(No Model.) 4 Sheets—Sheet 1.

B. WERTHEIMER.

CIGAR BUNCHING MACHINE.

No. 460,415. Patented Sept. 29, 1891.

Fig. 1.

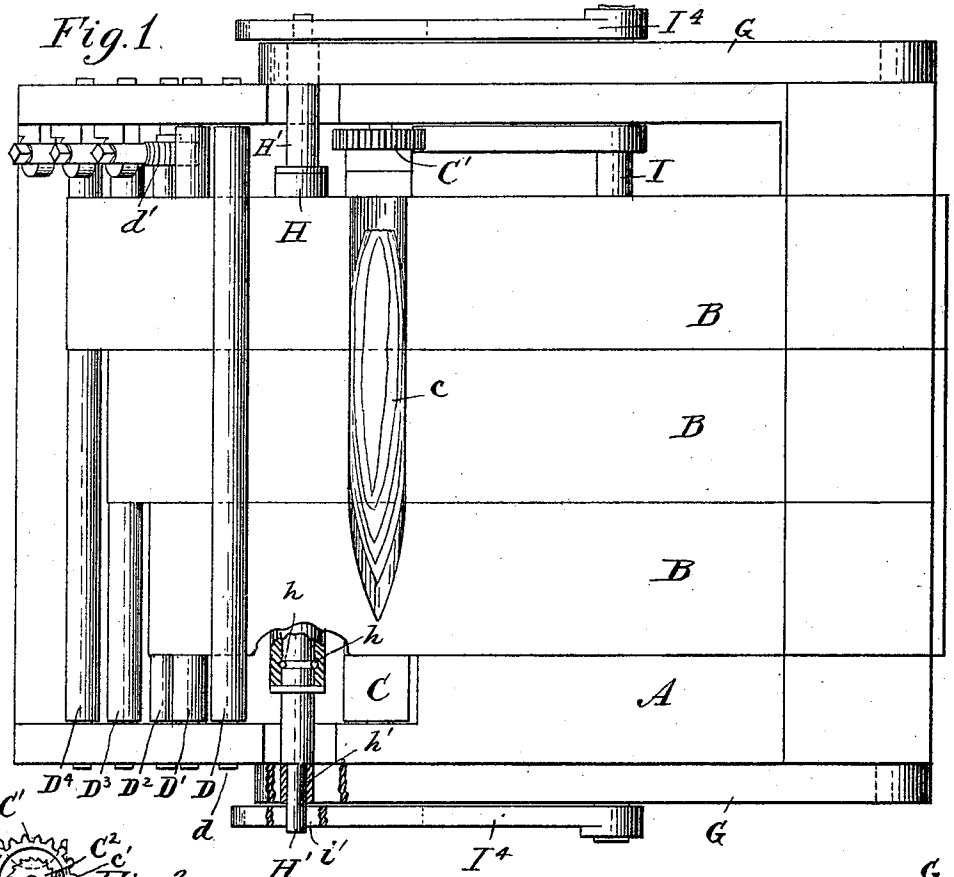

Fig. 3.

