

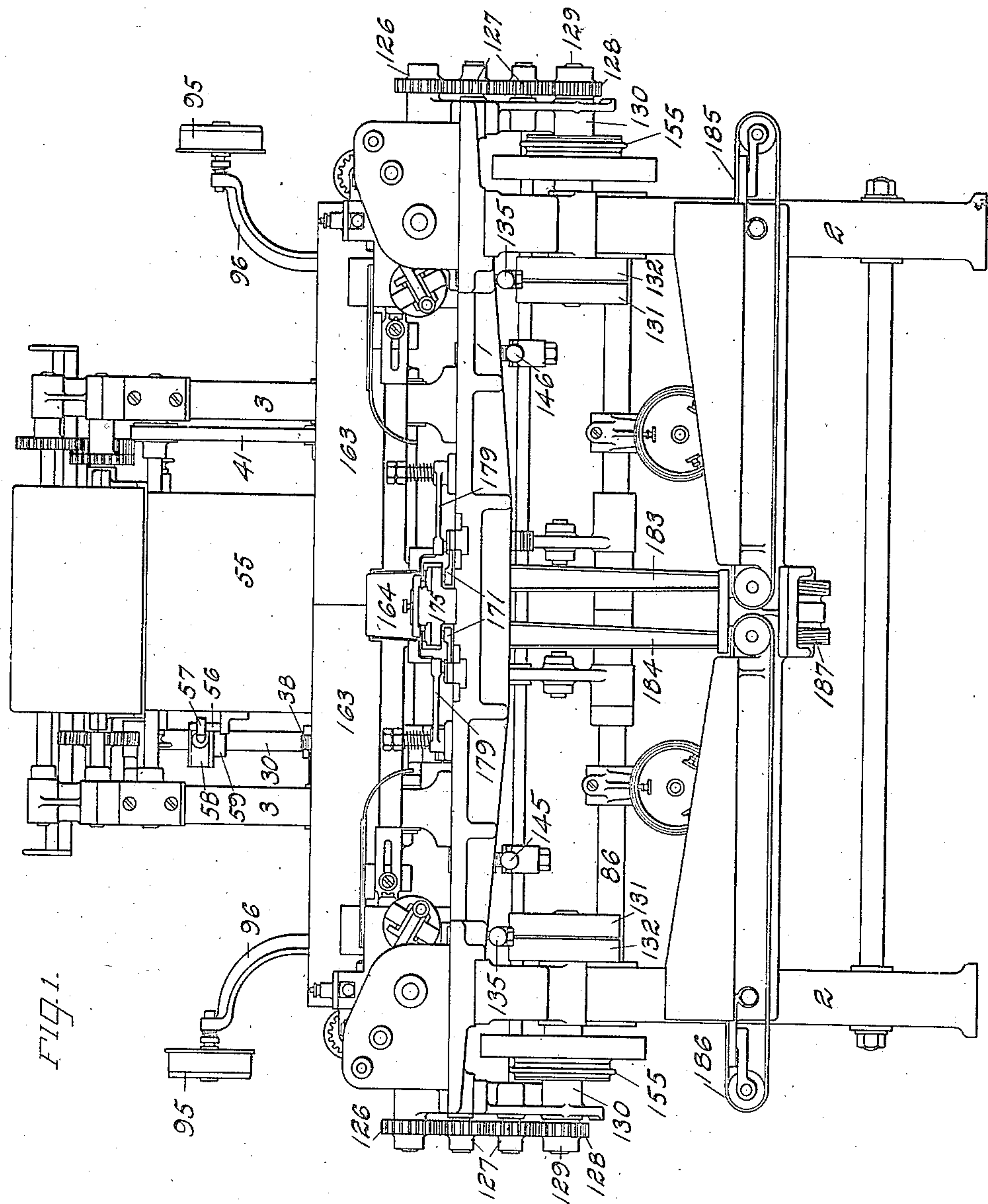
No. 863,217.

PATENTED AUG. 13, 1907.

S. I. PRESCOTT.
CIGARETTE MACHINE.

APPLICATION FILED NOV. 12, 1904.

11 SHEETS—SHEET 1.



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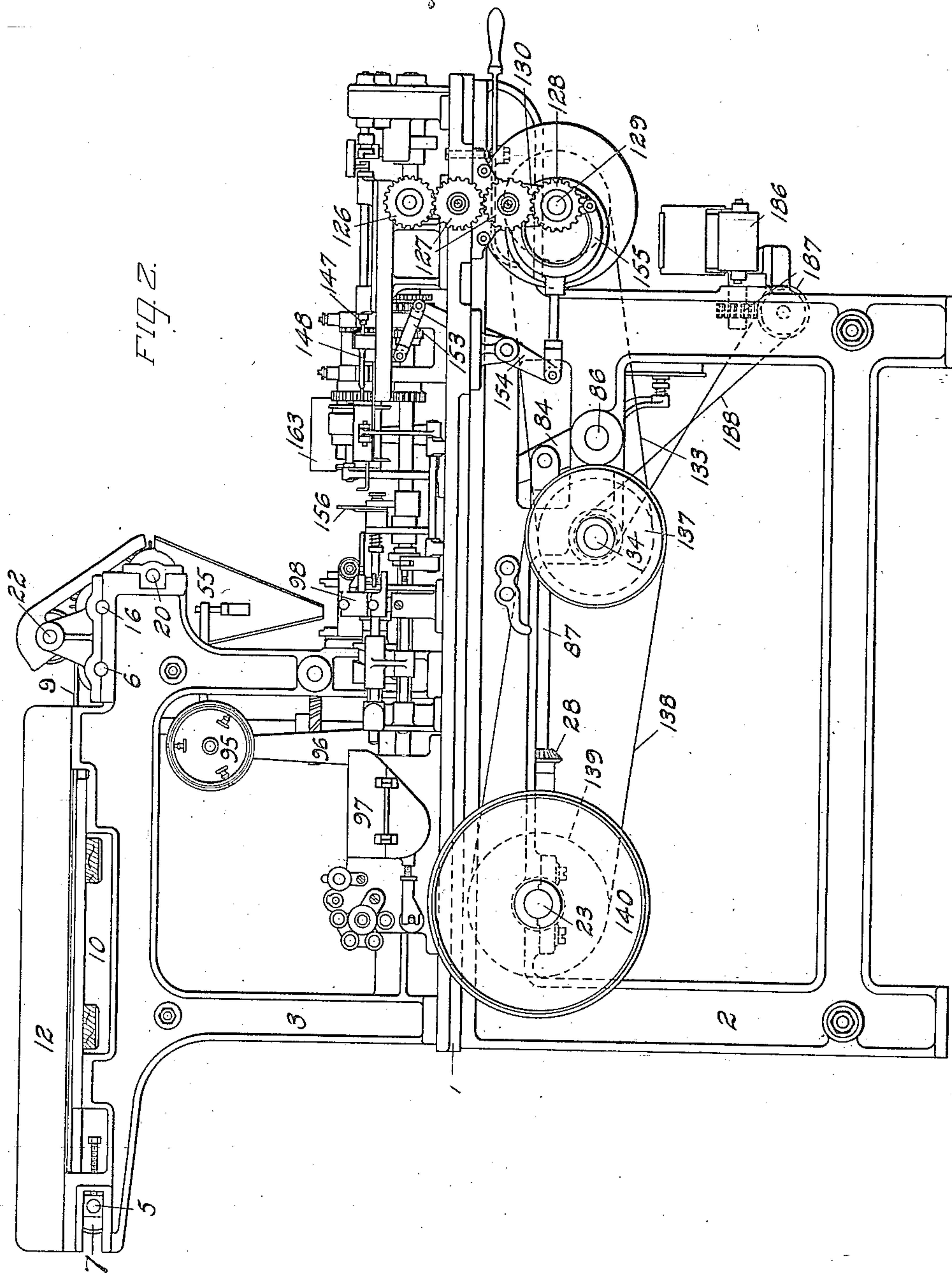
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11 SHEETS—SHEET 2.



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11 SHEETS—SHEET 3.

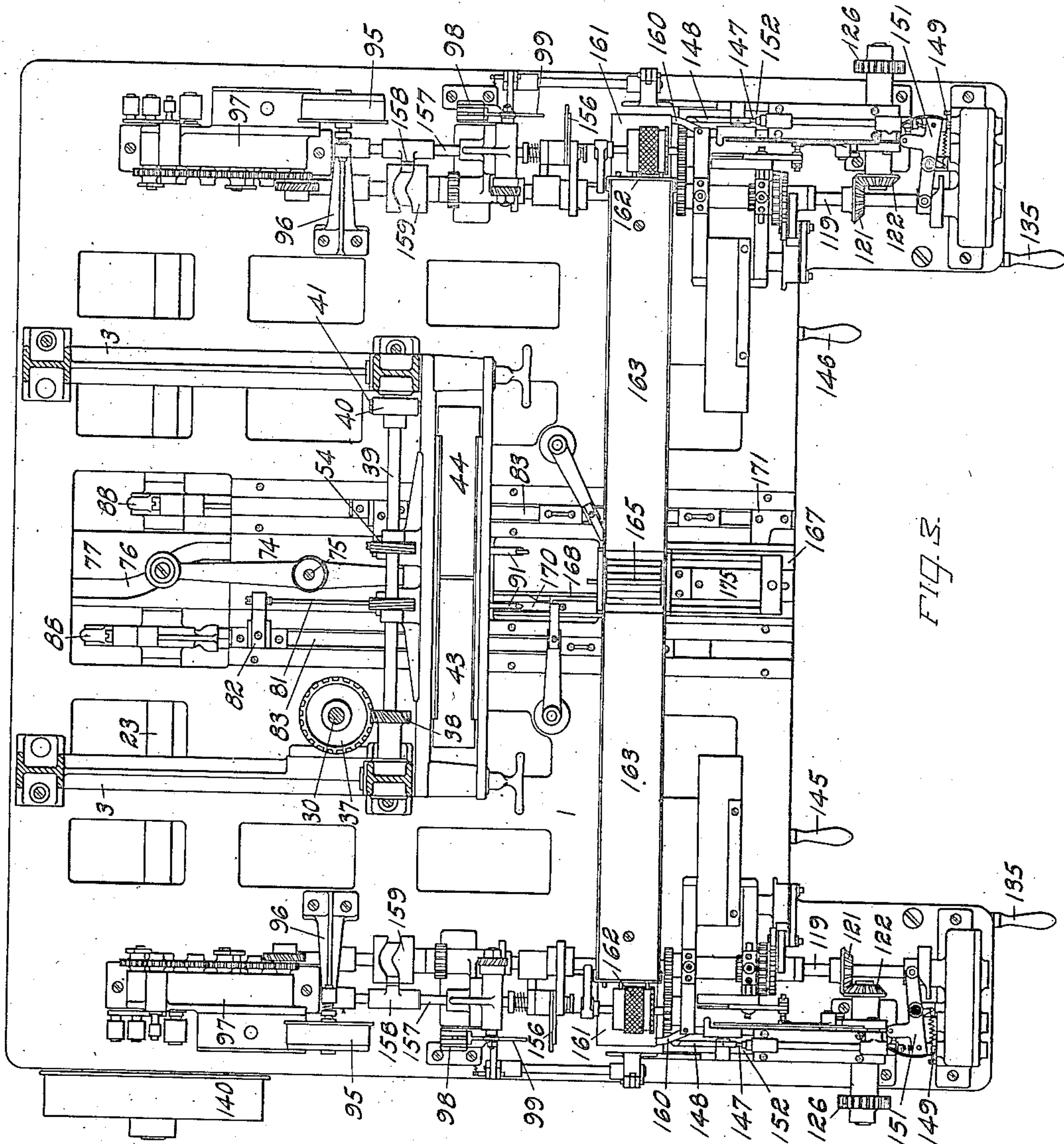


FIG. 3.

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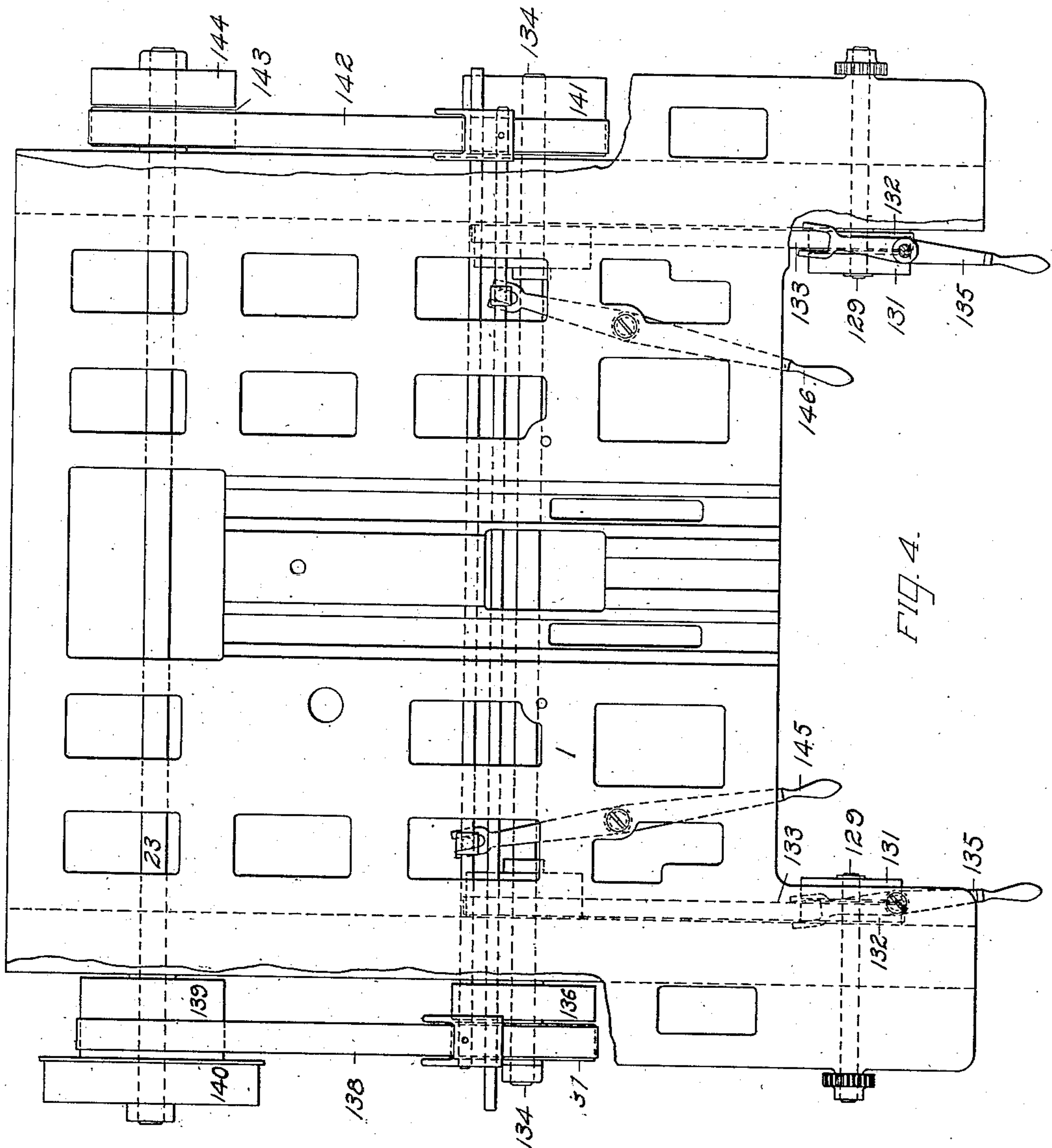
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11 SHEETS—SHEET 4.



