

No. 760,316.

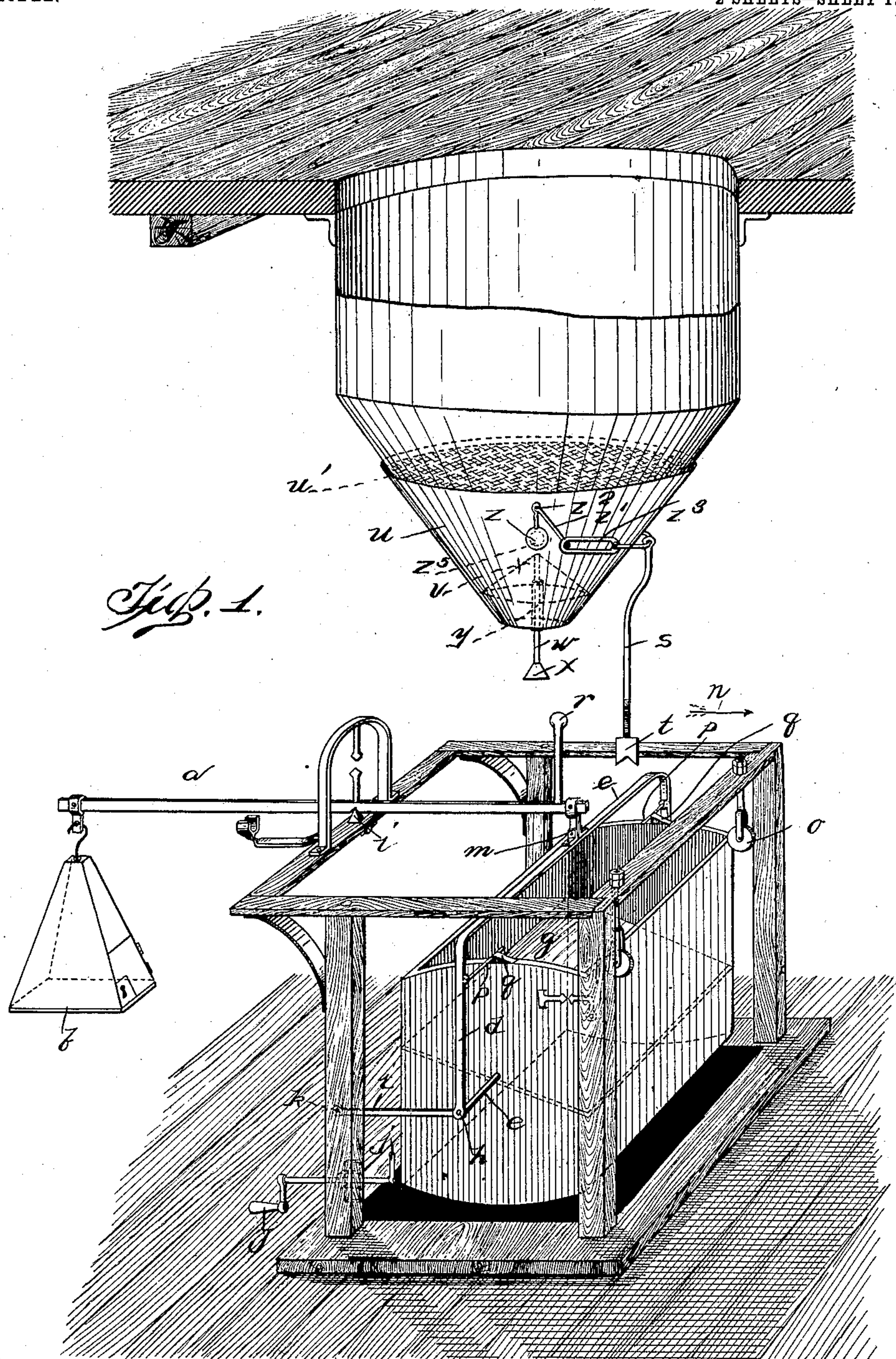
PATENTED MAY 17, 1904.

