

(No Model.)

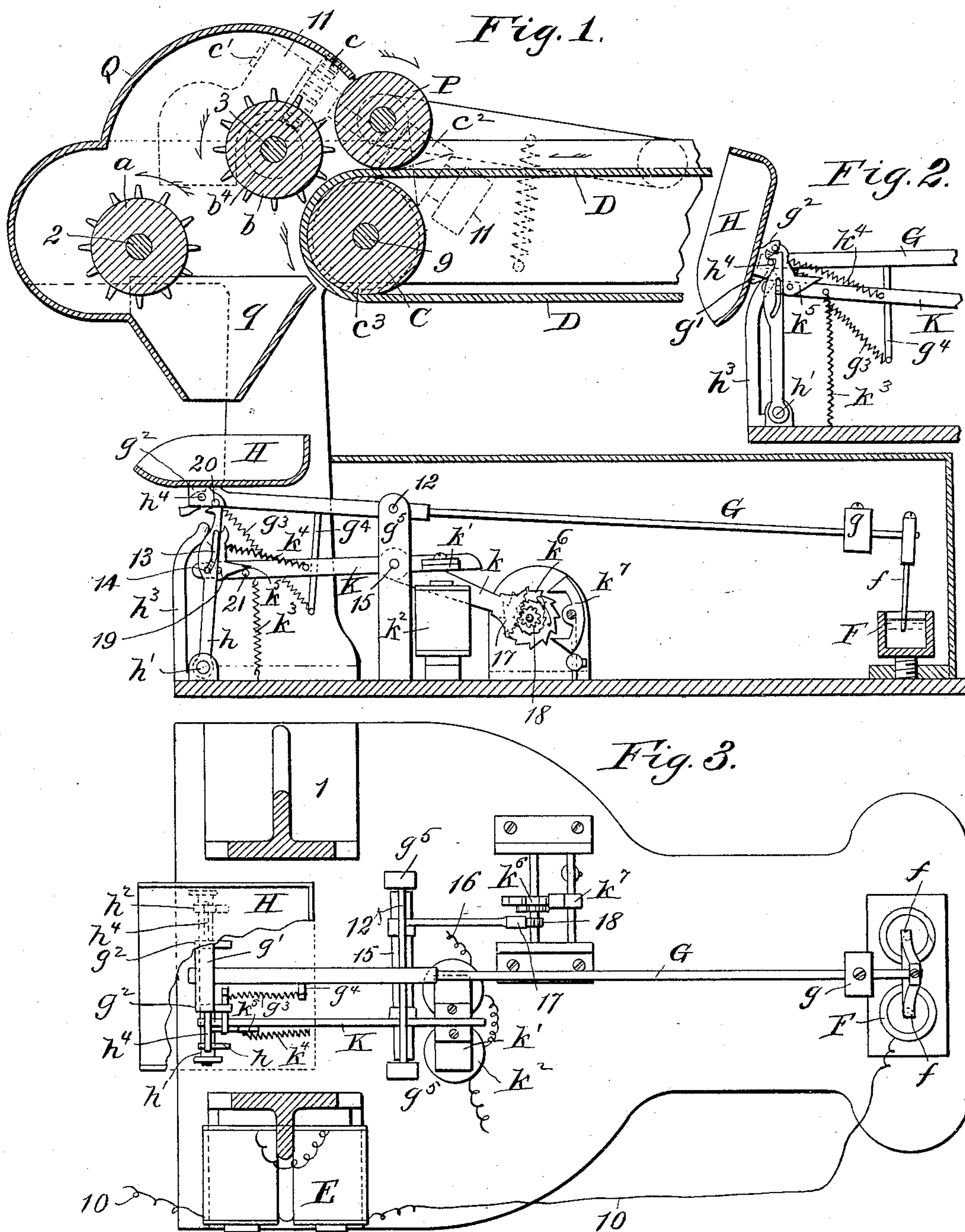
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A. L. MUNSON.

AUTOMATIC WEIGHING AND FEEDING APPARATUS.

No. 566,925.

Patented Sept. 1, 1896.