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11 SHEETS—SHEET 5.

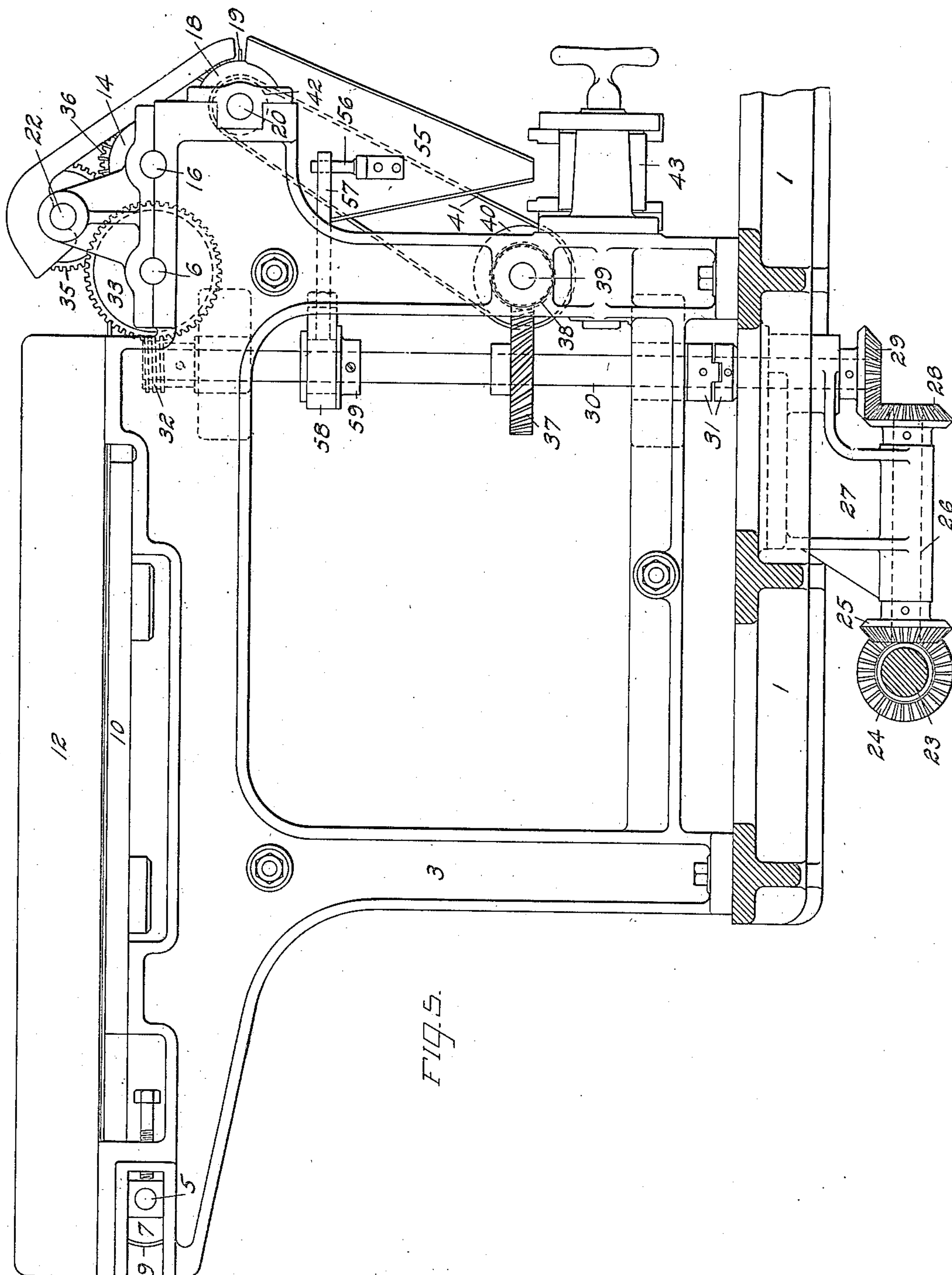


FIG. 5.

ATTEST
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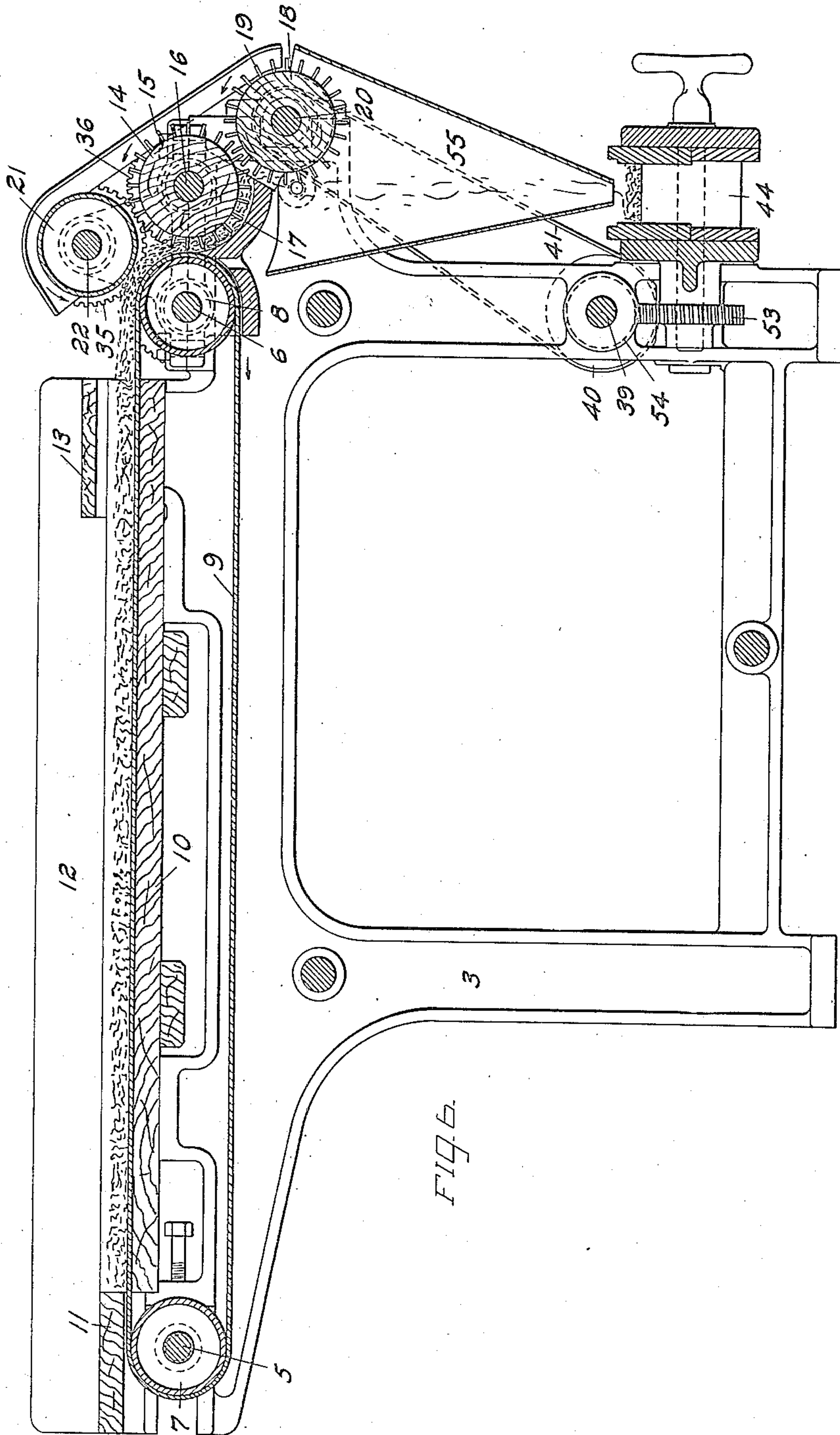
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11 SHEETS—SHEET 6



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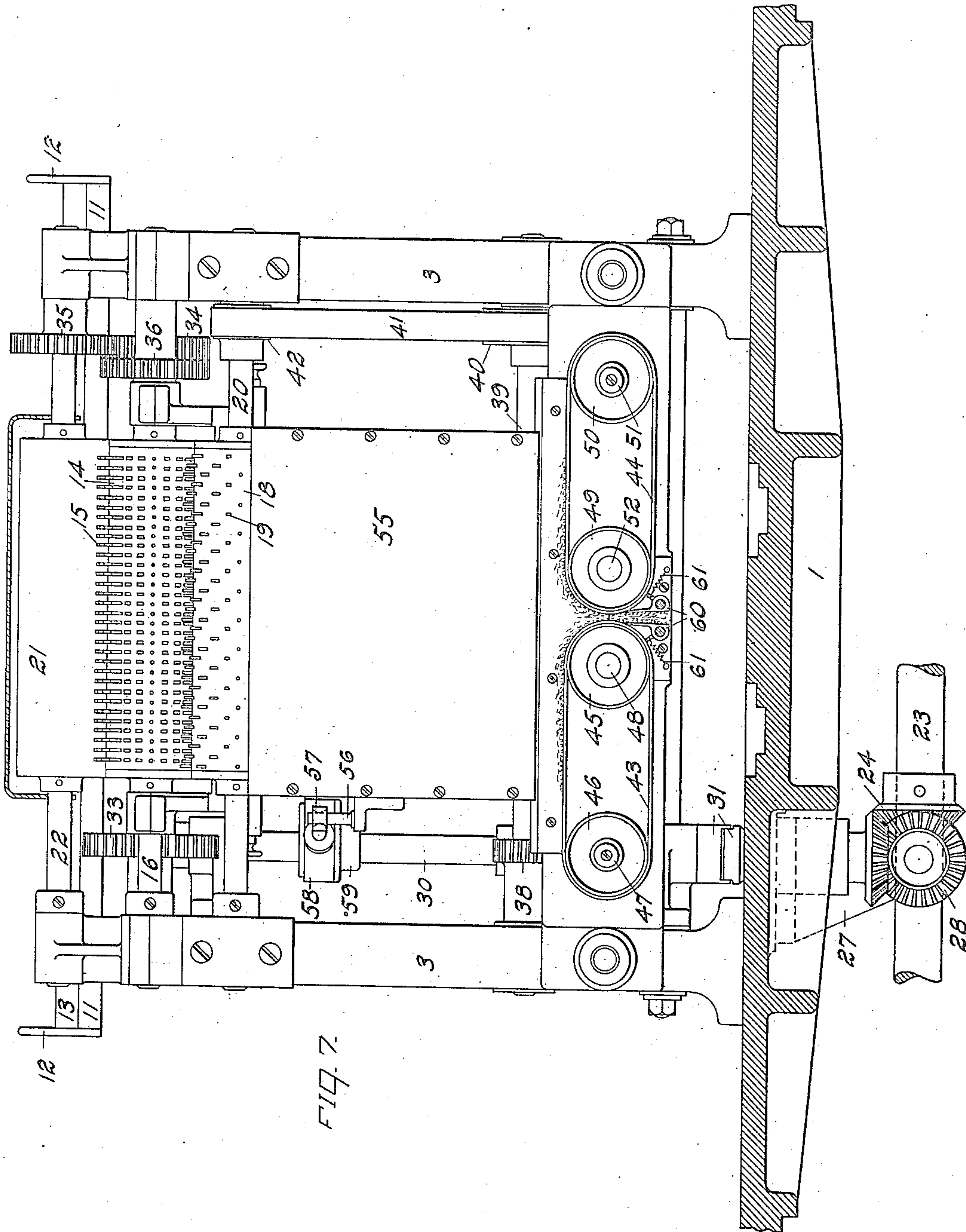
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11 SHEETS—SHEET 7.



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APPLICATION FILED NOV. 12, 1904.

