

(No Model.)

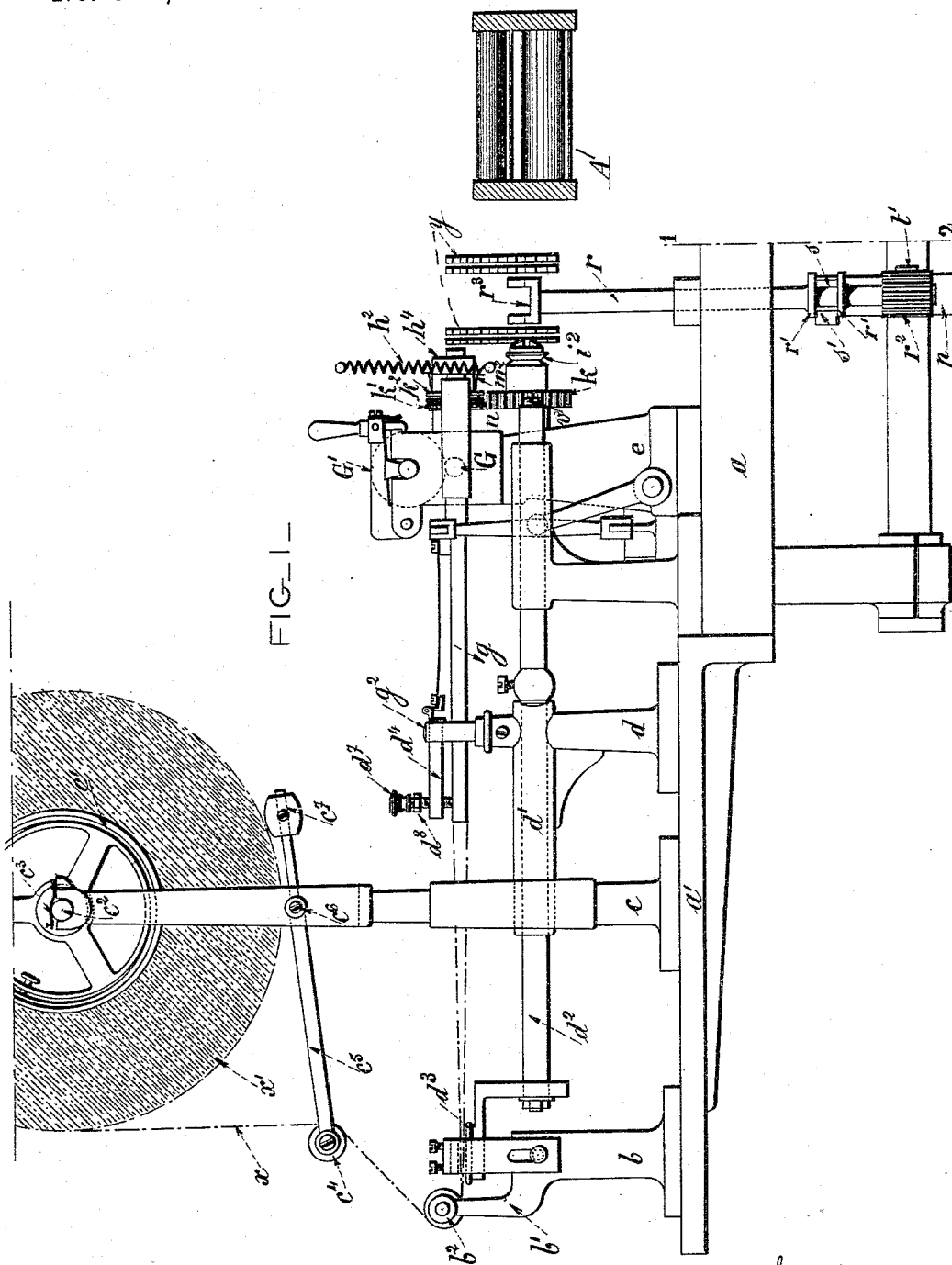
5 Sheets—Sheet 1.

