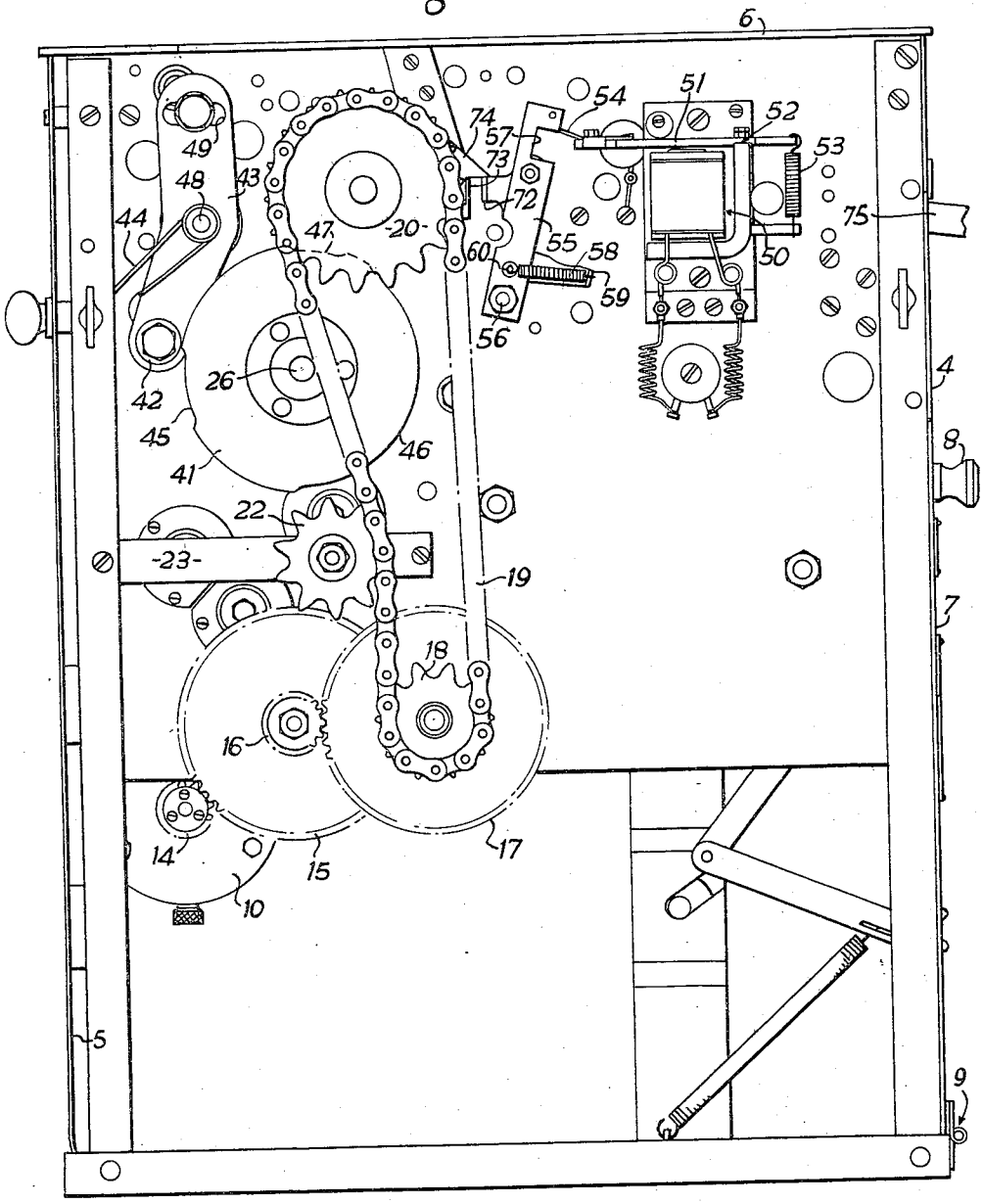
July 25, 1961 S. G. MARSHALL ET AL 2,993,435

TICKET PRINTING AND ISSUING MACHINES

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Fig. 1.



