No. 804,017. PATENTED NOV. 7, 1905.

O. M. LISSAK.

MACHINE FOR AUTOMATIC GAGING.

APPLICATION FILED SEPT. 20, 1904.

4 SHEETS—SHEET 1.

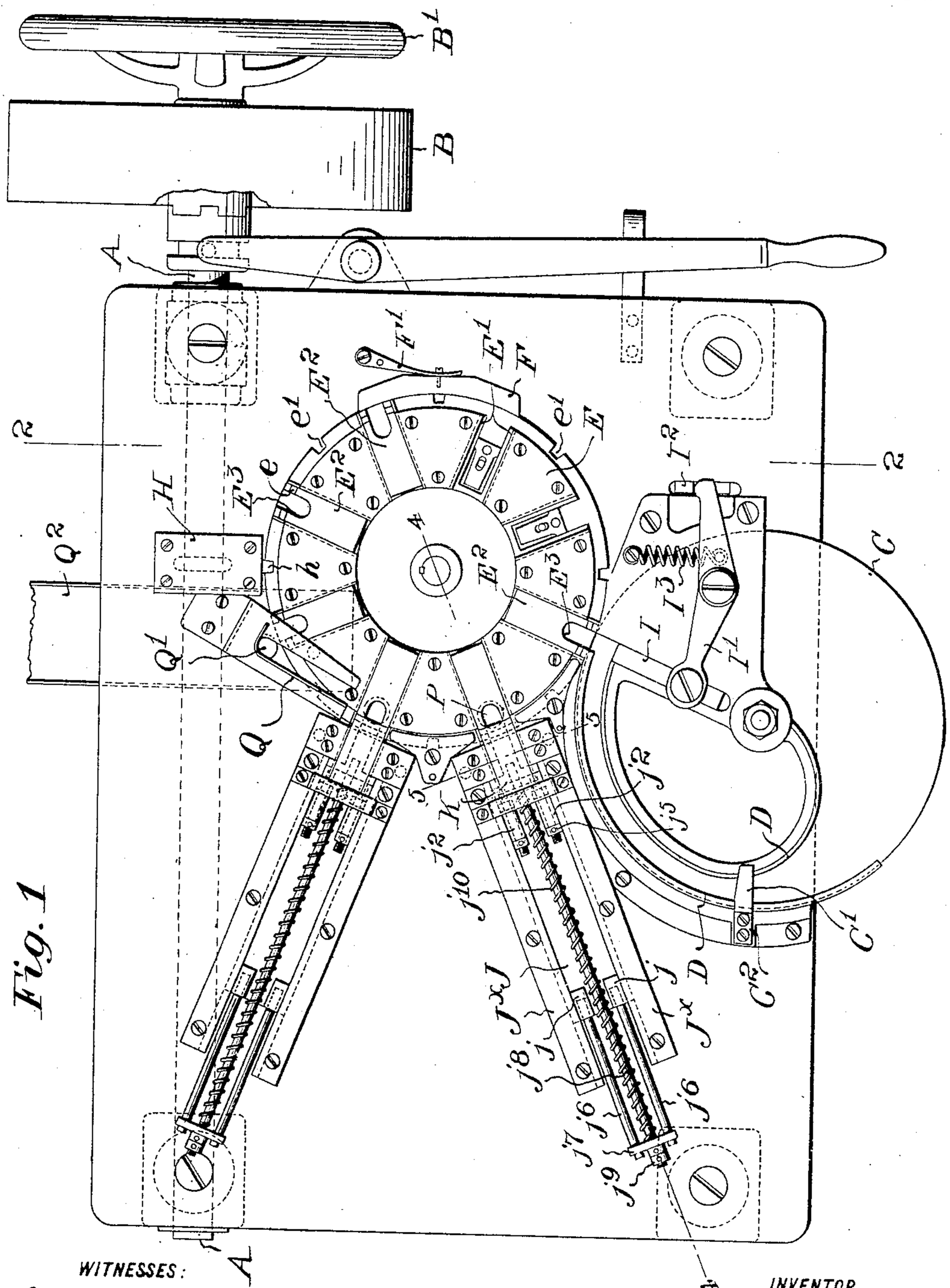

Fig. 1

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4 SHEETS—SHEET 2.

