

(No Model.)

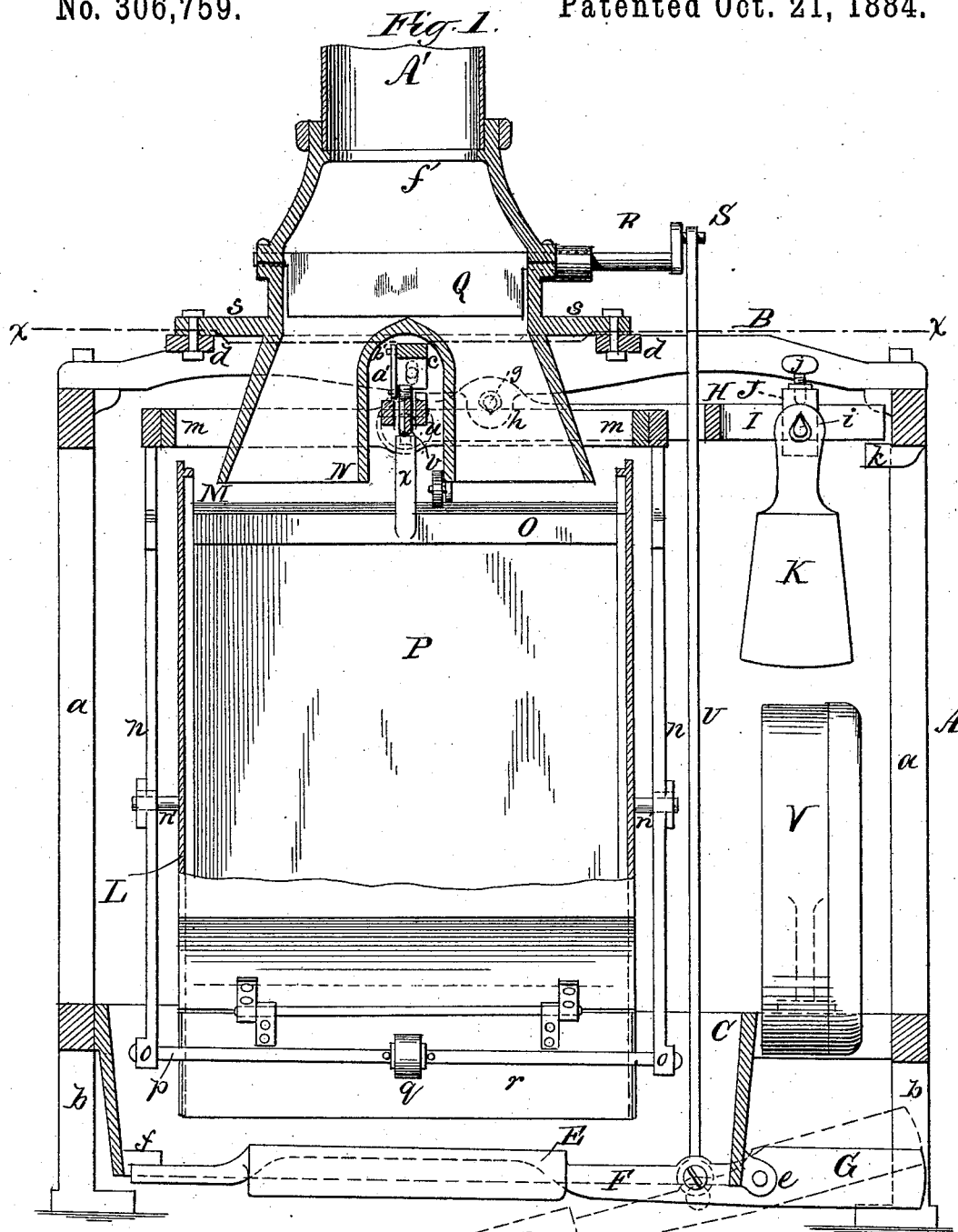
3 Sheets—Sheet 1.

M. F. KOCH.

AUTOMATIC GRAIN SCALE AND REGISTER.

No. 306,759.

Patented Oct. 21, 1884.



WITNESSES

John C. Tunbridge.
John W. Spear.

INVENTOR:

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(No Model.)

