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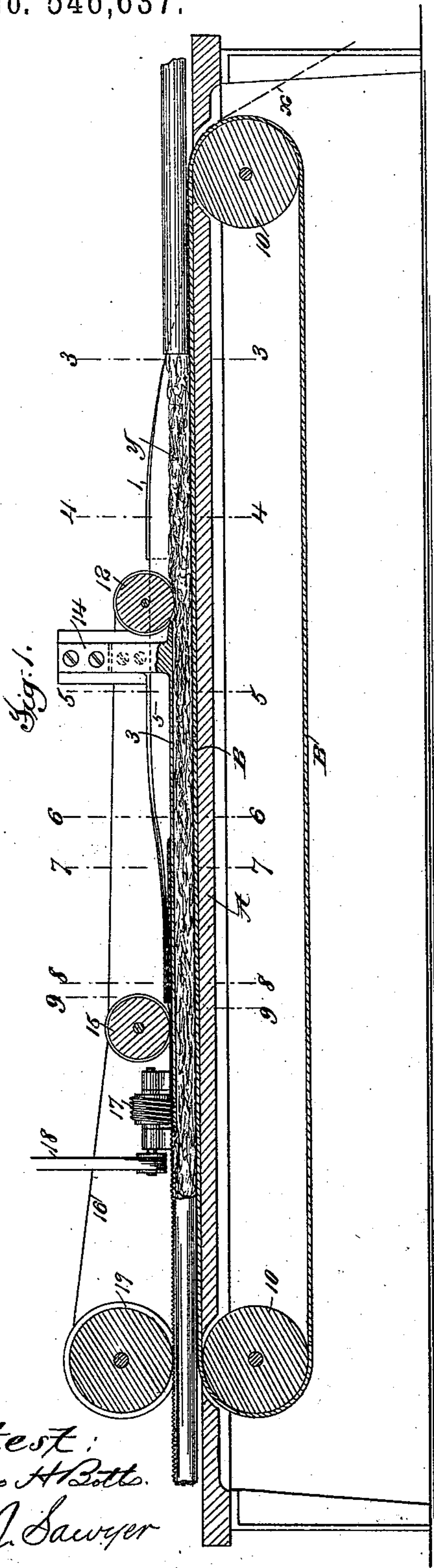
2 Sheets—Sheet 1.

W. H. BUTLER.

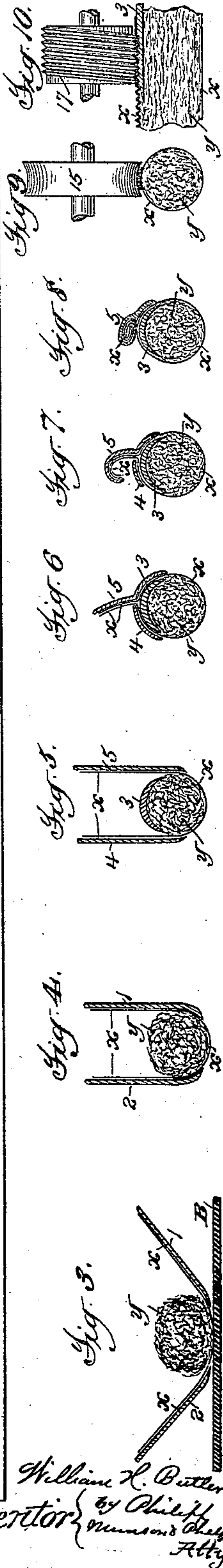
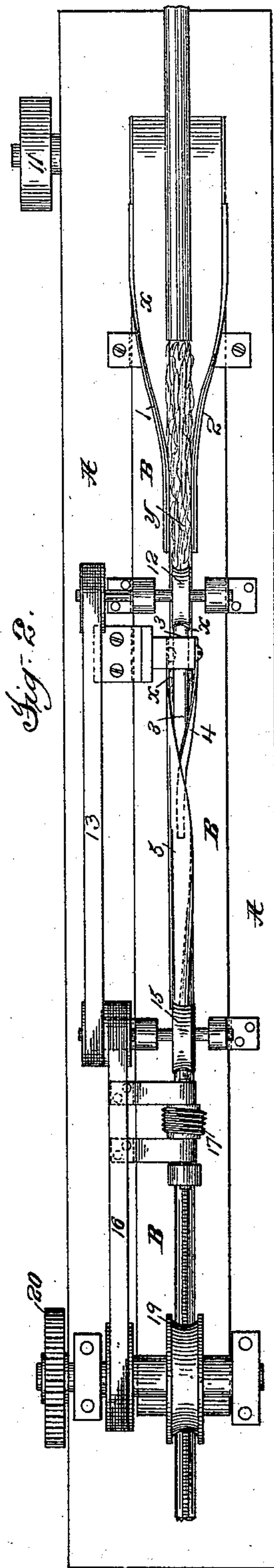
METHOD OF AND MACHINE FOR MAKING CIGARETTES.