WITNESSES:

H. Graham.

J. E. Hutchinson.

INVENTOR

A. L. Munson

BY Graham & Low ATTY'S.

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Fig. 4.

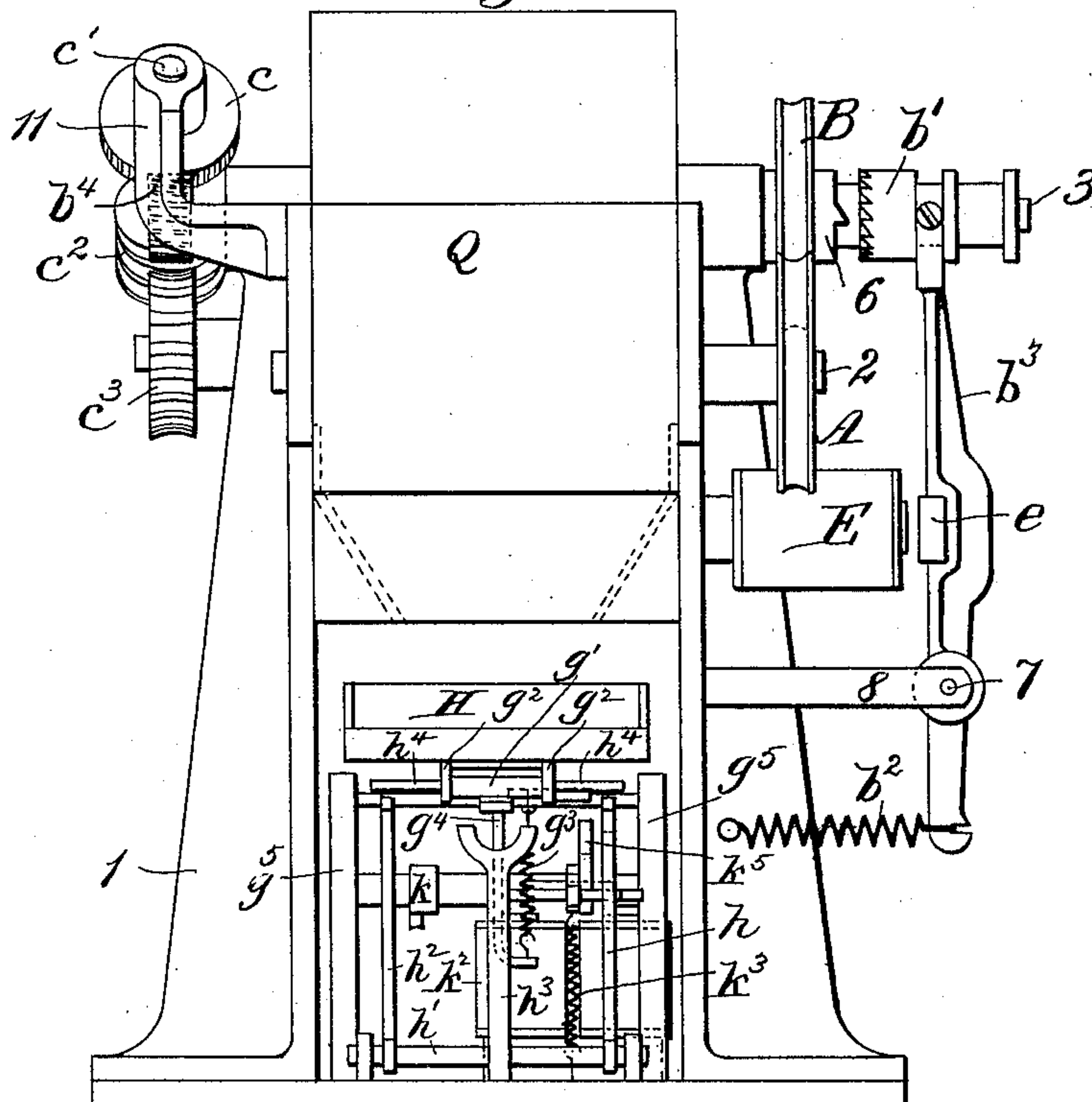
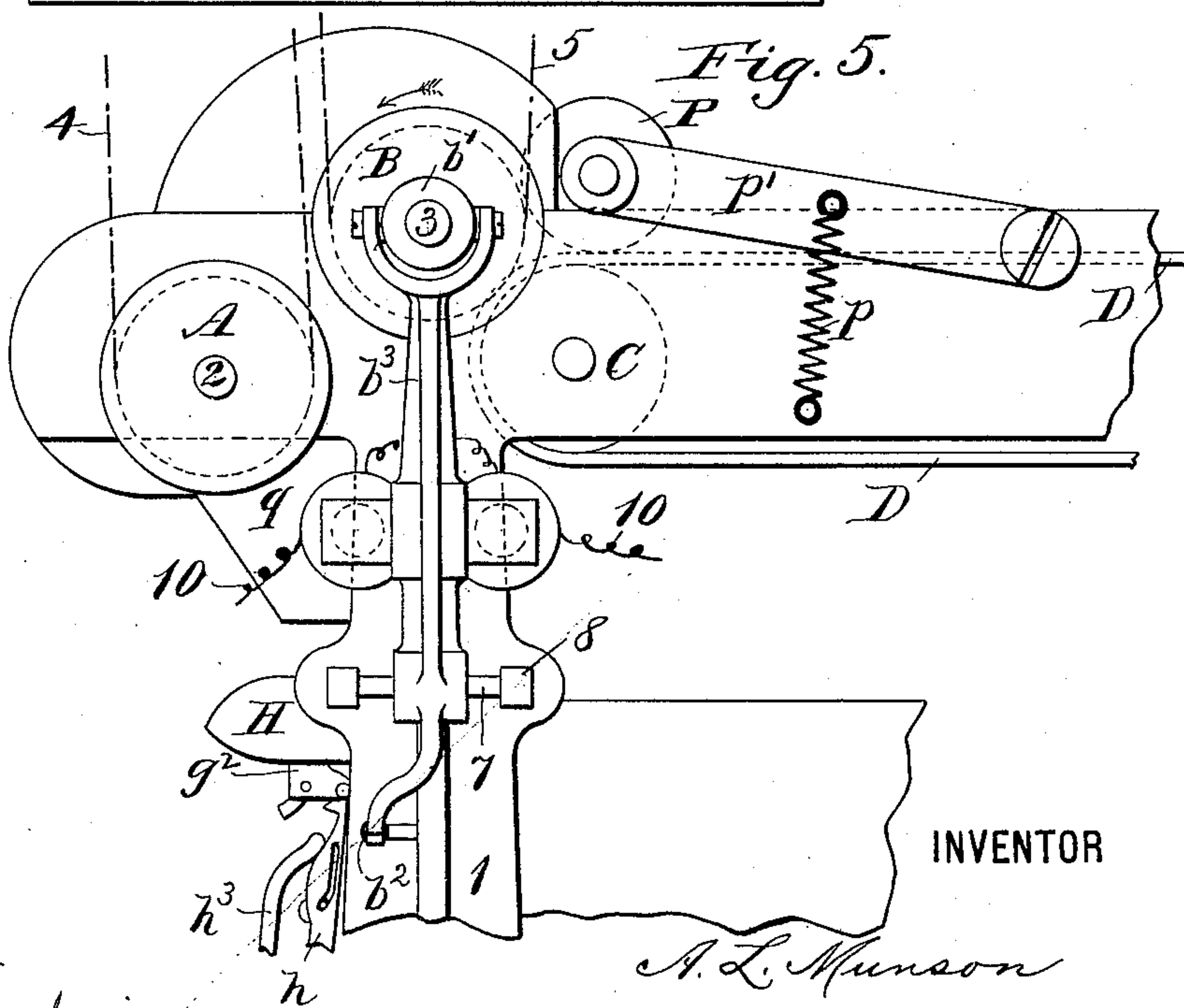


Fig. 5.