11 SHEETS—SHEET 8.

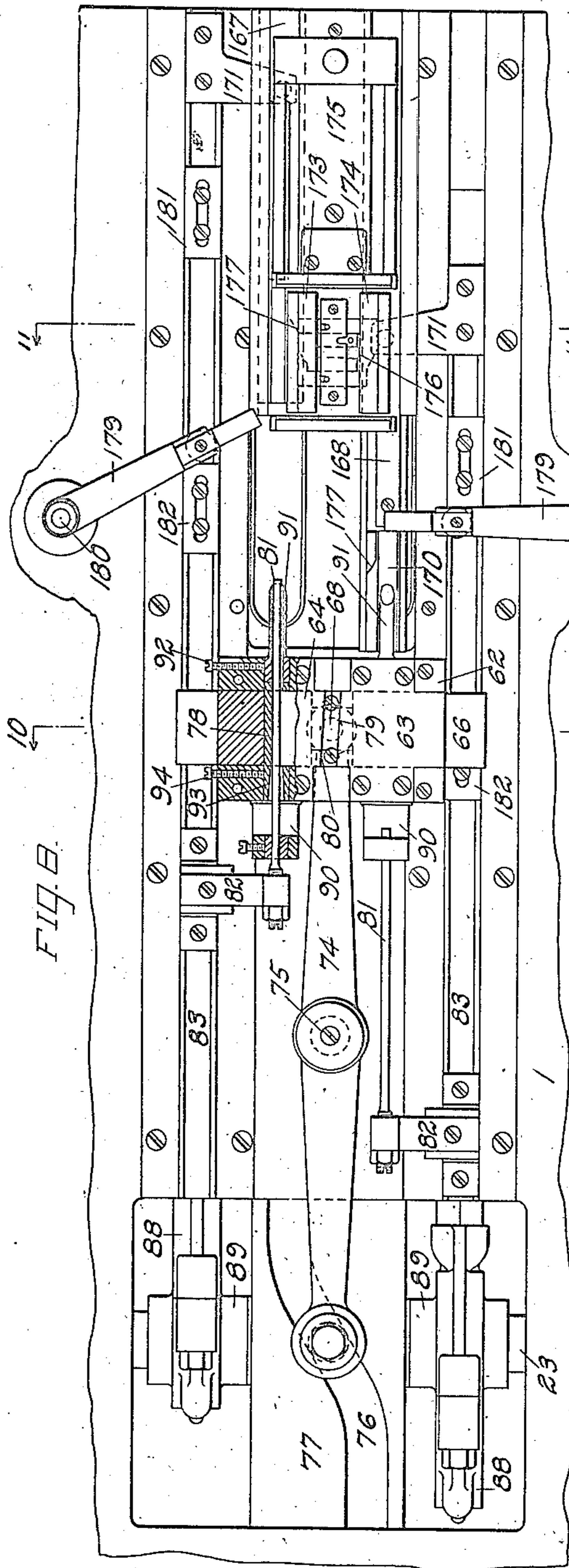


FIG. 8.

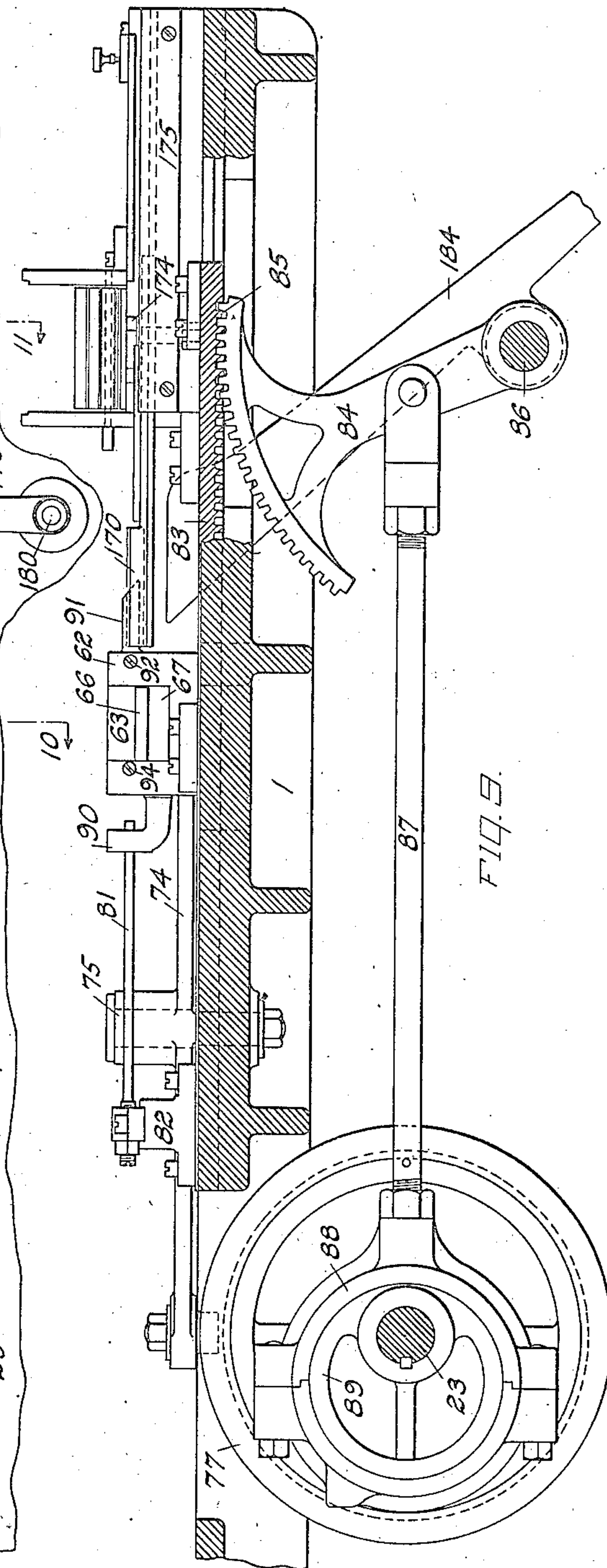


FIG. 9.

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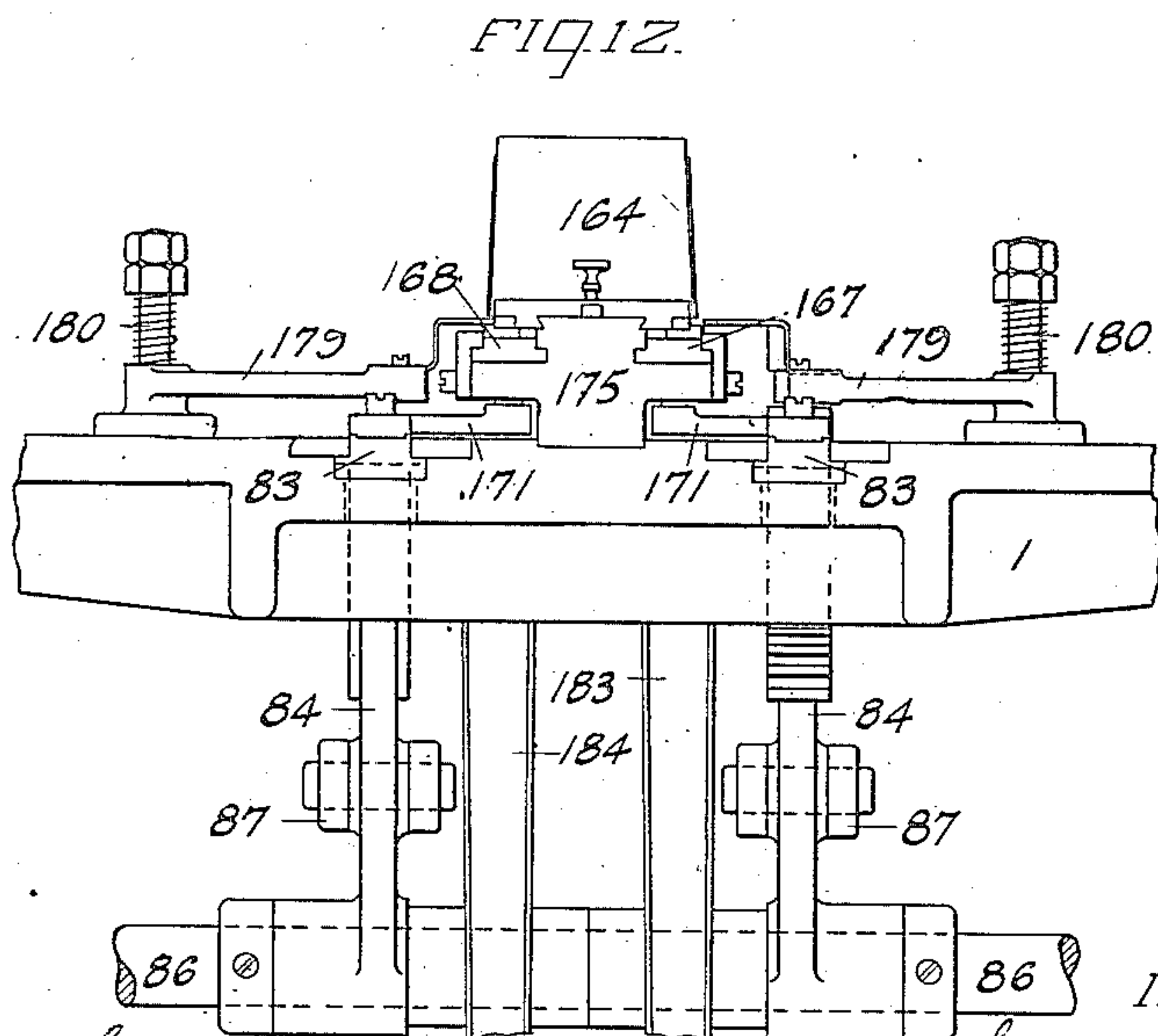
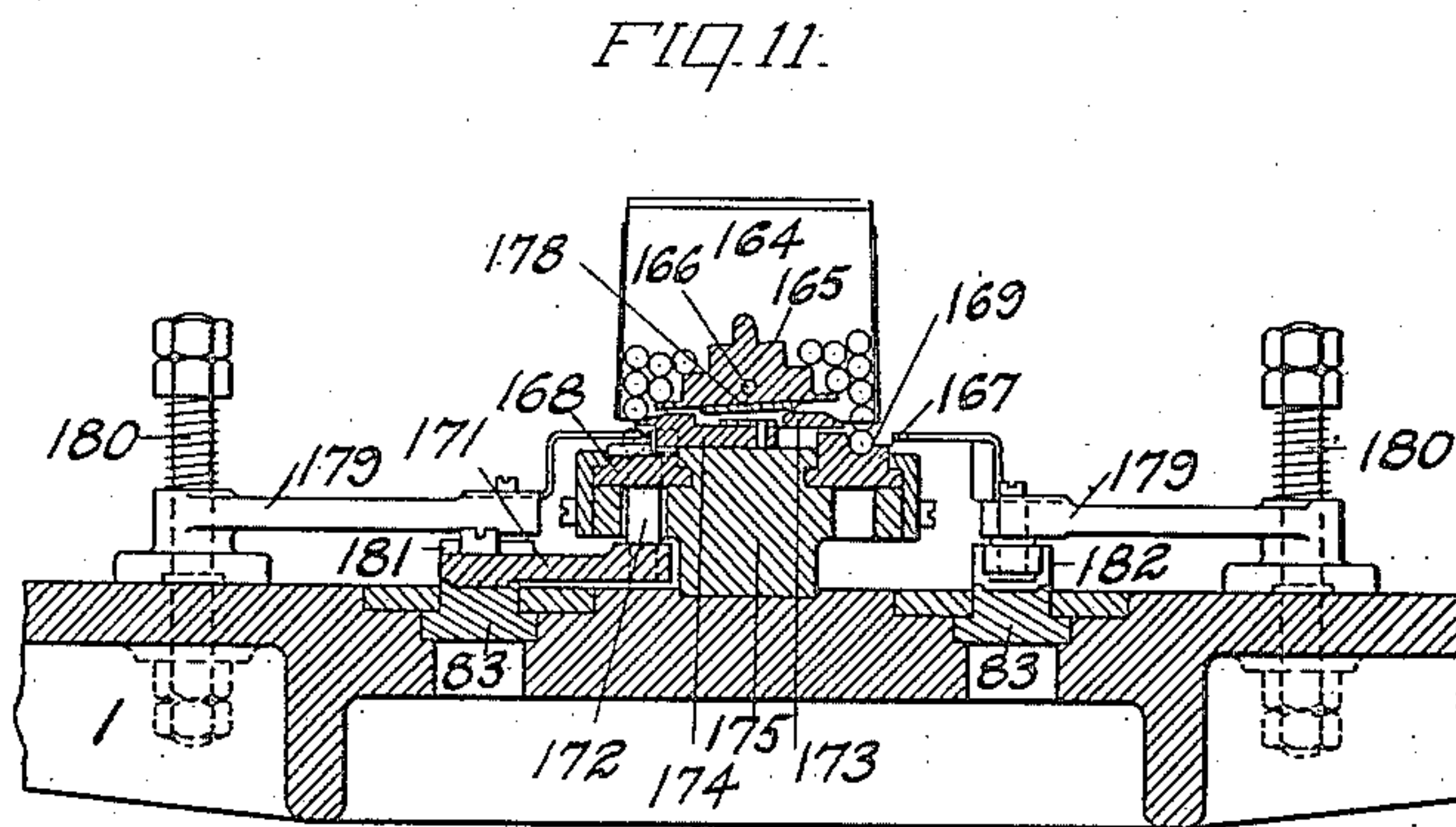
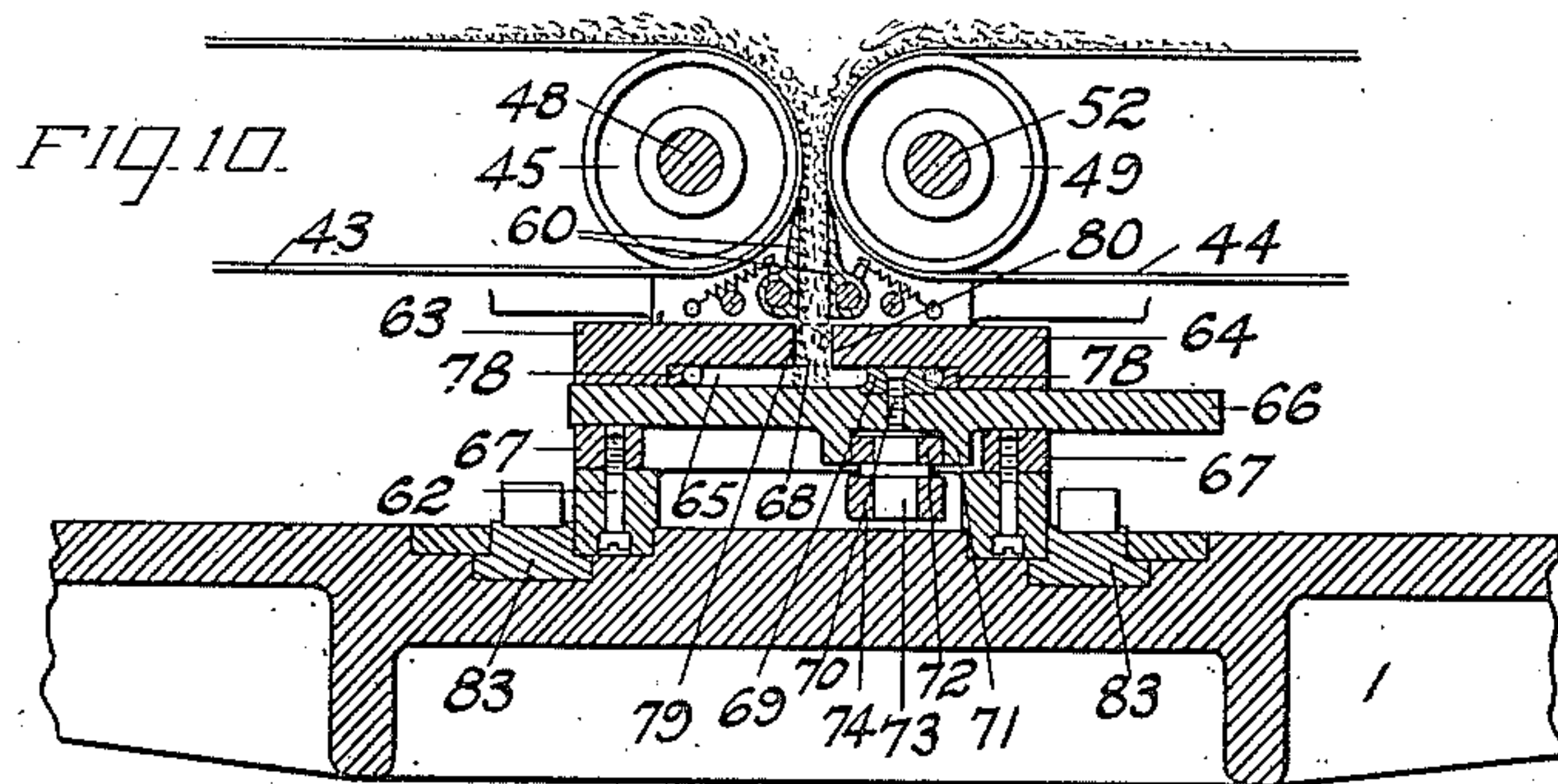
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PATENTED AUG. 13, 1907.