No. 546,637.

Patented Sept. 17, 1895.



Attest:
Geo. H. Botts.
C. J. Sawyer

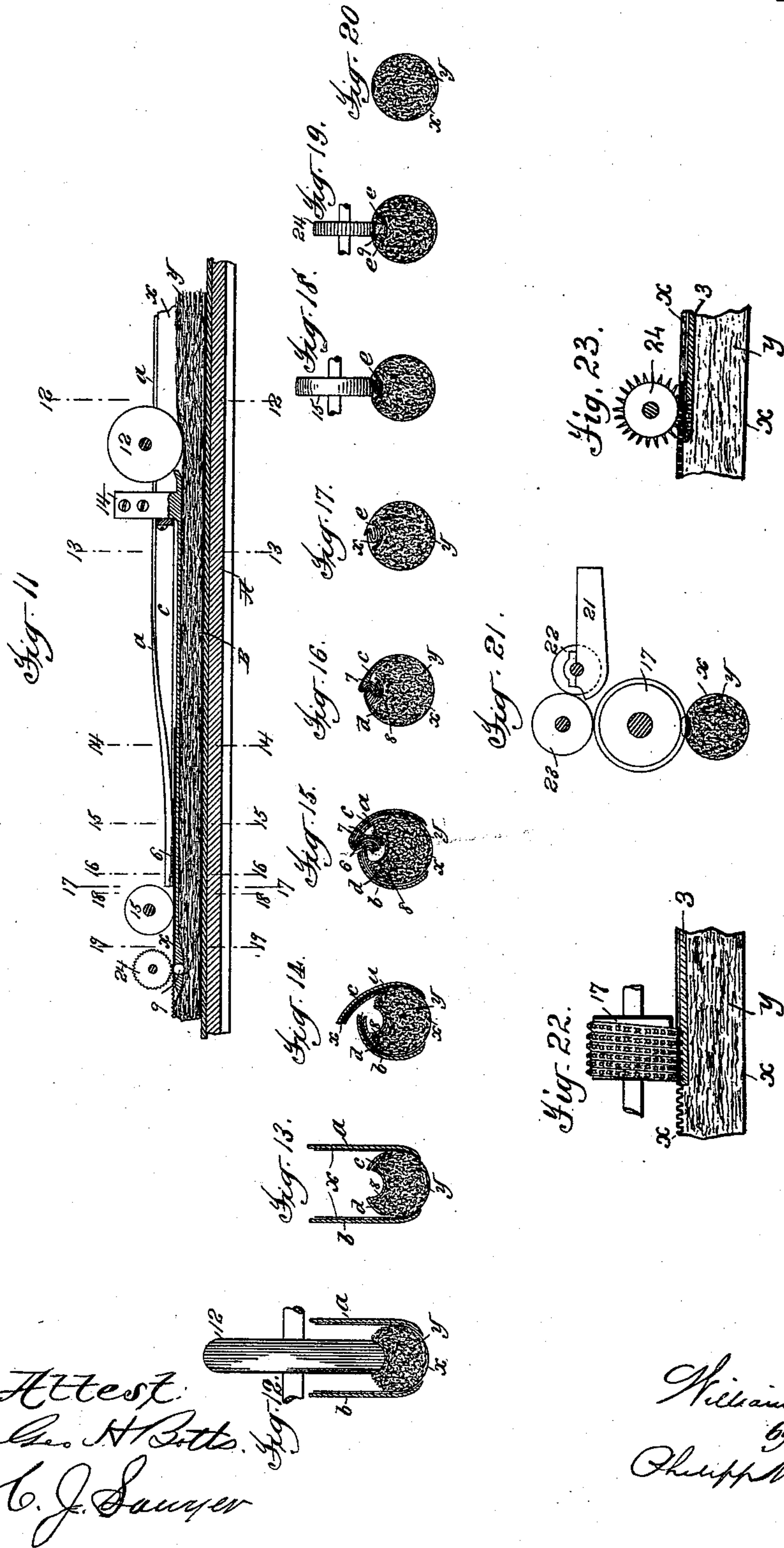


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2 Sheets—Sheet 2.

W. H. BUTLER.
METHOD OF AND MACHINE FOR MAKING CIGARETTES.
No. 546,637.

Patented Sept. 17, 1895.



Attest:
Chas. H. Butts.
C. J. Sawyer

Inventor:
William H. Butler
by
Chas. H. Butts & Chas. J. Sawyer
Attys

UNITED STATES PATENT OFFICE.

WILLIAM H. BUTLER, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE BON-SACK MACHINE COMPANY, OF SALEM, VIRGINIA.

METHOD OF AND MACHINE FOR MAKING CIGARETTES.

SPECIFICATION forming part of Letters Patent No. 546,637, dated September 17, 1895.

Application filed May 9, 1892. Serial No. 432,334. (No model.) Patented in France January 3, 1894, No. 235,268; in Italy February 23, 1894, No. 35,795/188; in Trinidad June 26, 1894; in Barbadoes July 6, 1894, No. 81; in Cape Colony July 12, 1894, No. 376 or 6/678; in Natal July 16, 1894; in South African Republic July 18, 1894, No. 675, and in Austria June 14, 1895, No. 45/2,150.

To all whom it may concern:

Be it known that I, WILLIAM H. BUTLER, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Methods of and Machines for Making Cigarettes, fully described and represented in the following specification and the accompanying drawings, forming a part of the same, and for which I have obtained Letters Patent in France, No. 235,268, dated January 3, 1894; in Italy, No. 35,795/188, dated February 23, 1894; in Trinidad, dated June 26, 1894; in Barbadoes, No. 81, dated July 6, 1894; in Cape Colony, No. 376 or 6/678, dated July 12, 1894; in Natal, dated July 16, 1894; in South African Republic, No. 675, dated July 18, 1894, and in Austria, No. 45/2,150, dated June 14, 1895.

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, after which the wrapper and the filler therein are cut into suitable lengths to form cigarettes. In machines of this class the edges of the wrapper have generally been united by being overlapped and secured by pasting, and difficulty has been found in drawing and securing the wrapper about the tobacco with sufficient tension to make the cigarette as solid as desired.

The especial object of the invention is to provide a machine by which the wrapper may be drawn to the required tension and secured by a strong seam, and I secure this result by turning the edges of the wrapper outwardly or inwardly and folding or rolling them together, and then pressing, crimping, indenting, or perforating the rolled or folded together wrapper-edges to complete the seam, and I preferably employ a support inside the wrapper, on which the edges of the wrapper are pressed down, and which forms one member of the pressing, crimping, indenting, or perforating devices, so that the seam is formed flat upon the cigarette. I prefer to secure the wrapper, as above described, without the use of paste; but my invention includes an im-

proved method and mechanism for making cigarettes having paste applied in connection with the formation of the seam.

For a full understanding of my invention a detailed description of a machine of the preferred form for carrying out my improved method and embodying all the features of my invention will now be given, in connection with the accompanying drawings, forming a part of this specification, and the method and features of construction forming my invention specifically pointed out in the claims.