C. A. MARCHAL.

MACHINE FOR MAKING PAPER CIGARETTE TUBES.

No. 546,404.

Patented Sept. 17, 1895.



Witnesses:
L. M. Wachsblager,
Geo. C. Moore,

Inventor
Charles Alfred Marchal,
By Briesen Knauth
his Attorneys.

(No Model.)

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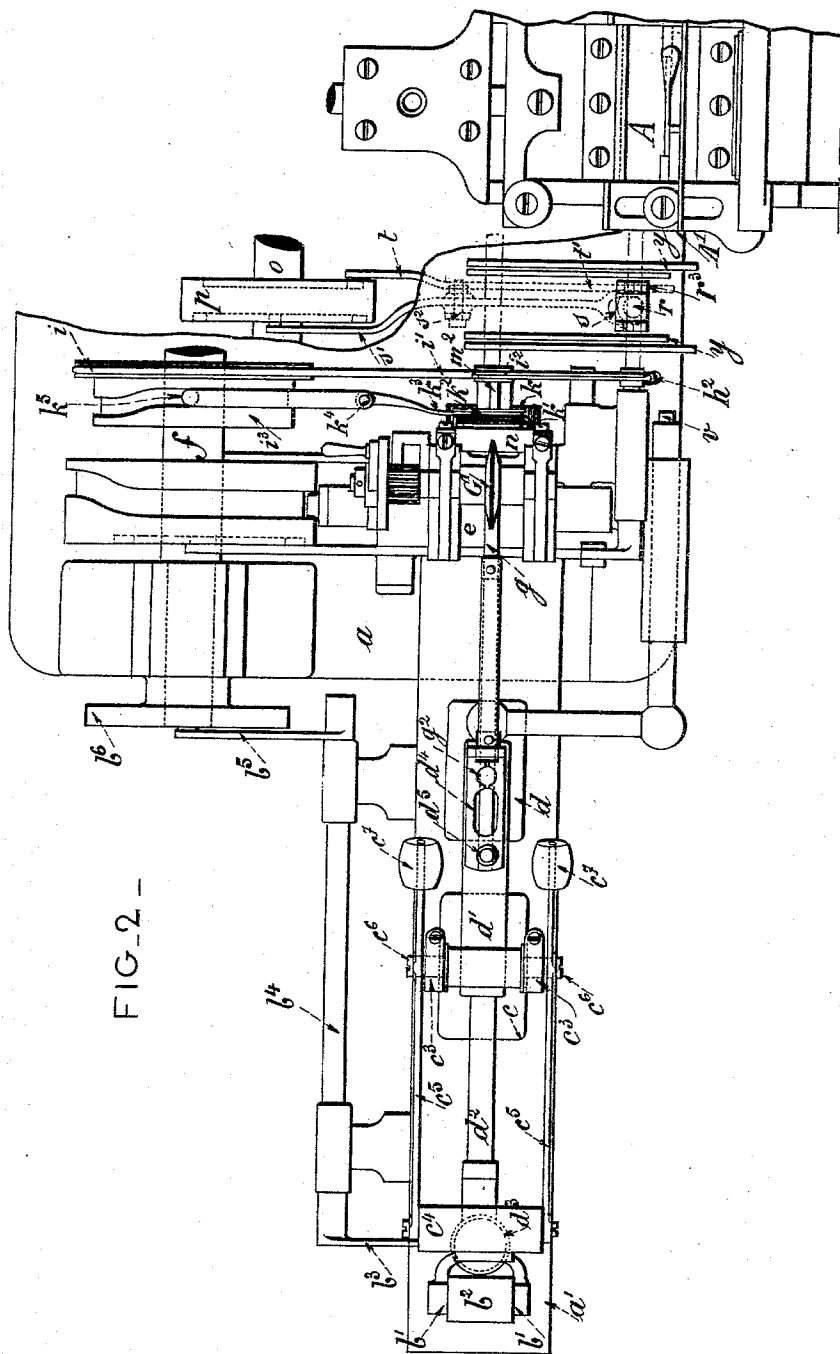


FIG. 2. -

Witnesses:
L. M. Hachschlager
Geo. C. Morris

Inventor
Charles Alfred Marchal,
By Briesen, Knauth
his Attorneys.

