(No Model.) 6 Sheets—Sheet 1.

J. A. BONSACK.

CIGARETTE MACHINE.

No. 355,968. Patented Jan. 11, 1887.

Fig. 4.

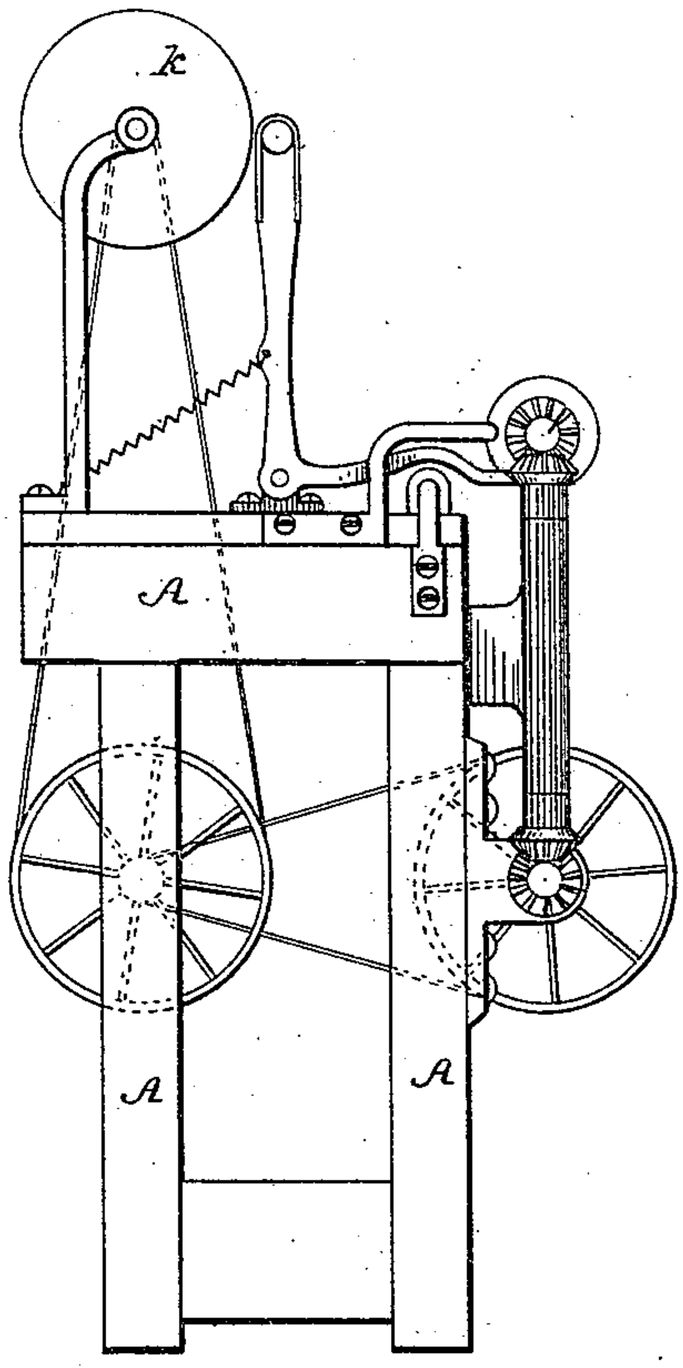
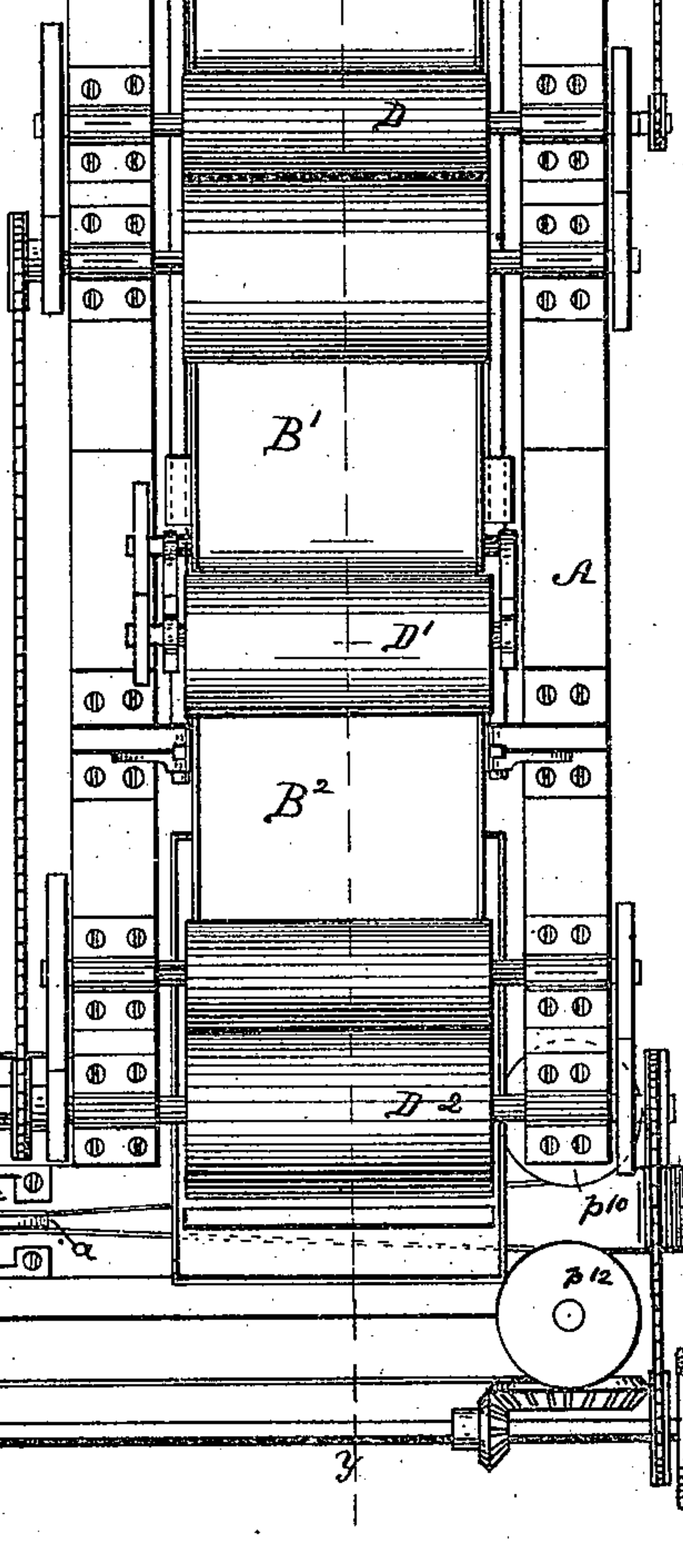
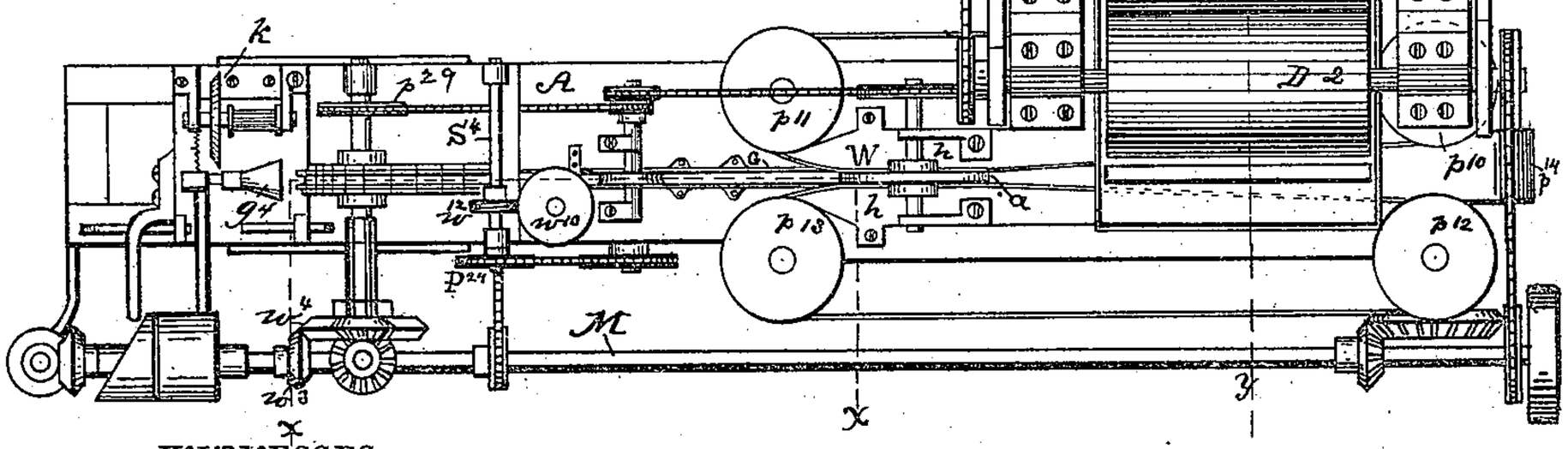