WITNESSES:

H. Graham.
J. Edwin Hutchison

INVENTOR

A. L. Munson
BY Graham & Low. ATTY'S.

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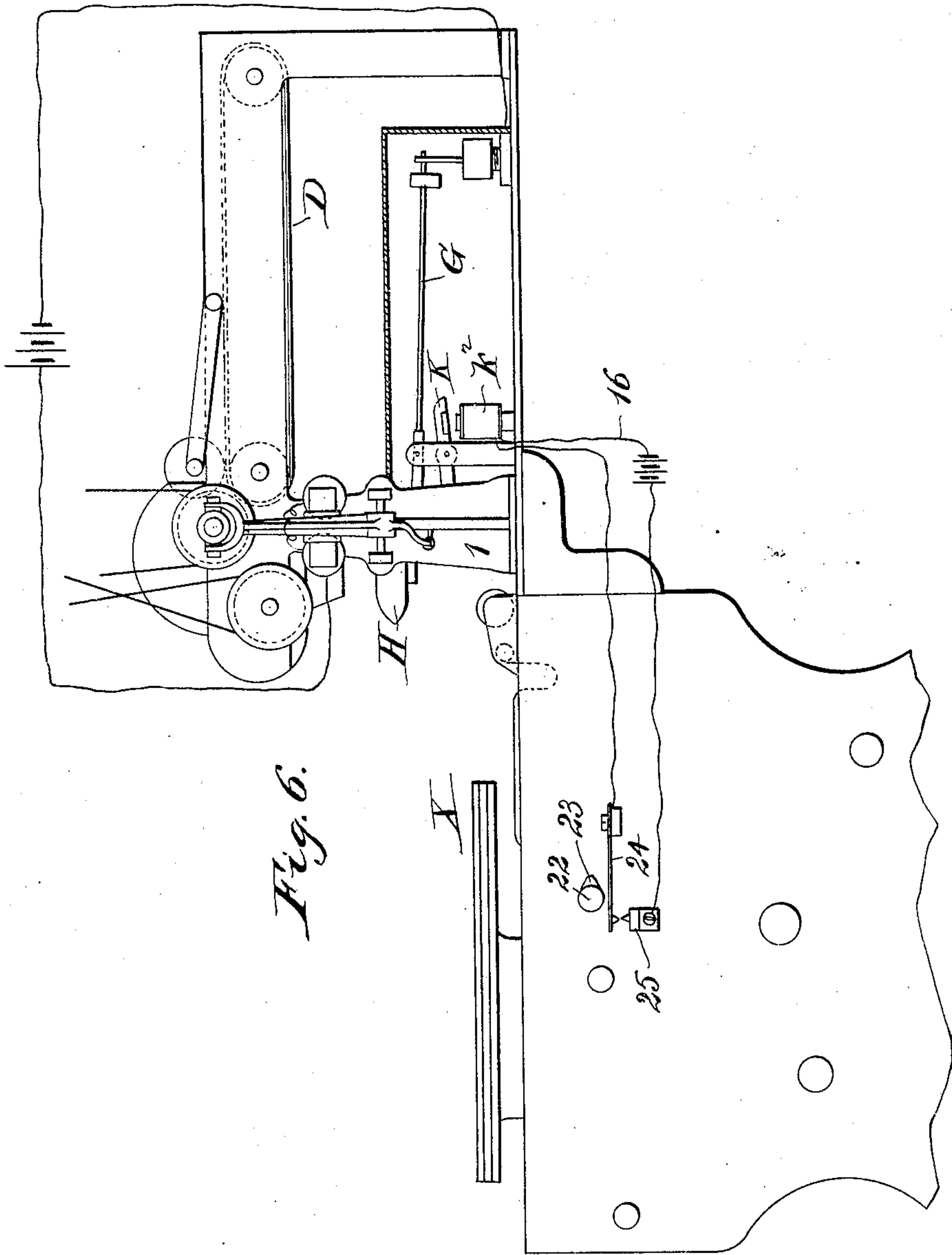
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BY Graham Low ATTY'S

UNITED STATES PATENT OFFICE.

ALBERT L. MUNSON, OF NEW YORK, N. Y., ASSIGNOR TO EMIL MOONELIS,
OF SAME PLACE.

