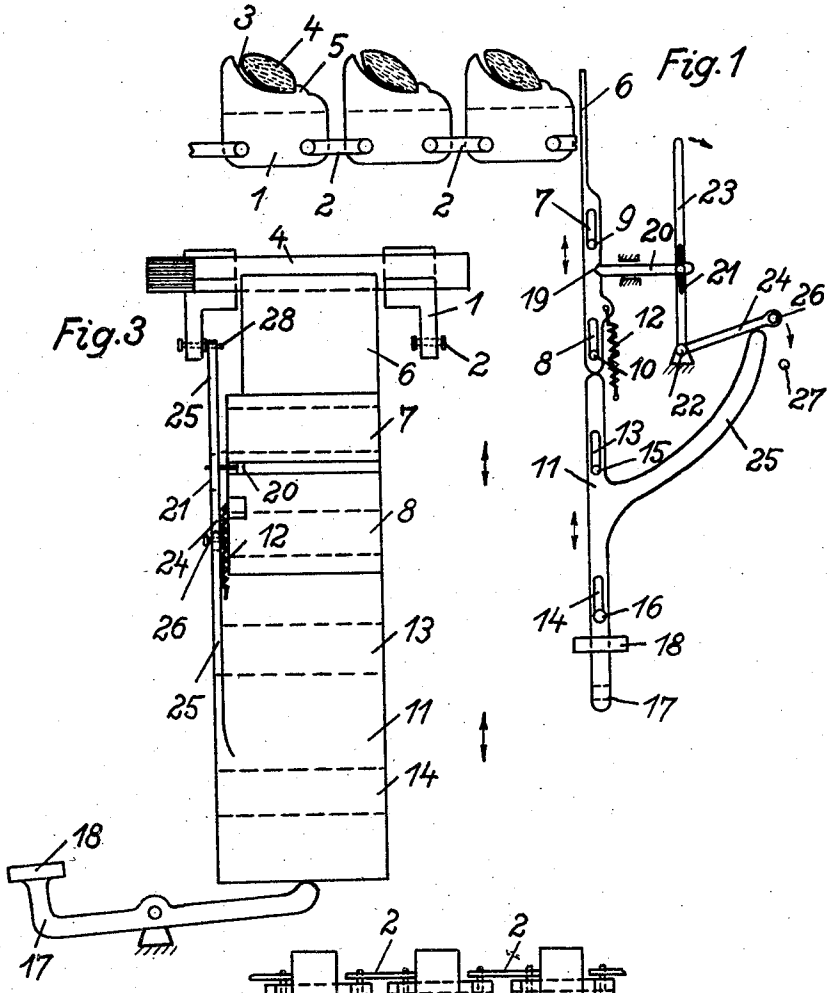
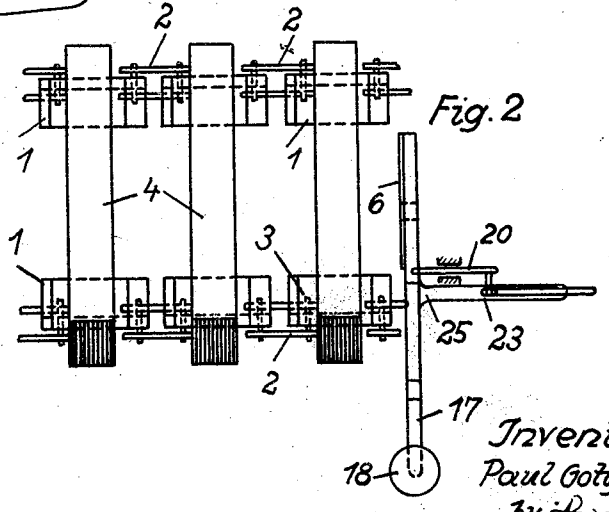
Jan. 6, 1931. P. GOTTSCHALK 1,787,901

DEVICE FOR REVERSING CIGARETTES

Filed March 21, 1929 4 Sheets-Sheet 1





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Jan. 6, 1931. P. GOTTSCHALK 1,787,901

