

No. 836,769.

PATENTED NOV. 27, 1906.

H. KURKIEWICZ.

MACHINE FOR FILLING TOBACCO INTO PAPER TUBES.

APPLICATION FILED NOV. 30, 1904.

11 SHEETS—SHEET 1.

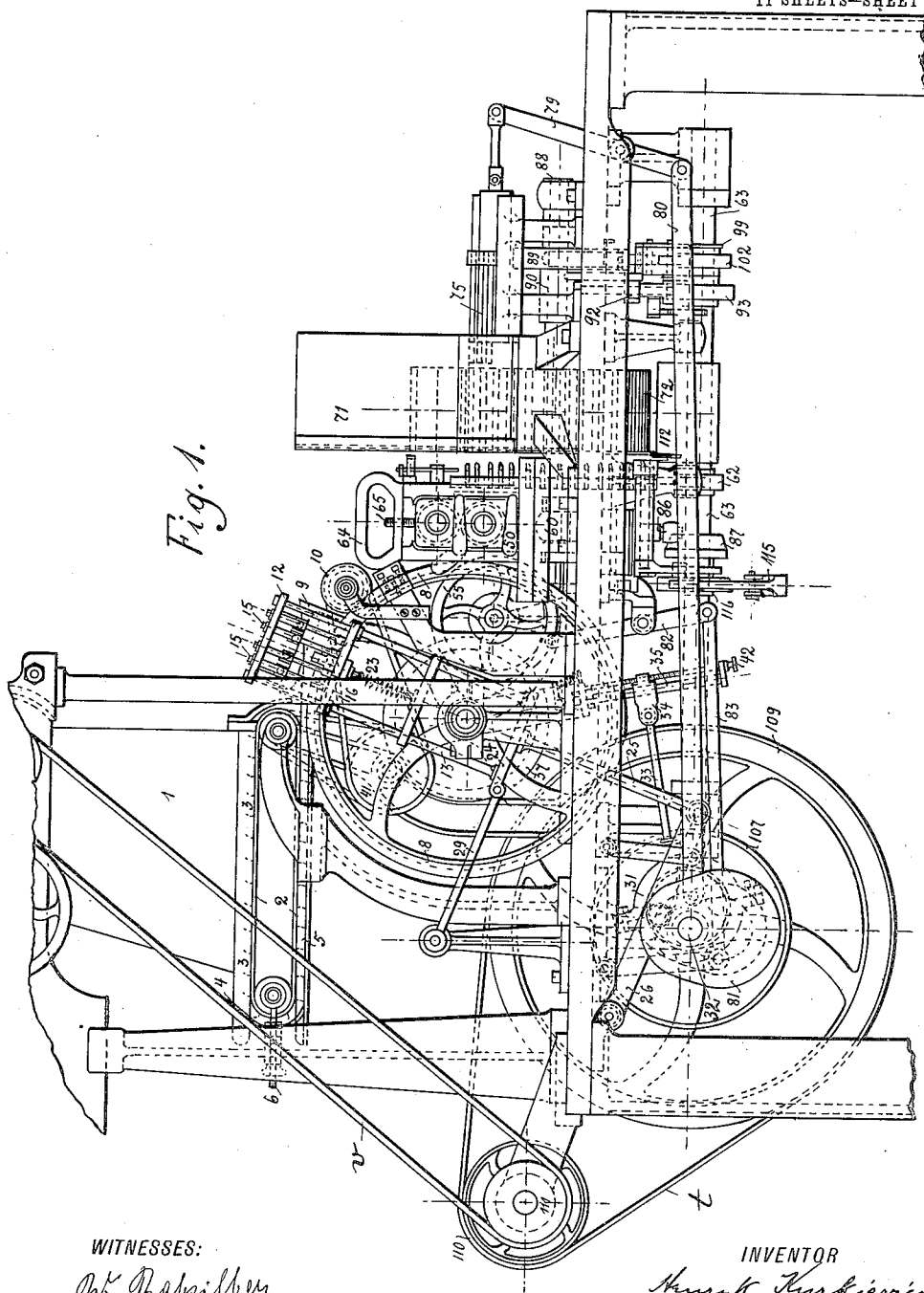


Fig. 1.

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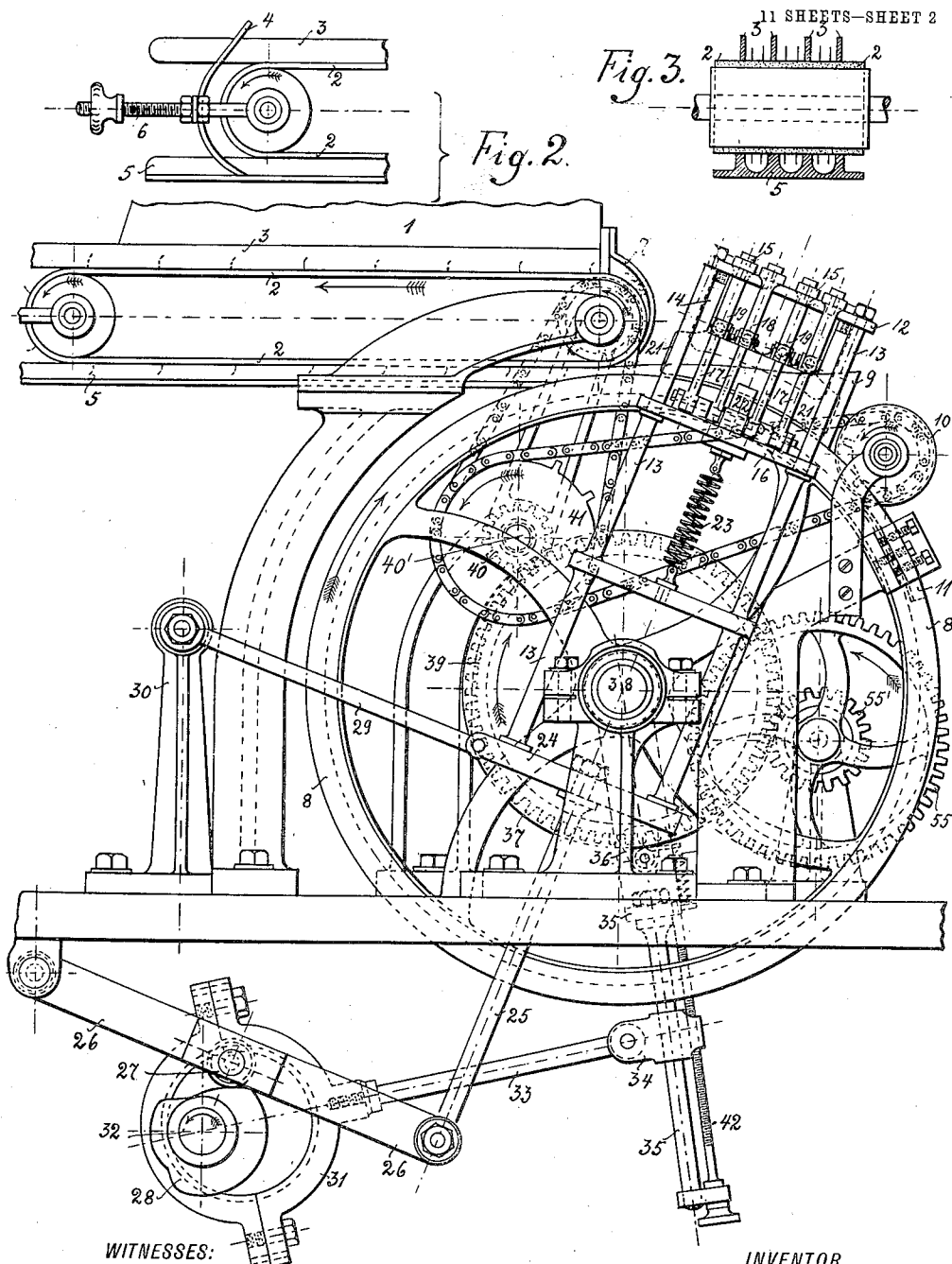
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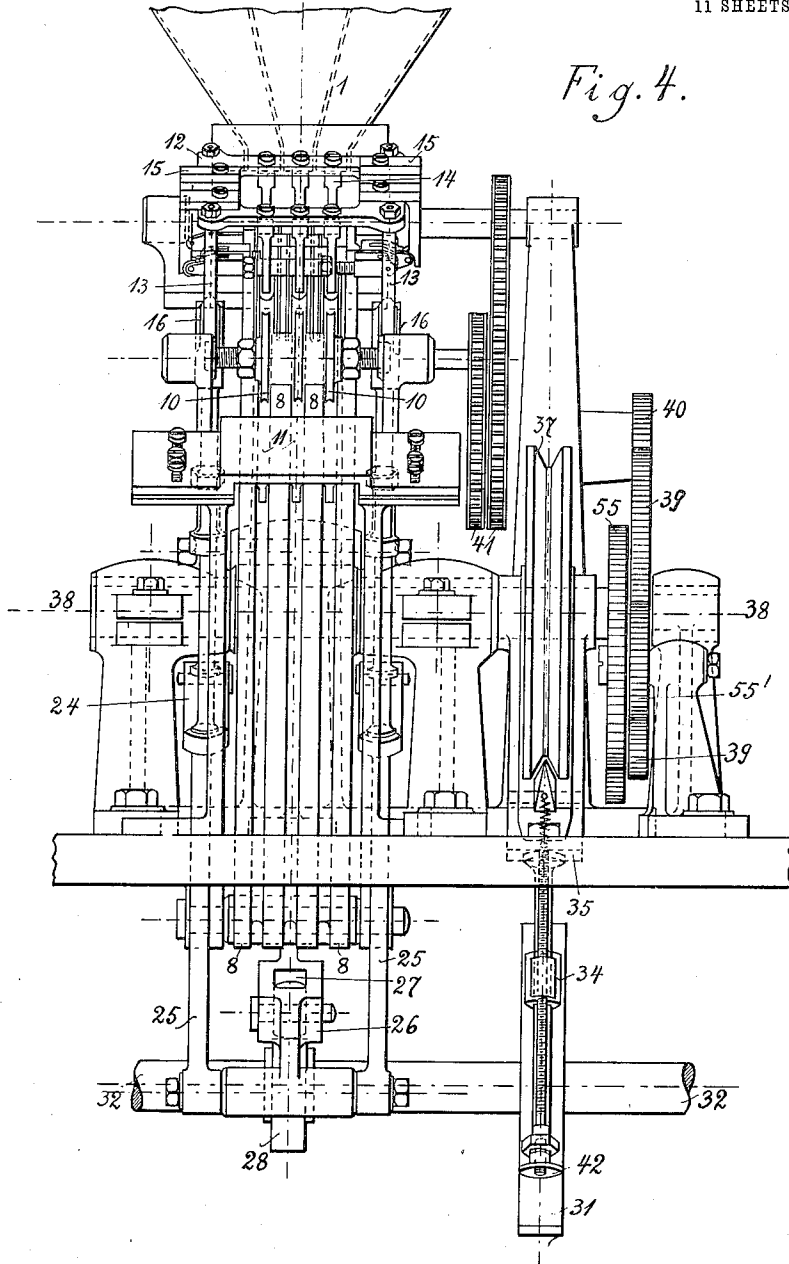
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11 SHEETS—SHEET 3.