Fig. 1.





WITNESSES

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CIGARETTE MACHINE.

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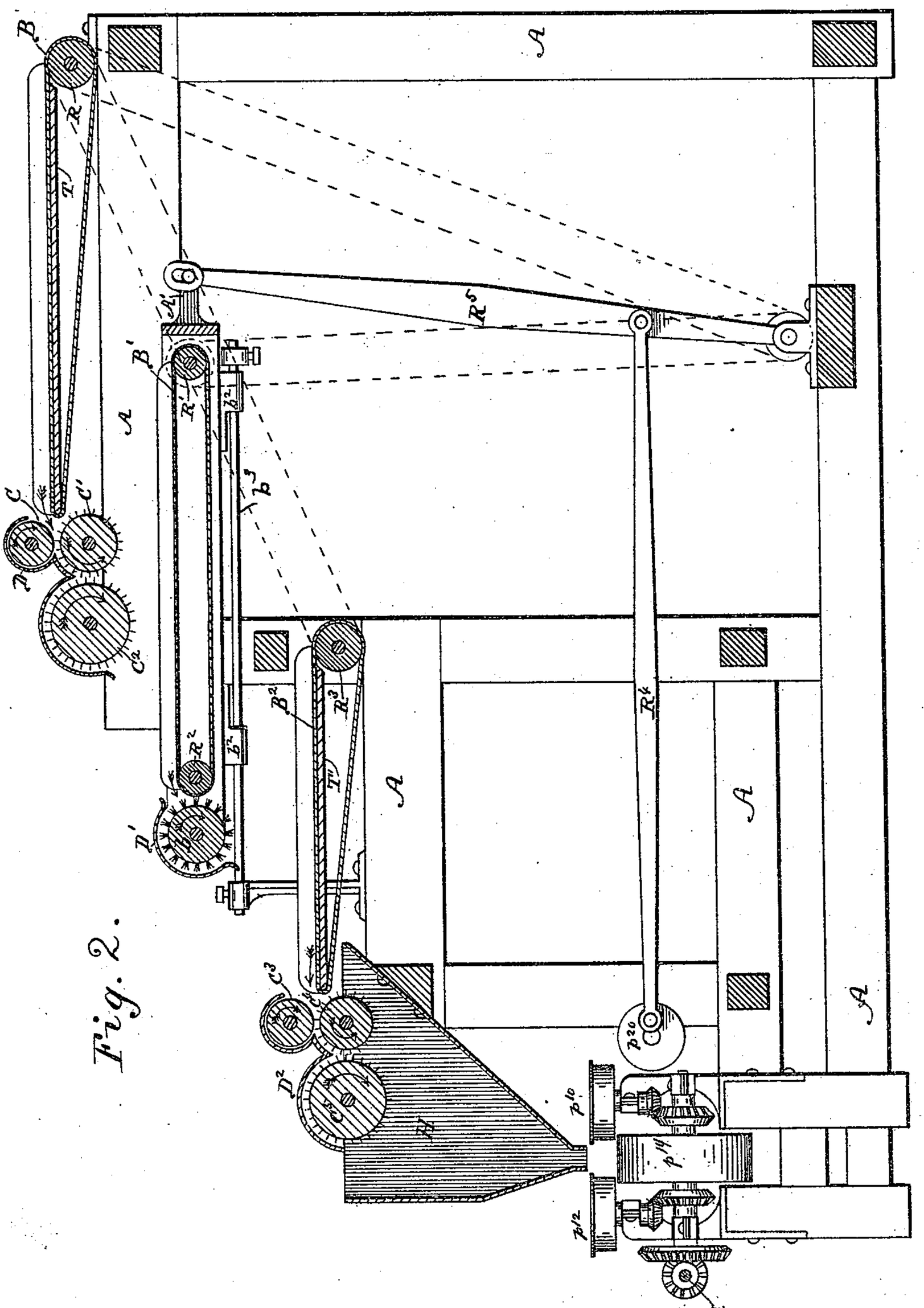

Fig. 2.