DEVICE FOR REVERSING CIGARETTES

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Fig.4a

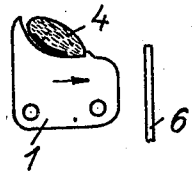


Fig.4b

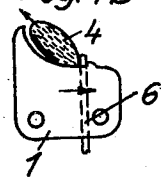


Fig.4c

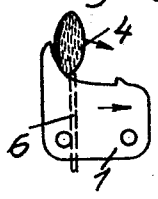


Fig.4d

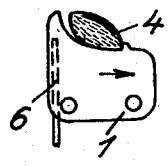


Fig.5c

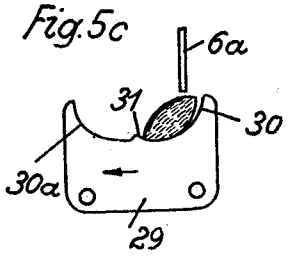


Fig.5b

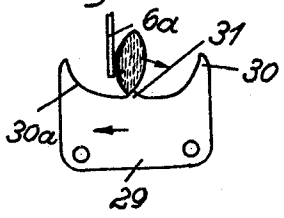


Fig.5a

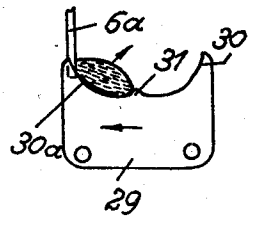


Fig.6

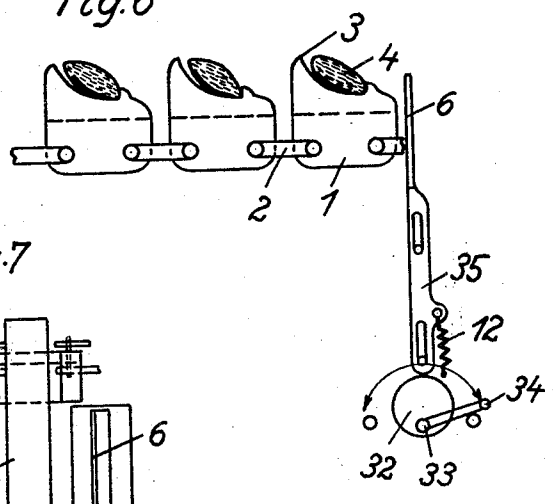
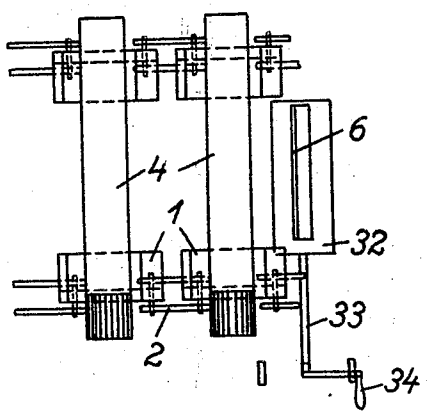


