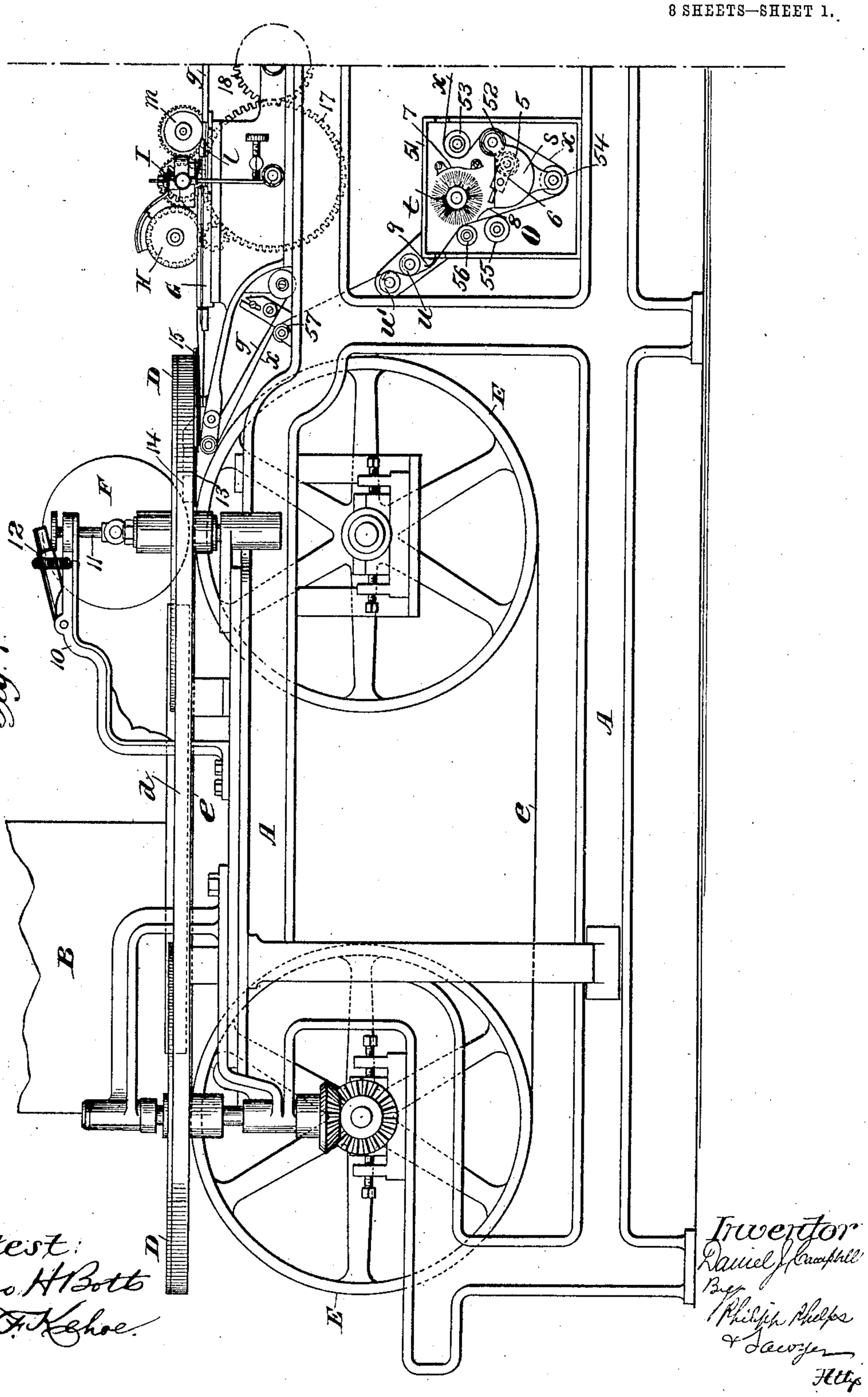
No. 876,327. PATENTED JAN. 14, 1908.

D. J. CAMPBELL.

CIGARETTE MACHINE.

APPLICATION FILED APR. 21, 1898. RENEWED SEPT. 19, 1903.

8 SHEETS—SHEET 1.



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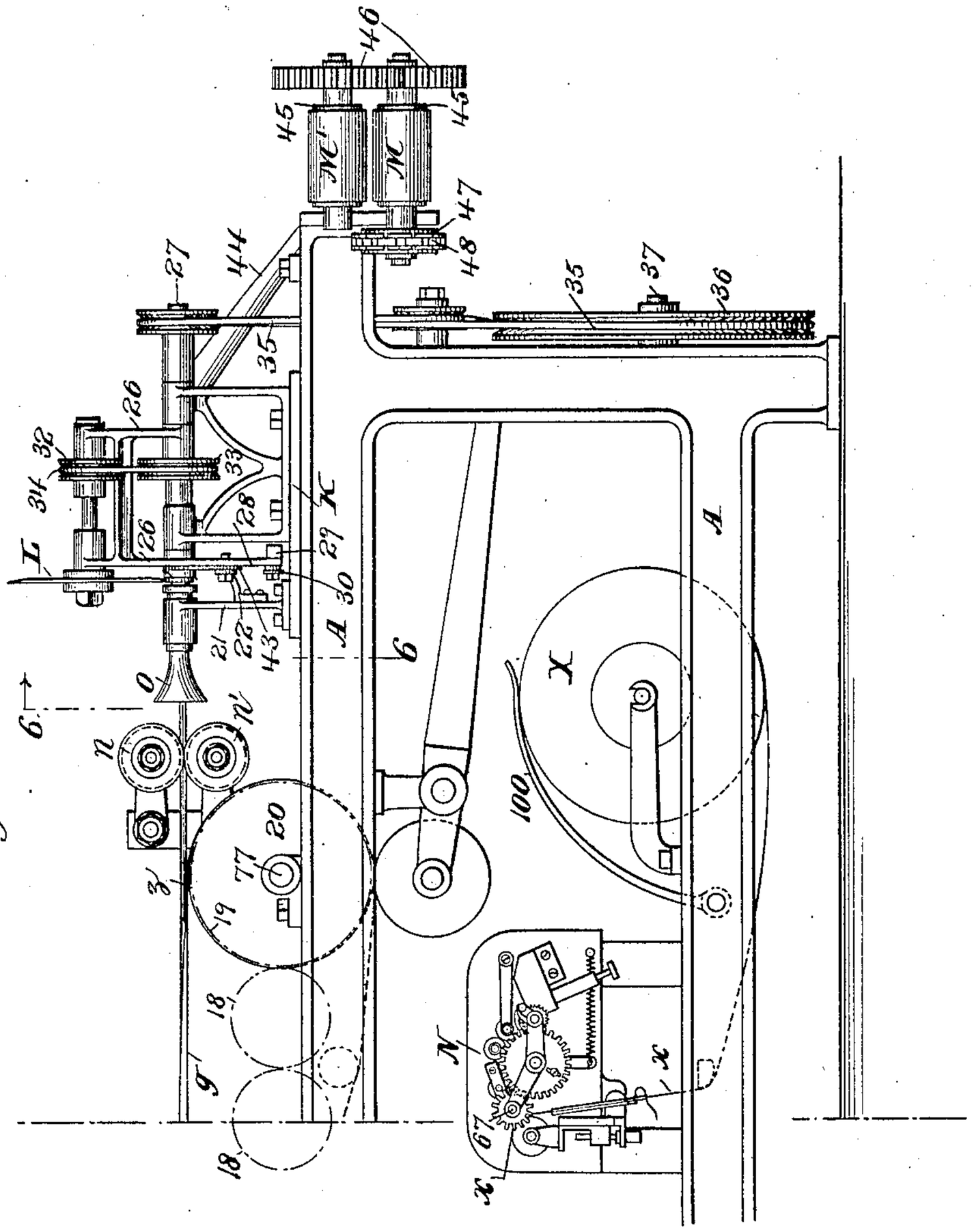

Fig. 1.