Fig. 2

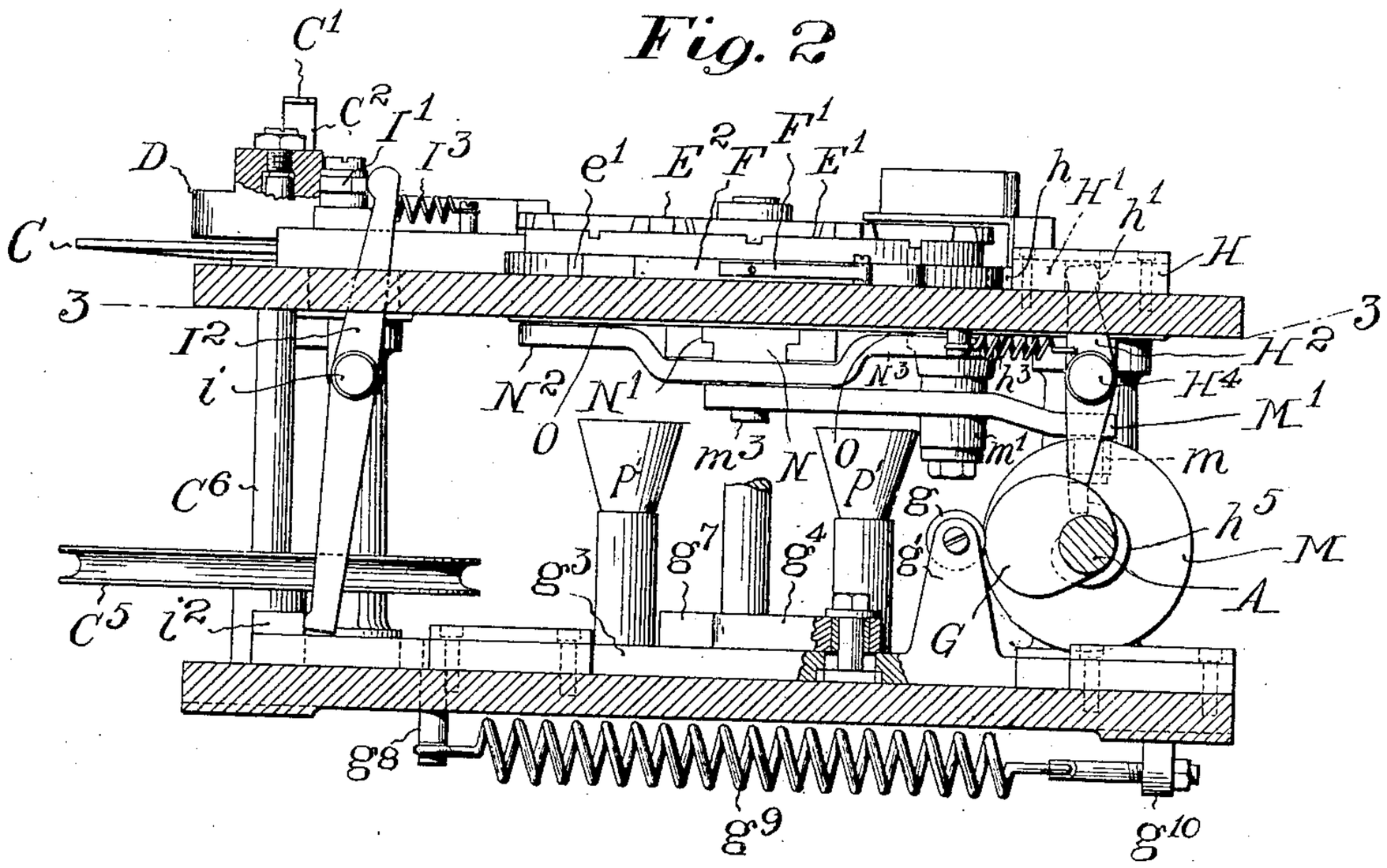


Fig. 4

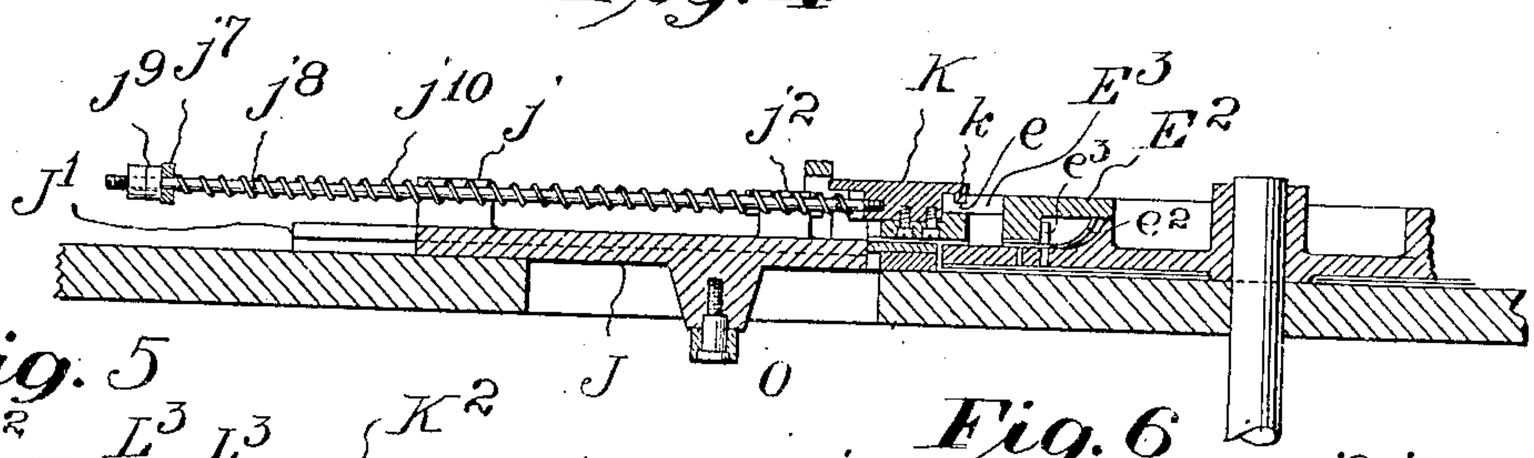


Fig. 5

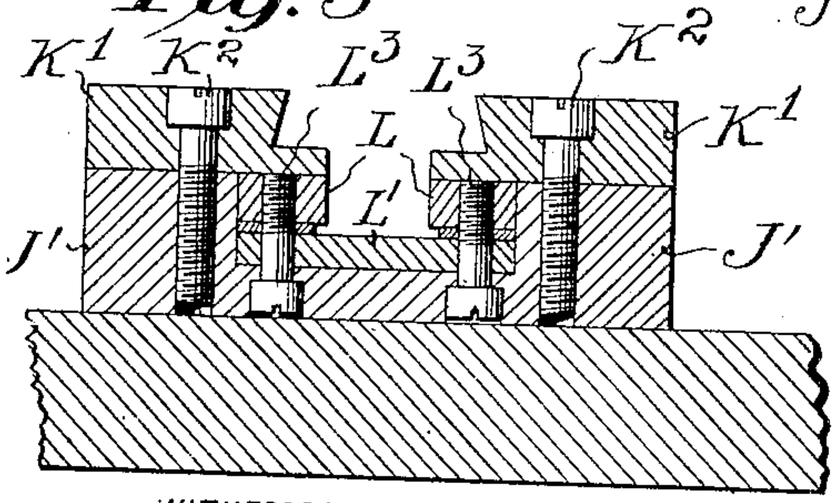
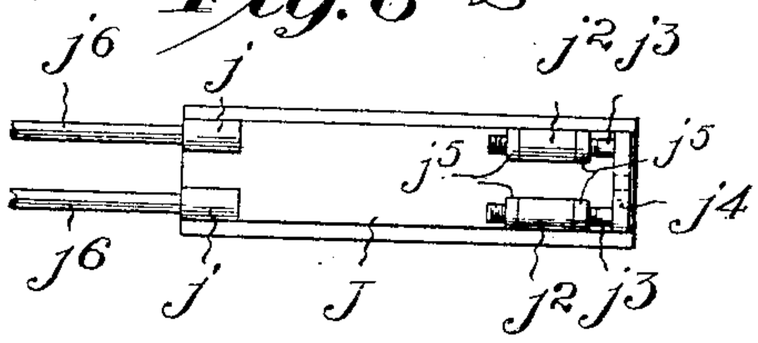


Fig. 6



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4 SHEETS—SHEET 3.