Fig.7

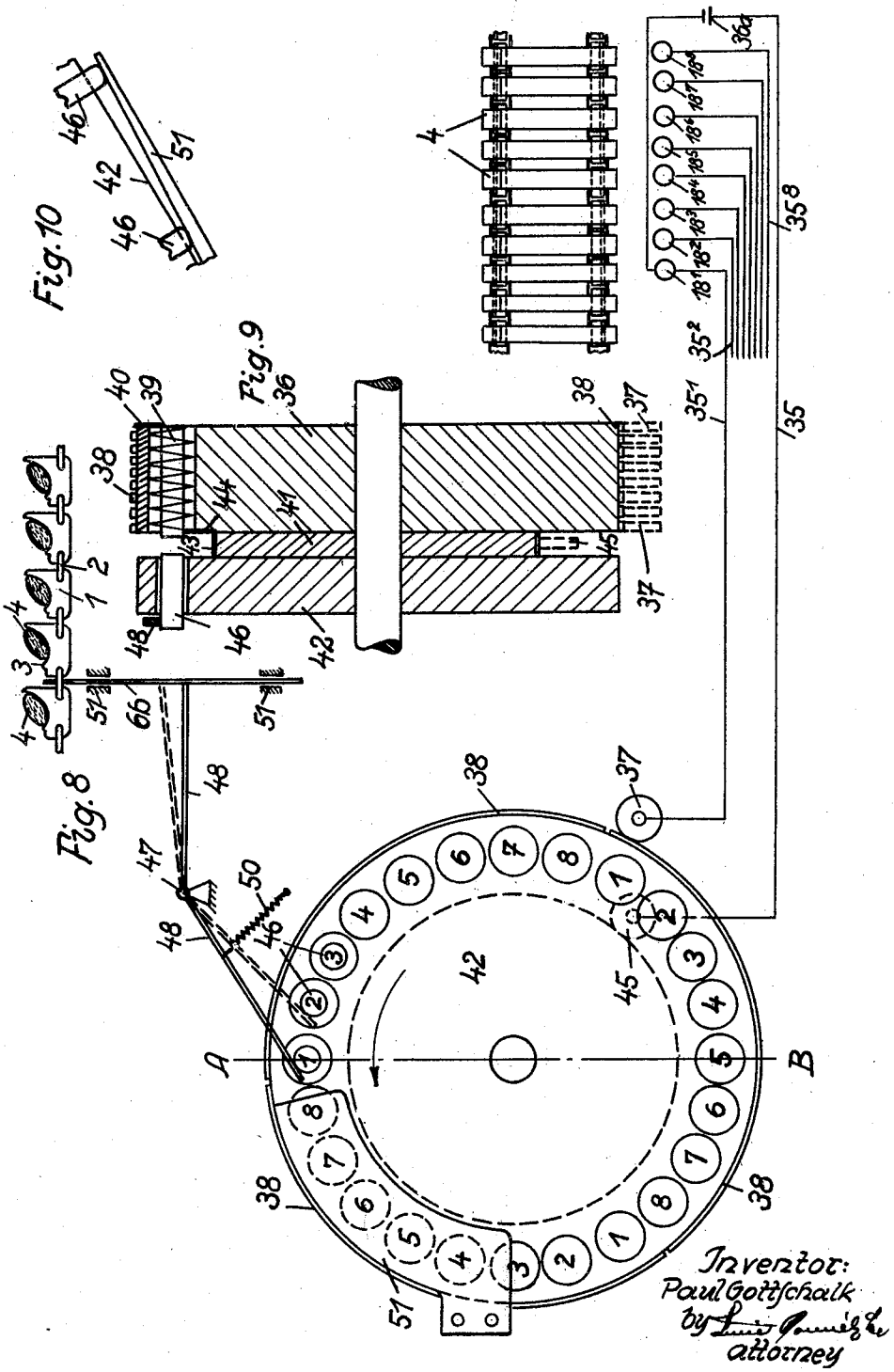


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DEVICE FOR REVERSING CIGARETTES

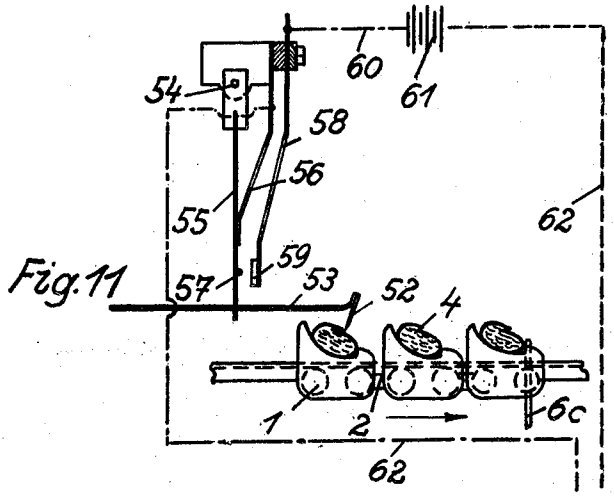
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DEVICE FOR REVERSING CIGARETTES

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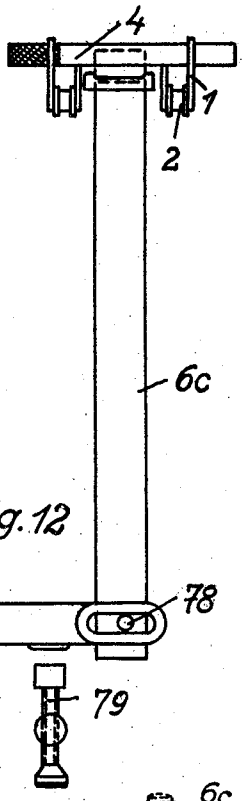
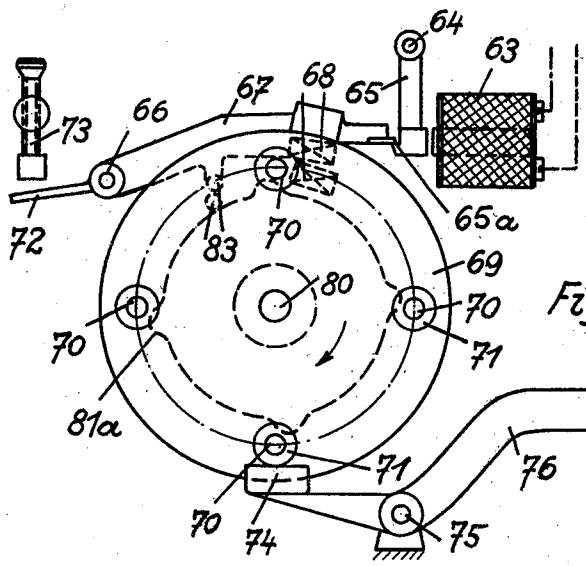