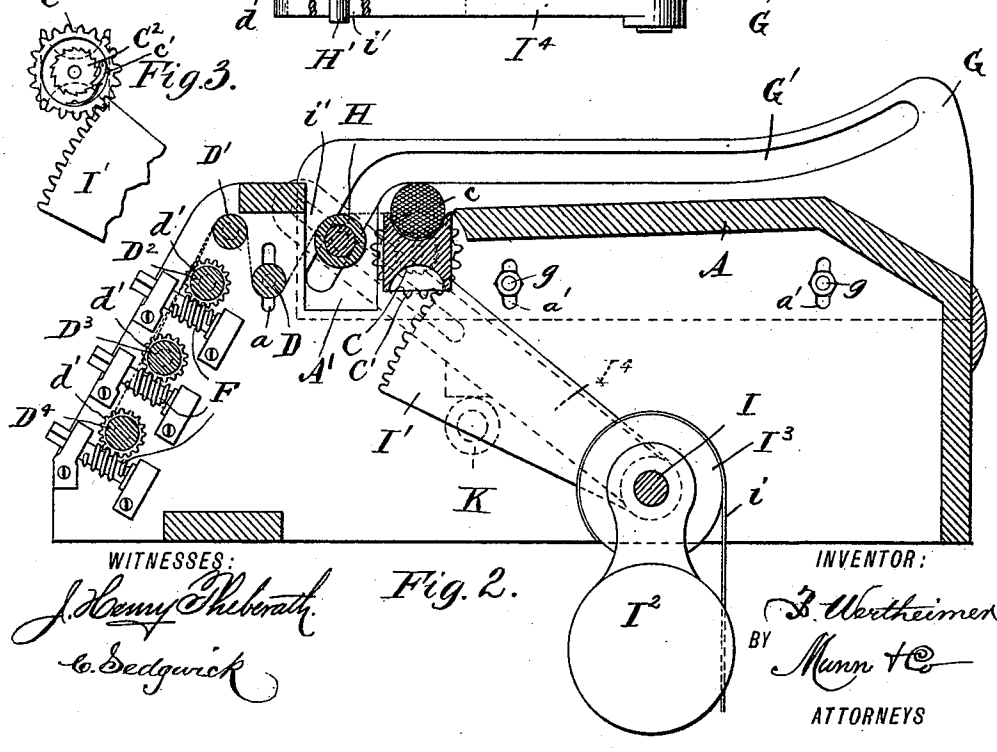

Fig. 2.

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B. WERTHEIMER.

CIGAR BUNCHING MACHINE.

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Fig. 4.

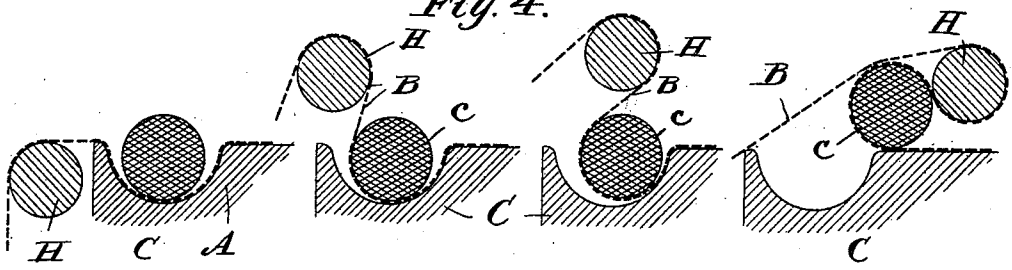


Fig. 5.

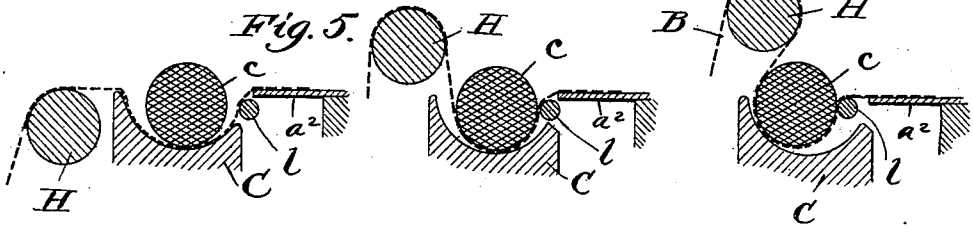


Fig. 6.

