *f f*, from the sloping slides of the hopper.

A similar-shaped opening is provided in the receiving-spout G, which is also closed by a gate, H, of like form and construction to that before described.

z z represents a line of bristles arranged vertically around the edges of the receiving and discharging spouts, against the lower ends of which the gates F and H lightly bear. This arrangement permits a close joint to be made between said gates and spouts without liability to injury from cobs, sticks, &c., which might otherwise prevent their being closed.

I represents a shaft, working in suitable bearings attached to the horizontal and vertical frames A and C, upon which is secured a double arm, K, extending vertically above and below said shaft to the levels of the gates F and H, with which it is connected by means of forked connections *k k'*, pivoted to the ends of said arm, and also to the ends of the gates. Secured to and extending upward vertically from the front end of the shaft I is a segmental arm, L, having upon its arc a slot, *l*, through which passes a stud, *m*, secured to the top of a forked standard, M, allowing

sufficient vibration to said arm and shaft to cause either of the gates to be opened or closed.

N represents a weighted arm, pivoted loosely upon the end of the shaft I, directly in front of the segmental arm L, so that when allowed to fall either way from the perpendicular it strikes against a lug, *x*, projecting forward from either side of said segmental arm, and carries it in the same direction as far as the slot *l* and pin *m* will permit, opening one and closing the other of the gates F and H.

It will be readily seen that if, by suitable mechanism actuated by the elevation or depression of the hopper, said weighted arm can be raised and caused to fall alternately to either side at the instant that the exact weight desired has entered or been discharged from said hopper, the operations of filling, weighing, and discharging will proceed automatically so long as grain is supplied from the spout above.

In order to produce such automatic motion of the arm N, another arm, O, is secured to its axis, and extends radially therefrom at nearly a right angle to the line of said weighted arm. Pivoted loosely to the face of the arm O, at its end, is a bar, P, from the face of which, at either end, project lugs *p p* over the weighing-beam X, so that, as said beam is raised or depressed by the filling or emptying of the hopper it shall strike against said lugs and produce a corresponding movement of the arm O, causing the weighted arm to be thrown beyond the perpendicular, when its fall will change the gates.

The lugs *p p* are provided with knife-edges at their points of contact with the weighing-beam, to avoid unnecessary friction, and V-shaped guides *x' x'* are secured upon the upper and lower sides of said beam, to cause the lugs to always rest against the beam at one point, it being evident that unless such were the case the amount of grain required to raise the weights and throw over the arm N would continually vary.

To enable the scales to be used without the automatic devices, a pinion, R, and two parallel racks, S S, are secured within the upper part of the vertical frame C, one end of each of said racks projecting immediately in the rear of the weighted arm N, where they are provided with lugs *s s*, which project forward upon either side of said arm, so that by turning the pinion in the right direction the racks will be moved in opposite directions and the lugs drawn together, as shown by the red lines in Fig. 5, clasping between them the arm, which is held in a vertical position, as indicated by the dotted red lines in Fig. 2.

The gates can now be operated by means of the handle T, secured to the shaft, and the hopper filled, weighed, and discharged in the usual manner.

The width of the gate is twice that of the openings, so that both of said openings may be closed, or either opened while the other remains closed, as may be desired.

It will only be necessary to use these devices and operate the machine by hand when there is a partial charge in the hopper or when it is desired to ascertain the exact weight of a draft. In the latter case the forked connection *k'* should be unhooked from the arm K before the hopper is filled, so as to prevent the discharge of the grain, and the weighted arm N allowed to fall before suspending the action of the automatic devices and proceeding to weigh the draft.

In order that this machine may be in all respects automatic, and register as well as weigh the charges, it only becomes necessary to attach to any of its parts which have a reciprocating motion one of the many devices used for such a purpose. We prefer to place such mechanism in the vertical frame C, as shown in Fig. 2, so that the scale-beam X shall actuate it only when raised to its highest point, by which arrangement none but full drafts, automatically discharged, would be registered, allowing lesser quantities—such as the last in the bin—to be weighed and discharged without changing its numbers.

The advantages claimed for this device over any others in use intended for a like purpose are, first, its parts are fewer and more simple, and less liable to get out of order, and it can be furnished at a less cost; second, it occupies but little more space than ordinary platform-scales of equal capacity, to which it can be readily attached at but small expense; third, by means of the locking devices its automatic action can be suspended and the scales used in the ordinary manner.

Having thus fully set forth the nature and merits of our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The swinging gates F and H, suspended by means of the links *f f* and *h h*, and operated by the arm K on the shaft I, substantially as described, and for the purpose set forth.

2. Also, the employment of the bristles *z z*, arranged vertically around the openings of the receiving and discharge spouts G and E, substantially as and for the purpose shown.

3. Also, the means employed for operating the weighted arm N, consisting of the short arm O, bar P, and lugs *p p*, against the latter of which the weighing-beam X is caused to strike as it is raised or lowered by the reception into or discharge from the hopper D of the grain.

4. Also, the V-shaped guides *x' x'* upon the weighing-beam X, for the purpose of receiving the lugs *p p*, substantially as and for the purpose shown.

5. Also, the pinion R and racks S S, the latter being provided with the lugs *s s*, by means of which the weighted arm N is secured in a vertical position and the automatic ac-

tion of the mechanism arrested when it is desired to use the device as an ordinary platform-scale.

6. Also, the within-described automatic grain-scale, consisting of the hopper D, spouts E and G, gates F and H, shaft I, double arm K, forked connections *k* and *k'*, segmental arm L, forked standard M, weighted arm N, short arm O, bar P, lugs *p p*, pinion R, and racks S S, provided with lugs *s s*, in combination with a platform-scale of the usual construction.

J. G. LETTELIER.
F. WHITE.

Witnesses:
GEO. S. PRINDLE,
C. H. BISHOP.
N. SWANN,
W. M. REEVES.