Fig. 4.



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Fig. 6.

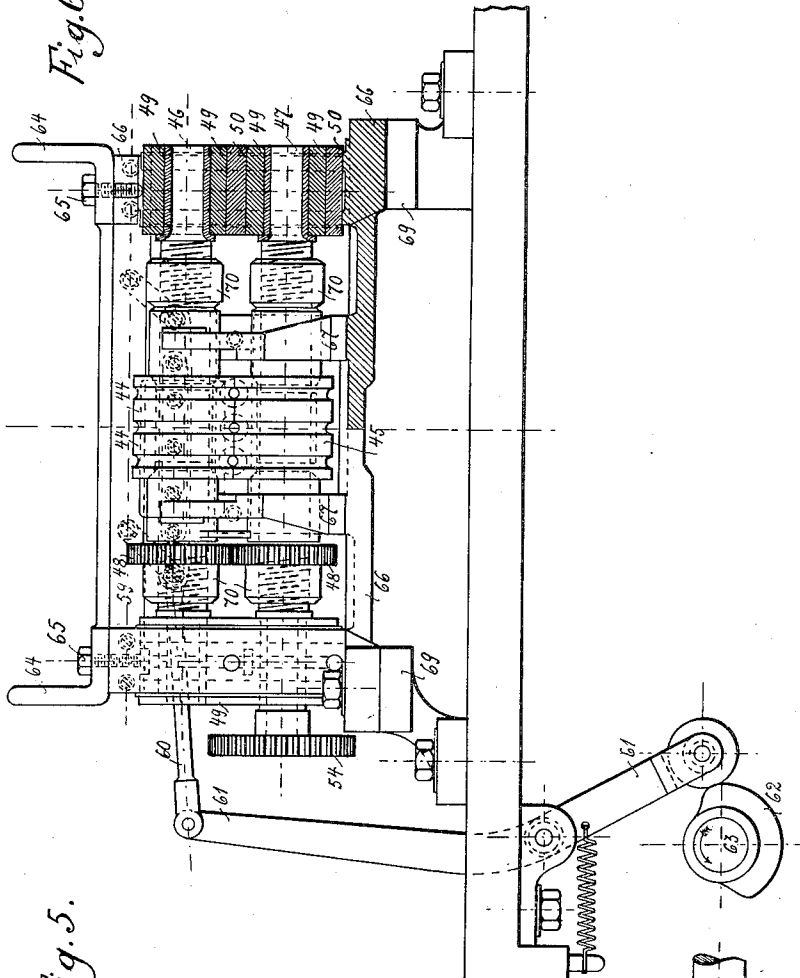
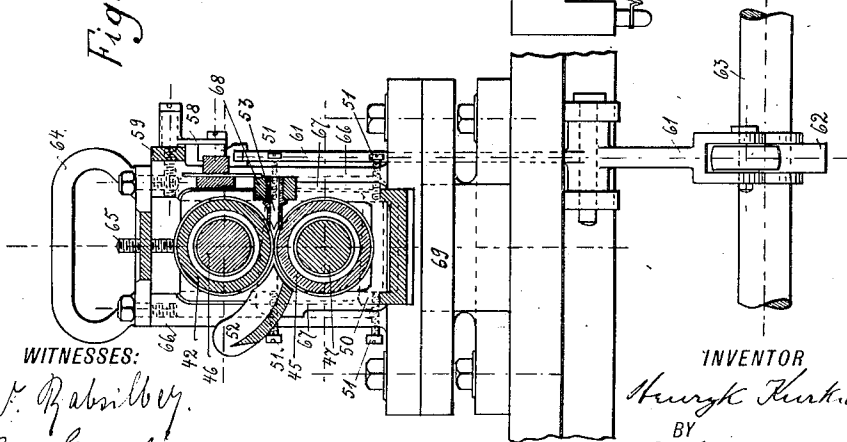


Fig. 5.



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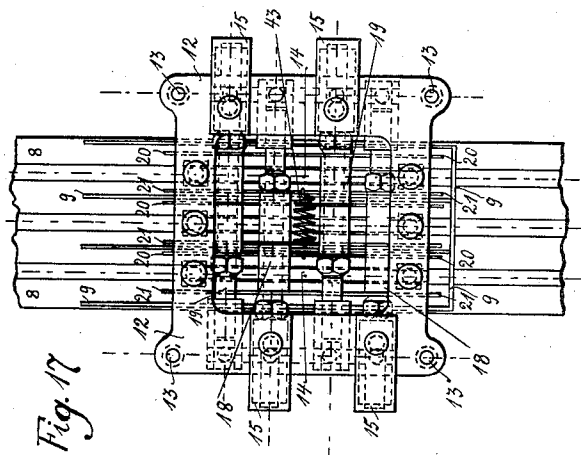


Fig. 17.

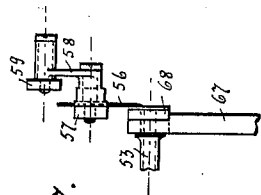


Fig. 7.

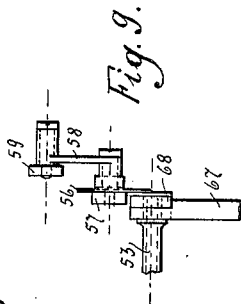


Fig. 9.

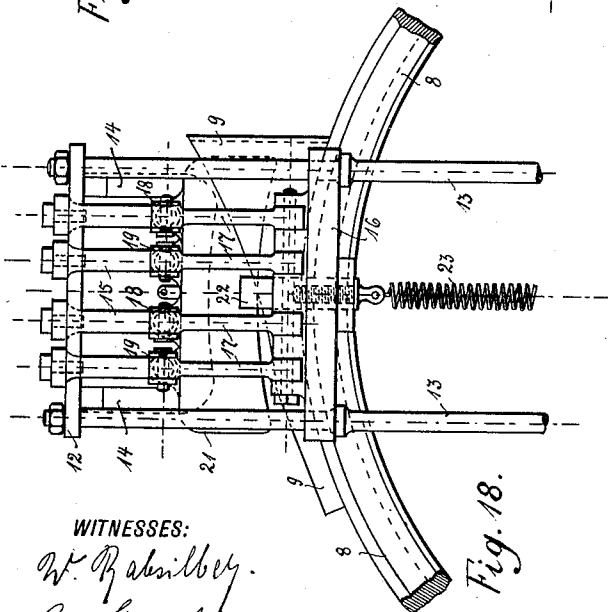


Fig. 18.

