

(Model.)

4 Sheets—Sheet 1.

H. BILGRAM.  
CIGARETTE MACHINE.

No. 506,412.

Patented Oct. 10, 1893.

Fig. 10

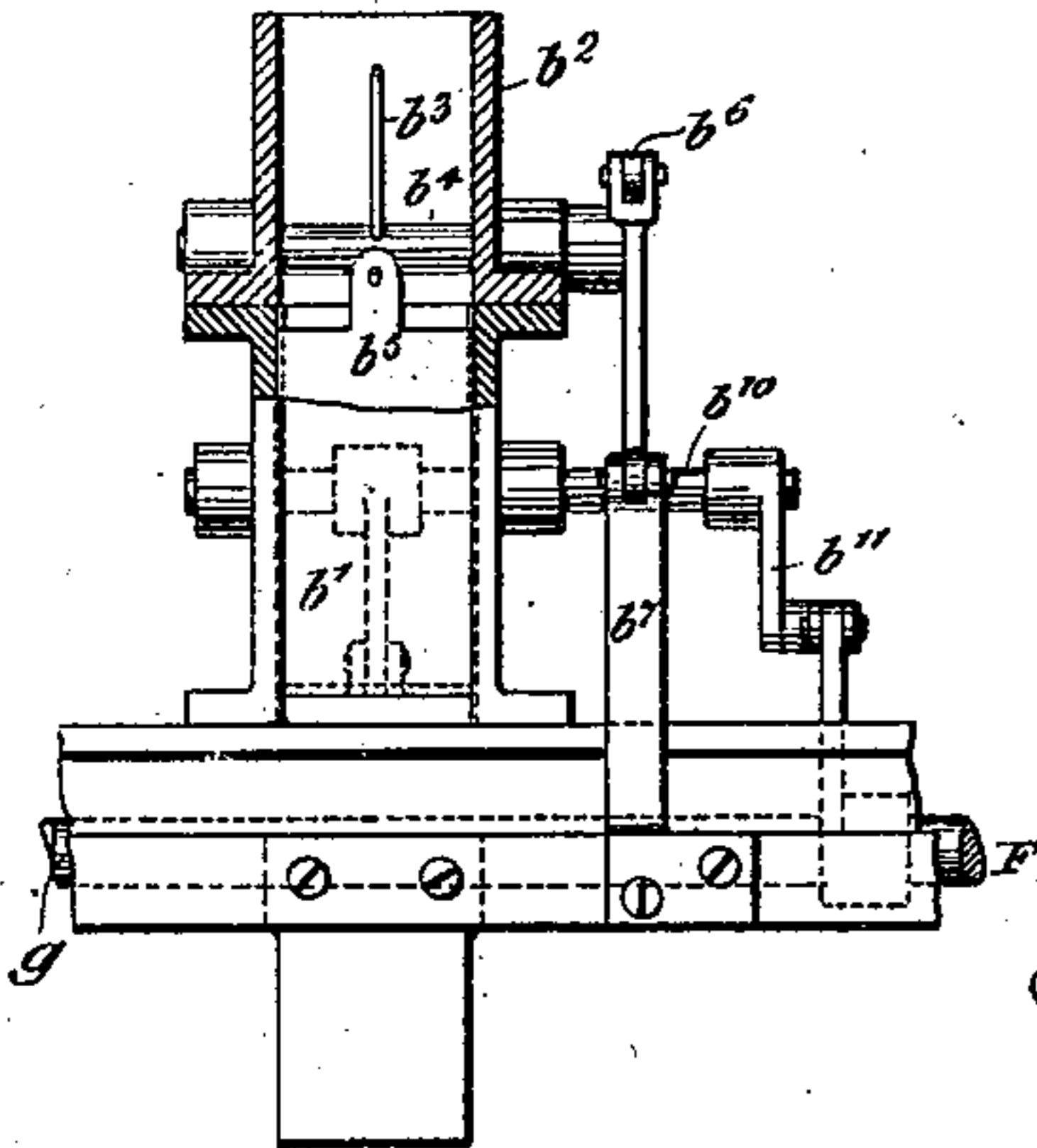


Fig. 1

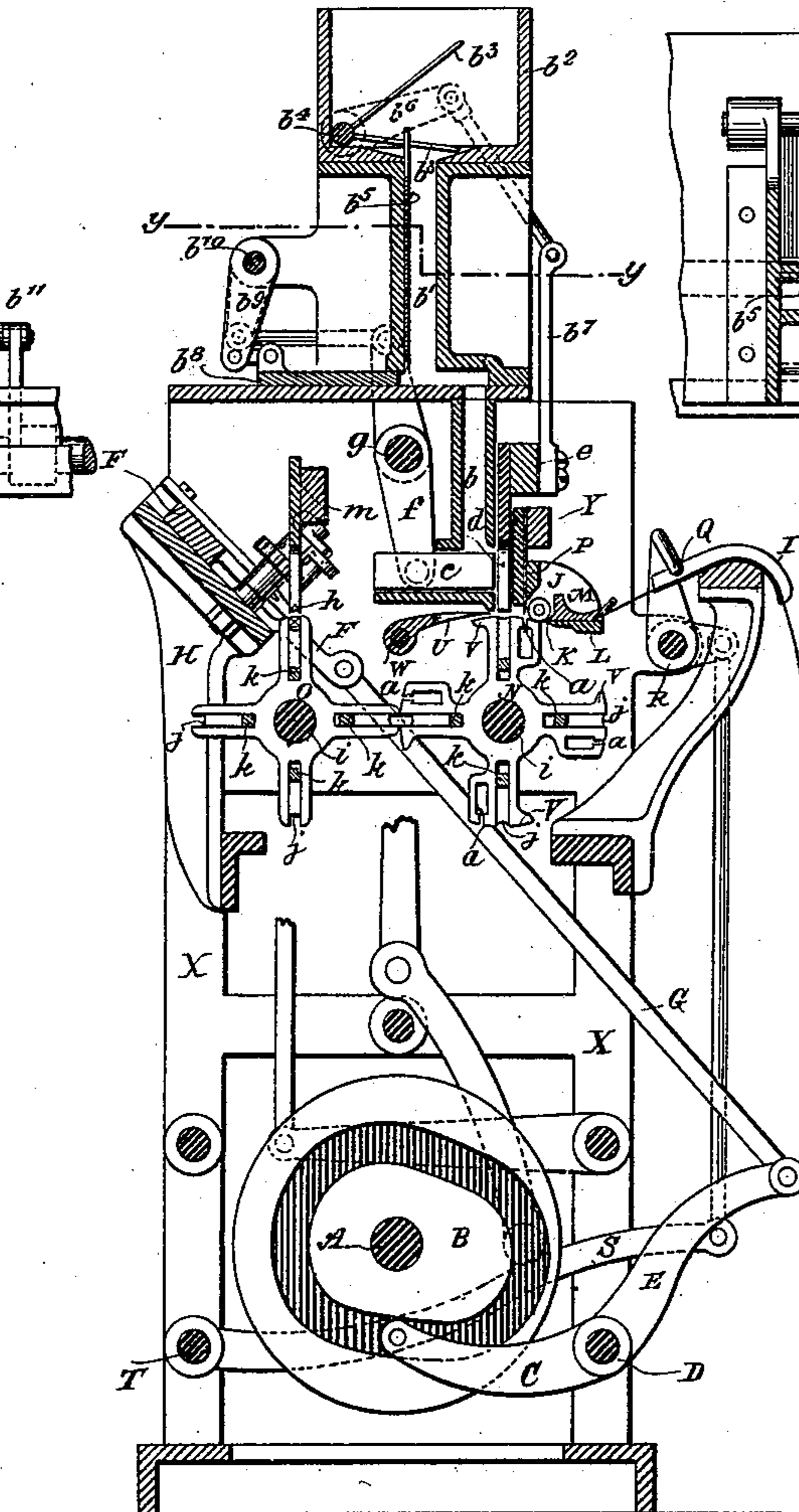


Fig. 11

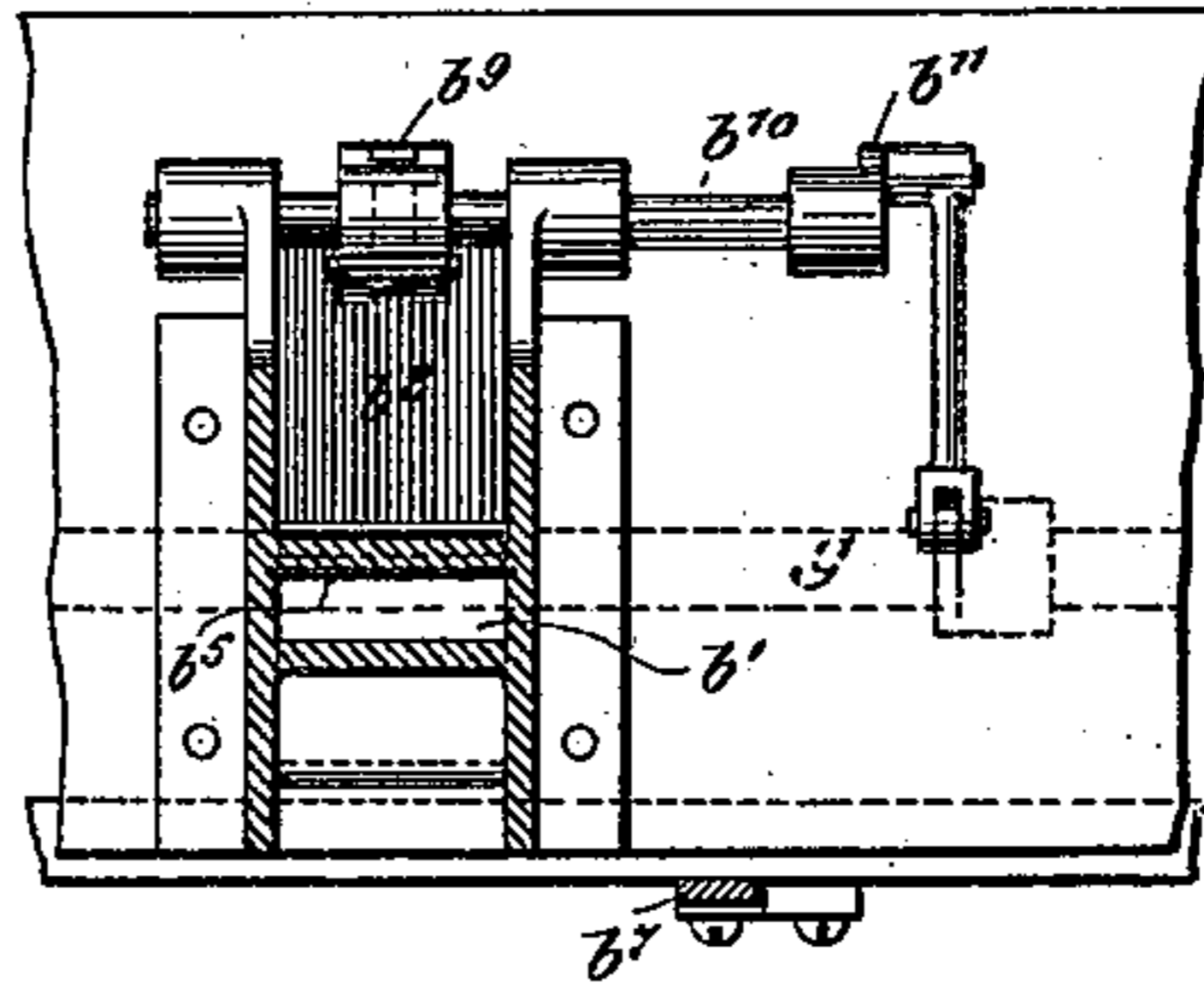
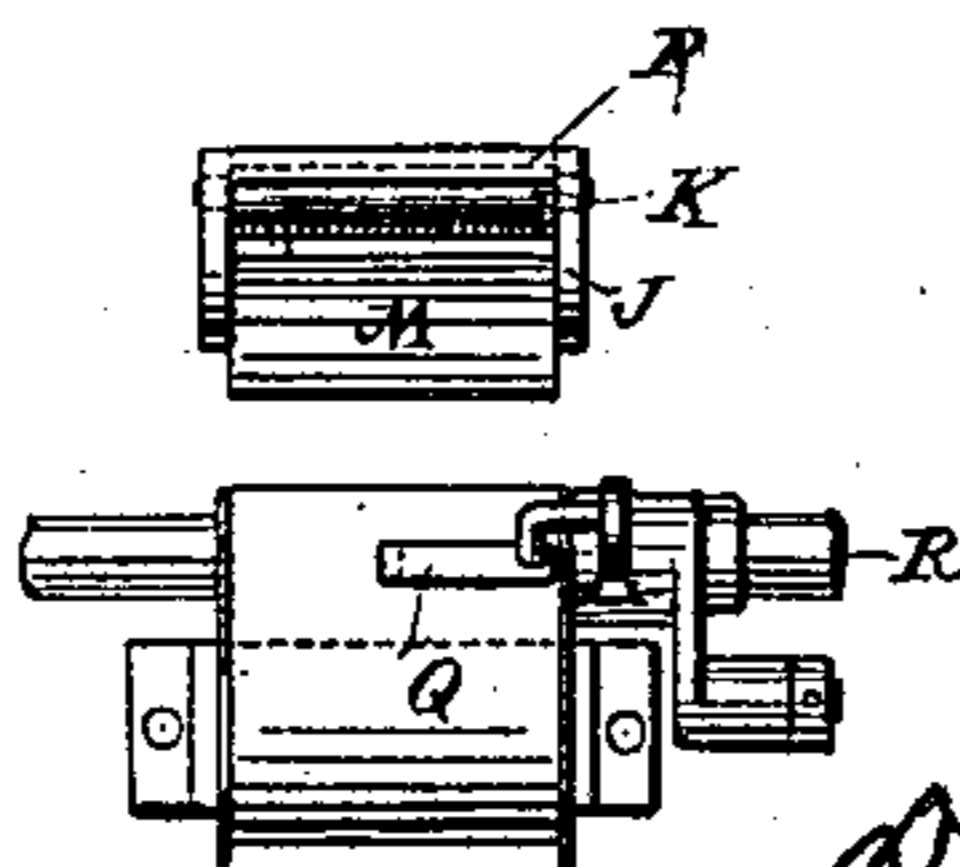


Fig. 9



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(Model.)

