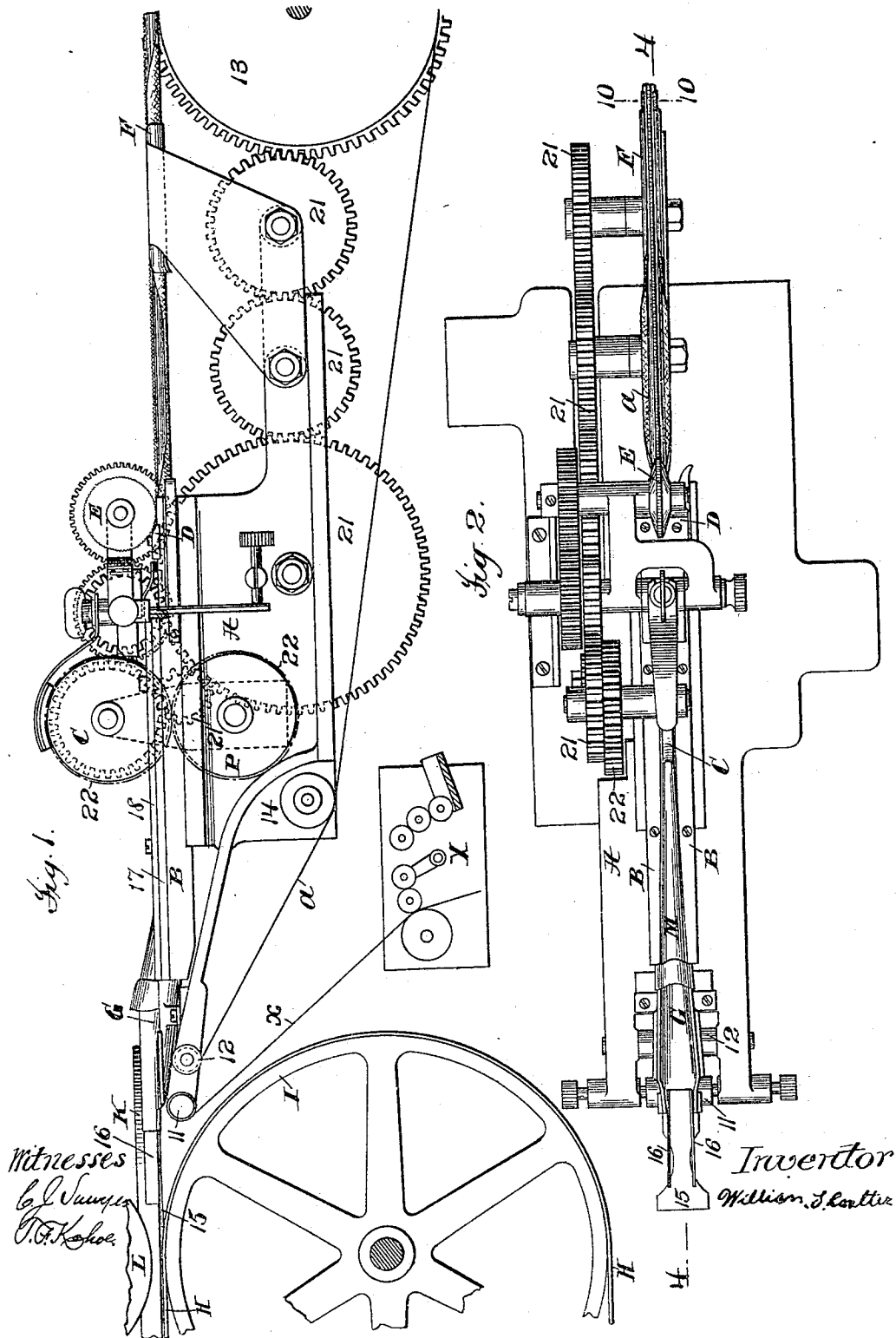


No. 819,730.

PATENTED MAY 8, 1906.