AUTOMATIC WEIGHING AND FEEDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 566,925, dated September 1, 1896.

Application filed October 4, 1895. Serial No. 564,684. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. MUNSON, a citizen of the United States of America, residing at the city, county, and State of New York, have invented certain new and useful Improvements in Automatic Weighing and Feeding Apparatus, of which the following is a specification.

My invention relates to means for feeding and delivering a granulated, fibrous, or finely-divided substance, such, for instance, as tobacco, in successive amounts each of a predetermined weight. The invention is thus especially adapted for the delivering of tobacco to cigarette-machines in which the cigarettes are individually made, but it will be understood that my improvements are not confined to this particular use, but may be employed in any case in which a finely-divided material is to be weighed out for packing into merchantable forms or for other purposes.

The invention consists in the parts and combinations thereof hereinafter particularly set forth and claimed.

In order to make the invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect in the manufacture of cigarettes, but without limiting my improvements in their useful applications to the particular construction, which, for the sake of illustration, I have delineated.

In said drawings, Figure 1 is a longitudinal vertical sectional view of an automatic weighing and delivering apparatus embodying my invention. Fig. 2 is a similar view of a portion of the apparatus with the parts in another position and the scale-pan canted. Fig. 3 is a sectional view on line X, Fig. 1, showing the lower portion of the apparatus in plan with the casing removed. Fig. 4 is an end elevation of the delivery end of the apparatus. Fig. 5 is a side view of a portion of the same. Fig. 6 is a side elevation of the apparatus as applied to a machine for making cigarettes.

In machines for rolling cigarettes individually the feed for delivering the determined quantity of tobacco to the rolling devices must be such that the quantity divided off

from the mass of tobacco to form the filler of a single cigarette will be accurate in weight and amount. If otherwise, cigarettes of many and varied sizes in diameter will be produced, causing a large number of the cigarettes to be rejected as unmerchantable. This defect is a prominent one in all machines heretofore produced of which I have knowledge, and particularly so in machines used in the production of "all-tobacco" cigarettes. In the present apparatus I have provided means by which the filler for each cigarette is separately weighed and delivered to the action of the rolling apparatus automatically, thereby enabling the machine to continuously produce cigarettes of absolutely even weight and size. This results in great economy in manufacture.

Referring to the drawings, and especially to the means by which the tobacco or other substance is received and delivered to the receptacle or scale-pan of the weighing apparatus, 1 is a standard or other suitable support carrying a frame or casing Q, within which latter are mounted shafts 2 and 3, carrying pulleys A B. These pulleys may be driven by belts 4 and 5 from any convenient motor, for instance, from overhead shafting, and may be geared together, if preferred. Upon the shaft 2 is fixed a roller *a*, provided with picker-teeth of any suitable form and arrangement, and revolved in the direction of the arrow *a'*. The pulley B is mounted so as to revolve freely upon its shaft 3, and upon the latter is fixed a roller *b*, also provided with picker-teeth, as illustrated. The rolls *a b* may be arranged in a known manner, with their teeth intermeshing to prevent tobacco of long fiber from being wound up and accumulating on the roll *b*. The pulley B is provided with a clutch member or tooth 6, with which is adapted to engage a sliding clutch member *b'*, feathered and adapted to move longitudinally upon the shaft 3. The clutch member *b'* is controlled by a lever *b³*, pivotally mounted at 7 upon a bracket 8 or other fixed part of the frame, and normally pressed in such direction as to keep the clutch members separated by a spring *b²*. The shaft 3 and roller *b*, as well as any devices which are actuated from the shaft 3, are thus adapted to remain at rest until the upper end of the

lever b^3 is moved inward sufficiently to engage the clutch members with each other, and then to remain in operation until the lever is released and the spring b^2 permitted to reassert itself. For the actuation of the lever to engage the clutch I prefer an armature e , fixed on the lever and adapted to be attracted by an electromagnet E , fixed on the frame and energized at the time when the tobacco-feed is desired to operate by a current from a battery or other generator, (not shown,) the circuit 10 from which includes the magnet-coil and is controlled by electric contacts operated by the weighing devices, as hereinafter described. It will be understood, however, that my invention is not confined to the employment of electric devices for the actuation of the clutch-lever.