In the drawings, Figure 1 is a vertical sectional elevation of so much of a cigarette-making machine as is necessary to illustrate the application of the present invention thereto. Fig. 2 is a plan view of the same. Figs. 3 to 9 are cross-sections on respectively the lines 3 to 9 of Fig. 1, looking to the left. Fig. 10 is a detail of the crimping device preferably employed. Figs. 11 to 20 show a modified form of a machine in which the edges of the wrapper are turned inwardly and the product of the same. Fig. 11 is a partial longitudinal section of the machine. Figs. 12 to 19 are cross-sections of the same on respectively lines 12 to 19 of Fig. 11, looking to the left. Fig. 20 is a cross-section of the completed cigarette. Fig. 21 shows a modification employing pasting devices. Fig. 22 shows a modified form of seam-closing worm. Fig. 23 shows a perforating device which may be used in forming the seam.

Referring to said drawings, A is the bed-plate or table of the machine, which serves to support the operating parts.

B is the carrying-belt, by which the cigarette-wrapper x and filler y are advanced, the filler passing onto the wrapper from the filler-forming mechanism, of any suitable form or being formed by hand. The belt B is carried by belt-rolls 10, driven in any suitable manner, a pulley 11 on the rear roll 10 being shown for this purpose. As the wrapper with the filler thereon is advanced by the belt B, the side edges of the wrapper are turned upward by guides 1 2 on opposite sides, and the filler is pressed and compacted by means of grooved roller 12, lying inside the turned-up edges of

the wrapper in advance of the guides 1 2, and being driven by a belt 13, as shown, or in any other suitable manner.

In advance of the pressing-roll 12 a bracket 5 with an overhanging arm 14 is mounted on the frame, and this arm 14 carries the interior support, which consists in the form shown of a finger 3, resting upon the filler inside the turned-up edges of the wrapper and extending 10 in the line of movement of the filler. The support 3 is shown as consisting of a plate curved about the top of the filler and extending through about half its circumference, and this is the preferred form; but it may consist 15 of a narrow, flat, or curved plate or bar. The folder, by which the edges of the wrapper are folded over the filler and support 3 and overlapped, consists of two curved guides 4 5, carried by the arm 14, guide 4 extending only 20 a short distance in advance of the arm 14, and acting to bend inward the upturned edge of the wrapper on one side and guide it until both upturned edges are within the control of the guide 5 on the opposite side, which draws 25 the wrapper tight about the filler and support 3 and turns down the overlapping edges, and preferably is constructed, as shown, so as to fold or roll the edges together, a strong joint being thus formed when the edges are 30 pressed down, even without crimping, indenting, or perforating. The operation of the guides 1 2 and 4 5, in connection with the finger 3, will be readily understood from Figs. 3 to 8, showing successive stages of the operation. 35

Just in advance of the end of the guide 5 is mounted a grooved pressure-roller 15, driven, as shown, by a belt 16 or in any other suitable manner, this pressure-roll coacting with 40 the support 3 inside the wrapper to press down flat the overlapped and rolled edges of the wrapper. It may be found that the pressure of this roll is sufficient to secure the wrapper without other devices, or I may construct this 45 roll so as to form a crimping, indenting, or perforating device, coacting with the support 3 to secure the wrapper, the support 3 being plain or formed with grooves, indentations, or perforations, into which the wrapper is pressed 50 by the roller, or the roller may be plain and the support be provided with suitable devices for crimping, indenting, or perforating the paper against the roll. I prefer, however, to use the roll 15 only for pressing down the 55 edges of the wrapper and to provide an independent crimping, indenting, or perforating device coacting with the support 3 in advance of the roll, and I prefer to use the device shown, consisting of a worm-wheel 17, 60 mounted to rotate transversely to the cigarette-rod and driven by a belt 18 or in any other suitable manner. The threads of this worm-wheel 17 are preferably of a pitch corresponding to the movement of the advancing 65 cigarette-rod, and preferably have quite sharp edges, by which the layers of the wrapper formed by the overlapping edges are crimped

and firmly secured together as the cigarette-rod passes the worm-wheel. The end of the support 3 may be plain and the wrapper be 70 crimped simply by the pressure of the worm-wheel against the plain surface; but I prefer to form the end of the support with grooves corresponding to the threads on the worm-wheel, into which the wrapper is pressed, as 75 shown in Fig. 10. The thread of the worm 17 may be smooth or roughened to form teeth or pins by which the wrapper is indented or perforated, as shown in Fig. 22, and the construction of the end of the support 3 may be varied 80 correspondingly. It will be understood, also, that the wheel and support may be formed in any other suitable manner, so as to crimp, indent, or perforate the wrapper by pressure between the wheel and support. 85