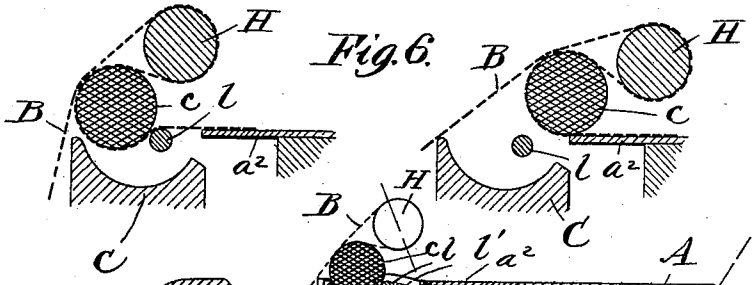
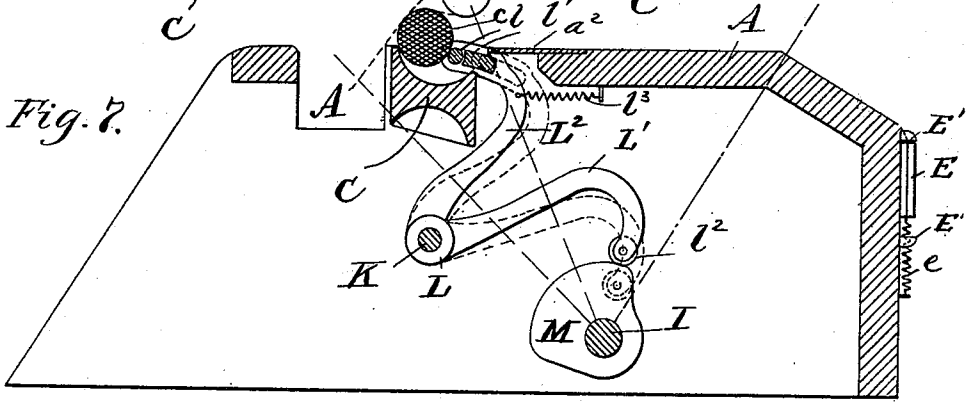


Fig. 7.



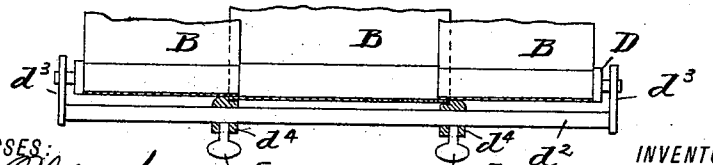


Fig. 8.

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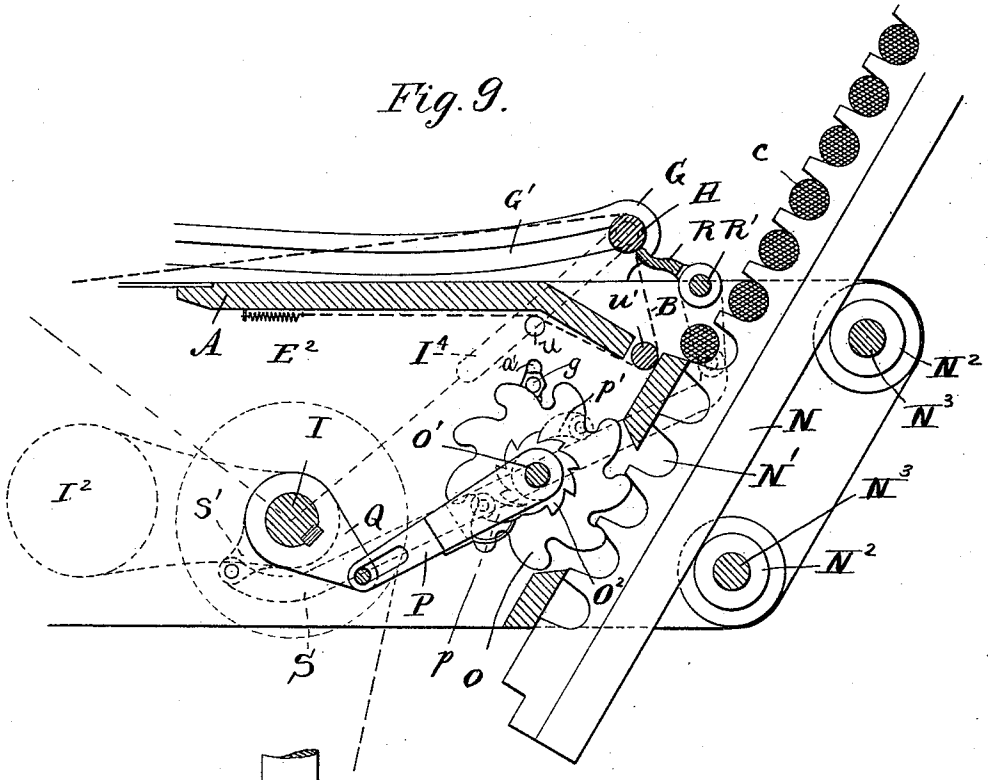
Fig. 9.