D is an endless feed belt or apron mounted at its inner end on a roller C in the casing Q and in proximity to the roller b , and extending outward for a convenient distance to receive the tobacco from any desired source, its outer end being carried by a roller or any well-known supporting means, which latter is preferably adjustable to take up any slack in the apron. The shaft 9 of the roller is suitably geared with the shaft 3, for which purpose I employ a transverse shaft c' , mounted on bearing-brackets 11 without the casing Q , and having fixed thereon a skew-toothed wheel c , meshing with another skew-toothed wheel b^4 on the shaft 3, and having also fixed thereon a worm c^2 , meshing with a worm-wheel c^3 on the shaft 9.

P is a presser-roller mounted above the apron D in arms p' , which latter are forced downward with a yielding pressure by springs p , Fig. 5, connecting said arms with the frame. As the tobacco is fed by the apron and passes under the roller P it is caught by the picker-teeth on the roll b and tossed over within the casing Q , some of it descending directly and some being thrown down by the toothed roller a . This fed and picked tobacco falls into and through a hopper q , forming the lower portion of the hopper Q , onto the scale-pan H . This pan is fixed to lugs g^2 , which are pivoted by a pin h^4 to a tubular cross-head g' , fixed on the scale beam or lever G . This beam is hinged by a pin 12 to brackets g^5 , fixed on the standard or base thereof, and is provided with the usual sliding weight g .

F indicates a pair of mercury-cups, in which terminate the ends of the otherwise continuous electric circuit 10, and in which are adapted to dip, when the scale-pan is not depressed, conducting needles or forks f , carried by the scale-beam. When the pan H is not carried down by a weight of tobacco, the circuit 10 is completed, magnet E energized, clutch members 6 and b' held in contact, and the shafts 3, c' , and 9 and the feed-apron D caused to operate, and as soon as the pan descends beneath the predetermined weight of tobacco, which latter will depend upon the

previous adjustment of the weight g , the needles f will rise from the mercury, breaking the electric circuit 10 and causing the feed apparatus to cease operation. In this position of the parts the cross-head g' rests upon and is supported by the forks of a column h^3 , fixed on the base of the frame. The proper amount of tobacco having thus been received in the scale-pan and the feed caused to cease, it remains to deliver the weighed tobacco from the scale-pan to the cigarette-machine at the time when the parts of the latter are in position to receive it. The scale-pan may tilt on its pivot h^4 , but is yieldingly held in its normal level position by a spring g^3 , connecting one of the lugs g^2 with a bracket-rod g^4 , fixed on the scale-beam.

h h^2 are hooked levers pivoted at h' to the base of the machine, normally out of line with the projecting ends of the pin h^4 , and adapted to have their hooked ends swung over the pin to hold down the scale-pan at the proper time and permit of its being tilted by an upward thrust. The levers are united so as to move together by their pivot-pin h' , and one of them is formed with a cam-slot 13, engaged by a pin 14 on an arm of a lever K . If this arm of the lever be elevated after the pan H has descended, the action of its pin 14 will be such as to cause the levers h h^2 to be thrown forward and engage the pin h^4 , as seen in Fig. 2. The lever K is fulcrumed on a pin 15, fixed in the brackets g^5 , is normally held with its operating-arm depressed by means of a spring k^3 , and has on its other arm an armature k' . k^2 is an electromagnet beneath and within attracting distance of said armature, so as to cause the operation of the lever K whenever the magnet k^2 is energized by a current in its circuit 16. This current is supplied by a battery or other known form of generator, (not shown,) and the contacts of the circuit, by which it is made and broken, are operated by a suitable moving part or parts of the cigarette-machine, thus insuring the delivery of the weighed tobacco thereon in the proper position of the cigarette-forming mechanism. In order that the movement of the lever K may not take place too suddenly, it carries fixed on its fulcrum-pin 15 an arm k , having a toothed segment 17, which gears with a pinion 18 on the shaft of an escapement-wheel k^6 , the latter being engaged by a weighted anchor k^7 . As the lever K ascends the wheel k^6 is caused to rotate, which movement is retarded by the anchor k^7 , which must be oscillated. The canting of the pan, thus depressed and held by the hooks h h^2 , is conveniently effected by the lever K . To this end said lever has a pan-tilting projection in the form of an angle-lever k^5 pivoted thereon at 19 and having a forked or socketed upper end adapted to engage beneath a pin 20 on one of the lugs g^2 of the scale-pan. One arm of this lever rests on a pin 21, fixed in the scale-beam, and it is held normally against

