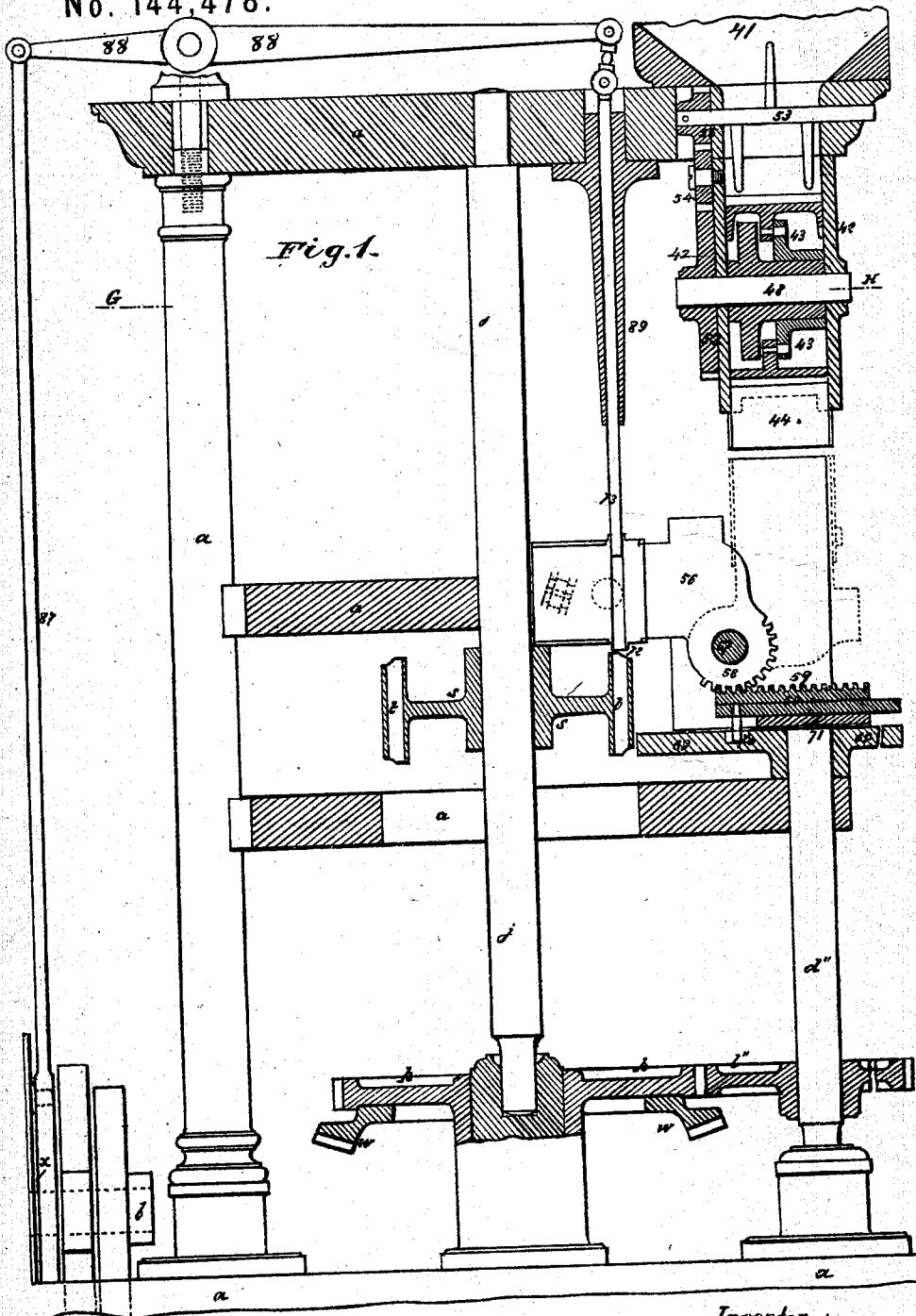


J. de S. RUISECO.
Cigarette Machines.

No. 144,478.

Patented Nov. 11, 1873.