(No Model.)

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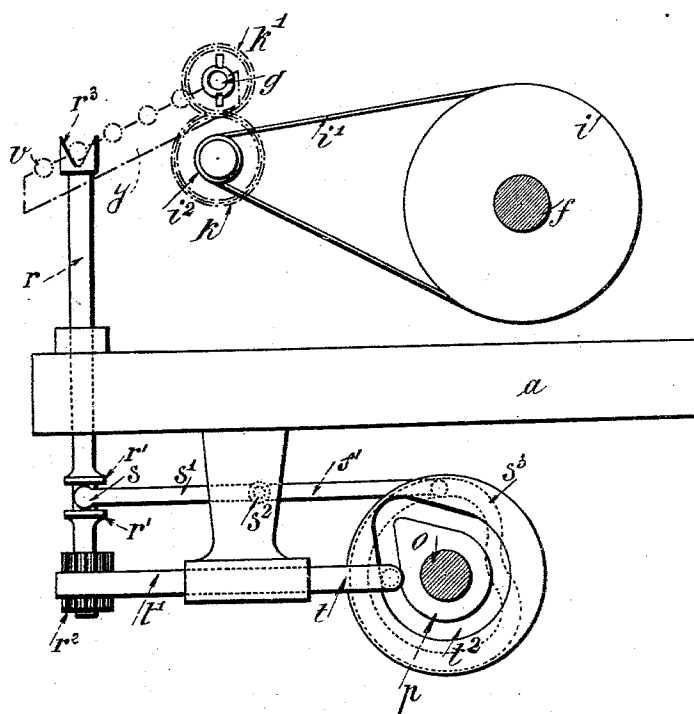
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FIG. 3.



Witnesses:
L. M. Hachschlager,
Geo. C. Moring

Inventor
Charles Alfred Marchal,
By Briesen Knautz
his Attorneys

(No Model.)