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Fig. 2

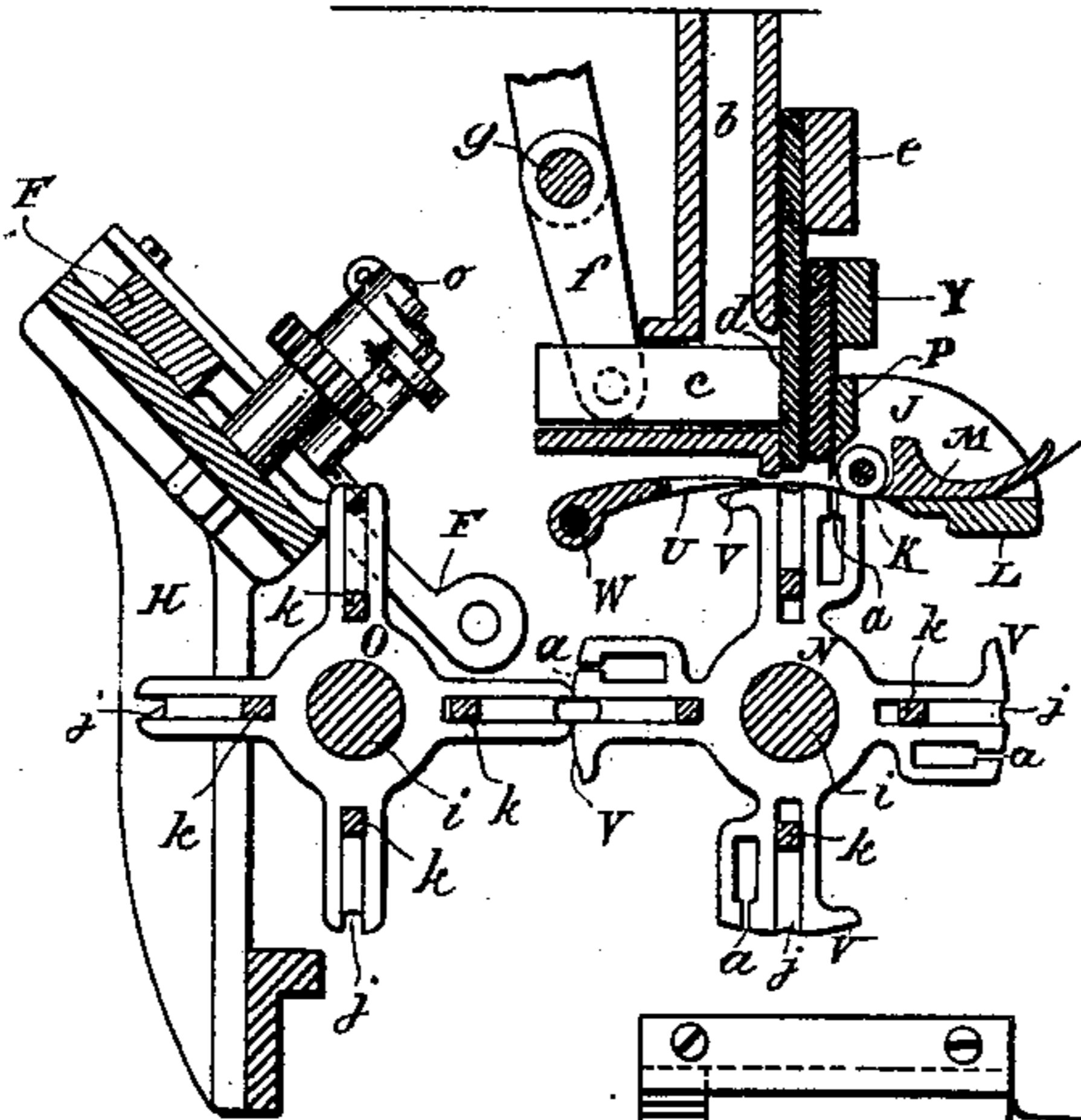


Fig. 3

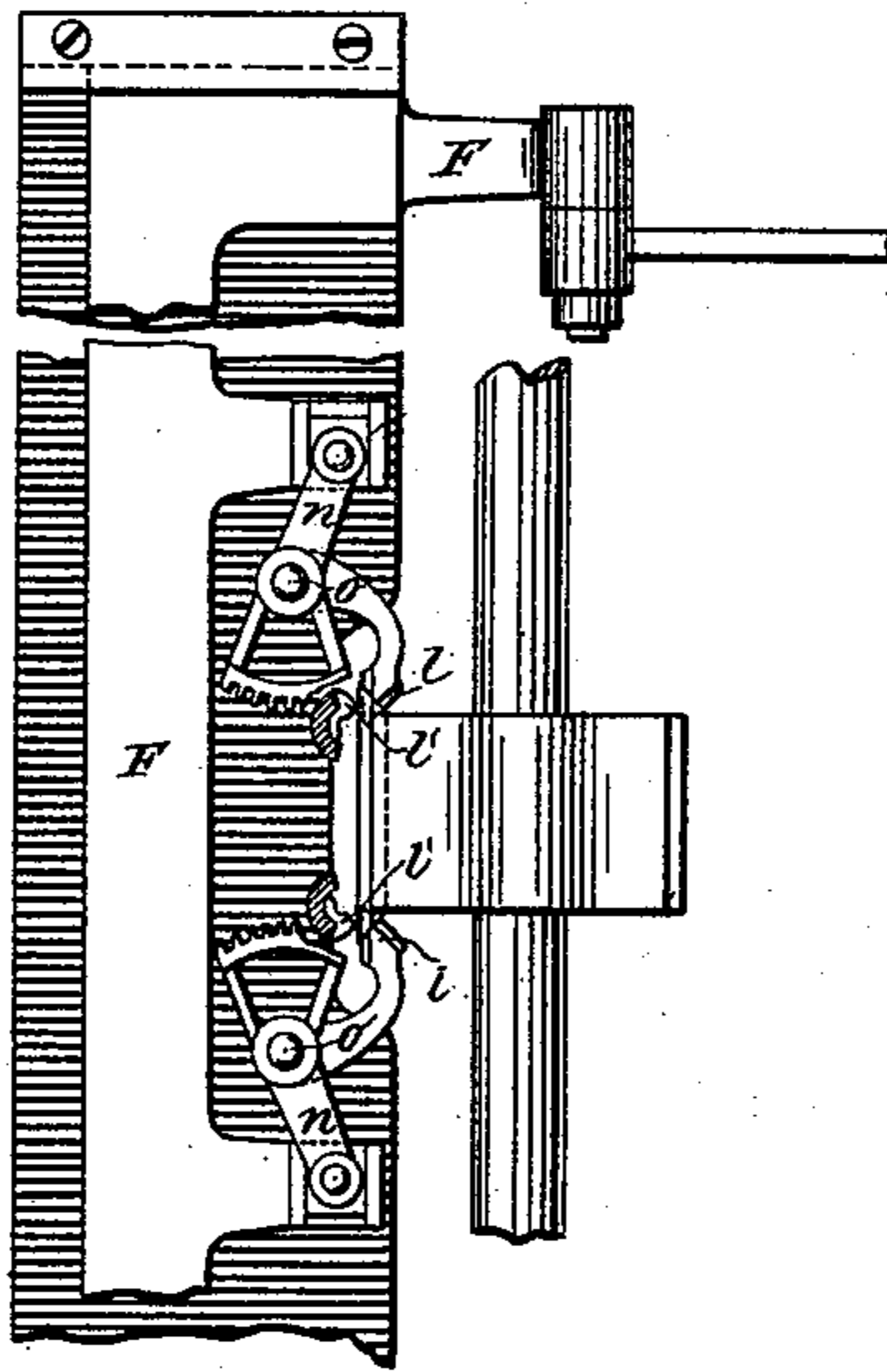


Fig. 4

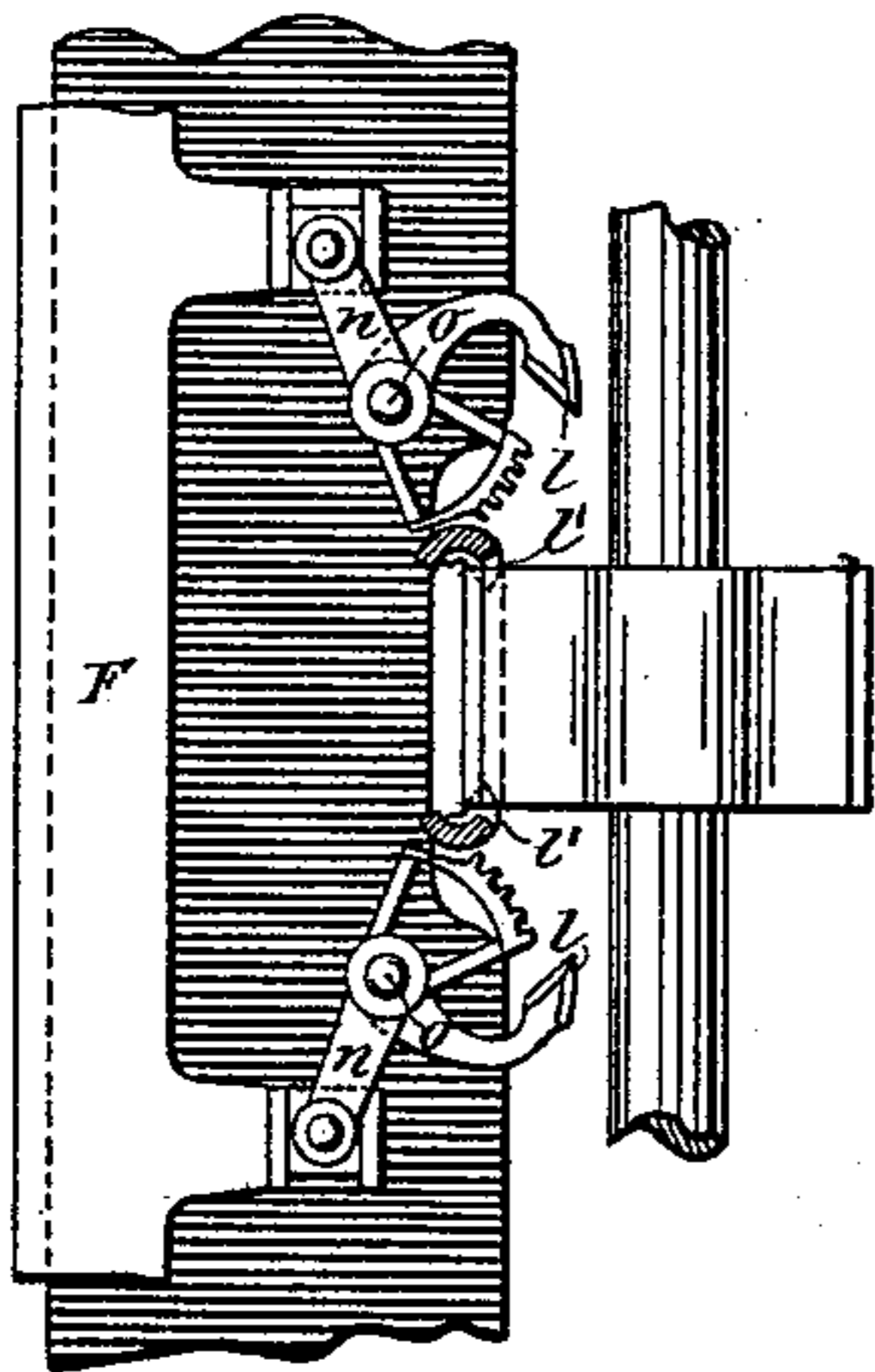


