

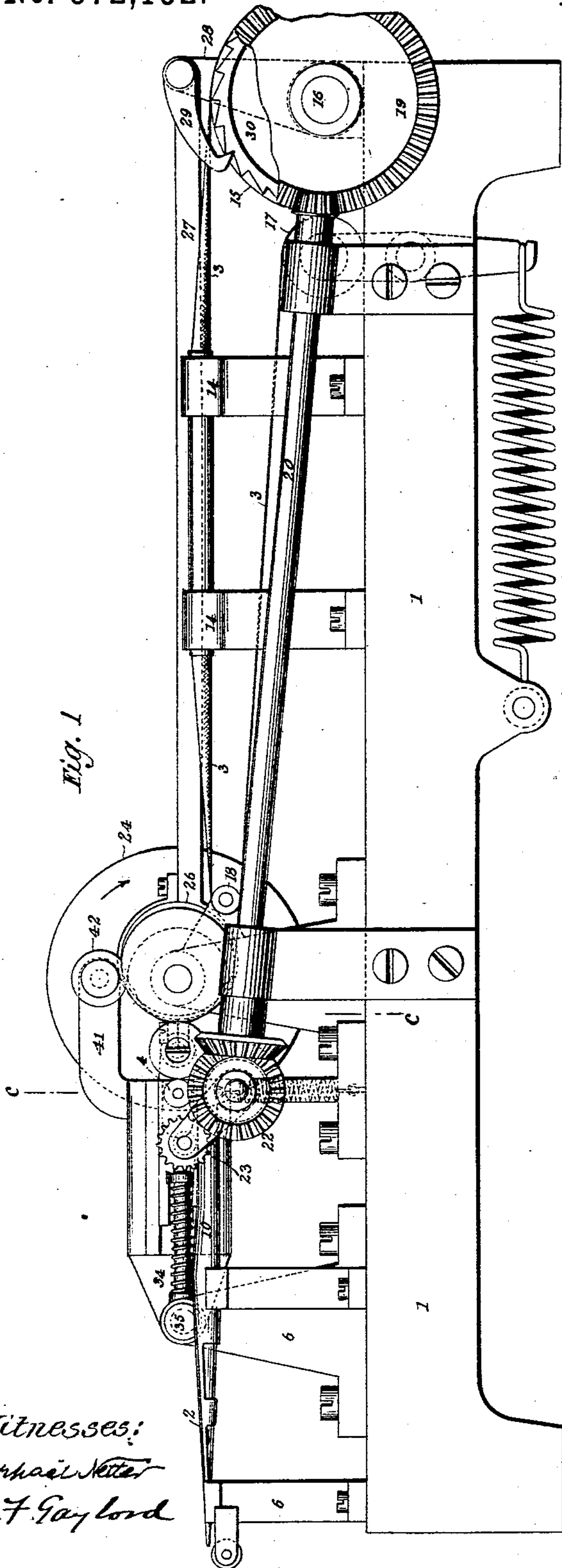
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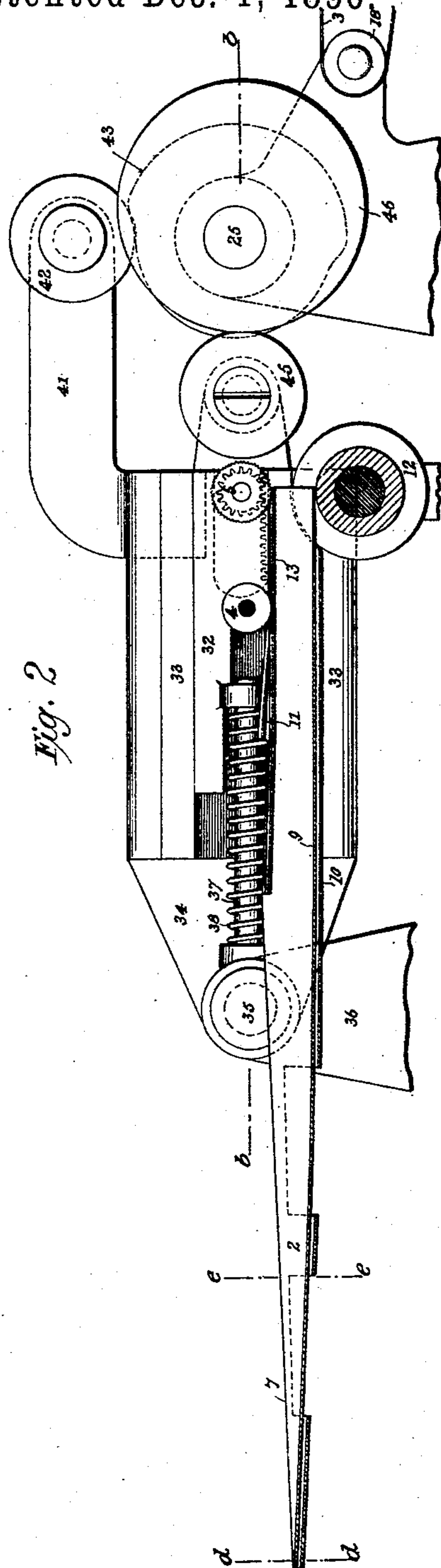
J. A. BONSAK.  
CIGARETTE MACHINE.

No. 572,152.

Patented Dec. 1, 1896



Witnesses:  
Kaphaei Ketter  
R. F. Gaylord



Inventor  
James A. Bonsack  
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attys.

(No Model.)