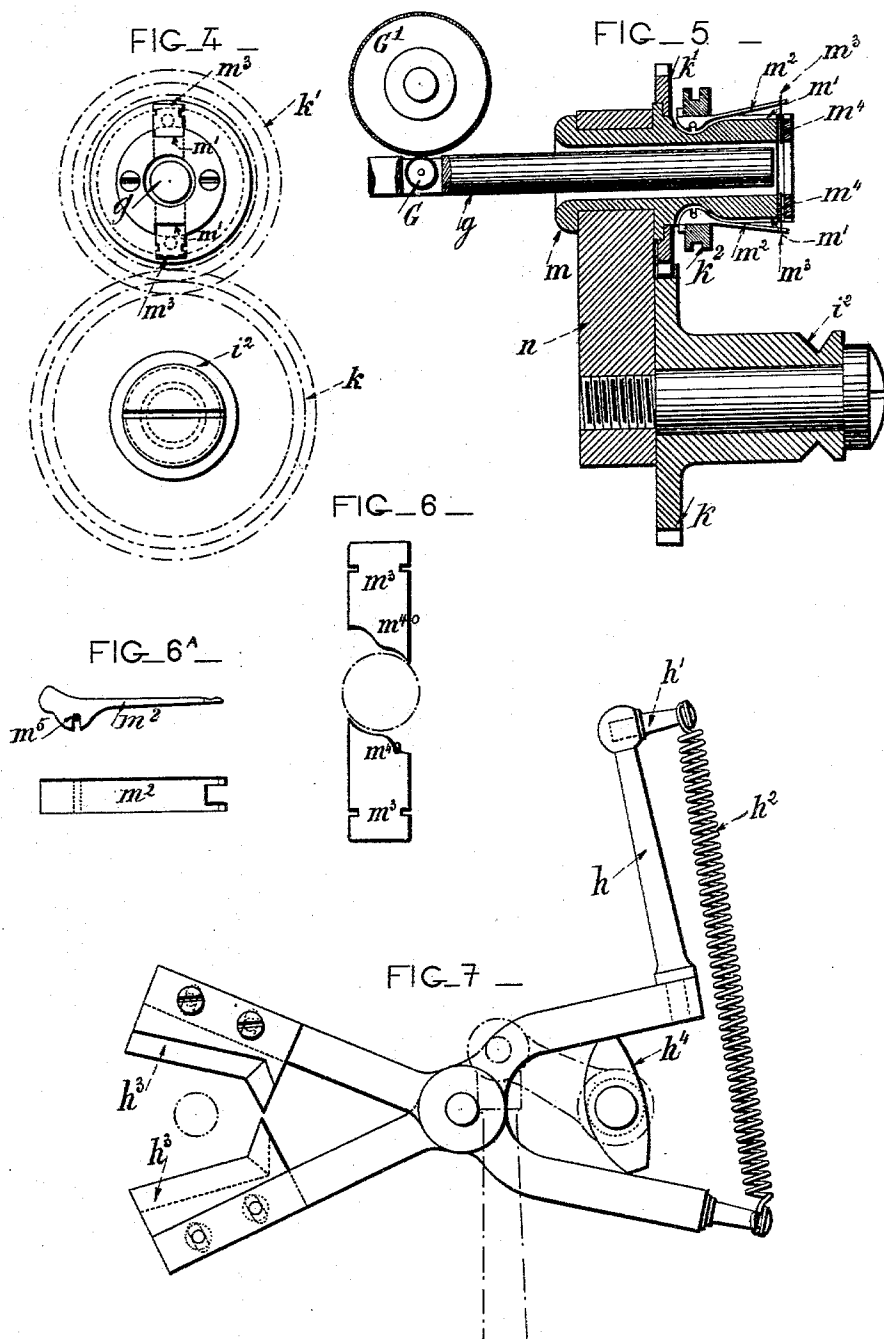
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C. A. MARCHAL.

MACHINE FOR MAKING PAPER CIGARETTE TUBES.

No. 546,404.

Patented Sept. 17, 1895.



Witnesses:
L. M. Hackschlagel,
D. C. Mease.

Inventor
Charles Alfred Marchal,
By Briesen Knautz
his Attorneys.

(No Model.)

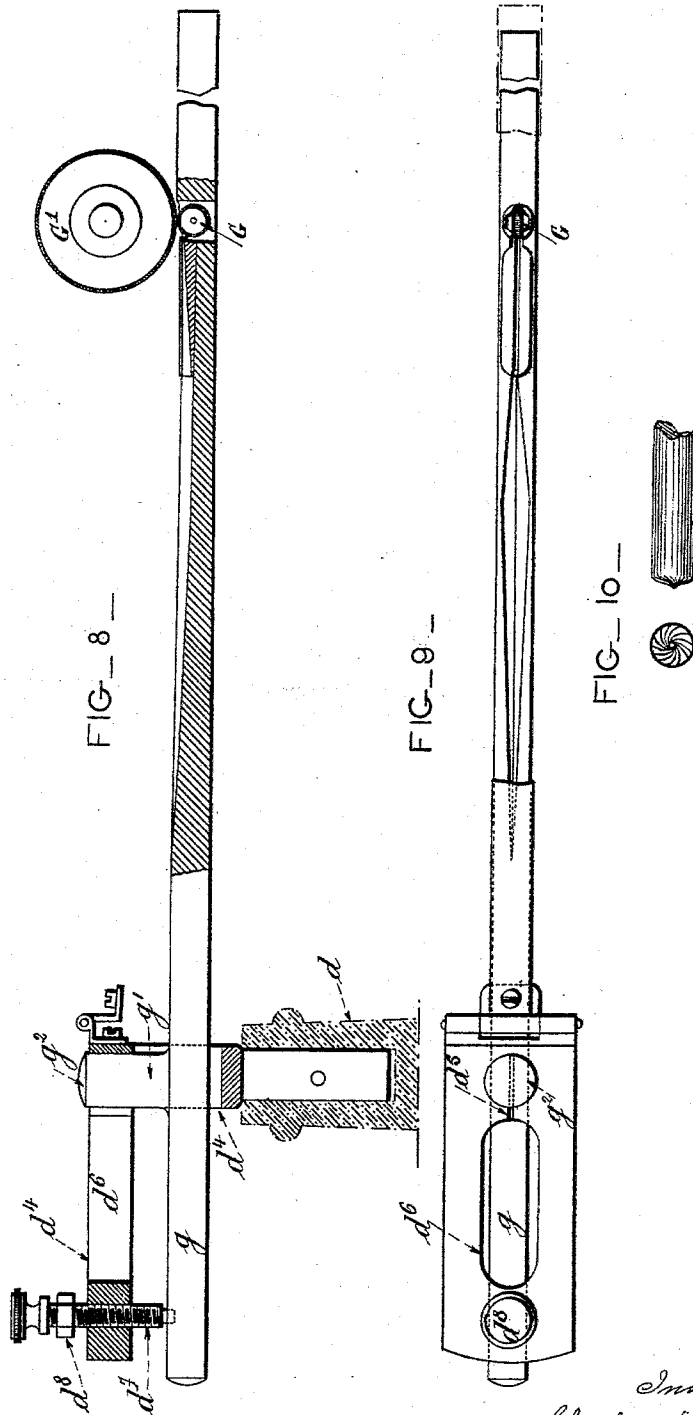
5 Sheets—Sheet 5.