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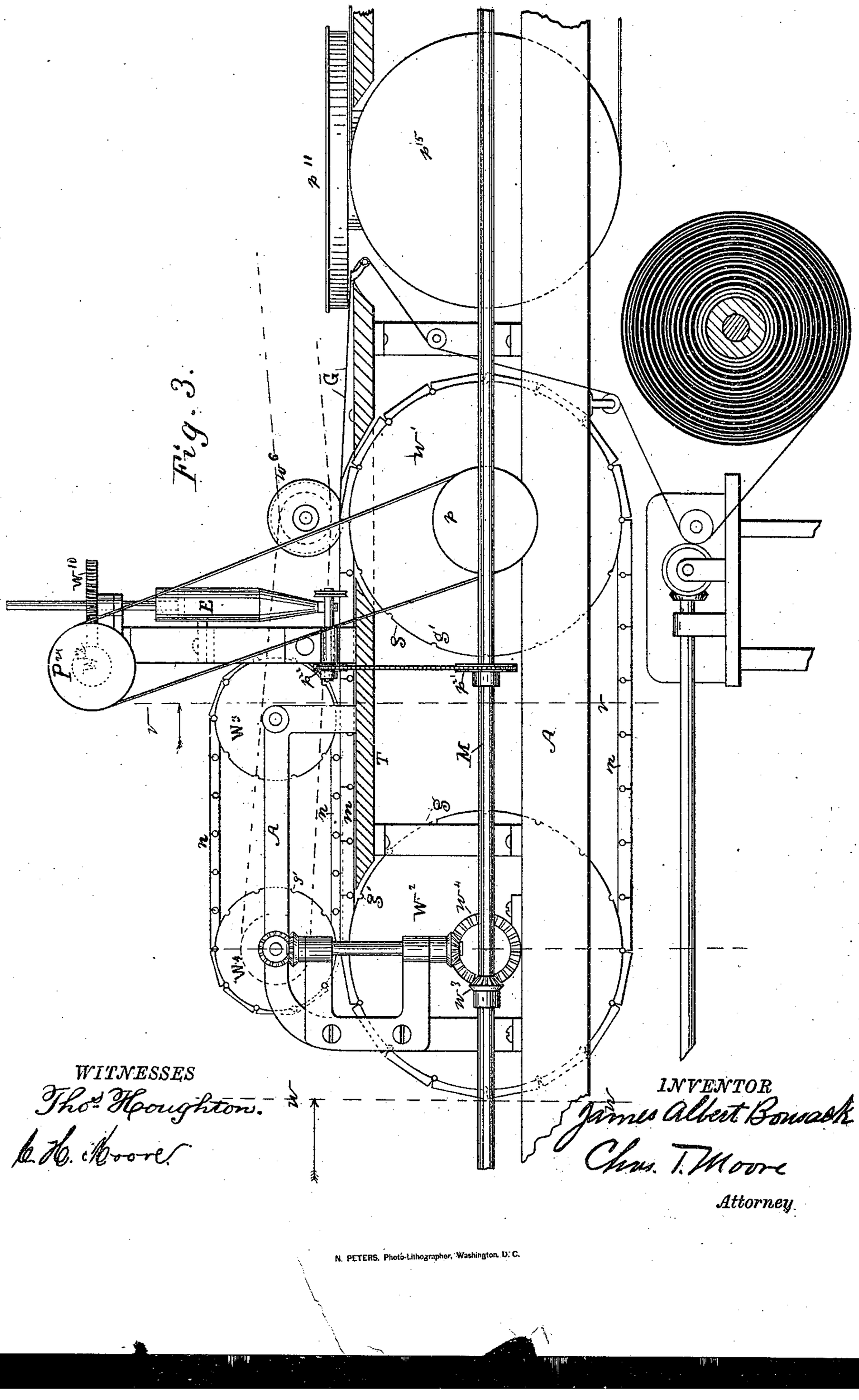

Fig. 3.

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No. 355,968. Patented Jan. 11, 1887.

Fig. 5.

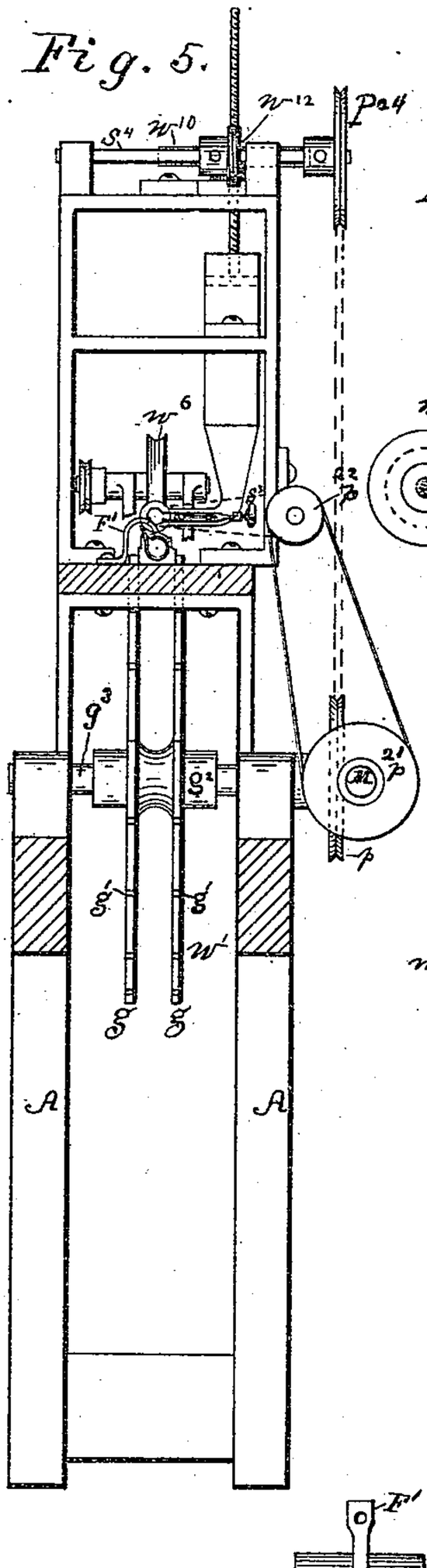


Fig. 7.