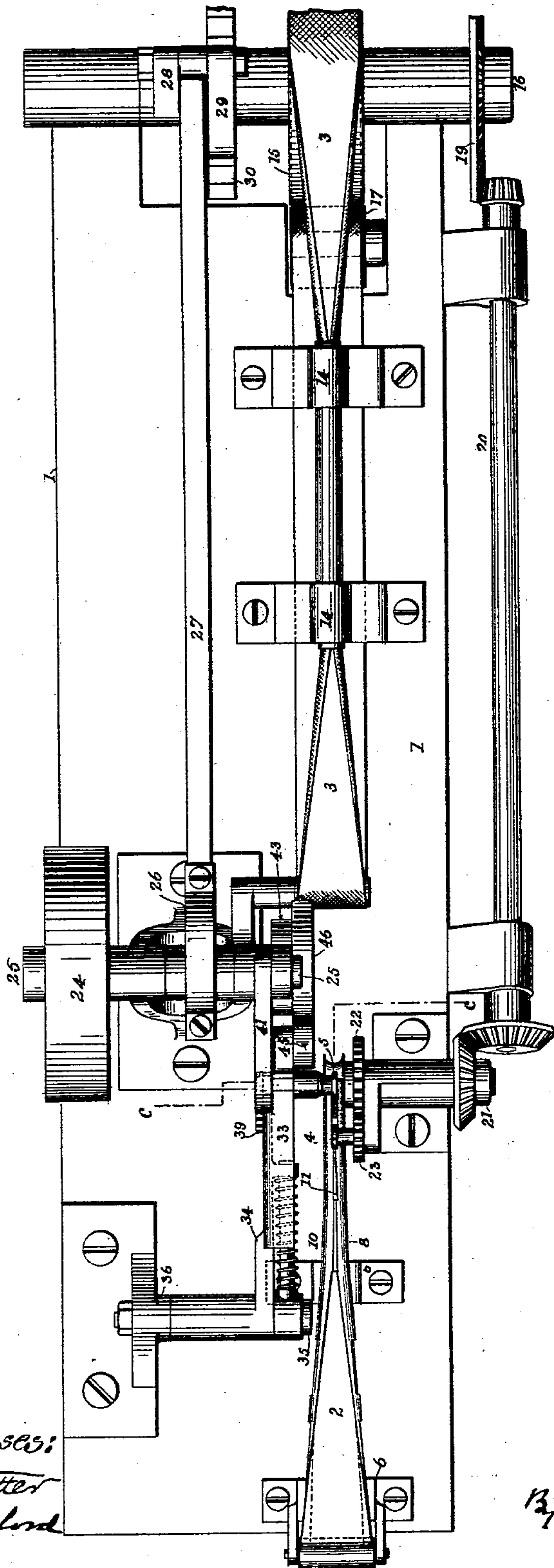
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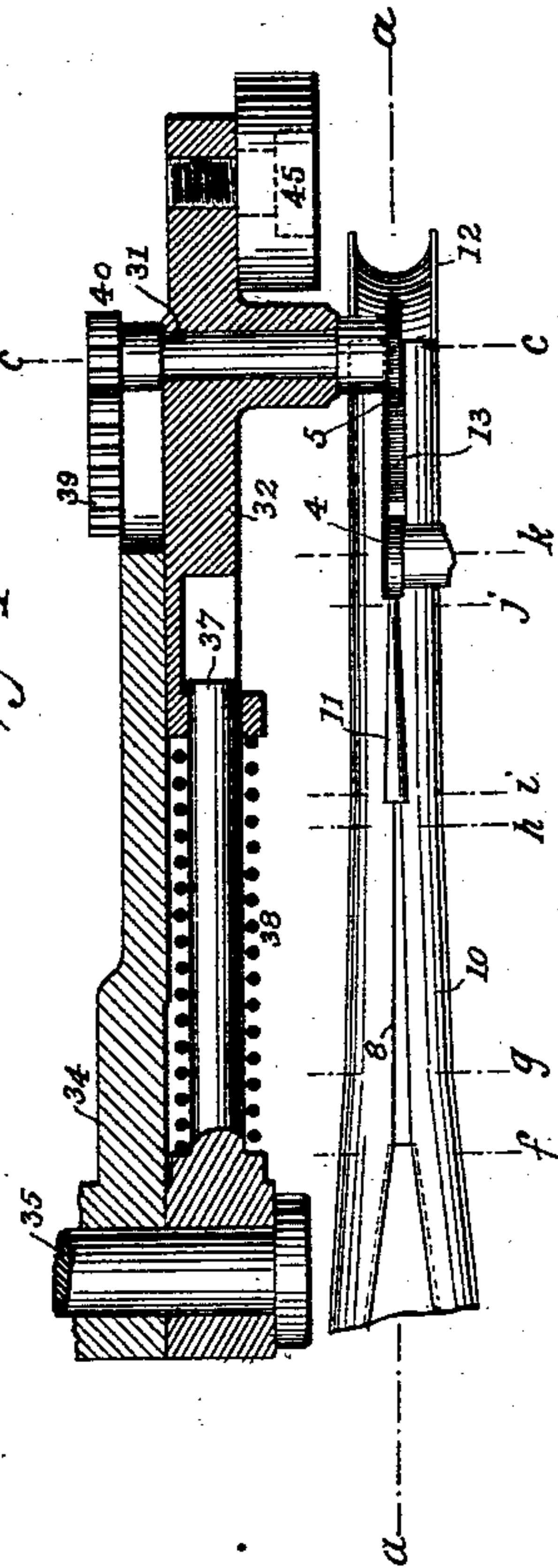
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Fig. 3



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Fig. 4



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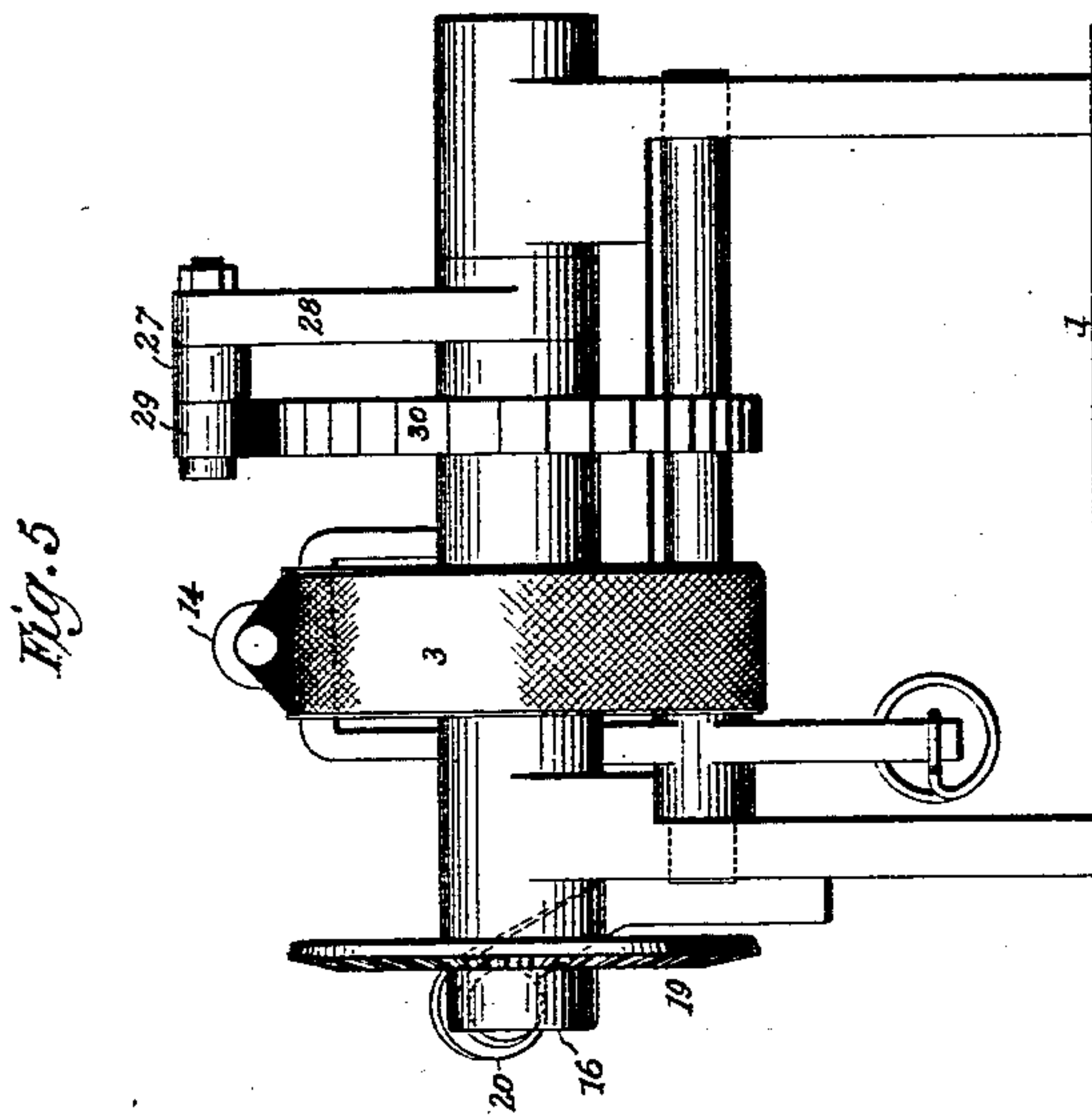
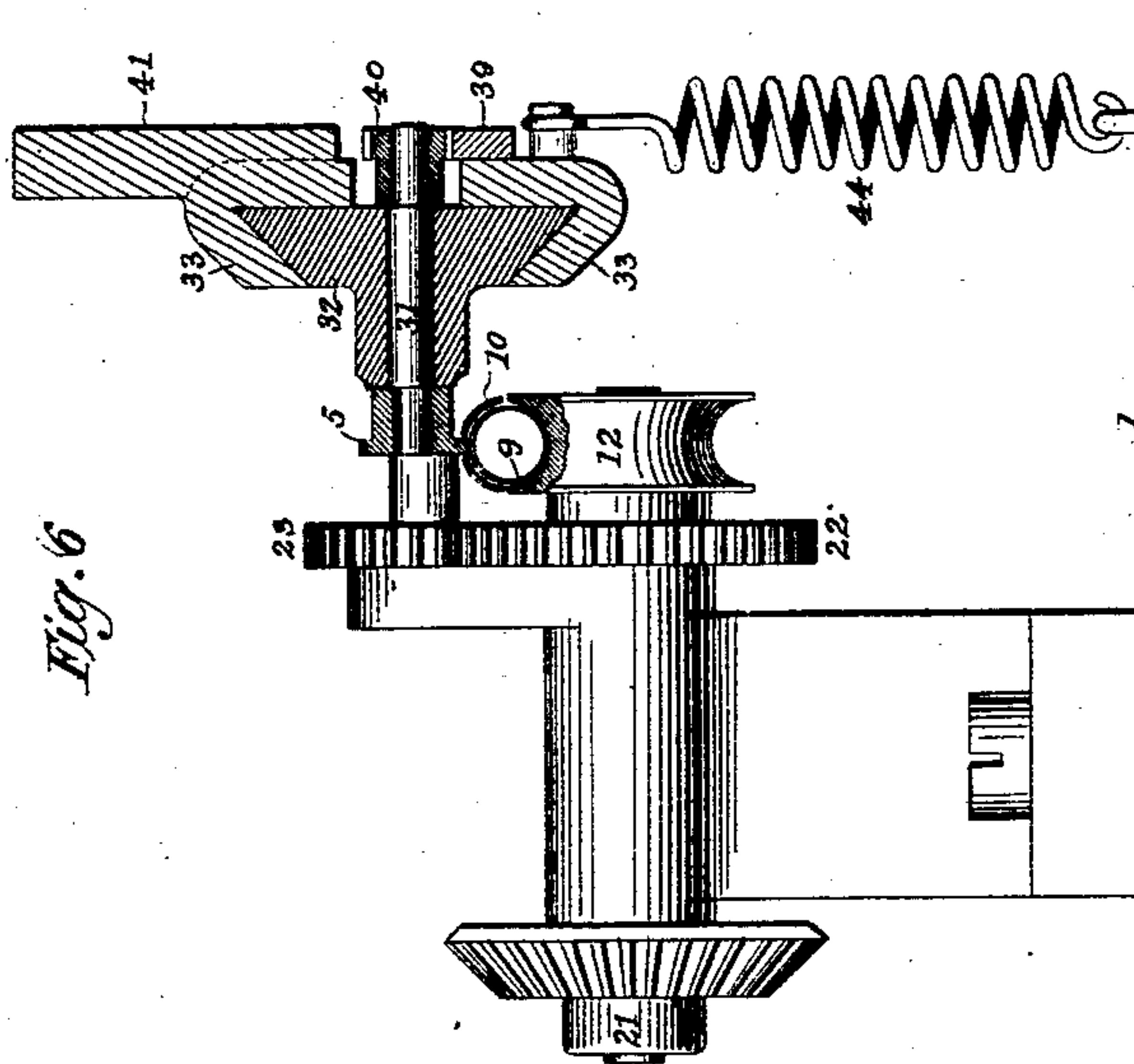
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FIG. 16.

