

J. A. BONSAK.

MACHINE OR APPARATUS FOR MAKING CIGARETTE TUBES.

No. 577,348.

Patented Feb. 16, 1897.

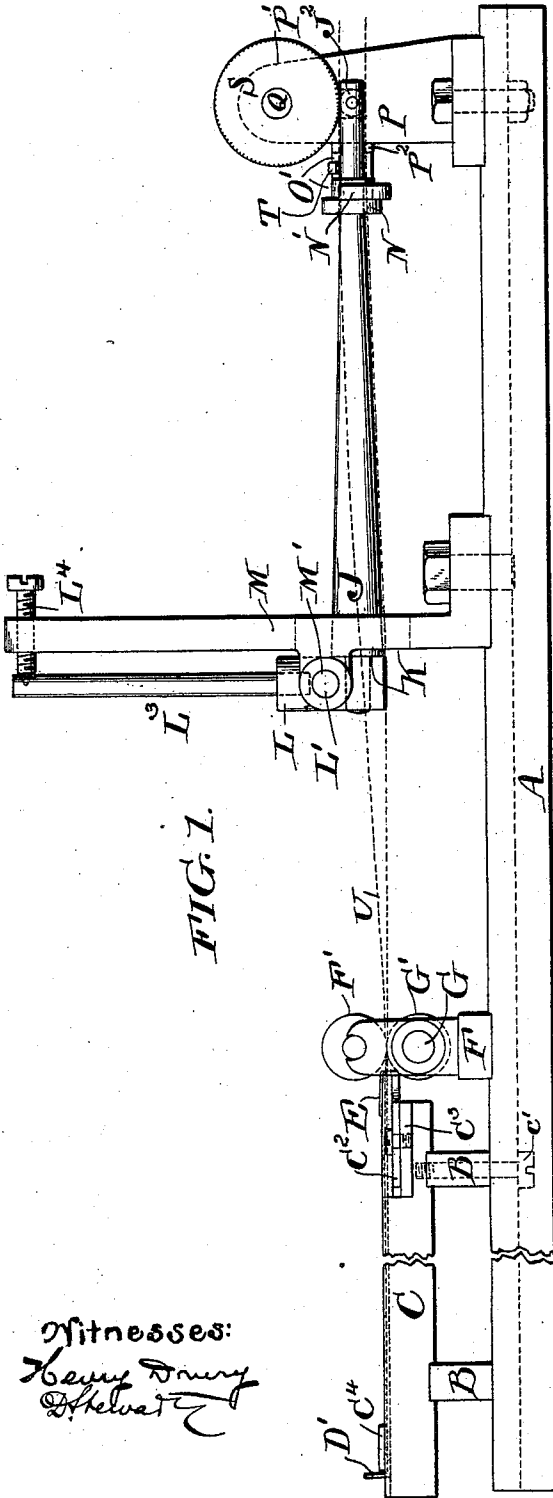


FIG. 1.