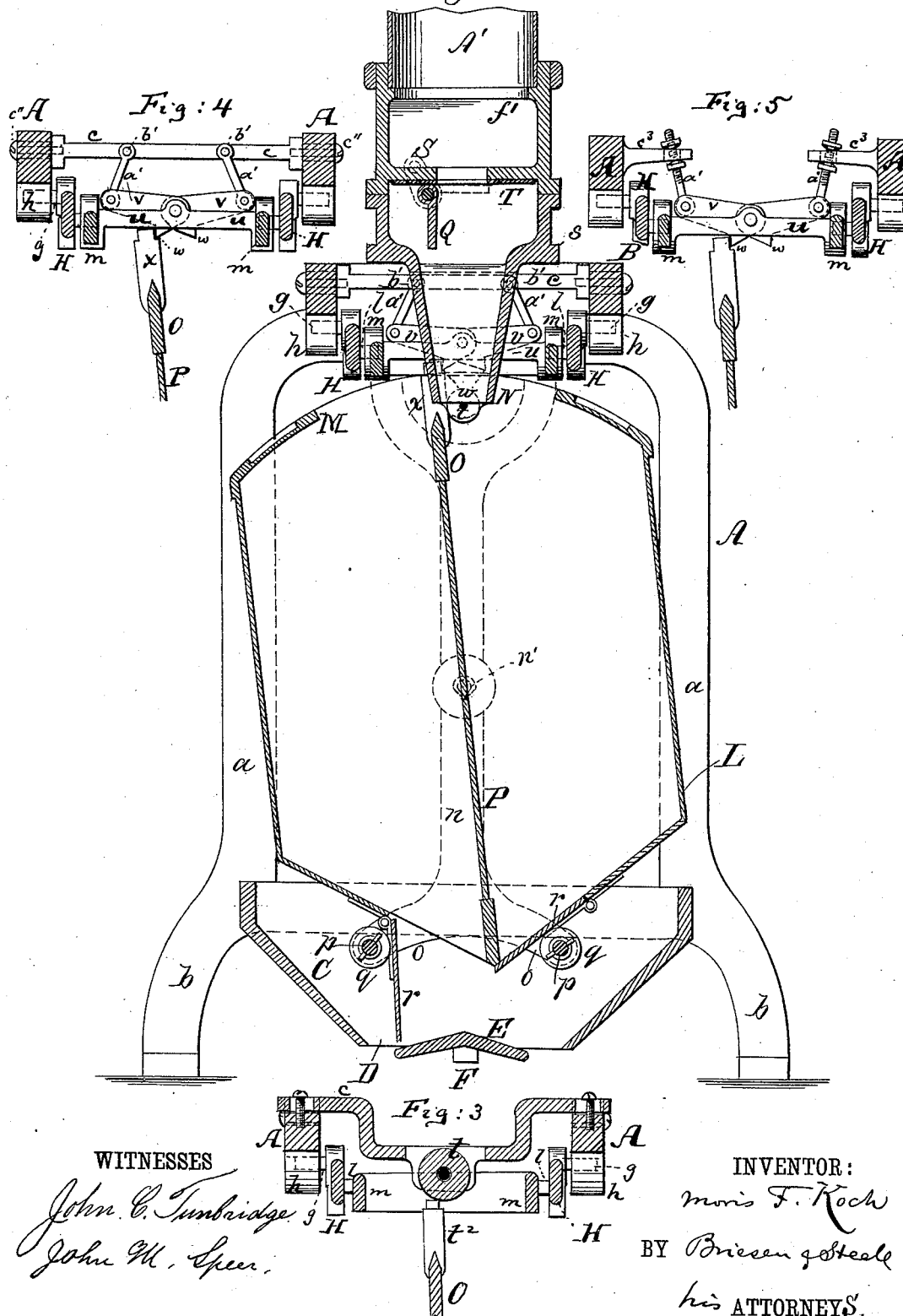
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Fig. 2. Patented Oct. 21, 1884.



(No Model.)

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Fig. 6.