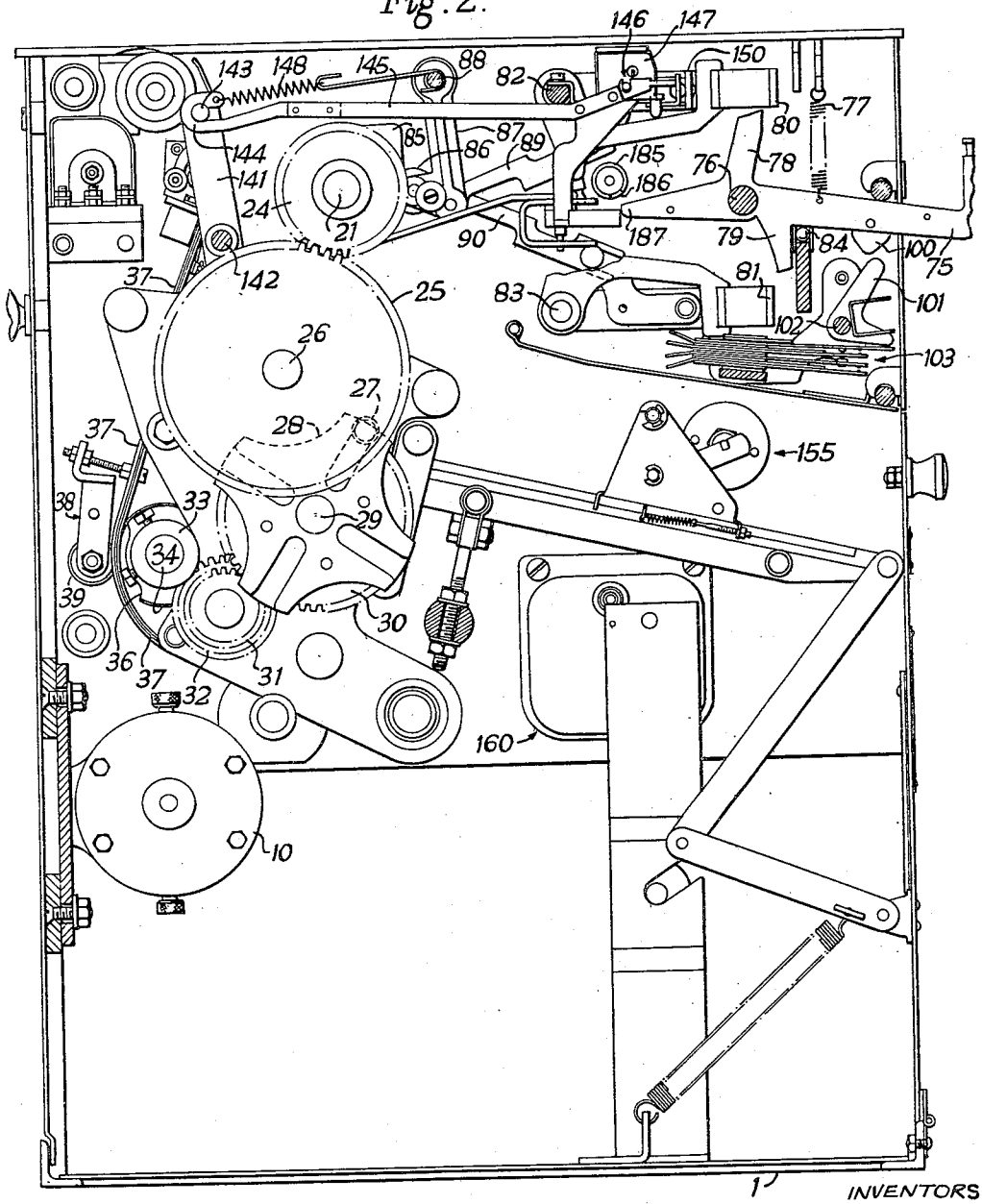
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TICKET PRINTING AND ISSUING MACHINES

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Fig. 2.