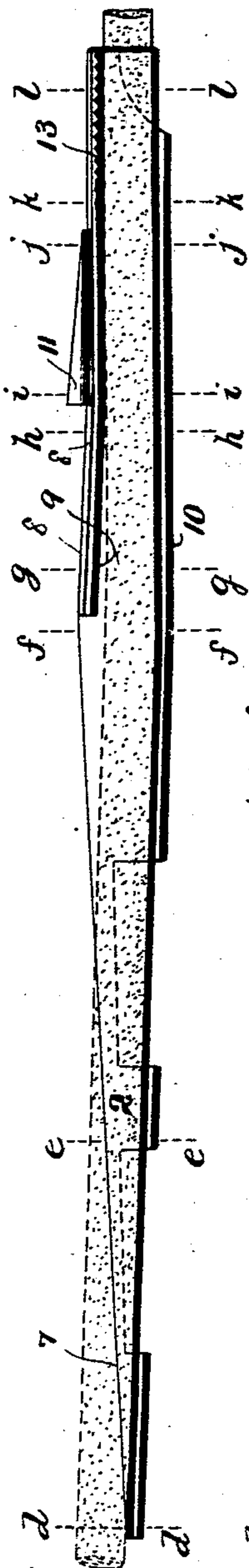


FIG. 17.

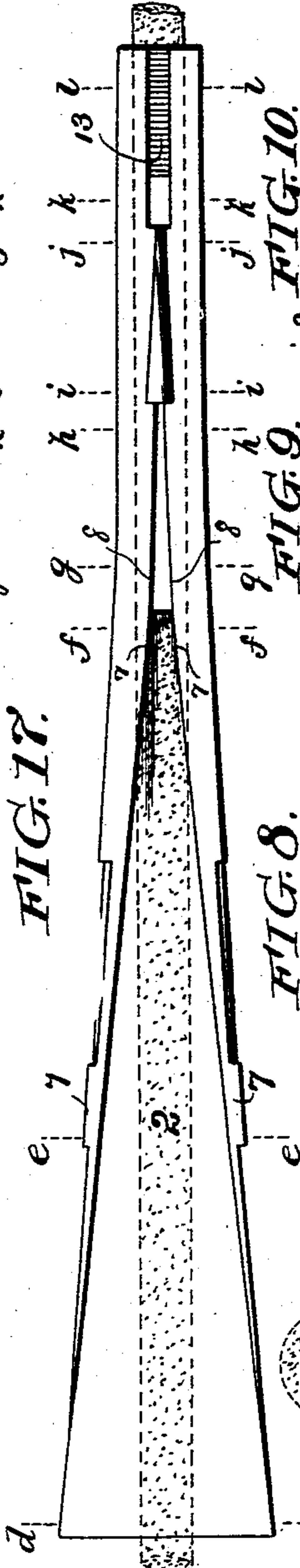


FIG. 8.