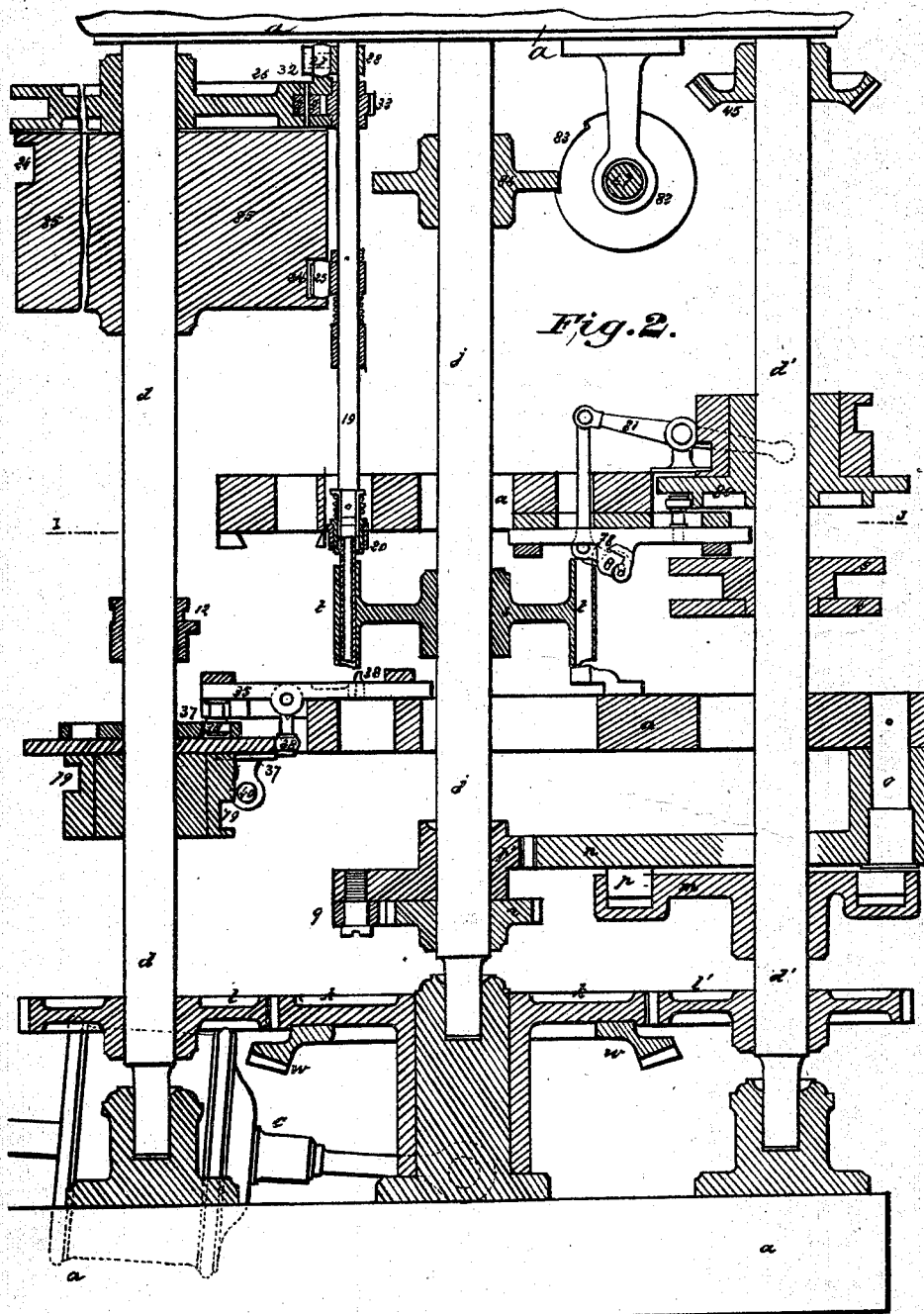
Witnesses:
1 Charles Dehnol
2 Emile Duhan