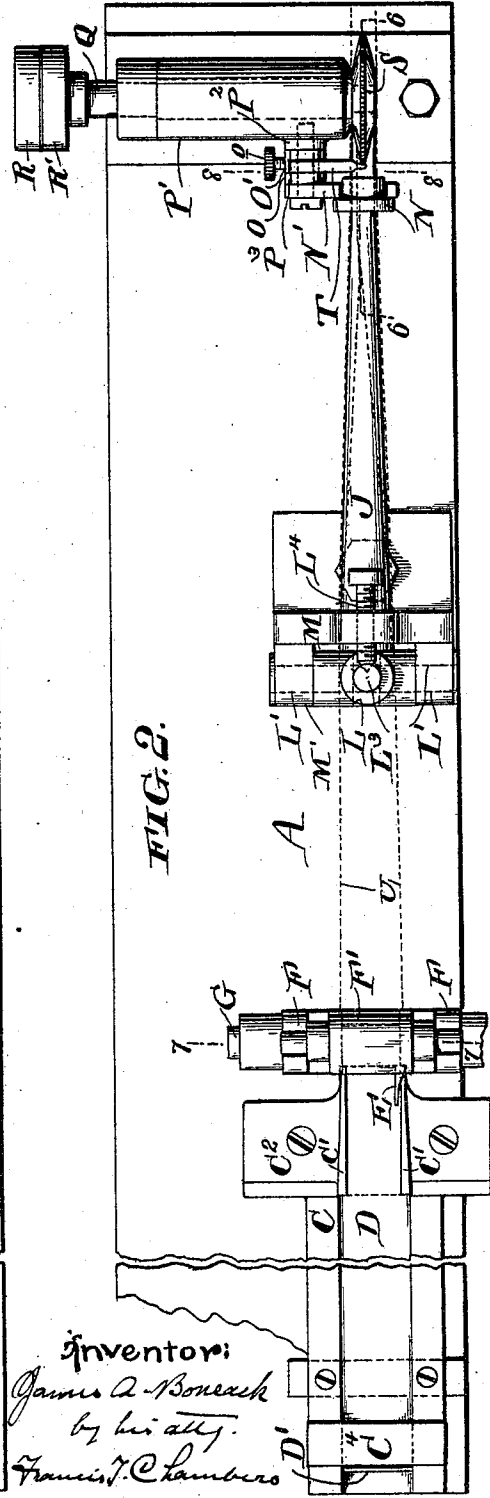


FIG. 2.

Witnesses:  
*Henry Dwyer*  
*Stelvat*

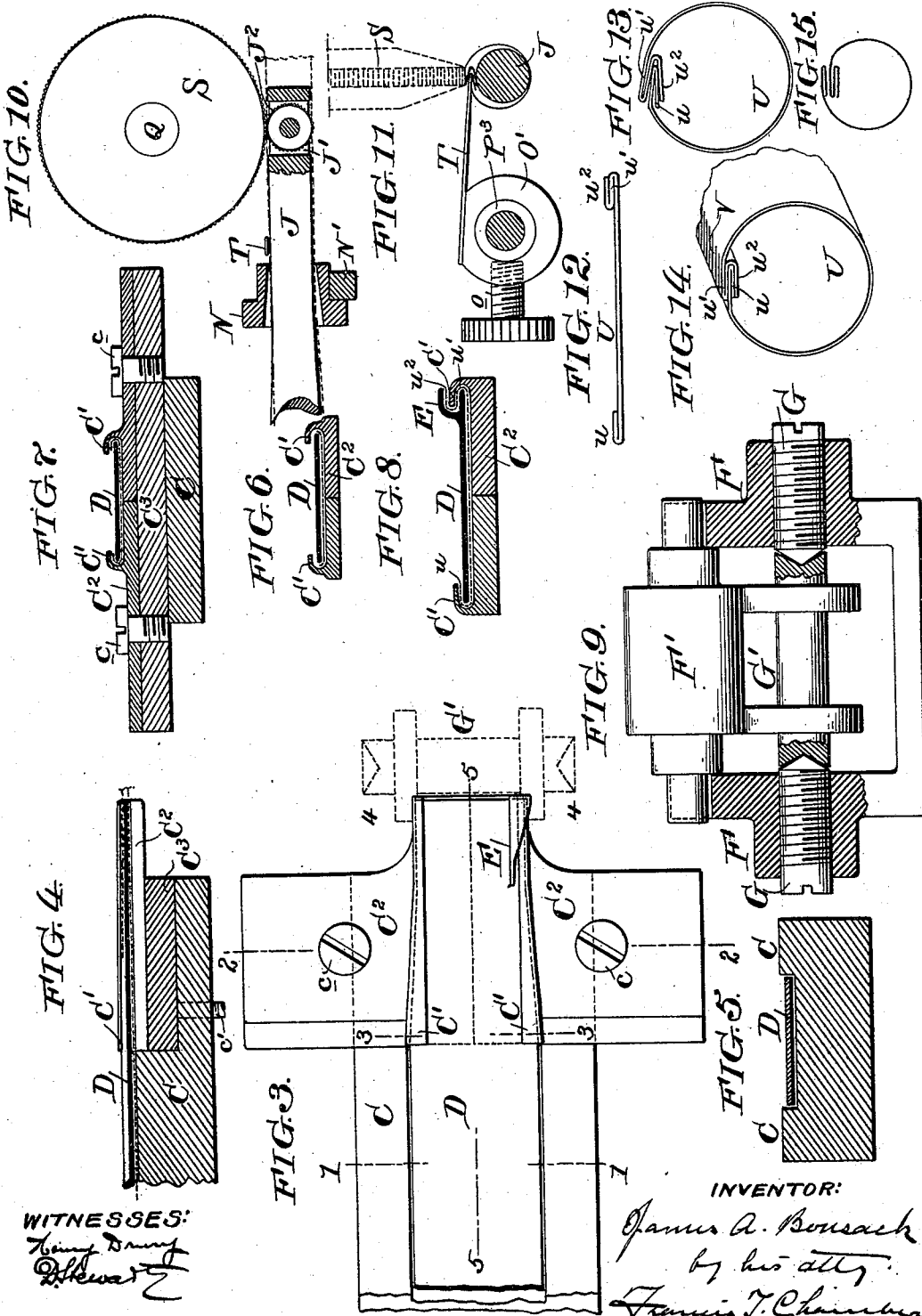
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WITNESSES:  
*Henry D. ...*  
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# UNITED STATES PATENT OFFICE.