Fig. 12



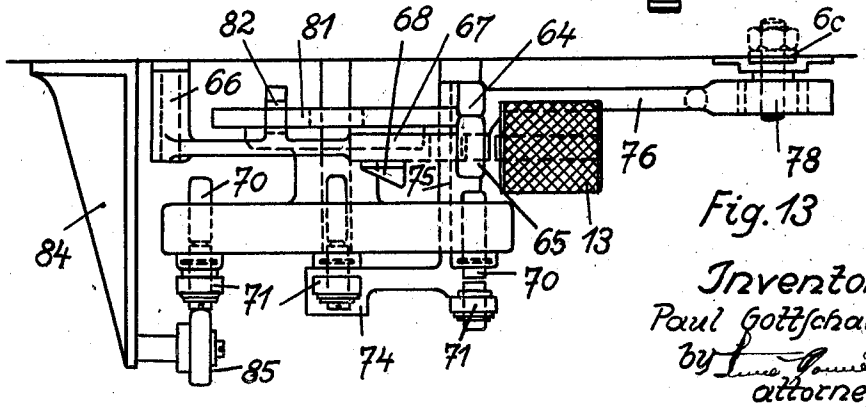


Fig. 13

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Patented Jan. 6, 1931 1,787,901

UNITED STATES PATENT OFFICE

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DEVICE FOR REVERSING CIGARETTES

Application filed March 21, 1929, Serial No. 348,854, and in Germany March 24, 1928.

With respect to devices for the mechanical packing up of cigarettes and similarly shaped articles of manufacture it has already been proposed to insert into the path from the cigarette machine or the like and the packing device a portion of a certain length permitting the operator to watch the cigarettes etc. and to reverse them by hand if they should lie the wrong way. This procedure is, however, circumstantial and consumes much time.

The object of the present invention is to substitute mechanical operation for that manual operation, and for this purpose I provide at the device feeding the cigarettes etc. into the packing up machine an adjustable abutment member which contacts, when in its operative position, with the upper or the lower edge of the obliquely located cigarettes etc. which are moved along in a correspondingly arranged guide way, the arrangement being such that when the feeding device is moved the respective cigarettes are turned at that edge which contacts with, and is retained by, said abutment member. This latter is preferably arranged between the two known conveying chains and is actuated manually by the medium of a grip, a push button or the like. A locking device may be provided for retaining the abutment member in its operative position, and that locking device can be released automatically when the feeding device is actuated, the abutment member returning then into its position of rest in which it is inoperative. It is suited to the purpose to provide a plurality of abutment members so that a corresponding number of cigarettes etc. can be turned, if necessary.

The abutment member or members can be actuated also electrically, that is to say, the grip or other manually operable member actuates said member or members not directly, but indirectly by any suitable electric or electrically controlled transmission means. This means may be designed, for instance, in this way that by depressing a push-button an electric circuit is closed into which an electromagnet is inserted, this magnet being attached to a carrier located in the proximity of the reversing device and operating an armature which is shiftable upon said carrier and acts upon the reversing device when being moved past it.

There are cases in which it may be suited to the purpose to make use of a feeler or feeling arm or lever which co-operates with the same of the cigarette that lies the wrong way; or a photo-cell or the like may be used by which an electric circuit into which the reversing device is inserted can be closed and opened, as required. In cases like these the reversing device is controlled, preferably, in this way that when said circuit is closed or opened a pawl is released and is moved into a position in which it gets into the path of a plurality of abutment pins or the like located in a rotatory disk or drum, said pawl shifting then the nearest pin into a position in which it can operate the reversing device proper, all as more fully described hereinafter.