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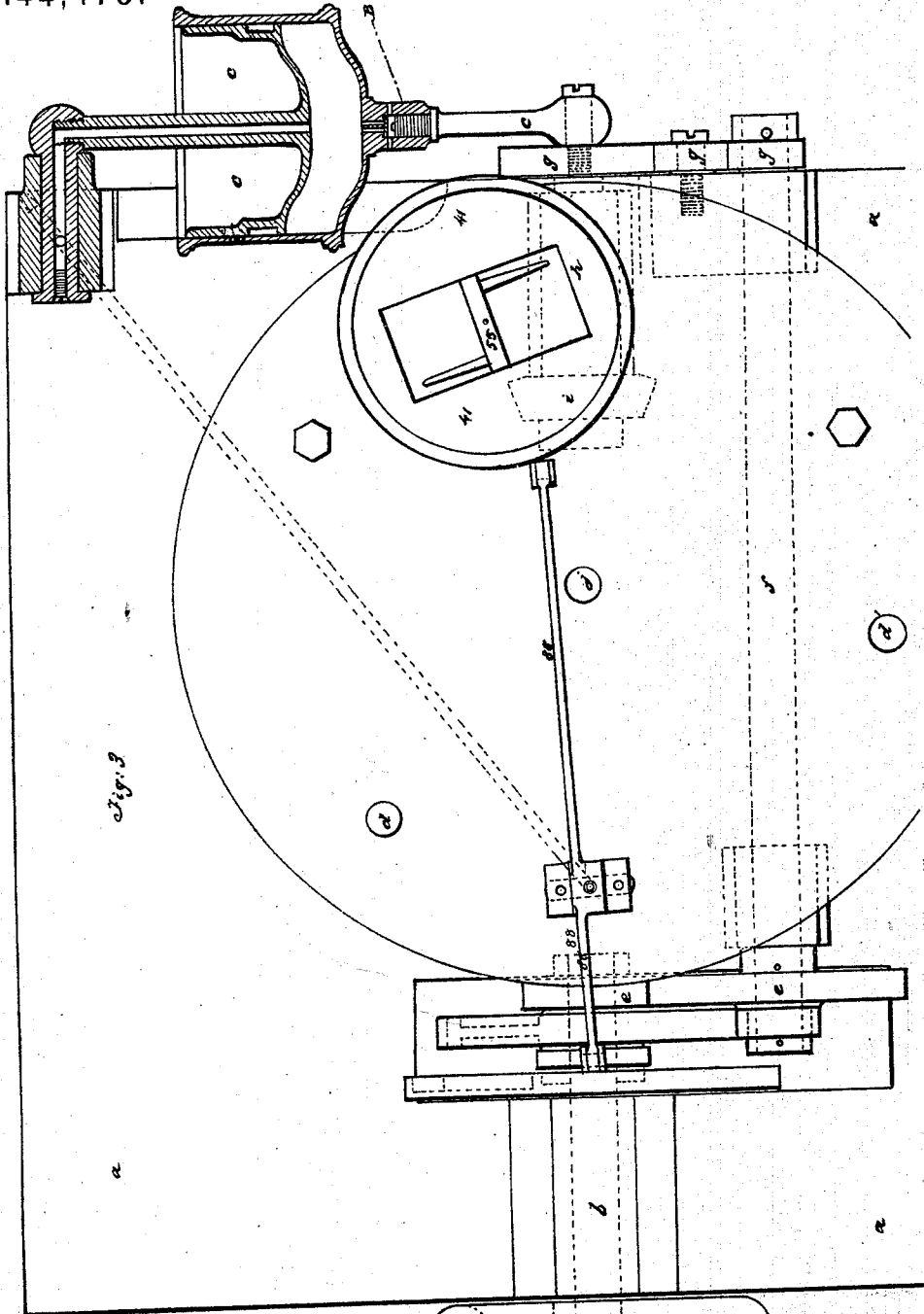
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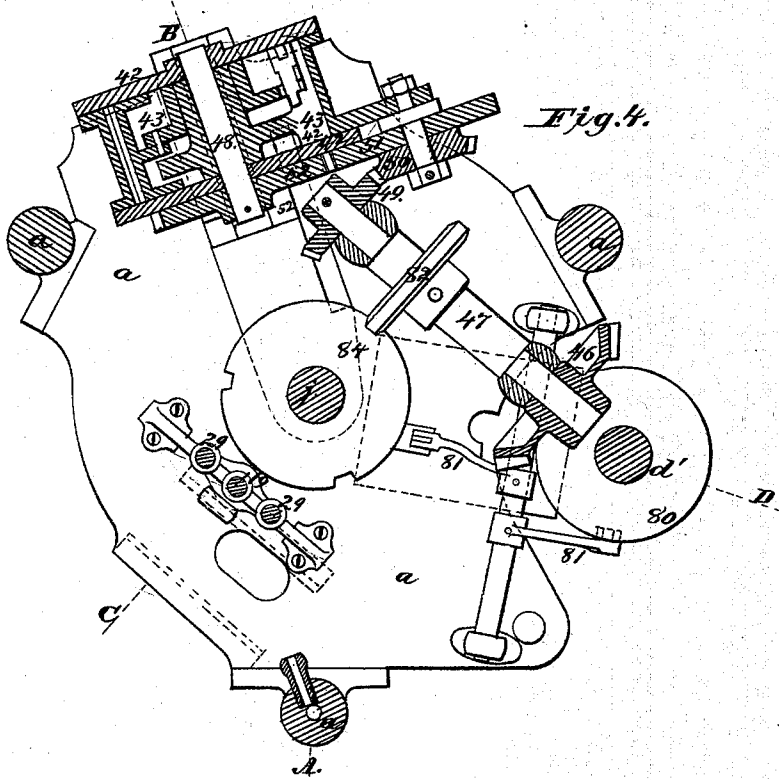
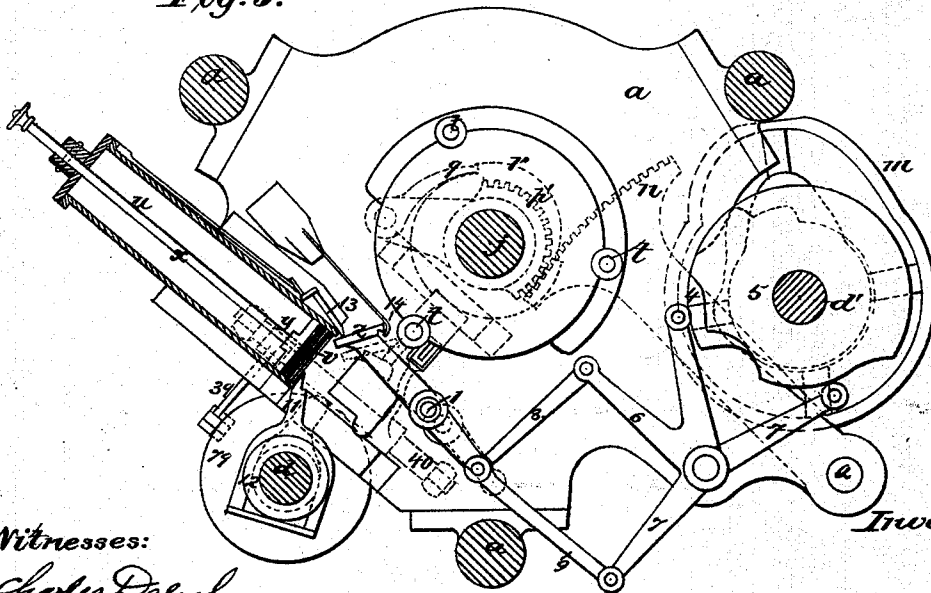


