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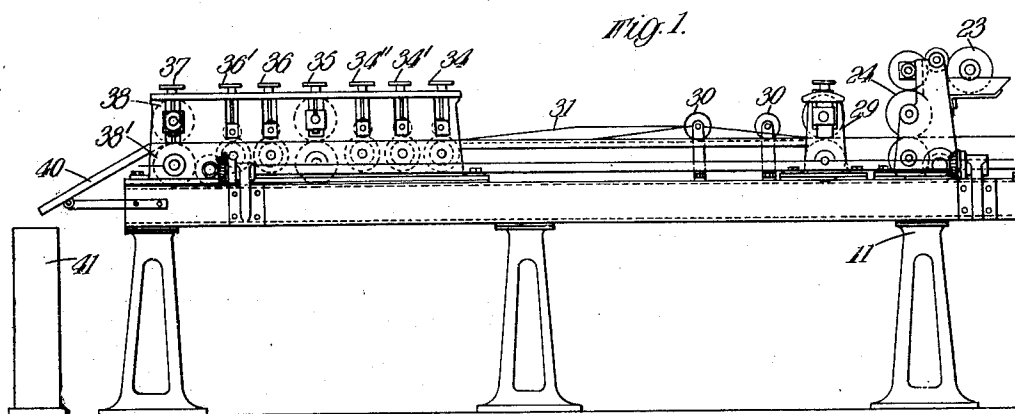
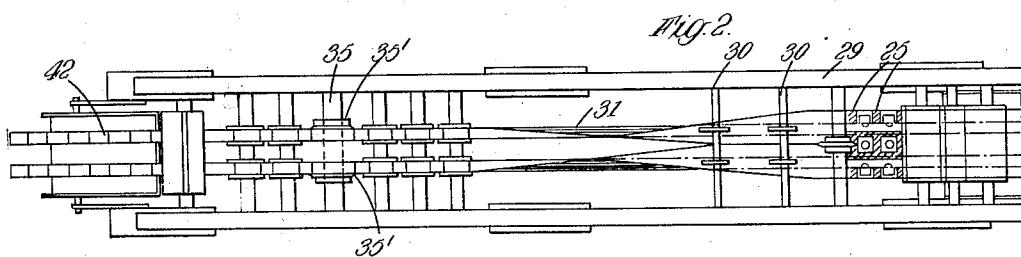
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METHOD OF AND APPARATUS FOR MAKING TICKETS

