M. McBRIDE.

Cartridge Weighing Machine.

No. 209,824. Patented Nov. 12, 1878.

Fig. 1.

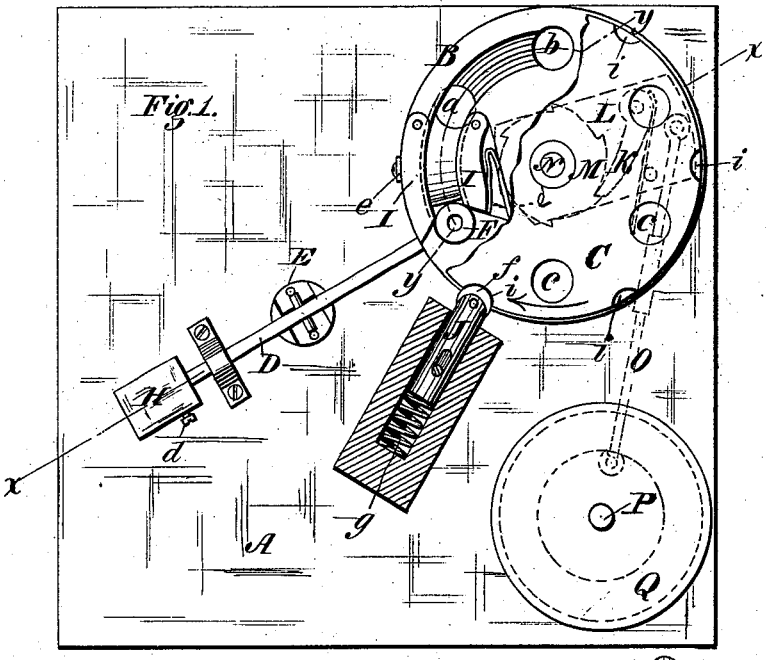



Fig. 2.

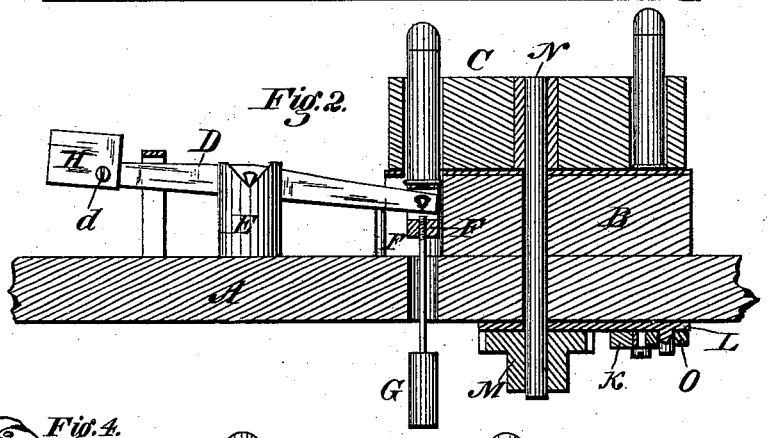



Fig. 4.

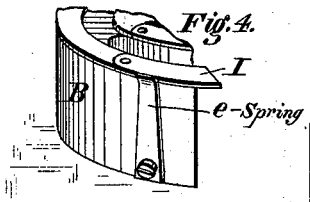
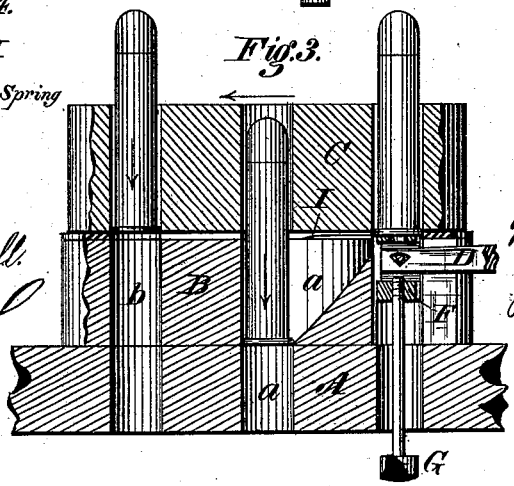



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN CARTRIDGE-WEIGHING MACHINES.