Fig. 4.

Fig. 5.



Witnesses:

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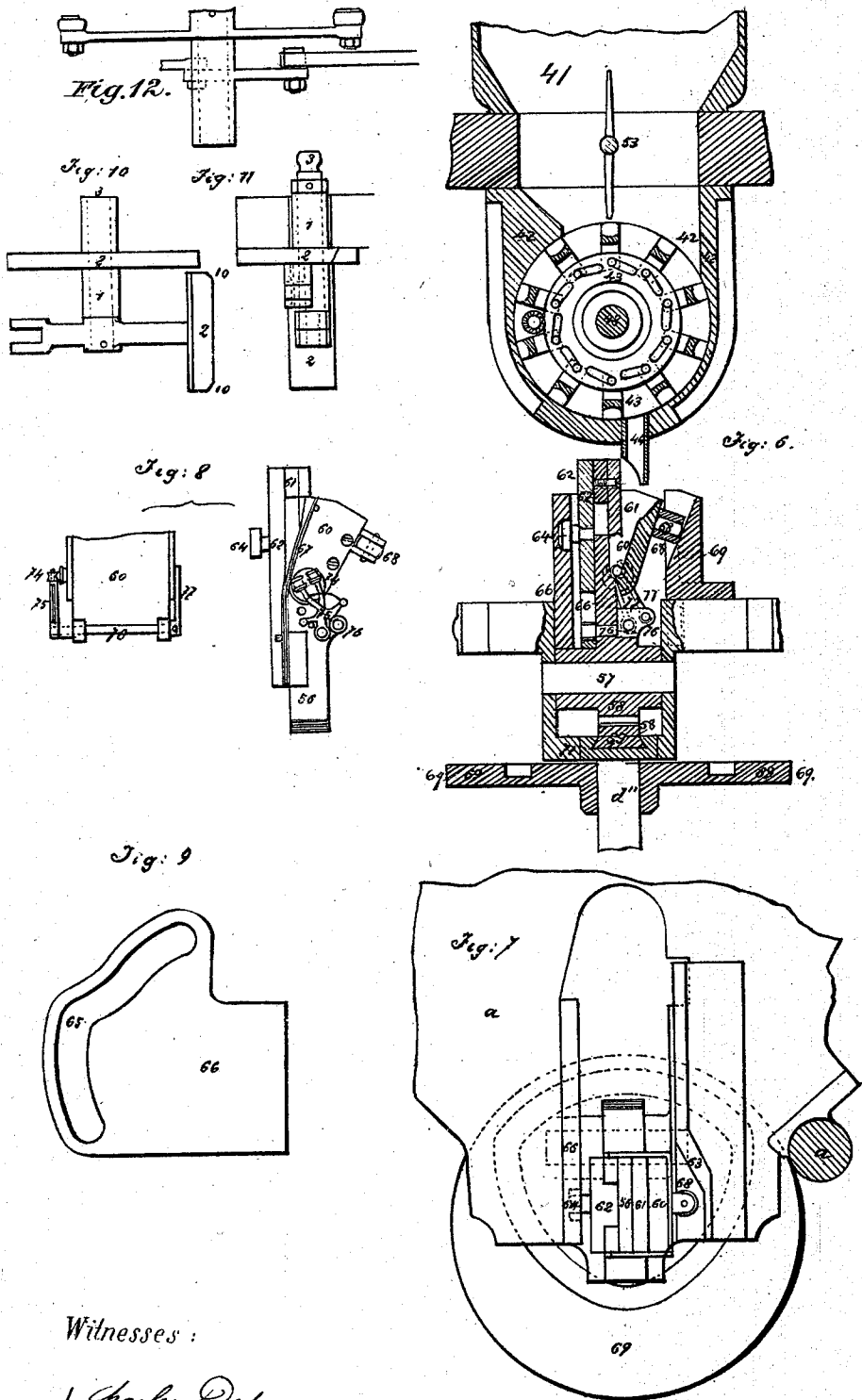
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Witnesses :