C. A. MARCHAL.

MACHINE FOR MAKING PAPER CIGARETTE TUBES.

No. 546,404.

Patented Sept. 17, 1895.



Witnesses:
L. M. Wackenhayer,
Geo. E. Morse

Inventor
Charles Alfred Morcel
By Briesau Knautz
his Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES ALFRED MARCHAL, OF PARIS, FRANCE.

MACHINE FOR MAKING PAPER CIGARETTE-TUBES.

SPECIFICATION forming part of Letters Patent No. 546,404, dated September 17, 1895.

Application filed October 26, 1894. Serial No. 527,076. (No model.) Patented in France August 24, 1894, No. 24,951.

To all whom it may concern:

Be it known that I, CHARLES ALFRED MARCHAL, a citizen of the Republic of France, and a resident of Paris, France, have invented certain new and useful Improvements in Machines for Making Paper Cigarette-Tubes, (for which I have obtained Letters Patent in France, No. 24,951, dated August 24, 1894,) of which the following is a specification.

This invention relates to machines known as "Decouplés" and others for manufacturing paper cigarette-tubes without adhesive material—that is to say, for manufacturing tubes and cigarettes which are closed by interlocking the edges of the paper or by any other means that do not require the use of adhesive material and are twisted at an end thereof.

These improvements consist, first, in a novel arrangement of mechanism which can be easily adapted to existing machines for closing or twisting one end of the paper tube before the latter is cut off to the required length, the object being to prevent the escape of the tobacco from the tube and especially of the picadura tobacco employed in the manufacture of what are known as "Havana cigarettes." This arrangement of mechanism consists of two thin blades placed opposite to one another and perpendicularly to the longitudinal axis of the spindle, and which in turning approach one another when the tube is finished in order to twist its end, which extends six or eight millimeters beyond the end of the tube-forming spindle, and thereby to form with this projecting part a sort of bottom, which retains the tobacco in the tube. In open-end non-pasted cigarette-tubes as at present constructed there is nothing to prevent the escape of the tobacco from the tubes, especially when this tobacco is of a granular nature like that used in Havana cigarettes, or when it is dry like that used in ordinary cigarettes, such as "Caporal," &c.