The invention is illustrated diagrammatically and by way of example on the accompanying drawing on which Fig. 1 is a side-view of a part of a cigarette conveying device combined with a reversing device designed according to this invention, this device being shown in operative position. Figure 2 is a plan of these parts. Figure 3 is a front view of the parts shown in Fig. 1, seen from the right to the left. Figures 4*a*, 4*b*, 4*c* and 4*d* show one of the upper parts on the left of Fig. 1, the cigarette being shown in four positions. Figures 5*a*, 5*b* and 5*c* are similar representations showing a modification. Figure 6 is a view similar to Fig. 1 and shows another constructional form of the means for turning the cigarette. Figure 7 is a front-view of the members on the right of Fig. 6, some of these members being shown in another position. Figure 8 shows another constructional form which is electrically operated. Figure 9 is a section in the plane A—B of Fig. 8. Figure 10 is a side-view of some details of Fig. 9. Figure 11 shows parts of a modification in which an automatic electric control device is employed. Figure 12 shows parts of the same modification, these parts being turned by 90° with respect to

Fig. 11. Finally, Figure 13 is a plan of the parts shown in Fig. 12.

The cigarettes are fed forward by means of a conveying device formed in the example shown by two uniformly moved chains consisting of links 1 connected with each other by eyes 2. The links 1 are provided with recesses 3 for the reception of the cigarettes 4 which are supported therein in an oblique position, which is that position in which they are introduced into the packing boxes. At the lower end of each recess 3 is an abutment 5 by which the cigarette is retained in its oblique position.

Between the two chains an upright abutment plate 6 is provided, and is guided vertically, for instance by slots 7 and 8 and by pins 9 and 10 engaging these slots, these pins extending forth from stationary parts of the frame of the device. The lower edge of the plate 6 rests upon another vertically movable plate 11 and is held in contact with it by a helical spring 12. The plate 11 is also guided by slots 13 and 14 and by pins 15 and 16 also projecting forth from stationary parts of the device; it bears with its lower end upon an arm of a double-armed lever 17, the other arm of which is provided with a button 18 by which the lever can be turned.

The plate 6 is also provided with a recess 19 which is engaged by a horizontal guided pin 20, the other end of which engages a slot 21 provided in a lever 23 fulcrumed on a pivot 22 and being firmly connected with an oblique arm 24 bearing upon an upwardly extending arm 25 made integral with the plate 11.

The manner of operation of this device is as follows:

The operator watches the cigarettes 4 passing along in front of him upon the links 3 of the chains 1. If anyone of the cigarettes is in inverse position, the operator depresses the knob 18 as soon as that cigarette has arrived before the abutment plate 6, whereby the plate 11 is lifted into the position shown in Fig. 1, so that the upper end of said plate extends between the two chains. Simultaneously therewith the arm 25 of the plate 11 has come into contact with the arm 24 which is connected with the arm 23, whereby the pin 20 is shifted in the direction to the plate 6 so as to engage the recess 19 thereof, all these parts being then in the position shown in Fig. 1. If now the knob 18 is released the plate 11 and the arm 25 move back into their former position, whereas the upper parts remain in their upper position. This is due to the fact, that a pin 26 provided at the free end of the arm 24 has engaged one of two bores 27 provided in the neighbouring part of the frame of the device. In Fig. 1 the pin 26 has engaged the upper of said holes, whereby the parts are retained in the upper position, as just described.

Referring now to Fig. 4*a*, the relative position of the cigarette 4 and the abutment plate 6 is the same as in Fig. 1. The plate 6 remains in its position, at least for the time being, but the cigarette is moved further onward by the conveying chain and contacts with the upper end of the plate 6, as shown in Fig. 4*b*. While now the chain proceeds in its path, the cigarette is retained by the plate 6, as in Fig. 4*c*, but instantly thereafter the cigarette turns over to its other side, as in Fig. 4*d*, so that it is now in the inverse position relatively to Fig. 4*a*. Immediately thereafter the plate 6 is automatically moved back into its lower or lowermost position.

The links 1 of one of the chains are provided with inwardly directed pins 28, the position of which with respect to the lever 23 is such that any of them can contact with the upper end of said lever when this is in upright position, as in Fig. 1. The respective pin turns then the lever 23 downwardly, and with it the arm 24 is turned so that the pin 26 leaves the upper bore 27 and engages finally the lower bore so that the parts are then in their position of rest in which they remain until the knob 18 is operated another time.