Filed Jan. 29, 1929

6 Sheets-Sheet 1



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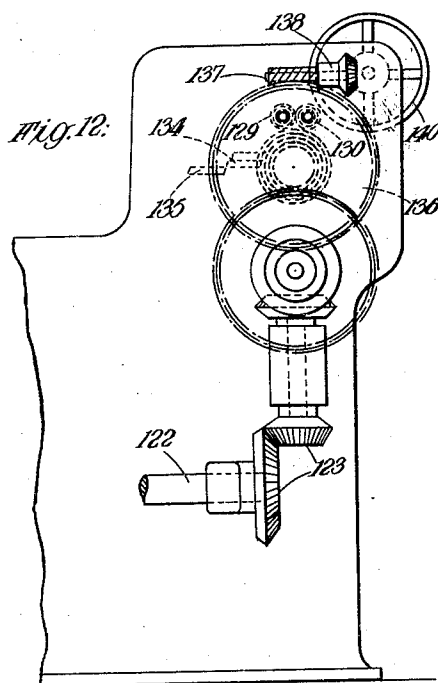
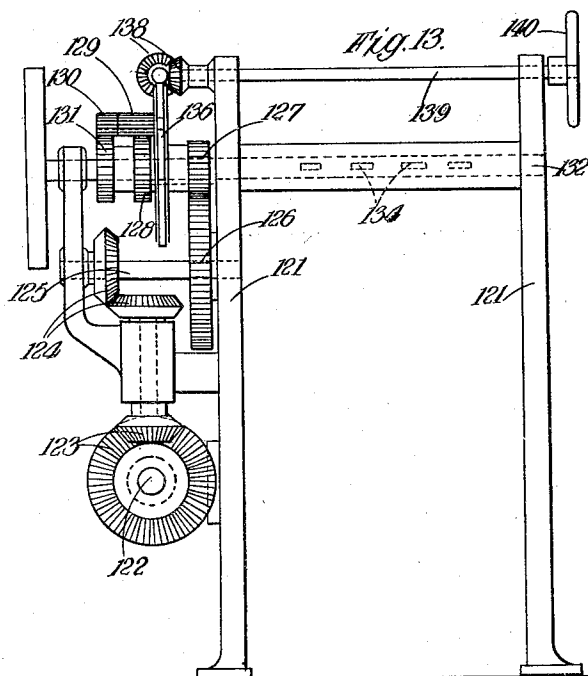
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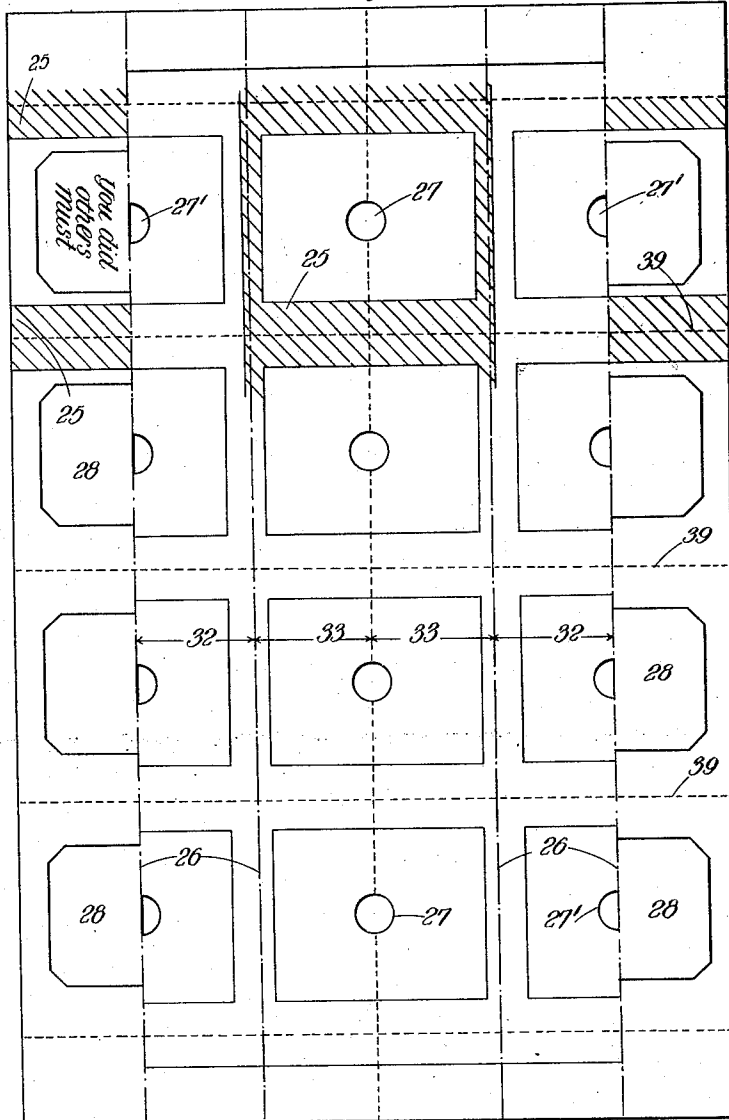
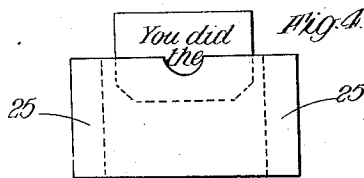
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6 Sheets-Sheet 3

Fig. 3.