W. T. COALTER.
CIGARETTE MACHINE.
APPLICATION FILED AUG. 17, 1896.

3 SHEETS—SHEET 1.

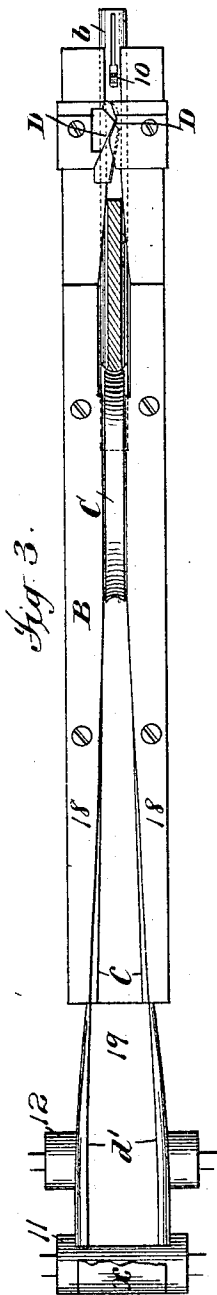


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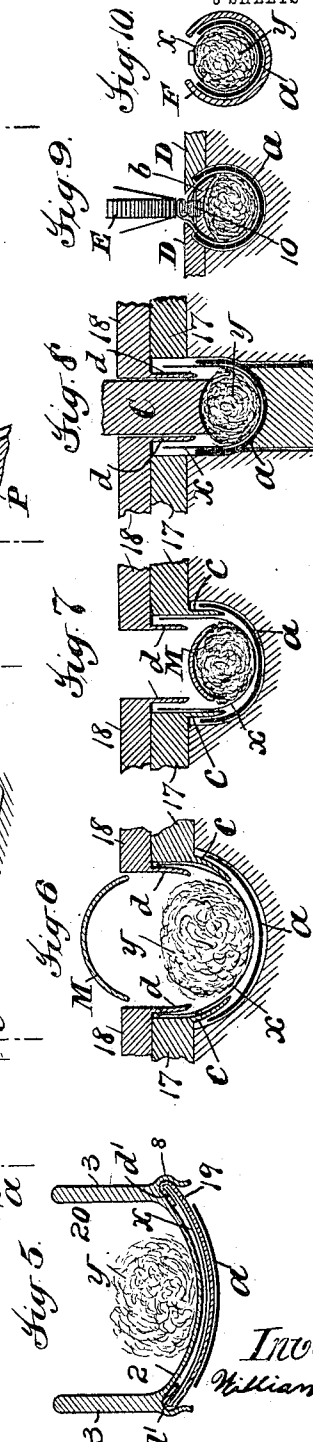
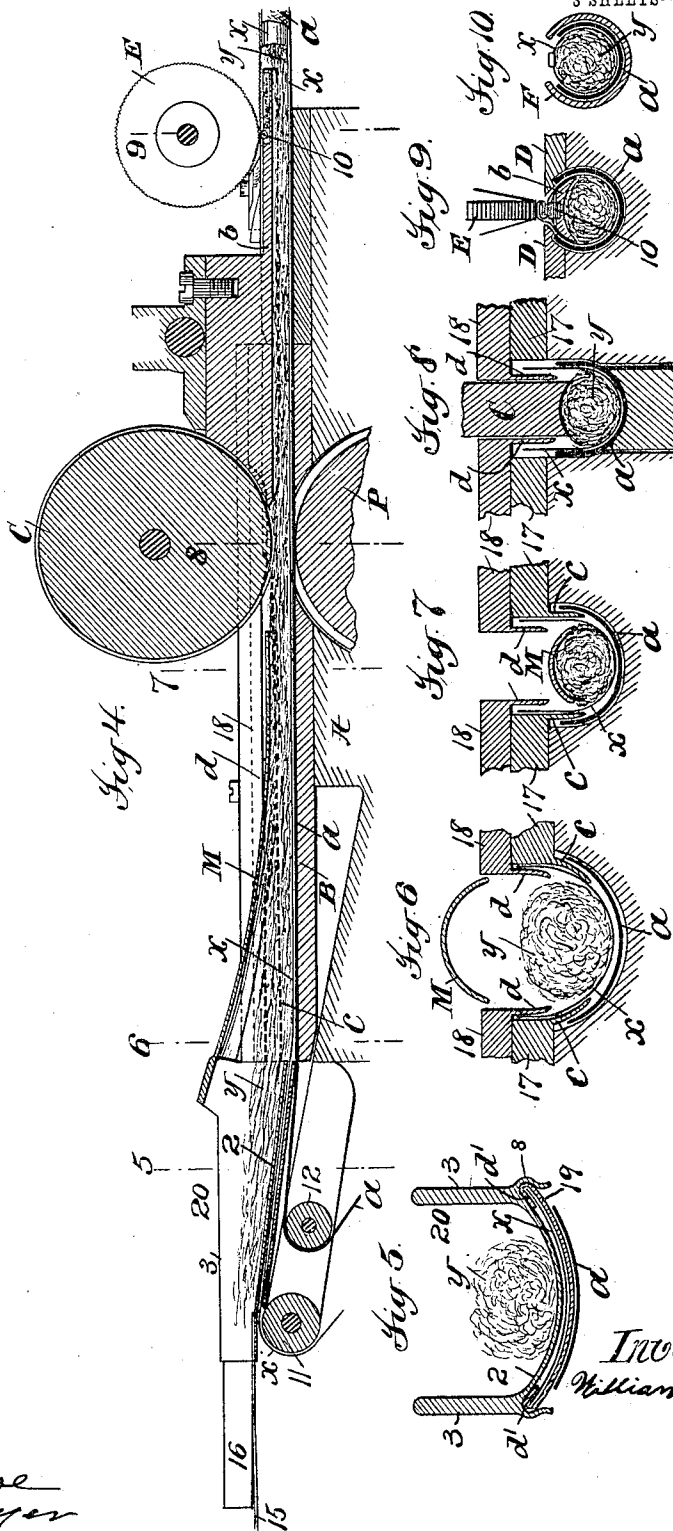
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3 SHEETS—SHEET 2.