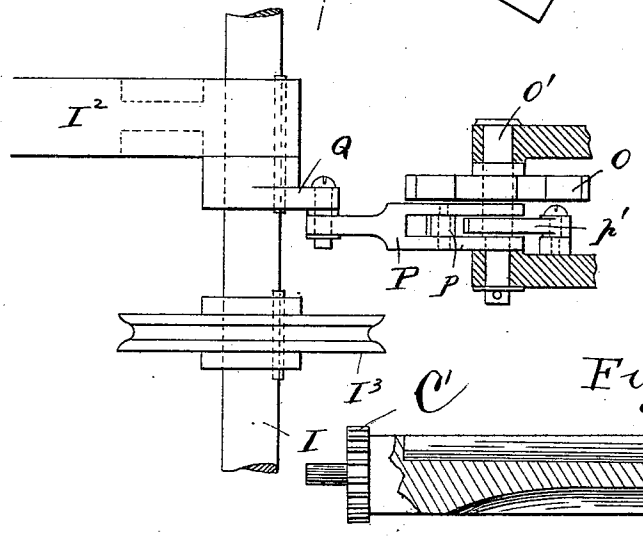
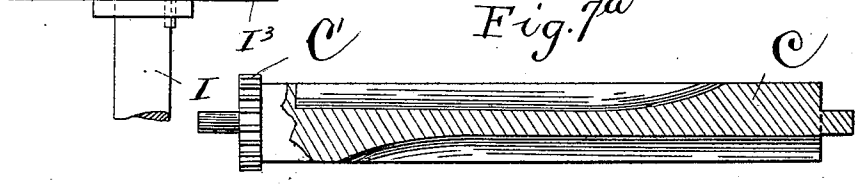


Fig. 10.

Fig. 7a



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B. WERTHEIMER.

CIGAR BUNCHING MACHINE.

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Fig. 11.

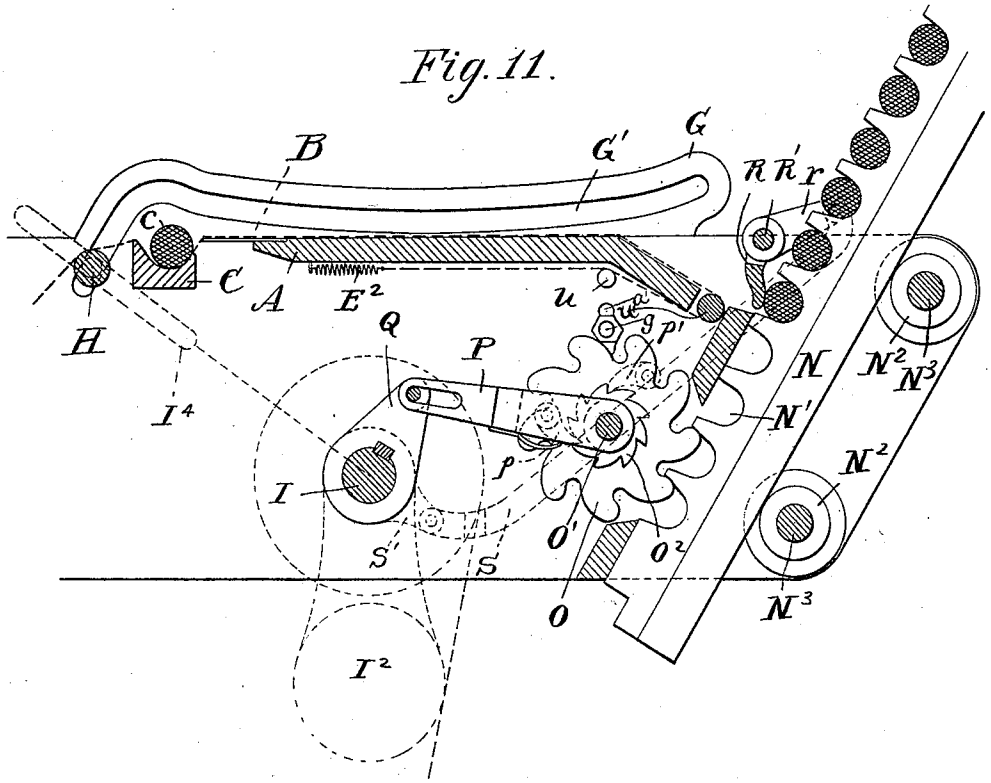
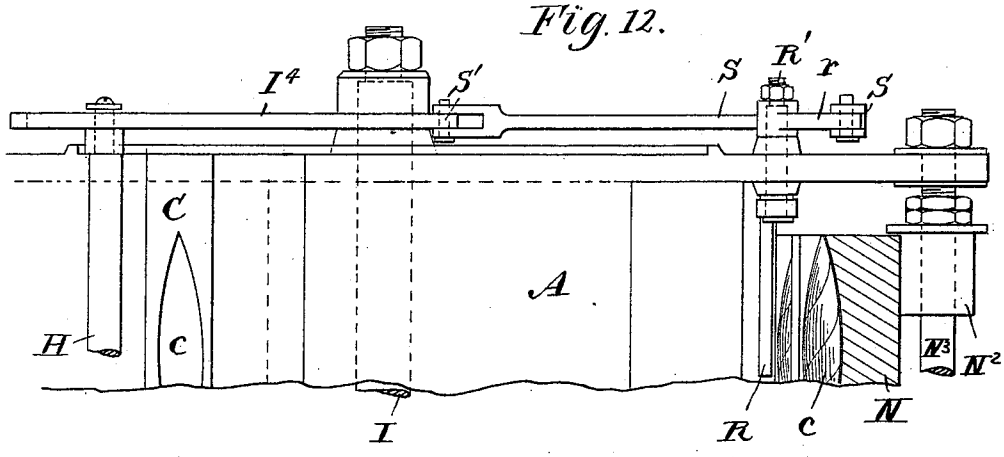