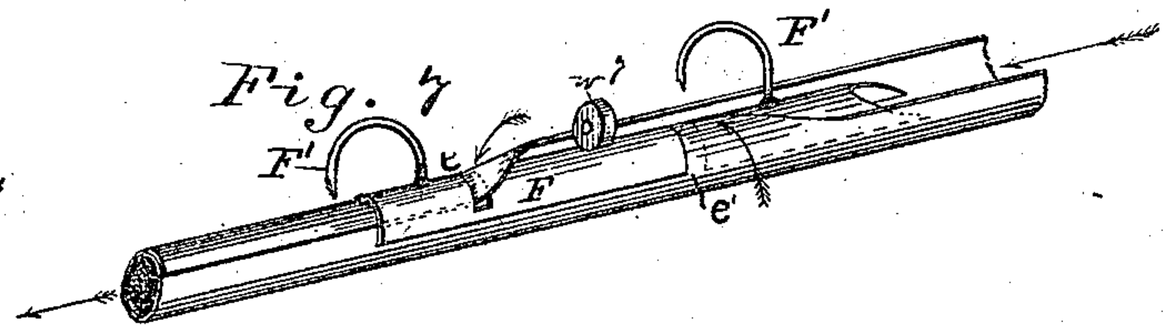


Fig. 8.

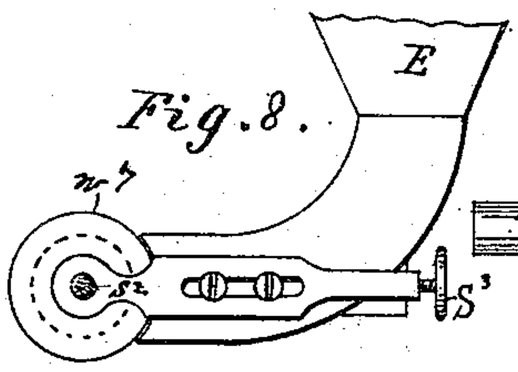


Fig. 6.

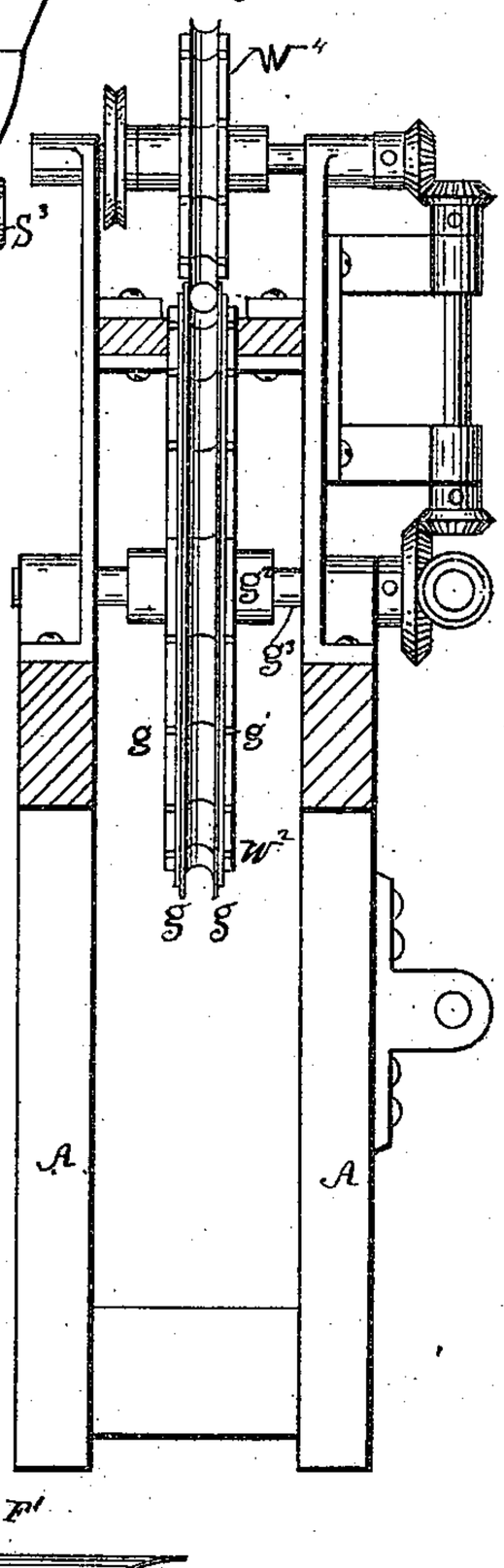


Fig. 10.

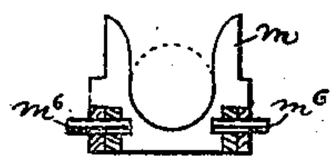
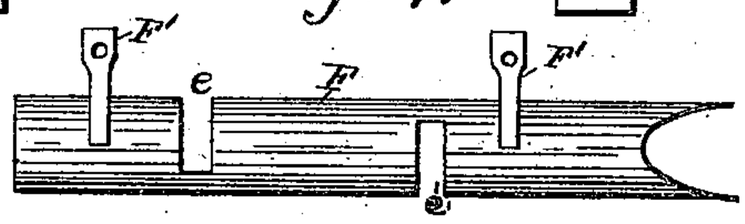


Fig. 9.



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No. 355,968. Patented Jan. 11, 1887.