In the constructional form described the abutment plate 6 is moved upwardly when it is moved from its position of rest into its operative position, but also the reverse can take place, as is shown in the modification Figs. 5*a*–5*c*. In this modification the chain links 29 are longer than in the first-described case and each of them is provided with two oppositely located recesses 30 and 30*a*, between which is a projection 31, by which the recesses are separated from one another. In Fig. 5*a* it is assumed that the cigarette is in the wrong position and must be reversed. As the operator has detected this necessity in proper time he has actuated the knob 18 (Fig. 3), whereby the abutment member 6*a* has been so much lowered as to form an obstacle for the cigarette. This latter is now turned from the position, Fig. 5*a*, into the position Fig. 5*b* and is now thrown over from the recess 30*a* into the recess 30, it being understood that the chain is moving in the direction indicated by the arrow. In Fig. 5*c* the cigarette lies in proper position in the recess 30.

It is suited to the purpose of the device to provide more than one of the reversing devices shown in Figs. 1, 2 and 3, at least two of them. It must be borne in mind that the operator overlooks, perhaps, a cigarette lying in the wrong way. If there are two reversing devices he may then actuate the second thereof in order to inverse that cigarette now. It is also possible that the operator turns by inadvertence a cigarette which is in its

proper position. Also in such a case that cigarette may be returned into its proper position by means of the second reversing device.

Another constructional form is shown in Figs. 6 and 7, in which the abutment member 6 is practically the same as in Fig. 1, but is lifted and lowered by an eccentric 32 supported on an axle 33 and connected with an arm 34, by means of which the eccentric can be turned into one or the other of two positions. In Fig. 6 the position of the eccentric 32 is such that the member 35, the upper portion of which forms the abutment plate 6, is in its upper position in which said plate 6 is in its operative position and can act in the manner described with respect to the Figs. 4*a*–4*c*. In the other position of the arm 34 and the eccentric 33 the members 35 and 6 are in their position of rest. The two positions of the parts 32 and 34 are determined by two abutment pins located lefthand and righthand from the eccentric, as shown in Fig. 6. If the machine is provided with this device, the operator must be more attentive than in the other case (Figs. 1–3) because the plate 6 is not returned automatically into its position of rest but must be moved thereinto manually by means of the arm 34.

Instead of transmitting the motion of the operating member to the abutment plate 6 or any other appropriate abutment member mechanically as in Figs. 1–7, the respective abutment member may be controlled electrically. In such a case it is not requisite that the respective abutment member and the operating member lie so closely together as in the above-described constructional forms. The operating member may be located more or less remote from the abutment member. In the case of electric transmission it is suited to the purpose to delay the transmission in such a manner that the abutment member appears in front of the respective cigarette only just prior to the cigarette arriving at said member. A constructional form designed in this manner is illustrated in Figs. 8–10. In the right-hand lower corner of Fig. 8 there are eight keys 18^1, 18^2 . . . 18^8, which are inserted into conducting wires 35^1, 35^2 . . . 35^8 in such a manner that the circuits, of which said wires form parts, are closed when the keys are depressed. All keys are connected on one side with one pole of a battery 36*a*, the other pole of which is connected with a conducting wire 35. Each of the wires 35^1, 35^2 . . . 35^8 is connected with a roll 37 consisting of a conducting material. Instead of these rolls sliding contacts may be used. There are thus eight rolls or eight sliding contacts and each thereof is in contact with a conducting ring 38 provided upon a disk 36 which is common to them all and rotated by any desired means. The disk 36 is provided with a plurality of bores located parallel to the axis of the disk and in each bore is housed an electro-magnet 39. There are in the example shown in Fig. 8 three times more electro-magnets than there are keys, that is to say, there are 24 electro-magnets and in order to have also a like number of conducting members 38 upon the drum 36, each ring 38 is subdivided into three parts. Each electromagnet is connected with one of the circularly curved members 38 by a wire 40.

There are, besides the disk 36, two more disks 41 and 42, and all three disks are firmly connected with one another. The diameter of the disks 36 and 42 is preferably the same, but the diameter of the disk 41 is somewhat smaller, and this disk, which is located between the two other ones is provided on its circumferential surface with a conducting covering 43 connected by short wires with all electromagnets, the windings of these latter being thus inserted between the wires 44 and 40. The conducting covering or lining 43 is in contact with a roll or a sliding contact 45 which is in conducting connection with the wire 35 that is connected with the one of the poles of the battery 36*a*, as has already been mentioned.