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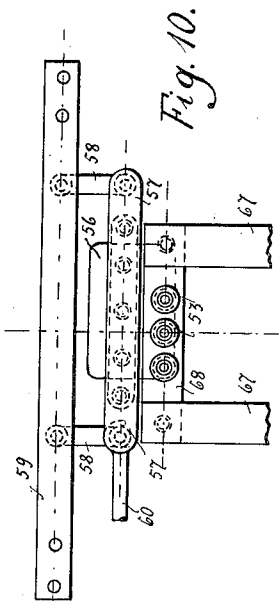


Fig. 10.

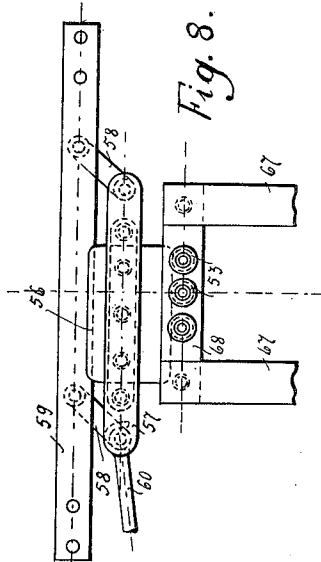


Fig. 8.

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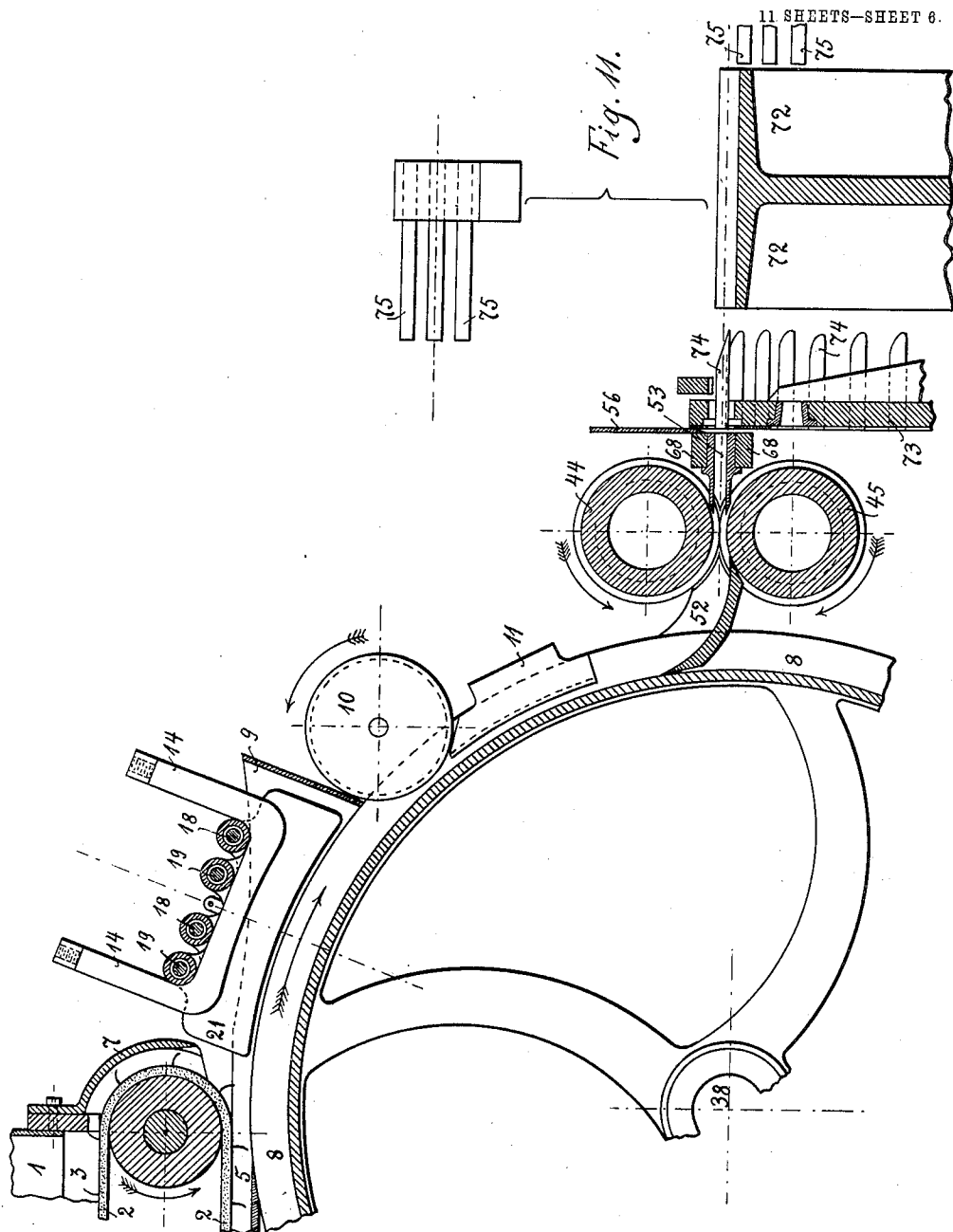
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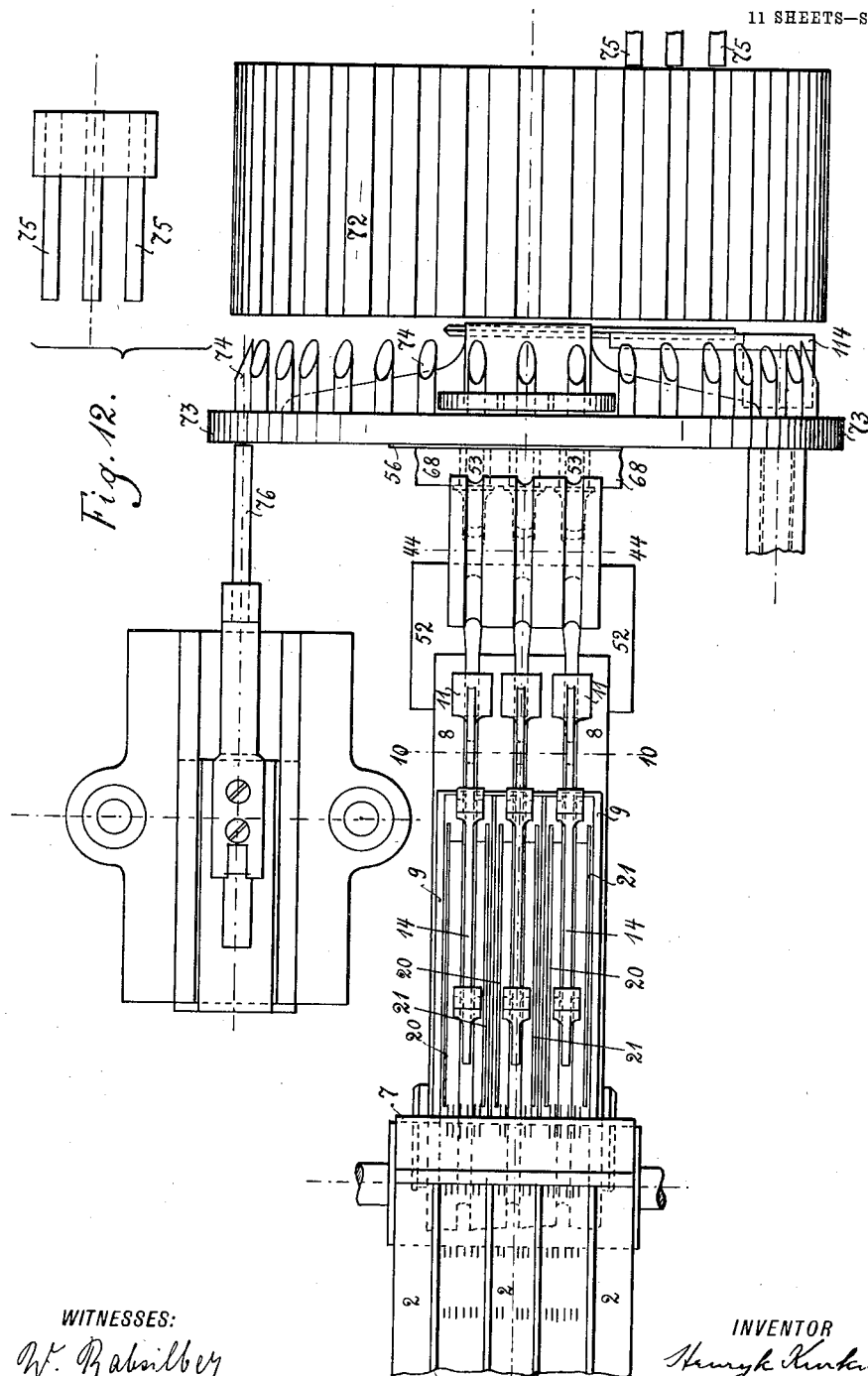
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Fig. 13.