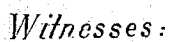
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1. Charles Detroit.

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UNITED STATES PATENT OFFICE.

JOSEPH DE S. RUISECO, OF PARIS, FRANCE.

IMPROVEMENT IN CIGARETTE-MACHINES.

Specification forming part of Letters Patent No. **144,478**, dated November 11, 1873; application filed July 19, 1873.

To all whom it may concern:

Be it known that I, Comte JOSEPH DE SUSINI RUISECO, of Paris, France, gentleman, have invented an Improved Cigarette-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed sheets of drawing making a part of the same.

My invention refers to a new or improved cigarette-making machine.

In using this machine, the tobacco is placed in a receiver above a distributing apparatus, which causes a gaged quantity of tobacco required for a cigarette to drop down to a compressor beneath, by the compressing action of which the tobacco, being rolled up, is inserted afterward into a paper tube ready to receive it, by means of a peculiar device, to be hereinafter described. The paper sheets are laid into a rectangular box of the like section to the surface of the cigarette-paper. A piston is constantly acting on the heap of sheets, and compels them to lean against a plate, which I call "hand," forming one end of the box, and intended to catch them one by one, and carry them to the rolling-rod, whereby the same are formed into tubes. The paper sheet is rolled up within a cylindrical tube or mold, split through one of its generating-lines, which split one edge of said sheet enters, and is caught by the rolling-rod, that is set rotating within the said mold. The lower end of the rolled-up sheet is then folded and the rod withdrawn. The rolled sheet is, together with the mold, carried up to the compressor containing a roll of tobacco, which is then, by another rod, driven into the paper tube. The mold moves anew, and presents the rolled sheet containing its tobacco, and having its lower end folded up, to the action of the upper-end folders, when the cigarette is completed, and the mold returned to its starting-point, or under the rolling-rod. On its entering the mold, the rod drives out the made cigarette, and gets hold of a new sheet, which undergoes the very same operations as the foregoing one.

From what has been said, the making of a cigarette consists of three different operations, effected by me simultaneously with three different molds, so as to obtain a threefold speedy

manufacturing action. The first operation consists in taking a sheet, rolling it, and folding the lower end thereof. The second operation consists in introducing the tobacco into the paper tube thus formed, and the third and last operation consists in folding the upper end.

The accompanying drawings illustrate my improved cigarette-machine.

Figure 1 is a vertical sectional view of my machine through the line A B, Fig. 3, showing the mode of distributing the tobacco. Fig. 2 is another vertical sectional view of the same through the line C D, Fig. 4, showing the rolling-rod motion, that of the upper folders, and also the way of transmitting motion to the mold-case to cause it to complete a threefold revolution, so that every one of the three molds shall stop successively in presence of the working parts, effecting the three above operations. Fig. 3 is a top view of the machine, showing the manner of transmitting motion from the driving-shaft to the various shafts of the working parts. Fig. 4 is a horizontal sectional view of the same through the line G H, Fig. 1, showing the manner of transmitting motion to the distributor. Fig. 5 is a horizontal sectional view of the same through the line I J, Fig. 2. Fig. 6 is a vertical sectional view of both the distributing and the compressing apparatus. Fig. 7 is a plan, and Fig. 8 a front and edge view, of the compressor. Fig. 9 shows the cam whereby the parts of the compressor are operated. Fig. 10 is an edge view of the hand and its slide. Fig. 11 is a front view of the same. Fig. 12 is a general view of the hand-operating levers. Fig. 13 shows different views of the lower folders. Fig. 14 is a general view of the parts constituting the rolling apparatus. Fig. 15 shows a view of the rolling-rod at the moment when the sheet is being got hold of. Fig. 16 shows two views, at right angles to each other, of the outside rod; and Fig. 18 shows different views of the inside rod of the rolling apparatus. Fig. 19 shows different views of a ring forming part of the rolling apparatus, and the function of which shall be explained hereinafter.