P. A. DEPAEPE.
AUTOMATIC BALANCE SCALE.

APPLICATION FILED JULY 14, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

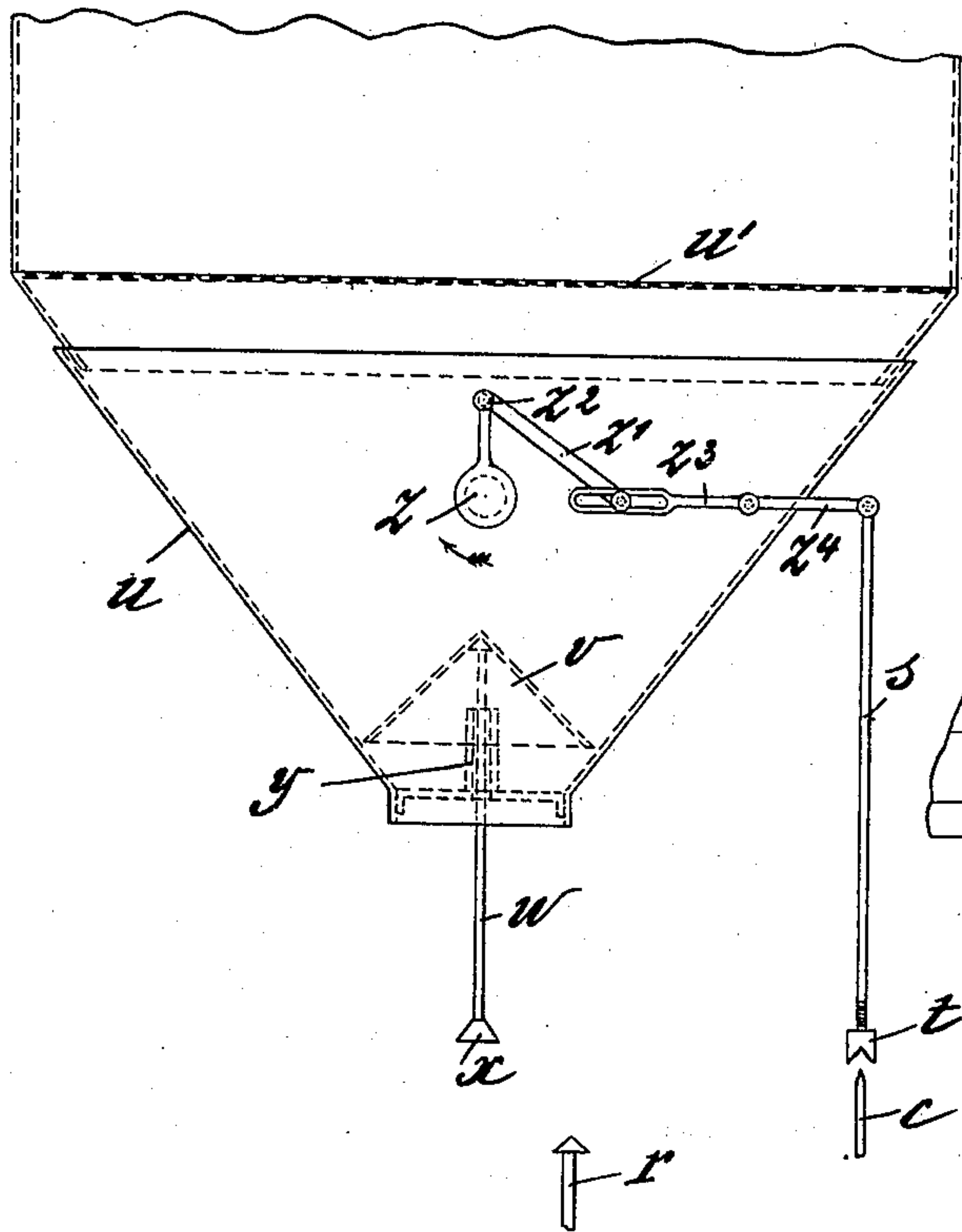


Fig. 4.