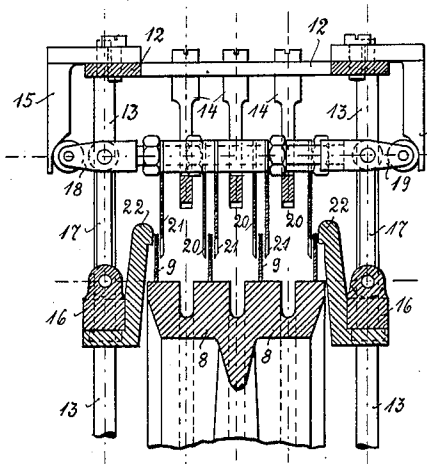


Fig. 14.

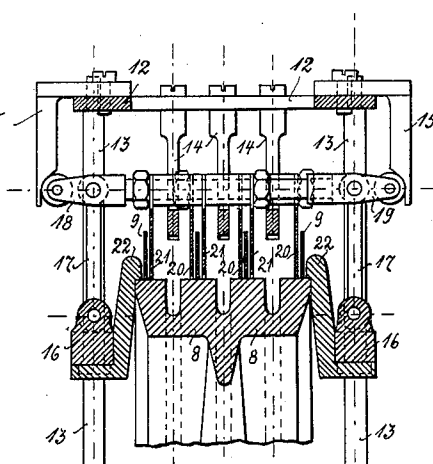


Fig. 15.

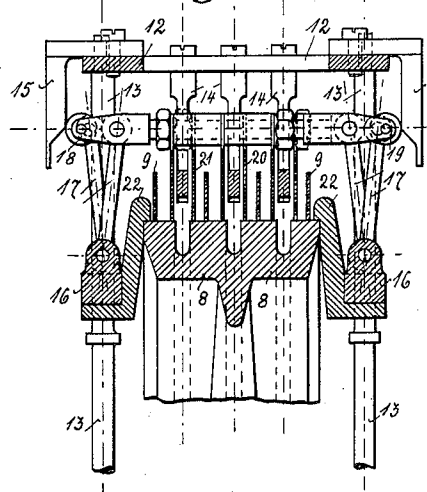
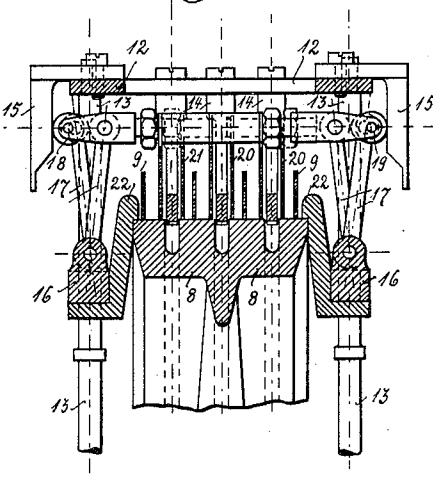


Fig. 16.



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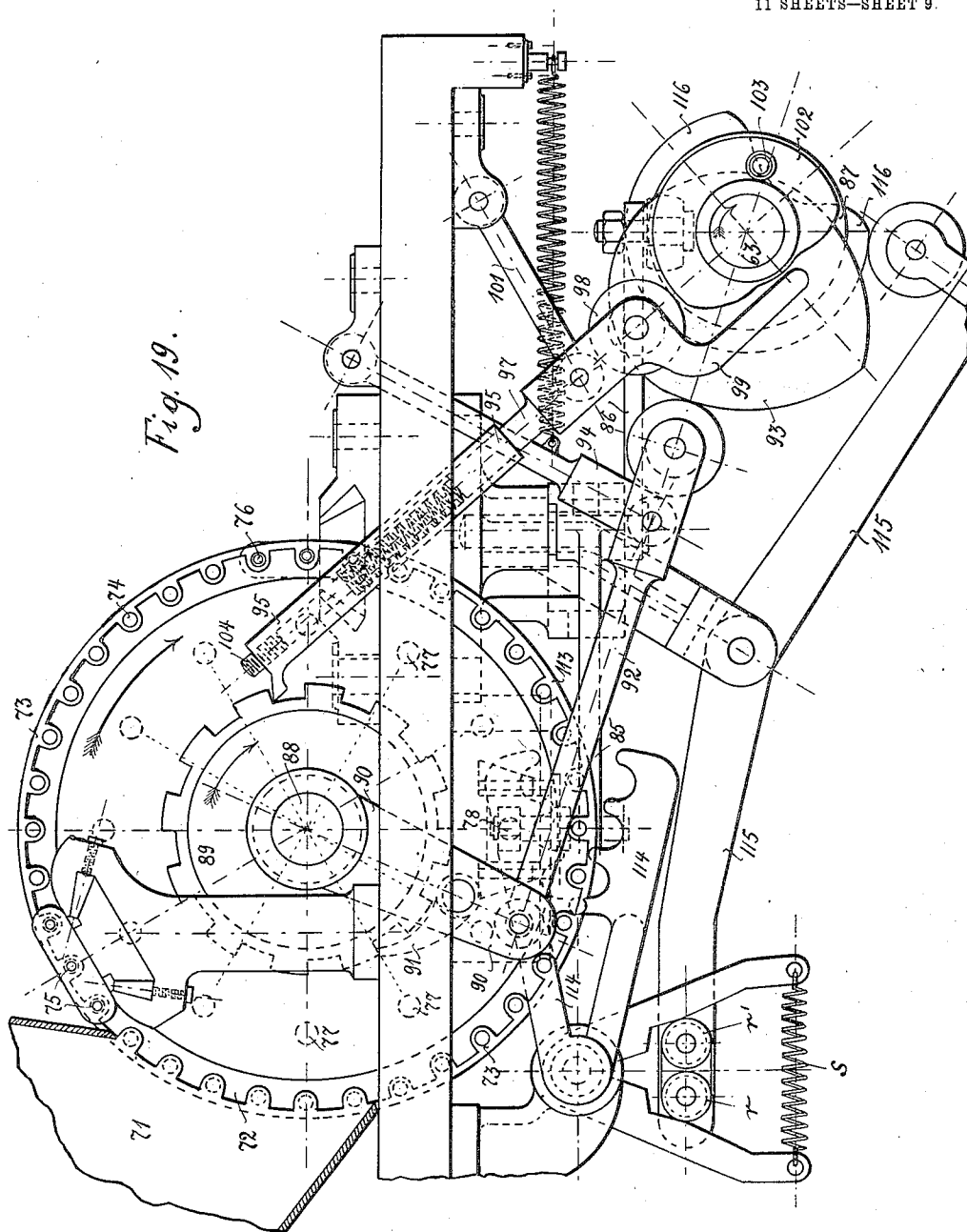
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MACHINE FOR FILLING TOBACCO INTO PAPER TUBES.