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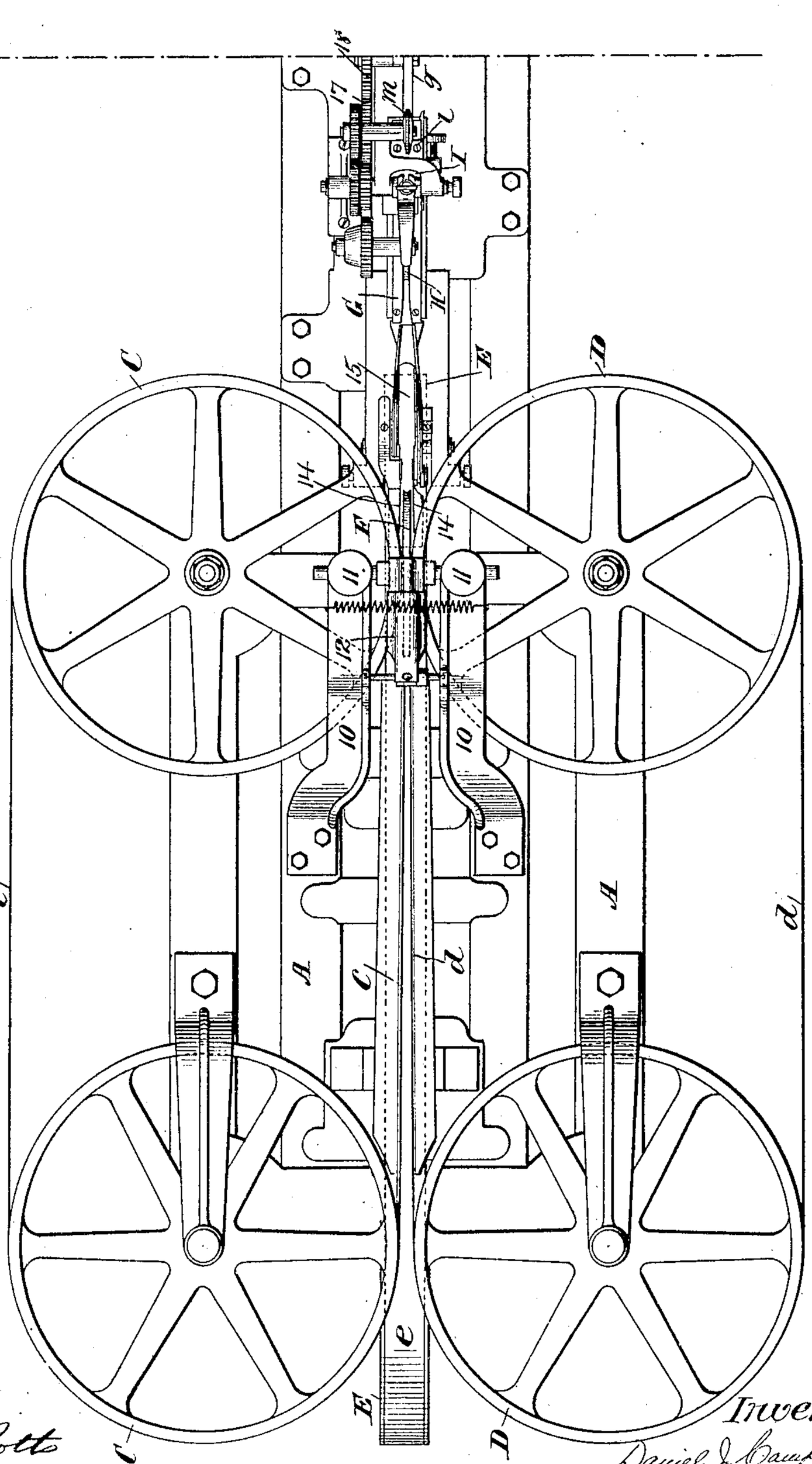
8 SHEETS—SHEET 3.

Fig. 2.



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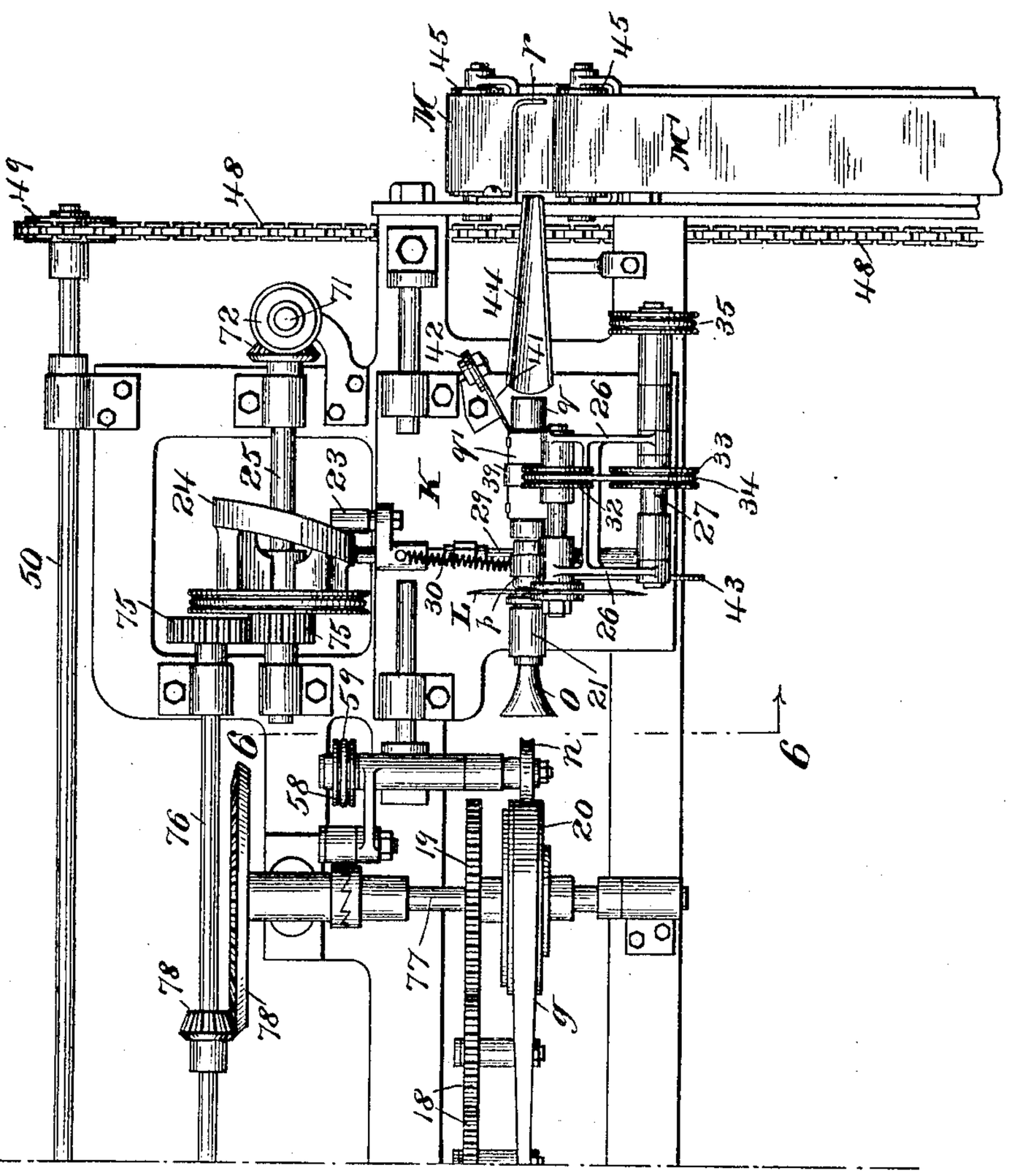

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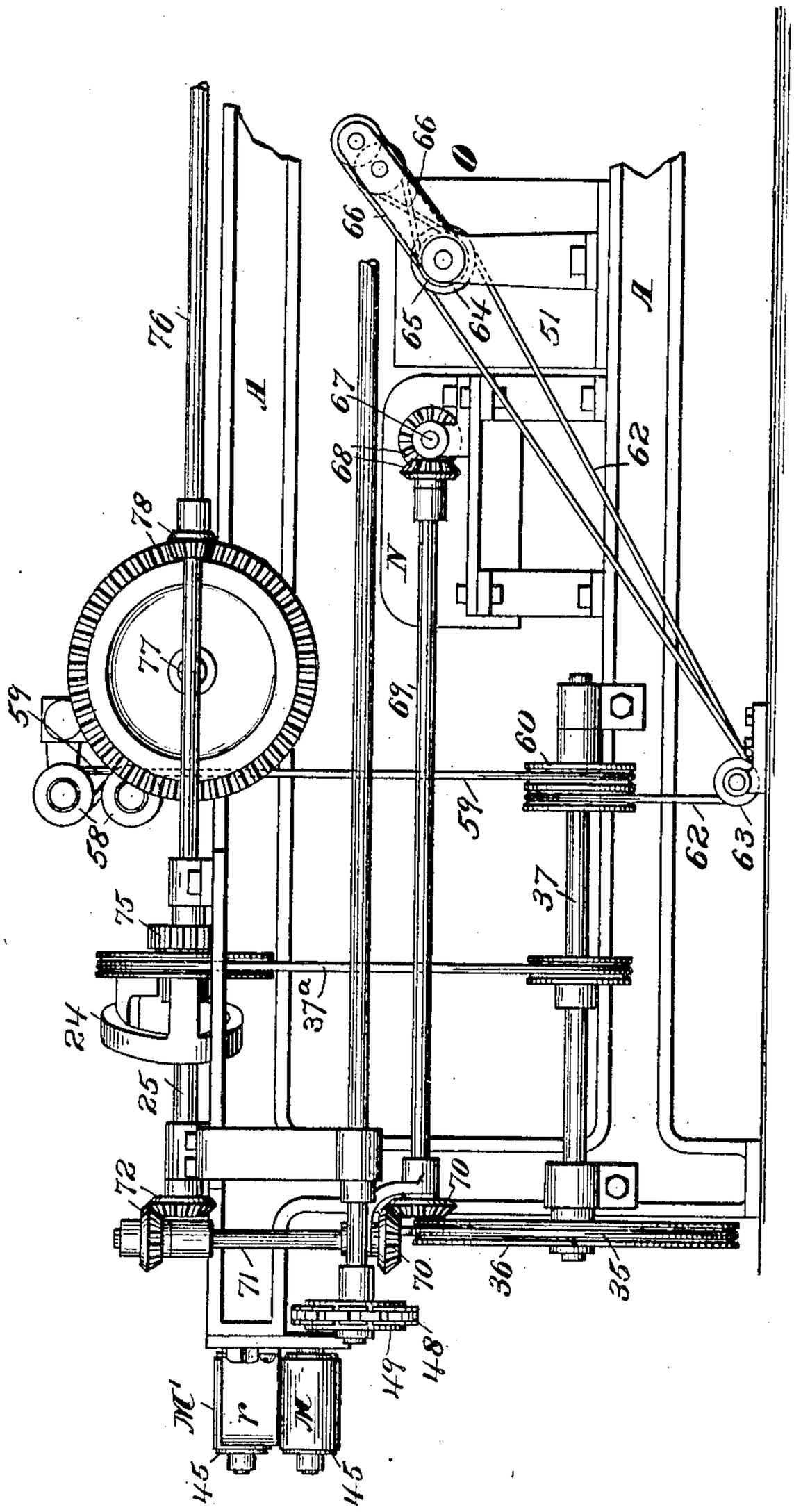
8 SHEETS—SHEET 5.