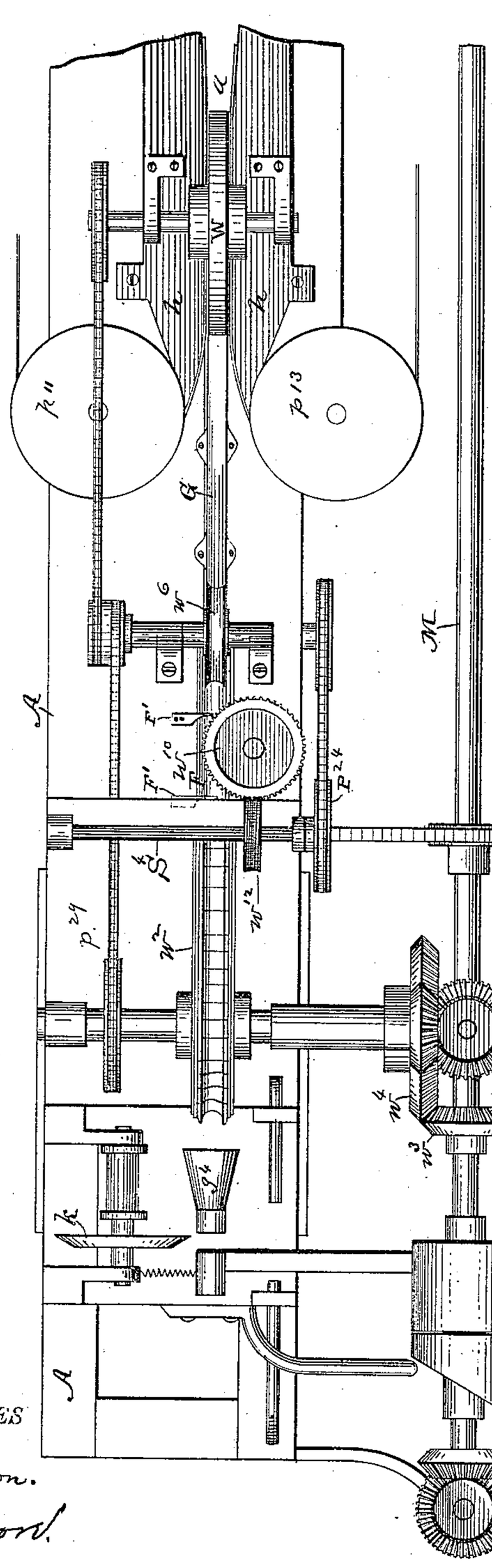

Fig. 11.

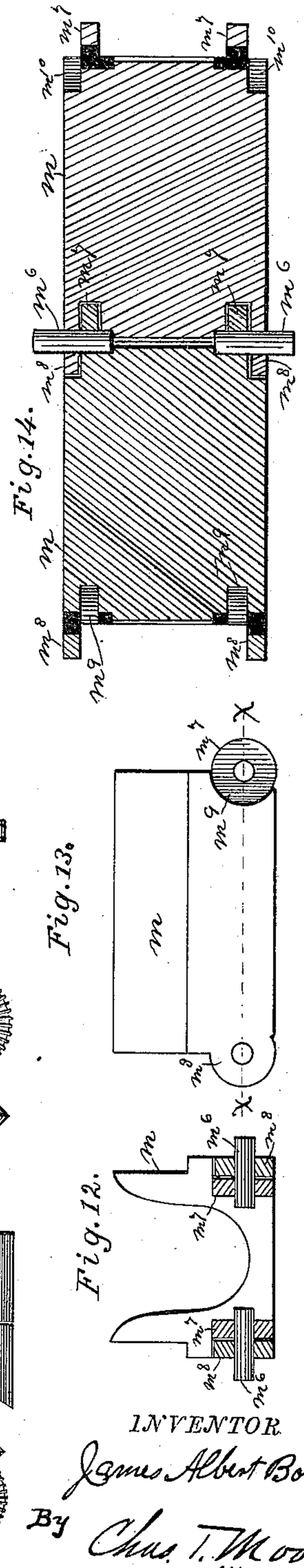

Fig. 14.

Fig. 13.

Fig. 12.

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No. 355,968. Patented Jan. 11, 1887.

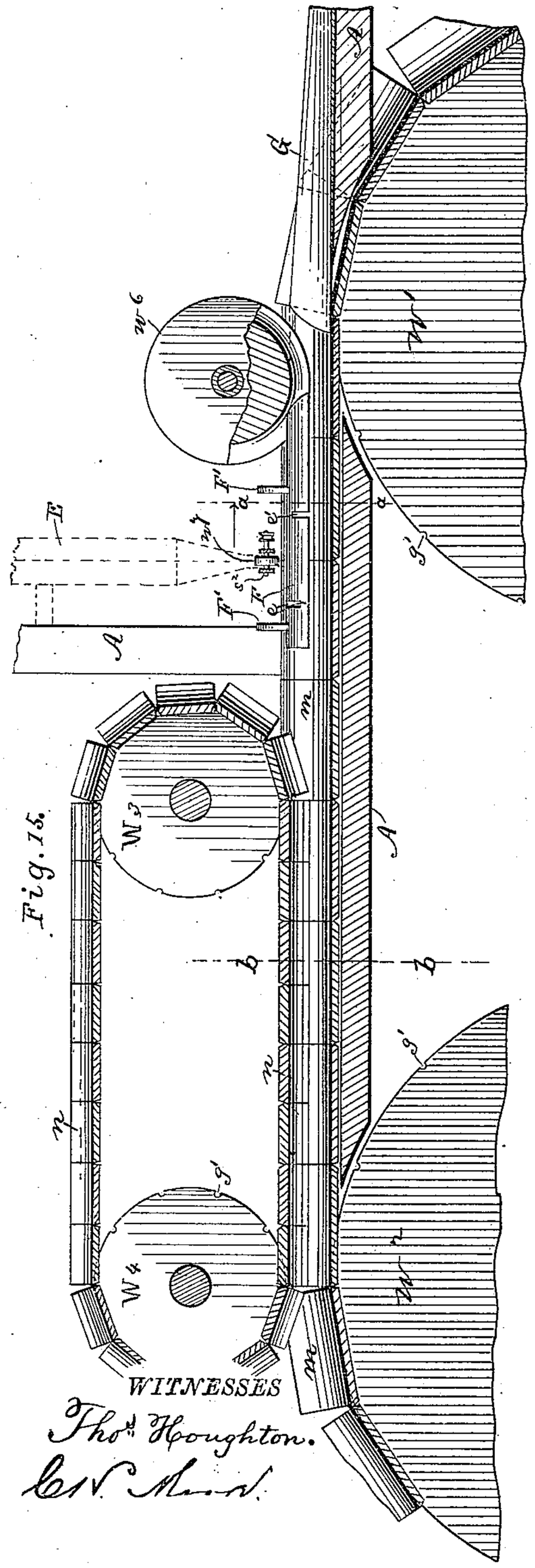

Fig. 15.