In its application to known machines for manufacturing cigarettes without adhesive material on what is known as the "Decouplé" system this new mechanism requires to be supplemented by another piece of mechanism the object of which is to take the fin-

ished tube—that is to say, the tube cut to length and twisted at one end—and to turn it around, so as to present it with its open end opposite the filling mechanism. The turning mechanism forms the second part of the improvements. This supplementary mechanism is not required, however, when the filling mechanism, instead of being placed at the other side of the driving-gear, as in the aforesaid Decouplé machines, is placed at the side of the driving-gear over the cam actuating the filling-spindle. In such an arrangement the twisted end is presented in a favorable position relatively to the filling mechanism.

In the annexed drawings, Figure 1 is an elevation of part of an improved Decouplé machine for manufacturing non-pasted cigarette-tubes, showing my improvements applied thereto. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a transverse section taken on line 12 of Fig. 1, showing the arrangement employed for turning around end for end the non-pasted tube after one of its ends has been closed or twisted. Figs. 4 and 5 are respectively an elevation and a vertical section of the mechanism for folding or twisting the end of the paper tube. Fig. 6 is a detail view, to a larger scale, of the blades of the twisting mechanism. Fig. 6^a shows part of the mechanism for actuating the twisting-blades shown in Fig. 7. Fig. 7 is an elevation of the scissors for cutting off the tubes. Fig. 8 and 9 are respectively an elevation and a plan view of the support for the tube-forming spindle and of the spindle itself, upon which spindle the tubes are made and closed. Fig. 10 represents the end of a finished tube, showing an end and side view of the same.

In the improved machine *a* designates the ordinary table, on which is fixed an extension *a'*, which carries four vertical supports *b c d e*. The first support *b* is cast in one with a fork *b'*, between the branches of which is arranged a roller *b²*, which serves as a guide for the paper *x*, which unwinds from a bobbin *x'*, mounted on the wheel or core *c'*, fixed on a shaft *c²*, the ends of which rest in bearings on the two branches of the support *c*. The shaft *c²* can turn freely in its bearings; but it is subjected to the action of two blade-springs *c³*, 100

the object of which is to increase the friction developed during the rotation of the shaft c^2 and to act as a brake.

The tension of the paper is obtained by a guide-roller c^4 , which rests upon it, and is mounted between the ends of two parallel balance-levers c^5 , carried on the support c , by screws c^6 , on which they are free to oscillate. These levers c^5 are also furnished with counterweights c^7 , which can be adjusted on them so as to balance the roller c^4 more or less, and thereby to permit as exact an adjustment as possible of the tension of the paper x .

The support b contains the rod or stem which carries the printing-stamp and which is actuated by a lever-arm b^3 , fixed on the end of a rock-shaft b^4 , operated by a lever b^5 , the end of which is provided with a friction-roller engaging in the groove of a cam b^6 , mounted on the intermediate shaft f , placed above the table a , as in the ordinary Decouplé machines.

The support c is provided with an opening at its lower part to allow of the passage through it of the long boss d' of the support d . In the interior of this long boss slides the rod d^2 , which carries the inking-pad d^3 , which at each revolution of the machine comes in contact with the printing-stamp carried by the support b .

As in the Decouplé or other similar machine after a tube has been made, the printing-stamp operated by the lever b^3 prints the required mark under the paper x , after which the said stamp is inked by coming in contact with the pad d^3 carried by the rod d^2 .

The support d carries at its upper end an L-shaped piece d^4 , the vertical branch of which allows the passage through it of the tube-forming spindle g , provided at its heel with an upright g' , (see Figs. 8 and 9,) which engages in a slot d^5 of the support d^4 , where it is suspended by a terminal button or head g^2 . This slot opens into a wider opening d^6 in the horizontal branch of the L-shaped piece d^4 , through which opening the head g^2 of the upright g' can pass. A screw d^7 , furnished with a lock-nut d^8 and screwed through the horizontal part of the support d^4 , enters by its pendent end into a hole in the spindle g and prevents any longitudinal displacement of the latter. To take out the tube-forming spindle g , the screw d^7 is unscrewed sufficiently and the spindle is slid back so as to bring the head g^2 opposite the opening d^6 of the horizontal branch of the L-shaped piece d^4 . The head g^2 is then passed through this opening and the spindle g is then easily removed.