The disk 42 is provided with as many bores as there are electro-magnets 39. These bores are located opposite said magnets and in each thereof an armature 46 can be shifted. In their position of rest, the armatures 46 project on the free surface of the disk 42 and are, therefore, able to contact with one arm of a bell-crank lever 48 which is pivoted at 47, The lever 48 is subjected to the pull of a helical spring 50 which continually tends to turn the lever from the position shown in Fig. 8 in full lines into the position shown therein in dotted lines, viz. in counterclockwise direction. The other end of the bell-crank-lever 48 is jointed to a vertically movable abutment member 6*b* guided in guide-members 51. The upper end of this member extends between the conveying chain in the same manner as has been described with respect to Figs. 1–4*d*, and the co-operation of the member 6*b* with the cigarettes is just the same as shown in Figs. 4*a*–4*d*.

As long as the bell-crank-lever 48 is retained in the position shown in full lines in Fig. 8 by any of the armatures 46, the abutment member 6*b* is in its inoperative position, so that the cigarettes can pass away over its upper edge. If, however, the circuit of any of the electro-magnets is closed by the depressing of the appertaining key, the appertaining armature is attracted by the core of the appertaining electro-magnet. In consequence thereof after the respective armature has reached the bell-crank-lever 48 this latter is released and drawn by the spring 50 into the position shown in dotted lines so that the abutment member 6*d* is raised into operative position. The upper end of this member can

now turn the respective cigarette in the manner already described.

In order to shift the respective armature back into its former position in which it is again able to lock the bell-crank lever, that is to say, to turn it from the position shown in dotted lines into that shown in full lines, a member 51, Fig. 10, is provided which is arranged obliquely with respect to the disk 42 and is able to act upon the armature in the manner shown in this figure.

While in the constructional form shown in Figs. 8 and 9 the various circuits are closed manually by the intermediary of the keys $18^1 \ldots . 18^8$, the constructional form shown in Figs. 11–13 operates perfectly automatically, that is to say, the keys or other circuit-closing members are actuated automatically. In Fig. 11, 53 denotes a lever provided at its operating end with a downwardly directed feeling member 52. The lever 53 has not a fulcrum proper but is attached to a lamella 55 consisting of sheet-metal or the like and being secured to an axle 54, from which the parts 55, 53, 52 are suspended. The lamella 55 contacts with a leaf-spring 56 by which it is generally held in vertical position, and there is also provided at the lamella a contact piece 57 which can contact with another contact piece 59 affixed to another leaf-spring 58 which is insulated from the leaf-spring 56, as shown in the upermost portion of Fig. 11. The leaf-spring 58 is connected by a wire 60 with the one pole of a battery 61, the other pole of which is connected by a wire 62 with an eletcromagnet 63. This latter is connected also with the leaf-spring 56 and as the lamella 55 consists of a conductive material, the circuit will be closed when the contact pieces 57 and 59 come in contact with one another.

If the cigarettes 4 moved along by the conveying chain in the direction indicated by the arrow are in their proper position they will pass away below the feeling member 52 and the lever 53 without altering the position of these parts. The cigarettes are in their proper position, if the seam is at the bottom, that is to say, if it is lying in the recess of the chain-link; but if the seam is on the other wrong side of the cigarettes, the paper edge will contact with the feeling member 52 and will take it along with it, that is to say, it will draw the lever 53 to the right (Fig. 11) and will thus move also the lamella 55, so that the circuit is closed by the contact pieces 57 and 59, in consequence of which the electromagnet 63 will be excited.

In front of the free end of the core of this electromagnet a lever 65 is fulcrumed on a pivot 64. The lower end of this lever serves as armature and is provided with a projection 65*a* which supports the free end of a pawl-like lever 67 supported on a pivot 66. At one side of the lever 67 an oblique projection 68 is provided which when the lever 65 is turned by the electromagnet and when, therefore, the lever 67 is released at 65*a* gets into the path of abutment bolts 70, located in a rotary disk or drum 69. There are, in the example shown, four bolts 70 which are distributed in equal distances from one another and each of which is provided with a roll 71 located on that side of the disk or drum which is counter to the oblique projection 68 of the pawl 67. The normal position of the bolts 70 with the rolls 71 is that of the bolt seen in Fig. 13 on the left side, as well as of the other bolt righthand from it. If the pawl 67 is in its inoperative position in which its front end is lying upon the projection 65*a* of the armature lever 65 the inner ends of the abutment bolts 70 which are directed towards the pawl 67 move freely onward below the lug 68. As soon, however, as the pawl 67 has been released and has turned on the axle so much that a projection 72 provided at its rear end contacts with an abutment screw 73, the next abutment bolt 70 arriving there as the drum 69 is rotating will be shifted by the lug 68 and thereby brought into a position in which it gets, during the further rotation of the drum, into a position in which the roll 71 attached to the front end of the respective bolt engages a double lever 76 which is turnable on a pivot or axle 75 and one end of which is designed to form an abutment member 74. This is the end engaged by said roll 71. The other end of the lever 76 is connected by a sliding pivot 78, with an abutment ledge 6*c*, the object of which is, as in the last described constructional form of the device, to turn the cigarettes which lie the wrong way into their proper position.