In all the figures the same letters and numeral figures of reference stand for the like parts where they recur.

a, framing; *b*, driving and transmitting shaft;

c, air-pump, either horizontal, as shown, or it may be vertical; *d d' d''*, vertical shafts, operating all the working parts; *e*, toothed pinions, transmitting the rotary motion from shaft *b* to shaft *f*; *g*, toothed pinions, transmitting the rotary motion from shaft *f* to shaft *h*; *i*, bevel-pinion on shaft *h*, meshing into a toothed bevel-wheel, *w*, capable of turning loosely on the central vertical shaft *j*, (see Fig. 3); *k*, toothed wheel on the hub of the wheel *w*; it gears into the three cog-wheels *l l' l''* on shafts *d d' d''*, so as to transmit the rotating motion to the three shafts, whereby the working parts are actuated. The means for transmitting motion from shaft *b* to the three shafts *d d' d''* may be obtained by any other suitable devices. *m*, large cam, Figs. 5 and 2, on the shaft *d*; *n*, toothed segment, pivoted on the stationary shaft *o*, a roller, *p*, on it being engaged into the cam-groove *f*; it meshes into a toothed sleeve, *p'*, turning loosely on shaft *j*, and provided with a pawl, *q*; *r*, three-toothed ratchet, keyed on shaft *j*, and operated by the pawl *q*. From the foregoing arrangement, it may be understood that the shaft *j* makes one complete revolution for three revolutions of the shafts *d d' d''*. *s*, mold-case on shaft *j*, having three molds in it, or vertical tubes *t t t*, split longitudinally through one of their generating-lines; *u*, rectangular box, Fig. 5, into which is placed the paper *v*; *x*, rod, provided with a piston, *y*, pressing constantly on paper *v*, which constant pressure is obtained by means of a weighted rope secured to the outward end of the rod *x*, and passing over a pulley; *z*, hand or catcher, Figs. 10 and 11, pivoted at 1 on a slide, 2, traveling horizontally; 3, tubes, fixed on the hand or catcher slide, and communicating with the sucking-pump *c*. This hand is hollow and pierced with holes, so that through the exhaust of the pump one sheet from the paper *v* will stick to its surface when closing the aperture of the box *u*. The displacing motion of the hand to transfer to one of the molds the sheet thus caught is obtained through the cams 4 5 on shaft *d'*, the knee-levers 6 7, and the connecting-rods 8 9, Fig. 5. In order to prevent the hand *z* from carrying more than one sheet at once, two of its angles are beveled, as at 10 10, Fig. 10, so that, by the exhaust of the pump, the two corners of the first sheet on the heap are raised and applied on the beveled angles 10 10, and said sheet is then separated from the block by two fingers, 11 11, advancing by the operation of a cam, 12, on shaft *d*, and keeping the position shown in Fig. 5 so long as the hand is off, that the whole heap of paper may constantly stand under the pressure of the piston *y*. During the hand's travel, a small stamp, 13, applies to the traveling sheet a trade-mark, while a spring, 14, causes the outer edge of the sheet (or the one which is to be outward when the cigarette is completed) to be folded, so that it may not rise again.

The rolling-rod (shown in details, Figs. 15, 16, 17, 18, and 19) consists of an outer tube,

15, Fig. 16, with a longitudinal slit, 16, and of a solid rod, 17, Fig. 18, having a rib, 18, which is located in the slit 16, one of the edges of which may be made to back or withdraw therefrom by the rotation upon itself of the rod 17, said rib forming, together with the backed edge, a sort of pinchers to take hold of the sheet. 19, rod, upon which the rolling device is set, Fig. 17; 20, ring, made to slide up and down, Fig. 19, on the rod 19. This ring has an inclined groove, 21, into which enters a trunnion, 22, fixed on the pinchers' head, and passing also through a groove formed on the head of the tube 15.

From this arrangement it is obvious that, when the ring 20 is lifted, the trunnion 22 being, by means of the inclined grooves, turned aside, the pinchers will assume within the tube a rotating motion, and their rib 18 shall lean against one edge of the slit 16, so as to pinch the paper.

The various motions of the rolling device are obtained as follows: 85, drum on shaft *d*, provided, first, with a cam, 24, into the groove of which a roller, 25, is engaged, which is fixed on the rod 19, so as to impart the up-and-down motions to all parts of the rolling device. Secondly, a cam, 26, on which is resting a roller, 27, secured on a cross-bar, 28, at the ends of which are attached the rods 29 29, holding the plate 30, Fig. 14, upon which rests the ring 20. This cam 26 lifts, therefore, the rods 29, and consequently the ring for allowing the pinchers to operate their local rotating motion. Springs 31 cause the downward motion of the rods 29. Thirdly, a toothed segment, 32, gearing into a small pinion, 33, on the rod 19, causes the rolling device to turn during the whole time it is within the mold, to roll up the sheet. The hub of this pinion is provided with two pins, 34, Fig. 14, going through a longitudinal groove formed on the rod 19, so that this pinion may be rendered independent from the up-and-down motion of said rod.