The spindle g beyond the milled roller G for creasing or goffering the longitudinal joint of the paper tube is prolonged two or three centimeters, as shown in Figs. 8 and 9, in order to support the manufactured tube during the operation of folding or twisting

its end. The dotted line shows the tube before it has been twisted and after the scissors have cut off the preceding tube.

The purpose of the construction represented in Figs. 8 and 9 is to regulate the pressure of the spindle g and of its crimping or goffering roller against the larger crimping or goffering roller above it, which serve, also, to transport the tube and at the same time to afford a simple and easy means of removing the spindle g when required. The spindle g hangs by the head g^2 in the narrow slot d^5 , and the screw d^7 acts upon the rear end of the spindle g to press the front end more or less firmly against the upper creasing or goffering roller.

The construction of the scissors for cutting off the paper tubes is as follows: The branch of one of the blades, instead of being curved, has an extension h , terminating in a stud h' , standing at right angles to it, and upon which is hooked one end of a spring h^2 , the other end of which is attached to the other branch of the scissors, and which spring constantly tends to draw the two blades h^3 together, the opening and closing of the said blades depending on a cam h^4 in the usual well-known manner. This construction of the scissors allows of the employment of a long spring h^2 for closing the blades together, which gives greater regularity and smoothness in the cutting off of the paper tube.

The folding or twisting mechanism is placed at the end of the prolongation of the tube-spindle g . It is actuated by a grooved pulley i on the shaft f , which communicates motion by a cord or strap i' to another pulley i^2 cast with or connected to a toothed wheel k , which gears with the pinion k' . The pinion k' is fixed on a socket m , (see Fig. 5,) on which is also secured a sleeve k^2 , having a circumferential groove. This sleeve k^2 is free to move longitudinally on the socket m , while the latter is rotated by the pinion k' . For that purpose there are engaged in the groove of the sleeve k^2 the ends of the branches of a fork k^3 at one end of a lever oscillating on an axis k^4 , fixed to the table a . The end of the lever k^3 opposite to the forked end is provided with a friction-roller k^5 , which takes into the groove of a cam i^3 cast with or connected to the pulley i , and which cam imparts to the forked lever k^3 the required oscillatory movements. The sleeve k^2 can slide, as before explained, on the socket m . Two grooves m' are formed diametrically opposite to each other, in which are placed two pieces m^2 , the free end of each of which is connected to a metallic blade m^3 , which moves in an opening m^4 , made perpendicularly to the axis of the spindle g in the thickness of the end of the socket m . The acting parts of the blades m^3 are cut out to a curvilinear shape, as shown clearly in Fig. 6, in such manner that as these blades approach one another they

seize the paper tube to be closed centrally by their projecting parts m^{10} .

The pieces m^2 , which impart alternating rectilinear radial movements to the blades m^3 , are raised out of the grooves of the socket m by the sleeve k^2 , as each of these pieces is provided with a projecting heel (see Fig. 6^a) and is pivotal on a pin m^5 sunk in the socket m , so that as the sleeve k^2 is moved backward on the sprocket m it turns the pieces m^2 on the said pin m^5 until the upper edges of the said heel parts of such pieces come level with the periphery of the socket m .

The tube-spindle g , above referred to, enters the central opening of the socket m and stops about half a millimeter short of the blades m^3 . All this twisting or folding mechanism is mounted on an intermediate support n , fixed on the principal support e .

When the paper tube is formed—that is to say, when the edges are interlocked or simply placed one over the other and pressed down or creased by the well-known devices G G' , Figs. 1, 2, and 8—it extends about seven millimeters beyond the spindle g , Figs. 8 and 9. The cam i^3 then acts on the forked lever k^3 , and the sleeve k^2 slides on the socket m while it continues to turn therewith, the said socket receiving its rotatory motion from the pinion k' , which gears with the toothed wheel k , driven by the grooved pulley i . During the longitudinal movement of the sleeve k^2 the pieces m^2 bend and approach each other and move the blades m^3 , which in turning twist the paper forming the end of the tube and press it down when they have quite come together, so as to form a twisted bottom normal to the longitudinal axis of the tube and presenting somewhat the external appearance shown in Fig. 10.