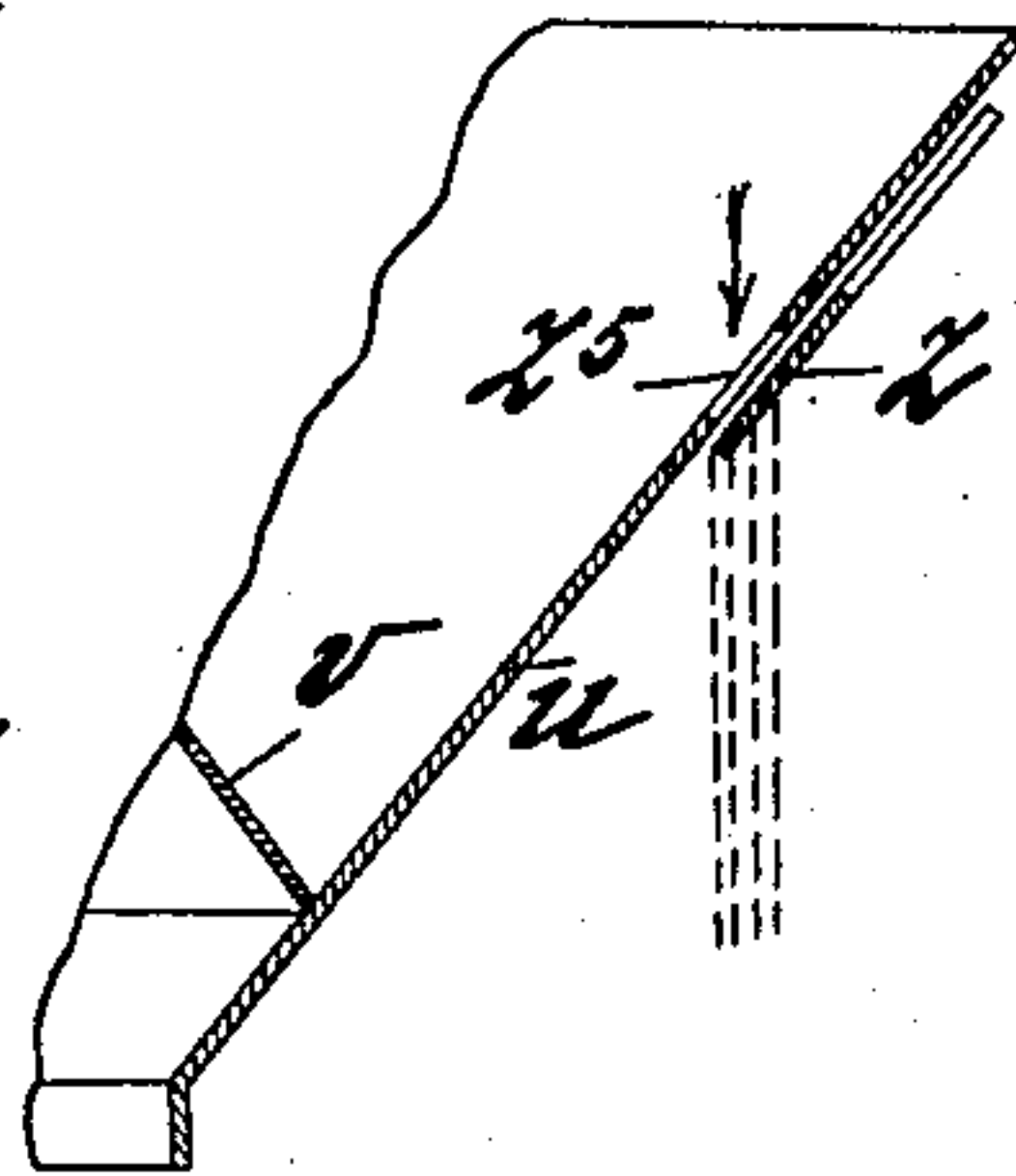
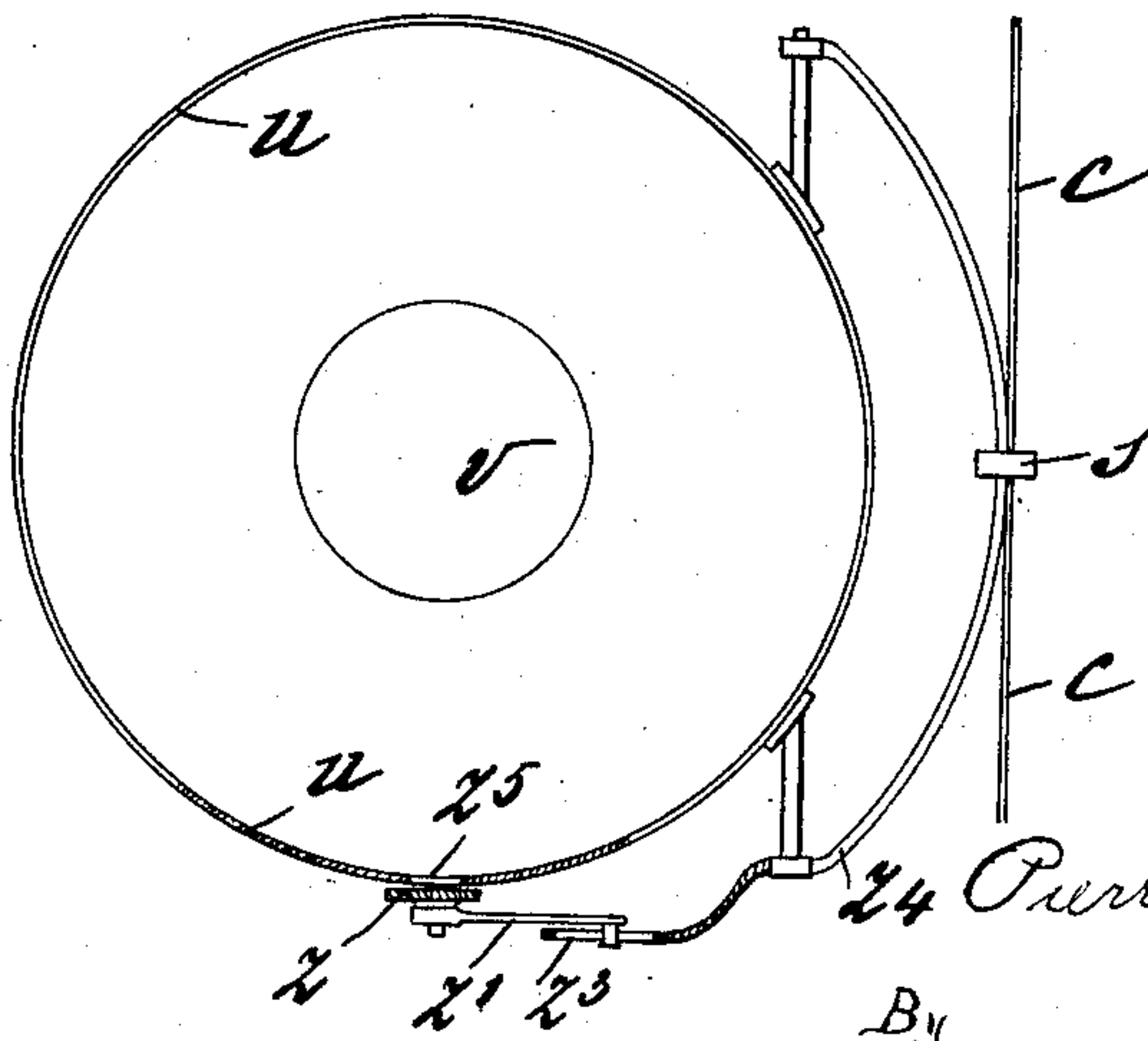