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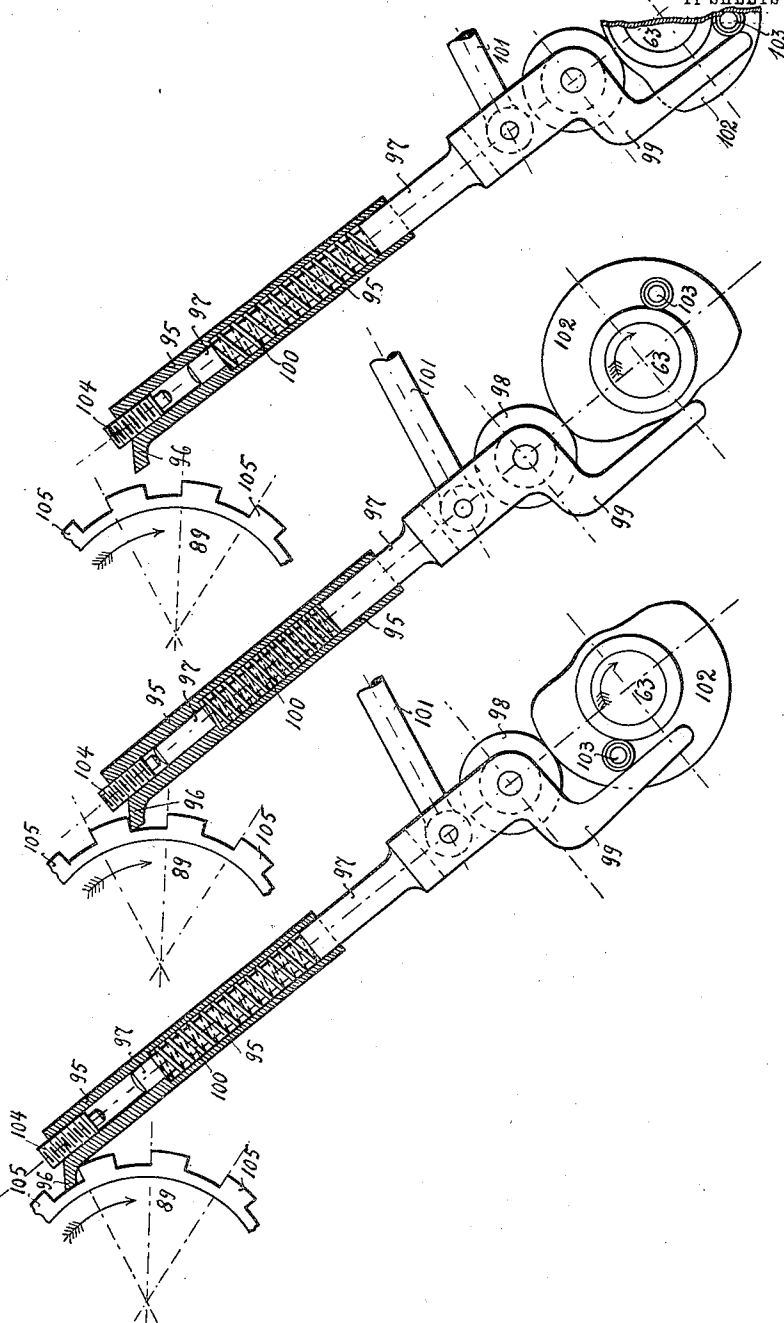
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Fig. 22.

Fig. 21.

Fig. 20.



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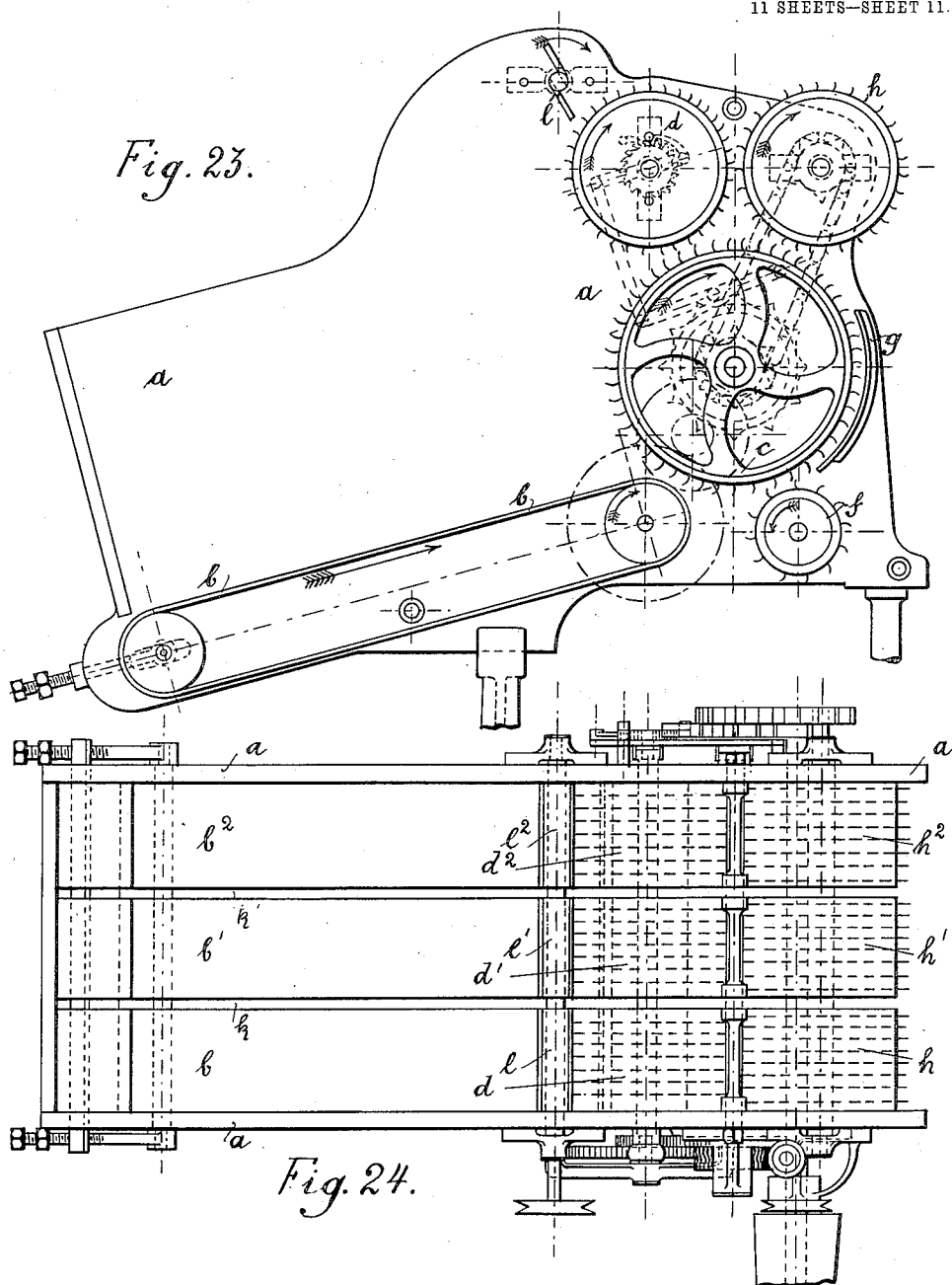
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11 SHEETS—SHEET 11.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR FILLING TOBACCO INTO PAPER TUBES.

No. 836,769.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed November 30, 1904. Serial No. 234,938.

To all whom it may concern:

Be it known that I, HENRYK KURKIEWICZ, a subject of the Emperor of Russia, and a resident of St. Petersburg, Russia, (whose post-office address is 125 Nevsky, St. Petersburg,) have invented certain new and useful Improvements in Machines for Filling Tobacco into Paper Tubes, of which the following is a specification.

My invention relates to a machine for filling previously-manufactured paper tubes with tobacco.

A machine constructed according to this invention is illustrated, by way of example, in the accompanying drawings, of which—

Figure 1 is a side elevation of the machine; Fig. 2, a side elevation of the tobacco-feed device; Fig. 3, a cross-section of the endless band and of the supply-channels; Fig. 4, a front elevation of the tobacco-feed device; Fig. 5, a side elevation, partly in section, of the molding or forming device; Fig. 6, a front elevation, partly in section, of the same device; Figs. 7 to 10 show the knife for cutting tobacco ropes in two principal positions. Fig. 11 is a section of the forming device and of the adjoining parts in the direction of the movement of the tobacco. Fig. 12 is a corresponding plan. Figs. 13 to 16 are cross-sections of the filling device, showing it in its four operative positions. Fig. 17 is a plan of the filling device. Fig. 18 is a side elevation of the filling device. Fig. 19 is a side elevation of the paper-tube drum and the scissors or shears. Figs. 20 to 22 show the feed motion for the paper-tube drum in three different operative positions in side elevation, and Figs. 23 and 24 are side elevation and plan of the tobacco-distributing device.

The machine according to this invention comprises five principal parts, serving different purposes. These parts are as follows: 1, an apparatus for distributing and spreading the tobacco; 2, a feed device for the distributed tobacco; 3, a filling device; 4, a device for forming or shaping the tobacco; 5, a feed device for the paper tubes.

The machine illustrated is constructed to manufacture three cigarettes at a time; but this number can be easily altered.

1. *Distributing apparatus*, (Figs. 23 and 24.)—This apparatus comprises a reservoir *a*, divided by partitions *k k* and *k' k'* into three equal compartments. Each compartment contains operating mechanism correspond-

ing to those of the others, and these sets are mounted on common spindles and actuated by one and the same means. The corresponding set of mechanism of each compartment is marked with similar letters. It is therefore sufficient to describe that of a single compartment in order to give a clear idea also of the other two.

a is the reservoir in which the tobacco is placed. The bottom of this reservoir is constituted by an endless belt or band *b*, which, constantly moving in the direction of the arrow, brings tobacco to the comb-drum *c*, the teeth of which take up said tobacco and supply it to a second drum *d*. The tobacco between the teeth of the drum *c* passes under the drum *d*, the excess of tobacco being removed by the teeth of the drum *d* into the reservoir *a*. The tobacco carried by the teeth of the drum *c* passes under a drum *h*, also provided with teeth and adapted to equalize the layer of tobacco supplied by the drum *c*. This tobacco after having passed under the drum *h* is prevented from leaving the drum *c* by a shield *g* until it reaches a doffer *f*, rotating at high speed and provided with teeth engaging with the teeth of the drum *c*, so that it will take off the tobacco and convey it farther into the three-sectioned hopper 1 of the feed device, Fig. 4.