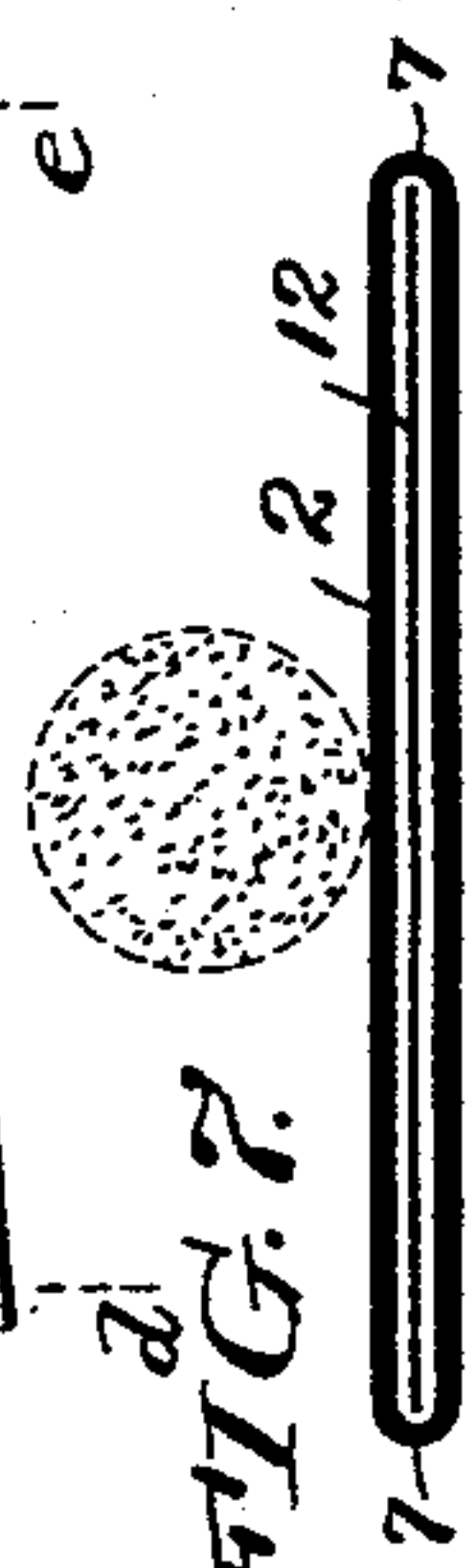


FIG. 9.

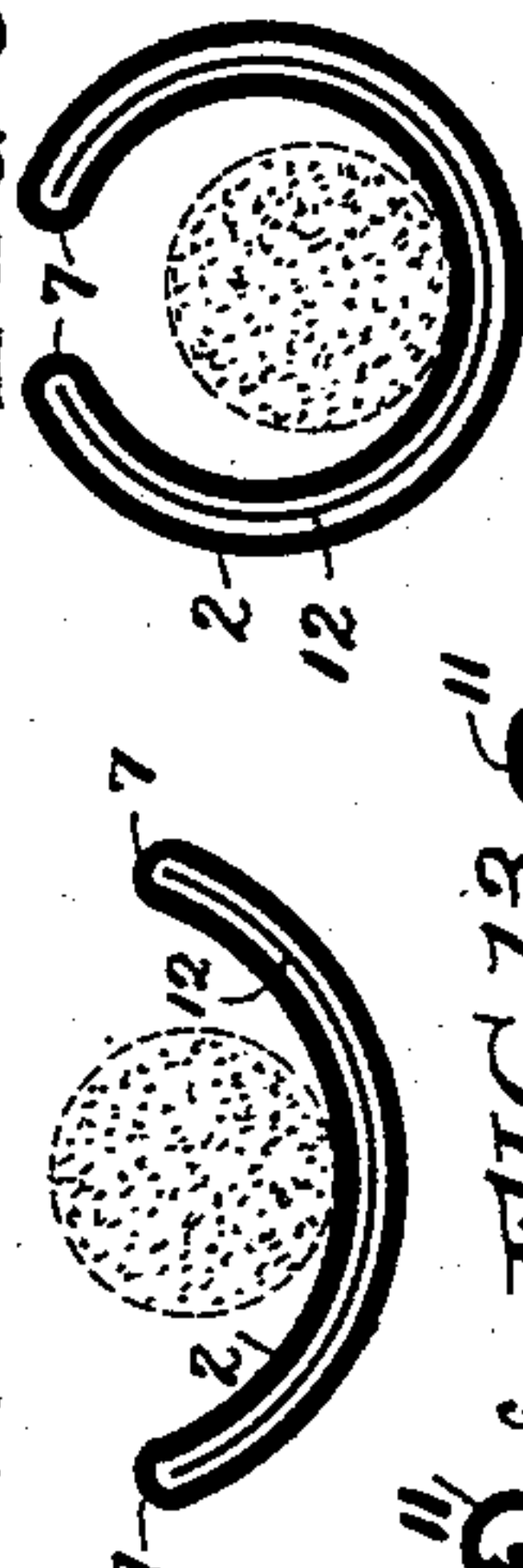


FIG. 10.

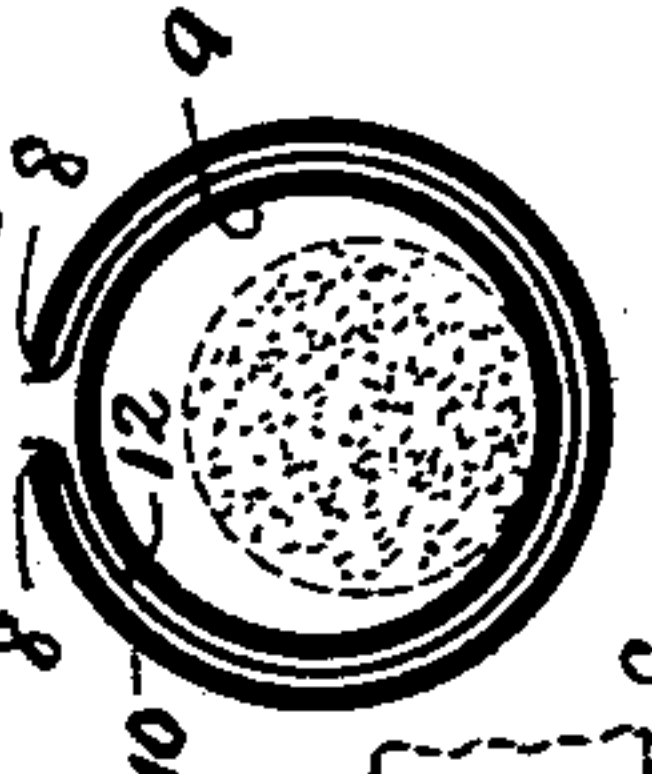


FIG. 11.