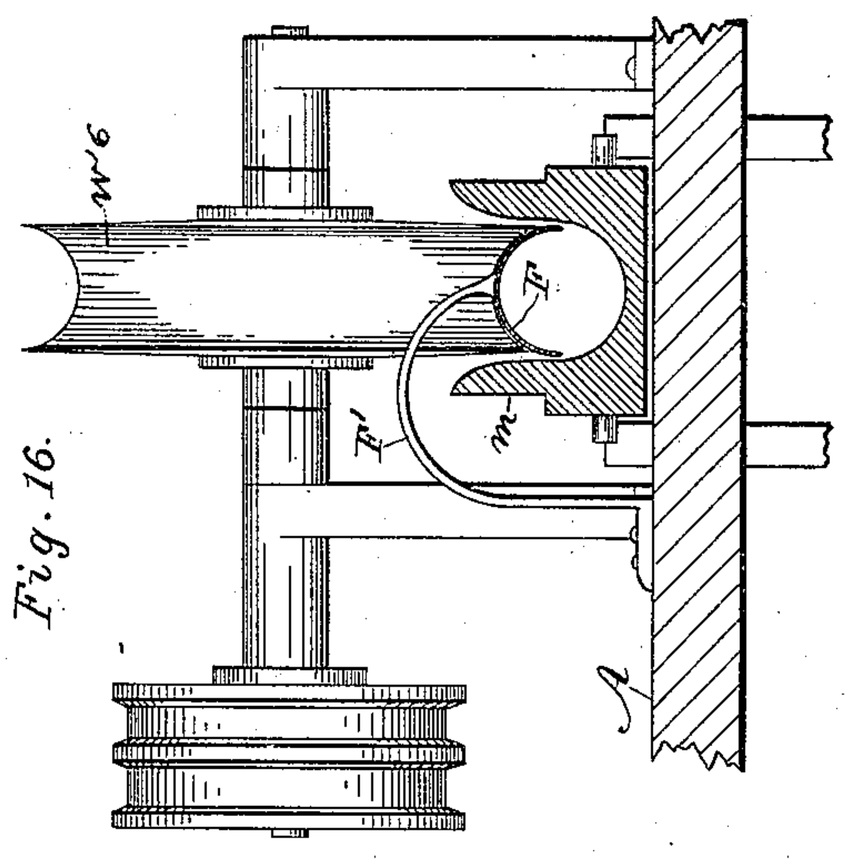

Fig. 16.

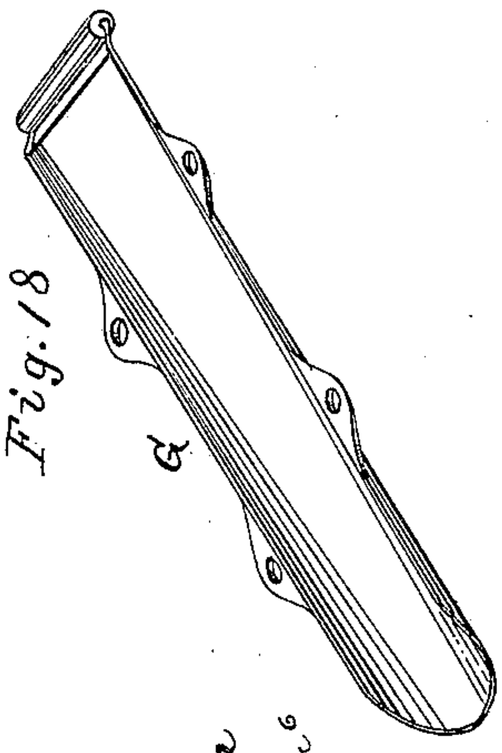

Fig. 18

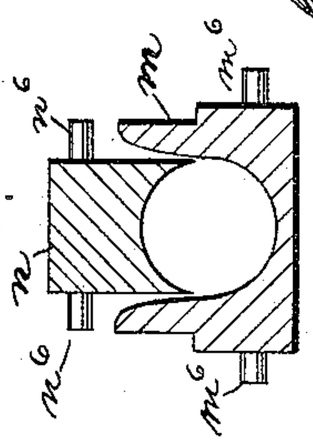

Fig. 17.

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UNITED STATES PATENT OFFICE.

JAMES ALBERT BONSACK, OF BONSACK'S, VIRGINIA.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 355,968, dated January 11, 1887.

Application filed August 30, 1884. Serial No. 141,797. (No model.)

To all whom it may concern:

Be it known that I, JAMES ALBERT BONSACK, a citizen of the United States, residing at Bonsack's, in the county of Roanoke and State of Virginia, have invented certain new and useful Improvements in Cigarette-Machines, of which the following is a specification, reference being had to the accompanying drawings.

In the drawings, Figure 1 is a plan view of my improved cigarette-machine. Fig. 2 is a central vertical section taken on the line *y y* of Fig. 1. Fig. 3 is a central vertical section taken on the line *x x* of Fig. 1. Fig. 4 is an end elevation of the cutting mechanism for severing the continuous cigarette into convenient lengths. Fig. 5 is a vertical section on the line *v v* of Fig. 3. Fig. 6 is a vertical section on the line *w w* of Fig. 3. Fig. 7 is a perspective view of the paper-folder, showing a section of the tobacco-filler with its paper cover. Figs. 8 and 9 are detail views. Fig. 10 is a vertical section through two adjacent links of endless chain *m*. Fig. 11 is an enlarged view of that part of Fig. 1 seen to the left. Fig. 12 is an enlarged vertical section through two adjacent links of chain *m*. Fig. 13 is a side elevation of one of the links in chain *m*. Fig. 14 is a sectional view on the line X X of Fig. 13, showing two links of the chain *m* connected by pivots m^6. Fig. 15 is an enlarged side elevation, partly in section, showing the tube-forming devices F and G, filler-forming wheel w^6, endless chain belts *m* and *n*, with their supporting-wheels W′ W^2 W^3 W^4, and pasting-wheel w^7. Fig. 16 is a vertical sectionon the line *a a* of Fig. 15. Fig. 17 is a vertical section on the line *b b* of Fig. 15, and Fig. 18 is a perspective view of metal guide G for giving the paper its initial curve.

Similar letters refer to similar parts in all the several views.

My invention relates to that class of cigarette-machines in which the loose tobacco is first evenly distributed and afterward formed into a continuous rod or filler for a cigarette, and subsequently enveloped in a paper cover, which is pasted and sealed, and the continuous cigarette finally severed by appropriate cutting mechanism into convenient length.

The object of my invention is to improve the method of folding a continuous paper ribbon about an already-formed tobacco-filler, to have the paste applied directly upon the edge of the paper and with greater uniformity, to avoid the annoyance incident to the unsealing of the cover during the passage of the cigarette through the machine, and to provide for keeping the freshly-sealed cover under pressure while being constantly fed toward the cutting-off mechanism.

My invention consists in certain novel devices and combinations of parts, which I will now proceed to describe, and point out particularly in the claims at the end of this specification.

A represents the frame of the machine, made of wood or, preferably, of metal.