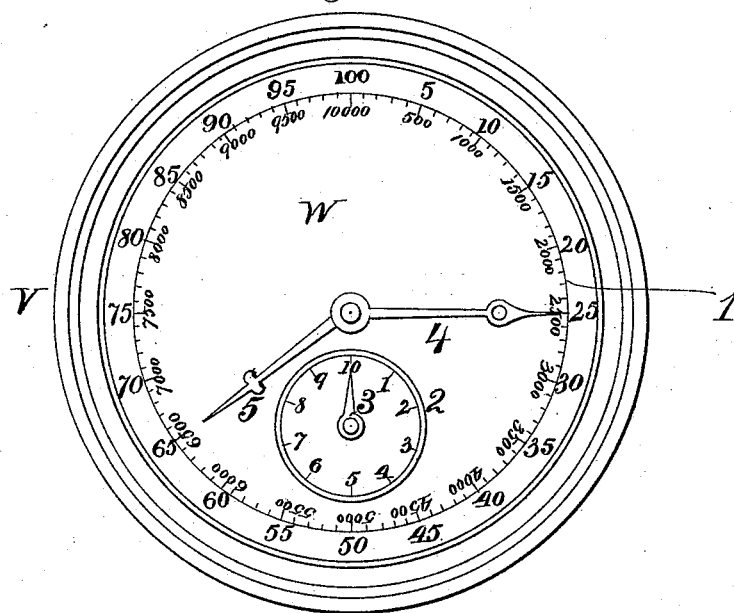
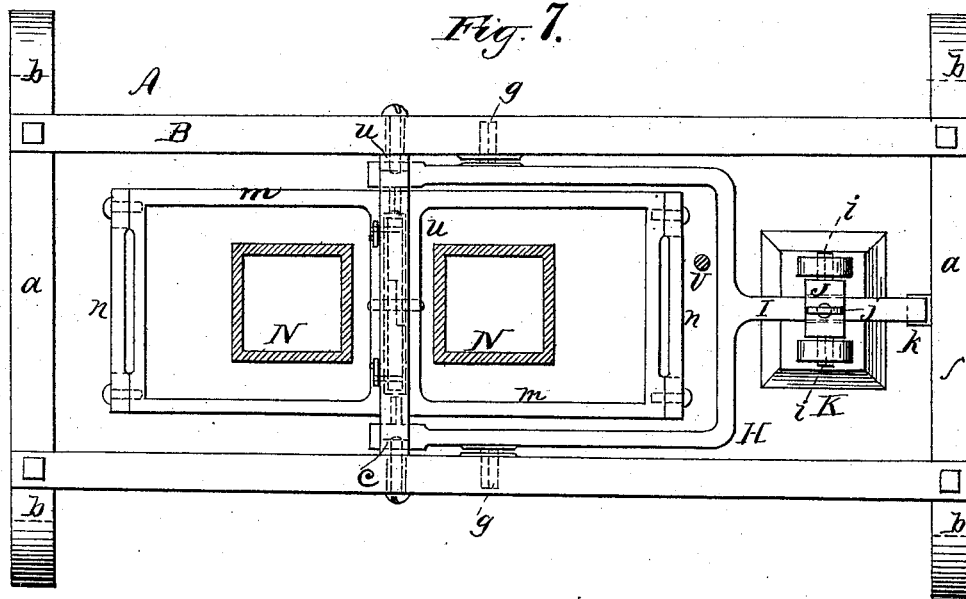


Fig. 7.



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UNITED STATES PATENT OFFICE.

MORIS F. KOCH, OF NEW YORK, N. Y.

AUTOMATIC GRAIN SCALE AND REGISTER.

SPECIFICATION forming part of Letters Patent No. 306,759, dated October 21, 1884.

Application filed April 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, MORIS F. KOCH, of New York, county and State of New York, have invented a new and useful Automatic Scale and Register, of which the following is a specification, reference being made to the annexed drawings.

My invention relates to the class of automatic scales in which the material to be weighed—such as grain—is received from a supply-tube in an oscillating box that is suspended from a scale-beam; and it consists in a device for bringing the oscillating box with certainty into the positions in which it is to be filled.

It also consists in other devices hereinafter described, which increase the accuracy and certainty of the action of the apparatus.

Figure 1 is a vertical central section of my improved scale. Fig. 2 is a vertical transverse section of the same. Figs. 3, 4, and 5 are vertical cross-sections of the frame in which the oscillating box is hung. Fig. 6 is a face view of the dial used for registering. Fig. 7 is a horizontal section of the scale on the line *x x*. Fig. 1.

Similar letters of reference indicate the same parts in the different figures of the drawings.