Witnesses

T. F. Kehoe
by Attorney



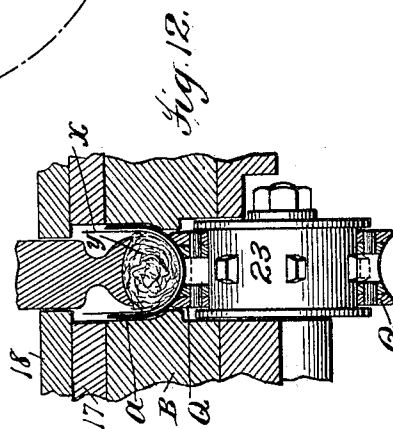
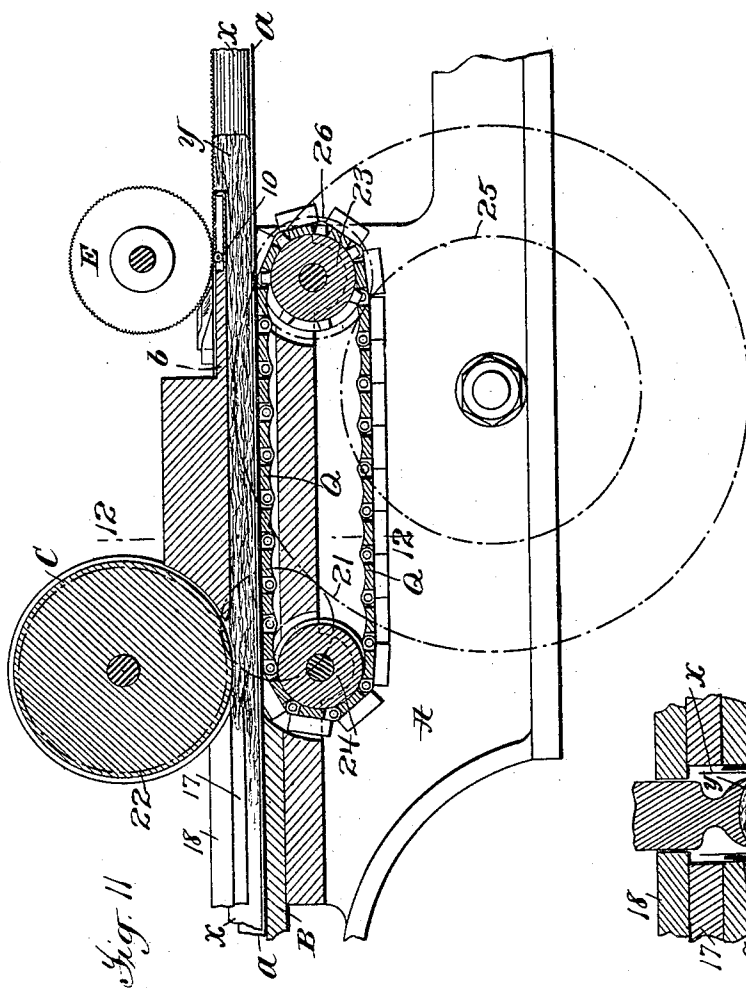
Inventor
William T. Coalter