Fig. 3.



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UNITED STATES PATENT OFFICE.

PIERRE ALPHONSE DEPAEPE, OF ANTWERP, BELGIUM.

AUTOMATIC BALANCE-SCALE.

SPECIFICATION forming part of Letters Patent No. 760,316, dated May 17, 1904.

Application filed July 14, 1902. Serial No. 115,499. (No model.)

To all whom it may concern:

Be it known that I, PIERRE ALPHONSE DEPAEPE, a subject of the King of Belgium, residing at Antwerp, Belgium, have invented certain new and useful Improvements in or Relating to Automatic Balance-Scales, of which the following is a specification.

The present invention relates to improvements in automatic balance-scales.

These improvements consist in special devices for assuring in a certain and exact manner and without mistake or delay the periodical feeding of the material to be weighed and in the suspension, retaining, and disengaging of the rotary drum, arranged in such a manner as to free the point of support of the cross-beam from the effect of the shocks resulting from the discharge of the drum.

These improvements are illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of an automatic balance-scale provided with my improvements. Figs. 2, 3, and 4 are respectively a front view, a sectional plan view, and a vertical section of the hopper for the materials to be weighed provided with the devices according to this invention.

aa represent the cross-beam of the scale, from one end of which is suspended the weight pan or plate *b*, while the other end carries a frame *c d d*, supporting the shaft of rotation *e* of the drum or receptacle *f*. The complete frame *c d d e* is jointed at *h h* to levers *i i*, capable of oscillating about fixed points *k k*, preferably situated in the vertical plane passing through the supporting-point *l* of the cross-beam. The frame *c d d e* is pivoted at *m* to the end of the arm *a*, the levers consequently forming, with the arm of the beam, a parallelogram *l m h k*, which during the movements of the cross-beam limits the oscillation of the axis *e* in a determined arc and maintains the rods *d d* of the frame in a vertical position.