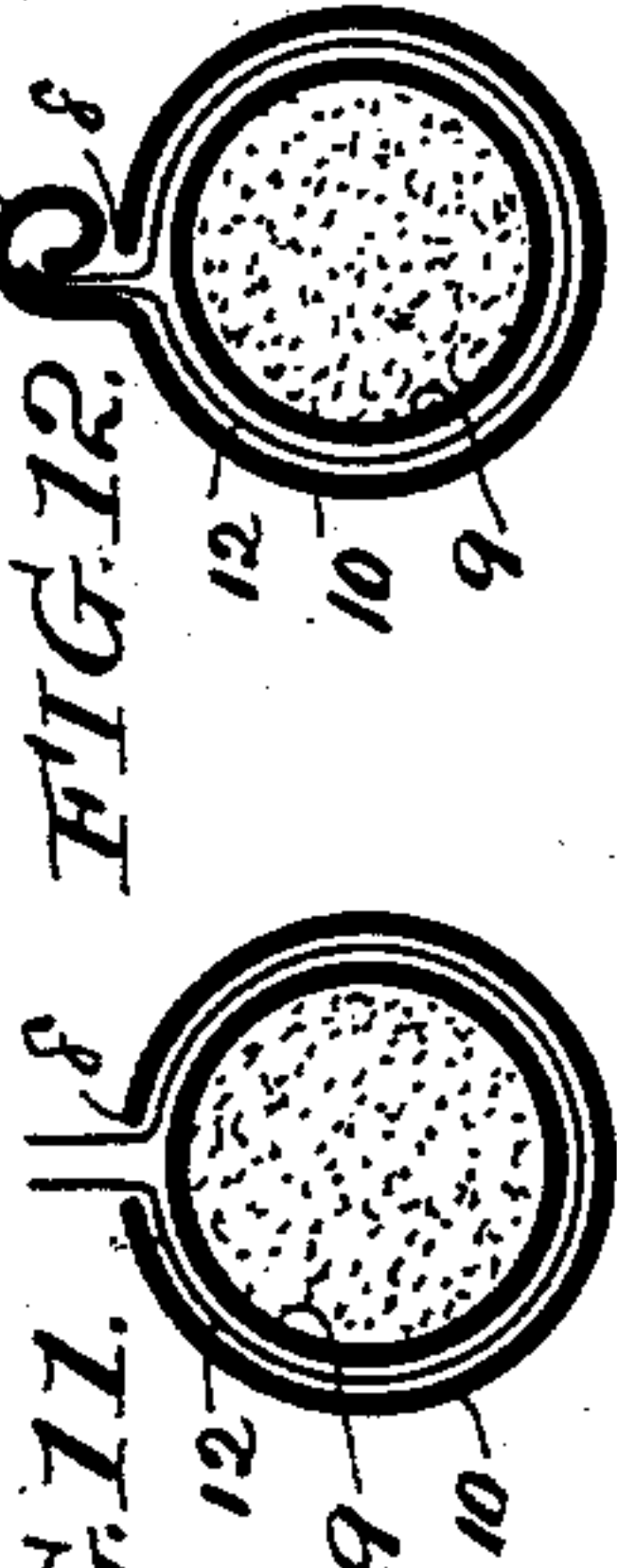


FIG. 12.

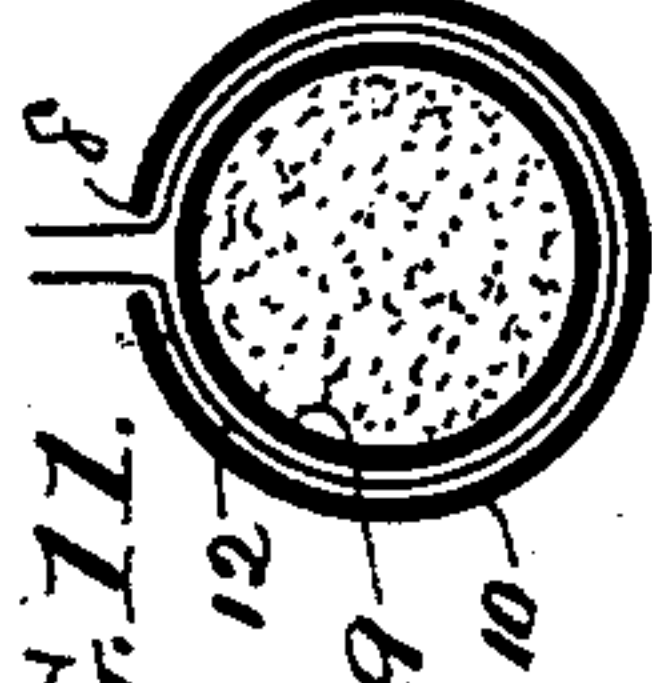


FIG. 13.

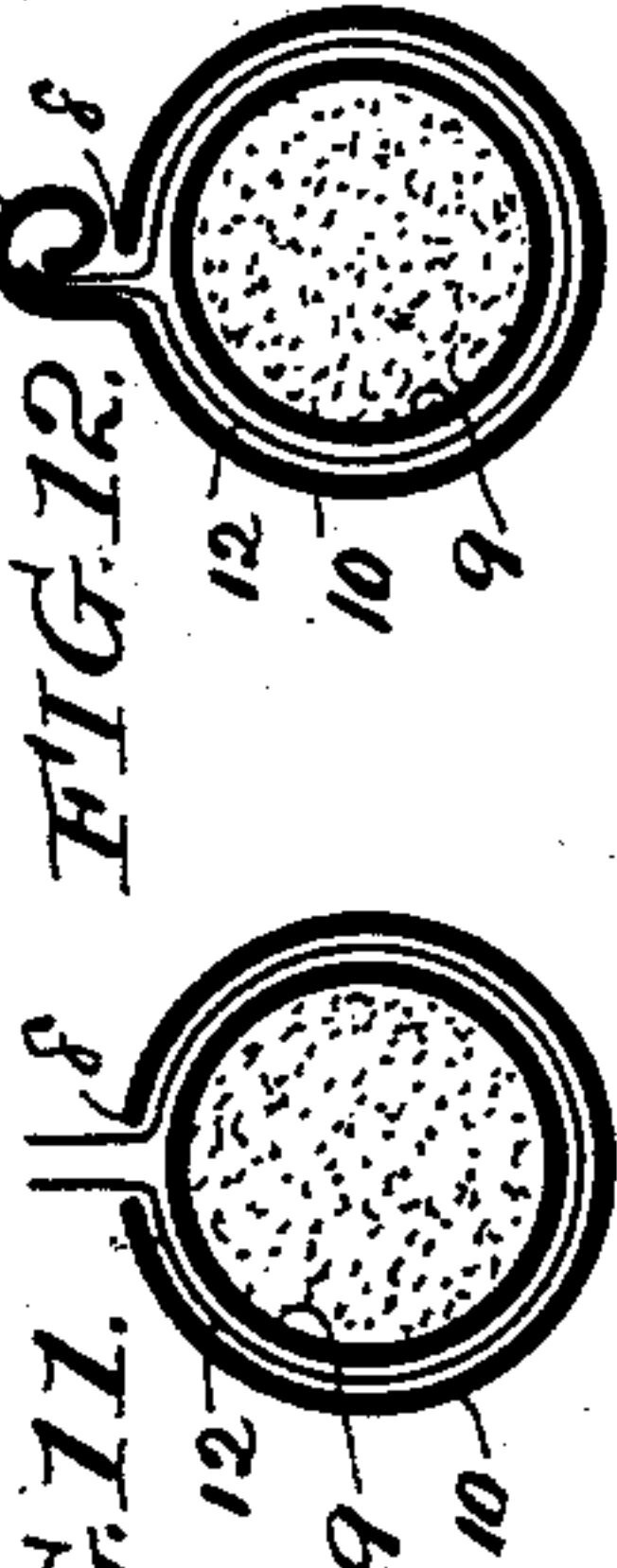


FIG. 14.