Fig. 3.



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8 SHEETS—SHEET 6.

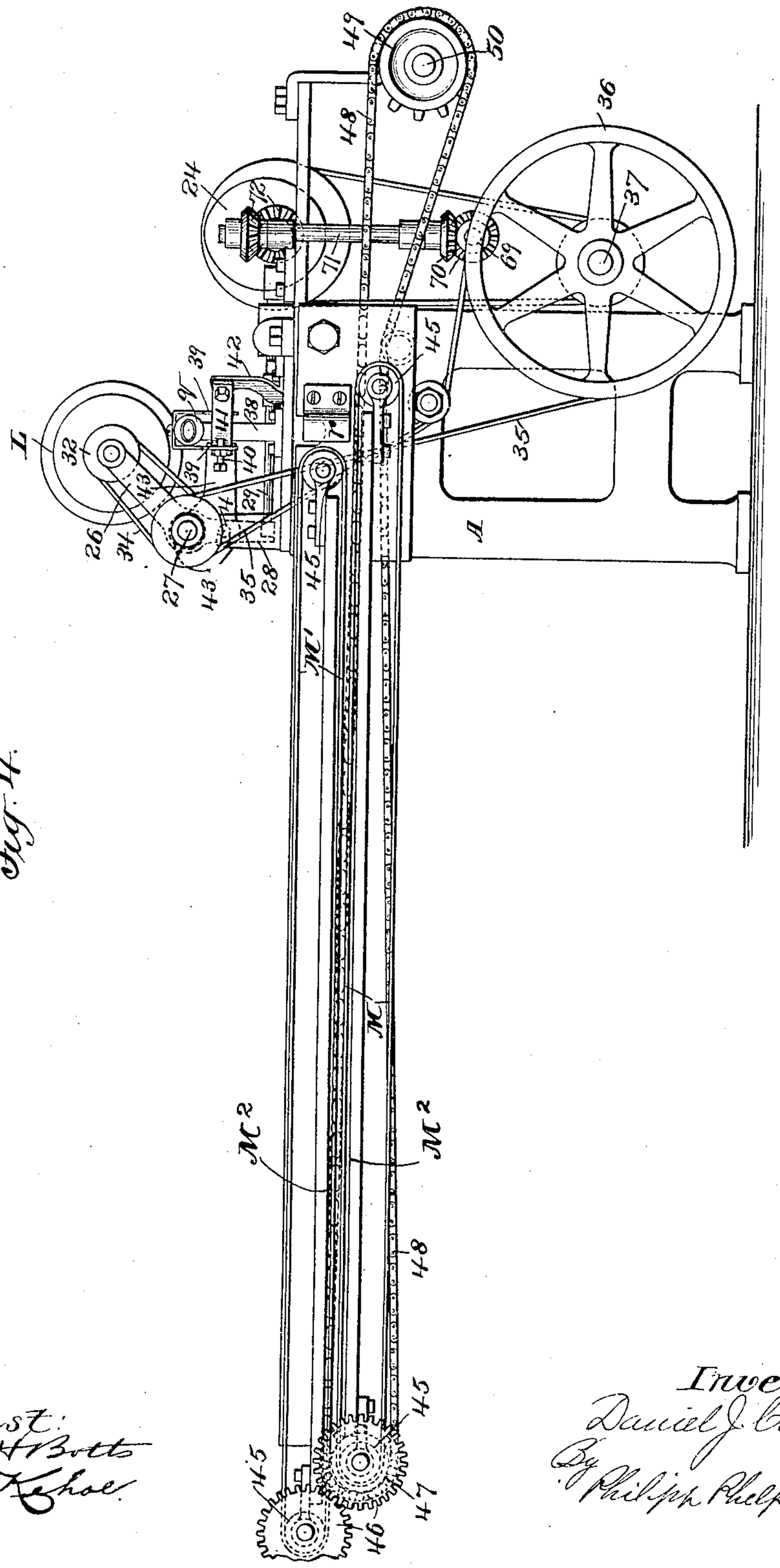

Fig. 4.

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8 SHEETS—SHEET 7.

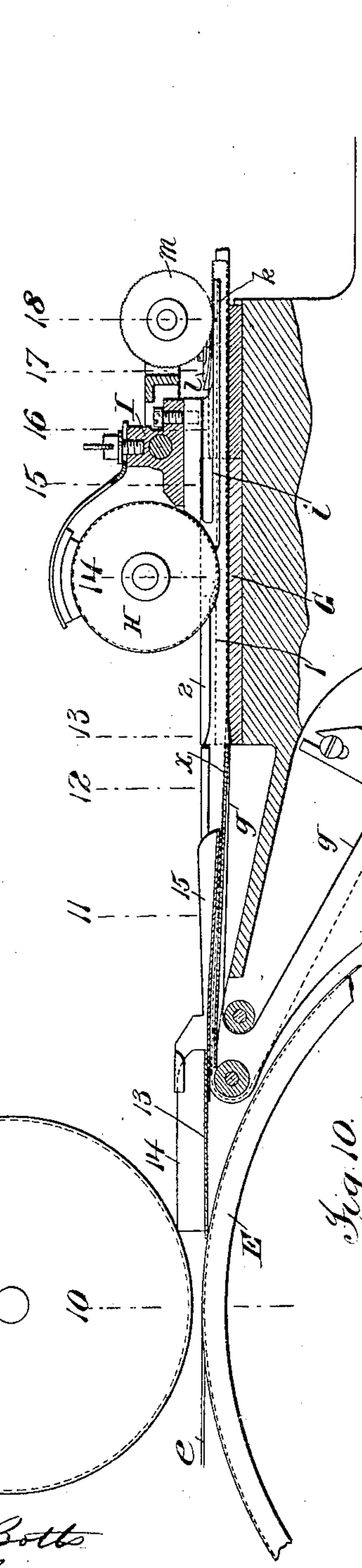
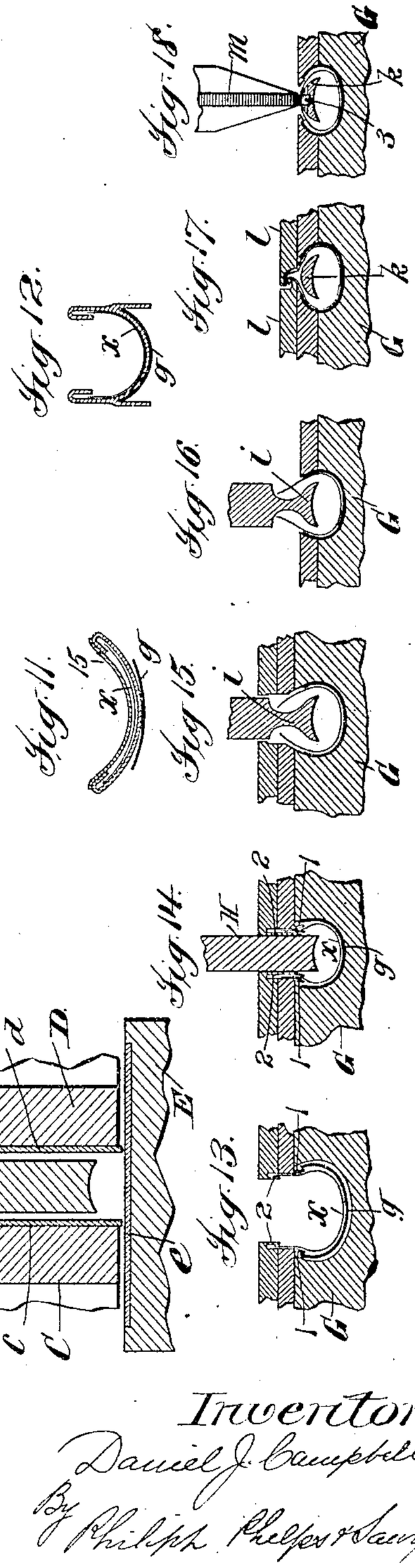


Fig. 5.



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8 SHEETS—SHEET 8.

Fig. 7.