2. *Tobacco-feed device*, (Figs. 2 and 4.)—1 is a hopper with three compartments, which receives tobacco from the distributing apparatus and supplies it to an endless band 2, constituting the bottom of the hopper 1. This band is provided with teeth and moves in the direction of the arrow, the tobacco being carried forward by the teeth. Four steel blades 3 touch with their upper edges the lower surfaces of the hopper 1, their lower edges being in contact with the band 2, which they divide into three channels which receive tobacco from the corresponding portions of the hopper 1.

4 is a shield keeping the tobacco back at the point of turning of the band.

5 is a three-section channel through which the teeth of the band 2 convey the tobacco.

6 represents two screws for tightening the band 2 and at the same time for securing the shield 4.

7 is a shield arranged at the opposite end of the band 2 at a small distance from it and provided with slots for enabling the teeth of this band to pass. This shield forms a kind

of stripping-comb which prevents the band 2 from carrying tobacco from below upward. (See Figs. 11 and 12.)

8 is a drum provided with grooves which receive the tobacco fibers supplied by the band 2 from the channels or passages 5. A fixed receiver 9, having three compartments, serves to keep back the loose tobacco on the drum 8.

10 represents three rollers mounted on the same spindle and pressing the tobacco into the grooves of the roller or drum 8.

11 represents three fixed stops serving for maintaining the tobacco in the grooves of the said drum.

The whole feed device is operated by means of an eccentric 31, mounted on a spindle 32. This eccentric by means of an eccentric-rod 33, a connecting-link 34, a bifurcated lever 35, and a pawl 36 transmits intermittent rotary motion to a wheel 37, mounted on the spindle 38 of the grooved drum 8. On the same spindle 38 is also mounted a toothed wheel 39, engaging with a pinion 40, supported on a spindle 40', carrying two sprocket-wheels 41. This spindle operates, by means of chains, the endless band 2 and the rollers 10.

42 is a set-screw for raising and lowering the connection piece 34 for altering the working of these driving parts.

3. *Filling device*, (Figs. 13 to 18.)—12 is a frame secured to four rods 13. To this frame are rigidly secured the fillers 14 and angle-pieces 15. On each pair of the rods 13 are mounted sliding cross-bars 16. These cross-bars 16 are connected to heads 18 and 19 by means of eight short rods 17. Each head carries at one end a roller in contact with the corresponding angle-piece. To the heads 18 are secured three cheeks or lateral fillers 21 and to the heads 19 similar fillers 20. To the cross-bars 16 are rigidly secured angle-hooks 22 and helical springs 23. The bottom ends of the rods 13 are secured in pairs to the cross-bars 24, Figs. 2 and 4, each of which is again mounted on a bar 25. The lower ends of these bars are pivoted to the lever 26 under the machine-table. This lever 26 is provided at its center with a roller 27, engaging with a cam 28, mounted on the spindle 32. The cross-bars 24 are pivoted to rods 29, which in their turn are rotatably supported in a bracket 30. The rods 29 hold the filling device and prevent it from swinging laterally under the influence of gravity. Practically the whole weight of the filling device is supported by the cam-lever 26, which causes said device to alternately rise and fall.

The filling device is arranged above the grooved drum 8 and presses the tobacco into the grooves of the said drum and forms it therein. When the endless band 2 conveys tobacco from the three-sectioned canal 5 between the walls of the reservoir 9 to the

grooved drum 8, the filling device rises, Fig. 13. As soon as the filling device has stopped after the delivery of the tobacco the filler sinks, the angle-hooks 22 come into contact with the edges of the drum 8, Fig. 14, and prevent the cross-bars 16, and consequently also the heads 18 and 19, from descending farther. The lateral fillers 20 and 21 almost touch the circumference of the drum 8, and thus hold back between them the tobacco fibers. The rods 13 continue their downward movement and impart the same motion to the frame 12 with its angle-pieces 15. The latter press the heads 18 and 19 against each other, so that the lateral fillers 20 and 21 come nearer to each other and compress the tobacco and push it directly over the grooves of the drum 8, Fig. 14. The frame 12 continues to descend, and the fillers 14 cause the pressed tobacco to enter the grooves of the drum 8, Fig. 14. Immediately afterward the filling device again moves upward; the helical springs 23 impart to the cross-bars 16 a downward movement, and suitable springs force the lateral fillers 20 and 21 apart, Fig. 13.

4. *Forming device*, (Figs. 5 and 6.)—44 and 45 are two rollers provided on their circumference with three semicircular grooves, so that at the point of contact of these two rollers circular openings are produced, by means of which the tobacco is given the shape of cylindrical ropes. These rollers 44 and 45 are secured to their spindles 46 and 47 by means of nuts, and the spindles in question are driven by pinions 48. The spindles 46 and 47 rotate in a bearing 49. In order to enable the mutual pressure of the two rollers to be adjusted, wedges 50 are provided between the bearings 49. These wedges can be moved by means of set-screws 51, whereby the distance between the spindles of the rollers is increased or reduced.

52 is a three-sectioned channel, Figs. 5, 11, and 12, arranged at such an angle that its upward edge is in contact with the grooves of the drum 8, while the opposite edge adjoins the forming-roller 45. Owing to this, the tobacco fibers carried by the drum 8 pass direct from its grooves into the channel 52, which guides them to the forming-grooves of the rollers 44 and 45.

53 represents three rigid tubes, one end of each of which is suitably beveled to fit one of the grooves of the forming-rollers, while the other end is cut off at a right angle. The tobacco fibers formed by the forming-rollers are forced through these tubes.

64 represents brackets which allow a slight raising for the adjustment of the whole forming device.

65 represents pressure-screws for the bearing 49.

66 is the bearing or bed plate for the forming device.

67 represents two double lugs at each side

of the rollers 45, which serve as a frame for attaching the channel 52 and for connecting to it a cross-bar 68, to which are secured the tubes 53, Figs. 7, 10, 11, and 12.

5 The bearing-plate of the forming apparatus rests with feet 69 on the machine bed or table.

The spindle 47 of the lower forming-roll 45 carries outside a toothed wheel 54, engaging with a pinion 55, Figs. 2 and 4, the shaft of said pinion carrying also a gear 55', which in its turn engages with the toothed wheel 39. In this way the forming device is operated simultaneously with the feed device. Figs. 7 to 10 show the arrangement of knives for cutting the tobacco ropes. The knife 56 is arranged between the lugs 57, connected by short links 58 to a cross-bar 59, secured to the bearing-plate of the forming apparatus. 20 Figs. 7 and 8 show the knife in the upper normal position, and Figs. 9 and 10 show it lowered in the operative position. The knife 56 is operated by a rod 60 and a lever 61, provided with rollers engaging with the circumference of a cam 62, mounted on the spindle 63. The knife 56 is thus caused to describe a curve during its movement, and as its cutting edge adjoins the end of the tubes 53 a cutting action takes place by which the 30 three ropes coming out from the tubes 53 are all cut at one operation.

5. *Feed device for the paper tubes*, (Figs. 11, 12, and 19.)—71 is a hopper which can be filled with previously-manufactured paper tubes. The bottom of this hopper is constituted by a drum 72, provided on its circumference with grooves parallel to the axis of the drum. This drum rotates intermittently through an angle corresponding to three 40 grooves, so that it takes up three paper tubes from the hopper. 73 is a pulley or disk mounted on the spindle 88 of this drum 72, and consequently rotating with the latter. This disk is provided with circular beveled 45 tubes or sockets 74, arranged to correspond to the grooves of the drum.

75 represents three plungers connected together and adapted to reciprocate in suitable guides. They enter the grooves of the 50 drum 72 as they reciprocate and eject from these three paper tubes and press them onto the three corresponding sockets 74, where they remain as the plungers move back. The drum 72 and the disk 73 then move forward, whereby the three sockets 74, provided 55 with paper tubes, are brought into line with the three tubes 53, so that the tobacco ropes, which at that moment are in the tubes, enter the sockets 74 and are cut immediately behind the disk at the smooth end of the tubes by the knife 56. The drum and the disk continue their intermittent rotary movement and the three tubes filled with tobacco stop in front of the three plungers 76. These 65 plungers are suitably guided and reciprocate,

so that they enter the sockets 74 and press the tobacco ropes into the paper tubes and return them thus filled into the grooves of the drum 72. The cigarettes so produced are retained in the grooves of the drum 72 70 while the same continues to turn by a guard 113, as seen in Fig. 19. The guard may be supported in any suitable manner and the projecting ends of the cigarettes come between the cutters 114 of the treble shears, 75 which cut off any projecting tobacco ends.