Fig. 12.



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UNITED STATES PATENT OFFICE.

BERNHARD WERTHEIMER, OF CARLSRUHE, GERMANY.

CIGAR-BUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 460,415, dated September 29, 1891.

Application filed October 11, 1890. Serial No. 367,820. (No model.)

To all whom it may concern:

Be it known that I, BERNHARD WERTHEIMER, a subject of the Emperor of Germany, residing in Carlsruhe, Germany, have invented new and useful Improvements in Cigar-Bunching Machines, of which the following is a specification.

My invention relates to improvements in that class of machines which are used in the manufacture of cigars, the machine being specially adapted to roll the wrappers upon the fillers and to automatically deliver the completed cigar into a form.

The object of the invention is to produce a machine which, while not entirely making a cigar, will greatly facilitate the manufacture and will form the cigar in such shape that the tobacco composing it will be evenly distributed and will roll the bunch symmetrically, an essential feature of the machine being the means by which the filler is placed in a loop of the wrapping-cloth without injury.

My invention relates to improvements in cigar-bunching machines; and the object of my invention is to produce a machine which will rapidly roll a symmetrical bunch and deliver it into a matrix of a mold.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of one form of rolling-table and shows the arrangement of the aprons which envelop the filler while it is being rolled. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a broken detail view of the gear mechanism for turning the filler-mold. Fig. 4 is a detail sectional view of a modified form of the rolling-table, having the filler-mold formed integral with it, the view showing also the progressive positions of the filler, aprons, and bunching-roller during the rolling process. Fig. 5 is a similar view of a modification of the rolling mechanism shown in Fig. 4, showing a slotted table, a slide to cover the slot, and a supplemental roller. Fig. 6 is a view similar to Fig. 5, but with the bunching and supplemental rollers in a more advanced position. Fig. 7 is a vertical sectional view of a preferred form of table and filler-mold, the side pieces being removed from the table. Fig. 7ª is a detail plan view of the double mold. Fig. 8 is a broken detail plan of the tension-roller and aprons and the means of adjusting the aprons. Fig. 9 is a broken detail sectional view of a modified form of rolling-table with a form connected therewith and means for actuating the form. Fig. 10 is a broken sectional plan of the form-operating mechanism. Fig. 11 is a sectional elevation of the connected rolling-table and form, as in Fig. 9, but with the latch in position to press a bunch into a matrix of the form, the view showing also a filler-mold in section; and Fig. 12 is a broken sectional plan of the connected form and table.