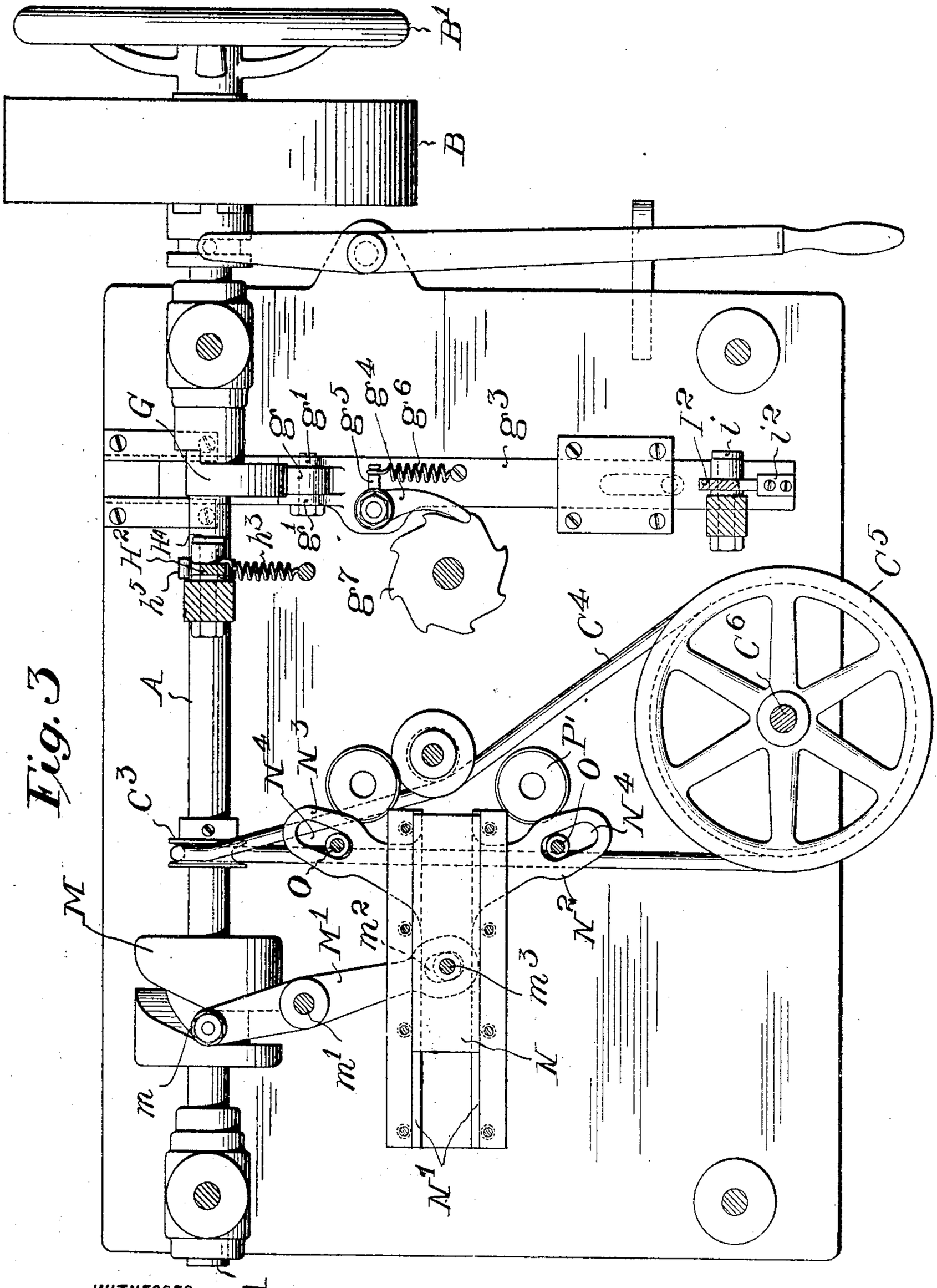

Fig. 3

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4 SHEETS—SHEET 4.