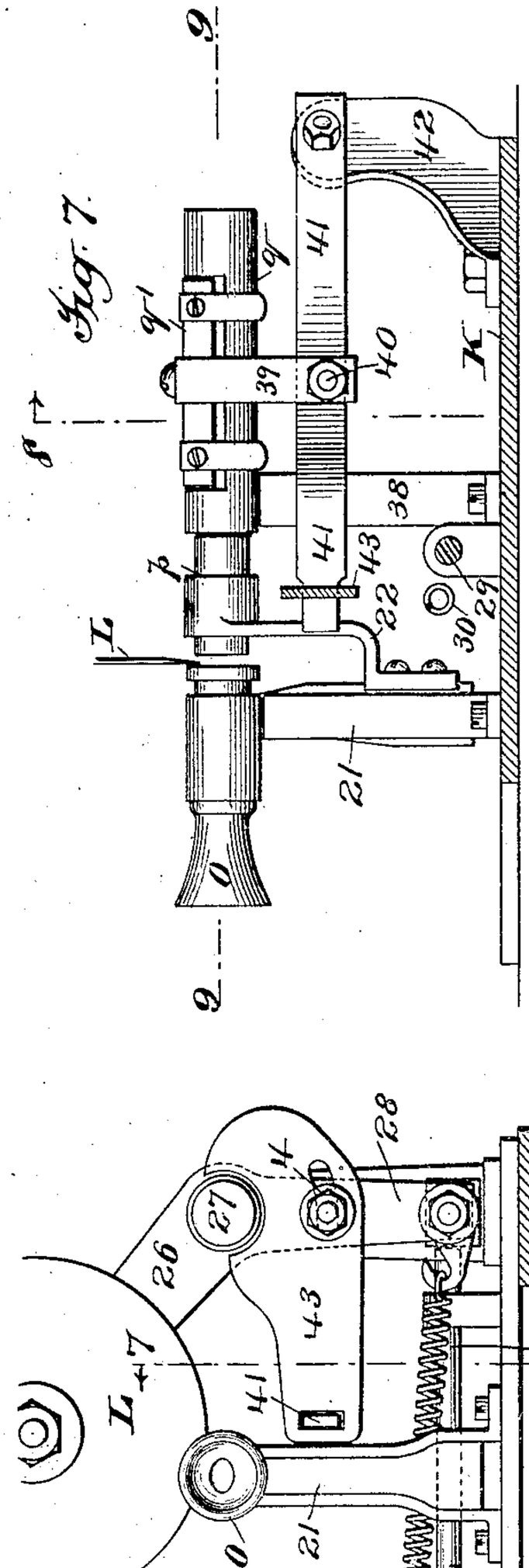

Fig. 9.

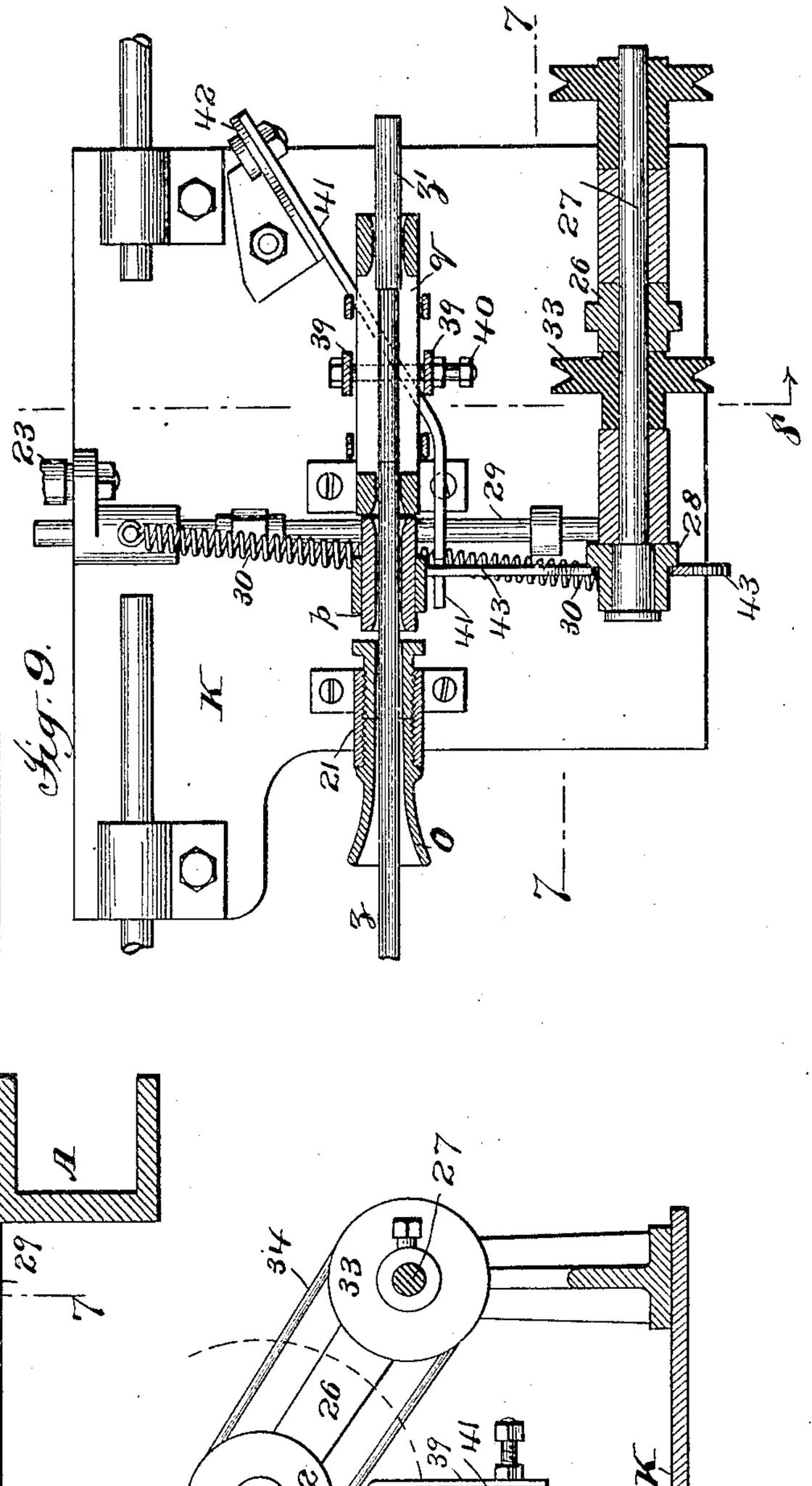

Fig. 6

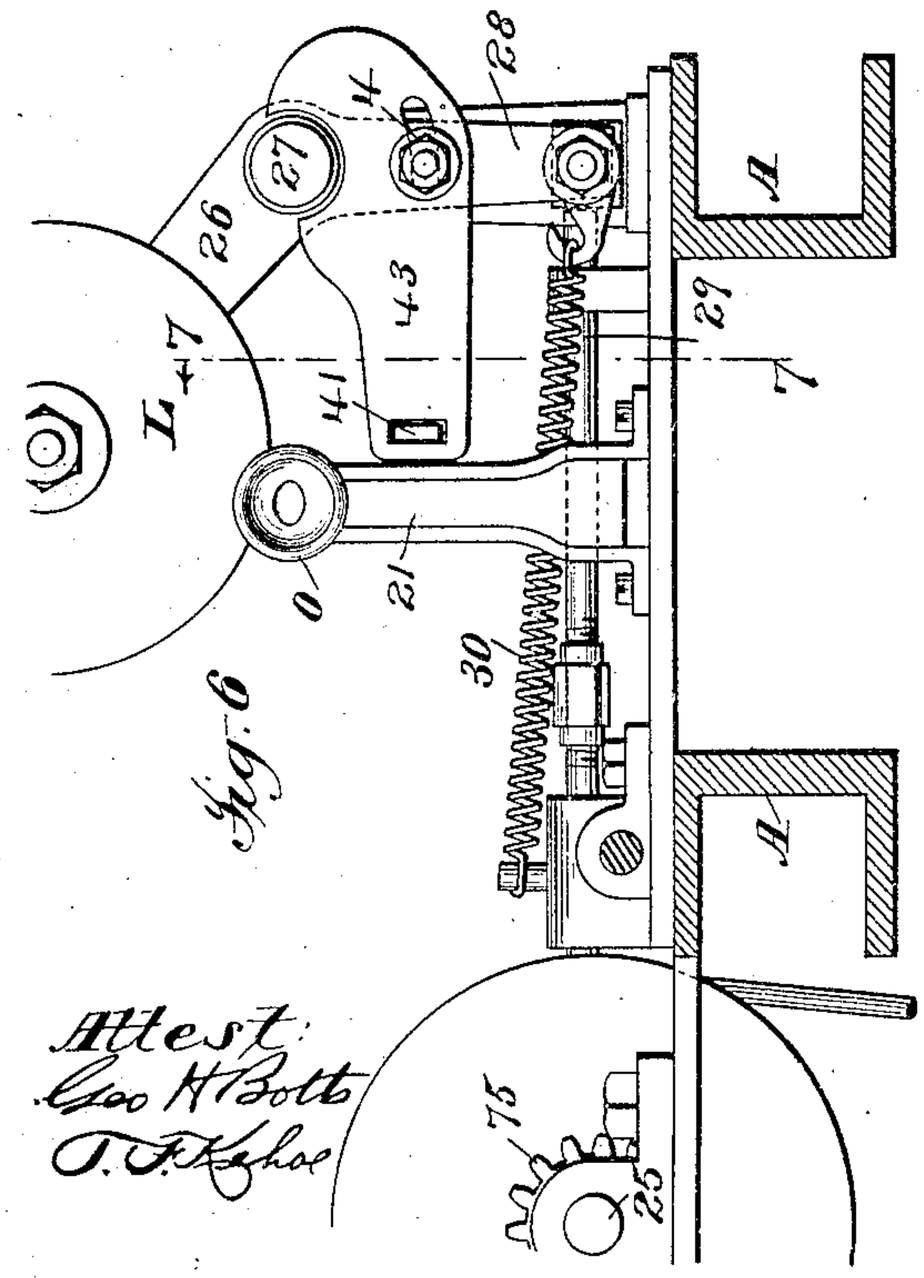

Fig. 8.