Fig. 7

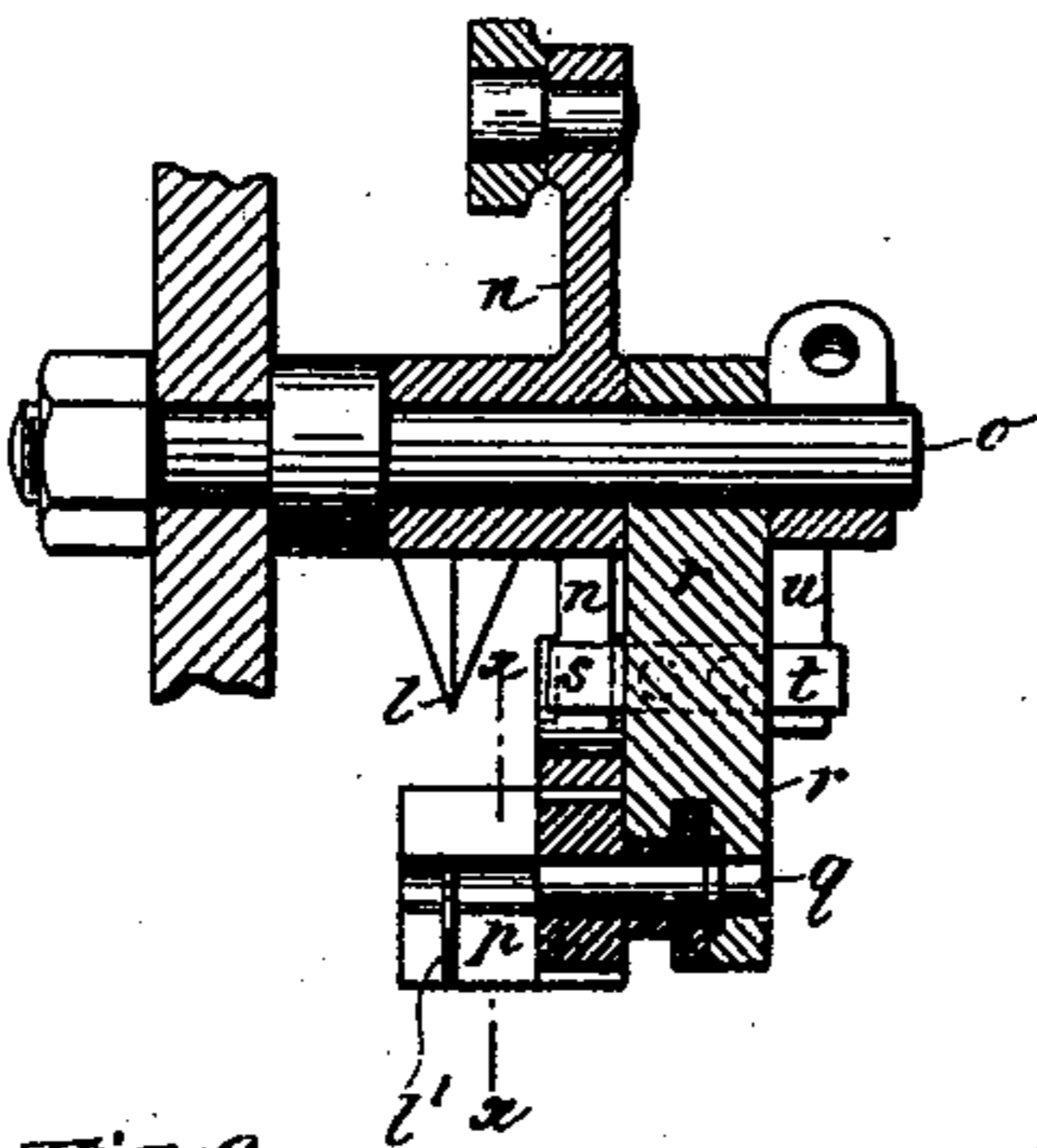


Fig. 8



Fig. 5

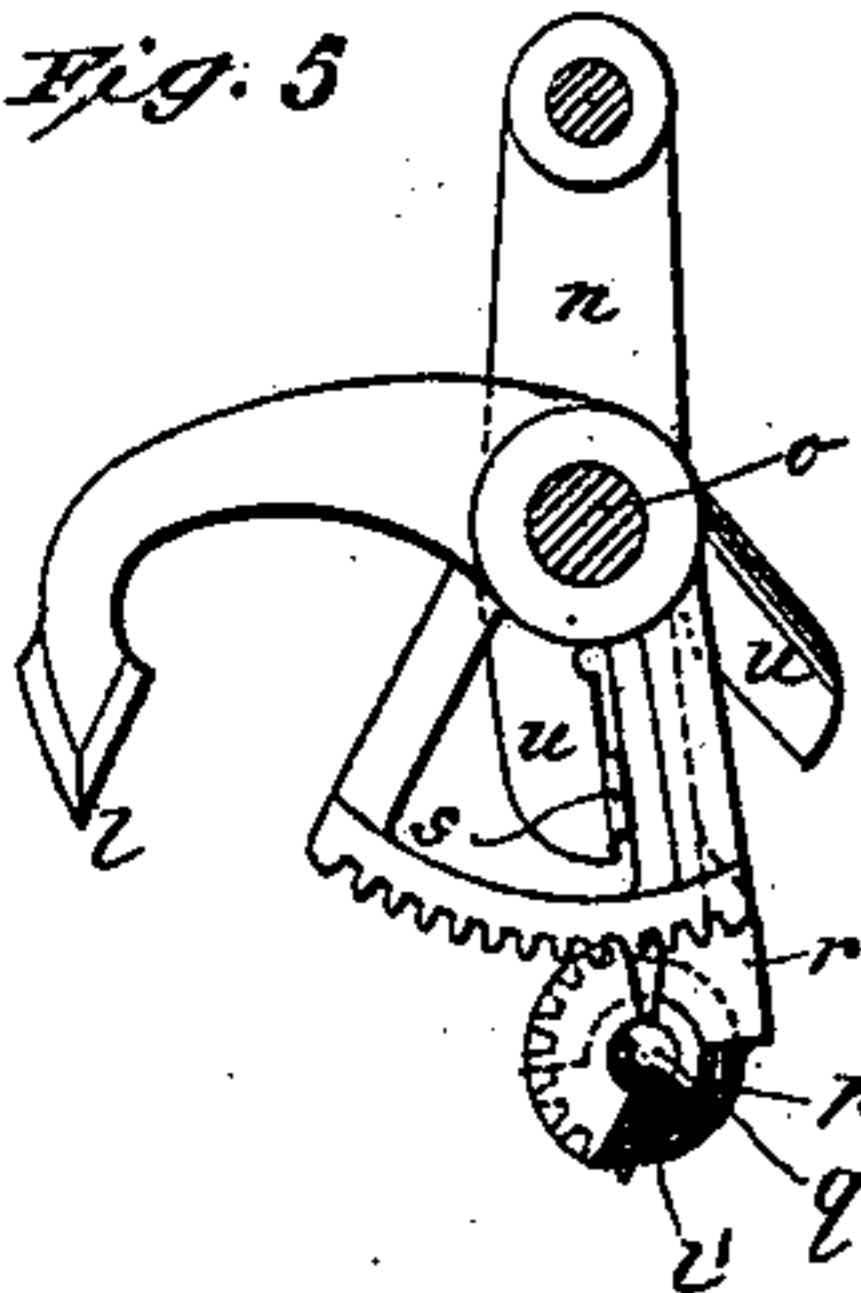
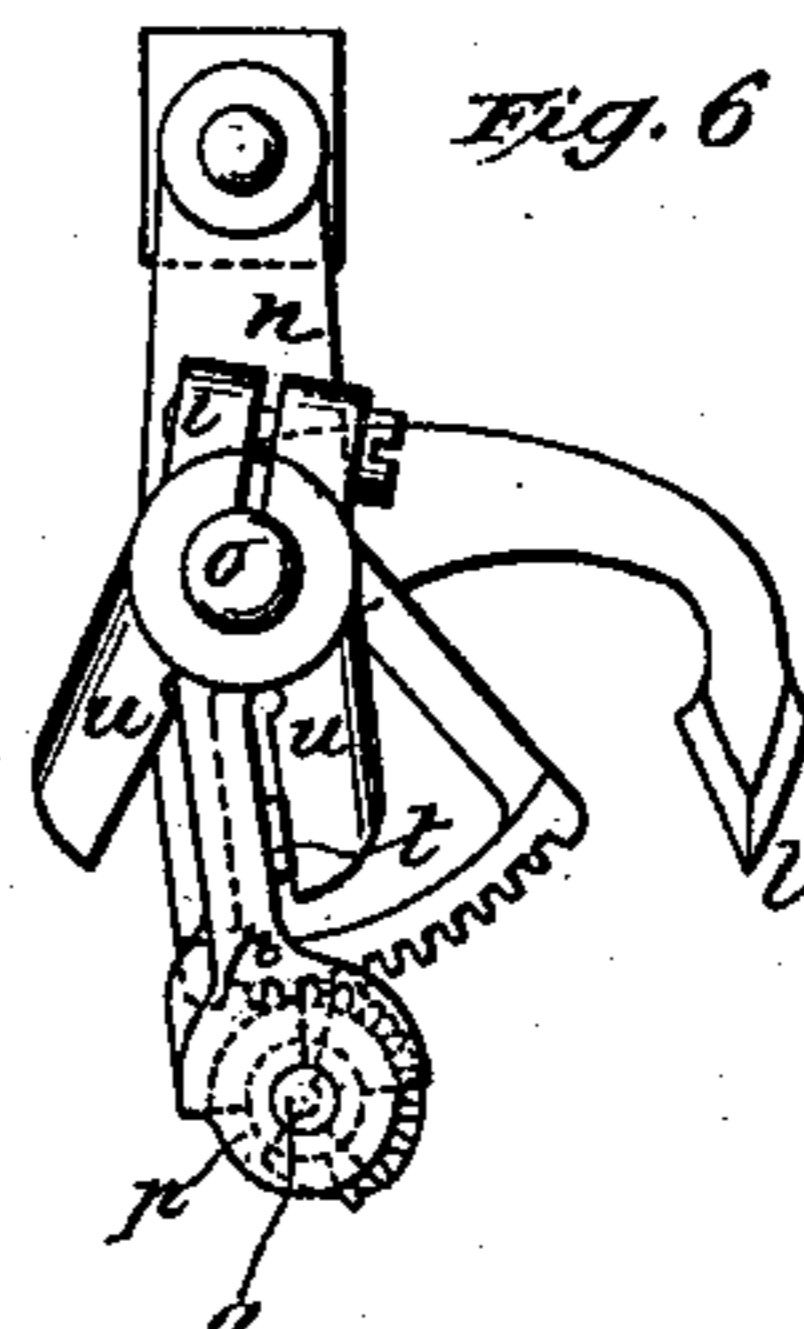


Fig. 6



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(Model.)