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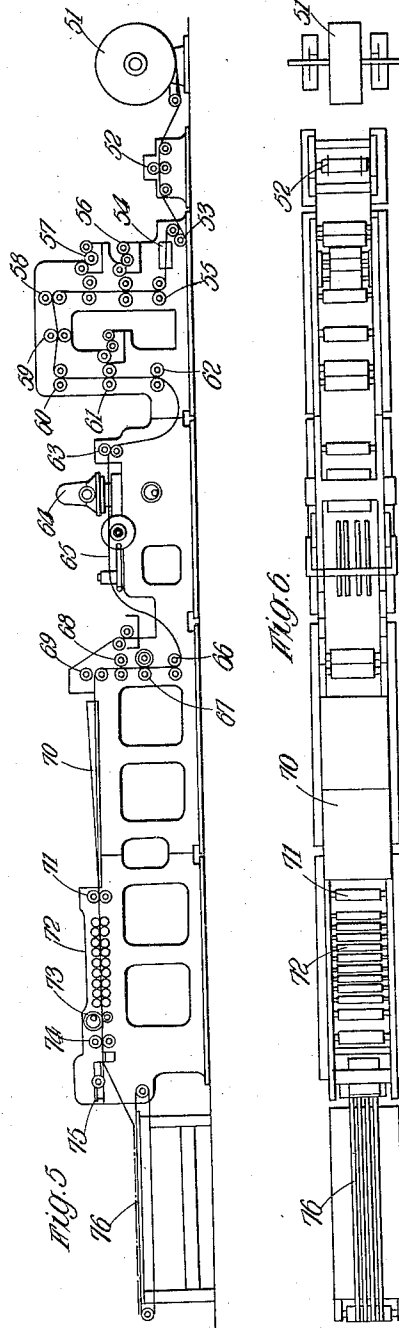
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6 Sheets-Sheet 5



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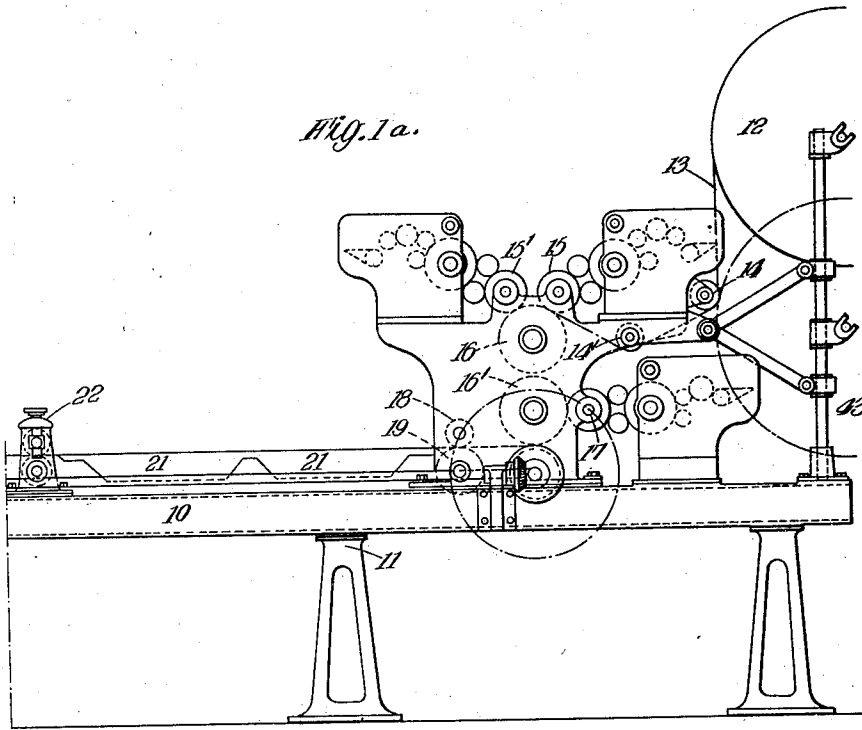
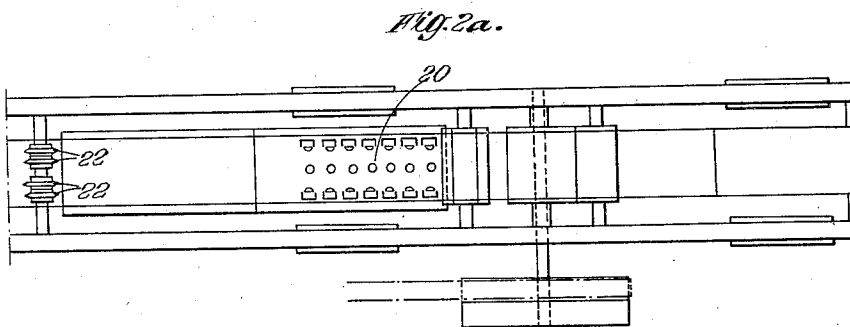
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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