The frame A, which supports all of the parts of the scale, is intended to rest upon the edges of the bin or spout into which the scale discharges. In the top of this frame A are secured three cross-bars, *c d d*. The central cross-bar, *c*, is made vertically adjustable, its ends being secured by screws *c' c'* to vertically-slotted parts of the frame A. The bar *c* may also be adjustable in the direction of its length, as shown in Fig. 3. The lower part of the frame A carries a hopper, C. The sides of the hopper C are inclined, leaving an opening, D, for the discharge of the material being weighed. In this opening is placed a ridge-shaped plate, E, which is attached to a lever, F, that is pivoted in the ears *e* at one end of the hopper C, and provided with a counter-weight, G, capable of holding the free end of the lever F in contact with the underside of a stop, *f*, when there is no discharge upon the plate E of material being weighed. The lever F connects by a rod, U, with the crank-

shaft of a gate, Q, which is hung in the upper part of the apparatus, as shown in Fig. 1, and as described in Letters Patent No. 255,832. A bifurcated scale-beam, H, is provided on opposite sides with knife-edges *g*, which are received in V-shaped bearings formed in ears *h*, projecting downward from the top frame, B. These V-shaped bearings centralize the knife-edges and limit the vibrations of the beam. An arm, I, projecting outward from the scale-beam H, and forming a part thereof, is provided with an adjustable sleeve, J, from opposite sides of which project knife-edges *i*, which support the weight K. These knife-edges also enter V-shaped bearings, as shown in Fig. 1. The weight K is adjusted toward or away from the knife-edges *g* by sliding the sleeve J on the arm I, and it may be secured in any desired position by turning a thumb-screw, *j*, which clamps the sleeve J to the arm I. The free end of the arm I rests normally on a lug, *k*, projecting from the frame A. Knife-edges *l* project inwardly from the sides of the forked scale-beam H, with their edges uppermost, and are received in V-shaped bearings in a rectangular frame, *m*, which supports the oscillating box L. The frame *m* is shown in top view, Fig. 7. The ends of the frame *m* are rigidly secured to the upper ends of upright bars *n*, that are forked at their point of attachment to the frame *m*. The upright bars *n* are also forked at their lower ends, as shown at *o*, Fig. 2, for receiving the connecting ties or rods *p*, which extend across below the oscillating box L, and which unite the frame *m*, uprights *n n*, and rods *p* all into one rigid structure. Each rod *p* is provided with a roller, *q*, for closing the gates *r* at the bottom of the oscillating box L. The oscillating box is provided at opposite ends near the middle of its height with knife-edges *n'*, which are supported in V-shaped bearings in the perpendicular side bars, *n*. The oscillating box L is partly closed at the top, having, however, an opening, M, into which the supply-spout N projects a short distance. The supply-spout N is provided with flanges *s*, which are secured to the cross-bars *d* of the frame A, or to other parts of said frame. The lower end of the supply-spout N is bifurcated, as in

Fig. 1, to accommodate the adjustable cross-bar *c* and the attachments thereof, presently to be described. The oscillating box *L* is by a partition, *P*, which extends to the lower angle of the bottom of the oscillating box *L*, divided into two equal compartments, the top of the partition forming a bar, *O*, with beveled upper edge, the same as shown in Patent No. 223,692. A roller, *t*, is hung in one of the branches of the supply-spout *N* in position to be touched by the edge of the bar *O* whenever the said bar passes the center line of the apparatus. The convexity of the roller *t* prevents the bar *O* from stopping at or near the center of its oscillation. The roller *t* may be hung in the bar *c*, as shown in Fig. 3, to be touched by an arm, *t'*, which projects from the bar *O*.

In a bar, *u*, extending across the center of the frame *m*, are pivoted two detent-levers, *v*, having nibs *w*, capable of engaging an arm, *x*, extending upward from the bar *O*. The outer ends of the detent-levers *v* are connected by links *u'* with pivotal pins *u''*, projecting from the side of the adjustable cross-bar *c*, as in Figs. 2 and 4, or from arms *c'*, which project from the frame *A*, as shown in Fig. 5. The detent-levers *v* retain the oscillating box *L* in either of the positions it occupies while being filled from the spout *N*. When the box *L* is filled, and in descending carries down the frame *m*, it swings the detent-levers *v* on their pivots, so as to disengage the nib *w* from the arm *x* when the box is free to oscillate. By raising or lowering one of the ends of the bar *c*, the time of releasing the detent-levers *v* may be varied so as to adjust the weighing capacity of the two compartments of the box *L*.