As above stated, the folding mechanism is applicable to existing machines for manufacturing non-pasted cigarette-tubes with their longitudinal edges interlocked or not, as the case may be, the interlocking being either external or internal; but when applied to existing machines for manufacturing non-pasted tubes on the Decouplé system the twisted end is presented to any suitable filling mechanism, as represented at A , for filling the cigarette. It is therefore necessary to add other devices which impart a half-turn to the tube, in order that the open end of the latter may be presented to the double filling-funnel A' in front of the ramming-spindle of the filling device A . Various arrangements of mechanism may be employed for this purpose. I prefer, however, that shown in Figs. 1, 2, and 3, but without limiting myself to the employment of that particular arrangement. This arrangement comprises a cam p , mounted on the lower intermediate shaft o of the machine, and each side of which cam is provided with a groove. On the front of the table a is a vertical cylindrical rod r , capable of being moved up and down and furnished with two collars r' , between which take the branches

of a fork s . This fork s forms one end of a lever s' , free to oscillate on a fixed axis s^2 , and the other end of which lever is furnished with a friction-roller which engages in a groove s^3 of the cam p . In the other groove t^2 of the cam p takes a friction-roller mounted at the end of a horizontally-sliding rod t , carrying a rack t' , which gears with a pinion r^2 on the rod r . This pinion r^2 is of a height sufficient to allow the rod r to move up and down vertically to a certain extent without the pinion r^2 coming out of gear with the rack t' .

The rod r terminates at its upper end in a fork r^3 , the two branches of which form a V-shaped notch. The rod r is placed in the center line of the tube-transporting mechanism y y , used in the well-known Decouplé machine, that is to say, between the sides of the movable carriage.

When a paper tube arrives over the fork r^3 upon the transporting mechanism y y , the cam p acts on the lever s' and raises the rod r , and the tube represented in the drawings by dotted lines is taken by the fork r^3 , is raised thereby, and is disengaged from the carriage on which it has been resting. Then the rack t' , actuated by the cam p , turns the pinion r^2 , and thereby the rod r and the paper tube resting on it, half a revolution, which causes the tube to be presented with its open end toward the ramming-spindle. Finally the rod r descends and returns the tube onto the transporting-carriage, whence it is conducted by the tube-pusher v , Fig. 2, into the double funnel A' between the pinchers, which hold it while being filled in the usual well-known manner from the filling device A .

I claim—

1. In a machine for making cigarette tubes without adhesive material, mechanism for closing or twisting one end of the paper tube which consists of a socket surrounding the end of the tube spindle, a sleeve adapted to slide longitudinally on the said socket and to turn therewith, means for reciprocating the sleeve, two pieces pivoted to the said socket diametrically opposite to one another and vibrated by the said sleeve when the said sleeve is operated and two blades connected to the said pivoted pieces and adapted to slide radially to and from one another across the said socket in order to flatten and twist the end of the paper tube, substantially as set forth.

2. In a machine for making cigarette tubes without adhesive material, in which one end of the paper tube is closed by folding or twisting, the combination with tube transporting mechanism, of devices for turning the paper tube round, end for end, which consists of a rod one end of which is adapted to receive and hold the tube while the said rod and the paper tube supported thereby is raised and lowered, and is caused to make a half revolution, and means for raising and lowering and rotating the said rod, substantially as set forth.

3. In a cigarette tube making machine, the

combination of a tube-forming spindle substantially as described, a rotary sleeve in operative relation thereto, blades carried by the sleeve, means for reciprocating the blades at
5 an angle to the axis of the sleeve, and means for rotating the sleeve and blades.

In testimony that I claim the foregoing as

my invention I have signed my name, in presence of two witnesses, this 21st day of September, A. D. 1894.

CHARLES ALFRED MARCHAL.

Witnesses:

GEORGE LAURENT,

EUGÈNE WATTIER.