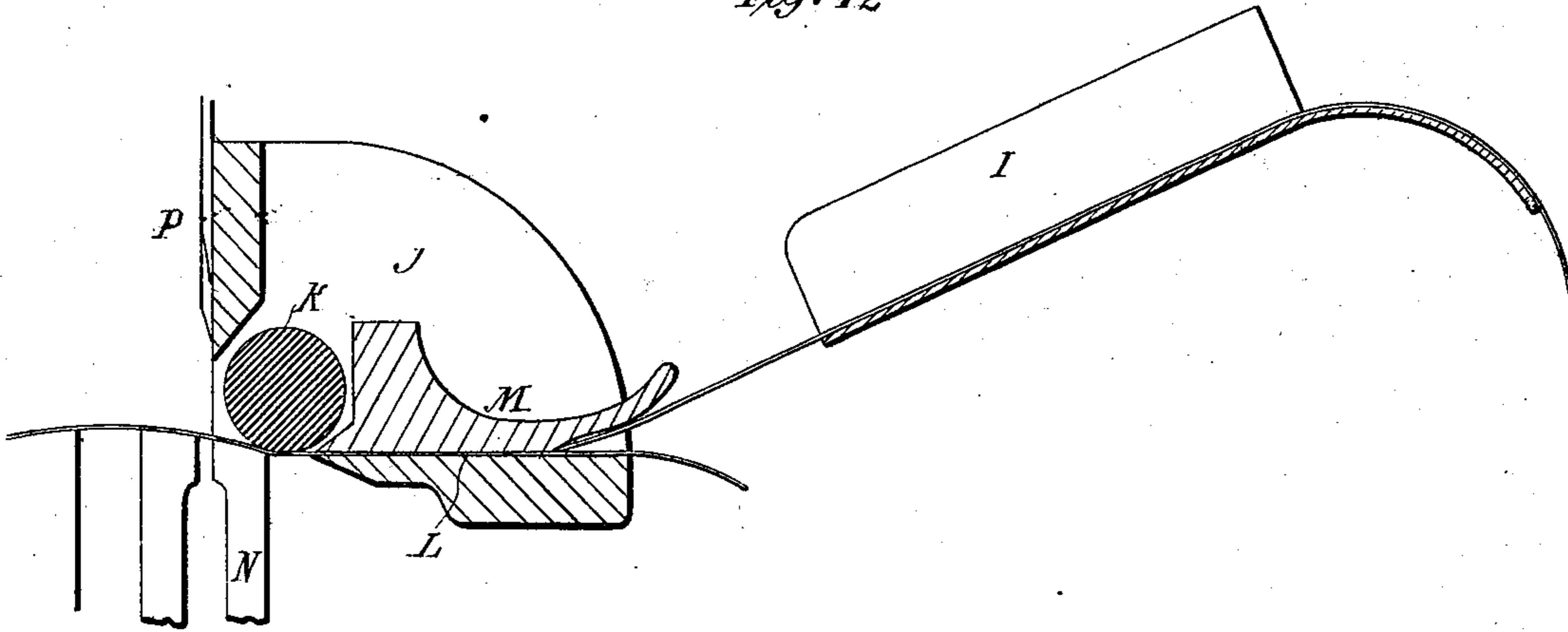
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H. BILGRAM.  
CIGARETTE MACHINE.

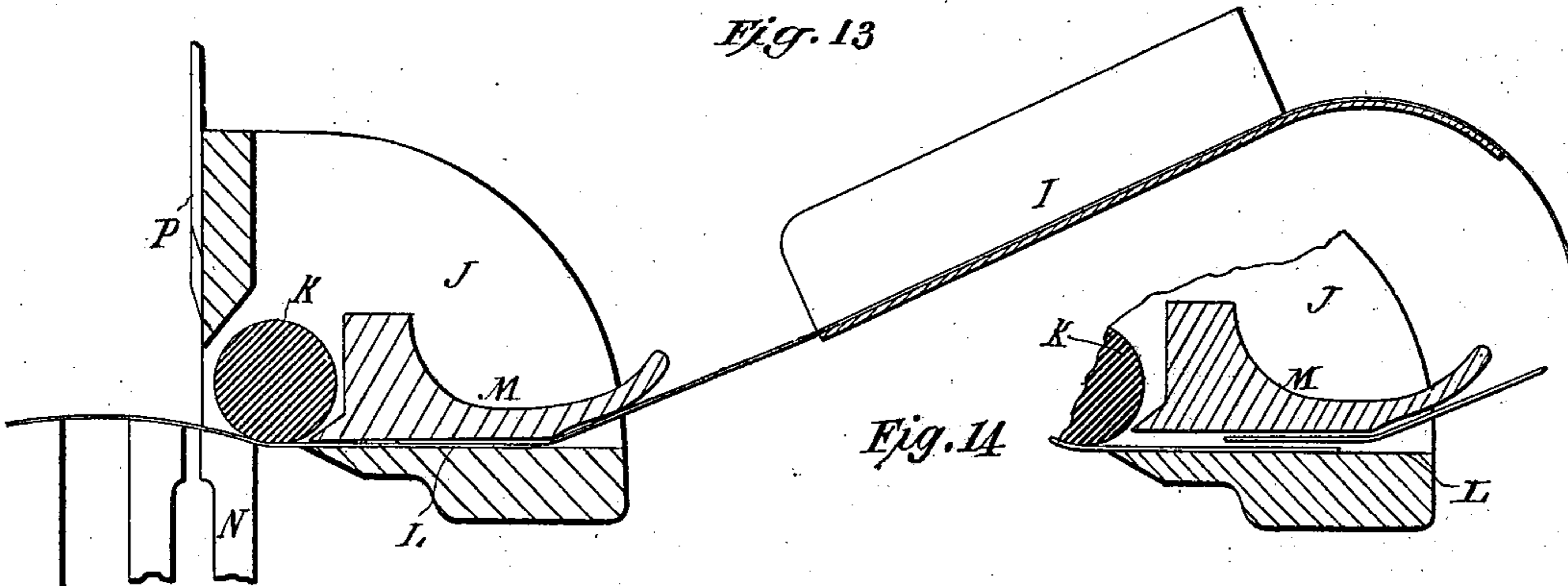
No. 506,412.