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APPLICATION FILED AUG. 17, 1896.

3 SHEETS—SHEET 3.



Attest

T. F. K. Shae
C. J. Sawyer

Inventor
William T. Coalter

UNITED STATES PATENT OFFICE.

WILLIAM T. COALTER, OF BARTON HEIGHTS, VIRGINIA, ASSIGNOR TO
THE AMERICAN TOBACCO COMPANY, OF NEWARK, NEW JERSEY, A
CORPORATION OF NEW JERSEY.

CIGARETTE-MACHINE.

No. 819,730.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed August 17, 1896. Serial No. 602,945.

To all whom it may concern:

Be it known that I, WILLIAM T. COALTER, a citizen of the United States, residing at Barton Heights, county of Henrico, and State of Virginia, 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 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.

While certain features of the invention are applicable also to cigarette-machines in which the edges of the wrapper are secured by pasting, the invention relates especially to that class of cigarette-machines in which the wrapper-seam is 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, and all the features of the invention therefore will be illustrated and described in connection with such a machine.

One feature of the invention relates to the construction of the former through which the tobacco filler and wrapper are carried by the belt to the wrapper-folding and seam-closing devices. In my improved construction I extend the former rearward for a considerable distance from the presser-roller, which is preferably used on top of the filler behind the wrapper-folding devices, and provide the former with side walls inclined toward each other so as to form a gradually-contracting channel by which the filler and edges of the wrapper are gradually brought to the horizontal dimensions of the cigarette, avoiding any sharp bend of the wrapper, and the extended continuous gradually-converging wrapper and belt-guides of the former hold the filler and wrapper steady, prevent the wrapper from running high and low, and give more room for adjusting the belt. With this gradually-converging former and guides carried thereby, moreover, the operator is enabled to run the wrapper through by operating the belt by hand in case of a breakage in

the wrapper. With this improved former I preferably use an inclined tongue above the filler extending from the mouthpiece, through which the tobacco enters the former approximately to the presser-roller, which tongue not only presses the tobacco down against the wrapper and belt and lessens the chance of any slipping, but being inclined downward gradually it molds the filler gradually until the latter reaches the presser-roller and keeps the tobacco pressed so firmly that it avoids to a great extent the difficulty with previous constructions that the tobacco gets into the groove of the wrapper-guide after leaving the mouthpiece and tears the paper, causing a choke in the machine and necessitating stopping the latter for cleaning out the channel and starting the paper again. I also preferably form the wrapper-guides so as to aid in avoiding this difficulty by inclining them slightly and gradually from the rear to the front end of the former, so as to widen slightly the grooves in which the wrapper edges run, with the result that any small fibers of tobacco that may get into these grooves at or near the mouthpiece, where this is most likely to occur, will tend to run out of the grooves as they widen or will not cause a choke or tearing of the wrapper on account of the greater space in the grooves and freer movement of the wrapper.

With the extended former having its side walls inclined so as to form a gradually-contracting channel the mouthpiece may be made quite short, and the bending of the edges of the wrapper and belt is performed largely by the gradually-contracting guides in my improved former. The belt-guides in the former are preferably put in at an angle, being inclined inward at the rear end of the former and this incline being gradually reduced, so as to bring the edges of the wrapper gradually to vertical position, so as to avoid any sharp bend of the edges of the wrapper as they pass from the mouthpiece into the former, and thus avoid danger of tearing the wrapper, these inclined guides thus forming substantial continuations of the surfaces on which the edges of the wrapper are supported in the mouthpiece. The wrapper-guides may be similarly inclined also, so as to correspond in form with the belt-guides, so as to avoid any substantial change of angle of these guides

between the mouthpiece and former; but this form of the wrapper-guides is less important and in many cases will not be necessary, this depending somewhat on the form of the mouthpiece.