When the rolling operation has taken place, the folding of the lower end is effected by means of folders. (Shown in details, Fig. 13.) These folders consist of sliding pieces 35, provided with projecting spurs, which strike the rolled paper and form the first two creases of the fold, the third one being effected by the spur 36, which plunges into the center of the cigarette.

The sliding motion of the pieces 35 is obtained by means of cams 37 on shaft *d*, and acting on rollers 38 fixed on said pieces, Fig. 2.

The dipping motion of the spur 36 is obtained from cam 79, whereby levers 39, fixed on the rocking shaft 40, (shown in dotted lines,) Fig. 5, are caused to work in due time.

When the paper sheet is rolled up and its lower end is creased, as described, the mold-box will execute one-third of a revolution, and the mold-holder of said sheet come and lay it close to the compressor.

I will now describe the tobacco-pot, distributor or doser, and compressor, the latter form-

ing the roll to be inserted in the rolled sheet or paper tube. 41, tobacco-pot, into which is put the tobacco, either smashed or not; 42, distributor-box, Figs. 1 and 6, placed beneath the pot 41; 43, distributor proper, or a wheel with cells, which, by the rotating motion of the wheel, are filled with tobacco dropping from pot 41. These cells are provided with small pistons, which, by their displacement, allow the capacity of the said cells being increased or diminished, and consequently a proper dosing of tobacco being obtained at will. 53, paddle-agitator, having a continuous rotary motion at the bottom of the pot 41, for the purpose of avoiding subsidence of tobacco and facilitating its feed. The distributing-wheel 43 has likewise a continuous rotary motion, and its cells, on coming up successively in front of the lower box 44, leading to the compressor, let out their contents.

In order to properly regulate the feed from the distributor to the compressor, I stop the box 44 by means of a small paddle-door opening and shutting in due time.

The rotating motions of the agitator and distributor are obtained in the following manner: 45, beveled pinion, Fig. 2, meshing into another pinion, 46, on one end of a horizontal shaft, 47, Fig. 4. This shaft 47 transmits its motion to the shaft 48 of the distributor 43 through its bevel-pinion 49, meshing into 50, and the cog-wheel 51, meshing into 52 on shaft 48. The rotating motion of the shaft 48 is imparted to the agitator 53 through the wheels and pinions 52 54 55 in gear with one another; but any other suitable transmitting mechanism may be used.

The compressing-mold for the tobacco dropping from the distributor (shown in details, Figs. 6, 7, 8) consists of three main or working parts, two of which describe a section of a quarter of a circle, and it is by bringing the three sections together, so as to constitute a whole circle, that each dose of tobacco is compressed into the form of a roll or cylinder. These three working parts are so arranged as to leave, when at work, not any aperture or slit through which might pass out any bit of tobacco, but constitute, as it were, a sufficient space to admit the staple dropping from the distributor, which space becomes progressively narrower, until it presents a cylindrical or any other desired form to give to the rolls.

This compressing apparatus is composed of the following parts: 56, piece having edges, as shown at Fig. 6, so as to present a quarter-of-circle surface, pivoted on a stationary shaft; and to this effect its lower part is a toothed sector, 58, operated by a rack, 59. 60 is another piece, having likewise a quarter-of-a-circle surface, and so jointed to the former 56 as to form at a given time a semicircle surface therewith. The nearing of the two pieces 56 and 60 is eccentrically effected, so that, notwithstanding the oscillating motion of the piece 60, the two junction-ribs of the two quarter-of-circle pieces will be in constant contact, and

leave no issue for any staple to pass out. 61 is a third piece, fixed on a slide, 62, capable of a displacing vertical motion over the first piece 56. This piece 61 has a semicircle surface, and is to form, at a given time, together with the two other pieces, 56 and 60, a whole circle. On the piece 60 is fixed a roller, 68, in contact with a stationary part or incline, 63. The slide 62 is provided with a roller, 64, entering a groove, 65, Fig. 9, forming part of a piece, 66, fixed on the machine-frame. A spring, 67, Fig. 8, keeps the piece 60 apart from those 56 and 61.

All being arranged as hereinabove described, it will be understood that, by means of the rack 59, the whole compressing device will assume, on shaft 57, a transverse rocking motion relatively to itself. In this motion the roller 68, in rubbing on the incline 63, causes a nearing of the piece 60, which is applied on the surface of the piece 61, and the two quarter-of-circle surfaces will constitute a semicircle one. The dose of tobacco has been already compressed in an oblong space, the top and bottom of which are two semicircle surfaces. The entire compressor continuing its rocking motion, owing to the cut of the groove 65, the roller 64 causes the slide 62 and piece 61 to descend until the latter is sufficiently neared to form, together with the two other pieces, 56 and 60, the entire circle.