In carrying out the invention the filler is formed in the usual way, either by rolling it upon the rolling-table or upon the knee. The rolling table or frame A of the machine has a flat top, across which extends longitudinally the aprons or bands B, the bands being arranged parallel with each other and slightly overlapping, as shown in Fig. 8, and having their ends severally secured at one end of the machine to the rollers D^2 D^3 D^4, and the opposite ends of the aprons are secured between the clamp E on the opposite end of the machine, as shown in Fig. 7, the clamp comprising two similar plates, which are closed upon the aprons, and which are connected with the springs *e* upon the lower edges, the vertical movement of the clamp being limited by the stops E′ above and below it. The clamp thus gives the necessary elasticity to the aprons; but instead of using the clamp E the aprons may be attached directly to a spring E^2 on the under side of the table-top, the apron being doubled over one end of the table, as shown in Fig. 9, for the purpose.

The aprons are given the proper tension by the tension-roller D, which extends transversely across the machine-frame in front of the apron-rollers D^2 D^3 D^4, and which rests upon the upper surface of the aprons, the ends *d* of the roller being reduced and made to extend through vertical transverse slots *a* in the side of the machine-frame, so as to permit of the necessary vertical movement of the roller. The object of having the several aprons and an adjusting-roller for each apron is to prevent the cylindrical form of the bunch, as the outside aprons may be

drawn tighter than the central apron, thus causing the bunch to be tapered at the ends. When the outside aprons are tightened, as described, they draw harder on the ends of the bunch than the center apron does on the middle of it, and as a result the tip and reduced end are formed. A roller D′ is also arranged a little above the roller D and between it and the band-rollers above mentioned, and the aprons are made to extend below the tension-roller D and above the roller D′.

A filler-mold C is mounted in a recess in the upper side of the table or frame A, the said mold being concave on its upper and lower sides to receive a filler, and the mold has at one end a gear-wheel C′, which connects with suitable mechanism, as described below, to rotate the mold and turn it over, the ends of the mold being pivoted in suitable supports to enable it to turn easily. The gear-wheel C′ turns loosely on one of the trunnions of the mold C, and fixed to the mold is a ratchet-wheel C^2, which is engaged by a pawl c', carried by the gear-wheel, so that the gear-wheel may turn freely in one direction without actuating the mold, and when turned in the opposite direction the pawl by engaging the ratchet-wheel will cause the mold to turn.

The ends of the aprons are fixed to the rollers D^2, D^3, and D^4, as already described, and the ends of the rollers are provided with worm-wheels d', which mesh with worms F, arranged at right angles to the rollers, so that by turning the worms the gears and rollers may be also turned, thus rolling the aprons upon the rollers and giving to them the necessary tension.

On each side of the machine-frame A are side pieces G, which project above the surface of the table-top, and which are secured to the table or frame by means of the bolts g, which extend through vertical slots a' in the sides of the frame, thus affording means for vertically adjusting the said pieces. The side pieces G have a slotted track G′ therein, which extends for the most part parallel with the table-top A, and a little above the same, but which is curved upwardly at its rear end, and at its forward end is curved downward so as to be opposite the ends of the transverse recess A′ in the table-top, said recess being directly in the rear of the mold C.

A shaft I extends transversely through the lower portion of the machine-frame, and extending radially from one side of the shaft is a segmental arm I′, the outer end of which is provided with teeth which mesh with the gear-wheel C′ on the end of the mold C, so that when the shaft I is oscillated the movement will be transmitted to the mold, the parts being arranged so that the mold will be turned through an arc of one hundred and eighty degrees. The shaft I has also a weight I^2 attached thereto by means of a suitable arm, and the weight is arranged in relation to the arm I′ so that when it drops into its normal position, as shown in Fig. 2, the upper teeth of the arm I′ will be in engagement with the gear-wheel C′, thus holding the mold C in position to receive the filler. A pulley I^3 is fixed to the shaft I and a chain or strap i is attached to the pulley, the free end of the said strap connecting with a suitable treadle, so that by pressing the treadle the shaft will be turned in one direction, and upon removing the pressure the weight I^2 turns the shaft in the opposite direction.