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METHOD OF AND APPARATUS FOR MAKING TICKETS

Application filed January 29, 1929, Serial No. 335,972, and in Great Britain January 31, 1928.

This invention relates to a method of, and apparatus for, making the known tickets which are adapted to carry a removable slip bearing advertising matter.

5 The object of the present invention is to provide a method and apparatus for making and delivering automatically such tickets in a complete state.

10 The method according to the present invention consists in interposing the continuous section or portion from which the removable slips are made between two other continuous sections or portions, of material adapted to form the outer layers of the ticket proper.

15 In one method according to the present invention the three sections or portions may be made from one blank, in which case the blank would be printed, scored and the 20 printed section or portion folded within the unprinted sections or portions. In another method three separate strips might be used, as described hereafter.

25 Apparatus made according to the present invention comprises one or more printing units for printing the advertising matter (in one or more colours), a stamping unit, gluing rollers for applying glue to the unprinted sections or portions, a folding device for folding the printed section or portion between 30 two unprinted and glued sections or portions, and a cutting device for severing the tickets one from another.

35 The accompanying drawings illustrate by way of example, two embodiments of the present invention, wherein, Figures 1 to 4 illustrate one embodiment, and Figures 5 to 13 a second embodiment.

40 Figure 1, 1a are elevations of apparatus according to the first embodiment.

Figure 2, 2a are plans.

45 Figure 3 is an enlarged face view of a blank made by apparatus illustrated in Figures 1 and 2 after it has been printed, punched, scored, and glued, but not folded.

Figure 4 is a face view of a complete ticket.

50 Figures 5 and 6 are respectively diagrammatic elevation and plan views of a slightly modified apparatus made according to the

embodiment illustrated in Figures 1 to 4.

Figures 7, 8, 9 and 10, are detail views of a part of the apparatus shown in Figures 5 and 6.

Figure 11 shows a blank after passing 55 through the stamping unit.

Figures 12 and 13 are detail views of another part of the apparatus shown in Figures 5 and 6.

Referring to Figures 1 to 4 of the drawings:—

60 The frame 10 is mounted on standards 11 and carries a reel 12 of the material (in this case cardboard) to be formed into blanks. The cardboard 13 is in this case wide enough 65 for two blanks, and is led from the reel 12 over two guide rolls 14, 14' respectively to the first printing cylinders 15, 15' respectively which print advertising matter in two colours on the outside margins of the cardboard. The cardboard is now fed from the 70 printing cylinders between the impression cylinders 16 and 16', and during its travel over the latter it is acted upon by a printing cylinder 17. This cylinder 17 prints on the reverse side of the cardboard in one colour 75 only, but it is to be understood that more than one printing cylinder for printing on this side of the cardboard may be employed if desired. The board is now conveyed through 80 a rotary stamping unit consisting of an upper roller 18 provided with suitable projections adapted to act on a lower compression roller 19 to effect the stamping operation substantially as shown at 20 in Figure 2. After 85 passing through this stamping unit the board is passed over heated plates 21 to prepare it for the gluing operation and to dry off the ink. The board next passes through a rotary scoring device 22 where it is scored longitudinally and symmetrically in two places on 90 each side of its centre line, as clearly shown by the dot-and-dash lines in Figure 3. The board is now passed through the gluing apparatus which consists of a three roller system 23 for supplying the glue to the applying roller 24 which has an embossed pattern adapted to apply glue as shown by the glue 95 markings 25 (see Figures 2 and 3). The board as it comes from the gluing rollers is 100