Patented Oct. 10, 1893.

*Fig. 12*

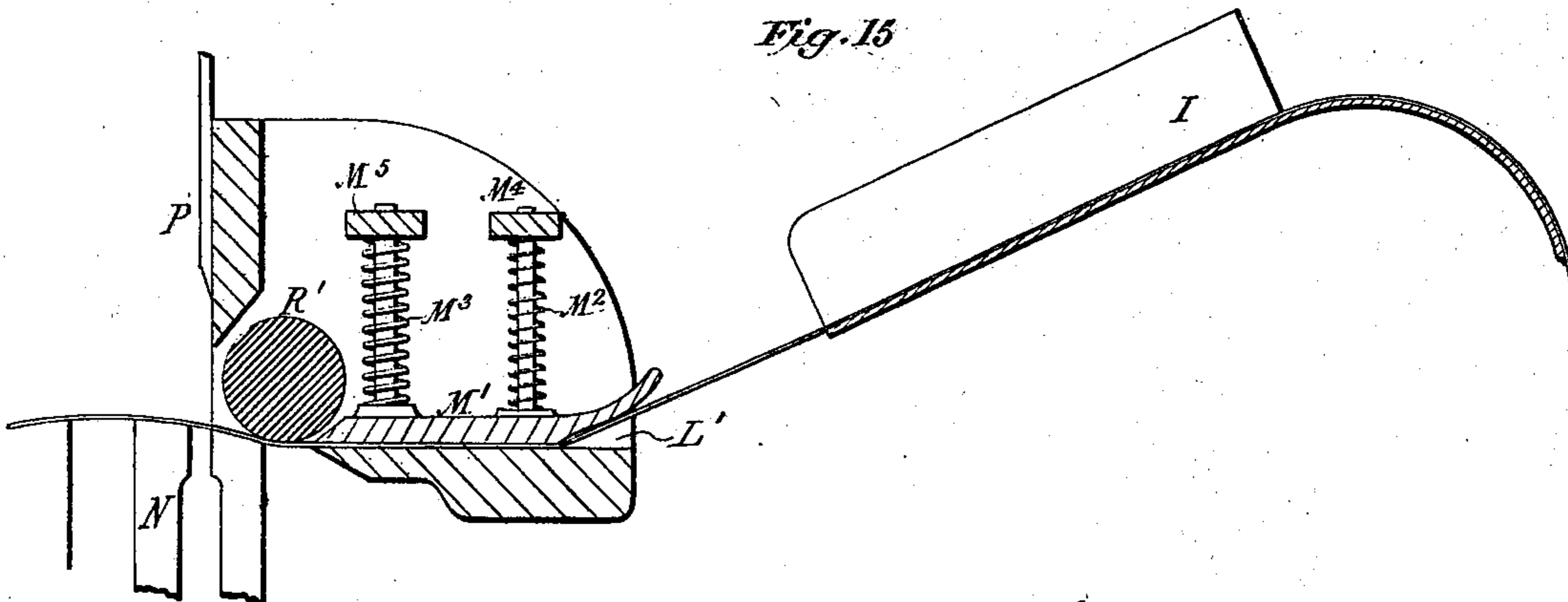


*Fig. 13*



*Fig. 14*

*Fig. 15*



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(Model.)

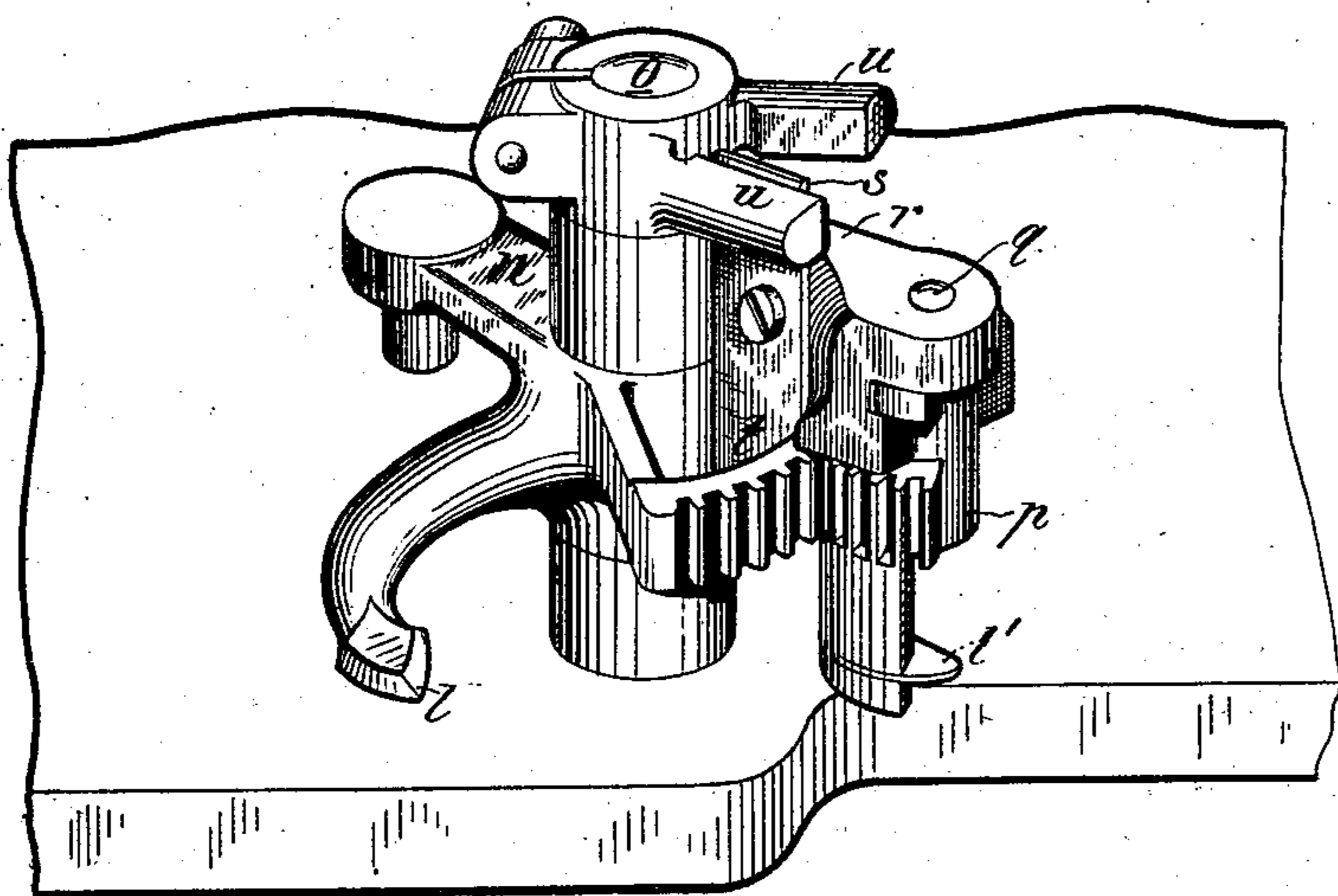
4 Sheets—Sheet 4.

H. BILGRAM.  
CIGARETTE MACHINE.

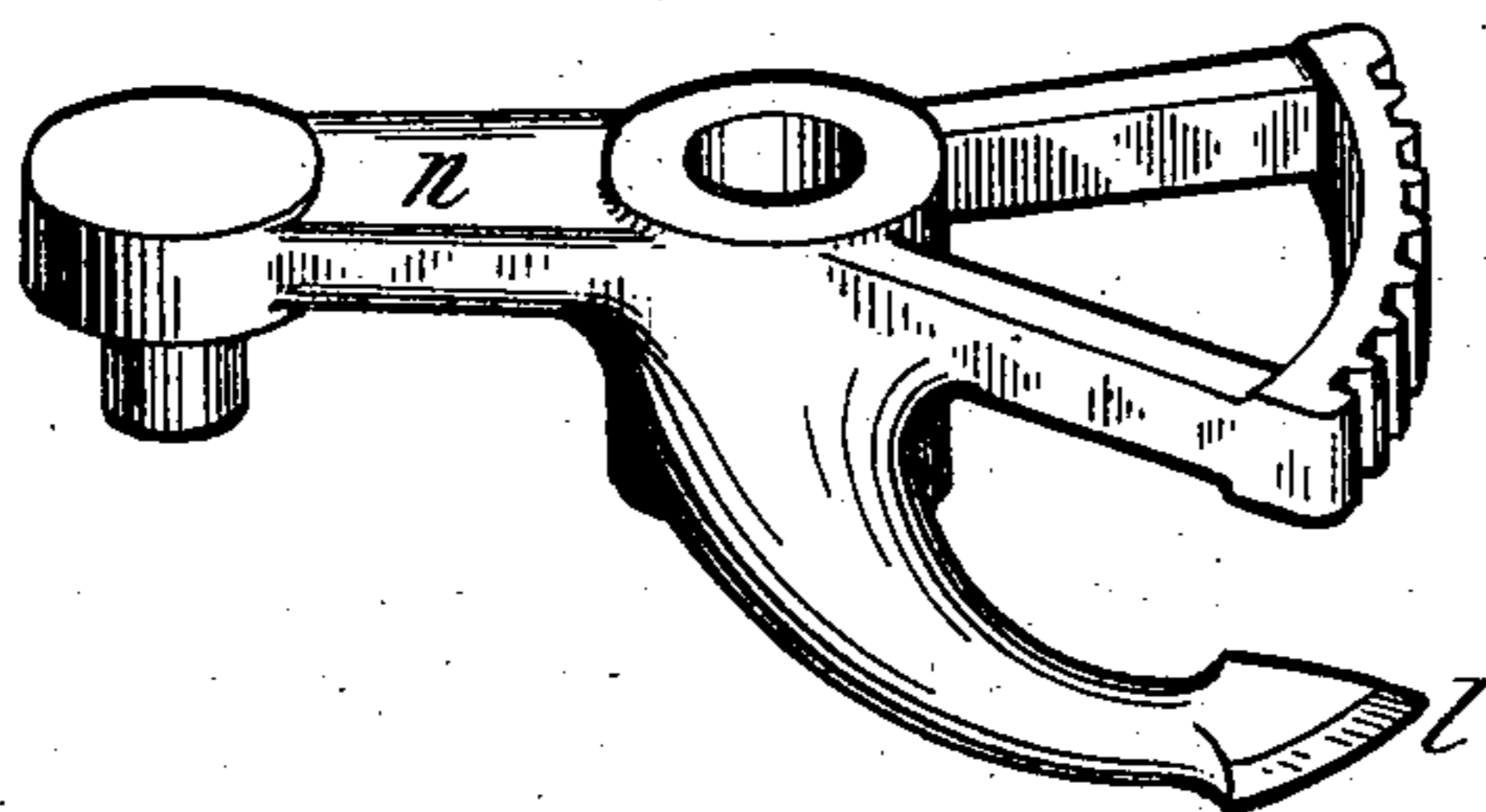
No. 506,412.