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CIGARETTE MACHINE.

APPLICATION FILED NOV. 12, 1904.

11 SHEETS—SHEET 9.



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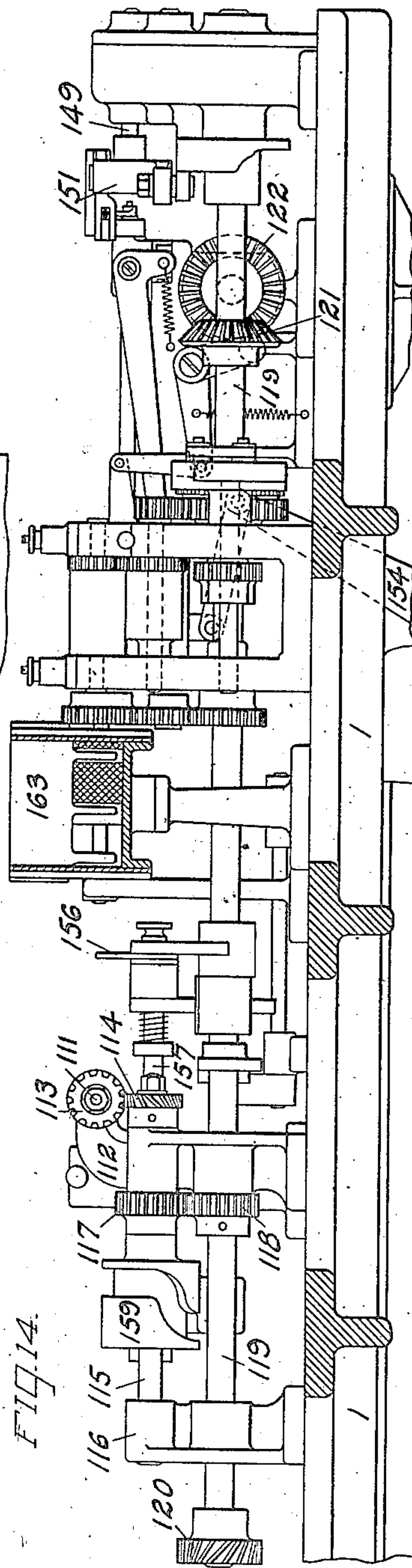
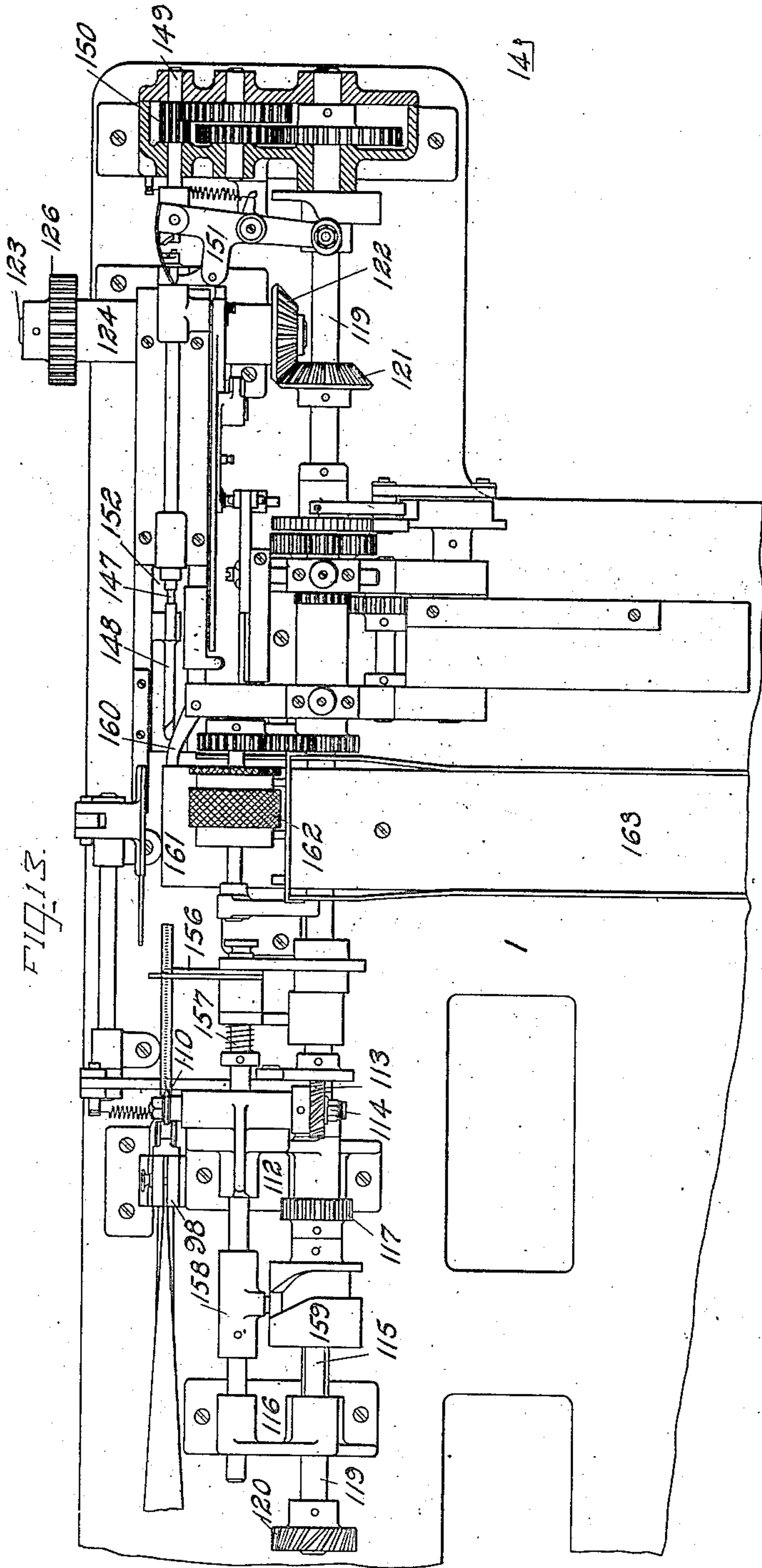
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11 SHEETS—SHEET 10.



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APPLICATION FILED NOV. 12, 1904.

11 SHEETS—SHEET 11

FIG. 5.

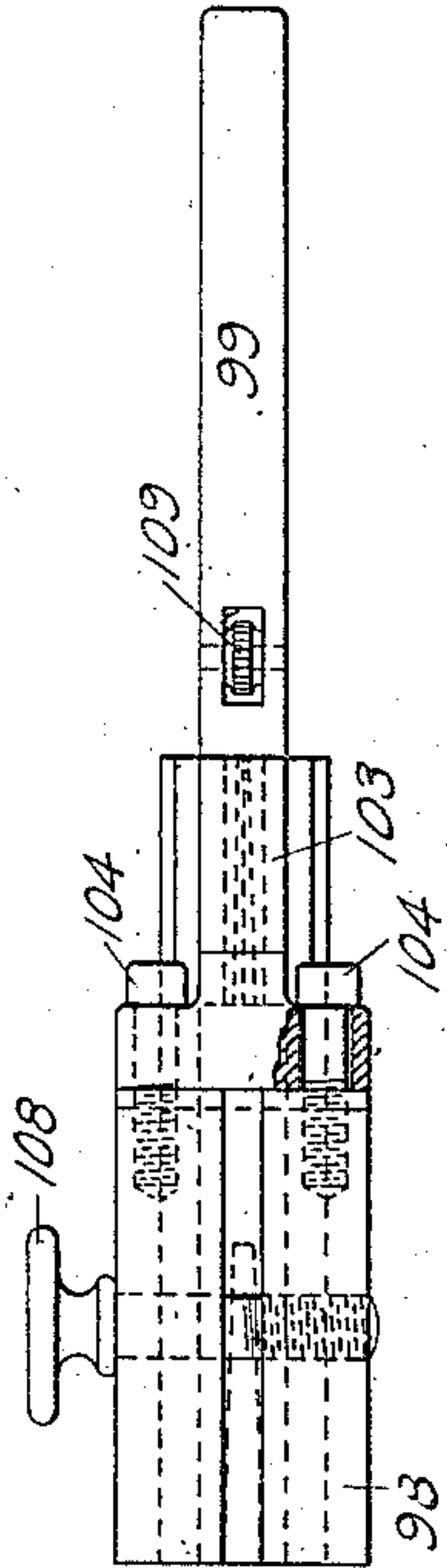


FIG. 16.

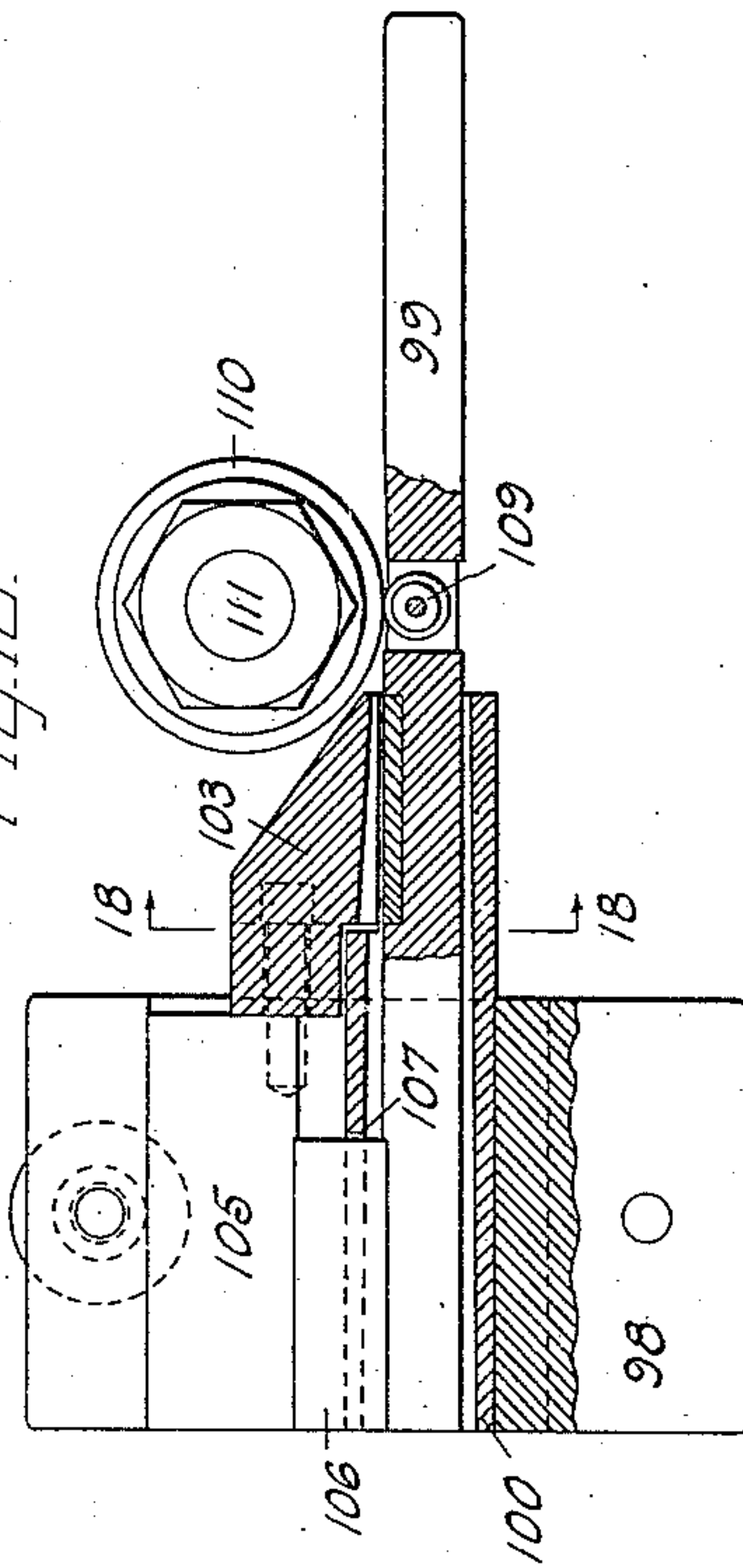


FIG. 18.