The drum or receptacle *f* is divided by a partition *g g* into two superposed compartments of equal size. This partition passes through the medial axis of the drum; but it is downwardly inclined toward one side (in this case toward the right) in such a manner as to bring the center of gravity of the drum below the axis

when the upper compartment is charged. The drum is thus caused to rotate in the direction of the arrow *n* as soon as the charged drum sinks below the stop *o*, which otherwise keeps it from tilting over until it descends slightly under the weight of the goods charged into it. The sudden shocks which are produced at the moment of discharge, resulting from the tilting movement of the drum *f*, and which are received at the "suspension-point," properly so called, of the drum—*i. e.*, at *h h*—are transmitted to the points *k k* of the levers *i i*, but not to the point of suspension *m* of the frame *d c d* nor to the pivotal point *l* of the cross-beam. The vertical rods *d d* of the frame carry detents *p p*, which drop behind catches *q q* of the drum each time the latter comes into its charging position—*i. e.*, into the vertical position. As the rods *d d* do not alter their vertical position with regard to the medial vertical plane passing through the drum *f*, the stoppage is always effected in an absolutely exact manner. This is of great importance in order to avoid loss of unweighed material, as the opening of the feeding-conduit could not otherwise be opened by the movement of the cross-beam without the drum having arrived at and been retained in its charging position.

The cross-beam *A* of the scale is provided with a projecting arm *r*, adapted to effect the main opening of the charging-funnel, while the bar *c* can, moreover, come in contact with a rod *s*, controlling the closing device of an auxiliary charging-opening, which is brought into action after the principal charging-opening is closed. This rod *s* is provided at its lower end with a fork *t*, adapted to engage on each side of the cross-bar *c c*, and it is adjustable in length, so as to regulate and control the supply, according to the various substances to be weighed, in such a manner that the weight of the column of the substance which falls after the complete closing of the auxiliary opening forms in reality and in an absolutely exact manner the additional weight of goods necessary to produce the balance of the scale. The fork *t* forms, preferably, a counterweight or may be weighted.

The charging device is shown in detail in Figs. 2 and 4 and is particularly constructed

for the supply of grain and other granular or powdery materials. The supply-hopper is constituted by a funnel u , the main charging-opening of which is arranged at the bottom, while the auxiliary charging-opening is provided in the lateral wall. The main charging-opening is normally closed by a dome-shaped or conical valve v , the apex of which extends toward the interior of the hopper, while its seat is preferably formed by the inclined conical bottom part u of the hopper. This valve is provided with a downwardly-extending spindle w , passing vertically through a hollow tube or guide y in the cone, and at its free end is provided with an enlargement, cup, or the like x , adapted to engage the head of the pin r on the frame. Above the valve is preferably a sieve u' in order to retain stones and other impurities, and thus to relieve the valve of a portion of the weight of the charged material. The valve is maintained seated by its own weight and by that of the substance bearing upon it. The opening or raising of the valve is effected by the motion of the projection or pin r on the frame of the scale-pan. The opening of the valve is effected when the pin r ascends, the valve moving upward into the material and thus agitating the material and dislodging any that may have adhered to it. The material falls down over the edges of the valve, while the central guiding parts remain clear and unobstructed. The closing of the valve is effected on the descent of the pin r , whereby the stream of material is gradually diminished as the valve approaches its seat. The body of the valve v can of course have any suitable form according to that of the opening. The auxiliary supply-opening is normally closed by a disk z , swinging about z^2 and connected by a lever system $z^1 z^3 z^4$ to the rod s . This arrangement has the advantage of producing a gradual closing without any possibility of obstructing the small opening z^5 in the wall of the hopper, for it is well known that grains, of wheat particularly, among granular materials, have the tendency, owing to their pointed form, to arrange themselves in a fan shape, one against the other, when they descend vertically, and thus are liable to obstruct an opening of a small width, so that it is not possible to cause them to pass freely through small openings without shaking or agitation. This, however, cannot take place in the present instance, as the lateral opening in the inclined wall of the hopper is covered and uncovered by an outside laterally-swinging disk, whereby the direction of fall of the grain is changed and the grains can fall in a thin stream, which can be regulated to a stream of a few grains or even of a single grain at a time. The importance of this arrangement with a view to the regular and continual working of the scale will be immediately understood.