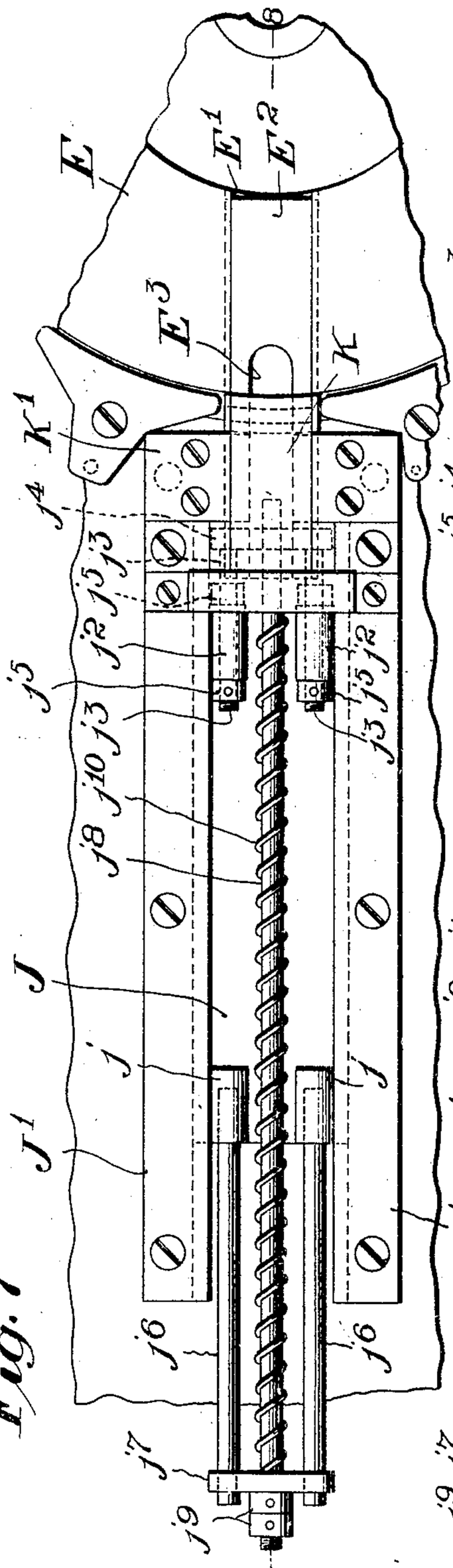

Fig. 7

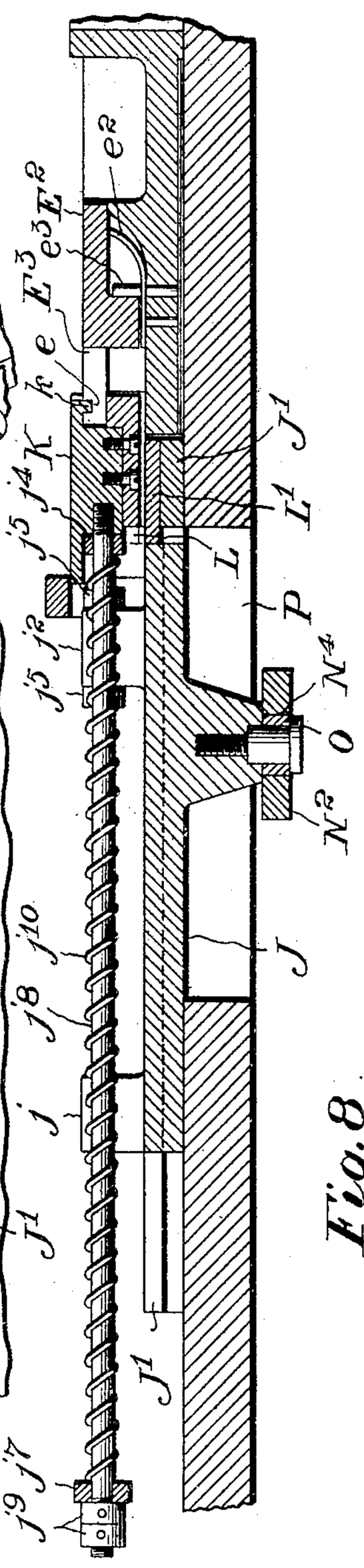

Fig. 8

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MACHINE FOR AUTOMATIC GAGING.

No. 804,017. Specification of Letters Patent. Patented Nov. 7, 1905.

Application filed September 20, 1904. Serial No. 225,219.

To all whom it may concern:

Be it known that I, ORMOND M. LISSAK, a citizen of the United States, residing at Westpoint, county of Orange, and State of New York, have invented a new and useful Improvement in Machines for Automatic Gaging, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My machine has for its purpose to gage the size of cartridges or other articles within certain limits, determining whether the cartridge is below a minimum or above a maximum size or between the two sizes within the limits determined.

The specific machine illustrated and described herein has for its purpose the gaging of the thickness of the head-flange of the cartridges, although, as will be evident, by mere adaptation the machine may be used for gaging the size of other parts of the cartridge or the size of other articles.

I will first describe the embodiment of my invention illustrated in the accompanying drawings and then specifically point out the invention in the claims.

In the drawings, Figure 1 is a plan. Fig. 2 is a section on line 2 2, Fig. 1. Fig. 3 is a sectional plan on line 3 3, Fig. 2. Fig. 4 is a partial section on line 4 4 of Fig. 1. Fig. 5 is an enlarged section on line 5 5 of Fig. 1. Fig. 6 is a detail view. Fig. 7 is an enlarged plan view of a portion of the mechanism. Fig. 8 is a section on the line 8 8, Fig. 7.

A is the main shaft of the machine, driven by means of a pulley B, operated by a belt (not shown) from a source of power. (Not shown.) On this shaft is also the hand-wheel B′, by which the shaft may be operated by hand.

C is a table. D is a fixed guideway. The cartridges are placed upon this table with their heads downward, and the table is given a rotary movement, carrying the cartridges through the guideway. C′ is an overhang, supported by the bracket C^2 from the frame of the machine. This overhang C′ rests over the guideway D and is of height above the guideway of the proper length of a cartridge, so that any cartridge which is of improper length will be caught by this overhang and may be readily removed. This table C is given a continuously-rotary movement by means of a pulley C^3 on the shaft A, connected by a belt C^4 with the pulley C^5 on the shaft C^6 of the table C.

E is a table, which is given a step-by-step motion, as will hereinafter be described. In this table are a series of grooves E′, in which rest the carriers E^2, having the grooved portion E^3, adapted to receive and hold the cartridge. The ends of these carriers have a cut-away grooved curved portion *e*, having a common center which is the center of the table. A leaf-spring e^2, Fig. 4, secured to the table, has one end bearing against the under side of the carrier E^2, which acts to prevent free movement of the carrier in the groove, and a pin e^3 on the table limits the inward movement of the carrier. In the periphery of the table, intermediate of the slides, are orifices *e′*. F is a brake-shoe, against which presses the spring F′. The shoe rests against the periphery of table, and its purpose is to prevent any free movement of the table. The table is given a step-by-step movement in the following manner: Upon the shaft A is the cam G, Figs. 2 and 3, which bears against a roller *g*, carried by the bracket *g′*, connected to a bar g^3, which bar g^3 slides in a guideway in the bed of the machine. The bar g^3 has attached to it a depending rod g^8, to which is secured one end of a helical spring g^9, the other end of which is secured to a lug g^{10} on the under side of the bed-plate. This spring serves to hold the roller *g* in contact with the cam G. Pivoted to this bar g^3 is the pawl g^4, having the tailpiece g^5 and the spring g^6, connected to the tailpiece on the pawl. This pawl works in the ratchet g^7, which ratchet is on the shaft of the table E. As may be seen, in the rotation of the shaft A the bar g^3 is given a reciprocatory movement. In its forward movement it moves the ratchet a distance of one tooth, which moves the table the distance between the carriers E^2, and the table E remains at rest during the return movement of the bar to enable the pawl to engage the next tooth of the ratchet. In order to hold the table positively at rest, in addition to the friction-brake I provide the following means: H is a guide-frame in which a plate H′, having the locking-dog *h*, slides. This plate H′ has an orifice *h′* in which the end of a lever H^2 works. This lever is acted upon by a spring h^3, which spring tends to force the plate H′ and its dog *h* forward. The lever