The motions of the parts constituting the compressor are so imparted that the two quarters of circle and the semicircle, when they are brought together, travel somewhat farther than the limit of the circle, and then are brought back thereto, which arrangement is of some importance, as its effect is to compress the roll to a diameter rather smaller than that of the mold, in order to avoid adhesiveness of the roll on the walls of the compressor, and allow a more ready and speedy cleaning out of the mold. The to-and-fro motion of the rack 59 operating the compressor is obtained from a cam, 69, on shaft d'' , Fig. 1, in the groove of which cam is engaged a roller, 70, fixed on said rack. This latter slides in a stationary part, 71. Upon one outward side of the piece 60 is a small metallic collar, 72, Fig. 1, which forms an extension of the cylindrical inward space, which contains the tobacco-roll. By the forward rocking motion of the compressor, this collar is caused to enter, engage perpendicularly the paper tube in its mold, and the compressor is then placed in such a position that a reciprocating rod, 73, will dip through this compressor and drive the tobacco-roll into the paper tube. On entering the compressor, the rod 73 will set aside two small rollers, 74, Fig. 8, turning at the free end of two levers, 75, the axes 76 of which are carrying at the other side two small pinchers, 77, Fig. 6, which are thus brought near to each other, and the effect of which is to force the upper end of the paper tube against the collar 72, Fig. 1, of the compressor. The movement of the rod 73 is obtained from an eccen-

tric, 86, on the driving-shaft *b*, Fig. 1, operating a connecting-rod, 87, which actuates a lever, 88, to the end of which is hinged the said rod. 89, Fig. 1, is a guide, whereby the vibrations of the rod are prevented and its entering the compressor insured.

As soon as the roll is inserted into the paper tube, the central shaft *j* will execute one-third of a revolution, and the mold will bring this tube to the action of the folders or upper-end creasers 78, Fig. 2, (which are actuated in the same way as the lower-end ones, already described,) by means of cams 80, Fig. 2, on shaft *d'*, and of a set of levers, 81, Figs. 2 and 4. The cigarette is at that moment completed, and, on the central shaft *j* executing its last third of a revolution, the mold is brought back to its starting-point, or in vertical projection to the rolling-rod. This, on entering the mold, drives out the cigarette contained therein, which is carried along a suitable inclined plane to a receiver, while the rolling-rod in the mold is ready to take hold of a fresh sheet and recommence another operation.

As the shaft *j* executes its rotating movement, and as I use three molds, *t*, it is obvious that by a single revolution of said shaft three cigarettes will be made, the three different operations taking place successively for each cigarette, and simultaneously for the three.

In order to stop the central shaft *j* at each third of a revolution, I have keyed on shaft 47, Figs. 2 and 4, and receiving its motion from shaft *d'*, a wheel, 82, having a cut, 83, corresponding to another cut in another wheel, 84, on the central shaft *j* of the molds, which latter wheel is formed with three cuts or holes like to the above. At the moment the third of a revolution commences, the wheel 84 is free, and when the same third is about to finish, the said wheel is, without any collision, trimmed in by the wheel 82, owing to a bevel so calculated as to annul the relative speed of the two parts in contact. This bevel, slightly rounded, causes the wheel 84 to pass, without collision, from absolute speed to rest.

Having thus described my improved cigarette-machine, I wish it to be understood that in some cases I dispose the sucking-pump *c* vertically, and actuate the same by the connecting-rod 87, whereby the rolling-rod is operated, instead of its being disposed horizontally, as shown, and also to vary the transmissions of motion to the working parts.

I claim—

1. The combination of the box *u*, piston *y*, fingers 11, the transferring-hand *z*, and the air-pump, as and for the purpose described.
2. The combination of tube 15, rod 17, ring 20, trunnions 22, rods 19 and 29, pinion 33, and springs 31, all constituting the pinching and rolling device, operating as and for the purpose set forth.
3. The combination of the distributor with the compressor, when the parts of the latter operate as and for the purpose described.
4. The arrangement of the part 56 60 and sliding former 61, constituting the roll-compressor, rocking as described, in combination with the incline 63, as specified.
5. The combination of the levers 75, rollers 74, pinchers 77, collar 72, and rod 73, operating as described, for the purpose set forth.
6. The device for folding the lower end of the cigarette, consisting of the sliding pieces 35 and spur 36, with mechanism for operating the same, as and for the purpose set forth.
7. The combination of the rotating case *S*, provided with molds *t*, the compressor 56, the tube-forming device, and the folding and creasing devices, as described.
8. A pivoted and perforated compressor, rocked by any suitable means, in combination with the plunger 73 and a mold, *t*, as and for the purpose described.

COUNT JOSEPH DE SUSINI RUISECO.

Witnesses:

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