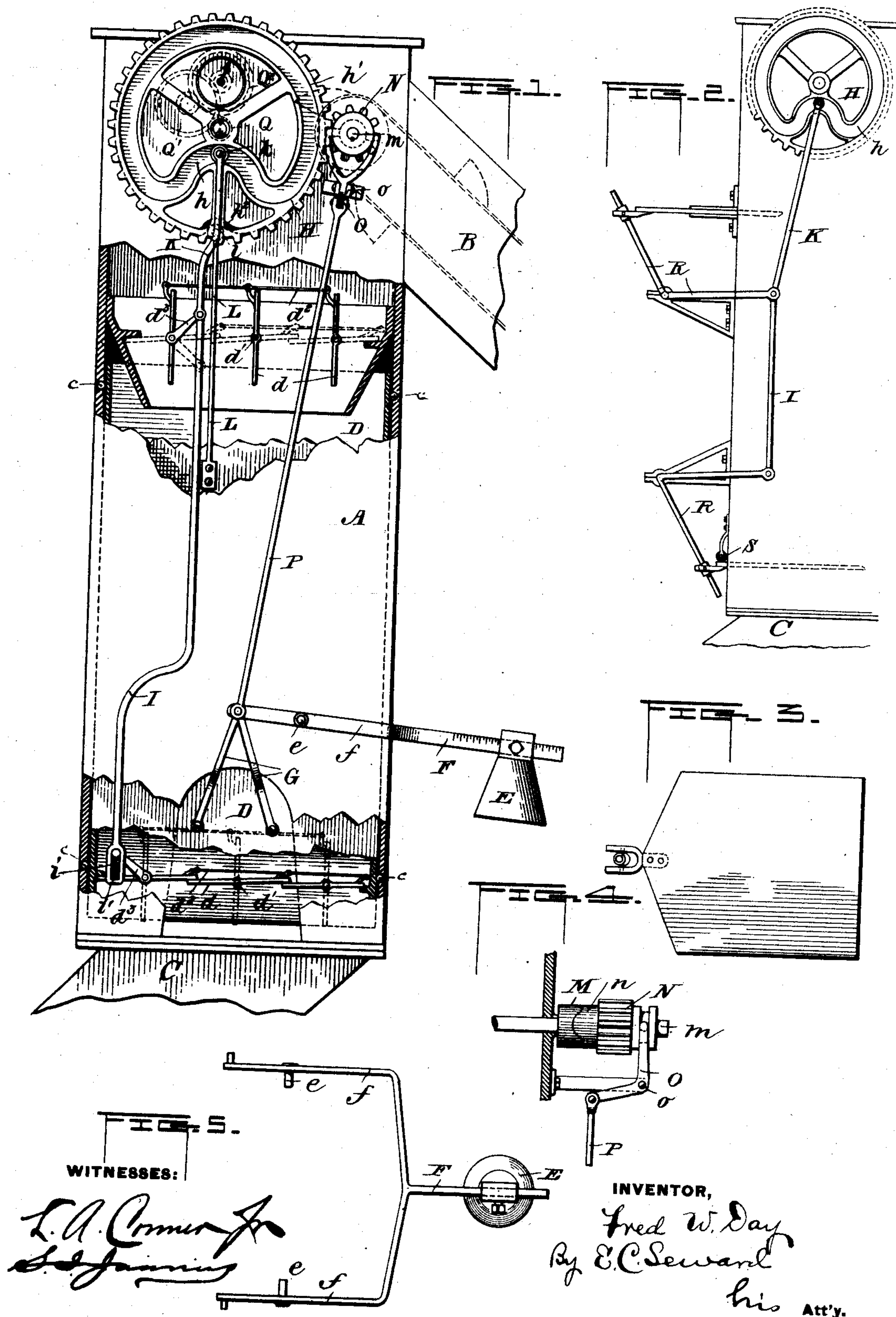


(No Model.)

F. W. DAY.
AUTOMATIC GRAIN WEIGHER.

No. 431,140.

Patented July 1, 1890.