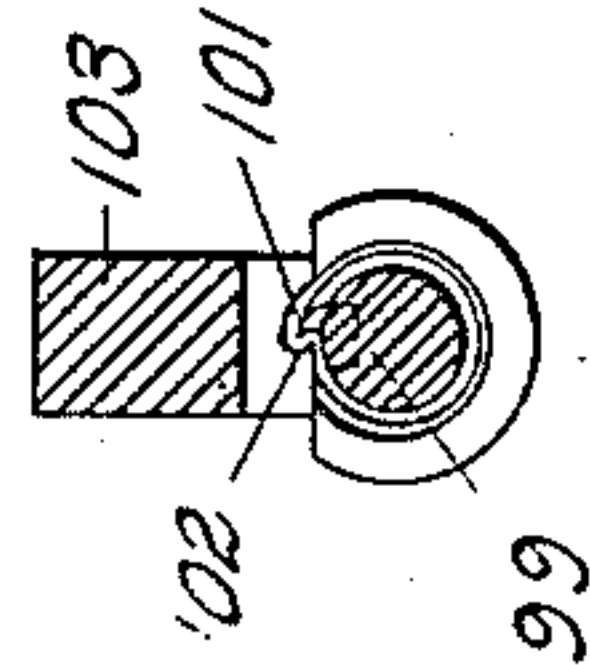


FIG. 17.

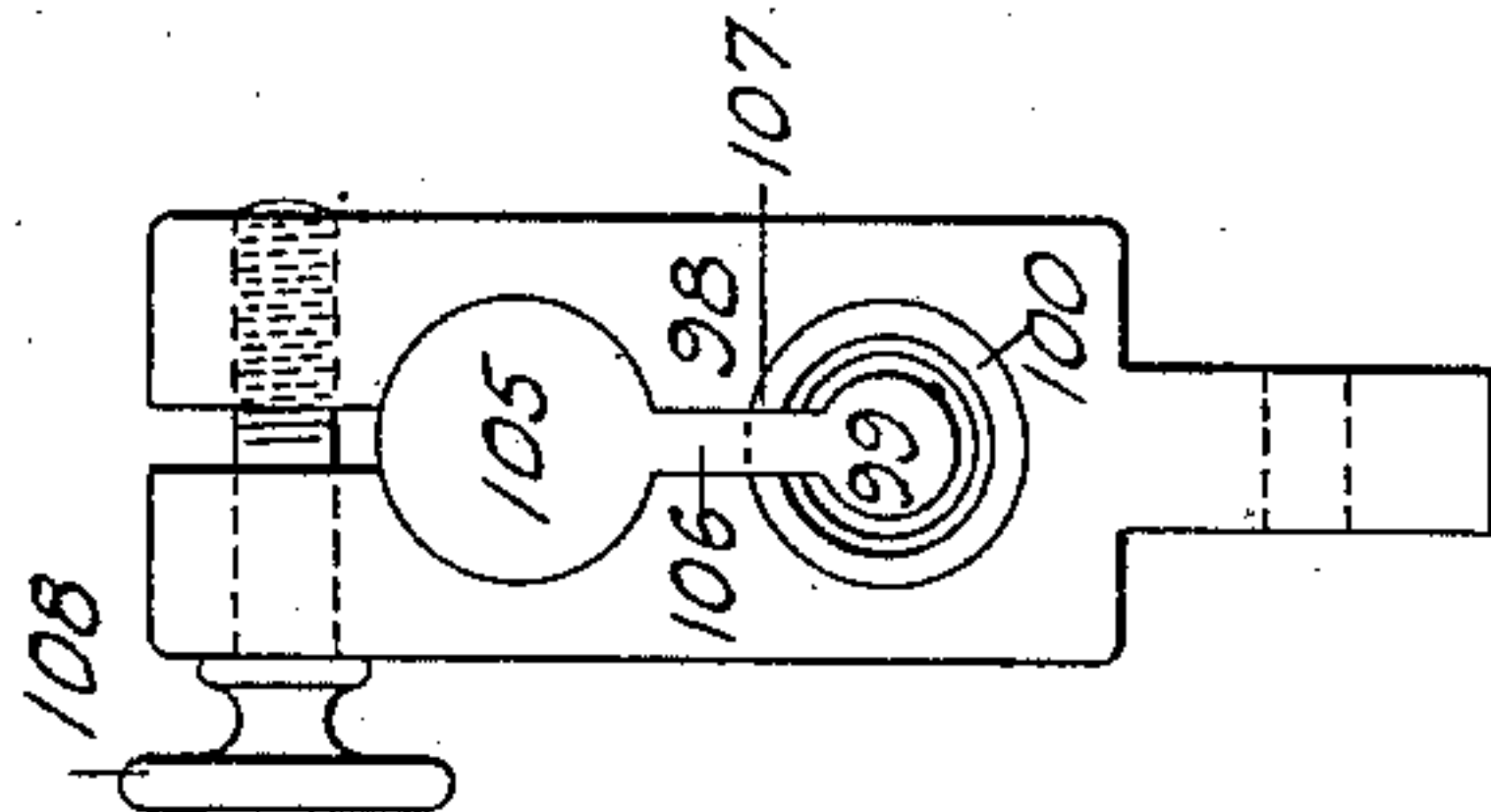


FIG. 20. FIG. 21. FIG. 22. FIG. 23. FIG. 24. FIG. 25.



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UNITED STATES PATENT OFFICE.

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CIGARETTE-MACHINE.

No. 863,217.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed November 12, 1904. Serial No. 232,480.

To all whom it may concern:

Be it known that I, SYDNEY I. PRESCOTT, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Cigarette-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in cigarette machines, and more particularly to that class of machines in which a charge of tobacco of the proper shape is introduced into a formed tube or casing.

In these machines, as heretofore constructed, it has been customary to introduce the charge of tobacco into a shaper or mold which acted to compress it into a short rod or filler, after which an ejector mechanism, such, for instance, as a plunger, was forced into the shaper case or mold and pushed the rod of tobacco out into a previously formed tube which was brought into proper relation with the discharge opening of the shaper case. In some of these constructions, charges are pulled off or otherwise separated from a mass of tobacco, these charges being fed directly into the shaper case. In other constructions, the mass of tobacco was subjected to the action of a separating or picker mechanism which disintegrated the fibers of the mass, the fibers being showered onto a belt and then again compacted into a sheet or mass. In constructions of the form first referred to, the tobacco is fed into the shaper case in a more or less matted condition, so that the fibers have little resiliency, and the little resiliency remaining therein is practically destroyed by the action of the shaper. In some of these constructions, it has been customary, after the shaper has acted, to withdraw it slightly, thus releasing the compression on the charge before it is introduced into the formed tube or wrapper. In the second class of constructions referred to, that is, the constructions in which the tobacco is separated by picker mechanism, the tobacco is re-shaped after being separated into a sheet or mass, from which charges are cut and introduced into the shaper. This re-shaping operation destroys the resiliency of the tobacco fiber to a considerable extent, and in these constructions it has been customary to retain the shaping pressure on the charge in the shaper until it was ejected by the ejecting plunger. The filler produced, therefore, by both these constructions has had the natural resiliency of the tobacco fiber practically destroyed, so that when it is introduced into the formed tube or wrapper, the cigarette is too hard and does not have the free draft which is desirable. Furthermore, as is well-known, tobacco fiber is exceedingly hygroscopic and the tobacco is, therefore, sensitive to changes in atmospheric con-

ditions. When the machines referred to are operated on days when there is considerable moisture in the air, there is liability not only that the fillers will be compressed to such a degree as to interfere seriously with the smoking of the cigarettes, but also that the fillers which are more readily compressible, because the tobacco is damp, will be made too small to properly fit the interior of the tubes into which they are introduced. Furthermore, in the operation of these machines, it frequently happens that the shaping devices gum up, the condition of the tobacco being such that the pressure thereon of the shaping devices causes the juices to exude therefrom.

In automatic machines of this type when the tobacco is shredded or separated by mechanism from which the fiber drops onto a conveyer, the specific type of conveyer varies with the particular construction of the machine. The effect of thus showering the tobacco on a conveyer is to cause the fine tobacco, known as "shorts" to drop through the interstices of the longer fibers to a considerable extent as these fibers lie on the belt, so that a sheet of tobacco is formed with the long fibers lying on one side and the "shorts" lying principally on the other side, although the "shorts" will, to some degree, be intermingled with the long fibers. In the machines referred to, the sheets of tobacco thus formed are converted into cigarette filler without substantially changing the relation of the tobacco fiber, the result of this being that, in many instances, cigarettes are formed having long fibers of tobacco on one side and short fibers on the other, which cigarettes have an uneven draft and therefore burn unevenly. Furthermore, in machines for making cigarettes by introducing a formed filler into tubes in which a tube or wrapper making apparatus is used in connection with the filler forming and introducing apparatus, a single wrapper making mechanism is employed which supplies the wrappers as they are needed directly to the filler forming and introducing mechanism. The tube forming apparatus necessarily operates on very thin paper and the fragile wrappers produced need to be handled with great care. The result of this is that the tube forming mechanism cannot be run at very high rates of speed and the production of the entire machine is, therefore, limited by the speed of the tube making apparatus. Furthermore, any defect in the operation of either apparatus necessarily results in stopping the operation of the entire machine.

It is one of the objects of this invention to produce an improved cigarette machine in which formed fillers are introduced into tubes, in which the filler forming apparatus is of such a character that undue compression of the filler is avoided.

A further object of the invention is to produce an im-

proved cigarette machine of the type referred to in which the formed fillers shall have the long and short fibers so related to each other as to make a cigarette having a free and even draft.

- 5 A further object of the invention is to produce an improved cigarette machine of the type referred to in which the fillers are formed and the tubes for the fillers are also formed, which is capable of running at high speeds.
- 10 A further object of the invention is to improve the details of construction of machines of the character referred to, whereby the machine is simplified and cheapened in its construction and rendered capable of being operated by unskilled labor.
- 15 With these and other objects not specifically referred to in view, the invention consists in certain constructions and in certain parts, improvements and combinations as will be hereinafter fully described and specifically pointed out.
- 20 In the drawings—Figure 1 is a front elevation of an organized machine embodying the invention. Fig. 2 is a side elevation of the machine illustrated in Fig. 1. Fig. 3 is a plan view. Fig. 4 is a detail plan view illustrating the construction and arrangement of the driving
- 25 mechanism employed. Fig. 5 is a side elevation on an enlarged scale, illustrating the construction of the feeding and separating mechanisms employed. Fig. 6 is a sectional view of the construction shown in Fig. 5. Fig. 7 is a front elevation of the construction shown in
- 30 Fig. 5, the bed of the machine and the hood covering the separating rollers being shown in section. Fig. 8 is a plan view, partly in section, of the filler forming and tube transferring mechanism, certain parts being shown in section. Fig. 9 is a side elevation of the construction
- 35 shown in Fig. 8. Fig. 10 is a section on the line 10—10 of Fig. 8. Fig. 11 is a section on the line 11—11 of Fig. 8. Fig. 12 is an end view of the construction shown in Fig. 8. Fig. 13 is a plan view, and Fig. 14 is a side elevation of the tube making mechanism employed, cer-
- 40 tain parts of the construction shown in Fig. 13 being omitted in Fig. 14. Fig. 15 is a plan view of the means employed for forming the strip into tubular form and the seaming devices. Fig. 16 is a vertical section of the construction shown in Fig. 15. Fig. 17 is an end view
- 45 of the construction shown in Fig. 16. Fig. 18 is a detail section on the line 18—18 of Fig. 16, certain parts being omitted. Fig. 19 is an end view looking in the direction opposite to that in which Fig. 17 is taken, the forming mandrel being shown in section. Figs. 20, 21, 22,
- 50 23, 24 and 25 are diagrammatic views illustrating the operations performed in forming the tube and seaming the same.

Referring to the drawings which illustrate one embodiment of the invention, the parts of the machine are
55 mounted in a frame of a usual type, the frame consisting of a bed plate 1 mounted on legs or standards 2. The machine which has been selected to illustrate the invention is an automatic machine provided with means for automatically feeding the tobacco, means for auto-

60 matically forming the filler, means for automatically forming the tubes and inserting mouth-pieces therein, and means for automatically assembling the fillers and the formed tubes.

When the invention is embodied in a machine which
65 employs automatic feeding devices, these feeding de-

vices may be widely varied in their construction. As shown, the bed plate 1 supports side plates or standards 3, one being located on each side of the machine. These side standards serve to support shafts 5 and 6, the shaft 5 being mounted in adjustable bearings. On the shafts 70 5 and 6 are mounted rolls 7 and 8, these rolls serving to support a traveling belt 9 on which the tobacco is evenly spread by a feeder. The upper run of the belt 9 (see Fig. 6) travels over a supporting table 10 above which is mounted a table 11 having side wings 12. This upper 75 table has a rectangular opening therein through which the tobacco is spread upon the belt, a cross bar 13 being provided near the delivery end of the table under which the belt carrying its charge of tobacco passes.