B represents the first feed-belt or endless apron, upon which the tobacco is spread for distribution, supported upon a table, T.

C′ is a roller, provided with pins on its face, which receives the tobacco from the endless apron B and passes it under the smooth roller C, which presses the tobacco well down between the pins of the roller C′, which allow said roller to pass it under the concave back D.

C^2 is a stripping-roller, which, having a faster motion than roller C′, strips the tobacco from it and throws it upon the second endless apron, B′, which apron is distended between rollers R′ R^2, journaled in the reciprocating frame A′, which has motion imparted to it by means of the vibrating arm R^5 and pitman R^4, which are actuated by a crank-pin on pulley, p^{20}.

A hood or cover, D′, is applied to the end of the reciprocating frame A′, covering the brush *b* and preventing the tobacco brushed off of the belt from flying out into the room, and the frame is guided and supported in its reciprocating movements by the sleeves b^2 b^2, embracing and sliding upon the rod b^3, attached to the main frame.

It will be observed that the endless apron B′ has both a revolving and a sliding or reciprocating motion, which causes the tobacco to be more evenly spread upon the third endless apron, B^2, which passes around the pulley R^3 and forward over the curved edge of a subjacent table, T′, which gives support to the upper section of the apron, the travel of which

carries the tobacco to a second set of distributing-rollers, C^3 C^4, and stripping-roller C^5, provided with a concave back, D^2. Said distributing mechanism is the counterpart of the first set of three rollers above described. The tobacco is removed from apron B′ by a revolving brush, *b*, placed in close proximity thereto and under the concave back D′. The stripping-roller C^5 throws the tobacco, which is now fully prepared, into the hopper H, from which it falls into the filler-forming mechanism, consisting of four vertical pulleys, p^{10} p^{11} p^{12} p^{13}, and two horizontal pulleys, p^{14} p^{15}, each pair of pulleys being connected by an endless steel belt, so as to form a receptacle for pressing the filler into a continuous rod. Near one end of said steel belts is journaled a compressing-wheel, W, which is rotated by the friction of the belts forming the sides of the trough at *a*, which converge at that point and are curved to run parallel to the sides of the wheel by backing-strips *h h*. The tobacco, in passing between the three steel belts above mentioned and under wheel W, is thereby compressed into the form of a continuous rod or filler, and continues to travel forward in the machine. As the filler emerges from between the pulleys p^{11} p^{13} it is fed upon a continuous paper ribbon or wrapper for the cigarette.

So far my machine does not differ materially from that described in my prior patents, numbered, respectively, 238,640 and 247,795, and of the dates of March 8, 1881, and October 4, 1881.

In my machine as described in the above patents the tobacco was fed from the filler-forming mechanism upon a continuous paper ribbon and drawn therewith through a forming-die, which further compressed the tobacco and enveloped it in the paper ribbon after exposing the edge of the paper to the action of a pasting-wheel, which caused the edge of the paper to adhere to the body of the cigarette when pressed upon it.

In my present machine I do not use the forming die or tube, which necessitates the use of an auxiliary tape or belt for assisting the passage of the tobacco and paper wrapper through the tube, the paper ribbon used for covering the cigarettes being too delicate to make the passage through a die unassisted.

Instead of the forming-die or folding-tube, as used in my old machines, I use the following devices:

F represents a semicircular piece of metal having two slots, *e e′*, cut into it from either side—one from the right-hand side or edge, the other from the left-hand side—so as to form two entrances for the continuous paper ribbon, as shown in Fig. 7. F′ F′ represent two arms, by which said piece F is supported in position in the machine.

W′ W^2 are wheels about which the chain belt *m* is distended, the wheels being constructed in the following manner:

The circular disks *g g*, constituting one of the wheels, are provided with recesses *g′ g′* at equal intervals upon their peripheries suitable to receive the bearing-pivots of a chain or belt. Said disks are connected by a central hub, g^2, and mounted upon a suitable shaft, g^3, in frame A, as shown in Figs. 3, 5, and 6. The wheels W′ and W^2 are alike and are hung in a similar manner.

Sprocket or chain wheel W^2 is connected by beveled gears w^3 w^4 with the main driving-shaft M.

m represents a chain belt distended between wheels W′ and W^2, as seen in Figs. 3 and 15. Each link of the chain *m* is provided with two inner and two outer lugs or ears, m^7 m^8, and corresponding recesses, m^9 m^{10}, as seen in Figs. 12, 13, and 14, which admits of the interlocking of the several links of the chain by the insertion of rods or pivots m^6, as is clearly shown in section, Fig. 14. The chain *n* is formed in substantially the same manner as chain *m*.

W^3 W^4 represent two similar wheels to W′ W^2, but of smaller diameter and connected by a chain belt, *n*.

E represents a paste-reservoir of cylindrical form, in which a piston is gradually forced down by means of worm-wheel w^{10} and screw w^{12} on shaft S^4, which is provided with pulley P^{24}, the latter receiving motion from a pulley, *p*, on the shaft of the wheel W′.

w^7 is a pasting-wheel mounted on a shaft, S^2, running parallel to the main shaft M, and is provided with a pulley, p^{22}, which receives motion from pulley p^{21} on main shaft M through a suitable belt. The pasting-wheel is made adjustable by means of thumb-screw S^3 at the bottom of the reservoir E.

w^6 is a small grooved wheel adapted to run in the U-shaped recess of endless chain *m*. w^6 has a semicircular groove in its periphery equal in diameter to one-half of the cigarette, and the wheel receives motion from a cord or belt running around a pulley on its shaft and the pulley p^{29} on the shaft of the wheel W^2.

G is a slightly-concave metal guide to conduct the continuous paper ribbon from the point between pulleys p^{11} p^{13}, where it receives the compressed rod of tobacco which forms the filler, to the top of wheel W′ into the groove of endless chain *m*.