UNITED STATES PATENT OFFICE.

FRED W. DAY, OF JANESVILLE, WISCONSIN.

AUTOMATIC GRAIN-WEIGHER.

SPECIFICATION forming part of Letters Patent No. 431,140, dated July 1, 1890.

Application filed July 27, 1889. Serial No. 318,874. (No model.)

To all whom it may concern:

Be it known that I, FRED W. DAY, of Janesville, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Automatic Grain Weighers, Sackers, and Registers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in automatic grain weighers, sackers, and registers.

The object is to provide a simple and effective apparatus, which may be readily adjusted to grain-elevators in common use, and which will automatically weigh the grain as it falls from the elevator, deliver it in predetermined quantities to sacks, and register the number of sacks filled.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view of the apparatus in side elevation, portions of the casing and receiver being broken away to show the positions of the flippers. Fig. 2 is a partial side elevation showing slides instead of flippers. Figs. 3, 4, and 5 represent parts in detail.

A represents a vertical casing, preferably, but not necessarily, square or rectangular in cross-section. The grain-elevator B (a portion of its upper end only being shown) is so located as to deposit the grain into the upper end of the casing A, and a funnel-shaped spout C is secured to the lower end of the casing to convey the grain into sacks.

Within the casing A a receiver D is loosely fitted, so as to permit of a free limited vertical movement, and to guard against possible binding, it is found advantageous to insert anti-friction rollers *c* between the casing A and the receiver.

The receiver D is provided with ends which are capable of being opened and closed as desired. In Fig. 1 the means shown for such

purpose consists of flippers *d*, secured to rocking-shafts *d'* journaled in the sides of the receiver. The flippers are connected together by a rod *d²* in a manner quite similar to the connection of the several slats of an ordinary window-blind, so as to move together, and one of the rock-shafts *d'* projects through the casing A and is provided at its end with a crank *d³*, by means of which the flippers are operated to open and close the ends. The crank *d³*, in connection with the upper set of flippers, is turned in the opposite direction from the shaft from that in the lower set of flippers, so that a downward pressure simultaneously made upon the two cranks would tend to open the lower set and close the upper set, while the reverse movement would tend to close the lower set and open the upper set.

The receiver D is supported and held in elevated adjustment when empty by a weight E upon a scale-bar F, pivoted to a suitable support at *e* on the casing A, for example, and having a forked end the branches *f* of which partially embrace the casing A and receive upon their ends the weight of the receiver. The connection of the receiver with the ends of the branches *f* is preferably effected by means of a pair of straps G on opposite sides of the receiver, attached at their lower ends to the receiver, near its bottom, at points some considerable distance apart, the upper ends of each pair of straps approaching each other and being pivotally secured to the branches *f*. The weight E and scale-bar F permit the counterbalancing of the receiver and its attachments and the further counterbalancing of so much grain to be received within the receiver as is desired to form the contents of a single sack. When the limit is reached, it is obvious that the receiver will drop within the casing A, and such movement of the receiver is relied upon to close the receiver to the inflow of grain and to open it to deposit its load in the sack and register the fact that it has discharged its load by means of the following mechanism: A combined cam and spur-wheel H is journaled in suitable

bearings, preferably above the receiver D, and is provided upon its face with a cam-groove h , circular throughout the greater portion of its length, but for a short distance receding toward the center of the wheel. A rod I connects the cranks d^3 on the flipper-operating shafts, and a second rod K is loosely connected at one end either to the upper crank d^3 or to the rod I, and at its opposite end is provided with a laterally-extending stud k , on which is an anti-friction roller which engages the groove h on the wheel. The lower end of the rod I has a slotted engagement i with the crank d^3 , so that the receiver may be permitted to drop a short distance without disturbing the rod I and its connections. A spring i' within the slot serves to hold the crank d^3 normally with its wrist-pin in the top of the slot. The wheel H is further provided with a cam-rim h' , circular throughout save only a depression h^2 at one point to receive a roller l on the upper end of a standard L, secured to the receiver, so that when the receiver is elevated to receive its load the roller l will seat in the depression h^2 and prevent the wheel H from rotation; but when the receiver drops the wheel H will be free to rotate, and the roller l in engagement with the rim h' will prevent the receiver from rising until the wheel H has completed its revolution or until the depression h^2 again registers with the roller l .