Another feature of the invention relates to means for giving a positive motion to the tobacco filler and wrapper as they approach the wrapper-folding and seam-closing devices, so as to avoid dragging or slowing up of the tobacco-filler at this point. In this class of machines the tobacco-filler is liable to run irregularly at the grooved presser-roller used behind the wrapper-folding and seam-closing devices, which is caused to some extent by irregularity in the feeding of the tobacco, so that the filler is larger at some places than at others, and in part by the dragging of the filler caused by its compression in being carried under the support inside the wrapper, previously referred to as forming part of the seam-closing devices. The result is that there is liability to choking of the machine at or beyond the presser-roller and the cigarettes are not perfectly uniform, and in case the wrapper-strip is printed either in the machine or previously, as usual in cigarette manufacture, the print will not come at the same point on all the cigarettes, as is desirable. For the purpose of avoiding these difficulties I use positive feeding devices engaging the belt and filler, so as to aid in securing the uniform feed of the latter in passing under the support, this means preferably consisting of feeding devices, such as a grooved chain or wheel below the belt, and driven at the same rate of speed as and co-acting with the presser-roller, so as to give a positive motion to the tobacco filler and wrapper at this point and prevent any dragging of the filler or wrapper. I preferably use an endless-chain construction, as this enables me to conveniently and efficiently continue the hold upon the lower side of the belt from the presser-roller as far as may be found requisite for securing the best action, so that this hold upon the belt may be maintained beneath the support and until the seam is closed, if desired.

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 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, Figure 1 is a side elevation of so much of a cigarette-machine as is necessary to illustrate the invention. Fig. 2 is a plan view of the same with the devices for feeding the tobacco to the mouthpiece omitted. Fig. 3 is a plan view of the filler-

forming and wrapper-folding and seam-closing devices with the top portion of the mouthpiece and top filler-pressing tongue removed. Fig. 4 is a longitudinal section on the line 4 of Fig. 2. Figs. 5, 6, 7, 8, and 9 are cross-sections looking to the left on, respectively, the lines 5, 6, 7, 8, and 9 of Fig. 4. Fig. 10 is a cross-section on the line 10 of Fig. 2, showing the compressing-tube. Fig. 11 is a partial section similar to Fig. 4, but on a larger scale, showing the preferred construction of my improved feeding devices for the filler and wrapper. Fig. 12 is a cross-section of the same on the line 12 of Fig. 11.

Referring to the drawings, A is the frame, on which the various devices are mounted, which frame may be of any suitable form. On this frame is mounted the former B, providing the channel through which the wrapper-strip *x* and filler *y* are carried by the belt *a* beneath the roll C, which is shown as corresponding to the grooved presser-roll of the machines now in use, and past the interior support *b* and wrapper-folding guides D, by which the edges of the wrapper are folded together, to the external crimping-wheel E, coacting with the roller 10, carried by the interior support *b* to indent or perforate the edges of the wrapper together to form what is known as a "crimped" seam, and from which the continuous cigarette-rod, with its seam thus closed, passes with the belt through the compressing-tube F, by which the cigarette-rod is compressed to its final form, so as to be delivered in firm condition and of exact shape, the machine, as shown, being constructed to produce a cylindrical cigarette. It will be understood, however, that this compressing-tube or other means used for the same purpose will be formed in accordance with the shape of the cigarette to be produced. The wrapper *x* passes to the belt through a printing device X, shown diagrammatically and which may be of any suitable form, and over a wrapper support or roll 11, and the belt *a* passes over the rear belt support or roll 12 through the former and from the compressing-tube F returns around belt-driving roll 13 and guide-roll 14. The interior support *b* and wrapper-folding and seam-closing devices and the means for supporting and driving these parts may be of any suitable form and are shown as of a form now well known, so that no further description thereof need be given.