Motion is communicated to the various parts of the machine from the main shaft M by means of gear-wheels and chain belts, in the usual well-known manner, as shown in the various figures. The endless traveling chain or belt *m*, which is distended about the wheels W′ W^2, has the outward face of the band, or the respective links of the chain when such are used, grooved, the groove having vertical walls which lead to a concave or semicircular bottom. Into the groove of the band or chain as above formed the paper ribbon for the cover of the cigarette is drawn and conformed to the groove therein, and upon the paper in the groove is fed the already-formed tobacco filler, which passes under the wheel w^6, the paper passing between the side of said wheel w^6 and the vertical walls of the grooved chain

or band *m*. Immediately in front of said wheel is placed the paper-folder F, which sets down in the groove of the chain or band sufficiently deep to form with its concave surface and the bottom of the groove a perfectly circular chamber, one end of the folder being formed to fit close against the under peripheral surface of the wheel w^6, and forming a line tangent thereto. The folder is provided with two supporting-arms, F′ F′, by which it is held entirely free from contact with the vertical walls of the groove in the chain *m*, so as to permit the upturned edges of the ribbon to pass between the folder and the sides or walls of the groove until the paper is drawn under the folder through the slots *e e′*. It will be observed that these slots are made one on either side of the folder, and that the edge of the paper last drawn under will be caused to overlap the other, so that if the paste is applied at the point indicated by the position of the pasting-wheel w^7 in Figs. 7 and 15, the overlapping edge will adhere to the under lap, thus enveloping the tobacco-filler with a continuous paper cover or wrapper.

Directly above the advancing chain *m* is a second band or chain, *n*, revolving on pulleys W^3 W^4, the chain being similar to *m*, but having a face sufficiently narrow to enter the groove in *m*. The two grooves in bands *m* and *n* are semicircular, and their parallel sides form a cylindrical tube or bore, which receives the cigarette and causes it to constantly advance by the revolution of the bands or chains *m* and *n*. The cigarette being once drawn into this tube is compelled to advance with it until the withdrawal of the bands as they diverge on their return travel, the cigarette being fed into the guide or holder g^4, and projected against a revolving knife, *k*, which cuts it into the desired lengths.

The pasting device differs from that in my former patents herein referred to in the following particulars: In my former patents the paste-reservoir E rested upon a roller, the peripheral face of which was slightly concave, and the wheel which supplied the paste to the edge of the paper ribbon rotated on a vertical axis and at right angles to that of the roller upon which the reservoir E rested. As it was necessary that the wheel transferring the paste to the paper should have a narrow rim to avoid using an unnecessary quantity of paste, I found in practice that the paper in being drawn through the forming-die often varied sufficiently from a direct line to carry it below the edge of the pasting-wheel, and consequently the paper received no paste in such places, and the cigarette would open immediately on leaving the tube. To overcome this difficulty in my present machine, I cause my pasting-wheel to receive its supply of paste directly from the reservoir, and I rotate the wheel at right angles to the line of travel of the cigarette. By this means I remedy the difficulty named, the action of the wheel having a constant tendency to keep the paper well up under it, and the cross movement given to it has a tendency to apply the paste more thoroughly and evenly.

The cutting mechanism being substantially the same as that shown in my patent of October 4, 1881, already referred to, will therefore need no further notice here.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making a continuous cigarette, two endless traveling chains or belts, each having a peripheral groove, and the parallel faces of which are adapted to form by reason of their grooves the upper and lower halves of the cylindrical chamber, in combination with a semicircular paper-folder having side openings to accommodate the two edges of an endless paper ribbon, substantially as described.

2. In a machine for making a continuous cigarette, two endless traveling chains or belts, each having peripheral grooves, the parallel faces of said belts being adapted by reason of their grooves to form a cylindrical chamber when brought in contact, and a semicircular paper-folder, all in combination with a pasting-wheel for the purpose of folding a continuous paper ribbon about an already-formed tobacco-filler, and sealing the envelope and feeding the continuous cigarette to appropriate cutting mechanism, substantially as described.

3. In a machine for making continuous cigarettes, two endless traveling belts having peripheral grooves adapted to the formation of a cylindrical chamber when their parallel faces are in contact, a semicircular paper-folder having openings in opposite sides for the accommodation of the two edges of a paper ribbon for the purpose of folding the ribbon about an already-formed tobacco-filler, sealing the envelope, and feeding the continuous cigarette to a cutting mechanism, all jointly and severally in combination with a filler-forming mechanism, substantially as described.

4. In a machine for forming a continuous cigarette, two endless chains or belts having peripheral grooves for the purpose of feeding a continuous cigarette, a forming-wheel for the purpose of giving the tobacco the desired shape, a paper-folding device for the purpose of folding the paper ribbon about the already-formed filler, and a pasting-wheel for applying paste to one edge of the paper, all in combination with a filler-forming mechanism, substantially as described.

5. In a machine for forming a continuous cigarette, a distributing mechanism, a filler-forming mechanism, a forming-wheel, a paper-folding device, a paste-reservoir and a pasting-wheel, and two endless traveling chains or belts having peripheral grooves and adapted to form a cylindrical chamber, in combination

with a cutting mechanism, substantially as described.

6. In a machine for forming a continuous cigarette, a paper-folder consisting of a single piece of metal of semicircular form, having right and left openings for the accommodation of the two edges of a continuous paper ribbon for the purpose of enveloping a continuous tobacco-filler in said ribbon and sealing the same, substantially as described.

7. In a machine for forming a continuous cigarette, a paper-folder consisting of a single piece of metal of semicircular form, having side openings, and one or more supports for holding it suspended in the peripheral groove of a revolving chain or belt and out of contact therewith for the purpose of folding a continuous paper ribbon about an already-formed tobacco-filler, substantially as described.

8. In a machine for making a continuous cigarette, the combination, with the mechanism for forming a continuous filler for the cigarette, devices for folding the paper wrapper about said filler, and a device for applying paste to said wrapper, of two endless traveling chains or belts, each having a peripheral groove placed on either side of the continuous cigarette when formed, pressing its freshly-sealed edges together, and feeding it forward, and a cutting mechanism for separating it into suitable lengths, substantially as described.

9. In a machine for forming a continuous cigarette, a paper-folder consisting of a single piece of semicircular metal having two slots, one on either side, for the accommodation of the edges of the paper wrapper, and a device for applying paste to one of the edges of said paper arranged between the two slots, substantially as described.

10. In a machine for forming a continuous cigarette, a paper-folder consisting of a single semicircular piece of metal having two slots, one on either side, through which the edges of the paper pass, the first slot operating to turn the edge of the paper beneath the plate, and the second slot operating to turn the other edge of the paper beneath the plate also, and upon the other opposite edge of the paper, and means for applying paste to the edge of the paper last folded down, substantially as described.

11. In a machine for making continuous cigarettes, the combination, with the mechanism, substantially as described, for forming the filler, and the folder for folding the web of paper around the filler, of a wheel for applying paste to one edge of the paper web, rotating on an axis transverse to the line of movement of the said web, substantially as described.

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