On opposite ends of the shaft I are the arms I^4, the arms being arranged on the outer sides of the machine-frame, and the ends of the arms extend opposite the slotted track G′ in the side pieces G, and are slotted, as shown at i', to receive the ends of a shaft H′, which carries a bunching-roller H, the roller being arranged beneath the aprons B and being provided with ball-bearings having balls h, which turn in suitable grooves in the shaft H′. The shaft H′ should have suitable friction-rollers, as h', at each end to enable it to run easily in the tracks G′. The arms I^4 are placed upon the shaft I in such a manner that when the machine is at rest, as shown in Fig. 2, the arms will be opposite the recess A′ in the front end of the table or frame, and the roller H will extend through the recess.

When a bunch is to be rolled, the filler is placed in the mold C above the aprons B, and the cigar-wrappers are placed upon the aprons behind the filler. The operator then steps upon the treadle, thus turning the pulley I^3 and the shaft I, raising the arm I′ and weight I^2 and moving the arms I^4, and when the arms are moved they cause the shaft H′ to travel along the grooved track G′, thus raising the bunching-roller H and carrying the aprons B over the filler; and that this operation may be nicely performed the side pieces G are adjusted so as to bring the bunching-roller a proper distance above the filler. This movement of the bunching-roller H carries the apron around the filler, as described, and when the bunching-roller reaches this point the aprons have been drawn to their limit, and the continued movement of the bunching-roller raises the filler from the mold and rolls it in a well-known manner upon the table, thus enveloping it by the wrappers or binders when they are spread in front of the mold, as described below. The movement of the bunching-roller is clearly shown in Figs. 4 and 5, and in Fig. 4 the mold is shown as made integrally with the rolling-table. When the pressure upon the treadle is removed, the weight I^2 drops beneath the shaft, thus turning the shaft and carrying the arms I′ and I^4 back to their normal position, and during this movement the segmental arm I′, operating on the gear-wheel C′ and ratchet-wheel C^2, tips the mold C completely over; and it will be observed in this connection that the mold, which is shaped to receive the filler, has one side with its point to the right and the opposite side with its point to the left, and as the mold is automatically tipped back and forth,

as described, it is thus adapted to be used in connection with either right hand or left hand over leaves and wrappers. The double form of mold described above is the preferred form and is shown in Figs. 7 and 7ª.

To provide against too much one-side pressure from the wrapping-roller H, the following mechanism is used: A shaft K extends transversely through the machine-frame in front of and a little above the shaft I, and fixed to the shaft near each end is a hub L, having the curved arms L′ and L² radiating therefrom. The arms L² are curved and made to extend to a point just in front of the mold C, the arms being slotted to receive a supplemental roller *l*, which extends transversely across the machine-frame, and the slotted arms are provided with a follower *l′* to hold the roller in place. The lower arms L′ are curved at the ends and extend opposite and a little above the shaft I, the shaft having cams M to actuate the arms, and the arms having suitable trucks *l*³ in the ends to reduce friction between the arms and cams. The cam M is shaped to rock the arms L′ and L², so that during the upward movement of the roller H and filler, as described above, the roller *l* will force the aprons B against the lower side of the filler and press lightly against the filler until it reaches the table-top, and when the bunching-roller is used, as described, the table-top is provided with a prolongation or flange *a*³, which extends well into the recess occupied by the mold C. The supplemental roller and its actuating mechanism described above are used in the form of machine shown in Fig. 7.

In Fig. 8 I have shown means for preventing the displacement of the aprons B and holding them in position upon the tension-roller D, which consists of two arms *d*³, attached loosely to opposite ends of the roller and carrying a cross-bar *d*², on which are adjustably mounted the blocks *d*⁴, the inner ends of the blocks being rounded to press lightly upon the aprons, and being also provided with suitable shoulders, so that they may be pressed simultaneously upon two aprons, the blocks being adjustable by means of suitable thumb-screws *d*⁵.