The tobacco for the filler is fed to the former through a mouthpiece G, through which the wrapper *x* and a belt *a* run, and the tobacco may be fed by any suitable tobacco-feeding means, that shown consisting of a bottom belt H, running on a large belt-roll I and side wheels K and a top wheel L, as in the now well-known Bonsack machine, the mouthpiece G being provided with the usual scraper 15, which takes the tobacco from the belt H,

and the tobacco passing between the side guides 16 to the body of the mouthpiece, as in constructions now well known.

Referring now to the special construction of the former B, in which certain features of the invention are embodied, the former B is preferably made of two superposed plates 17 18, these plates being provided with downwardly-extending flanges *c d*, forming, respectively, belt and wrapper guides, this two-plate construction being now well known. In constructions heretofore in use, however, this former and the channel therein have extended rearward in substantially straight lines, so as to form only a comparatively short straight channel behind the presser-roller C, and both the belt and wrapper guides *c d* have been straight, forming guiding-surfaces vertical throughout the length of the former. In my improved construction these plates extend rearward a considerable distance from the roller C and are tapered inward from their rear end, so as to form inclined side walls, producing a gradually-contracting channel in the former extending from its rear end, so that the wrapper and belt are thus gradually curved and the filler molded by continuous gradually-inclined walls, avoiding any sharp bend of the wrapper or belt, as in passing from the mouthpiece to the straight former now in use. The belt guides or flanges *c* on the lower plate 17 also are preferably inclined or curved inwardly toward the bottom of the channel, as clearly shown in Figs. 3, 6, and 7, these curved or inclined flanges forming substantial continuations on the same angle of the wrapper-guiding surfaces of the mouthpiece, so that there is no sharp bend of the wrapper in passing from the mouthpiece to the former. These guides *c* gradually change to a vertical position, as shown, so that the belt and wrapper edges are gradually brought to vertical position in the former and any sharp bend avoided. The wrapper guides or flanges *d* may also be inclined or curved similarly to the guides *c* for a short distance from the rear end of the former, as shown in Fig. 6; but, as above stated, this is less important. I preferably, also, make the distance between these wrapper-guides *d* and the inner side of the plate 17 increase slightly from the rear end of the former, so that the width of the wrapper-grooves increase slightly and gradually in order that any fine particles of tobacco that may get into these grooves will more readily run out as the grooves widen and not interfere with the run of the wrapper. This feature is illustrated in Figs. 6 and 7, the wrapper-grooves being shown wider in the latter figure than in the former.

While the former has been shown as made of the two superposed plates 17 18 and the belt and wrapper guides *c d* as formed by

flanges on these plates and this in the preferred construction, it will be understood that this part of my invention is not to be limited to such preferred construction.

With the gradually-contracting channel in the former B produced by the inclined side walls, as above described, is preferably used an inclined top filler molding-tongue M, which is shown as carried by the mouthpiece G, this being the preferred construction, although the tongue may be mounted in any other suitable manner, this tongue M preferably extending forward to, or nearly to, the roller C or substantially the same point when this roller is not used and acting to gradually press down the tobacco against the wrapper and belt and gradually mold the tobacco to form a filler of the proper size and secure the other advantages above pointed out. While this tongue is preferably used, however, it will be understood that it may be omitted and the other features of the invention used without it.

At the rear end of the former B is mounted the mouthpiece G, this mouthpiece preferably being formed in two parts, as shown, a bottom 19, fixed to the frame of the machine and having side wrapper-guides *d'*, forming rearward extensions of the wrapper guides or flanges *d* of the former B, and a top part 20, which is preferably made readily detachable from the machine, especially in case the tongue M is carried thereby, as shown, so that access to the filler within the former B may quickly and conveniently be secured. This top part 20 is shown as secured to the bottom 19 by spring-flanges 8, (see Fig. 5,) which hold the two parts together with sufficient firmness for the operation of the machine, while at the same time permitting the top part 20 with the tongue M, carried thereby, to be readily detached. This upper part 20 of the mouthpiece G has a bottom plate 2, upon which the tobacco to form the filler *y* is fed in out of contact with the wrapper *x* and side walls 3, forming a trough within which the tobacco lies, this trough being open at the top, so that the tobacco may readily be reached by the operator up to the point when it passes beneath the tongue M, and, as above explained, by removing the top part 20 of the mouthpiece the tobacco may when necessary readily be reached between the mouthpiece and the presser-roller C. It will be seen that the plate 2, forming the bottom of the top part 20 of the mouthpiece G and over which the tobacco is fed to the former, extends over the wrapper in advance of the belt-support 12, so that the wrapper is directly supported by the belt at the time the filler is brought into contact with it and by the open top of the mouthpiece the tobacco may conveniently be examined and its proper condition assured before it is allowed to pass onto the wrapper, thus avoiding the danger of tearing the latter