said pin, with the said socket in position beneath the pin 20, by a spring k^4 , connecting the lever with the scale-beam. This arrangement of the lever k^5 permits it to turn as it is canting the scale-pan, Fig. 2. Such being the arrangement of the parts, it will be observed that the same upward movement of the lever K, which causes the scale-pan to be confined by the hook-levers h h^2 , will cause the lever k^5 to tilt it and deliver its contents to the machine or apparatus being fed, such, for instance, as the rolling devices of a cigarette-machine. The latter are seen at X in Fig. 6. When said rolling devices are in position to receive the charge of the scale-pan H, the rotation of a shaft 22, forming a portion of the cigarette-rolling or other mechanism which is being fed, will cause a cam or finger 23 to depress an electric spring-contact 24 into engagement with an opposing contact 25. Both of these contacts being in the circuit 16 of the magnet k^2 , the pan will be thereupon canted, as already described, furnishing to the devices X the filling for a cigarette. The pan having thus delivered its load, and the continued rotation of the shaft 22, having separated the contacts 24 and 25, the magnet k^2 is deenergized and the spring k^3 permitted to return the lever K. The pin 14 thereupon retracts the hooks h h^2 , the spring g^3 returns the pan to a level position, and the lightened pan is raised by the weight g .

It will be understood that the above-described operation is successively, rapidly, and automatically performed so long as the shafts 2 and 3 are kept in operation, the necessary tobacco supplied to the apron D, and the electric currents furnished to the circuits 10 and 16.

I claim—

1. In an apparatus for weighing, the combination of a weighing scale-pan pivotally mounted, means for positively holding down said pan when it has descended under a weight of material, a device independent of the support of the pan for upwardly canting the pan and an electromagnet for operating said means and device, substantially as set forth.

2. The combination of a pivotally-mounted

scale-pan, a hook for positively holding down the same, a tilting device for canting the pan, and an electromagnet for operating said hook and device, substantially as set forth.

3. The combination with a mechanism to be fed, of a balance mechanism having a pivotally-mounted scale-pan, a feed apparatus therefor, means for actuating said apparatus controlled by the balance mechanism, and means for canting the pan operating in conjunction with the said mechanism to be fed, substantially as set forth.

4. The combination with a mechanism to be fed with tobacco or other material, of a pivotally-mounted scale-pan, and means for canting the latter connected with and controlled by said mechanism, substantially as set forth.

5. The combination of a pivotally-mounted scale-pan, means for supplying the same, devices for locking and tilting the pan, and an escapement governing the movement of the said devices, substantially as set forth.

6. In apparatus for delivering weighed portions of tobacco, or other material, in combination with a scale mounted on an adjustably-loaded lever, an electromagnet and its armature-lever carrying a bell-crank, a pair of hooked arms one of which has a curved slot engaged by a pin on the armature-lever, springs for the scale, the armature, and the bell-crank thereon, arranged and operating, substantially as described.

7. The combination of a feed apparatus, a weighing mechanism including a scale-pan for receiving material from said apparatus, an electromagnet controlling said feed apparatus and controlled by the weighing mechanism, a cigarette-forming mechanism, means for delivering the contents of the pan to said forming mechanism, and an electromagnet controlling the said delivery means and controlled by the forming mechanism, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two witnesses.

ALBERT L. MUNSON.

Witnesses:

GEO. H. GRAHAM,
E. L. TODD.