Patented Oct. 10, 1893.

*Fig. 16*



*Fig. 17*



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# UNITED STATES PATENT OFFICE

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## CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 506,412, dated October 10, 1893.

Application filed April 21, 1890. Serial No. 348,819. (Model.) Patented in England May 20, 1890, No. 7,885; in Brazil July 1, 1890, No. 882; in Spain July 17, 1890, No. 10,855; and in Mexico April 9, 1891, No. 102.

*To all whom it may concern:*

Be it known that I, HUGO BILGRAM, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Cigarette-Machines, of which the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification.

The following named Letters Patent on the said invention have been granted, viz: British Patent No. 7,885, dated May 20, 1890; Brazilian Patent No. 882, dated July 1, 1890; Spanish Patent No. 10,855, dated July 17, 1890; Mexican Patent No. 102, dated April 9, 1891.

This invention relates to a machine for making what is known as "Spanish" cigarettes, that is, cigarettes the overlapping edges of whose wrappers are not secured together by adhesive material, but which have a wrapper longer than the filler and the ends of which are tucked in to secure the wrapper in place until such time as it is desired to smoke such cigarettes, when it is customary to loosen the tucked in ends, unroll the wrapper and re-roll and re-wrap them again. Such a machine contains mechanisms for performing substantially the following operations: To feed paper to the cutters; to cut the paper into suitable wrapper widths or sizes; to feed measured quantities of tobacco upon wrappers; to fold or wrap the wrappers around the tobacco; to tuck in the ends of the wrappers; and to expel the finished cigarettes from the machine.

In all of the cigarette machines heretofore constructed, so far as I know, which feed strips of paper to be cut up into suitable sizes for individual wrappers, difficulty has been experienced in starting the successive strips into the machine when in operation; hence it has been customary to use very long strips of paper wound into rolls which are unwound as needed by the machine, and it has been deemed impracticable to use strips of paper cut from ordinary sized sheets without first pasting their ends together to form a continuous strip or roll, and when this is done the lapped and pasted ends are objectionable,

and they also offer difficulties in operating the machine.

In the manufacture of what are known as "Spanish" cigarettes or cigarettes in which paste or gum is not used to fasten the edges of the wrapper together, such edges are held in position by the folding over of their end portions upon each other or tucking in the end portions of the wrapper into the body of the cigarettes. When the end portions of the wrappers are simply folded over upon each other there is a liability of such portions becoming unfolded and thus releasing the wrappers from restraint and permitting them to become unwrapped from the tobacco forming the filler. On the other hand when the end portions of the wrappers have been tucked into the body of the cigarettes so that the wrappers would be held securely in place such tucking in has been done by a finger or other device acting upon the folded over portions so as to move or tuck them into the body of the cigarettes from the center of such cigarettes, and in a direction substantially parallel with their axial line, and when this work is performed in this way it is somewhat difficult to reopen the tucked in ends of the wrappers for the customary operation of re-rolling owing to the fact that the tucking-in movement, which is on substantially the axial line of the cigarettes, necessarily leaves a portion of the paper forming the ends of the wrapper turned in and back upon the body of the wrapper, to such an extent that difficulty is experienced in getting hold of such ends. Therefore such cigarettes are objectionable, owing to the above-named difficulties.

The present invention has for its objects the improvement of cigarette machines in the above named respects; and consists of mechanisms by which strips of paper are fed successively into the machine without interrupting the operation thereof, or interrupting the continuous supply of complete wrappers thereto, and the ends of the wrappers are tucked in, in such a manner that the wrappers are properly held in place and the ends are more readily opened for the operation of re-rolling.

The invention is herein illustrated as applied to a machine for making "Spanish" cigarettes like that shown and described in Letters Patent of the United States numbered 150,549, dated May 5, 1874, which machine contains mechanism for performing the several operations heretofore referred to, and reference is here made to said patent for a full, clear and exact description of those several mechanisms.

Figure 1 of the accompanying drawings (four sheets) is a sectional view of the present invention applied to a machine like that shown in the said Patent No. 150,549, wherein only those parts of the machine are shown which are necessary to illustrate my improvements in connection with the parts which are not changed. Fig. 1 is here shown as looking at the machine from the side opposite to that from which Fig. 1 of Patent No. 150,549 is shown. Fig. 2 is an enlarged sectional view of forming or folding wheels, a portion of the paper-feeding, wrapper-cutting, tobacco-feeding and tucking-in mechanisms, as shown in Fig. 1. Figs. 3 and 4 are enlarged detail plan views of a portion of the tucking-in mechanism, the former one showing the tucking-in fingers in position when the first tuck of the ends of the wrapper is completed, and the latter one showing the position of said fingers when the last tuck is completed. Figs. 5 and 6 are enlarged detail views of the tucking-in fingers and their connecting levers as seen from opposite sides thereof. Fig. 7 is a sectional view of the same fingers and levers showing the arrangement of the several parts relatively to each other. Fig. 8 is a sectional view on line  $x-x$ , of Fig. 7, of one of the tucking-in fingers and the block to which it is attached. Fig. 9 is a plan view of the paper-feeding device shown in section in Fig. 1. Fig. 10 is a front view of the tobacco feeding mechanism, a portion thereof being broken away to more clearly show the operative parts thereof. Fig. 11 is a sectional view of the feeding mechanism on the line  $y-y$  of Fig. 1. Fig. 12 is an enlarged sectional view of the paper-feeding mechanism showing one strip of paper nearly fed through, and the succeeding strip just placed therein with its forward end resting against the forward portion of the weight or pressure device M, which portion serves as a stop for such end of paper to determine the length of the first wrapper to be cut from such strip as it is fed through the feeding mechanism. Fig. 13 is an enlarged sectional view of the paper-feeding mechanism showing the lapping ends of paper as the same are fed through and between the weight or pressure device M and bed L. Fig. 14 is an enlarged sectional view of the weight or pressure device M, bed L and lapping ends of paper as the same are shown in Fig. 13, except that the part M is raised away from the ends of paper and the ends of paper are raised away from the bed L to more clearly show the position of such

ends relatively to each other and to the parts between which they are fed. Fig. 15 is an enlarged sectional view of another form of pressure device showing a system of springs and plate in place of the weight M. Fig. 16 is a perspective view of the tucking-in fingers and connected parts shown in Figs. 5, 6 and 7. Fig. 17 is a perspective view of one of the tucking-in fingers.

In the drawings X represents the frame of the machine.

A represents the driving shaft to which a pulley may be attached for giving motion to the several parts. The shaft A is to be provided with the several cams by which the requisite motion is given to the several operative parts of the machine, at the proper times, so as to perform the several operations of such a machine, only one of such cams being herein shown, which one is to operate the tucking-in mechanism, in place of the two required in the machine of Patent No. 150,549.

The paper-feeding mechanism consists of a curved guide I, a support J having journaled in it the roller K, and is also provided with a bed L for receiving the weight M, which serves as a pressure device and rests upon bed L and co-operates therewith, the under side of the roller being on nearly a line with the surface of the bed. The support J is secured to the frame X in such position that the under side of the roller K is near the upper portion of the periphery of the wheel N, hereinafter described, so that, as the wheel N revolves, the roller K is caused to revolve likewise. The roller K is preferably provided with a surface of india-rubber or similar material.

The weight M or pressure device is constructed much thinner at the edge farthest from the roller K than it is at its opposite edge, the thin edge preferably being curved where its flat surface meets the surface of the bed, so as to permit an end of one strip of paper overlapping the end of another strip to readily enter between them and at the same time form a stop against which such overlapping end can rest when first placed in guide I. The side of the weight M or pressure device which is to serve as a movable stop for the forward end of each succeeding strip of paper is located the width of one or more wrappers from the cutter P, so that the entering end of each successive strip will, when fed, be at or near the cutter and a complete wrapper will be made from the first cut from each strip. The weight M or pressure device is preferably constructed with its flat surface of a less width than that of the bed and with its edge nearest the roller K passing underneath such roller nearly to its center but not in actual contact with the surface thereof. The paper is passed along the curved guide I, between the flat surfaces of the weight M and bed L, thence under the roller K, so that, as the periphery of the radial arms of the wheel N revolves, the paper is siezed and fed to the cutter the required distance to be sev-

ered into wrapper widths. The weight M or pressure device is made thin at its edge farthest from the roller K so as to permit the overlapping end of a succeeding strip of paper to be readily drawn beneath it by the frictional contact of such end with that of the underlapping one as it is moved or fed along between the bed and weight by the roller K and the radial arms of the wheel N. The roller K and the radial arms of the wheel N engage with the paper and move or feed it along as the wheel N is revolved or driven by the mechanism connected with it and forms the paper-engaging device. The weight M is made thicker toward the side nearest the roller K, and, therefore, it will exert an increased pressure on the bed as the roller is approached. From this it will be seen that but little pressure will be exerted upon the overlapping end of a strip of paper as it enters between the weight and bed but the pressure will increase as such end is fed along, and as the thickness of the weight increases a correspondingly increased pressure is exerted upon the lapped ends, and consequently the frictional contact of such ends with each other increases correspondingly as the friction of the bed and weight increases. By these means a succeeding strip of paper is entered between a preceding strip and the weight M and is fed along by the advance of the preceding strip to the roller K without any slip between the two strips of paper. It will also be seen that with a movable stop located one or more wrapper widths from the cutter blade, as heretofore described, each succeeding strip of paper will enter the feeding devices upon the beginning of the feeding of a wrapper and, therefore, it will be at or near the cutter blade when a wrapper is cut from the preceding strip, and at the first cut from such succeeding strip a complete wrapper will be made, and the greatest number of complete wrappers can be cut from each strip with the least waste of paper.