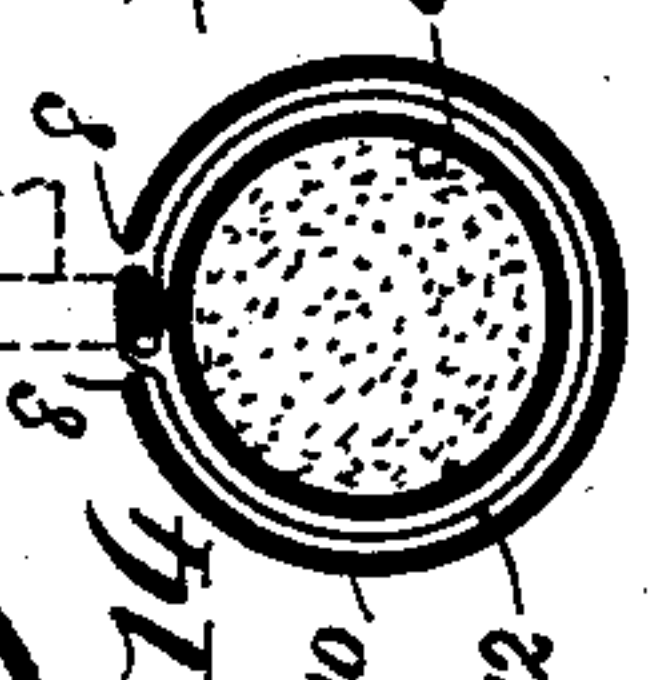
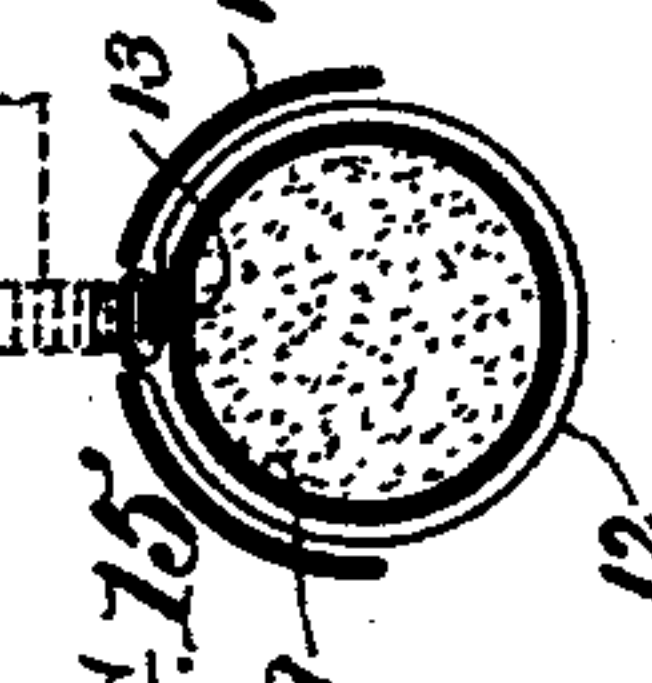


FIG. 15.



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# UNITED STATES PATENT OFFICE.

JAMES A. BONSAK, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE  
BONSAK MACHINE COMPANY, OF SALEM, VIRGINIA.

## CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 572,152, dated December 1, 1896.

Application filed April 4, 1892. Renewed December 9, 1893. Serial No. 493,451. (No model.) Patented in England April 8, 1892, No. 6,734; in Germany April 15, 1892, No. 74,352, and in Spain February 21, 1893, No. 13,305.

*To all whom it may concern:*

Be it known that I, JAMES A. BONSAK, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Cigarette-Machines, (for which Letters Patent for Great Britain, No. 6,734, dated April 8, 1892, for Germany, No. 74,352, dated April 15, 1892, and for Spain, No. 13,305, dated February 21, 1893, have been granted,) of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The present invention relates generally to machines for forming continuous cigarettes; and it relates particularly to that class of machines in which a continuous wrapper-tube of paper is first formed and its seam finally closed by crimping and the tube charged with the tobacco filler.

One purpose of the invention is to produce a wrapper-forming device by which a ribbon of wrapper-paper can be tubularly formed to encircle the tobacco filler and its edges joined without the wrapper coming in contact with the filler, the filler being delivered into the wrapper-tube only after the tube has been properly brought to tubular form. It is desirable to thus keep the filler from the wrapper for the reason that if the filler be in contact with the portion of the wrapper being formed it will, because of its irregularity of density and therefore of form, tend to displace the wrapper and especially to cause the joined or joining edges thereof to get out of the desired relative position. When such displacement occurs, the result is an imperfect or unsealed seam, and also the feed of the seam to the crimping devices may be laterally irregular, in which case the thin body of the wrapper-tube may take the action of the crimping devices in part and so become ruptured or weakened. I employ, therefore, a forming device which in general shape is like the common helicoidal wrapper-formers, but which especially consists, particularly along its forward or tubular end, of an inner closed tube adapted to hold or contain the tobacco filler and conduct the same to within the

formed wrapper; and it consists also of a wrapper-forming guide or guides located around and slightly separated from the tobacco-tube, such a guide device being preferably an outer helicoidal forming-tube conforming to the filler-tube and adapted to cause the wrapper, as it is fed forward, to be tubularly shaped around the filler-tube as a mandrel and with the edges of the wrapper joined or lapping one upon the other.

It is also the object of the invention to effect the sealing of the joined edges of the wrapper by a crimping mechanism adapted to act upon the wrapper-tube seam independently of the forward feed of the wrapper. That is, heretofore it has been proposed to crimp the edges of a wrapper-tube simultaneously with the forward feed of the same, the crimping device or devices acting conjointly and in time with the feeding devices. Thus the crimping mechanism is dependent upon the feeding devices and is not operated except with or because of the operation of such devices. I propose to employ a crimping mechanism which can be operated independently of and without affecting or being affected by the feeding action. Thus isolating the crimping mechanism permits it being operated with special reference to its kind of work. Preferably I employ a crimping device that has motion along the wrapper-tube seam and that acts on the same intermittently, alternating in interval of action with the devices that feed the cigarette forward, and accordingly the wrapper forming and feeding action is suspended or partially suspended while the seam-crimping action is effected. The wrapper being stationary while the crimper operates, there is no motion of the seam parts against the crimping device, and thus injury to the wrapper is obviated, and, further, the crimping action may be modified or regulated to insure proper crimping without affecting or being affected by the feeding action.

In the drawings accompanying this description, Figure 1 is an elevation view of one form of machine embodying my invention. Fig. 2 is an enlarged detail view showing in elevation and partial vertical section, along the



plane *aa* of Fig. 4, the seam-sealing mechanism and adjacent parts. Fig. 3 is a plan view of the machine. Fig. 4 is an enlarged detail view showing in plan the essential parts of the seam-sealing devices, portions of the supporting and operating parts of the same being in horizontal section on plane *bb* of Fig. 2. Fig. 5 is an end-elevation view of the machine as seen from the right-hand end of Figs. 1 and 3. Fig. 6 is an enlarged detail view, looking toward the left-hand or front end of the machine, of the parts of the machine cut by the vertical plane *cc* of Figs. 1, 3, and 4. Figs. 7 to 15 are enlarged detail views showing cross-sections of the wrapper or cigarette tube former on the respective planes *dl* of Figs. 2, 4, 16, and 17, as hereinafter will be more fully referred to and explained. Figs. 16 and 17 are respectively a vertical longitudinal section and a plan of the tube-former, showing the filler in place upon it.

In the views, 1 represents the base of the machine, which may be of any suitable form and on which are properly supported the various pillars, brackets, or arms that carry the working parts of the machine.

2 represents a curved wrapper-former, through which the strip or ribbon of paper is fed and during its forward movement is brought to tubular form with its opposite edges joined or in lapping contact, the mandrel part of this former being the tube which serves to deliver the tobacco into the sealed wrapper-tube.

3 represents a continuous belt which is adapted to hold the completed and continuous cigarette and draw it forward, thus effecting the feed of the wrapper-ribbon through the former and assisting the feed of the tobacco through the former mandrel or filler tube into the wrapper-tube.

4 indicates a presser-wheel by which the joined edges of the paper ribbon are during the forward feed of the ribbon flattened down upon the paper tube previous to being finally sealed by crimping.

5 is a crimping-wheel that is intermittently brought to contact with the joined edges of the wrapper-tube and is driven along the same for a short distance to crimp together such edges, and thereby finally seal them, between succeeding steps of the feed of the wrapper-ribbon or while the wrapper is stationary, or practically so.