In Figs. 9 to 12, inclusive, I have shown means for delivering the completed bunches upon a form. The form-plate N has the usual forms or molds N′ extending transversely across it, each being adapted to receive and shape a bunch, and the plate is mounted obliquely at the right hand of the table-top upon suitable rollers N², which turn upon the shafts N³. The form-plate N is actuated by a toothed wheel O, which meshes with the lower portion of the form on the plate, the wheel being secured upon a shaft O′, which turns in suitable bearings, and which has also a ratchet-wheel O² affixed thereto, and means are provided, as described below, for raising the form-plate a distance of one form or bunch each time a cigar is rolled, and in order that the plate may move accurately the end of the table top or frame A is shaped so as to form a guideway between it and the rollers N². A split lever P is pivoted at one end on the shaft O′, its opposite end being slotted, as shown, and connected with a crank Q on the main shaft I of the machine, the lever carrying a spring-pressed pawl *p*, which engages the ratchet-wheel O² and turns the wheel and the shaft to which it is affixed when the shaft I is turned in one direction, and to prevent the ratchet-wheel and shaft from turning back a pawl *p′* is provided, the pawl being pivoted upon a suitable support opposite the pawl *p*. A latch R extends transversely across the table-top near its rear end and opposite the form-plate N, the latch being fixed upon a suitable shaft R′, which is connected at each end by means of cranks *r* and levers S with the short arms S′, which are fixed to the main shaft I, the arms S′ being made to extend oppositely to the arms I⁴, which receive the shaft H′ of the bunching-roller H, as already described.

As shown in Figs. 9 and 11, the aprons B are doubled beneath the table-top, being held in place by the roller *u* and guided around the end of the table through a slot in the same by means of a roller *u′*. It will be noticed in this connection that the rear end of the table-top is inclined downwardly, so that the bunches which are rolled thereon will easily enter the forms N′ of the form-plate N at the end of the table.

When the shaft I is actuated to roll the bunch in the manner already described, the levers S, cranks *r*, and shaft R′ are also actuated, and during the forward movement of the bunching-roller H the latch R is raised to the position shown in Fig. 9. Upon the return movement of the bunching-roller and its actuating arms or levers the formed bunch rolls down the incline at the rear end of the table into one of the forms N′ of the form-plate, and the latch R is forced downward upon the bunch, thus pressing it firmly into the form, when the shaft I is again actuated to repeat the operation. The crank Q, lever P, and pawl *p* actuate the ratchet-wheel O², shaft O′, and toothed wheel O, thus raising the form-plate the distance of one form, so that it is ready to receive another bunch.

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

1. A cigar-bunching machine having a plurality of parallel bunching-aprons arranged side by side, said aprons being independently adjustable in length in relation to each other, substantially as described.

2. A cigar-bunching machine having a plurality of parallel independent bunching-aprons arranged side by side, the aprons being secured at one end to independent rollers having a worm and gear mechanism for adjusting the aprons longitudinally, substantially as described.

3. In a cigar-bunching machine, the combi-

nation, with the rolling-table, the mold therein, and the bunching-aprons extending over the mold and arranged side by side, of tracks arranged at the sides of the table and extending upward in the rear of the mold and forward nearly parallel with the table-top, and a bunching-roller held to move in the tracks, substantially as described.

4. In a cigar-bunching machine, the combination, with the rolling-table, the mold therein, and the bunching-aprons extending over the mold, of the bunching-roller held to move in tracks extending upward in the rear of the mold and forward nearly parallel with the table-top, and the supplemental roller mounted in cam-operated arms in front of the mold and adapted to press the bunching-aprons against one side of the filler, substantially as described.

5. The combination, with the table-top having suitable bunching aprons and rollers, of an oscillating double-filler mold mounted in the table-top, having the points of each mold side extending in opposite directions, substantially as described.

6. In a cigar-bunching machine, the combination, with the table and the driving-shaft therein, of the form-plate mounted obliquely on rollers at the end of the table and provided with a series of transverse forms or molds, a toothed wheel arranged to mesh with the forms on the plates, a ratchet-wheel secured to the toothed-wheel shaft, a lever pivoted to the toothed-wheel shaft and provided with a pawl to engage the ratchet-wheel, and a crank connection between the lever and the main shaft, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BERNHARD WERTHEIMER.

Witnesses:

FRANZ FLASSLACHER,

FRIEDRICH QUEHL.