In the device shown in Fig. 15, a plate M' at its side farthest from the roller R', is employed to exert a light pressure upon the bed L' by means of springs M<sup>2</sup>, preferably two in number, and also an increased pressure as such roller is approached by the springs M<sup>3</sup>, also preferably two in number, in a manner similar to that of the weight M. The plate M' is provided with suitable studs, or other means of holding the springs, which studs pass through cross-bars M<sup>4</sup>, M<sup>5</sup> in the sides of the frame of the bed L' and against which the springs bear and exert their force upon the plate M'. The side of the plate M' farthest from the roller R' is preferably constructed like the corresponding side of the weight M so as to serve the same purposes. The tension of the springs M<sup>2</sup> and M<sup>3</sup> is adjusted so that the plate M' will act upon the lapping ends of paper in substantially the same manner that the weight M acts.

Preferably a finger Q, which may be curved

and of spring material, is attached to rock-shaft R which is connected by a pitman to lever S, which is pivoted to shaft T and is connected to a cam by a roller working in a groove therein. This cam groove is so shaped as to cause the finger Q to press upon the paper in the guide I, a portion of the time that the wheel N and roller K remain stationary, and then to release the paper at the proper time for such wheel and roller to feed it forward the required distance for a wrapper width by their revolution, the paper being held between wheel N and roller K while the gripping device and cutters operate.

It will be understood that the main object of this paper-feeding mechanism is to provide means by which successive strips of paper can be entered and fed into the machine without its being stopped or interrupting the continuous supply of complete wrappers thereto. Therefore, the length of such strips is immaterial even if it be that of continuous rolls.

The gripping device holds the paper while the cutter blade severs it, and consists of fingers U and anvils V, the latter attached to wrapper-folding or forming wheel N against which the paper is gripped and held. The fingers are attached to rock-shaft W provided with suitable connections between it and one of the cams (not shown) on shaft A, by which the required motion is given to said rock-shaft and fingers at the proper time to perform the gripping operation.

The mechanism for cutting wrapper widths from the strips of paper consists of a cutter blade P, mounted in a vertically moving frame Y, and openings *a* in the periphery of the radial arms of the wheel N. Preferably the cutter blade is serrated and shears the paper by a downward stroke against and in front of one wall of openings *a*. Vertical movement is given to the frame Y, by connecting it with one of the cams on shaft A, which cam is so shaped as to give the requisite amount of movement to the frame and at the proper time for it to perform the cutting operation.

The tobacco-feeding mechanism consists of a hopper *b*<sup>2</sup> provided with stirrers and a measurer, a compressor and a forcer.

The stirrers are pins *b*<sup>3</sup> attached to a rock-shaft *b*<sup>4</sup> at about an angle of forty-five degrees to each other and about midway over the receptacle or channel *b*<sup>1</sup>, the lower one of the two stirrers being arranged so that as it is rocked by the rock-shaft *b*<sup>4</sup> it will pass above and below the horizontal plane of such shaft. The lowermost stirrer *b*<sup>3</sup> has attached to it the vertically reciprocating plate *b*<sup>5</sup> which extends into and nearly to the bottom of the receptacle or channel *b*<sup>1</sup> forming one side or wall for the greater portion of such receptacle or channel, which side or wall is reciprocated in a vertical direction. The rock-shaft *b*<sup>4</sup> is suitably journaled in the ends of the hopper *b*<sup>2</sup>, or otherwise, and is provided with an arm *b*<sup>6</sup> which is connected by a pitman to an arm *b*<sup>7</sup> attached to the movable frame *e* which operates

the plunger or piston  $d$ . Motion is given to the rock-shaft  $b^4$ , stirrers  $b^3$  and movable plate  $b^5$  by the movable frame  $e$  through its connections with one of the cams on main shaft A, and as frame  $e$  moves up and down the plate  $b^5$  moves correspondingly. This up and down or reciprocating movement of the plate  $b^5$  tends to push or force the tobacco which enters the mouth of the receptacle  $b'$  down to the bottom of such receptacle in a somewhat compact and uniform mass so that the slider or separator  $b^8$  will have a more uniform mass from which to take the desired quantity.

The stirrers  $b^3$  agitate or stir the tobacco in the hopper and thus tend to facilitate its entrance into the mouth of the channel or receptacle  $b'$ .

The measurer consists of the receptacle or channel  $b'$  and the slider or separator  $b^8$  which delivers tobacco in measured quantities to the channel  $b$ . The slider or separator  $b^8$  is connected by a pitman to an arm  $b^9$  on rock shaft  $b^{10}$ , which shaft has another arm  $b^{11}$  connected by a pitman to an arm on rock shaft  $g$  which shaft is caused to rock or move the required amount and at the proper time by being suitably connected to one of cams on shaft A, which cam is suitably shaped to do this work.

The compressor consists of a channel  $b$  and the slider or collector  $c$ , the latter being connected to the rock shaft  $g$  through a connection with an arm  $f$  on said shaft.

The forcer consists of a plunger or piston  $d$  attached to a vertically movable frame  $e$  and working in the lower end of channel  $b$  to force the tobacco into the wrapper. Movement up and down of the required amount and at the proper time is given to this frame  $e$  by being suitably connected with one of the cams on shaft A, which is so shaped that it will do this work.

The wrapper folding or forming mechanism consists of the two revolving wheels N and O, plunger  $d$  and presser or holder  $h$ . The wheels are mounted on shafts  $i$ , and consist essentially of slotted radial arms to receive the wrappers and fillers and ejectors. The revolution of these wheels is controlled, so that when the wheels are at rest the slot of one of the arms of wheel N will register with the exit of channel  $b$  and the slot of another one of the arms of wheel N will register with a slot in one of the arms of wheel O. The shafts  $i$  receive equal and simultaneous motion from one of the cams on shaft A, through suitable connections between the wheels and shaft, so that the wheels receive a quarter turn with each revolution of shaft A, and they are held in such registering positions by suitable stops or holding devices, which are engaged with and disengaged from such wheels at the proper times by their connections with one of the cams on shaft A.

The ejectors or dischargers  $j$  consist of pieces sliding in the slots in the folding or forming wheel arms and are provided with spring sides

to hold them in place by frictional contact against the walls of the slots, and with projections  $k$ , which extend beyond the slots in the radial arms of wheels N and O, and they are operated to eject or discharge the cigarettes from the slots by sliding frames which receive and engage with the projections  $k$  and move the ejectors or dischargers outward. These sliding frames are operated by one of the cams on shaft A, to perform their work at the proper time, through suitable connections between such frames and cam.

The mechanism for tucking in the ends of the wrapper consists of wheel O and the presser or holder  $h$  which holds the cigarette in position, and the fingers  $l$  and  $l'$  which tuck in the ends of the wrapper. This presser or holder is attached to a sliding frame  $m$  operated by one of the cams on shaft A, by being suitably connected thereto, the cam being so shaped and connected to the frame as to give the requisite amount of movement and at the proper time to cause the presser or holder to perform its work.

There are four tucking-in fingers, two of which,  $l$ , are preferably attached directly to the levers  $n$  (one finger to each lever) which levers are pivoted on studs  $o$  secured to the frame of the machine, and the other two  $l'$  being attached to blocks  $p$  (one finger to each block) provided with pinions and which are pivoted on studs  $q$  secured to levers  $r$ , which are in turn pivoted on studs  $o$  on which levers  $n$  are also pivoted. See Figs. 3, 4, 5, 6, 7, 8 and 16. The fingers  $l'$  during the time that they are tucking in the last portion or fold of the ends of the wrapper move within the space occupied by the body of the cigarette and tuck in such portion or fold by moving at an angle to the axial line of the cigarette so that a rolling motion is given to the paper forming the ends of the wrapper, and such ends are not turned back upon the body of the wrapper so as to seriously interfere with getting hold of them to reopen and re-roll the cigarette.

Levers  $n$  are moved by being connected at one end to sliding frame F by a pin and squared block working in a slot therein.

Frame F is moved by being connected by pitmen G to arms E, on rock-shaft D, which is provided with an arm C carrying a roller working in groove of cam B, shown in Fig. 1. This frame is preferably arranged to slide up and down at an angle of forty-five degrees to the sides of the cigarette when such sides form substantially a square.

Blocks  $p$  have two backward and forward movements, one on their pivots  $q$  and the other on studs  $o$  through levers  $r$  pivoted thereon. The former movement is a rolling one by which the fingers  $l'$  tuck into the body of the cigarette the last portion or fold of the ends of the wrapper, such portion or fold being moved or tucked in sufficiently to hold the body of the wrapper in place around the filler, but as such portion or fold is tucked in with a

rolling movement by the tucking-in fingers  $l'$ , the paper is not turned back upon the body of the wrapper to such an extent as to prevent its removal from its tucked in position for the purpose of re-rolling. The latter movement causes blocks  $p$  and fingers  $l'$  to be moved out of the way of wheel O when rotating and also out of the way of fingers  $l$  on levers  $n$ , when they operate to tuck in the first portion of the wrapper ends.

Blocks  $p$  are moved on their pivots  $o$  by segmental racks on levers  $n$  engaging with their pinions, and levers  $r$  are moved in one direction by projections  $s$  thereon, striking one side of the openings in levers  $n$  and, in the present case, in the opposite direction by gravity, but are stopped in position to tuck in the ends of the wrapper by projections  $t$  striking against one side of adjustable stops  $u$ , the other side of which limits the movements of the levers  $r$  in the other direction, by contact of projections  $s$  therewith.

The operation of the machinery is briefly as follows: The tobacco is placed in the hopper  $b^2$  and fed to the channel or receptacle  $b'$  where the reciprocating side or wall of such receptacle assists in packing or forcing it toward the bottom thereof into a somewhat compressed and uniform mass, where the reciprocating slider or separator  $b^8$ , measures off the desired quantity of tobacco from one cigarette and discharges it into the channel  $b$ , from the bottom of which the reciprocating slider or collector  $c$  forces it beneath the piston or plunger  $d$  and directly over a slot in one of the radial arms of wheel N. A wrapper of the desired width cut from a strip of paper lies between the tobacco and the slot of wheel N, in such position that when the tobacco and wrapper have been forced into the slot, pushing the ejector or discharger inward sufficiently to receive the tobacco, the wrapper will be folded around three sides of the cigarette and its projecting edge will extend toward wheel O far enough to cover the remaining side and give the desired overlap, which preferably is equal to two sides or half the circumference of the cigarette. As the folding or forming wheels revolve to bring the unfinished cigarette to register with a slot in arm of wheel O, the free edge of the wrapper, by its contact with arm of wheel O, is folded down to cover the fourth side of the cigarette, and as the ejectors or dischargers operate to transfer the cigarette to wheel O, the wrapper is again folded down to overlap, and as the wheels are further revolved the wrapper is brought in contact with the presser or holder  $h$  which is in position, and completes the overlap and holds the cigarette for the action of the tucking-in fingers; these now operate to tuck in the projecting ends of the wrapper, by an upward and inward movement of the fingers  $l$  on levers  $n$  to fold them in these directions, and then being withdrawn, the fingers  $l'$  on blocks  $p$  move downward and inward with a movement to give to the last tuck or fold of

the wrapper ends a rolling movement into the body of the cigarette and thus complete it. The fingers being then withdrawn and moved out of the way, the wheels are further revolved, and the arm of wheel O, carrying the finished cigarette is brought to register with any suitable receptacle or channel, into and through which the cigarettes may be forced by the ejectors.