The continuous cigarette is advanced from the folding and crimping, indenting, or perforating devices by the belt B and any suitable feeding mechanism coacting therewith or independent thereof. I have shown a 90 grooved roll 19 coacting with belt-roll 10, and from the shaft of which the rolls 12 15 are driven, this shaft being driven by any suitable means, such as a gear 20, as shown.

While it will be found that the wrapper is 95 secured firmly without pasting by the devices shown, it is evident that I may use paste, if desired, and that my invention provides a very simple, convenient, and efficient method and machine for making pasted cigarettes. 100 Thus in the construction shown it is necessary only to mount a suitable paste-fountain to deliver paste to the worm-wheel 17 or other crimping, indenting, or perforating device, the paste being transferred to the wrapper and pressed therein by means of the 105 sharp edges of the worm-wheel or the teeth or pins of the indenting or perforating device, a very small amount of paste being thus sufficient. Such a construction is shown in 110 Fig. 21, in which a paste-fountain 21 is mounted above the worm 17, and paste is delivered therefrom to the worm-wheel by fountain-roll 22 and paste-roll 23, the latter engaging the worm and being driven by friction or positively, as preferred. 115

In the construction above described the edges of the wrapper are turned outwardly to form the seam; but this is not necessary, and I have shown in Figs. 11 to 20 a construction 120 in which the edges are turned inwardly and then folded or rolled together and secured by crimping, indenting, or perforating. In this construction the roller 12 is preferably made convex, so as to form a recess for 125 the guides by which the edges of the wrapper are folded or rolled together and the interior support against which they are secured. The exterior side guides *a b* are made continuous throughout and operate, as the guides 130 1 2 3 4 of the construction previously described, to fold the wrapper about the filler; but their construction is varied so as to coact with interior side guides to turn the edges

of the wrapper inward instead of outward. The interior guides *c d* are carried by the arm 14, and are gradually curved inward over the filler with the exterior side guides *a b*, the edges of the wrapper lying between the exterior and interior guides and being gradually closed over the filler. The exterior guide *a* is provided with a wing 6, curving gradually inward and coacting with wings 7 8 on interior guides *c d*, so as to turn two edges of the wrapper inward and roll or fold them together, as shown in Figs. 14 to 16. When the edges have been thus folded or rolled together, the guides *a b c* terminate, but the wing 8 of the guide *d* is prolonged and curved over the top of the filler, so as to form a concave finger *e*, which is the interior support against which the edges of the paper are pressed down and secured.

The position of the edges of the wrapper, after they have been rolled or folded together and released from the guides, and that of the interior support *e*, is shown in Fig. 17.

The roller 15 is mounted in advance of the ends of the guides, as in the construction previously described; but in this construction the roller is preferably made convex, so as to press down the folded or rolled edges of the wrapper into the recess or chamber formed by the concave support *e*, the wrapper thus being drawn tightly about the filler, aiding in securing the result desired of a firm solid cigarette. The support *e* and roller 15 may be used to secure the wrapper together by pressure or by crimping, indenting, or perforating, as previously described; but in this construction, also, I preferably use the roller 15 only to press down the edges and employ an independent crimping, indenting, or perforating device. These devices may be the same as previously described, consisting of a worm 17, coacting with the end of the support *e*, which is suitably formed for this purpose; but I have shown a construction in which the support *e* is provided with a recess or holder, in which runs a roller 9, the recess and holder being preferably formed so that the roller is held therein without a shaft and rotates freely by friction with a roller 24, mounted and driven in any suitable manner. The rolls 9 24 may be formed in any suitable manner, so as to crimp, indent, or perforate the edges and secure them together, both of the rollers being of special construction for this purpose, or either one of them may be plain. It will be understood, also, that in place of the roll 9 I may use a ball mounted in the holder on the support or a worm mounted in the holder, so as to rotate transversely to the travel of the cigarette and coacting with the worm 17, of the construction previously described.