A clutch-section M is secured on a shaft m driven by the elevator-shaft. A corresponding clutch n is loosely mounted on the shaft m in gear with the wheel H. A shifting-lever O is pivotally supported at o and has secured to one of its ends a rod P, connected with the receiver preferably with the branches of the scale-bar at the point of their connection with the straps G, so that the depression of the receiver will throw the clutch-sections into engagement, and hence, through the pinion N, will set in motion the wheel H.

By a simple arrangement of reducing-gear, consisting, preferably, of a pinion Q on the shaft of the wheel H, a wheel Q' in engagement with the pinion Q, a wheel Q² in engagement with a pinion on the shaft of the wheel Q', and an index-hand on the shaft of the wheel Q² passing over a dial-plate of any well-known and approved form each revolution of the wheel H, and hence each discharge of the receiver may be registered.

The operation is simply as follows: The weight having been properly set, the grain flows into the open end of the receiver until the weight is overbalanced, when the receiver drops. This movement, through the rod P, pinion N, wheel H, and rods I and K, forces the cranks d^3 downward, which closes the upper end of the receiver and opens its lower end. The grain flows out into the sack and the receiver is held depressed by the standard L and its connection with the wheel H until the latter has completed its revolution,

when the receiver rises, the clutch-sections are disengaged, the lower end of the receiver is closed and the upper end opened, and the process is repeated. The register has in the meantime registered the discharge, in the manner above indicated.

In Fig. 2 slides are shown in the place of flippers, the slides being withdrawn by means of the bell-cranks R, operated by the rod I and K, as before described. In this figure also a roller S, secured to the casing A, is employed to hold the receiver depressed, the slide when drawn out bearing against its under side, and when slid in leaving the receiver free to rise.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the construction herein set forth; but,

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

1. In combination, a rising and falling receiver, a weighing device forming a support for the receiver, opening and closing devices located above the receiver and at the bottom of the receiver, a cam-wheel controlled by the rising and falling receiver, and a common connection between the cam-wheel and the opening and closing devices above and at the bottom of the receiver, whereby the opening and closing devices are simultaneously operated and the receiver prevented from assuming its normal position for a predetermined time, substantially as set forth.

2. In combination, an outer casing, valves secured in the upper portion thereof, a rising and falling receiver located within said outer casing, valves secured in the lower end thereof, a rod connecting the valves of the outer casing and the receiver, a cam-wheel, a rod connecting the first-named rod to the cam-wheel, a scale-beam upon which the receiver is supported, mechanism for rotating said cam-wheel, and a rod connected to said scale-beam and to said mechanism, substantially as set forth.

3. In combination, an outer casing, valves secured in the upper portion thereof, a rising and falling receiver located within said outer casing, valves secured in the lower end thereof, a rod connecting the valves of the outer casing and the receiver, a cam-wheel, a rod connecting the first-named rod with the cam-wheel, a stop-post secured to the receiver and engaged with said cam-wheel for the purpose described, mechanism for throwing the cam-wheel in and out of motion, a scale-beam pivoted to the outer casing and supporting said rising and falling receiver, and a rod connecting said motion-imparting mechanism and the scale-beam, substantially as set forth.

4. The combination, with the rising and falling receiver and opening and closing flippers,

and the crank for operating the end opening
and closing flippers and provided with a wrist-
pin, of a connecting-rod and means for oper-
ating the rod, the end of the rod being pro-
5 vided with an elongated slot to receive the
wrist-pin of the crank, and a yielding cushion
seated within the slot to hold the crank into
normal adjustment, substantially as set forth.

In testimony whereof I have signed this
specification in the presence of two subscrib- 10
ing witnesses.

FRED W. DAY.

Witnesses:

JOHN MENZIES,
ALEX. MCGREGOR.