illustrated by Figure 3 which shows quite clearly that the board is scored along the lines 26, holes 27 and 27' are punched out of the board at equal intervals, and the portions 28 carrying the printed matter are stamped out at regular intervals along the outside margins. The board is now ready to be cut along its centre-line. For this purpose it is passed through rotary slitting apparatus 29 and cut along its centre-line, thereby being divided into two portions and then passed through pressure rollers 30 which serve to hold the two portions whilst entering the folding station 31. The folding station comprises eight rails, four rails operating on each portion or blank. The first two rails are provided so that the longitudinal movement of the blank relatively thereto raises both outer margins of the one portion to an angle of 90 degrees relatively to the centre portion formed between the two scoring lines 26 26'. The movement of the blank past the next rail of each set causes the raised margins carrying the advertising slips 28, to be pressed down flat on the portion 32 (see Figure 3) whereupon the fourth rail of each set comes into action and causes the remaining raised margins to be folded down, so that the slips 28 are interposed between the sections 32 and 33 (see Figure 3). The two completely folded parts of the blank are now passed between a series of three pressure rollers 34, 34', 34'', where the folds are pressed and glued together. On issuing from the pressure rollers the folded and glued strips are passed through trimming apparatus 35 consisting of two pairs of rotary knives 35' arranged to trim off the material of the outer edge of each strip thereby releasing the slips 28. The two folded and glued strips are now passed between two further sets of adjustable pressure rollers 36, 36' where they are pressed to a uniform thickness.

Although not shown in the drawing it is proposed to incorporate an automatic device for indicating if the caliper measure of the finished strip exceeds a predetermined thickness. The strips would normally pass through this calipering device before passing on to the rotary cross cutter 37 consisting of a number of blades carried on the cylinders 38, 38', where, as shown by the dotted lines 39, Figure 3, the strips are cut transversely to produce tickets of the required length which are passed down a chute 40, to a stacking device 41, as shown at 42 in Figure 2.

In order to avoid delay when the board on the reel 12 is finished and the necessity for feeding an entirely fresh reel of board through the whole of the mechanism, a second reel 43 is provided and the end of the board on the reel 12 would be pasted to the commencement of the board on the reel 43. When the reel 43 is finished the end of the

board would be pasted to a new supply placed, meanwhile, on the reel 12.

In the apparatus shown in Figures 5 to 13, the arrangement of parts is somewhat different from that above described, and the machine is intended to work upon a sheet of cardboard twice the width of that shown in Figure 3, so that four tickets are produced simultaneously. In these figures the cardboard is led under the rollers 52 into rollers 53, through a board brushing device 54, (where the surface of the board is cleaned to prevent undue clogging of printing stereotypes and punching dies), through further rollers 55 into the printing units 56 and 57, which make an imprint on one side only of the sections which are to form the removable slips. The board from this point travels through rollers 58, into the scoring apparatus 59, where the underneath side is scored as already described, through feed rollers 60 into another printing device 61, in which the board is printed on the other side of the sections which are to form the removable slips. The board then passes through further rollers 62 and is allowed to sag at this point. Up to the present the operation has been continuous, but at this point the board has to pass through the stamping unit 64, which consists of reciprocatory male and female dies, and for this reason the board is again allowed to sag, after passing through the device 65 which is a gripper feeding device, actuated by an eccentric drive, and provided to regulate the length of board passing through the device at any moment. This device is necessary to ensure that the stamping is in correct register with the printing. The stamping unit 64 and gripping device 65 are shown in detail in Figures 7, 8, 9 and 10. In these figures 101 is the stamping head with guides 102, and plunger 103, to which is attached the upper die of stamping apparatus 104. The plunger is moved up and down in the usual manner, by means of the eccentric 105 and rod 106. The board travels in the direction of the arrow through the stamping apparatus and is moved forward periodically by means of a transport arrangement, which grips the board on its forward feeding motion. The lower part of this gripping device 107 slides by means of shoes 108 on slide tracks 109 and crank wheels 110 on the inner sides of which are mounted face cams 111 which act on bell crank levers 112 and 113 the upper ends of said bell crank levers carrying a runner slide on which slides the upper part of the gripping device 114 which is connected with its lower counterpart by slide bolts 115. The operation of this device is as follows:—