in pinching off or otherwise handling the tobacco while upon the wrapper and the latter unsupported by the belt.

Referring now to my improved feeding devices for giving a positive motion to the tobacco-filler as it approaches the wrapper-folding and seam-closing devices, these feeding devices are formed in the construction shown in the general views and Fig. 8 of a grooved feeding-roll P, engaging the lower surface of the belt *a* through an opening in the bottom of the former B and coacting with the grooved roller C on top of the filler, which may, as shown, correspond in general to the presser-roller of the machines now in use. These two rollers C P coact, as shown in Figs. 4 and 8, to grip the filler *y* with the wrapper *x* and the belt *a* and assure the positive and uniform motion of the filler and wrapper with the belt. These feeding-rollers may be driven in any suitable manner; but the upper roll C is shown as driven from the roll 13 through intermediates 21, as in the case of the corresponding presser-roller now in use in such machines, and the shafts of the two feeding-rolls C P are geared together by gears 22, so as to move at the same surface speed. In Figs. 11 and 12 I have shown a construction employing a grooved chain or belt in place of the lower roller P, this chain or belt being arranged so as to coact with the roller C at its rear end, but preferably extends forward from this roller, as shown, so as to engage the belt and aid in carrying the filler and wrapper beneath the support B and to or beyond the seam-closing devices. In the construction shown in these figures a linked chain Q is used, having the outer surface of its links curved to receive the belt and wrapper, as shown in Fig. 12, and driven by a sprocket-wheel 23 at its forward end, with a supporting-roll 24 at its rear end beneath the roller C, the sprocket-wheel 23 being driven from the stud of the large intermediate 21 through a gear 25 on the stud meshing with gear 26 on the shaft of the sprocket-wheel. While the construction shown, employing but a single roller above the belt, will be found efficient for the purpose, either with feeding-roll P or the chain or belt Q below the feeding-belt *a*, it will be understood that suitable feeding devices may be used above the filler coacting with the roll P or chain Q and that various forms of feeding devices may be used in place of those shown by me as the preferred form of embodiment of my invention.

The tube F, formed of a metal plate bent into cylindrical or other desired form, with its longitudinal edges preferably slightly separated over the line of travel of the seam of the cigarette-rod, as shown in Figs. 1, 2, and 10, I consider the preferred construction for the purpose for which it is used, as such a tube may readily be changed in size by opening or closing it so as to properly handle the

cigarette-rod under different conditions of the tobacco or cigarette-rods of different sizes or forms. The purpose for which this tube F is used will now be described more in detail. In making a crimping-seam in a cigarette-rod with mechanism such as that heretofore described, including an external crimping-wheel E and an internal support *b*, the tobacco is compressed by the internal support, so that as it passes the latter it does not completely fill the wrapper. The natural expansion of the tobacco has been relied upon to fill the wrapper, and thus correct the irregularities in the form or disposition of the filler produced by the support inside the wrapper; but it has been found in practice that cigarettes of exact form with the tobacco completely and evenly filling the wrapper are not secured. This difficulty is avoided, however, by the provision of the tube F, which is located beyond the seam-inclosing devices and by which the cigarette-rod is compressed to correct the irregularities thus produced, the cigarettes delivered being thus of exact form, with the tobacco properly filling the wrapper, so that they can be safely handled with the cigarette catching and packing devices now in use.