I desire it to be understood that I can either use the roller *t* in connection with the detent-levers *v* or alone—that is to say, without these detent-levers. The bottom of the box *L* is inclined from its sides downward toward the center line, and the gates *r*, when closed, are in the same plane as the portion of the bottom of the box to which they are attached, so that when open they will be closed by their engagement with the rollers *q* as the box is oscillated. The supply-spout *N* is provided with a swinging valve, *Q*, which is fastened to a crank-shaft, *R*, extending through the side of the spout. The valve *Q* closes against a valve-seat, *T*, in the upper portion of the spout *N* and shuts off the supply of material to be weighed. The crank on the end of the shaft *R* is connected by the rod *U* with the lever *F*, so that whenever the said lever is depressed by a discharge from the oscillating box *L* upon the plate *E* the supply-spout *N* will be closed. The registering mechanism in the box *V* receives motion from some vibrating part of the machine, either from a projection on the arm *I* of the lever *H*, as shown in Patent No. 223,692, or otherwise. The dial *W* of the register, as shown in Fig. 6, is provided with three cir-

lar rows of graduations. One of these circles, 2, has a pointer, 3, which shows thereon each single discharge of the weighing-box *L*. The outer side of the larger circle, 1, of graduations represents multiples of the motions of the index 3, which are shown by a pointer, 4, and the multiples of the record of this circle are in turn denoted by figures inside of the larger circle, 1, by the aid of a pointer, 5. These pointers are turned by suitable means, the pointer 3 moving one step at each discharge from the weighing-box, the pointer 4 one step at each revolution of the pointer 3, and the pointer 5 one step at each revolution of pointer 4. Thus, if every ten discharges of the box *L* yield one bushel, the pointer 4 shows the numbers of bushels between one and one hundred and the pointer 5 shows the numbers of bushels from one hundred to ten thousand. The pipe *A'*, through which the supply-spout *N* receives the material to be weighed, is inserted in the upper end of the spout, and rests upon a narrow internal flange, *f'*, which is formed in the spout, and is in absolute continuity therewith. The spout *N* dips into the box *L*, as shown, the partition *P* reaching up to a less distance than the walls of the box to permit this. By this arrangement it becomes impossible that grain overflow if the weighing apparatus should become clogged. I regard this feature as a valuable improvement on Patent No. 222,851, in which the spouts *A* and *B* are disconnected.

My improved weighing apparatus is adapted to weighing wheat and other grain, and all kinds of granular, comminuted, and even liquid material.

The operation is as follows: Material to be weighed is conveyed by the pipe *A'* to the spout *N*, which delivers it to one of the compartments of the oscillating box *L*. When enough material has entered the compartment to overbalance the weight *K*, the box *L* descends by its own gravity, and, carrying down the bar *u* and pivotal ends of the detent-levers *v*, causes the detent-levers to turn on their pivots and withdraw the nib *w* from the arm *x*, allowing the superior weight of the filled side of the box *L* to tilt the box on its knife-edges *n'* and release the gate *r* on the filled side of the box *L*, allowing the material to escape into the hopper *C* and upon the plate *E*, causing the lever *F* to turn on its fulcrum and register one discharge of the box *L*, at the same time momentarily closing the valve *Q* upon its seat *T*, preventing the flow of the material from the pipe *A'* until the gate *r* in the bottom of the empty chamber of the oscillating box *L* is closed, and until, in fact, the weight *G* of the lever *F* lifts said lever, when the valve *Q* will be again thrown open and the empty compartment of the box *L* begin to fill. Should the chute into which the hopper *C* discharges become filled with the material being weighed so as to choke the opening *D* and prevent the free action of the lever *F*, the valve

Q will remain closed and the apparatus will cease to operate or waste any grain until the material below the hopper C is removed.

I do not limit or confine my improvement to the exact form herein shown and described, as these may be varied without departing from the spirit of my invention. Among obvious modifications I will mention that the roller *t* may be journaled upon the bar O. In this case a projection would be formed on the spout N or bar *c* to engage the said roller.

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

1. The combination, with the oscillating box and scale-beam of an automatic weighing-machine, of oppositely-arranged adjustable detent-levers *v*, provided with nibs *w*, whereby the oscillating box is locked in one or the other of the positions in which it is filled, and released by the downward movement of the scale-beam and oscillating box, as described.

2. The combination of the oscillating and vertically-movable box L, provided with the rigid central longitudinal bar O, having beveled edge on its upper surface, with the roller *t*, hung in the stationary part of the weighing-machine for preventing the said oscillating box from resting in a central position without at any time stopping its motion, as described.

3. In an automatic scale, the pivoted and vertically-movable weighing-box L, having gates *r* in the bottom and central partition, P, combined with the single spout N, which dips into the chambers of the weighing-box alternately, so as to prevent overflowing the partition passing beneath said spout when the box oscillates, as specified.

MORIS F. KOCH.

Witnesses:

HARRY M. TURK,
WILLY G. E. SCHULTZ.