It will be readily understood that the various shafts, cams, rock-shafts, arms and levers are to be so formed and timed as to give to the various operative parts of the machine the necessary extent of movement at the proper times to perform the several operations, hereinbefore described.

Each revolution of the driving-shaft completes one cigarette, and such machine has worked successfully with shaft A speeded to forty revolutions per minute making forty cigarettes. The operative parts, such as paper-feeding and cutting, tobacco-feeding and wrapper-folding mechanisms, can be multiplied without increasing those parts of the machine which give movements to these operative parts, and thus multiply its capacity so that eighty, one hundred and twenty, or other multiple of the capacity of the machine herein described can be easily produced.

It is manifest that the herein described paper-feeding mechanism can be used with advantage with machines other than those which make "Spanish" cigarettes, for its operation is in no way dependent upon the construction of the other parts of the machine; also the weight M and bed L, can be used with advantage in paper-feeding mechanisms where other means than those herein described are employed for moving the paper through such mechanisms, and other means are used for cutting the paper into wrapper sizes.

I have herein described and shown a weight M for exerting an increasing pressure on two advancing lapping ends of paper, and I have found such a device a very satisfactory one for this purpose, but it is manifest that other means can be employed for this purpose, such for instance as an arrangement of springs; therefore I do not wish to be understood as limiting myself to the weight M, or to its particular shape. It is also manifest that the tucking-in mechanism herein shown and described can be used with advantage with machines making any kind of cigarettes, the ends of whose wrappers are to be tucked in, although it is especially advantageous with those kinds which are to be re-rolled; and also that this tucking-in mechanism can be employed advantageously with other forms of wrapper-folding devices or mechanisms than those herein described; therefore I do not wish to limit myself to the particular form of wrapper-folding device with which my tucking-in mechanism is to be used, or to the particular form of cigarette that such device is to wrap or fold.

The rolling motion given the tucking-in

fingers, by means of which the paper which forms the last tuck or fold is moved or tucked into the body of the cigarette with a rolling movement as herein shown and described, is in the arc of a circle which is believed to be the preferable way, but other ways may be substituted for giving the rolling motion to such fingers, even if it be angular so long as it is not at right angles to or substantially parallel with the sides of the cigarettes. As the rolling movement given to the paper forming the ends of the wrapper by the fingers *l'* is especially advantageous in completing the last tuck or fold while moving the paper into the body of the cigarette, I therefore do not wish to limit myself to the form of mechanism herein shown and described for giving the last tuck or fold to the wrapper ends.

I claim—

1. In a cigarette machine, the combination, substantially as set forth, of a bed, a pressure device cooperating therewith and provided with means which exert a light pressure at the point where the paper enters between it and the bed, a paper-engaging device and driving mechanism connected therewith, whereby a strip of paper having its end overlapping the end of a preceding strip can be entered between the pressure device and bed by the frictional contact of the lapping ends of paper and the advance of the preceding strip.

2. In a cigarette machine, the combination, substantially as set forth, of a bed, a pressure device cooperating therewith and provided with means which exert an increasing pressure between the point where the paper enters and the opposite side of the device, a paper-engaging device and driving mechanism connected therewith, whereby overlapping ends of paper in contact with one another are held together with an increasing force as the two strips of paper are advanced or fed through the mechanism.

3. In a cigarette machine, the combination, substantially as set forth, of a bed, a pressure device cooperating therewith and provided with means which exert a light pressure at the point where the paper enters between it and the bed and increases as the opposite side of the device is approached, a paper-engaging device and driving mechanism connected therewith, whereby a strip of paper having its end overlapping the end of a preceding strip can be entered between the pressure device and bed by the frictional contact of the overlapping ends of paper and the advance of the preceding strip, and the overlapping ends are held in contact with an increasing force as the two strips are advanced or fed through the mechanism.

4. In a cigarette machine, the combination substantially as set forth, of a bed, a weight M lighter at the point where the paper enters than at its opposite side, a paper engaging

device and driving mechanism connected therewith, whereby succeeding strips of paper can be entered and fed between the bed and weight by the frictional contact of their overlapping ends.

5. In a cigarette machine, the combination, substantially as set forth, of a cutter blade, mechanism to move the same, a paper-feeding mechanism, substantially as described, and a movable stop located one or more wrapper widths from the cutter blade, whereby strips of paper enter the paper-feeding mechanism at such points of its feed that a complete wrapper will be made from the first cut from each succeeding strip.

6. In a cigarette machine, the combination, substantially as set forth, of wrapper-folding mechanism and a tucking-in mechanism provided with one tucking-in finger which, during a portion of its movement, moves within the space occupied by the body of the cigarette and at an angle to the axial line thereof, whereby the paper forming one tuck or fold of the ends of the wrapper is moved into the desired position by giving it a rolling motion by the tucking-in finger.

7. In a cigarette machine, the combination, substantially as set forth, of wrapper-folding mechanism and a tucking-in mechanism provided with one tucking-in finger which, during a portion of its movement, moves in the arc of a circle within the space occupied by the body of the cigarette; whereby the paper forming one tuck or fold of the ends of the wrapper is moved into the desired position by giving it a rolling motion by the tucking-in finger.

8. In a cigarette machine, the combination substantially as set forth, of a wrapper-folding mechanism and a tucking-in mechanism provided with one tucking-in finger, which, during a portion of its movement, moves within the space occupied by the body of the cigarette and in the arc of a circle, and has its axis of rotation at a point formed by the intersection of the lines of the tucked-in end and a portion of the exterior of the body of the cigarette, whereby the paper forming one tuck or fold of the ends of the wrapper is moved into the desired position by giving it a rolling motion by the tucking-in finger.

9. In a cigarette machine, the combination, substantially as set forth, of wrapper-folding mechanism and a tucking-in mechanism provided with one tucking-in finger which has movement in two directions, one of which is circular, whereby the tucking-in finger is first brought into the position desired relatively to the cigarette and then said finger is moved in a circular direction to move the paper forming one tuck or fold of the ends of the wrapper with a rolling movement.

10. In a cigarette machine, the combination, substantially as set forth, of wrapper-folding mechanism and a tucking-in mechanism provided with one tucking-in finger which has

movement in two directions, each one of which is in the arc of a circle, each arc having a different axis, whereby the tucking-in finger is first brought into the position desired relatively to the cigarette and then said finger is moved so as to give the paper forming one tuck or fold of the ends of the wrapper a rolling movement.

11. In a cigarette machine, the combination, substantially as set forth, of wrapper-folding mechanism and a tucking-in mechanism provided with a pair of tucking-in fingers both of which for a portion of their movement have a common pivot, and one finger of such pair has a pivot independent of such common one during another portion of its movement, whereby the paper forming one of the ends of the wrapper is tucked or folded into the desired position.

12. In a cigarette machine, the combination substantially as set forth, of wrapper-folding mechanism and tucking-in mechanism provided with a pair of tucking-in fingers, each of which is connected with a single pivoted lever, whereby movement given to such lever moves both fingers to tuck or fold in the paper forming one of the ends of the wrapper into the desired position.

13. In a cigarette machine, the combination substantially as set forth, of wrapper-folding mechanism and tucking-in mechanism provided with a pair of tucking-in fingers, each of which is connected with a single pivoted lever, which, during a portion of its movement, moves each finger in the arc of a different circle, whereby movement given to such lever moves both fingers to tuck or fold in the paper forming one of the ends of the wrapper into the desired position.

14. In a cigarette machine, the combination substantially as set forth, of wrapper-folding mechanism and tucking-in mechanism provided with one tucking-in finger which is pivoted on a loosely pivoted lever, which lever is moved in one direction by gravity and in the opposite direction by a positive force when bringing the finger into and out of position to tuck or fold in the paper forming one of the ends of the wrapper.

15. In a cigarette machine, the combination, substantially as set forth, of wrapper-folding mechanism and a tucking-in mechanism provided with one tucking-in finger which is pivoted on a loosely pivoted lever, which is in turn provided with a stop adapted to contact with a stationary part and which limits the movement of the lever in one direction, whereby the tucking-in finger is, when moved into and out of position to tuck or fold in the paper forming one end of the wrapper, stopped

in position for such finger to tuck or fold in such end.

16. In a cigarette machine, the combination, substantially as set forth, of wrapper-folding mechanism and a tucking-in mechanism provided with one tucking-in finger which is pivoted on a loosely pivoted lever, which in turn is provided with a stop adapted to contact with a stationary part and which limits the movement of both the lever and finger in one direction, whereby the tucking-in finger, when moved into and out of position to tuck or fold in the paper forming one end of the wrapper, is stopped in position for such finger to tuck or fold in such end, and the movement of said finger when tucking or folding in such end is also limited.

17. In a cigarette machine, the combination, substantially as set forth, of wrapper-folding mechanism provided with cigarette-forming recesses of substantially square form and tucking-in mechanism provided with tucking-in fingers arranged to move in a plane at an angle of about forty-five degrees to the sides of the cigarette, whereby the end of the wrapper is tucked or folded in from two opposite corners of the cigarette.

18. In a tobacco-feeding mechanism of a cigarette machine, the combination, substantially as set forth, of a hopper, a receptacle communicating with the hopper and provided with a reciprocating side or wall therefor and a separator which removes the desired quantity of tobacco from the receptacle, whereby tobacco fed into the receptacle is assisted in its movement toward the separator.

19. In a tobacco-feeding mechanism of a cigarette machine, the combination, substantially as set forth, of a hopper, a receptacle communicating with the hopper and provided with a vertically reciprocating side or wall and a separator which removes the desired quantity of tobacco from the receptacle, whereby tobacco fed into the receptacle is assisted in its movement toward the separator.

20. In a tobacco-feeding mechanism of a cigarette machine, the combination, substantially as set forth, of a hopper, stirrers located in said hopper, a receptacle communicating with the hopper and provided with a reciprocating side or wall, and a separator which removes the desired quantity of tobacco from the receptacle, whereby tobacco in the hopper is agitated to assist it in being fed into the receptacle and the tobacco is also assisted in its movement toward the separator.

HUGO BILGRAM.

Witnesses:

HENRY F. NEWBURY,  
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