In Fig. 23 I have shown a modified construction, in which the support 3 is provided with a series of small perforations registering with pins or sharp-pointed teeth on a roll 24 outside the wrapper.

The machine shown in Figs. 11 to 19 is

claimed specifically in a companion application, Serial No. 432,914, filed May 13, 1892. It will be understood, also, that I may use any othersuitable devices for crimping, indenting, or perforating the edges of the wrapper.

What I claim is—

1. The method of making a cigarette which consists in advancing a continuous wrapper and a continuous filler, rolling or folding the edges of the wrapper together, and pressing, crimping, indenting or perforating them together and applying paste, substantially as described.

2. The method of making a cigarette, which consists in advancing a continuous wrapper and a continuous filler thereon, folding the wrapper about the filler and an interior support, rolling or folding the edges of the wrapper together, and securing the edges by pressing, crimping, indenting or perforating them against the interior support and applying paste in the indentations, substantially as described.

3. The combination with feeding devices for advancing a continuous cigarette wrapper and filler, of folding devices for folding the wrapper over the filler with its edges rolled or folded together, pressing, crimping, indenting or perforating devices acting on opposite sides of the rolled or folded edges, and pasting devices, substantially as described.

4. The combination with feeding devices for advancing a continuous cigarette wrapper and filler, of an interior support, folding devices for folding the wrapper over the filler and support with its edges rolled or folded together, a crimping, indenting or perforating device co-acting with the support to secure the edges, and pasting devices for applying paste to said crimping, indenting or perforating devices, substantially as described.

5. The combination with feeding devices for advancing a continuous cigarette wrapper and filler, of an interior support, folding devices for folding the wrapper over the filler and support with its edges rolled or folded together, a pressing device co-acting with the interior support to press down the edges, and a crimping, indenting or perforating device co-acting with the support to secure the edges, substantially as described.

6. The combination with feeding devices, of folding devices for folding the wrapper and rolling or folding the edges together, and pressing, crimping, indenting or perforating devices acting on opposite sides of the rolled or folded edges and including as one member a crimping worm, substantially as described.

7. The combination with feeding devices for advancing a continuous cigarette wrapper and filler therein with the edges of the wrapper engaged, of an interior support inside the wrapper, and a crimping worm coacting with said support to secure the edges, substantially as described.

8. The combination with feeding devices, of an interior support, folding devices for fold-

ing the wrapper over the support and rolling or folding the edges together, and a crimping worm co-acting with said support to secure the edges, substantially as described.

5 9. The combination with feeding devices, of an interior support formed or provided with a worm thread, folding devices for folding the wrapper over the support and rolling or fold-
10 ing the edges together, and a wheel rotating transversely to the line of feed co-acting with the worm thread on the support to secure the edges, substantially as described.

10 10. The combination with feeding devices, of an interior support formed or provided with
15 a worm thread, folding devices for folding the wrapper over the support and rolling or folding the edges together, and a worm wheel rotating transversely to the line of feed co-acting with the worm thread on the support to
20 secure the edges, substantially as described.

11. The combination with feeding devices for advancing a continuous cigarette wrapper and filler therein, of the interior support 3,

guides 4, 5 constructed to turn the edges of the wrapper outwardly and roll or fold them 25 together on the support, roller 15 co-acting with the support to press down the edges, and a crimping device co-acting with the support to crimp, indent or perforate the edges, substantially as described. 30

12. The combination with feeding devices, of the interior support 3, guides 4, 5 constructed to turn the edges of the wrapper outwardly and roll or fold them together, on the support, roller 15 co-acting with the support 35 to press down the edges, and crimping worm 17 co-acting with the support to secure the edges, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing 40 witnesses.

WM. H. BUTLER.

Witnesses:

J. M. W. HICKS,
C. J. SAWYER.