Referring in detail to these parts and their actuating mechanism, the wrapper-former 2, which at its rear or left-hand end and at about the middle of its length is supported on the uprights 6, consists, substantially, of a flat shallow tubular guide adapted to loosely inclose the wrapper-ribbon when in flat form. (See Fig. 7, which shows a section of this end of the former and of the contained wrapper.) From the rear end of the former to the plane *f*, Figs. 4, 8, 9, and 10, the edges 7 of the former gradually converge spirally, thus pro-

ducing two concentric tubes joined together by the edge parts 7 of the flat rear end of the former. At or about the position of the plane *f* the edges 7 are cut away, as seen at 8, Figs. 4 and 10, and the inner or mandrel tube 9 is completed circularly, while the outer or forming tube 10 is slotted along its central upper part to its forward end. These concentric tubes are slightly coned from plane *g* to about plane *h*, and the edges of the slot 8 in the outer tube correspondingly converge till at plane *h* their separation is about the same or slightly more than that of the thickness of the two edges of the wrapper-paper. From plane *h* the tubes preferably are cylindrical to their forward ends, and from end to end the two parts of the former are held separated by a practically uniform wrapper-space. On the outer tube and at one edge of the slot 8 is mounted an edge-former, which consists of a slender sheet-metal snail or convolute 11, conically shaped from plane *i* to plane *j*, and is arranged so that its longitudinal opening or throat corresponds in position to the slot 8. Beyond plane *j* and to the end of the former the slot 8 is of a width about the same as that of the seam of the paper tube to permit the presser-wheel 4 and the crimping-wheel 5 to bear upon the wrapper-seam parts.

The paper ribbon or wrapper 12 is fed in at the rear end of and through the former, and as it is drawn forward it is gradually brought into tubular form and its edges brought together until when they begin to emerge at the rear end of slot 8 they meet, as seen in Fig. 10. The further movement of the wrapper along the conical portion of the former, from *g* to *i*, contracts the wrapper-tube and projects the edges thereof out of the slot 8, as seen in Fig. 11. These projecting edges now enter the snail 11 and are coiled or curled one within the other, in form like the inner end of the snail, Fig. 13, and as the coil emerges from the snail it passes first under the wheel 4, which flattens it down upon the inner tube 9, and then it passes under wheel 5, which crimps it against the inner tube and thereby finally seals or fixes it, the feeding and seam-sealing actions being performed intermittently and alternately.

The mandrel or filler tube 9, particularly at its front end, is made as thin as proper strength and rigidity will permit, and the surface of its bore is to be as smooth and regular as practicable, so as to offer but little resistance to the passage of the tobacco filler. The filler is fed upon the rear end of the former—that is, upon the opened-out rearward continuation of the mandrel-tube—and is moved forward through the mandrel into the wrapper-tube in any suitable way. Preferably, however, the filler is first compacted into the form of a continuous rod of proper size, and such a tobacco rod is fed into and through the mandrel to within the sealed wrapper-tube, which, being fed by other devices and



having a clinging contact with the expanded tobacco rod, also helps to feed the latter through the mandrel. The mechanism for continuously producing such tobacco rod and feeding it into the tobacco-conduit of the former is no essential part of this machine and is not therefore described in full.

The forward end of the former-tube 10 is cut away from below to conform to the edges of the periphery of the grooved side wheel 12, while the mandrel or tobacco tube continues in plain tubular form to its forward end, these tubes ending, preferably, at or about the position of the guide-wheel, the groove in the periphery of which is slightly larger, by the thickness of the wrapper, than the exterior of the tobacco-tube. The tobacco-tube is notched or serrated at 13 for a short distance along its forward end and just under the slot 8 in the former-tube, Figs. 2 and 4. These serrations constitute a fine rack and are of size and space to conform to and mesh with similar serrations on the periphery of the crimping-wheel 5, which wheel has a motion rearwardly in meshing contact with said rack, (except for the wrapper between,) then rises therefrom and returns to the forward end of the tube. Thus it will be seen the seam is crimped down upon the body of the wrapper by the coöperation of the rack and crimping-wheel, and this while the cigarette is stationary. At the same time the guide-roll 12 resists any downward tendency of the tobacco-tube under the pressure of the crimping-wheel. This guide-wheel being in contact with the sealed wrapper-tube, it serves to assist as a feeding device to draw the wrapper through the former, it being driven coincidentally with the feeding-belt 3.

The feeding-belt 3 is of any suitable flexible material. It passes through the tubular guide 14 14 in line with the axis of the tobacco-tube, in which guides it is tubularly shaped to a size about the same as the cigarette, and is thereby adapted to inclose the cigarette, which extends from the forming and crimping devices to and within the contracted portion of the belt, and feed or advance the same forward. This belt passes continuously over drum 15 on shaft 16, up over the idle-pulley 18, and through the guides 14.

On the end of shaft 16 is carried a beveled gear-wheel 19, which meshes with the pinion of shaft 20, which is mounted in journals on the side of the machine and gears with the shaft 21, which carries the guide-wheel 12. On shaft 21 is the gear 22, which meshes with the driving-pinion 23 on the axis of the presser-wheel 4. Thus the presser-wheel is caused to rotate intermittently conformably with the movement of the forward feed of the cigarette and the forming-wrapper.

24 is the main driving wheel or pulley. Its shaft 25 carries the eccentric 26, the pitman 27 of which is pivotally attached to the upper end of rock-arm 28, which in turn is pivotally carried on shaft 16. On this arm is

hung the pawl 29, which engages the teeth of the wheel 30, fixedly carried on the shaft 16. By these means it will be seen that for one half-revolution of the main driving-wheel shaft 16 is partially rotated, thus effecting the forward feed of the cigarette and the forming-wrapper, while during the other half-rotation of the driving-wheel shaft 16 and the feeding devices are stationary and pawl 29 is carried over one or more teeth of the wheel 30, preparatory to reengaging the same for another operation of the feeding devices.

The crimping-wheel 5 is fixedly mounted on the inner end of the rotating shaft 31, pivotally carried on the slide 32, which slide reciprocates in ways 33, these ways being carried on a rocking plate 34, which is supported at its rear end by pivot 35 on the upright 36, secured to the bed of the machine. A plunger-rod 37, also mounted at its rear end on pivot 35, enters at its forward end a hole in the rear end of the slide 32, a spring 38 being interposed between the slide and the plunger and acting to tend to push the slide forward. On the back of the lower way 33 is mounted a rack 39, which is in mesh with the pinion 40, fixed to the outer end of the crimp-wheel shaft 31, and serves to cause the crimp-wheel to be positively driven, and also to be brought to proper meshing relation with the crimping-rack on the tobacco-tube. The rack 39, while preferably employed to insure the positive action of the crimp-wheel, is not, however, essential. Attached to the upper way of the slide 32 is an arm 41, carrying a friction-roller 42, that rides on a cam 43, mounted on the main shaft 25. The peripheral form of this cam, as seen in Fig. 2, consists of two semicircular parts of different diameters, whereby the revolution of the cam causes the forward end of the way-plate 34 and its carried parts to rise and be held at one position vertically during the half-revolution of the main shaft, and then to drop and remain at a lower position during the second half of the shaft's revolution, a spring 44, attached to the lower way, serving to depress the way-plate and thereby hold the crimp-wheel to working contact. At the forward end of the slide 32 is mounted a friction-roller 45, which bears against the peripheral face of the eccentric wheel 46, also carried on and rotated by the main shaft 25, and this cam acts to reciprocate the slide backward and forward in its ways.