The length of the rod s depends on the dis-

tance between the projecting pin r and the abutment x and on the height of the fall of the material and on the relative lengths of the levers z^1 , z^3 , z^4 , and z . This length is so arranged as in the first place to effect a complete opening of the auxiliary supply-passage and then to gradually effect its complete closure a short time before the drum arrives at its free or released position. As above mentioned, the length of the rod is adjustable, and this adjustment can be conveniently fixed by seals, stamps, or the like arranged in any suitable manner.

In order to prevent the drum from rotating in the direction of the arrow n when it is empty or charged, a locking or stop device j , operated by a rockable handle or the like, can be used. The device j consists in an arm carried by a crank which is mounted in suitable bearings adjacent to one of the lower corners of the scale-pan. By turning the crank so that the arm projects upwardly the scale-pan will be prevented from rotating in an opposite direction to the arrow n , and by turning the crank so that the arm j is moved to one side the scale-pan will be free to rotate under the action of the weighing operation as desired.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An automatic scale mechanism comprising a scale-beam, a pan suspended therefrom, a charging mechanism arranged above the pan comprising a hopper having a funnel-shaped delivering portion, the said funnel-shaped portion having a discharge-opening at the bottom and an auxiliary discharge-opening in its incline side portion, a valve controlling the bottom discharge-opening, and a valve controlling the auxiliary side discharge-opening, a means engaging the scale-pan for permitting the main valve to close first and then the auxiliary valve as the desired amount discharged into the scale-pan is reached, substantially as described.

2. An automatic weighing mechanism comprising a balance-scale and a pan suspended therefrom, means automatically controlled by the movement of the scale-pan for discharging substances into the same, the charging device having a funnel-shaped outlet, an inverted-cone valve arranged so that its edge comes in contact with the walls of the said outlet for closing the same, an auxiliary valve mechanism upon the side of the charging mechanism, and means for opening both the valves, the said means permitting of one valve closing before the other so that the discharge of the material is properly continued until the full measure is obtained, substantially as described.

3. An automatic measuring and weighing mechanism comprising a balance-beam, a pan suspended therefrom, a yoke for supporting the pan upon the balance, a charging mechanism arranged above the yoke having a downwardly-tapering discharge portion, open at

the bottom, the said tapering discharge portion also having an auxiliary outlet-passage in its side walls, a valve controlling the bottom discharge-opening and having a stem extending into the path of the pan-yoke, a valve controlling the auxiliary opening in the side walls of the discharge portion, a stem for controlling the same also extending into the path of the pan-yoke, the latter stem being longer than the first-mentioned stem so that the auxiliary discharge-opening will remain open after the bottom discharge-opening is closed, substantially as described.

4. An automatic valve-weighing mechanism, comprising a scale-beam and scale-pan, a charging device mounted above the same having a lower main discharge-valve, an upper auxiliary valve arranged a little higher upon said charging mechanism, a pivoted yoke for operating said auxiliary valve, a rod for actuating said yoke, the said rod engaging the scale-pan yoke, a stem projecting from the main valve and engaged by a projection carried by the scale-beam, the auxiliary-valve rod being longer than the main-valve stem to maintain the auxiliary valve in its open position after the main valve has been closed, substantially as described.

5. In automatic balance-scales a conical sup-

ply-hopper open at the bottom an auxiliary opening in the lateral wall of the hopper a swinging disk connected by a system of levers to a rod of adjustable length provided with a forked end a scale-pan frame and a cross-bar on the frame of the scale-pan for engaging said rod substantially as described.

6. An automatic balance-scale comprising a balance-beam, a vertically depending frame carried by one end of said beam, a scale-pan pivotally suspended in said frame and having an inclined central partition, guide-rods for directing the movement of the said frame, contacting stops on the scale-pan and frame, a supply-hopper provided with a bottom valve, a depending valve-rod adapted to be engaged by a part of the scale-pan frame when the latter rises, an auxiliary discharge-opening in the hopper, a disk controlling the same, and means for operating the disk extending into the path of the scale-pan frame and operated thereby, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PIERRE ALPHONSE DEPAEPE.

Witnesses:

A. GRAELY,
GREGORY PHELAN.