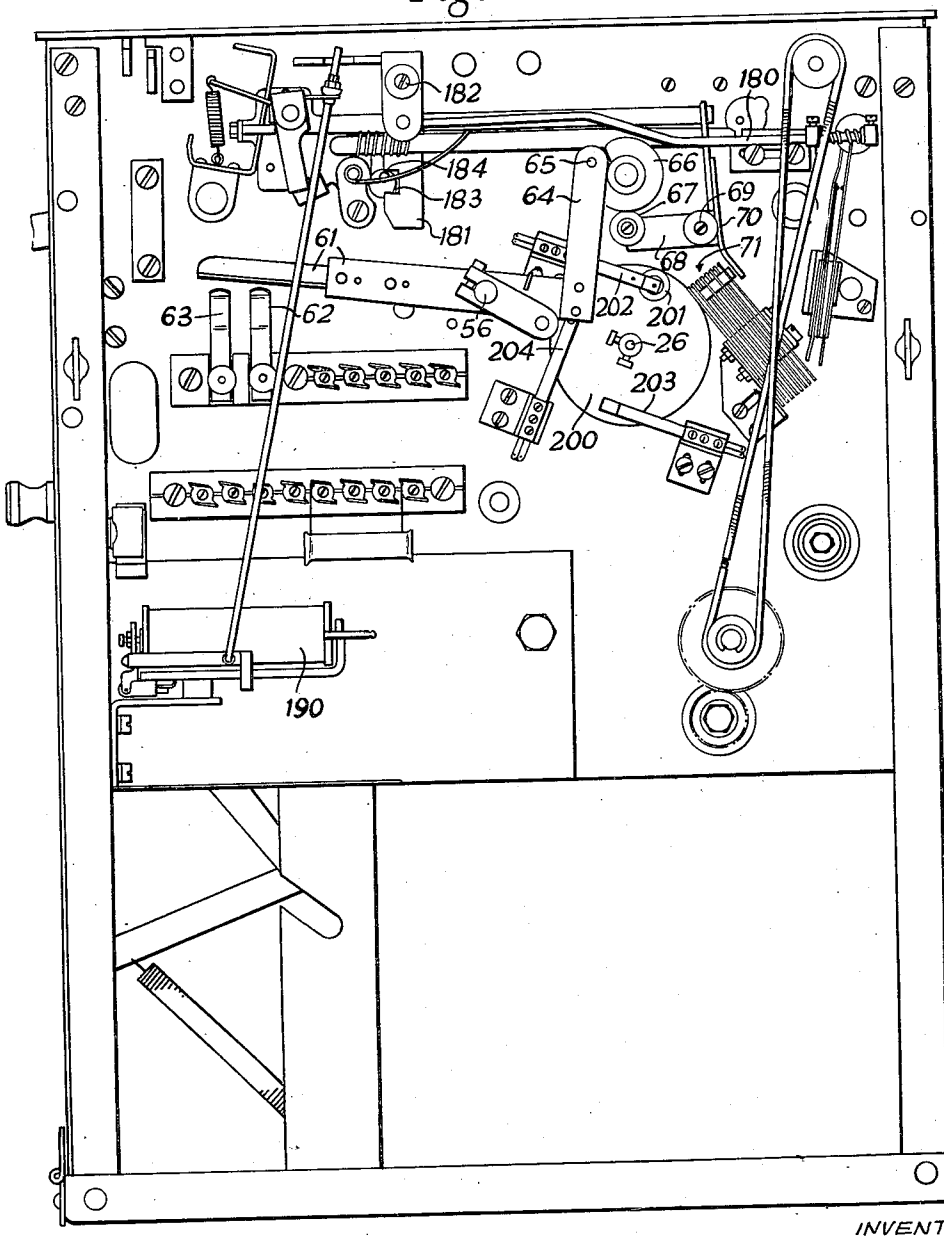
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TICKET PRINTING AND ISSUING MACHINES

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Fig. 3.