The cams 111, will rotate each as one with a wheel 110 and their shapes may be so arranged that they will operate the bell crank levers 112 and 113 through rollers 112a and 113a so as alternately to raise and lower the

upper part 114 of the gripping device. By means of this device the board is given a step-by-step motion, being fed forward after each stamping operation, during which it remains stationary.

In order to feed the board forward, the upper part 114 of the gripping device is lowered, when it is in its rearmost position, the board being clamped between the upper and lower parts 114 and 107 and held clamped throughout the forward movement of the device. At the end of its forward movement, the upper part 114 is raised, the board remains stationary, so that the stamping operation may be satisfactorily performed, and during the stamping operation, the gripping device travels back in order to be in readiness to feed another length of board forward for the next stamping operation. Thus it will be seen that the reciprocating motion of the transport arrangement feeds the same length of board forward at regular intervals. Figure 9 shows the device in its maximum forward position, that is at the moment it is about to return, leaving the board stationary whilst the punching operation is being effected. By this means the amount of board to be fed into the punching device at each operation can be regulated. Figure 10 shows the device at the commencement of its forward travel and gripping the board.

The holes punched in the board by the punching device serve the additional purpose of adjusting the register of the punching and the printing. It might happen on occasion that a variation in the feed of the machine occurs so that the printing is slightly out of register with the punching unit, and these variations can be adjusted satisfactorily by means of the device shown in Figure 8 wherein 116, 116 are worm wheels actuated by worms 117, 117, the worm wheels 116, 116 drive threaded spindles 116^a, 116^a in engagement with a slide plate 118. The action of rotating the spindle of the worms 117, 117 moves the plate 118 forwardly or rearwardly. The slide plate 118 is fitted with four set pins 119 and on the descent of the head of the punching device, to which the slide plate 118 is attached, and before the punching dies operate, the set pins 119 enter the holes already punched in the board during the preceding punching operation, so that the board is adjusted automatically backwards or forward as required while the machine is in operation. To ensure that the holes about to be punched are in accurate register in relation to the printing it is only necessary to turn the spindle of the worms 117, 117 one way or the other as required.

Reciprocating movement is imparted to the gripping device by the crank wheels 110 through connecting rods 110^a, and crank pins 110^b, which engage in slots 110^c in the wheels 110 for the purpose of adjustment.

Referring now to Figures 5 and 6, the board, after passing through the device 65, is again moved in a continuous manner by means of rollers 66 through mechanically driven rotary longitudinal slitting knives 67, which cut the board into four pieces; the board is also moved through the gluing rollers 68, where the four strips of board are glued as previously described, and thence it is moved between feed rollers 69. The board now enters the folding station 70, the construction of which is identical with that above described (it being understood of course that in the present case its parts are duplicated),—and subsequently it passes between pressing rollers 72, which ensure that the portions of the board are stuck together securely before the trimming operation, which is effected by mechanically driven rotary longitudinal cutting knives 73 to release the printed slips. The four strips of board now pass through the rotary cross cutter 75, where the tickets are separated one from another and are delivered to a laying-off table 76 provided with an endless conveyor or conveyors 77.

The rotary cross cutter is shown in detail in Figures 12 and 13. In these figures, 121 are the side stands of the machine, 122 is the driving spindle, which through intermediate bevel gears 123 and 124 drives a spindle 125 on which is fixed a gear wheel 126 which in turn drives a gear wheel 127.

Fixed to rotate as one with the gear wheel 127 is a gear wheel 128 which in turn drives a pinion 129 and this drives a pinion 130 which meshes with a gear wheel 131 which is keyed on to a knife spindle 132. 134 is a rotary cross knife, which, with the stationary knife 135 produces the cross cut. As it is essential that the cuts should take place at predetermined points in the lengths of the strips while they are moving, the rotary cross knife must be adjustable with regard to speed while running.