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UNITED STATES PATENT OFFICE.

DANIEL J. CAMPBELL, OF NEW YORK, N. Y., ASSIGNOR TO THE AMERICAN TOBACCO COMPANY, A CORPORATION OF NEW JERSEY.

CIGARETTE-MACHINE.

No. 876,327. Specification of Letters Patent. Patented Jan. 14, 1908.

Application filed April 21, 1898, Serial No. 678,349. Renewed September 19, 1903. Serial No. 173,897.

To all whom it may concern:

Be it known that I, DANIEL J. CAMPBELL, 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 especially to that class of cigarette machines in which the wrapper in the form of a continuous web is wrapped around a continuous filler and its edges united to form a continuous cigarette rod after which this rod is cut into suitable lengths to form cigarettes.

The especial object of the invention is to provide an improved cigarette machine for making elliptical cigarettes with the wrapper seam formed by bringing the opposite edges of the wrapper into suitable engagement with each other and incorporating them together by indenting or perforating to form what is known as a "crimped" seam cigarette, as distinguished from a cigarette in which the edges of the wrapper are secured by pasting.

The invention relates in part to the construction of the tobacco molding and wrapper folding devices by which a continuous cigarette rod is formed of the proper shape for producing elliptical crimped seam cigarettes, and in part to certain combinations therewith of devices for completing the formation of the elliptical cigarettes and securing their delivery in firm condition and proper form. Such devices for completing the formation of crimped seam cigarettes are applicable also in machines for making such cigarettes of other form than elliptical and the broader features of the invention include such constructions.

In making indented or perforated seams of that class known generally as crimped seams, a support is usually employed about which the wrapper is lapped and which coacts with a part outside the wrapper to form the seam. This support compresses the tobacco so that as it passes the support it does not completely fill the wrapper thus producing irregularities in the formation or disposition of the filler. When the natural expansion of the tobacco has been depended upon to fill the wrapper, it has been found in practice that cigarettes of exact form with the tobacco evenly and completely filling the wrapper are not secured. I avoid this difficulty in producing perfect cigarettes of proper form by providing means beyond the seam closing devices by which the cigarettes are compressed so as to correct the irregularities in the filler and am thus enabled to secure the delivery of cigarettes that are of exact form and with the tobacco properly filling the wrapper, so that they can be safely handled with the cigarette packing and catching devices now in use. I may employ means of various forms for this purpose, and operate upon the cigarettes either before or after they are severed from the continuous rod, but I preferably use a compressor having dies formed to compress the cigarettes to the exact form desired, by a reciprocating movement transversely to the cigarettes, this compressor moving with the cigarettes during the compressing operation and preferably acting upon the cigarettes after they are severed from the continuous cigarette rod. In making elliptical cigarettes this compressor may be and preferably is so formed as to crease slightly the wrapper at the edges of the cigarette in the same manner as in hand made elliptical cigarettes now well-known. With this compressor by which the cigarettes are positively compressed to the desired form, I preferably combine means for holding the cigarettes in form for a considerable time before they are delivered, which aids in securing their permanent retention of the desired form by giving the tobacco time to set in form and is especially important in making elliptical cigarettes. The means I employ for this purpose preferably consist of a pair of belts to which the cigarettes are delivered after being acted upon by the compressor and between which they are held in form and thus carried to the delivery point.

Another feature of the invention relates to means for controlling the feed of the wrapper to the wrapper folding and seam closing devices which are of general application in cigarette machines but especially with a printing mechanism acting upon the wrapper web through which the wrapper web must be pulled.

It is found in practice that it is very important to secure a uniform tension upon the wrapper as it passes through the wrapper folding devices and this is especially important and difficult in crimped seam cigarette machines. In such machines, any excessive

pull upon the wrapper as it goes through the former and folding and crimping devices result in wrinkling of the wrapper or the slip of the wrapper on the belt. This interferes with the action of the machine, causing a choke or injuring the cigarettes, and when the wrapper is printed for producing cigarettes with a print thereon, interferes with securing a uniform position of the print on the cigarettes. I avoid these difficulties by providing a governor acting on the wrapper before it reaches the filler forming and wrapping devices, and after it leaves the printer in case a printer is used, this governor acting to feed the wrapper in accordance with the tension thereon, so as to increase its feeding action and its aid to the feeding devices by which the wrapper is advanced with the filler, in case the pull on the wrapper increases, and thus maintain a practically constant tension on the wrapper at the folding and seam closing devices. The means I preferably employ for this purpose consist of driven feeding rolls over which the wrapper runs and arranged to feed the wrapper by surface friction, so that the feed increases with the tension of the wrapper, these rolls permitting the wrapper to run freely or slip when the tension is normal, so that the timing of the devices for feeding the wrapper through the crimper control fully the feed of the wrapper, and the governor need not be timed to run in unison therewith, as would be necessary in case positive feeding devices were used between the wrapper roll and the feeding devices of the crimper, the necessity for which accurate timing makes the use of such positive feeding devices impossible.

For a full understanding of the invention, a detailed description of a construction embodying all the features of the same in their preferred form, as applied to a crimped seam continuous rod cigarette machine for making elliptical cigarettes, will now be given in connection with the machine shown in the drawings forming a part of this specification, and the features forming the invention then specifically pointed out in the claims.

In the drawings:—Figures 1 and 1[a] show a complete side elevation of the cigarette machine with the tobacco feeder omitted, the division line between Figs. 1 and 1[a] being between the crimper and the delivery devices. Figs. 2 and 2[a] show similarly a plan view of the machine with the compressing and delivery belts partly broken away the cigarette rod being omitted from these figures for clearness. Fig. 3 is a side elevation of the delivery end of the machine looking at the side opposite that shown in Fig. 1[a]. Fig. 4 is an end elevation of the delivery end of the machine. Fig. 5 is a central longitudinal section through the filler forming and wrapper folding and seam closing devices. Fig. 6 is a cross section on an enlarged scale looking to the right from line 6 of Figs. 1[a] and 2[a]. Fig. 7 is a vertical section on the line 7 of Figs. 6 and 9. Fig. 8 is a cross section looking to the right from line 8 of Fig. 7, showing the compressor acting on a cigarette. Fig. 9 is a horizontal section on the line 9 of Fig. 7. Figs. 10 to 18 are sections on respectively the lines 10 to 18 of Fig. 5.

Referring to said drawings, A is the frame of the machine on which all the parts are mounted, B the vertical chute through which the tobacco is fed to the machine from the tobacco feeder placed above the machine, as usual in such constructions, *c*, *d* are feeding belts between which the tobacco is fed from the chute B, these belts *c*, *d* running over horizontal belt wheels C, D and, with bottom belt *e*, which runs over vertical belt wheels E, forming a gradually tapering feeding trough by which the tobacco is gradually compressed as it is advanced by the belts *c*, *d*, *e*. Above the front belt wheel E is mounted a vertical presser wheel F, this wheel being carried by brackets 10 and preferably being mounted on screws 11 connected at their lower ends to the shaft of the wheel F and threaded at their upper ends in said brackets 10 and provided with thumb nuts by which they may be turned, so that the presser wheel F may be raised and lowered to secure the desired action, a spring pressed brake and cleaning plate 12 preferably being used which bears upon the top of the presser wheel, as shown. The presser wheel F coacts with the bottom belt *e* and side belts *c*, *d* to secure a partial compression of the tobacco filler and its proper feed to the devices for forming the continuous cigarette rod, the presser wheel F preferably being grooved, as shown, so as to aid in reducing the tobacco to a filler rod of the desired form. In addition to the adjustment of the presser wheel F, as previously described, the side belt wheels C, D are preferably made adjustable toward and from each other, as usual in such machines, so as to secure the formation of a filler of the desired size and shape as it leaves the presser wheel F, the size of this filler and the amount of compression depending to some extent upon the character of the tobacco, but the compression being sufficient to secure the proper action of the tobacco in connection wth the wrapper folding and seam closing devices. The parts thus far described are shown as of the construction common in the Bonsack cigarette machine, but it will be understood that the invention is not limited to these devices, but that any other suitable devices for forming the tobacco filler and securing its feed to the continuous rod forming devices may be used.

It will be understood that in forming elliptical cigarettes it is desirable to form a wider filler than in making round cigarettes, and the presser wheel F and belt wheels C, D will

be arranged or adjusted accordingly, a flattened filler with a rounded top being formed with the grooved presser wheel, as illustrated in detail in Fig. 10.