The tobacco having been evenly spread upon the belt 80 by the operator is forwarded by the belt to a separating mechanism, the details of construction of which may be widely varied. As shown, the separating mechanism includes a forwarding roll 14 having pins 15 on its circum- 85 ference, this roll being mounted on a shaft 16 suitably supported in the upper standards 3. This roll 14 is mounted so that the pins run in close proximity to the belt, and the tobacco advanced by the belt is forwarded by the roll along the surface of a curved guide 17 suit- 90 ably supported in the frame, this construction being well-shown in Fig. 6. As the tobacco is advanced along the curved guide 16 it is acted on by a picker roll 18 provided with pins 19, this picker roll being mounted on a shaft 20 suitably supported in the frame. This picker 95 roll 18 rotates in the same direction as the roll 14, and its pins 19 meet the advancing tobacco and separate it across the edge or end of the guide 17. This roll is driven at a considerably higher speed than the roll 14, so that the fibers of the tobacco are thoroughly separated and the tobacco falls in a shower. 100

If desired, a directing roll may be employed in connection with the belt to insure the accurate forwarding of the tobacco sheet. Such a roll is illustrated and marked 21, the roll being mounted on a shaft 22 sup- 105 ported in bearings carried on the upper standards or frame 3. This roll has a smooth surface and when used should be positioned so as to exert only a very light pressure on the tobacco, it being desirable that the tobacco sheet should reach the roll 14 without any further compression than is necessarily exercised by the 110 feeder in placing it upon the bed.

The machine so far described may be driven in any desired manner. As shown, (see Fig. 5) the main shaft of the machine, marked 23, and which runs across the machine from side to side, is provided with a bevel 115 gear 24 which meshes with a similar gear 25 on a countershaft 26 supported in a hanger 27 on the under side of the bed 1. This shaft 26 carries on its other end a gear 28 meshing with a bevel gear 29 on a vertical shaft 30. This shaft 30, as shown, is a two-part shaft, the 120 parts of the shaft being connected by interlocking blocks 31, the purpose of this construction being to allow the entire feeding mechanism, including the upper part of the shaft 30, to be removed without disturbing the driving mechanism. The upper end of this shaft 30 125 is provided with a worm 32 which meshes with a worm wheel 33 on the shaft 6. This shaft 6 is provided on the end opposite to that which carries the worm wheel with a broad faced gear 34 with which meshes a gear 35 mounted on the shaft 22 and a gear 36 mounted on the 130

shaft 16. The shaft 30 is further provided with a spiral gear 37 which meshes with a similar gear 38 on a cross shaft 39, this shaft having a belt pulley 40 thereon. Over this belt pulley 40 runs a belt 41, the belt passing also over a pulley 42 on the shaft 20 which is the shaft which carries the picker roll.

The separated tobacco fibers drop from the separating mechanism which has just been described onto a carrier, the construction and arrangement of which may be considerably varied. In the best construction, the carrier will be a two part carrier. In the particular construction shown, the carrier is formed by two belts 43, 44, the belt 43 being supported on pulleys 45, 46. As shown, the pulley 46 is an idler, being mounted on a stud 47 suitably secured to the frame, and the pulley 45 is a driven pulley mounted on a shaft 48. Similarly, the belt 44 is supported on pulleys 49, 50, the pulley 50 being an idler mounted on a stud 51, and the pulley 49 being a driven pulley and being mounted on a shaft 52. The shafts 48 and 52 may be driven in any desired manner. As illustrated, these shafts 48, 49 are provided with gears, only one of which, marked 53 (see Fig. 6) is shown. This gear 53 is driven from a worm 54 mounted on the shaft 39 before referred to. The construction illustrated provides for the continuous driving of the belts, and in the best constructions the belts, whatever mechanism be employed for driving them, will be continuously driven.

While the separated tobacco fibers may be directed from the separating mechanism to the carrier just described in any suitable manner, in the best constructions, a guide will be employed. While this guide may be of any suitable description, it will preferably be a channeled guide, as indicated at 55, the falling tobacco fibers being thus protected from air drafts. While the guide might be a stationary guide, in the best constructions, it will be given a movement so as to insure an even distribution of the tobacco on the carrier from side to side. The swinging of the guide may be effected in any desired manner. As shown, the guide 55 is pivoted to the curved guide 17 and is provided with a projection 56 which is engaged by a connecting rod 57 extending from an eccentric strap 58 surrounding an eccentric 59 on the vertical shaft 30. As the tobacco falls upon the carrier, the longer fibers are arranged loosely on the carrier and the fine tobacco or "shorts", as it is technically known, drops, to a very considerable extent, through the spaces between the long fibers. The result of this is that the tobacco, as it lies on the conveyer, will consist of two strata, the lower stratum consisting of "shorts" and the upper stratum of the longer fibered tobacco with some "shorts" mixed therewith.

It is desirable that in the formed cigarette filler, the longer fibers be arranged centrally of the cigarette, the shorts being as far as possible on the outside of the filler. This desirable result may be effected by employing the two-part carrier before described and by causing the feeding runs of the carrier to move towards each other, thus assembling the tobacco on their surfaces between the abutting ends of the two-part carrier. The width of the carrier illustrated is substantially equal to the length of the cigarette filler to be formed, and as the two parts of the carrier move toward each other, the two sheets of tobacco which are forwarded by

the carrier will be combined into a single sheet between the carrier, the shorts lying on both sides of the sheet, and the longer fibers in the center, as will be clearly understood from an inspection of Figs. 7 and 10.

In the best constructions, a suitable controller and directing device will be employed for the sheet of tobacco which results from the combining of the sheets on the two part carrier. In the construction illustrated, the directing means consists of a throat formed by a pair of pivoted plates 60 which are held against the belts forming the parts of the carrier by springs 61.

The formation of the filler from the tobacco advanced and delivered by the carrier may be effected by means which vary widely in their construction. In the particular construction shown, there is provided what may be termed a shaper-case, this case, in the particular construction illustrated, comprising a block 62 which is supported by the bed plate 1 (see Figs. 8, 9 and 10). This block supports a pair of plates 63, 64 which are recessed on their under side to provide a shaper chamber. The bottom of this chamber is formed by a plate 66 supported on bearers 67 which are secured to the block 62 by screws, or in any other suitable manner. In the particular construction shown, the opening into the chamber of the shaper casing is in the top of the casing and is formed by spacing apart the plates 63, 64, the opening being marked 68. The shaper, in the particular construction shown, is formed by a block 69 which reciprocates in the chamber. While this block may be reciprocated in any suitable manner, in the construction illustrated, it is secured by a screw 70 to the plate 66, this plate being a reciprocating plate. The reciprocation of the plate 66 may be effected by any desired means. As shown, this plate is provided on its under side with a pair of lugs 71 between which is located a block 72, this block being carried on a stud 73 which is mounted on a lever 74 pivoted at 75 to the bed plate of the machine. This lever is provided at its opposite end with a cam roll which engages a cam groove 76 in a cam drum 77, this drum being mounted on the main shaft 23 before referred to. When, as in the particular machine illustrated, rapidity of operation is desired, the shaping device will be constructed so as to form two fillers for each complete reciprocation of the shaper block. In the particular construction shown, the shaper block is provided with two half-round recesses one on each side thereof, which cooperate with half round recesses in blocks 78 located at the ends of the shaper chamber. The opening 68 is located, as has been before stated, in the top of the shaper chamber, and is in close proximity to the lower end of the throat formed by the plate 60, the opening 68 being substantially as long as the cigarette filler to be shaped in the casing. The parts are so proportioned that the sheet of tobacco formed by assembling the sheets lying on the carrier belts 43, 44 will be readily fed through the throat and into the shaper casing without any substantial compression of the tobacco sheet. This is important for the reason that it insures that the tobacco reaches the shaper casing in a loose or uncompressed condition, so that the natural resiliency of the fibers which make up the tobacco sheet is not destroyed by any substantial compressing action of the forwarding devices.

After a charge has reached the chamber in the shaper casing, it is cut off, and, in the preferred construction,

this will be effected by the movement of the shaper. While this may be accomplished in any desired manner, a ready means for effecting it is to form the upper edge of each side of the block 69 as a cutting edge, said edge coöperating with an edge formed on each of the plates 63, 64. The cut formed will preferably be a shearing cut, and in the construction illustrated, this is accomplished by disposing the cutting edges on the plates 63, 64 so that they will lie at an angle to the path of travel of the shaper block which is other than a right angle. The cutting edge on the plate 63 is marked 79 and the cutting edge on the plate 64, 80, the angle at which these edges lie with respect to the path of movement of the shaper block being illustrated in Fig. 8.

When the shaper block has completed the shaping of a filler, the filler is ejected from the chamber in the shaper casing. The mechanism by which the ejecting of the completed filler from the shaper casing is effected may be widely varied in its character. As shown, there is provided a pair of ejecting plungers 81, these plungers being carried on arms 82 mounted on slides 83 which reciprocate in ways formed in the bed 1. In the particular construction shown, the reciprocation of the slides is effected by means of toothed sectors 84 meshing with racks 85 formed on the under side of the slides, these sectors being pivoted on a bar 86 extending across the machine and being operated by connecting rods 87 extending from eccentric straps 88 which straps surround eccentrics 89 on the main shaft 23 before referred to. The eccentrics are, of course, arranged so as to time the movements of the plungers properly with relation to the movements of the shaper block. These plungers 81 are guided through openings in projections 90 extending backward from the plate 62. The fillers are ejected through spouts or nozzles 91 which will be hereinafter referred to, these nozzles being held in position by set screws 92 which abut against the blocks 78. Sleeve 93 having tapered openings therein, the sleeves being held in position by set screws 94 or in any other suitable manner, may be provided at the openings where the plungers enter the shaper casing, the tapered openings in these sleeves providing for the ready discharge of tobacco dust or any foreign matter which may be drawn backward by the plungers.

In the operation of the mechanism so far described, it will be seen that the tobacco is deposited on the carrier in a disintegrated, loose or separated condition, that is to say, the fibers of the tobacco are not matted so as to form lumps or knots, but they lie loosely with respect to each other. Furthermore, it will be noted that when the tobacco is advanced by the two part carrier into the throat 60, there is no tendency to compress the tobacco to any material extent, the operation of the two-part carrier merely assembling the two sheets or streams of tobacco into a single sheet or stream, the space between the parts of the carrier and the width of the throat being designed so as to readily accommodate the tobacco sheet formed by assembling the two sheets or streams carried by the parts of the carrier. This being the fact, it will be appreciated that the tobacco is introduced, in a loose or practically uncompressed condition, into the shaper case, so that the natural resiliency of the fibers which constitute the charge in the shaper case, has not been impaired to any extent.

In operating the shaper block, the parts are so timed as to give the volume of tobacco in the chamber of the shaper casing the required shape and compress it to the density required to form a proper cigarette filler. This compression, however, occupies but a very short space of time and is not maintained a sufficient time to give the charge what may be termed a permanent set. Furthermore, the mechanism is so constructed that the pressure on the charge in the casing is released before the ejecting plungers operate. By these features of construction, it is possible to give the tobacco the density required for the proper burning of the cigarette and to shape it so as to enable it to be introduced into the tube, and to do this without destroying the natural resiliency of the tobacco fibers.

In the machine which has been selected to embody the invention the simplicity of the filler forming mechanism makes it possible to operate it at a high rate of speed, which rate of speed is higher than it is desirable to run a single mechanism for making the wrapper tube. In the best embodiment of the invention therefore, a plurality of tube or wrapper forming apparatus will be employed with the filler forming mechanism. In the construction shown, two such tube making apparatus are employed, though the number of these apparatus may, under some circumstances, be varied, if desired. Furthermore, in the particular machine selected to illustrate the invention, the tubes will be provided with mouth-pieces before they are filled with tobacco, though it is obvious that the mouth-piece forming and introducing mechanism might be omitted, if a different class of cigarettes is to be formed.

In the construction shown, the paper from which the cigarette tube is to be formed may be derived from any suitable source. As shown, see Fig. 1, reels 95 are provided, these reels being supported on brackets 96 located on each side of the machine. When it is desired that the paper bear a printed or embossed mark, as is the case with many varieties of cigarettes, a suitable printing or embossing mechanism will be employed. Such printing mechanisms are indicated at 97, there being one on each side of the machine (see Fig. 2), but as such mechanism may be of any well-known kind, and as the specific features of it will in no way conduce to a clearer understanding of the present invention, a specific description thereof will not be given. After being printed or embossed, the strip or web of paper is led to a mechanism which converts the strip into a tube. This tube forming mechanism may be widely varied in its construction. As shown, there is provided on each side of the machine a carrier block 98 (see Figs. 2, 3 and 15 to 19 inclusive), each of these carrier blocks serving to support a mandrel 99 around which the strip of paper is folded.

It may be here remarked that the tube forming and mouth piece inserting mechanisms are duplicates and a description of one of these mechanisms is, therefore, sufficient for both. A guide as indicated at 100 in Fig. 17, is provided to coöperate with the mandrel in forming the strip or web of paper into tubular shape this guide being internally tapered so as to progressively effect the shaping of the strip.

In order to interlock the edges of the strip the mandrel may be provided with a seaming rib marked 101 (see Figs. 18 & 19) and the interior of the guide with a

coöperating seaming rib 102. For convenience in construction and to enable the parts to be readily gotten at, the guide will be made in two parts, one of the parts, marked 103, carrying the seaming rib. It will be observed that the interior surface of the part 103 of the guide is curved and tapered so that when it is in position, the curve and taper corresponds with the curve and taper of the bore of the remainder of the guide. The part 103 is secured to the carrier 98 by screws 104, or in any other suitable manner. The guide is slid into an opening in the carrier block which it fits snugly.

In the construction shown, the mandrel is provided with a circular supporting block 105, said block fitting in a recess in the carrier block 98, and being connected with the mandrel by a web 106. The guide is slotted, as indicated at 107 (see Figs. 16 and 17), the web 106 passing through the slot. It is apparent that if the slot 107 in the guide be properly located with respect to the seaming rib 102, the act of slipping the mandrel into position will not only properly center it, but at the same time, it will bring the seaming rib 101 into proper relation with its coöperating rib.