For this purpose, a worm wheel 136 is loosely mounted on a sleeve between the gear wheels 127 and 128, and carries pintles about which the two pinions 129 and 130 rotate.

The worm wheel 136 engages with a worm spindle 137 which, through bevel wheels 138 and a shaft 139, may be adjusted by means of a hand wheel 140.

If for example it is desired to advance the action of the cutting knife relatively to the board, the wheel 140 is turned in the required direction to accelerate the shaft 132 carrying the cutting blades 134 until it has overtaken the board to the required extent when the cross cut is effected in correct register, that is to say the insert is exactly in the middle of each cut ticket. The whole apparatus might be described as a differential gear by turning the hand wheel of which one way or the other, the speed is either accelerated or retarded so that as the folded and glued

blank travels at a regular speed towards the cross cutter, the position of the cross cut can be adjusted as required in order to obtain accurate register on this section of the machine.

5 Vast quantities of tickets can be turned out each working day by apparatus according to the present invention. It is therefore obviously an advantage to have as many differ-
10 to effect this each printing cylinder may have a number of different legends around its periphery. For example, in Figures 5 and 6 the four strips of the board to be printed are acted on by four plates each plate hav-
15 ing six different legends set equidistantly around its periphery, so that twenty four different legends are being printed at the one time. Each series of six legends are passed consecutively into four piles at the
20 end of the machine.

In an alternative method of carrying out the present invention three separate strips of material are used. In this case the central strip would be printed and cut out and then
25 fed between the strips constituting the outer layers. This could be done by means of a suitable roller feeding arrangement provided with the necessary guides. The outer strips would of course be punched out,
30 scored and gummed prior to folding. The subsequent operations could be identical with those already described.

By the use of the present invention it is possible to effect considerable economy in
35 time and labour when making tickets of the type indicated, and a machine made according to the present invention can produce maximum quantities in the minimum time.

I claim:—

40 1. Apparatus for making tickets from a single blank each adapted to carry a removable slip, wherein the continuous section of the blank from which the removable slips are made is interposed between two other continu-
45 ous sections of the blank adapted to form the outer layers of the ticket proper, comprising a blank reel, printing units for printing advertising matter on the sections of a blank, a stamping unit for severing the appropriate
50 section of the blank along three lines which correspond with three sides of the removable slip, gluing rollers for applying glue to predetermined portions of the blank, a folding device for folding the printed section to lie
55 between the unprinted sections, a cutting device for releasing the inset sections, and a cutting device for severing the tickets one from the other.

60 2. Apparatus for making tickets from a single blank each adapted to carry a removable slip, wherein the continuous sections of the blank from which the removable slips are made is interposed between two other continuous sections of the blank adapted to
65 form the outer layers of the ticket proper,

comprising a blank reel, printing units for printing advertising matter on the sections of a blank, a stamping unit for severing the appropriate section of the blank along three lines which correspond with three sides of the removable slip, a scoring device for scoring the blank longitudinally on either side of the center line of the blank, gluing rollers for applying glue to predetermined portions of the blank, a folding device for folding the printed section to lie between the unprinted sections, a cutting device for releasing the inset sections, and a cutting device for severing the tickets one from the other.

3. Apparatus for making tickets from a single blank each adapted to carry a removable slip, wherein the continuous sections of the blank from which the removable slips are made is interposed between two other continuous sections of the blank adapted to form the outer layers of the ticket proper, comprising a blank reel, printing units for printing advertising matter on the sections of a blank, a stamping unit for severing the appropriate section of the blank along three lines which correspond with three sides of the removable slip, a scoring device for scoring the blank longitudinally on either side of the center line of the blank, gluing rollers for applying glue to predetermined portions of the blank, a slitting device for cutting the blank longitudinally into a number of portions, a folding device for folding the printed section to lie between the unprinted sections, a cutting device for releasing the inset sections and a cutting device for severing the tickets one from the other.