JAMES A. BONSACK, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE BONSACK MACHINE COMPANY, OF SALEM, VIRGINIA.

## MACHINE OR APPARATUS FOR MAKING CIGARETTE-TUBES.

SPECIFICATION forming part of Letters Patent No. 577,848, dated February 16, 1897.

Application filed January 9, 1893. Serial No. 457,751. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. BONSACK, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented Improvements in Machines or Apparatus for Making Cigarette-Tubes, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to the manufacture of paper tubes for cigarette-wrappers, and has for its object to provide an improved apparatus or machine for the manufacture of such tubes.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated, and in which—

Figure 1 is an elevation, and Fig. 2 a plan view, of the tube-forming portion of a cigarette-machine constructed in accordance with my improvements. Fig. 3 is a plan view, on a larger scale, of a portion of the apparatus; Fig. 4, a longitudinal section on the line 5 5 of Fig. 3; Fig. 5, a cross-section on the line 1 1 of Fig. 3; Fig. 6, a cross-section on the line 3 3 of Fig. 3; Fig. 7, a cross-section on the line 2 2 of Fig. 3; Fig. 8, a cross-section, on a somewhat larger scale, taken on the line 4 4 of Fig. 3. Fig. 9 is an elevation, partly in section, of the pressing-rolls used in connection with my apparatus. Fig. 10 is an elevation, partly in section, taken on the line 6 6 of Fig. 2. Fig. 11 is a cross-section on the line 8 8 of Fig. 2. Figs. 12, 13, and 14 illustrate the effect of different parts of the mechanism upon the papers and also the steps of my improved process, and Fig. 15 shows a simpler form of seam.

Stated generally, my improved machine consists in combinations of devices by which one or both of the edges of a strip of paper or similar material of the desired width are formed into folds having the desired number of plies or thicknesses of material, one of the edge folds preferably having three plies, devices by which the strip is brought into tubular form, a device or devices by which the fold formed upon one edge of the strip is

opened, means by which the opposite edge of the strip is inserted in the opened fold to form a seam, and devices by which the seam is crimped to make it permanent.

Referring now particularly to the mechanism illustrated in the drawings, A indicates the frame of the machine. Extending upward from this frame are standards B B, which support a grooved guide-plate C, in the groove of which lies a flat former-plate D. As shown in the drawings, this plate is held in place longitudinally by means of an upwardly-bent end D', engaging a cross-bar C<sup>4</sup> on the plate C. The front end of the plate C is cut away or recessed to receive a plate C<sup>2</sup>, which, as shown, is secured to an intervening plate C<sup>3</sup> by screws c. The plate C<sup>2</sup> is formed with a groove in its face which registers with the groove in plate C, but narrows as it recedes from the edge of plate C, the former D also growing narrower to correspond with it, and the edges of this groove are provided with inwardly-extending devices for folding inward the edges of the paper, shown as flanges or fingers C' C', which extend over the former, as indicated in Figs. 6, 7, and 8.

Near the delivery end of the former D, I provide a folding device E, which conveniently is secured to its face and which is arranged to serve as a guide to direct the paper up and back over the flange C'. As is shown in Figs. 3 and 8, it projects over the edge of the adjoining flange or folding device C'. Immediately in front of or at the delivery end of the former I provide pressing-rolls G' and F'. These rolls, as best seen in Fig. 9, are supported on standards F F, the lower roll G' being supported on the conical ends of adjustable screws G G, and the upper roll F' resting in convenient bearings at the top of the standards F.

The paper is fed into the grooved guide-plate C and passes beneath the former-plate D until it enters the tapered groove in the plate C<sup>2</sup>. By the action of this groove and the narrowing former-plate the edges of the paper are thrown up above the top of the former and are folded over upon its face by means of folding devices, as indicated at C' C', thus forming the folds u and u', the fold

$u'$  being about double the breadth of the fold  $u$  and extending in toward the center of the former beyond the edge of the folder  $C'$ . As the paper advances, this projecting edge of the fold  $u'$  is engaged by the folder  $E$ , which turns it upward and outward over the edge of the folder  $C'$ , as indicated in Fig. 8. The paper then leaves the former and passes between the presser-rolls  $G'$  and  $F'$ , which crease the various folds, formed as before described, and bring the paper to the form and condition indicated in Fig. 12.