From the presser wheel F and belt wheels C, D, E the filler passes over the support 13 and between the side guides 14 and through the mouth piece 15 to the former G through which it is carried by the belt *g* upon the wrapper strip *x* fed from the wrapper roll X and shown as being printed between the web roll and the former G by a printing mechanism presently to be described. The former G is provided with outer side guides 1 for the belt *g* and inner side guides 2 for the wrapper *x*, these side guides preferably being formed by removable plates mounted upon the top of the body of the former, as shown, and the former G, as illustrated in Figs. 13 to 18, is gradually reduced in size so as to gradually form the tobacco into a filler rod before and during the folding of the wrapper about it, the bottom of the former G being made with a flat curve, as shown, so as to form the bottom of the cigarette to a flat curve to aid in securing the formation of elliptical cigarettes. As the tobacco wrapper passes through the former, the filler first passes under a wheel H rotating in the same direction as the filler which compresses the tobacco centrally of the filler, as shown in Fig. 14, and in conjunction with the belt *g* acts to positively feed the tobacco and wrapper forward under the curved presser bar *i* which, as shown in Figs. 15 16, is formed with a flat curve on its underface so as to aid in securing the proper form of the rod for the production of elliptical cigarettes. This bar *i* is supported by a bracket I above the filler and terminates in a finger *k* over which the edges of the wrapper are lapped by the wrapper folding devices *l*, and the edges secured by pressure against the finger *k*, the seam being formed, as shown, by the crimping wheel 3 carried by the finger *k* and the outside crimping wheel *m* co-acting therewith to form a crimped seam. The finger *k* is preferably formed with a flat curve on its underside, as shown, corresponding to the curve of an elliptical cigarette.

The construction and operation of the wrapper folding guides *l* and the crimping wheels *m*, 3, and the means for mounting and actuating these parts, as well as the wheel H, may be, and are shown as the same as in constructions now well-known and forming no part of the present invention so that a detailed description of the same is not required herein, all these parts being shown as driven by suitable gearing from a gear 17 below the former which is shown as driven by intermediates 18 from a gear 19 on the shaft of the forward belt wheel 20 of belt *g*.

The continuous cigarette rod *z* passes from the former G between revolving rubbers *n*, *n'* above and below the cigarette rod, these rubbers preferably being concave on their faces so as to practically inclose the cigarette rod. These rubbers act to hold the cigarette rod in proper central position as it goes into the mouth piece or funnel *o* on its way to the cutter, and aid in securing the proper filling out of the wrapper after the compression of the filler by the finger *k*, as well as acting to rub down and smooth out the wrapper. They act also to clean off any extra powder applied in printing by the printing mechanism shown and hereafter to be described that may adhere to the wrapper and to polish and rub in the powder forming the print so as to secure a clear, sharply defined and permanent print. These brushes may be made of any suitable material such as bristles, felt, or other suitable soft rubbing material. The cigarette rod passes from the rubbers through the funnel *o* and ledger forming a continuation of the same, which is mounted in a vertical support 21 upon the carriage K which also carries a rotary knife L by which the cigarette rod is cut as it passes from the ledger, this carriage K also carrying the guide and support *p* through which the cigarette rod passes and in which it is supported during the operation of cutting and from which the cigarettes *z'* severed by the knife L pass to the compressor presently to be described, this guide and support *p* being shown as mounted in an arm 22 on vertical support 21.

The carriage K reciprocates longitudinally of the cigarette rod so as to move with the cigarette during the cutting operation, as usual in such machines, and is shown as actuated in one direction by a common means consisting of a roller 23 on the carriage K actuated by a rotary cam 24 carried by a shaft 25; it being actuated in the opposite direction by a spring (not shown) as usual in such machines and as shown in my application filed at even date herewith Serial Number 678,348. The rotary cutter L is shown as driven and oscillated in the usual manner, its shaft being carried in arms 26 mounted to rock on shaft 27 and rocked by arm 28 through the reciprocating cam rod 29 pivoted to the lower end of the arm 28 and moved in one direction by a rim cam on the cam disk 24 and returned to position by a spring 30. The cutter L is shown as rotated in the usual manner by means of belt pulleys 32, 33 on respectively the shaft of the cutter L and shaft 27 connected by belt 34, the shaft 27 being driven by belt 35 from pulley 36 on the shaft 37 at the bottom of the machine.

The compressor consists of a bottom elliptical die plate *q* mounted in fixed position upon the standard 38 on the carriage K and an upper reciprocating die plate *q'* which is

pressed upon each of the cigarettes z' as they pass beneath the die plate q' so as to press the cigarettes to an exact elliptical form, this compressor also being preferably formed so as to crease the cigarettes slightly on each edge in the same manner as in hand made elliptical cigarettes now well-known, as shown in Fig. 8, wherein the edges of the cigarette project slightly beyond the shaping groove or grooves formed by the die plates q, q' and are pinched by the flat faces of the latter projecting beyond such groove or grooves. The shaft 25 is driven from shaft 37 by means of a belt 37[a] passing over pulleys on said two shafts. The stationary die plate q is shown as having at opposite ends portions extending over the cigarettes and funnel-shaped so as to assure the proper delivery of the cigarettes from the guide and support p to the compressor q, q' and from the compressor for final delivery. The die plate q' is provided with the depending arms 39 connected by a bolt 40 which is threaded through an opening in a lever 41 pivoted on a vertical bracket 42 on the carriage K, and this lever 41 is oscillated vertically by an arm 43 through an opening in which passes the lever 41 and which is secured to the arm 28 by which the cutter is oscillated, the connection between the arms 43 and 28 being preferably made adjustable by a curved slot and nut connection 4, as shown, or otherwise, so as to secure exactly the desired compressing action of the die q' upon the cigarettes. By this construction it will be seen that the die q' is moved downward to act upon a cigarette as the cutter L makes its cutting stroke and while the carriage K is moving with the cutter and compressor in the direction of movement of the cigarette rod and cigarettes so that a cigarette is cut and the next cigarette in advance compressed in each movement of the carriage.

The cigarettes z' are delivered from the compressor through the guide on the top of the stationary die plate q through the usual inclined chute 44 onto a lower belt M by which the cigarettes are carried to the delivery point, the cigarettes being compressed and held in proper form on the belt M during this operation by the upper belt M′, these compressing belts running at right angles to the direction of movement of the cigarettes as they are delivered by the machine through chute 44, and being set at such a distance apart as to hold the cigarettes in form and advance them without rolling them over which, of course, would destroy the elliptical form. These belts are preferably backed by supporting strips M[2] which prevent sagging of the lower belt and hold both belts in proper relation to each other. As the cigarettes pass from the inclined chute 44 onto the belt M they are stopped and positioned accurately upon the belt by the plate r mounted upon the end of the machine and forming an abutment by which the cigarettes are stopped in proper position transversely to the belts M, M′. The belts M, M′ run over belt pulleys 45, the belt pulleys 45 at the delivery end of the belts being geared together by gears 46 and driven from the shaft of the lower belt pulley 45 by a chain wheel 47 thereon and chain 48 driven from chain wheel 49 on the shaft 50.

Referring now to the printing devices shown, which are designed especially for securing a gold or bronze print, the wrapper web x passes from the web roll X in the lower part of the machine through a printing device N which may be of any suitable form but is shown as of the construction now in general use on the Bonsack machine, and fully shown and described in United States Letters Patent No. 377,447, dated February 7, 1888 to James A. Bonsack so as to require no further description herein. This printing device, however, instead of printing in ink, as described in said patent, is arranged to make the desired impression from the die in sizing or other suitable liquid which will properly hold powder applied thereto.

From the printing device N the wrapper web x passes to the bronzing device O by which the print is completed. This bronzing device consists of a casing 51 inclosing all the parts so as to prevent waste of the powder, and within this casing 51 is a receptacle s for the powder in which is mounted a roll 5 so as to run in and take up the powder contained in the receptacle s, this roll 5 being mounted in a swinging carrier 6 pivoted in the receptacle s and spring pressed upward by a spiral spring (not shown) on the pivot or otherwise, so as to hold the roll 5 in engagement with another roll 52 mounted in the upper part of the receptacle s and to which the powder is transferred by the roll 5. The rolls 5, 52 are faced with felt or similar material to properly carry and apply the powder. The wrapper web x runs into the casing 51 through an opening at the top of the casing, then about guide roll 53 over roll 52 where the powder is applied, then downward around roll 54, upward over guide rolls 55, 56 opposite which the web is subjected to a brushing operation by a rotating brush t of suitable construction rotating in the opposite direction to the movement of the web x, and guard 7 on the upper side of the brush and a curved guard plate 8 on the underside of the brush being used by which the powder brushed from the web by the brush t is conducted back into the receptacle s. From the guide roll 56 the web x passes out of the casing 51 over guard plate 9 and between the feeding rolls u, u' of the tension governor and over guide roll 57 to the belt g and former G. The print is com-

pleted by rubbers n, n', as previously described.

The wrapper x is normally fed from the web roll X having tension plate 100, and drawn through the printer N and bronzer O by the feeding belt g co-acting with the roll H. As the tension on the web varies regularly with the size of the roll X and is affected by the running conditions of the crimper, and by those of the printer and bronzer when used, as in the construction shown, it is important to provide means for securing a practically uniform tension on the wrapper as it passes through the crimper, and the governing device formed by the rolls u, u' secures this result. These rolls u, u' are driven feeding rolls but feed only by friction of their surfaces, so that their feeding action is increased as the pull on the web x increases. They are preferably positioned relatively to the web x so as to have little or no feeding effect upon the web under normal tension, but permit the web to run freely or slip over them so as not to interfere with the feed of the web, but, on increase of pull above the normal tension, act to feed the web x sufficiently to prevent excess of tension on the wrapper as it goes through the crimper, the speed of the rolls u, u' being such that the timing of the wrapper by the feeding devices of the crimper is not interfered with. While I preferably use two feeding rolls, as shown, it will be understood that one or any other number of rolls may be used acting in the usual manner.