Specification forming part of Letters Patent No. **209,824**, dated November 12, 1878; application filed September 13, 1878.

*To all whom it may concern:*

Be it known that I, MATTHEW McBRIDE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Machines for Weighing Cartridges, of which the following is a specification:

My invention relates to a machine for separating those cartridges which are deficient in weight of metal or in quantity of powder from those of correct weight and quantity; and it consists, essentially, in an intermittently-rotating dial, arranged to receive the cartridges and carry them successively to a scale beam or lever, which, being depressed by cartridges of full weight, permits them to pass under a guide and to descend through the proper opening into the receptacle provided for them, while cartridges of deficient weight, failing to depress the scale beam or lever, pass over the guide and are delivered at a different point from those of correct weight.

The invention also consists in certain details of construction, all as hereinafter explained.

Figure 1 represents a top-plan view of my improved device, partially broken away; Fig. 2, a vertical section of the same on the line *x x* of Fig. 1; Fig. 3, an enlarged section, showing the operation of the guide and scale-beam, taken on the line *y y*, Fig. 1; Fig. 4, a perspective view, showing the arrangement of the guiding-plates and the spring acting therewith.

In the drawing, A represents a platform or table, upon which is mounted a stationary bed, B; and C represents a horizontally-rotating disk, to which an intermittent rotary motion is imparted through suitable mechanism, as hereinafter explained. The stationary bed B is provided with two openings, *a* and *b*, vertically through it, the former to permit the exit of cartridges of correct weight, and the latter that of cartridges of light weight.

The cartridges to be weighed or tested are placed by hand in holes or openings *c*, formed in the dial C, with their heads downward, as represented in Figs. 2 and 3, and are carried successively over the end of a scale-beam, D, projecting through the side of the bed-plate B, just in advance of the opening or passage *a*, as shown in Figs. 1 and 3. The beam or lever D is pivoted on knife-edge bearings in a post or support, E, secured to the table or platform A, and is furnished at its inner end with a pivoted block, F, held in a true vertical position by a pendent weight, G, as shown. Upon its opposite or outer end the beam or lever D is furnished with an adjustable weight, H, clamped at any desired point on the beam by means of a screw, *d*, and serving, when there is no cartridge upon the block F, to hold the upper face of the latter exactly flush with the upper face of the bed-plate B.

Commencing at the forward side of the block F is a vertical opening or passage, inclining from the side of the same downward to the bottom of the bed B, as shown in Fig. 3, the forward wall and sides of said opening being vertical, and a continuation of the opening being formed through the table or platform A, as shown.

Above the opening *a*, and extending from its front end to a point slightly in rear of the same, are two pivoted spring guide-plates, I, flush with the upper face of the bed-plate B, and on opposite sides of the opening, as shown in Fig. 1. These guides I are arranged at such distance apart that the body of a shell may readily pass between them; but the space thus left is not sufficient to allow the head of a shell so to pass. Hence it will be seen that if the cartridge is carried to the guide-plates I with its head above the same, it will be carried by the rotation of the dial C over the plates I and prevented from passing into the opening *a*; but if presented to the guide-plates I with its head or flange below the same it will drop, as it is carried off the block F by the dial C, to the inclined face of the opening *a*, down which it will move as the dial continues its rotation, until it finally discharges through the lower end of said opening into its proper receptacle. The cartridges being carried around by the dial C pass in succession to the block F, on which they stand in a true vertical position free of contact with any other part of the machine, the pendent weight G serving to hold the upper face of the block F in a true horizontal position, whereby the true vertical position of the cartridge is secured and maintained. The weight H is so adjusted

that cartridges of full weight when carried onto the block F shall cause the inner end of the beam or lever D and the block F to descend, thus carrying the head of the shell below the guide-plates I, and causing the cartridge to be delivered through the opening *a*, as above described, while cartridges of deficient weight, caused by too small a quantity either of metal or of powder, failing thus to depress the beam D and its block F, pass from the latter directly onto the guide-plates I, with their heads resting upon the upper face of the same. Thus supported, the light cartridges are carried forward by the dial C until they come over the opening *b*, through which they pass to the proper receptacle.