The paper folded as above described is next to be formed into a tube, and for this purpose it is carried along beneath a mandrel  $J$ , (see Figs. 1 and 2,) around which it is bent upward until its edges lap. This is accomplished by leading the paper through a device which will fold its edges around the mandrel—as shown, a conical ring  $N$ , placed around the mandrel on an arm  $N'$ , secured to some fixed part of the machine. In order to insure that the edge  $u$  shall enter between the folds  $u^2$  and  $u'$ , I provide a light finger  $T$ , which runs in the fold between  $u'$  and  $u^2$ , causing it to slightly gap open, so that the opposite edge  $u$  will pass into it, (see Fig. 11,) and the lapped edges are then passed through a crimping device, which effectually binds them together and makes the seam permanent.

As shown in the drawings, the mandrel  $J$  is supported by a standard  $M$ , the mandrel having a T-like head  $L$ , provided with trunnions  $L' L'$ , supported in lugs  $M'$ , extending out from the standard  $M$ . From the central branch of the T-head  $L$  arises an arm  $L^3$ , the upper end of which rests against an adjusting-screw  $L^4$ , working in the top of the standard  $M$  and by means of which the mandrel can be pressed upward. The free end of the mandrel is formed with a slot or cavity  $J'$ , in which is journaled a crimping-wheel  $J^2$ , this crimping-wheel being arranged to coact with a crimping-wheel  $S$ , supported in a standard  $P$ , secured in turn to the frame of the machine. The crimping-wheel  $S$  is secured to a shaft  $Q$ , to which are secured fast and loose pulleys  $R$  and  $R'$  or any convenient form of gearing. It will be readily seen that the force with which the crimping-wheel  $J^2$  will bear against the crimping-wheel  $S$  can be nicely regulated by the adjusting-screw  $L^4$ . In the plan shown I secure the bracket  $N'$ , which supports the collar  $N$ , to a stud  $P^2 P^3$ , extending out from the standard  $P$ , and in the plan shown I also show the finger  $T$  as secured to a collar  $O'$ , journaled on the part  $P^3$  of the stud and adjustably secured thereto by means of a set-screw  $o$ .

Of course it will be understood that the plate  $C^2$  need not be, as shown, secured to plate  $C^3$ , but can be secured directly to the plate  $C$ . The length of the flanges  $C'$  in proportion to the breadth of the former-plate  $D$  may be varied and the taper of the plate  $D$  prolonged.

In the drawings, for the sake of economizing space, I have shown the flanges  $C'$  as rather shorter than I should in practice make them.

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

1. In a machine for making cigarette-tubes from paper strips, the combination of the following devices or mechanisms: devices for forming a fold along one edge of a paper strip, said fold having three plies of paper, a device for opening up two plies of said fold, mechanism or means for inserting the opposite edge of the strip in said opened fold and mechanism for crimping the lapped folds together to form a permanent seam.

2. In a machine for making cigarette-tubes from paper strips, the combination of the following devices or mechanisms: devices for forming a fold along one edge of a paper strip having at least three plies of paper, mechanism for creasing said fold, devices for opening up two plies of said fold, mechanism or means for inserting the opposite edge of the strip between said opened plies, and mechanism for crimping the lapped folds to form a permanent seam.

3. In a machine for making cigarette-tubes from paper strips, the combination of the following devices or mechanisms: devices for folding one edge of the paper strip first inward and then outward, mechanism for forming the paper strip into a tube and inserting the opposite edge in the outermost fold of the folded edge, and mechanism for crimping the seam thus formed.

4. In a machine for forming cigarette-tubes, the combination of the following devices or mechanisms: mechanism for folding one edge of the paper strip inward and the other edge first inward and then outward, mechanism for forming the paper strip into a tube, inserting the fold of the first edge into the outermost fold of the second edge, and mechanism for crimping the seam formed by the two folded edges.

5. The combination of paper-folding mechanism adapted to independently fold the edge or edges of a strip of paper over upon themselves with mechanism for bending said paper into a tube and lapping the independently-folded edges and a crimper arranged to act on the seam so formed.

6. The combination of the former  $D$  with the outwardly-extending folder  $E$ , a folder  $C'$  arranged on one side of and extending over the former-face, a mandrel, means for lapping the edges of the paper thereon and a crimping device arranged to act on the seam formed by the lapped edges.

7. The combination with a mandrel and means for folding paper into tubular form around the same, of a fold-opener  $T$  adapted to open out a fold on the edge of the paper at or near the point on the mandrel where the edges thereof lap, and crimping mechanism

arranged to act on the seam formed by the lapping edges.

5 8. The combination of the crimping-wheel S, the mandrel J having a crimping-wheel J<sup>2</sup> adapted to coact with wheel S, the collar N, placed around the mandrel, a support N<sup>2</sup> for said collar independent of the mandrel, and

a fold-opener T situated in advance of the crimping-wheels.

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Witnesses:

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