A locking device is or may be provided for holding the parts in their assembled position. In the construction shown, the locking is effected by means of a clamping screw 108, the top of the carrier block being slotted so as to enable the screw to draw the parts together.

By locating the seaming rib in the interior of the guide the paper is under the control of the mandrel and guide not only during the shaping, but also during the folding operation by which the seam is formed, the seaming and shaping progressing simultaneously. This will be apparent from an inspection of the diagrams, Figs. 20 to 25 inclusive, which show the formation of the tube and seam at successive steps in the operation. Fig. 20 shows the paper after it has begun to assume its tubular form; in Fig. 21 the edges of the paper have been caused to approach nearer to each other, and in Fig. 22, the edges have been slightly overlapped and the bending of the edges by which the interlocking seam is to be formed has been begun. An inspection of Fig. 23 shows that the diameter of the tube has been reduced by a still further overlapping of the edges of the paper, and at the same time the bend in each edge of the paper has been increased. In Fig. 24, the overlapping of the edges has been increased and at the same time the bends in the edges of the paper have been still further interlocked. Fig. 25 shows the tube completely formed and the edges interlocked and ready for the action of the pressing device which is employed to flatten down the interlocked parts of the paper. This pressing device may be of any usual description, but in the preferred form, it will consist of a pair of wheels, one of which, marked 109, is journaled in the mandrel and the other of which, 110, is mounted on a short shaft 111 supported in a bearing carried on a bracket 112 extending upward from the frame. The wheel 110 is preferably a driven wheel. The driving of this wheel may be effected in any desired manner. As shown, the shaft 111 is provided with a spiral gear 113 which meshes with a spiral gear 114 mounted on a shaft 115, one end of which is supported in a bearing in the bracket 112 and the other end in a standard or bracket 116 rising from the frame. This shaft 115 is provided

with a gear 117 meshing with a gear 118 on a way shaft 119 which is the main shaft of the wrapper forming mechanism.

It will be understood that in the particular machine shown there will be two of these shafts, one on each side of the machine. Each of the shafts 119 is also provided with a spiral gear 120 which drive the printing mechanisms before referred to. The driving of these way shafts 119 may be effected in any desired manner, but in the best constructions, the driving mechanism for each of these shafts will be of such a character that either or both of the shafts may be disconnected, thus throwing out of operation either or both of the wrapper forming mechanisms and this without disturbing the operation of the filler forming mechanism. As shown in the drawings, each shaft 119 is provided with a bevel gear 121 which meshes with a bevel gear 122 on a shaft 123 supported in standards 124 which rise from the bed of the machine. Each shaft 123 (see Figs. 1, 2 and 21) is provided with a gear 126 which is driven by means of idle gears 127 from a gear 128 mounted on a shaft 129, this shaft being journaled in a hanger 130 and in one of the legs of the machine. Each shaft 129 is provided with fast and loose pulleys 131, 132 and is driven by belts 133 from a shaft 134 which extends across and underneath the bed of the machine. Belt shifters 135 of ordinary construction are provided to shift each belt from its fast to its loose pulley, as may be desired.

The shaft 134 may be driven in any desired manner. As shown, it is provided at one end with fast and loose pulleys 136, 137 which are driven by a belt 138, the belt in turn running around a pulley 139 mounted loosely on the main shaft 23, this pulley being fast to a power pulley 140 which is driven in any suitable manner, as, for instance, by a belt from the factory line shaft. While the shaft 23 may be driven in any suitable way, as shown, the shaft 134 is provided on the end opposite to that which carries the pulleys 136, 137 with a wide faced pulley 141, this pulley serving to drive a belt 142 which in turn drives fast and loose pulleys 143, 144 on the shaft 23. Belt shifters 145, 146 of usual construction are provided.

With the driving mechanism described, it is apparent that by operating either of the belt shifters 135, the corresponding wrapper forming mechanism will be thrown out of operation. By operating the belt shifter 145, the entire machine may be stopped and by operating the belt shifter 146, the main shaft 23 may be stopped, the stoppage of which effects a stoppage of the feeding and filler forming mechanism which, as has been described, are driven from this shaft.

The mouth piece inserting mechanism may be of any suitable construction. That illustrated in connection with the machine embodies a coiling spindle 147 (see Figs. 2, 3, and 13), there being of course one of these spindles located on each side of the machine. The coiling spindle 147 is provided with a nick or slot in its side into which the edge of a mouth piece blank cut from a strip of mouth piece material drawn from a roll is inserted, after which the spindle is revolved to wind up the blank into a coil. Before the spindle completes its revolution, a transferring tube 148 slides over the spindle and removes the formed mouth piece therefrom. The winding spindle is driven from a short

shaft 149 carrying a gear 150 which is driven through a proper train of gearing from the wayshaft 119 before referred to (see Fig. 13). The stopping and starting of the winding spindle is controlled by a clutch mechanism; marked 151. The construction of the driving mechanism, the clutch mechanism and the winding spindle is substantially the same as that described in the Patent No. 721,087, dated Feb. 17, 1903, granted to The American Tobacco Company as the assignee of S. D. S. & S. S. D. Rakowitzky. Specific description, therefore, of this part of the mechanism is not necessary, reference being made to the above patent therefor.

The transferring tube 148 is driven from a slide 152, this slide being connected by a link 153 (see Fig. 2) to a lever 154 which is operated by an eccentric and strap 155 mounted on the shaft 129.

After the mouth piece has entered the tube, the tube length is cut off by shears 156, these shears being carried on a sliding rod 157 which has a cam lug 158 secured thereto, this lug working in a cam 159 secured to the shaft 115 before referred to. This construction gives the cutters a traveling movement with the cigarette tube while cutting, as is common in machines of this general type.

After the tube length has been cut off and as the mouth piece and tube are retreating, the tube at this time being over the mouth piece transferring tube 148, the insertion of the mouth piece is completed and the mouth piece and tube are stripped from the transferring tube by means of a dog 160 which is mounted and operated in substantially the same manner as the similar dog in the construction in the Rakowitzky patent referred to. The assembled tube and mouth-piece forming the completed wrapper are delivered onto a table 161 from which they pass under a re-rolling roll 162, the formation and operation of this roll being substantially the same as the similar re-rolling roll described in said Rakowitzky patent.

It is desirable that the operation of the wrapper forming devices, whether there be one or a plurality of such devices employed, be independent as far as possible of the operation of the filler forming mechanism, so that a stoppage of one part of the machine will not necessarily require a stoppage of the other part of the machine. The best constructions embodying the invention will accordingly include a magazine into which the wrapper forming mechanism or mechanisms deliver and from which the completed wrappers are taken to have the fillers inserted therein. Furthermore, the wrapper forming mechanisms, will, in the best constructions, be caused to supply wrappers to the magazine somewhat more rapidly than they are required by the filler forming mechanism. This results in supplying the magazine with an excess of wrappers, so that in case it becomes necessary to throw either of the wrapper forming mechanisms out of operation, the filler forming mechanism may continue to run drawing its wrappers from the supply stored in the magazine. In the machine selected to illustrate the invention, as has been said, two wrapper forming mechanisms are employed, and in this construction, also, the magazine is so located that the wrapper forming mechanisms deliver thereto. In the specific machine referred to, the magazine runs across the front

of the machine and is marked 163, the re-rolling rolls 162 being located at the opposite ends of the magazine and discharging the re-rolled cigarette wrappers into the ends thereof.

The means by which the completed cigarette wrappers are discharged from the magazine to be assembled with the fillers may be varied widely in character. In the construction shown, the magazine is provided about centrally thereof with a depression or well 164 in its bottom into which the cigarette wrappers drop from the main part of the magazine. This well is of sufficient size to contain a considerable number of wrappers and devices, which may be widely varied in construction and are employed to separate a cigarette wrapper from the number in the well, so that they may be delivered singly. In the specific construction shown, there is provided a tilting plate 165, this plate being mounted on a pin or axle 166 which is journaled in opposite sides of the magazine or well wall. In the best constructions, this plate will be formed with steps, as is clearly shown in Fig. 11, and where, as in the machine selected to illustrate the invention, the filler forming mechanism operates in conjunction with a plurality of wrapper forming mechanisms, this plate will preferably be stepped on opposite sides, so as to provide for the discharge of tubes from each side of the well. The edges of the bottom steps are spaced from the magazine wall a distance slightly greater than the diameter of a tube or wrapper, so that the tubes may readily fall down between the edges of the plate and the magazine wall. The width of the upper faces of these lower steps is preferably made a little greater than twice the diameter of the cigarette tubes, so that two tubes may rest thereon and fall thereupon readily, this width, however, not being sufficiently great to let a third tube fall partially down into the space between the outer tube and the magazine wall and thus wedge the tubes on the step. The steps above the lower step are preferably wide enough to easily hold three tubes without wedging. In the operation of this feeding mechanism, the plate supporting the cigarette tubes on its upper face is preferably given a quick tilting movement. This tilting movement agitates the cigarette tubes in the magazine well and at the same time facilitates the discharge of the bottom tubes. The tubes drop into a mechanism by which they are brought into position to receive the filler. This tube or wrapper transferring mechanism may be widely varied in its details of construction. In the particular machine shown, the transferring mechanism comprises two slides 167, 168. The slide 167 is provided at its forward end with a concave recess 169 of sufficient size to hold a tube or wrapper and the slide 168 is provided with a similar recess 170 (see Figs. 8, 9 and 11.) These slides, in the specific construction shown, are reciprocated alternately by mechanism which may be of any suitable description. As shown, each of these slides 167, 168 is connected to an arm 171, the connection being effected by a pin 172, or in any other suitable manner. These arms 171 are in turn connected to the slides 83 before referred to, these being the slides which operate the ejecting plungers. The slides 167, 168 are preferably arranged to run close to the bottom of the well in the magazine, so that the tubes drop directly from the magazine into the slides. In prior constructions in which a similar transferring

mechanism was employed, the tubes passed from a containing hopper through narrow passage-ways on each side of the hopper, these passage-ways being high enough to accommodate a row of a dozen cigarette tubes more or less. These tubes were horizontally arranged in the channels and the mechanism was intended to feed them downward one by one as is the case with the present construction. The tubes, however, are, as is well-known, formed of a very light paper and the addition of the mouth-piece to them causes them to be much heavier at one end than they are at the other. It has been found in practice, therefore, that when tubes are fed horizontally through any channels in the manner described, they tend to tilt, the heavier end descending first, and thus become wedged in the channels. By causing the delivery mechanism to run close to the bottom of the magazine the feeding through long channels, and the tendency of the tubes to wedge is avoided.

In the best constructions, a cut off mechanism will be employed to separate the tubes as they drop into the transferring device from the tubes above and to sustain the weight of these upper tubes. While this cut off mechanism may be of any suitable description, in the construction shown, two horizontal sliding gates 173, 174 (see Fig. 11) are provided which reciprocate underneath the tilting plate 165 before referred to. These sliding gates (see Fig. 8) are provided with projections forming guides which slide in openings in a block 175, the gates being normally forced forward by a spring 176 (see Fig. 8) located between them. The slide 167 is provided with a cam surface 177 and the slide 168 with a similar cam surface, these cam surfaces cooperating with cam surfaces on the underside of the gates. As each slide moves forward, its cam surface strikes the corresponding cam surface on the gate and slides the gate back against the tension of the spring, thus opening it and permitting a tube to drop from the magazine. On the forward movement of the slide, the spring closes the gate, the opening and closing movement of the gates taking place alternately in correspondence with the movement of the slides.

It has been heretofore stated that the plate 165 has a sudden tilting movement. While this movement may be effected in any suitable manner, in the construction shown, the movement of the cut-off gates is utilized to effect the movement of the plate. In the particular machine illustrated, this is accomplished by causing each of the gates on their forward movement to strike the bottom of the plate, the bottom of the plate being provided with a projection 178 which lies in the path of the gates.

As each transferring slide carries forward its tube, it positions it over the nozzle 91 which nozzles constitute the delivery orifices for the shaping chamber. The proper plunger 81 is then operated to force the charge of tobacco from the shaping chamber into the tube, the slide which has carried the tube forward being at this time retracted and the tube held upon the nozzle by means of a swinging stop arm 179, there being one of these arms, of course, on each side of the machine. These arms 179 are pivoted on posts 180, and each arm is operated by blocks 181, 182 carried on the slides 83 before referred to. Each arm is thrown into position behind the cigarette tube being filled by means of the block 181 on a movement of the

slide in one direction and is thrown out by the block 182 on the movement of the slide in the other direction. The movement produced by the block 182 is so timed that the arm 179 begins its backward movement at the time the end of the charge of tobacco lying in the nozzle is substantially in register with the end of the wrapper tube overlying the nozzle. This occurs before the plunger 81 has completed its movement, the continued movement of the plunger operating to force the tube off the nozzle and the tobacco out of the tube. The movement of the arm 179, however, under the influence of the block 182 is a more rapid movement than the movement of the plunger because of the arc through which the arm swings. The arm, therefore, gets completely out of the way of the end of the filled tube at the time the completed cigarette is pushed off the nozzle 81 by the plunger.

The completed cigarettes may be discharged in any suitable way. In the particular machine shown, they drop down through chutes 183, 184 and are delivered to a suitable collecting mechanism. While this collecting mechanism may be of any suitable description, in the specific machine shown, it consists of two belts 185, 186 which may be driven in any desired manner. As shown, these belts are driven through worm gearing 187 which is in turn driven by a belt 188 from the shaft 134 before referred to. While a single collecting belt might be employed, the use of two belts is advantageous, for the reason that if any defect in the workmanship of the completed cigarettes appears, it is possible to tell immediately on which side of the machine the defect has occurred and to stop that side of the machine to remedy the defect without interfering with the operation of the other side.

The improvements in the tube forming mechanism and in the mechanism for inserting the mouth-pieces into the continuously advancing tube before the same is cut into lengths are not herein claimed, these improvements forming the subject-matter of a divisional application Ser. No. 292,900, filed December 22, 1905.