H² is pivoted at H⁴, the lower end resting against the cam h^5 of the shaft A. As may be seen from the construction of this cam, during one portion of its revolution, the lever is moved against the action of the spring to hold the plate H and its dog h in the retracted position, while in the other position of the cam h^5 the spring h^3 is allowed to act, moving the plate H′ and the dog h forward. The forward movement takes place when the machine is at rest and when one of the orifices e' is opposite the dog h, and the dog h enters the orifice e' and locks the machine from movement.

The cartridges are fed into the grooved portions E³ of the carriers E² in the following manner: I is a pushing-ram in line with the end of the guideway D and also in line with the grooved portion E³ in the carrier E² when the table E is at rest. The pushing-ram I is given a movement forward, forcing a cartridge from the guide into the carrier when the table E is at rest in the following manner: I′ is a lever, one end of which is connected to the pushing-ram I. The other end is in contact with the vertical lever I², pivoted at i. The lower end of this lever I² is in contact with the projection i^2 on the bar g^3 and is moved by the bar g^3 when it is moving to its retracted position. The pushing-ram is normally held in its retracted position and the end of the lever I² is maintained in contact with the projection i^2 on the bar g^3 by means of a spring I³, connected to the lever I′. Up to this point it may be seen the cartridges may be placed with their heads downward upon the table C and in the revolution of the table will be carried through the guideway D. Those cartridges which are overlength will be stopped by the overhang C′, while those cartridges of proper length will pass under the overhang in line with the pushing-ram I, which will force the cartridge into the grooved portion E³ of the carrier E² on the table E when the table is at rest.

As stated, this table is given an intermittently-rotary movement, and the cartridge which was received from the table C into one of the carriers is carried forward in the next movement of the table E. When the table is next at rest, this carrier will be in line with the first of my gaging devices, which I call the "minimum" gage, it being designed to discard the cartridges whose head-flanges are thinner than the minimum thickness desired for the flange of the cartridge. This mechanism consists of the following: J is a gage-slide which moves in a guideway in the gage-slide guide J×. Connected to this gage-slide are the lugs $j\,j$ and also lugs $j^2\,j^2$. Through the lugs j^2 pass the bolts j^3, connected by the cross-bar j^4. The ends of these bolts are threaded, and by means of nuts j^5 the position of the cross-bar j^4 with respect to the lugs j^2 may be determined. Connected to the lugs $j\,j$ are the bars $j^6\,j^6$. These bars at their outer end pass loosely through orifices in the cross-head j^7. Through the center of this cross-head passes the rod j^8. The outer end of the rod j^8 beyond the cross-head j^7 is threaded and provided with the adjusting and jam nuts j^9. The rod j^8 also passes loosely through an orifice in the cross-bar j^4. Between the cross-head j^7 and the cross-bar j^4 and surrounding the rod j^8 is the spring j^{10}. The end of the rod j^8 beyond the cross-bar j^4 is secured to the delivery-slide K. (See Fig. 4.) This delivery-slide K has an overhanging projecting piece k, corresponding with and adapted to engage the grooved curved portion e of the slide E² when in the rotation of the table the two interconnect. This delivery-slide K works in a groove in the supplementary guide K′, Fig. 5, mounted on the gage-block J′, by means of the screws K², the gage-block being removably secured to the frame. In the gage-block J′, by means of the hardened-steel pieces L and L′, secured by the screws L³, is formed a gage of the minimum thickness of the flange of the head of the cartridge. Upon the shaft A is the cam M, in which works the roller m on the lever M′, pivoted at m'. The other end of this lever is slotted at m^2. In this slotted end works the pin m^3, connected to a slide N, working in the guideway N′ on the frame of the machine. To this slide N are connected the arms N² and N³, which arms are slotted at N⁴. In the slotted ends of these arms work the pins O O. These pins are connected, respectively, to the two gage-slides J. In the drawings there are shown two of these gage-slides and appurtenant mechanism, as before described. One of the spaces formed by the steel pieces L and L′ is of minimum thickness and the other of the maximum thickness desired of the flange of the head. The description of one of these is therefore sufficient for the description of both, as they are duplicates, with the exception of the different extent of the space between the two sets of steel pieces L and L′. As may be seen in the rotation of the shaft A, the slide N, and therefore the gage-slides J, are given a reciprocatory movement. The cam is so adjusted and constructed that the gage-slides are given a reciprocatory motion during the period at which the table E is at rest and so that the gage-slide remains at rest during the intermittent movement of the table. I will now describe what occurs in the reciprocation of one of these gage-slides As before described, the reciprocatory motion takes place at the time the table E is at rest, at which time the part k of the delivery-slide will have intermeshed with the groove portion e of the cartridge-carrier. In the forward movement of the gage-slide away from the table the spring