Generally, the upper end of the abutment ledge 6*c* is in a position in which it does not come in contact with the cigarettes that are moved away over it by the conveying device. The double lever 76 is at this time in contact with an abutment screw 79 located therebelow. As soon, however, as any one of the abutment bolts which is in its operative position engages the abutment 74 of the double lever 76, this latter is turned on its axle 75 and the abutment ledge 6*c* is lifted so that it contacts with that cigarette which lies the wrong way, and is turning it by 180°.

The rotary speed of the disk or drum 69 is in such a relation with respect to the feeding speed of the conveying chain 1, 2 that that period of time in which the abutment bolt 70 has been moved to the abutment member 74 of the double lever (the bolt 70 having been moved by the pawl 67 which had been released when the respective circuit was closed) corresponds with that period of time which the cigarette lying the wrong way requires to get from the feeling lever 53 to the place in front of the abutment ledge 6*c*.

In order to move the pawl 67 (which had been released when the circuit was closed and the electromagnet excited) back into its inoperative position after the abutment bolt 70 had been shifted rearwardly, there is provided upon the axle 80 of the rotating drum 69 a cam disk 81 provided with as many cams 81*a* as there are abutment bolts 70. These cams co-operate with a roll 83 located at a projection of the pawl 67, the cooperation taking place in this manner that this pawl when being in its operative position, is lifted, after the respective abutment bolt has been shifted, as described, to such a height that its front end gets to rest upon the nose 65*a* of the armature lever 65. This return-movement of the pawl 67 takes place before the next abutment member 70 has been moved to the curved face or the cam 68 of the pawl 67.

The abutment bolts 70 shifted forwardly into operative position by the cam 68 are, after the reversing device has been actuated moved backwardly into inoperative position by a roll 85 carried by an arm 84; in lieu of this roll a curved member of suitable shape may be used.

I wish it to be understood that I do not limit my claims solely to the details of the several constructional forms shown in the drawing merely by way of example. The reversing device to be operated by the cigarettes lying the wrong way can be actuated, instead mechanically or electrically, also with the aid of a photo-cell co-operating with electric means for turning the cigarettes that lay the wrong side into the proper position.

I claim:—

1. In combination with a conveying device feeding parallel, obliquely located cigarettes and similarly shaped articles of manufacture into packing boxes or the like, a reversing device for such of the respective articles of manufacture as are laying the wrong side, this device comprising a vertically movable abutment member adapted to be moved into the path of the respective articles and to contact with the one edge of the same when in its operative position, and means for thus actuating said member.

2. In combination with two conveying chains feeding parallel, obliquely located cigarettes and similarly shaped articles of manufacture into packing boxes or the like, a reversing device for such of the respective articles of manufacture as are laying the wrong side, this device comprising a vertically movable abutment member adapted to be moved between said chains into the path of the respective articles and to contact with the one edge of the same when in its operative position, and means for thus actuating said member.

3. In combination with a conveying device feeding parallel, obliquely located cigarettes and similarly shaped articles of manufacture into packing boxes or the like, a reversing device for such of the respective articles of manufacture as are laying the wrong side, this device comprising a vertically movable abutment member adapted to be moved into the path of the respective articles and to contact with the one edge of the same when in its operative position; means for thus actuating said member, means for locking this member automatically, and means attached to said conveying device and adapted to release the said actuating member after it had been locked.

4. In combination with a conveying device feeding parallel, obliquely located cigarettes and similarly shaped articles of manufacture into packing boxes or the like, a reversing device for such of the respective articles of manufacture as are laying the wrong side, this device comprising a plurality of vertically movable abutment members, each of which is adapted to be moved into the path of the respective articles and to contact with the one edge of the same when in its operative position, and means for thus actuating each of said abutment members.

In testimony whereof I affix my signature.

PAUL GOTTSCHALK, Ingenieur.