The rubbers n, n' rotate in the same direction as the cigarette rod z is moving, being actuated by pulleys 58 on their respective shafts and belt 59 which is driven by pulley 60 on shaft 37, and from this pulley 60 the brush t of the bronzer O is driven by belt 62 passing around guide pulley 63 at the base of the machine and pulley 64 on the shaft of the brush t, and from a double pulley 65 on the shaft of the brush t the feeding rolls u, u' are driven by straight and crossed belts 66, as shown in Fig. 3, so as to rotate the rolls u, u' in opposite directions. The parts of the printing device N are actuated by suitable gearing from shaft 67 (see Figs. 1 and 3), which is geared by beveled gears 68 to shaft 69 which is driven by beveled gears 70 from a short vertical shaft 71 driven by bevel gears 72 from shaft 25 carrying cam 24, which shaft 25 is driven by gears 75 from the main driving shaft 76 which also drives the shaft 77 of the forward belt roll 20 of belt g through bevel gears 78. It will be understood, however, that it is immaterial how the parts are driven, this driving means for the various parts being shown only for the purpose of illustration and may be widely varied.

It will be understood that I am not to be limited to the exact arrangement or form of the devices shown as embodying my invention but that many modifications may be made therein by those skilled in the art while retaining the invention defined by the following claims.

What I claim is:—

1. The combination with the filler forming and wrapping devices of a crimped seam continuous rod cigarette machine, and seam closing devices comprising a support within the wrapper and means co-acting with said support to crimp the seam, of means beyond the seam closing devices for inclosing and pressing the cigarettes and thereby correcting irregular formation of the filler due to the use of the interior support and bringing the cigarettes into the form with the filler evenly disposed and filling the wrapper which they would have had except for the use of the interior support, substantially as described.

2. The combination with the filler forming and wrapping devices of a crimped seam continuous rod cigarette machine, and seam closing devices comprising a support within the wrapper and means co-acting with said support to crimp the seam, of a compressing device beyond the seam closing devices for inclosing and pressing the cigarettes and thereby correcting irregular formation of the filler due to the use of the interior support and bringing the cigarettes into the form with the filler evenly disposed and filling the wrapper which they would have had except for the use of the interior support, said compressing device moving with the cigarettes, substantially as described.

3. The combination with the filler forming and wrapping devices and the seam crimping devices of a crimped seam continuous rod cigarette machine, and means for severing the cigarettes from the cigarette rod, of means for pressing the cigarettes into final form after they are severed from the cigarette rod, substantially as described.

4. The combination with the filler forming and wrapping devices and the seam crimping devices of a crimped seam continuous rod cigarette machine, and means for severing the cigarettes from the cigarette rod, of a compressing device for inclosing and pressing the cigarettes into final form after they are severed from the cigarette rod and moving with the cigarettes, substantially as described.

5. The combination with the filler forming and wrapping devices and the seam crimping devices of a crimped seam continuous rod cigarette machine, of means beyond the seam crimping devices for pressing the cigarettes into final form, a carrying belt receiving the cigarettes after they are pressed, and a compressing belt coacting with the carrying belt to hold the cigarettes in form, substantially as described.

6. The combination with the filler forming and wrapping devices and the seam crimping devices of a crimped seam continuous rod cigarette machine, of rotating rubbers acting on the rod beyond the crimping devices inclosing the rod and formed and arranged to aid in shaping it to the form desired, substantially as described.

7. The combination with the filler forming and wrapping devices and the seam crimping devices of a crimped seam continuous rod cigarette machine, of rotating rubbers acting on the rod beyond the seam crimping devices inclosing the rod and formed and arranged to aid in shaping it to the form desired, means for severing the cigarettes from the cigarette rod, and a compressing device for inclosing and pressing the cigarettes after they are severed from the rod, substantially as described.

8. The combination with the filler forming and wrapping devices and the seam crimping devices of a crimped seam continuous rod cigarette machine, of rotating rubbers acting on the rod beyond the seam crimping devices inclosing the rod and formed and arranged to aid in shaping it to the form desired, means for severing the cigarettes from the cigarette rod, a compressing device for inclosing and pressing the cigarettes after they are severed from the rod, a carrying belt receiving the cigarettes after they are pressed and carrying the cigarettes sidewise, and a compressing belt co-acting with the carrying belt to hold the cigarettes in form, substantially as described.

9. The combination with the filler forming and wrapping devices and the seam crimping devices of a crimped seam continuous rod cigarette machine, means for severing the cigarettes from the cigarette rod, and a compressing device having co-acting die plates shaped to inclose and press the cigarettes into final form after they are severed from the cigarette rod and means for pressing said die plates together and separating them for the receipt of the cigarettes, substantially as described.

10. The combination with the filler forming and wrapping devices of a crimped seam continuous rod cigarette machine, of a compressing device having co-acting die plates shaped to inclose and press the cigarettes into final form and means for pressing said die plates together and separating them for the receipt of the cigarettes, a carrying belt receiving the cigarettes and carrying them sidewise, and a compressing belt co-acting with the carrying belt to hold the cigarettes in form, substantially as described.

11. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, of filler forming and wrapping devices co-acting therewith to form a cigarette rod, and means for crimping the seam of the cigarettes on its passage through the said chamber, substantially as described.

12. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices co-acting therewith to form a cigarette rod, and devices for crimping the seam of the cigarette rod on its passage through said chamber, of means beyond the seam crimping devices for inclosing and pressing the cigarettes into elliptical form, substantially as described.

13. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices co-acting therewith to form a cigarette rod, and devices for crimping the seam of the cigarette rod on its passage through said chamber, of a compressing device beyond the seam crimping devices for inclosing and pressing the cigarettes into elliptical form and moving with the cigarettes, substantially as described.

14. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices co-acting therewith to form a cigarette rod, and devices for crimping the seam of the cigarette rod on its passage through said chamber, and means for severing the cigarettes from the cigarette rod, of means for pressing the cigarettes into elliptical form after they are severed from the cigarette rod, substantially as described.

15. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices co-acting therewith to form a cigarette rod, and devices for crimping the seam of the cigarette rod on its passage through said chamber, of rubbers inclosing and acting on opposite sides of the rod beyond the seam crimping devices, means for severing the cigarettes from the cigarette rod, and means for pressing the cigarettes in elliptical form after they are severed from the cigarette rod, substantially as described.

16. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices, and seam crimping devices of rotating rubbers inclosing and acting on opposite sides of the rod beyond the seam crimping devices and formed and arranged to aid in securing the elliptical form of the rod, means for severing the cigarettes from the cigarette rod, and means for pressing the cigarettes

into elliptical form after they are severed from the cigarette rod, substantially as described.

17. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices co-acting therewith to form a cigarette rod, and devices for crimping the seam of the cigarette rod on its passage through said chamber, of rubbers beyond the seam crimping devices inclosing and acting on opposite sides of the rod and a compressing device through which the cigarettes pass from the rubbers having co-acting die plates shaped to press the cigarettes into elliptical form, and means for pressing said die plates together and separating them for the receipt of the cigarettes, substantially as described.

18. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices co-acting therewith to form a cigarette rod, a seam closing device comprising a support within the wrapper and means co-acting with said support to crimp the seam, of a compressing device having co-acting die plates shaped to inclose and press the cigarettes into elliptical form and means for pressing said die plates together and separating them for the receipt of the cigarettes, substantially as described.

19. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices co-acting therewith to form a cigarette rod, and devices for crimping the seam of the cigarette rod on its passage through said chamber, of means beyond the seam crimping devices for inclosing and pressing the cigarettes into elliptical form, means for severing the cigarettes from the cigarette rod, a carrying belt receiving the cigarettes, and a compressing belt co-acting with the carrying belt to hold the cigarettes in form, substantially as described.

20. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices coacting therewith to form a cigarette rod, and devices for crimping the seams of the cigarette rod on its passage through said chamber, of means beyond the seam crimping devices for inclosing and pressing the cigarettes into elliptical form, means for severing the cigarettes from the cigarette rod, a carrying belt receiving the cigarettes, and a compressing belt coacting with the carrying belt to hold the cigarettes in elliptical form, substantially as described.

21. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, and filler forming and wrapping devices co-acting therewith to form a cigarette rod, and means for severing the cigarettes from the cigarette rod, of means for inclosing and pressing the cigarettes into elliptical form after they are severed from the cigarette rod, a carrying belt receiving the cigarettes, and a compressing belt co-acting with the carrying belt to hold the cigarettes in form, substantially as described.

22. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices co-acting therewith to form a cigarette rod, and devices for crimping the seam of the cigarette rod on its passage through said chamber, of rubbers acting on opposite sides of the rod beyond the seam crimping devices, means for severing the cigarettes from the cigarette rod, means for inclosing and pressing the cigarettes into elliptical form after they are severed from the cigarette rod, a carrying belt receiving the cigarettes, and a compressing belt co-acting with the carrying belt to hold the cigarettes in form, substantially as described.

23. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, filler forming and wrapping devices co-acting therewith to form a cigarette rod, and devices for crimping the seam of the cigarette rod on its passage through said chamber, of rubbers beyond the seam crimping devices acting on opposite sides of the rod and a compressing device through which the cigarettes pass from the rubbers having coacting die plates shaped to inclose and press the cigarettes into elliptical form, means for pressing said die plates together and separating them for the receipt of the cigarettes, means for severing the cigarettes from the cigarette rod, a carrying belt receiving the cigarettes, and a compressing belt co-acting with the carrying belt to hold the cigarettes in form, substantially as described.