4. Apparatus as claimed in claim 1 having a transport device actuated to cause the blank to pass through the stamping unit intermittently.

5. Apparatus for making tickets from a single blank each adapted to carry a removable slip, wherein the continuous section of the blank from which the removable slips are made is interposed between two other continuous sections of the blank adapted to form the outer layers of the ticket proper, comprising a blank reel, printing units for printing advertising matter on the sections of a blank, a stamping unit for severing the appropriate section of the blank along three lines which correspond with three sides of the removable slip, a scoring device for scoring the blank longitudinally on either side of the center line of the blank, gluing rollers for applying glue to predetermined portions of the blank, a slitting device for cutting the blank longitudinally into a number of portions, a folding device for folding the printed sections to lie between the unprinted sections, a cutting device comprising rotary knives adapted to trim off the material of an edge of each of the printed sections corresponding with the fourth side of each of the removable

slips, and a cutting device for severing the tickets one from the other.

6. Apparatus as claimed in claim 1, including a board brushing device actuated before the blank enters the printing units.

7. Apparatus for making tickets from a single blank each adapted to carry a removable slip, wherein the continuous section of the blank from which the removable slips are made is interposed between two other continuous sections of the blank adapted to form the outer layers of the ticket proper, comprising a blank reel, printing units for printing advertising matter on the sections of a blank, a stamping unit for severing the appropriate section of the blank along three lines which correspond with three sides of the removable slip, registering means for ensuring that the stamping is in correct register with the printing, gluing rollers for applying glue to predetermined portions of the blank, a folding device for folding the printed section to lie between the unprinted sections, a cutting device for releasing the inset sections, and a cutting device for severing the tickets one from the other.

8. Apparatus for making tickets from a single blank each adapted to carry a removable slip, wherein the continuous section of the blank from which the removable slips are made is interposed between two other continuous sections of the blank adapted to form the outer layers of the ticket proper, comprising a blank reel, printing units for printing advertising matter on the sections of a blank, a stamping unit for severing the appropriate section of the blank along three lines which correspond with three sides of the removable slip, means for feeding the blank intermittently for ensuring that the correct length of the blank is fed to the stamping unit for each stamping operation registering means for ensuring that the stamping is in correct register with the printing, gluing rollers for applying glue to predetermined portions of the blank, a folding device for folding the printed section to lie between the unprinted sections, a cutting device for releasing the inset sections and a cutting device for severing the tickets one from the other.

9. Apparatus for making tickets from a single blank each adapted to carry a removable slip, wherein the continuous section of the blank from which the removable slips are made is interposed between two other continuous sections of the blank adapted to form the outer layers of the ticket proper, comprising a blank reel, printing units for printing advertising matter on the sections of a blank, a stamping unit for severing the appropriate section of the blank along three lines which correspond with three sides of the removable slip, means for feeding the blank intermittently for ensuring that the correct length of the blank is fed to the

stamping unit for each stamping operation registering means for ensuring that the stamping is in correct register with the printing, gluing rollers for applying glue to predetermined portions of the blank, a folding device for folding the printed section to lie between the unprinted sections, a cutting device for releasing the inset sections, a rotary cross-cutter for severing equal lengths of the printed, glued and folded blanks to form the completed tickets and means for adjusting the positions of said cross-cutter to ensure that the cross-cut is effected in the correct position relatively to the printing and stamping.

10. For use in the method of making tickets carrying removable slips, in which the continuous section of a blank from which the removable slips are made is interposed between two other continuous sections of material adapted to form the outer layers of the ticket proper, means comprising a board brushing device, printing cylinders for printing on the sections of a blank, a scoring device for scoring a blank along longitudinal lines, a stamping unit, means for ensuring correct register of the stamping and the printing, gluing rollers, a rotary slitting device for dividing a blank into parts, a folding station, a trimming device for releasing the removable slips a rotary cross-cutter for severing equal lengths of the printed, stamped and folded parts of the blank, means to permit adjustment of the cross cutter to ensure that the cross-cut is effected in the correct position relative to the printing, and a delivery table for aligning and sorting the completed tickets.

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