j^{10} will tend to be compressed. If its resistance to compression is greater than the resistance to movement of the delivery-slide, the delivery-slide will move with the gage-slide J. As the delivery-slide K is interconnected with the cartridge-carrier E^2, it with its cartridge will also be moved forward through the gage in the block J'. If the cartridge-flange is thinner than the gage before described, it will pass freely through said gage and in line with an orifice P in the table connected with a chute P' and will fall free from the carrier. Of course its passage through the gage shows that it is an undersized cartridge, and therefore defective. If, on the other hand, it is not below the minimum thickness, it will not pass through the gage, and the spring j^{10} will not have sufficient force to move the delivery-slide farther, but will be compressed, and the slide J will move without moving the slide K. On the return movement of the gage-slide the cartridge and its carrier will be again delivered to the table. In the next intermittent movement of the table this cartridge will come opposite the second gage, which is the maximum gage and is precisely the same as the construction just described, with the exception that the gage-space is the maximum limit. Any cartridge which is of proper size should pass through this gage and drop through a corresponding orifice in the table into a hopper. If it does not pass through this gage, it is again delivered to the table, and in the next intermittent movement of the table the upper projecting portion of the cartridge comes in line with the bifurcated angular or inclined cam Q, which carries it from out of the carrier and into alinement with the orifice Q' in the table in line with the hopper Q^2.

By the use of this machine a manufacturer of cartridges may within limits accurately gage the size of any part of the cartridge. The first gaging device determines the cartridges which are undersized, and the second gaging device determines those that are oversized. In the particular machine shown the gaging-space through which the cartridge is carried is adjusted in construction and size for the thickness of the flange of the head of the cartridge. It is only necessary to adjust the construction and size of the gaging-space for any other part of the cartridge to use this machine to gage other parts of the cartridge than the thickness of the flange.

I use a spring-pressure to move the delivery-slide instead of a positive movement for the following reasons: By the use of a spring of known strength a uniform pressure at all times acts upon the piece when it is brought into the gaging-space. Also such pressure can be adjusted so as not to be sufficient to hold it or force it through the gage-space against the resistance to its passage in case the piece should be under or over sized.

While I have illustrated and described my invention as specifically applied to the gaging of cartridges, I do not intend to limit it to such use, as it may be applied by mere adaptation to gaging other articles.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. An automatic gaging-machine, comprising, in combination, a carrier adapted to receive the article to be gaged, a delivery-slide, means to reciprocate said delivery-slide, a gage in line of movement of said delivery-slide and means to engage and disengage said carrier and delivery-slide.

2. An automatic gaging-machine, comprising, in combination, a carrier adapted to receive the article to be gaged, a delivery-slide, reciprocating mechanism for said delivery-slide, yielding connection between said reciprocating mechanism and said delivery-slide, a gage in line of movement of said delivery-slide, and means to engage and disengage said carrier and delivery-slide.

3. An automatic gaging-machine, comprising, in combination, a carrier adapted to receive the article to be gaged, a delivery-slide, mechanism to move said delivery-slide, yielding connection between said mechanism and said delivery-slide, a gage in line of movement of said delivery-slide, and means to engage and disengage said carrier and delivery-slide.

4. An automatic gaging-machine, comprising, in combination, a carrier, operating means for moving said carrier and a yielding connection between said carrier and operating means, and a gage in line of movement of said carrier.

5. An automatic gaging-machine, comprising, in combination, a carrier, operating means for reciprocating said carrier and a yielding connection between said carrier and operating means, and a gage in line of movement of said carrier.

6. An automatic gaging-machine, comprising, in combination, a table provided with a groove, a carrier adapted to move in said groove, means to give said table an intermittent rotary movement, a delivery-slide, interlocking devices for said carrier and delivery-slide, means to move said slide to and from the table, and a gage in line of movement of the carrier when moved by the delivery-slide.