It will be understood that the seam may be secured by other suitable means than that shown, many of which are now well known, and that the term "crimped" seam used in some of the claims is intended to cover all forms of such seams whether the machine acts by pressing, crimping, indenting, corrugating, or perforating the edges together. It will be understood also that many of the features of my invention may be used without the others and in machines of other form than that shown and that my invention is not limited to the exact form of any of the devices shown as the preferred embodiment of the respective features of the invention, but that many modifications may be made therein while retaining the invention.

What I claim is—

1. In a cigarette-machine, a former having the belt-guides *c* extending along the former and inclined downwardly toward each other at the rear end of the former and gradually changing to vertical position, substantially as described.

2. Former B having its side walls inclined to form a gradually-contracting channel and having the belt-guides *c* and wrapper-guides *d* extending along the side walls of the former and inclined downwardly toward each other at the rear end of the former and gradually changing to vertical position, substantially as described.

3. In a cigarette-machine of the class described having a tubular tobacco-receiving means, wrapper-guides inclined to form grooves for receiving the edges of the wrapper, said grooves increasing gradually in

width in the direction of movement of the wrapper, substantially as described.

4. Former B having the inclined side walls forming a gradually-contracting channel and having the wrapper-guides *d* inclined to form wrapper-grooves increasing gradually in width in the direction of movement of the wrapper, substantially as described.

5. Former B having the inclined side walls forming a gradually-contracting channel and having the wrapper-guides *d* inclined to form wrapper-grooves increasing gradually in width in the direction of movement of the wrapper, in combination with the top filler-molding tongue M, substantially as described.

6. In a cigarette-machine of the class described having a tubular tobacco-receiving means, wrapper-guides inclined to form grooves for receiving the edges of the wrapper, said grooves increasing gradually in width in the direction of movement of the wrapper, in combination with a filler-molding tongue, substantially as described.

7. The combination with the wrapper-folding and seam-closing devices of a continuous-rod crimped-seam cigarette-machine, of a presser-roller above the filler adjacent to and behind the wrapper-folding devices, and the inclined top filler-molding tongue rearward of and adjacent to the presser-roller, substantially as described.

8. The combination with the wrapper-folding and seam-closing devices of a continuous-rod crimped-seam cigarette-machine, of a former provided with inclined side walls forming a gradually-contracting channel, a presser-roller adjacent to and behind the wrapper-folding devices, and an inclined top filler-molding tongue rearward of and adjacent to the presser-roller, substantially as described.

9. The combination with a former having inclined side walls forming a gradually-contracting channel with wrapper and belt guides extending through the channel, of a mouthpiece having a bottom over which the tobacco is fed in out of contact with the wrapper, and an inclined top filler-molding tongue, substantially as described.

10. The combination with the filler forming and wrapping devices of a cigarette-ma-

chine, and a belt carrying the filler and wrapper, of feeding devices engaging the filler and belt and driven by means other than the belt for securing the movement of the filler with the belt to the wrapping devices, substantially as described.

11. The combination with the filler-forming and wrapper-folding devices of a cigarette-machine, of a support within the wrapper, means coacting with said support to secure the edges of the wrapper into a seam, a belt carrying the filler and wrapper, and feeding devices engaging the filler and belt adjacent to and behind the support for securing the movement of the filler with the belt beneath the support, substantially as described.

12. The combination with the filler forming and wrapping devices of a cigarette-machine, and a belt carrying the filler and wrapper, of a feeding-roll above the filler, and feeding devices driven by means other than the belt and engaging the belt and coacting with the roll to secure the movement of the filler with the belt to the wrapping devices, substantially as described.

13. The combination with the filler forming and wrapping devices of a cigarette-machine and a belt carrying the filler and wrapper, of feeding devices for securing the movement of the filler with the belt to the wrapping devices, said feeding devices including a feeding belt or chain engaging the wrapper-belt and moving therewith to the wrapping devices, substantially as described.

14. The combination with the filler forming and wrapping devices of a cigarette-machine, printing devices for the wrapper, and a belt carrying the filler and wrapper, of feeding devices engaging the filler and belt and driven by means other than the belt for securing the movement of the filler with the belt to the wrapping devices, substantially as described.

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

WILLIAM T. COALTER.

Witnesses:

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