The disk 73 is provided with openings 77 corresponding to each group of three tubes 74. At each stopping of the disk a suitably-guided reciprocating bolt 78 enters the corresponding holes 77 and securely holds the 80 disk in a given position.

The plungers 75 are operated by means of a lever 79, Fig. 1, a rod 80, and a cam 81, mounted on the spindle 32. The plungers 76 85 are actuated by a lever 82, Fig. 1, and a rod 83, operated by a cam 84, mounted on the same spindle 32. The fixing-bolt 78 is reciprocated by means of a rod 85 and the lever 86, Figs. 1 and 19, operated by a lateral cam 87, 90 mounted on the spindle 63.

The shears 114 are operated by means of a cam 116, mounted on the spindle 63 through the lever 115. This lever carries two rollers r and r' , which act on the back arm of the 95 shears. When these rollers rise, the shears open; when they sink the shears are closed by a spring s .

The spindle 88, which carries the roller 72 and the disk 73, is provided with a ratchet-wheel 89. This wheel is operated by means of an arm 90, loosely mounted on the spindle 88 and carrying a pawl 91, engaging with the wheel. The arm 90 is moved by a rod 92, supported at its free end by a link 94 and operated by a cam 93, mounted on the spindle 63. 100 An escapement device (shown in Figs. 19 and 22) controls the position of the drum 72, and with it the disk 73, and governs their stepwise movement. This escapement consists of a 110 tube 95, provided at one end with a tooth 96 and having entering it a lever 97, provided at its bottom end with a roller 98 and a bell-crank lever 99. A helical spring-100 is arranged between the tube 95 and the lever 97. 115 One end of this spring rests against an inner shoulder of the tube 95 and the other end against a projection of the lever 97. This lever is pivoted with its other end to a depending link 101 and is operated by a cam 102, 120 mounted on the spindle 63 and provided with a lateral pin 103.

At the moment when the ratchet-wheel 89 begins to rotate the roller 98 is in contact with the projecting part of the circumference 125 of the cam 102 and the tooth 96 is between two teeth of the ratchet-wheel 89, Fig. 20. After the latter has completed half of its angular movement the tooth 96 strikes one of the teeth 105 of the ratchet-wheel, and dur- 130

ing the subsequent movement of the ratchet-wheel 89 this tooth will force back the tube 95 and compress the spring 101, Fig. 21. The elasticity of this spring will therefore take up the energy of the movement of the ratchet-wheel until the set-screw 104 strikes the end of the lever 97. Then the wheel 89 will stop and at that moment the cam-roller 98 will be at the end of the projecting portion of the cam 102. From that point the roller 98 and the lever 97 move downward along the inclined portion of the cam 102, and the spring 100 is released during the return of the tube 95. The pin 103 strikes the bell-crank lever 99 and swings the rod 97 and the depending lug 101 outward, so that the tooth 96 becomes disengaged from the ratchet-wheel 89. The escapement-rod remains in the oblique position until the cam 102 allows the tooth 96 to fall again onto the following tooth of the ratchet-wheel 89, Fig. 22.

The whole machine is driven by a transmission-belt acting on a belt-pulley 107, mounted on the spindle 32, Fig. 1. This spindle causes the spindle 63 to rotate by means of bevel-wheels. (Not shown.) The spindles 32 and 63 carry all the cams and eccentrics operating the before-mentioned device. Another pulley 109 on spindle 32 drives, by means of a belt *t*, a pulley 110, mounted on a spindle carrying a conical pulley 111. This pulley operates by means of a belt *v* the distributing device.

Working of the machine.—After the machine has been started the reservoir *a* is filled with tobacco and the hopper 71 with paper tubes. The drums of the distributing apparatus will then convey the tobacco in a continuous manner and in uniform layers to the three-section hopper 1, which brings it to the endless band 2. This band, which continuously travels in the direction indicated by the arrow, then draws the tobacco into the triple canal 5, and from there its lower portion conveys the tobacco to the drum 8 by means of its teeth, Fig. 11. As soon as the tobacco has passed into the hood 9 and under the filling device the intermittently-moving tobacco-feed apparatus stops, the lateral fillers 20 and 21 simultaneously with this stoppage move downward and approach one another and compress the tobacco. The fillers proper then force the tobacco into the grooves of the drum 8, and the filling apparatus again moves upward. During the next angular movement of the drum 8 a great quantity of tobacco is brought to the drum, while the tobacco in the grooves thereof passes on under the roller 10 and the stops 11. This tobacco is then sufficiently compressed and tight to permit of it being pushed from the drum 8 into the three-section passage 52 and into the grooves of the forming-rollers 44 and 45. The latter finally shape the tobacco into strips or cylindrical ropes and force them into the

tubes 53. During this operation the disk 73 remains at rest, the knife 56 is raised, and the tobacco ropes come out from the tubes 53 into the sockets 74. As soon as the advance of the tobacco is interrupted the knife 56 descends and cuts the ropes at the back end of the sockets 74, the front portion of which has just been supplied again with paper tubes pushed forward by the plungers 75 from the grooves of the drums 72. After the tobacco has been cut by the knife 56 the disk 73 executes a partial rotation, the knife moves back, and the tobacco enters the next series of sockets 74, and so on. The tobacco entering the sockets 74 is driven by the second set of plungers 76, Fig. 12, into the paper tubes contained in the said sockets 74. After the paper tubes have been filled with tobacco in this way they are pushed out by the same plungers 76 into the grooves of the drum 72. As the drum 72 continues to rotate the cigarettes pass between the shears 114, which remove the tobacco ends projecting from the end of the sockets, and the completely-finished cigarettes roll on to an endless band 112, Fig. 1, which takes them away from the machine.

The machine just described is arranged for simultaneous production of three cigarettes. It is, however, obvious that the machine can be modified so as to produce simultaneously a larger or smaller number of cigarettes without departing from the spirit of this invention.

I claim as my invention—

1. In a machine for filling tobacco into paper tubes, the combination with a reservoir to hold the tobacco and means for removing the tobacco from said reservoir, of a hopper arranged to receive the tobacco, a moving endless band forming the bottom of said hopper, a trough-shaped channel in which the said band travels in one direction, a rotating drum adjacent to said channel and having circumferential grooves, into which the tobacco is fed by said band and a shield at the turn of the said band near the said drum, said shield being adapted to strip the tobacco from the band on its return movement.

2. In a machine for filling tobacco into paper tubes, the combination with a reservoir for holding the tobacco and means for removing the tobacco from said reservoir, of a hopper, arranged to receive the tobacco from the said means, a moving endless band forming the bottom of said hopper, a channel, in which the said band travels, a rotating drum adjacent thereto and provided with circumferential grooves to receive the tobacco, a shield at one turn of said band to prevent the tobacco from falling off of said band and another shield, provided with slots at the other turn of said band to strip the tobacco from said band.

3. In a machine for filling tobacco into paper tubes, the combination with a reservoir for the tobacco and means for removing

the same from said reservoir, of a hopper, adapted to receive the tobacco, an endless band moving in one direction at the bottom of said hopper and provided with teeth to carry the tobacco away falling on said band, a trough arranged below said band and a rotating drum adjacent thereto and provided with means to receive the tobacco from said band, a shield at one turn thereof, to retain the tobacco on said band and means at the other turn thereof to strip the tobacco from said band.

4. In a machine for filling tobacco into paper tubes, the combination with a reservoir for the tobacco and means for carrying the tobacco out of said reservoir, of a hopper, adapted to receive the tobacco and having partitions therein, a moving endless band at the bottom of said hopper and having teeth to hold the tobacco on said band, longitudinal strips between the hopper and the said band to form channels on said band, a divided channel below said band, and a rotating drum provided with circumferential grooves to receive the tobacco, means at one turn of the said band to retain the tobacco thereon and means for tightening the band.

5. In a machine for filling tobacco into paper tubes, the combination with a reservoir and means for removing the tobacco from the said reservoir, of a hopper adapted to receive the tobacco, a moving endless band arranged at the bottom of said hopper and provided with teeth, the said band moving in a channel, a rotating drum having circumferential grooves and located adjacent to said channel to receive the tobacco from the said band, and a hood supported near said drum to retain the tobacco in the grooves and operating means adapted to impart to the said drum and the said band an intermittent movement.

6. In a machine for filling tobacco into paper tubes, the combination with a reservoir and means for removing the tobacco therefrom, of a hopper, a moving endless band at the bottom thereof, a trough below said band, a rotatable drum, adjacent to said trough and having circumferential grooves to receive the tobacco from said band, a hood supported in a fixed position near the periphery of said drum, to retain the tobacco thereon, a movable frame, fillers arranged therein to fill the tobacco into the said grooves of the said drum, rollers journaled near said drum for pressing the tobacco into the said grooves and fixed stops for retaining the tobacco therein during the rotation of the said drum.