While the concrete machine shown in the drawings and described herein illustrates an embodiment of the invention in its preferred form, it is to be understood that changes and variations may be made in said machine without departing from the invention. It is to be understood, therefore, that the invention is not to be confined to the particular construction herein shown and described. It is further to be understood that certain features of the invention may be used independently of other features.

What is claimed is:—

1. The combination with a plurality of wrapper forming mechanisms, of a filler forming mechanism, and means for assembling the wrappers produced by the several wrapper forming mechanism with fillers produced by the filler forming mechanism, substantially as described.

2. The combination with a plurality of wrapper tube forming mechanisms, of a filler forming mechanism, and means for causing the fillers produced by the filler forming mechanism to be incased in wrapper tubes produced by the tube forming mechanisms, substantially as described.

3. The combination with a plurality of wrapper tube forming mechanisms, of a tube reservoir to which the forming mechanisms deliver, a filler forming mechanism, a tube feed for removing tubes from the reservoir, and

- means for causing the fillers to be incased in the tubes, substantially as described.
4. The combination with a plurality of wrapper tube forming mechanisms, of mouth-piece forming and inserting mechanism, a tube reservoir to which the assembled tubes and mouth pieces are delivered, a tube-feed, and means for incasing filler in the tubes, substantially as described.
5. The combination with a filler forming mechanism, of a tube forming mechanism, a tube magazine, and transferring mechanism between the tube magazine and the filler forming mechanism, substantially as described.
6. The combination with filler forming mechanism, of tube forming mechanism, a magazine intermediate the filler forming mechanism and the tube forming mechanism, transferring mechanism between the magazine and the tube forming mechanism, and means for causing the tube forming mechanism to supply tubes to the reservoir at a greater rate of speed than they are removed therefrom by the transferring mechanism, substantially as described.
7. The combination with a plurality of wrapper tube forming mechanisms, of a tube reservoir to which the tube forming mechanisms deliver, a driving mechanism common to the tube forming mechanisms, and means whereby any tube forming mechanism may be disconnected from its driving mechanism without disconnecting the others, substantially as described.
8. The combination with a plurality of wrapper tube forming mechanisms, of a reservoir to which they deliver, a tube feed, a filler length forming mechanism, driving mechanism for the tube forming mechanisms, said driving mechanism operating to cause the tube forming mechanisms to produce tubes more rapidly than the tubes are removed by the tube feed, and means whereby any tube forming mechanism may be disconnected from the driving mechanism without disconnecting the others, substantially as described.
9. The combination with a plurality of wrapper tube forming mechanisms, of a tube reservoir to which the tubes are delivered, driving mechanism for the tube forming mechanisms, filler forming mechanism, a driving means therefor, and means for interrupting the operation of the filler forming mechanism without interrupting the operation of the tube forming mechanisms, substantially as described.
10. The combination with a plurality of wrapper tube forming mechanisms, of a reservoir to which the tube forming mechanisms deliver, a tube feed, a filler forming mechanism, a single driving shaft, driving connections from said shaft to the tube forming mechanisms and to the filler forming mechanism, means for interrupting the operation of any tube forming mechanism without disturbing the other driving connections, and means for interrupting the operation of the filler forming mechanism without interrupting the operation of the tube forming mechanisms, substantially as described.
11. The combination with a fiber separating mechanism, of a movable carrier, a guide intermediate the separating mechanism and the carrier, and means for swinging the guide across the path of the carrier to evenly distribute tobacco thereon, substantially as described.
12. The combination with a fiber separating mechanism, of a movable carrier, a channeled guide through which the tobacco passes onto the carrier, and means for swinging the guide across the path of the carrier to evenly distribute the tobacco thereon, substantially as described.
13. The combination with a fiber separating mechanism, of a continuously moving carrier, a guide intermediate the separating mechanism and the carrier, and means for swinging the guide across the path of the carrier to evenly distribute tobacco thereon, substantially as described.
14. The combination with a fiber separating mechanism, of a continuously moving carrier, a channeled guide through which the tobacco passes onto the carrier, and means for swinging the guide across the path of the carrier to evenly distribute the tobacco thereon, substantially as described.
15. The combination with a fiber separating mechanism, of a two-part carrier on which the tobacco drops from the separating mechanism, a delivery throat located between the parts of the carrier, and means for causing the parts of the carrier to deliver into the throat, substantially as described.
16. The combination with a fiber separating mechanism, of a carrier comprising a pair of belts to the upper runs of which the tobacco is delivered from the separating mechanism, a delivery throat located between the belts, and means for giving the belts a movement, said means causing the upper runs of the belts to move toward each other, substantially as described.
17. The combination with a fiber separating mechanism, of a two-part carrier, a guide between the separating mechanism and the carrier, means for swinging the guide across the path of movement of the carrier, a delivery throat located between the parts of the carrier, and means for causing the parts of the carrier to deliver into the throat, substantially as described.
18. The combination with a fiber separating mechanism, of a carrier comprising a pair of belts to the upper runs of which the tobacco is delivered from the separating mechanism, a guide between the separating mechanism and the carrier, means for swinging the guide across the path of movement of the belts, a delivery throat located between the belts, and means for giving the belts a movement which causes the upper runs of the belts to move toward each other, substantially as described.
19. The combination with fiber separating mechanism, of a carrier comprising two continuously running belts, the feeding runs of which move toward each other, and a delivery throat located between the belts, substantially as described.
20. The combination with a fiber separating mechanism, of a two-part carrier comprising a pair of continuously running belts, the feeding runs of which move toward each other, a delivery throat located between the belts, a guide between the separating mechanism and the carrier, and means for swinging the guide across the path of movement of the carrier, substantially as described.
21. The combination with a fiber separating mechanism, of a two-part carrier comprising a pair of continuously running belts, the feeding runs of which move toward each other, a delivery throat located between the belts, a channeled guide between the separating mechanism and the carrier, and means for swinging the guide across the path of movement of the carrier, substantially as described.
22. The combination with a fiber separating mechanism, of a shaper case, and means for introducing tobacco fiber therinto in a sheet and in a substantially uncompressed condition, a shaper working in the case, and an ejecting mechanism, substantially as described.
23. The combination with a fiber separating mechanism, of a shaper case, a shaper operating therein, the said shaper case having an opening through one of its sides, the opening being substantially equal in length to the length of the shaper, means for feeding tobacco fiber in a sheet through the opening in a substantially uncompressed condition, and an ejecting mechanism, substantially as described.
24. The combination with a shaper case, of a shaper having a plurality of operating faces, means for reciprocating the shaper in the case, continuously operating means for feeding tobacco fiber into the case, and an ejector mechanism, substantially as described.
25. The combination with a shaper case having an opening in one of its sides, of a shaper having a plurality of working faces, means for reciprocating the shaper in the case, a continuously operating carrier for the tobacco fiber, and an ejecting mechanism, substantially as described.
26. The combination with a fiber separating mechanism, of a shaper case, means whereby tobacco may be introduced therinto in a sheet in a substantially uncompressed condition, a shaper working therein, tube supporting means, an ejector mechanism operating to transfer the shaped charge forward, and actuating means for the shaper, said means operating to cause the shaper to release the pressure on the shaped charge before the ejector mechanism operates, substantially as described.

27. The combination with a shaper case, of a shaper working therein, said shaper having a pair of operating faces, means for continuously feeding tobacco into the case in a substantially uncompressed condition, tube supporting means, an ejecting mechanism, and actuating means for the shaper, said means causing the shaper to release its pressure on the shaped charge before the ejector mechanism operates, substantially as described.

28. The combination with a fiber separating mechanism, of a shaper case, a shaper working therein, said shaper having a pair of operating faces, means for continuously feeding tobacco into the case in a substantially uncompressed condition, tube supporting means, an ejector mechanism, and actuating means for the shaper, said means causing the shaper to release its pressure on the shaped charge before the ejector mechanism operates, substantially as described.

29. The combination with a pair of feeding belts to which tobacco is supplied in a loose condition, of means for causing the upper runs of the belts to move toward each other to gather the tobacco lying on the belts into a single stream, a shaper case lying beneath the belts and having an opening in the top, a throat lying between the belts and registering with the opening in the shaper case, the tobacco being fed through the throat and into the shaper case by the movement of the belts, a shaper working in the case, charge ejecting mechanism, and a tube presenting mechanism, substantially as described.

30. The combination with a pair of feeding belts to which tobacco is supplied in a loose condition, of means for causing the upper runs of the belts to move toward each other to gather the tobacco lying on the belts into a single stream, a shaper case lying beneath the belts and having an opening in the top, a throat lying between the belts and registering with the opening in the shaper case, the tobacco being fed through the throat and into the shaper case by the movement of the belts, a shaper working in the case, charge ejecting mechanism, actuating means for the shaper, said means operating to cause the shaper to release its pressure on the shaped charge before the ejecting mechanism operates, and tube presenting mechanism, substantially as described.

31. The combination with a pair of feeding belts, of tobacco separating mechanism delivering onto the belts, means for causing the upper runs of the belts to move toward each other to gather the tobacco lying on the belts into a single stream, a shaper case lying beneath the belts and having an opening in the top, a throat lying between the belts and registering with the opening in the shaper case, the tobacco being fed through the throat and into the shaper case by the movement of the belts, a shaper working in the case, charge ejecting mechanism, and tube presenting mechanism, substantially as described.

32. The combination with a pair of feeding belts, of tobacco separating mechanism delivering onto the belts, means for causing the upper runs of the belts to move toward each other to gather the tobacco lying on the belts into a single stream, a shaper case lying beneath the belts and having an opening in the top, a throat lying between the belts and registering with the opening in the shaper case, the tobacco being fed through the throat and into the shaper case by the movement of the belts, a shaper working in the case, charge ejecting mechanism, actuating means for the shaper, said means operating to cause the shaper to release its pressure on the shaped charge before the ejecting mechanism operates, and tube presenting mechanism, substantially as described.

33. The combination with a shaper case having an opening in one of its sides, of a pair of continuously operating feeding belts, the feeding runs of which move toward each other, means located between the belts for delivering the tobacco into the shaper case, said belts and delivery means operating to deliver the tobacco in a substantially uncompressed condition, a shaper having two operating faces working in the case, tube supporting means, an ejector mechanism, and actuating means for the ejector, said means operating to cause the shaper to release its pressure on the formed charge before the ejector mechanism operates, substantially as described.

34. The combination with a shaper case, of a shaper working therein, said shaper having a cutting edge, the shaper case having an opening in one of its sides substantially equal in length to the shaper, one of the edges of the said opening lying at an angle to the path of movement of the shaper which is other than a right angle, and feeding means, whereby the shaper acts to cut off the charge with a shearing cut, substantially as described.

35. The combination with a shaper case, of a shaper working therein, said shaper having two operating faces and two cutting edges, the shaper case having an opening which is substantially equal in length to the operating faces of the shaper, the edges of said opening lying at angles to the path of movement of the shaper which are other than right angles and tobacco feeding means whereby the shaper acts to cut off charges with a shearing cut, substantially as described.

36. The combination with a filling mechanism, of a tube magazine, a plate forming the bottom of the magazine and spaced from the magazine wall to provide for the discharge of the tubes, means for tilting the plate, tube transferring mechanism, and means for causing said mechanism to move close to the under side of the magazine to receive the tubes, substantially as described.

37. The combination with a filling mechanism, of a tube magazine, a stepped plate forming the bottom of the magazine, the plate being spaced from the magazine wall to provide for the discharge of the tubes, means for tilting the plate, and a tube transferring mechanism, substantially as described.

38. The combination with a filling mechanism, of a tube magazine, a stepped plate located therein and serving to support the tubes on its upper face, said plate having its lower steps spaced from the magazine wall a distance substantially equal to the diameter of a tube and its other steps spaced from the wall a distance equal to the sum of the diameters of a plurality of tubes, means for tilting the plate, and a tube transferring mechanism, substantially as described.

39. The combination with a filling mechanism, of a tube magazine, a plate forming the bottom of the magazine and spaced from the magazine wall to provide for the discharge of the tubes, means for tilting the plate, tube transferring mechanism, means for causing said mechanism to move close to the under side of the magazine to receive the tubes, and a cut-off mechanism operating to separate the tubes in the magazine from the tubes in the transferring mechanism, substantially as described.

40. The combination with a filling mechanism, of a tube magazine, a stepped plate forming the bottom of the magazine, the plate being spaced from the magazine wall to provide for the discharge of the tubes, means for tilting the plate, a tube transferring mechanism, and a cut-off mechanism operating to separate the tubes in the magazine from the tubes in the transferring mechanism, substantially as described.

41. The combination with a filling mechanism, of a tube magazine, a stepped plate located therein and serving to support the tubes on its upper face, said plate having its lower steps spaced from the magazine wall a distance substantially equal to the diameter of a tube and its other steps spaced from the wall a distance equal to the sum of the diameters of a plurality of tubes, means for tilting the plate, a tube transferring mechanism, and a cut off mechanism operating to separate the tubes in the magazine from the tubes in the transferring mechanism, substantially as described.

42. The combination with a filling mechanism, of a tube magazine, a tilting plate forming the bottom of the magazine, said plate being spaced from the magazine wall to provide for the discharge of the tubes, a cut-off mechanism, means whereby the cut-off mechanism tilts the plate, and tube transferring mechanism, substantially as described.

43. The combination with a filling mechanism, of a tube magazine, a pivoted stepped plate mounted therein, said plate being spaced from the magazine wall for the discharge of the tubes, a cut-off mechanism, means whereby

the cut-off mechanism tilts the plate, and tube transferring mechanism, substantially as described.

- 5 14. The combination with a filling mechanism, of a tube magazine, a stepped plate located in the magazine and supporting the tubes on its upper face, said plate being spaced from the walls of the magazine to provide a discharge orifice for the tubes, a pair of cut off gates, means for reciprocating the gates, and a projection carried by the plate and in the path of the cut-off gates whereby the

movement of the gates tilts the plate, substantially as described. 10

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

SYDNEY I. PRESCOTT.

Witnesses:

A. WHITE,

T. F. KEHOE.