The positions on the main shaft of the eccentric 26, cam 43, and eccentric-wheel 46 are such that during that half-revolution of the shaft when the feeding mechanism is stationary, Fig. 2, the way-plate is lowered and the slide moved to the limit of its backward movement. This brings the crimping-wheel to contact with the turned-down edges of the seam, and as the slide is moved backward the crimping-wheel is passed along the seam of the formed wrapper and thereby finally seals the folds of the same together and down



flat upon the body of the wrapper. When the crimping-wheel has reached the end of its backward movement, the way-plate is raised, so that the crimping-wheel leaves the wrapper and returns to its forward position preparatory to being again depressed to contact with another portion of the wrapper-seam. As the crimp-wheel thus returns it is rotated backwardly by its guide-rack, and thus brought to be, when at its forward point, in position to mesh with the crimping-serrations upon the tobacco-tube when next it is depressed to act on the wrapper-seam parts. During this return of the crimp-wheel the forward feed of the cigarette and forming-wrapper is effected, so that a new portion of seam is presented ready for the immediate repetition of the crimping action.

I do not deem it essential that the tobacco-tube be serrated so as to coöperate with the crimp-wheel to help form crimps, or vice versa, for either or both of the crimping parts may be so crimped.

In my present invention the wrapper or wrapper-tube is in all cases to be fed along longitudinally through the tube-forming mechanism or over an internal support preferably forming part of such tube-forming mechanism, and I do not in this application claim any combination of devices arranged to act on a blank which is folded into a tube while remaining longitudinally stationary with respect to the forming mechanism or the support or mandrel round which it is formed.

I have shown in the drawings the general character and configuration of the curved former which I prefer to use, but it will be understood that the length of the former can be varied without in any way departing from my invention.

I am aware that it has been proposed to employ the following combinations of devices in the construction of cigarette-machines, and I therefore disclaim the same, when broadly considered, from my invention, as described and claimed herein, viz: the combination, with feeding devices for advancing a continuous cigarette-wrapper and filler therein with the edges of the wrapper engaged, of an interior support located within the wrapper, and devices coacting therewith to press down and secure the edges of the wrapper; also, the combination of the devices last named with devices for folding the wrapper with its edges rolled or folded together over the filler and a support located within the wrapper; also, the combination, with feeding devices for advancing a continuous cigarette-wrapper and filler therein with the edges of the wrapper engaged, of a support located within the wrapper and forming one member of crimping, indenting, or perforating devices, and a member outside the wrapper coacting therewith to secure the wrapper edges; also, the combination of the devices last named with devices for folding the wrapper with its

edges rolled or folded together over the filler and a support located inside the wrapper.

What I claim as new is—

1. In a cigarette-machine, the combination of the following groups of mechanism or instrumentalities; a wrapper-tube-forming mechanism adapted to tubularly shape a continuous ribbon of wrapper-paper moving through it and around a tobacco filler also moving through said mechanism and join or bring the opposite edges of said wrapper into lapping contact; a feeding mechanism adapted to feed the wrapper forward through the tube-forming mechanism; a crimping mechanism adapted to operate independently of the action of the feeding mechanism to crimp the joined edges of the wrapper and seal the same; and mechanism acting to bring the crimping mechanism into and retract it from contact with the paper.

2. In a cigarette-machine, the combination of the following instrumentalities; a wrapper-forming mechanism adapted to tubularly shape a continuous ribbon of wrapper-paper moving through it and around a tobacco filler also moving through said mechanism and join the opposite edges of said wrapper; and intermittently-operating seam-crimping mechanism adapted to act upon the joined edges of the wrapper to close and seal the same together; a feeding mechanism adapted to intermittently feed the wrapper-tube through the tube-forming mechanism; and mechanism acting to bring the crimping mechanism into and retract it from contact with the paper.

3. In a cigarette-machine, the combination of a wrapper-forming mechanism, adapted to tubularly shape a ribbon of wrapper-paper around a tobacco filler moving through said mechanism and join the edges of said wrapper; a seam-crimping mechanism acting intermittently to close together the engaged edges of the formed wrapper and seal the same; and a feeding mechanism acting intermittently and alternately with the said seam-sealing mechanism and adapted to feed the wrapper through the machine.

4. In a cigarette-machine, the combination of a wrapper-forming mechanism adapted to tubularly shape a continuous wrapper and join its opposite edges; a seam-crimping mechanism adapted to act to close together the edges of the wrapper and seal the same; a feeding mechanism adapted to feed the wrapper-tube through the wrapper-forming mechanism; and a filler-feeding channel or tube located within the wrapper and constructed and arranged to confine the filler from the unsealed wrapper and to deliver the tobacco into the wrapper-tube at or near the seam-sealing devices.

5. In combination in a cigarette-machine, a wrapper-former acting to tubularly shape the wrapper and join its opposite edges; a seam-sealing mechanism acting intermittently to seal the edges of the wrapper; a



filler-feeding tube located within the formed wrapper and adapted to deliver the tobacco into the wrapper-tube and also adapted to support the wrapper edges against the action of the exterior seam-sealing mechanism; and a feeding mechanism acting to feed the wrapper and filler through the machine.

6. In a cigarette-machine, the combination of a wrapper-forming guide adapted to tubularly shape a continuous wrapper around a tobacco filler moving through said mechanism and bring the edges of said wrapper to contact; a seam-sealing mechanism adapted to act intermittently to seal together the engaged edges of the wrapper; a feeding mechanism adapted to draw the wrapper through the wrapper-forming guide; and driving mechanism adapted to intermittently and alternately operate said sealing and feeding mechanism.

7. In a cigarette-machine an interior support, mechanism for intermittently feeding a tubularly-formed wrapper-ribbon along and over said support and around a tobacco filler moving through said mechanism, a crimping device located exteriorly to the wrapper-tube and adapted to act intermittently on the joined edges of the wrapper and against the interior support, the feeding mechanism and crimping mechanism acting alternately, and so that a substantially continuous line of crimping is formed along the tube by successive actions of the crimper.

8. In a cigarette-machine an interior support having a serrated anvil action, mechanism for intermittently feeding a tubularly-formed wrapper-ribbon along and over said

support and around a tobacco filler moving through said mechanism, a crimping device located exteriorly to the wrapper-tube and adapted to act intermittently on the joined edges of the wrapper and against the serrated portion of the interior support, the feeding mechanism and crimping mechanism acting alternately, and so that a substantially continuous line of crimping is formed along the tube by successive actions of the crimper.

9. In a cigarette-machine mechanism for tubularly forming a ribbon of wrapper-paper and joining or bringing its edges together, the combination of a tube adapted to serve as a conduit or channel for the tobacco filler and confine the same until delivered in the wrapper-tube, and also adapted to act as a mandrel upon which the wrapper is tubularly formed, and an outer tube inclosing the said filler-tube, such outer tube having a longitudinal slot adapted to guide the edges of the wrapper and being also adapted to receive the wrapper-ribbon and form it on the inner tube.

10. In a cigarette-machine mechanism for cylindrically forming a wrapper-ribbon and bringing its edges into engagement, a tubular mandrel adapted to serve as a filler-tube or tobacco-conduit, a wrapper-forming tube surrounding the filler-conduit and slotted to permit the passage of the edges of the wrapper, and an edge-former adapted to receive the edges of the formed wrapper and bend them to engagement one within the other.

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Witnesses:

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