24. In a crimped seam continuous rod cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, and filler forming and wrapping devices co-acting therewith to form a cigarette rod, of a compressing device having co-acting die plates shaped to inclose and press the cigarettes into elliptical form and means for pressing said die plates together and separating them for the receipt of the cigarettes, means for severing the cigarettes from the cigarette rod, a carrying belt receiving the cigarettes, and a compressing belt co-acting with the carrying belt to hold the cigarettes in form, substantially as described.

25. In a crimped seam continuous rod

cigarette machine, the combination with a former having a wrapping chamber formed with a flat curve, of filler forming and wrapping devices co-acting therewith to form a continuous rod, and devices for crimping the seam of the cigarette rod on its passage through said chamber, and means beyond the seam crimping devices inclosing and pressing the cigarettes into elliptical form and then holding them in such form during a portion of their travel to aid in securing their retention of the elliptical form, substantially as described.

26. The combination with the filler forming and wrapper folding devices of a continuous rod cigarette machine, of a support within the wrapper, means co-acting with said support to secure the edges of the wrapper into a seam, and means beyond the support for inclosing and pressing the cigarettes and thereby correcting irregular formation of the filler due to the use of the interior support and bringing the cigarettes into the form with the filler evenly disposed and filling the wrapper which they would have had except for the use of the interior support, substantially as described.

27. The combination with the filler forming and wrapper folding devices of a continuous rod cigarette machine, of a support within the wrapper, means co-acting with said support to secure the edges of the wrapper into a seam, means for severing the cigarettes from the cigarette rod, and means for inclosing and pressing the cigarettes into final form after they are severed from the rod, substantially as described.

28. The combination with the filler forming and wrapper folding devices of a continuous rod cigarette machine, of a support within the wrapper, means co-acting with said support to secure the edges of the wrapper into a seam, and a compressing device beyond the support having co-acting die plates shaped to inclose and press the cigarettes and thereby correcting irregular formation of the filler due to the use of the interior support and bringing the cigarettes into the form with the filler evenly disposed and filling the wrapper which they would have had except for the use of the interior support and means for pressing said plates together and separating them for the receipt of the cigarettes, substantially as described.

29. The combination with the filler forming and wrapper folding devices of a continuous rod cigarette machine, of a support within the wrapper, means co-acting with said support to secure the edges of the wrapper into a seam, means beyond the support for inclosing and pressing the cigarettes into final form, a carrying belt receiving the cigarettes after they are pressed, and a compressing belt co-acting with the carrying belt to hold the cigarettes in form, substantially as described.

30. The combination with the filler forming and wrapper folding devices of a continuous rod cigarette machine, of a support within the wrapper, means coacting with said support to secure the edges of the wrapper into a seam, rubbers inclosing and acting on opposite sides of the rod beyond the support, means for severing the cigarette rod into cigarettes, a compressing device for inclosing and pressing the cigarettes into final form after they are severed from the rod, a carrying belt receiving the cigarettes after they are pressed, and a compressing belt coacting with the carrying belt to hold the cigarettes in form, substantially as described.

31. The combination with the filler forming and wrapping devices of a continuous rod cigarette machine, and feeding devices for advancing the wrapper strip with the filler, of a governor acting upon the wrapper between the wrapper roll and feeding devices and controlled by the tension of the wrapper to prevent excess of tension on the wrapper as it is advanced with the filler by said feeding devices, said governor permitting free movement past it of the strip under normal tension and arranged to feed and engage the strip on increase of tension, substantially as described.

32. The combination with the filler forming and wrapping devices of a continuous rod cigarette machine, and feeding devices for advancing the wrapper strip with the filler, of a governor feeding device between the wrapper roll and said feeding devices arranged to permit the wrapper to move at a different speed from said governor feeding device and controlled by the tension of the wrapper to prevent excess of tension on the wrapper as it is advanced with the filler by said feeding devices, said governor permitting free movement past it of the strip under normal tension and arranged to feed and engage the strip on increase of tension, substantially as described.

33. The combination with the filler forming and wrapping devices of a continuous rod cigarette machine, and feeding devices for advancing the wrapper strip with the filler, of a governor feeding device between the wrapper roll and said feeding devices permitting the wrapper strip to run freely under normal tension but brought into feeding action by the tension of the wrapper to prevent excess of tension on the wrapper as it is advanced with the filler by said feeding devices, substantially as described.

34. The combination with the filler forming and wrapping devices of a continuous rod cigarette machine and feeding devices for advancing the wrapper strip with the filler, of a governor feeding device having one or

more positively driven feeding rolls between the wrapper roll and feeding devices and acting to feed the wrapper by surface friction and arranged to prevent excess of tension of the wrapper as it is advanced with the filler by the increased feeding action of said roll or rolls as the tension is increased, said rolls permitting free movement of the strip past them under normal tension, substantially as described.

35. The combination with the former, and wrapper folding and seam closing devices of a crimped seam continuous rod cigarette machine, and a belt for advancing the filler and wrapper, of a governor feeding device acting upon the wrapper to aid the belt in advancing the wrapper and controlled by the tension of the wrapper to prevent excess of tension on the wrapper as advanced by the belt, said feeding device permitting free movement past it of the strip under normal tension, substantially as described.

36. The combination with the former, wrapping devices and seam closing devices of a crimped seam continuous rod cigarette machine, and a belt for advancing the filler and wrapper, of a governor feeding device between the wrapper roll and said belt arranged to permit the wrapper to move at a different speed from said governor feeding device and controlled by the tension of the wrapper to prevent excess of tension on the wrapper as advanced by the belt, said feeding devices permitting free movement past it of the strip under normal tension, substantially as described.

37. The combination with the former, wrapping devices and seam closing devices of a crimped seam continuous rod cigarette machine, and a belt for advancing the filler and wrapper, of a governor feeding device having one or more positively driven feeding rolls between the wrapper roll and feeding devices and acting to feed the wrapper by surface friction and arranged to prevent excess of tension of the wrapper as it is advanced by the belt by the increased feeding action of said roll or rolls as the tension is increased, said feeding device permitting free movement past it of the strip under normal tension, substantially as described.

38. The combination with the filler forming and wrapping devices of a continuous rod cigarette machine and feeding devices for advancing the wrapper strip with the filler, of a printing device for printing the wrapper strip before it reaches said feeding devices, and a governor feeding device between said printing device and said feeding devices arranged to permit the wrapper to move at a different speed from said governor feeding device and controlled by the tension of the wrapper to prevent excess of tension on the wrapper as it is advanced with the filler by said feeding devices, substantially as described.

39. The combination with the filler forming and wrapping devices of a continuous rod cigarette machine and feeding devices for advancing the wrapper strip with the filler, of printing devices acting to print the wrapper strip in suitable material for holding powder, apply powder to the print and remove the excess of powder and a governor feeding device between said printing devices, and said feeding devices arranged to permit the wrapper to move at a different speed from said governor feeding device and controlled by the tension of the wrapper to prevent excess of tension on the wrapper as it is advanced with the filler by said feeding devices, substantially as described.

40. In a cigarette machine, a governor feeding device for the wrapper strip having two or more feeding rolls, u, u' acting on the strip by surface friction, whereby the feeding action increases with the tension, and arranged to permit the strip to run at a different speed from the rolls, said rolls permitting free movement of the strip past them under normal tension, substantially as described.

41. The combination with the former, folding devices, interior support k, seam forming wheel m and feeding belt g, of a crimped seam cigarette machine, of a governor feeding device for the wrapper strip having two or more feeding rolls u, u' over which the strip f runs freely under normal tension and arranged to feed the strip by surface friction on increase of tension, substantially as described.

42. In a crimped seam continuous rod cigarette machine, former G and presser bar i having flat curves forming an elliptical molding and wrapping chamber, in combination with wrapper folding and seam closing devices, including means for crimping the same, substantially as described.

43. In a crimped seam continuous rod cigarette machine, former G and presser bar i having flat curves forming an elliptical molding and wrapping chamber, in combination with wrapper folding devices, interior support k and exterior devices coacting with said support to form a crimped seam, substantially as described.

44. In a crimped seam continuous rod cigarette machine, former G and presser bar i having flat curves forming an elliptical molding and wrapping chamber, in combination with wrapper folding devices, interior support k formed with a flat curve on its inner face and exterior devices co-acting with said support to form a crimped seam, substantially as described.

45. In a crimped seam continuous rod cigarette machine, former G and presser bar i having flat curves forming an elliptical

molding and wrapping chamber, belt *g* and feeding roll H co-acting therewith, in combination with wrapper folding and seam closing devices, including means for crimping the seam, substantially as described.

46. In a crimped seam continuous rod cigarette machine, former G and presser bar *i* having flat curves forming an elliptical molding and wrapping chamber, belt *g* and feeding roll H co-acting therewith, in combination with wrapper folding devices, interior support *k* and exterior devices co-acting with said support to form a crimped seam, substantially as described.

47. In a crimped seam continuous rod cigarette machine, former G and presser bar *i* having flat curves forming an elliptical molding and wrapping chamber, belt *g* and feeding roll H co-acting therewith, in combination with wrapper folding devices, interior support *k* formed with a flat curve on its inner face and exterior devices coacting with said support to form a crimped seam, substantially as described.

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

DANIEL J. CAMPBELL.

Witnesses:
C. J. SAWYER,
T. F. KEHOE.