7. In a machine for filling tobacco into paper tubes the combination with a reservoir and means for removing the tobacco therefrom, of a hopper, a rotatable drum having peripheral circumferential grooves therein, means for delivering tobacco from said hopper into said grooves, means for retaining the tobacco in said grooves, a movable frame,

fillers therein adapted to fill the tobacco into the grooves of the said drum and rollers journaled above said drum to press the tobacco into the grooves.

8. In a machine for filling tobacco into paper tubes, the combination with a hopper, of a rotatable drum having peripheral circumferential grooves, means for delivering tobacco from said hopper to said drum into the said grooves, means, as a hood, for retaining the tobacco in said grooves, a frame, adapted to be raised and lowered away from and toward the said drum, fillers in said frame for filling the tobacco into said grooves, rollers, journaled above said drum to press the tobacco into the said grooves and fixed stops for retaining the tobacco in said drum during its rotation and means for imparting an intermittent rotation to said drum.

9. In a machine for filling tobacco into paper tubes the combination with a hopper, of a rotatable drum having peripheral circumferential grooves, means for imparting an intermittent impartial rotation to said drum, means for delivering tobacco from said hopper to said drum, and a frame, movable with relation to said drum, fillers secured to said frame and adapted to hold the tobacco in the grooves of said drum and compressing it therein, and means for alternately raising and lowering the said frame away from and toward said drum.

10. In a machine for filling tobacco into paper tubes, the combination with a hopper, of a rotatable drum having peripheral circumferential grooves, means for conveying tobacco from said hopper to said drum, a fixed hood arranged near said drum to hold the tobacco thereon, and a frame, adapted to alternately rise away from and descend toward said drum, lateral fillers in said frame, adapted to compress the tobacco and fillers adapted to cause the tobacco thus compressed to enter the grooves of the said drum.

11. In a machine for filling tobacco into paper tubes, the combination with a hopper, of a rotatable drum having peripheral circumferential grooves, means for supplying tobacco thereto, means to retain the tobacco on said drum, a frame, rods for carrying said frame, lateral fillers therein adapted to be moved toward each other to compress the tobacco, fillers adapted to descend toward the grooves in said drum thus causing the tobacco to enter said grooves, and means for alternately raising and lowering the said frame away from and toward the said drum.

12. In a machine for filling tobacco into paper tubes, a rotatable drum having peripheral circumferential grooves, means for supplying tobacco thereto, and a frame arranged to alternately move toward and away from said drum, lateral fillers in said frame adapted to hold the tobacco on said drum and compress the same, angle-pieces secured to

said frame and adapted to move the lateral fillers toward each other, fillers on said frame arranged to descend toward the said drum and cause the tobacco to enter the grooves therein, and means to retain the tobacco in the said grooves.

13. In a machine for filling tobacco into paper tubes a rotatable drum, means for imparting an intermittent rotation thereto, a movable frame, secured to rods, cross-bars connecting said rods, bars carrying said cross-bars, a lever pivoted to said bars, and provided with a roller, a cam mounted on a shaft and cooperating with said roller and means for rotating said cam thereby causing the said frame to alternately rise away from and descend toward said drum.

14. In a machine for filling tobacco into paper tubes a drum, having peripheral circumferential grooves means for imparting an intermittent rotation to said drum, rollers journaled near said drum and provided with semicircular grooves to form circular openings, a channel between said drum and said rollers, adapted to convey the tobacco from said drum to said rollers, means for rotating the latter and means for regulating the pressure between the said rollers.

15. In a machine for filling tobacco into paper tubes an intermittently-rotating drum provided with peripheral circumferential grooves, adapted to receive the tobacco, superimposed rollers, journaled near said drum and having semicircular grooves arranged to form circular openings, wedges between the bearings of said rollers, means for removing said wedges, thereby regulating the pressure between the said rollers, a channel between the latter and the said drum to convey the tobacco from the latter to the said rollers, brackets for conveying the rollers and means for adjusting their position with respect to the drum.

16. In a machine for filling tobacco into paper tubes, a pair of rollers shaped to form circular openings between them, means for rotating the said rollers, means for conveying tobacco thereto, tubes adjacent to said rollers and adapted to receive the tobacco ropes formed thereby, knives adapted to cut the said tobacco ropes, a rod, a lever, a roller on said lever and a cam therefor arranged on a shaft to cause the knives to make a curved cutting movement, thereby cutting the said tobacco ropes in one operation.

17. In a machine for feeding tobacco into paper tubes a hopper containing the paper tubes, a rotatable drum forming the bottom of the said hopper and provided with axial peripheral grooves each adapted to receive a paper tube, a disk rotating together with the said drum, tubes on the said disk and reciprocating plungers arranged to enter the grooves in the said drum and push the said paper tubes on the tubes on the said disk.

18. In a machine for feeding tobacco into paper tubes, a hopper containing the paper tubes, a rotatable drum arranged at the bottom of said hopper and provided with axial peripheral grooves each adapted to receive a paper tube, a disk mounted on the shaft of said drum, beveled tubes on said disk to receive the paper tubes, reciprocating plungers arranged to enter the grooves in said drum to push the paper tubes on the tubes on said disk and means for intermittently moving said drum.

19. In a machine for feeding tobacco into paper tubes, a hopper containing the paper tubes, a rotatable drum located at the bottom of said hopper and provided with axial peripheral grooves, each adapted to receive a paper tube, tubes arranged to receive the paper tubes, reciprocating plungers adapted to enter the said grooves and push the paper tubes therein on the said tubes, plungers to push tobacco into the paper tubes and return the filled paper tubes to the said drum and means for imparting an intermittent movement to the said drum.

20. In a machine for filling tobacco into paper tubes, the combination with a hopper containing the paper tubes of a rotatable drum forming the bottom of the said hopper and provided with axial peripheral grooves each adapted to receive a paper tube, a disk, rotating together with said drum, tubes on said disk, each adapted to receive a paper tube, reciprocating plungers arranged to enter the grooves in said drum and force the paper tubes on the tubes on the said disk, plungers to push tobacco into the paper tubes at the same time returning the filled tubes to the said drum, a guard to retain the filled paper tubes on the drum and means including an escapement device for imparting a stepwise movement to the said drum.

21. In a machine for feeding tobacco into paper tubes the combination of a hopper containing the paper tubes, a rotatable drum at the bottom of said hopper and provided with grooves for the paper tubes, a disk having tubes and mounted on the shaft of the said drum, reciprocating plungers arranged to enter the said grooves and place the paper tubes onto the tubes on the said disk, other plungers to push tobacco into the said paper tubes at the same time returning the filled tubes to the said drum, a guard to retain the filled paper tubes on the drum, shears to cut off the projecting tobacco ends, means for imparting a stepwise movement to said drum and means for actuating the said plungers.

22. In a machine for feeding tobacco into paper tubes, a hopper, a rotatable drum provided with grooves on its periphery, a disk rotating with said drum, tubes on said disk, reciprocating plungers arranged to enter the grooves in said drum and push the paper tubes onto the tubes on the said disk, other

plungers to push tobacco into the said paper tubes, and return the filled paper tubes to the said drum, a guard, shears for cutting off the projecting tobacco ends, means for actuating the various plungers, means, including an escapement device, for imparting a step-wise movement to the said drum and the said disk and means for holding the disk and drum in a fixed position.

10 23. In a machine for filling tobacco into paper tubes, the combination with a reservoir for the tobacco and a hopper for the paper tubes, of a rotatable drum having peripheral circumferential grooves, means for
15 conveying the tobacco from the said reservoir to the said drum in a continuous operation, a movable frame, adapted to rise from and descend toward the said drum, fillers mounted in said frame to compress the tobacco and cause it to enter the grooves in the
20 said drum, rollers to press the tobacco into the said grooves, a pair of rollers for shaping the tobacco, a passage arranged between the said

pair of rollers and the said drum, tubes arranged to receive the tobacco shaped by the
25 said rollers into a cylindrical rope, a knife to cut the tobacco rope, a rotatable drum provided on its periphery with grooves for the paper tubes, a disk rotating with the said drum and having tubes arranged to receive
30 the paper tubes, plungers to push the tobacco into the said tubes and paper tubes and the latter on the drum, shears for removing the projecting tobacco ends, means for imparting an intermittent rotation to
35 both said drum and said disk, means for actuating the plungers and means for operating the said knife and the said shears.

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

HENRYK KURKIEWICZ.

Witnesses:

N. TSCHÉKALOFF,
G. PICHARD.