In order to adapt the machine for separating the cartridges with extreme accuracy, the plates I have their inner edges beveled off on the under side, so that in the event of a cartridge so nicely balancing the weight H as to cause only an exceedingly slight vibration of the beam, it shall still be delivered to its proper place either above or below the guide-plates I. The guide-plates I are also pivoted at the end opposite that at which the cartridge is delivered to them, and are held inward toward each other by light springs *e e'*, so that in the event of the head of a shell being delivered to the guide-plates I against their edges they may yield and permit the head to pass either above or below, as the case may be.

In order that the weighing may be perfectly accurate, it is necessary that the cartridge, and the dial C which carries it, should be brought for the moment to a stand-still; and to accomplish this purpose a suitable intermittent motion is imparted to the dial, and a detent is provided, consisting of a bolt, J, mounted in a suitable block, provided at its outer end with a roller, *f*, and urged outward by a spring, *g*, to cause the roller to seat itself, when a cartridge is carried onto the block F, in one of a series of notches, *i*, formed in the sides of the dial C, the roller *f* causing the bolt J to be readily forced back, when the necessary force is exerted to again rotate the dial. The detent and its notches *i* are so arranged that the dial shall be held at a time when the block F and opening *b* are exactly in line with the holes for the cartridges in the dial, in order that a light cartridge, if carried around by the dial, may be discharged through the opening *b* while the dial is in rest and another cartridge is being weighed.

An intermittent rotary motion is imparted to the dial C by means of a spring-pawl, K, pivoted to a vibrating yoke, L, and engaging with teeth or notches of a ratchet-wheel, M, secured upon the lower end of the vertical shaft N, upon which the dial is mounted, the yoke L receiving its vibratory movement from a crank-wheel on the lower end of a vertical driving-shaft, P, through the medium of a pitman, O. The shaft P is furnished with a driving-wheel, Q, which may receive its motion from any source.

It is apparent that instead of the above any suitable mechanism may be employed to secure the intermittent rotary motion of the dial; and also that the other details of construction may be modified without departing from my invention—as, for instance, by the employment of a spring or liquid support for the block F, or by forming the rear end of the beam into a screw-stem, on which the weight might be adjusted by turning; but the form shown is considered the best for practical use.

Having thus described my invention, what I claim is—

1. The combination of a cartridge-carrier, a fixed bed having two delivery-openings, a plate or track separating the two openings, and a scale-beam arranged in the path of the cartridges, so as to deliver them to one or the other of the delivery-openings according to the weight.

2. The combination of the carrier, the plates I, the incline, the two outlets, and the scale-beam, when arranged substantially as shown.

3. In a cartridge-weighing machine, the combination of a movable cartridge holder or die and a stationary scale, arranged in the path of the moving cartridges to receive and sustain them successively and determine their course through the machine from that point forward, substantially as described and shown.

4. In a cartridge-weighing machine, the combination of a rotary vertically-chambered carrier, two delivery-openings at different levels, and a scale-beam arranged to sustain the cartridges one at a time, and determine their course to one or the other outlet according to the weight, substantially as shown.

5. In combination with the carrier, the scale-beam, and the two discharge-openings at different points, the plates or guides, arranged to sustain the elevated cartridges and at the same time permit the carrier to advance those which have descended.

6. In combination with the rotary carrier, the scale-beam, and the two delivery-openings at different points, the plates or guides I, pivoted and provided with springs, whereby they are adapted to yield when a cartridge-head comes in contact with their edges.

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