7. An automatic gaging-machine, comprising, in combination, a table provided with a groove, a carrier adapted to move in said groove, means to give said table an intermittent rotary movement, a delivery-slide, interlocking devices for said carrier and delivery-slide, yielding means to move said slide to and

from the table, and a gage in line of movement of the carrier when moved by the delivery-slide.

8. An automatic gaging-machine, comprising, in combination, a table provided with a groove, a carrier adapted to move in said groove, means to give said table an intermittent rotary movement, a delivery-slide, interlocking devices for said carrier and delivery-slide, reciprocating mechanism for said delivery-slide, yielding connection between said reciprocating mechanism and said delivery-slide, and a gage in line of movement of the carrier when moved by the delivery-slide.

9. An automatic gaging-machine, comprising, in combination, a table provided with a groove, a carrier adapted to move in said groove, means to give said table an intermittent rotary movement, a delivery-slide, interlocking devices for said carrier and delivery-slide, reciprocating mechanism for said delivery-slide, connection between said reciprocating mechanism and said delivery-slide, and a gage in line of movement of the carrier when moved by the delivery-slide.

10. An automatic gaging-machine, comprising, in combination, a table provided with a plurality of grooves, a carrier in each groove, means to give the table an intermittent rotary movement, a plurality of delivery-slides, each in line with a carrier when the table is at rest, means to move the slides to and from the table, interlocking devices for the slides and carriers, and a gage in line of movement of each carrier when moved by its delivery-slide.

11. An automatic gaging-machine, comprising, in combination, a table provided with a plurality of grooves, a carrier in each groove, means to give the table an intermittent rotary movement, a plurality of delivery-slides, each in line with a carrier when the table is at rest, yielding means to move the slides to and from the table, interlocking device for the slides and carriers, and a gage in line of movement of each carrier when moved by its delivery-slide.

12. An automatic gaging-machine, comprising, in combination, a table provided with a plurality of grooves, a carrier in each groove, means to give the table an intermittent rotary movement, a plurality of delivery-slides, each in line with a carrier when the table is at rest, reciprocating mechanism for said slides and a yielding connection between said reciprocating mechanism and said slides, interlocking devices for the slides and carriers, and a gage in line of movement of each when moved by its delivery-slide.

13. An automatic gaging-machine, comprising, in combination, a table provided with a plurality of grooves, a carrier in each groove, means to give the table an intermittent rotary movement, a plurality of delivery-slides, each in line with a carrier when the table is at rest, reciprocating mechanism for said slides and a connection between said reciprocating mechanism and said slides, interlocking devices for the slides and carriers, and a gage in line of movement of each carrier when moved by its delivery-slide.

14. In an automatic gaging-machine, of the character described, a gaging device, comprising, in combination, a gage-slide, a delivery-slide, a gage in line of movement of the delivery-slide and a yielding connection between said gage-slide and delivery-slide.

15. In an automatic gaging-machine of the character described, a gaging device, comprising, in combination, a gage-slide, a cross-bar carried by said slide, a rod passing loosely through said cross-bar, a delivery-slide to which said rod is connected, a cross-head connected to said rod, and a spring between said cross-bar and cross-head.

16. In an automatic gaging-machine of the character described, a gaging device, comprising, in combination, a gage-slide, an adjustable cross-head carried by said slide, a rod passing loosely through said cross-head, a delivery-slide to which said rod is connected, a cross-bar connected to said rod, and a spring between said cross-bar and cross-head.

17. In an automatic gaging-machine, of the character described, in combination, an intermittently-rotated table having grooves, carriers in said grooves, each of said carriers having a groove in the end portion, concentric with the table, a delivery-slide having an overhanging projecting piece, corresponding with and adapted to engage, the grooved end of the carrier.

18. In an automatic gaging-machine, of the character described, in combination, a rotary table, an intermittently-rotated table, grooves in said last-mentioned table, carriers in said guides adapted to receive the articles, a guideway adapted to convey articles placed on the first-mentioned table, in the rotation of the table, in line with one of said carriers and a pushing-ram in line with said carrier, and means to reciprocate said pushing-ram.

19. In combination, a support for the article to be gaged, a gage, and a yielding means adapted to move said support toward said gage.

20. In combination, a support for the article to be gaged, a gage, and a yielding means adapted to move said support toward and from said gage.

21. In combination, a plurality of gages, a support for the article to be gaged, means to bring said support successively in line with the gages, and means to reciprocate said support toward and from each of said gages.

22. In combination, a plurality of gages, a support for the article to be gaged, means to

bring said support successively in line with the gages, and yielding means to reciprocate said support toward and from each of said gages.

23. In an automatic gaging-machine, of the character described, the combination with the rotary table and its carriers, of a bifurcated cam adapted, in the movement of the table, to receive the article in the carrier between its jaws, and move it free from the carrier and table.

In testimony of which invention I have hereunto set my hand, at Westpoint, on this 2d day of September, 1904.

ORMOND M. LISSAK.

Witnesses:
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F. W. COE.