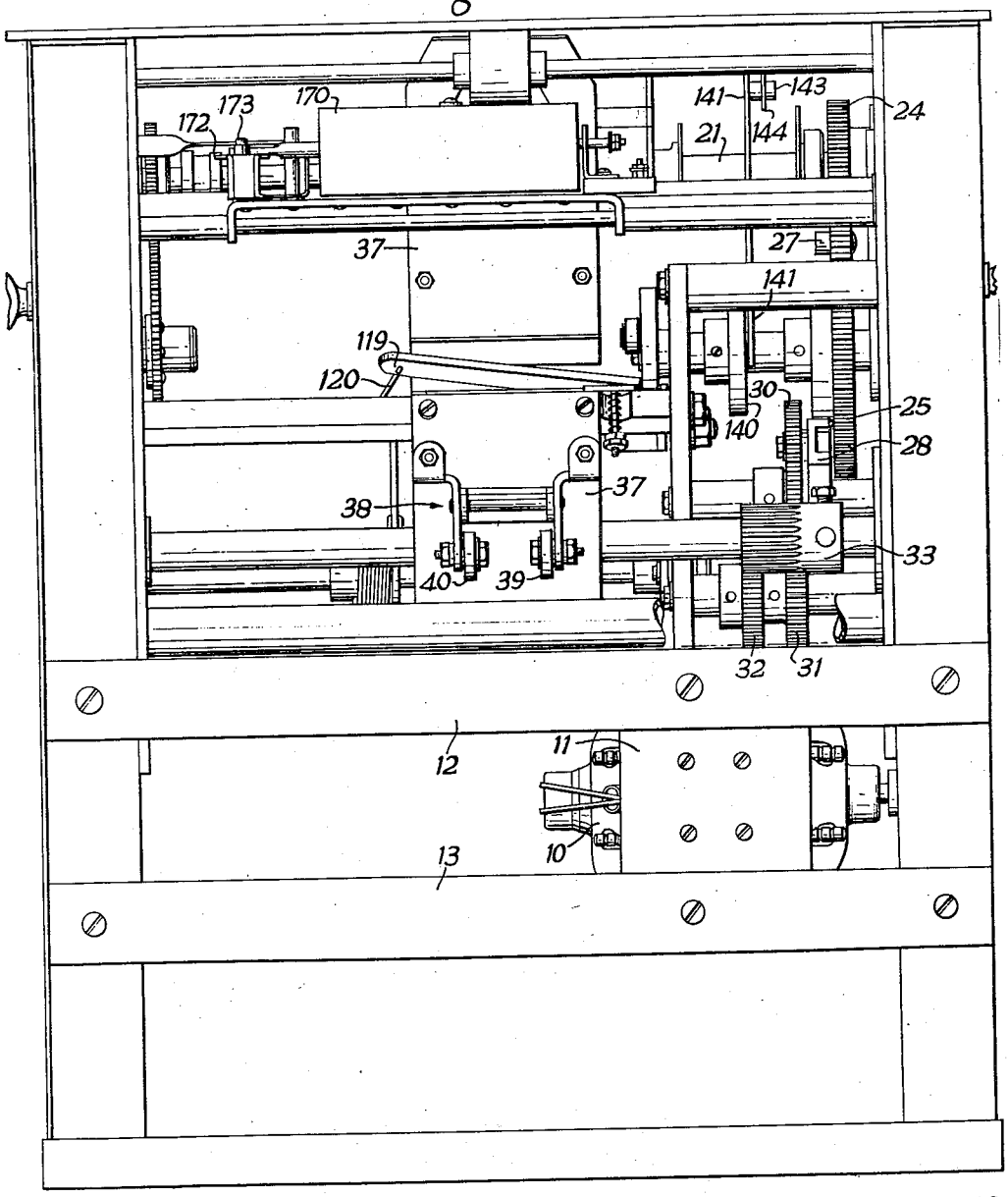
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TICKET PRINTING AND ISSUING MACHINES

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Fig. 4.



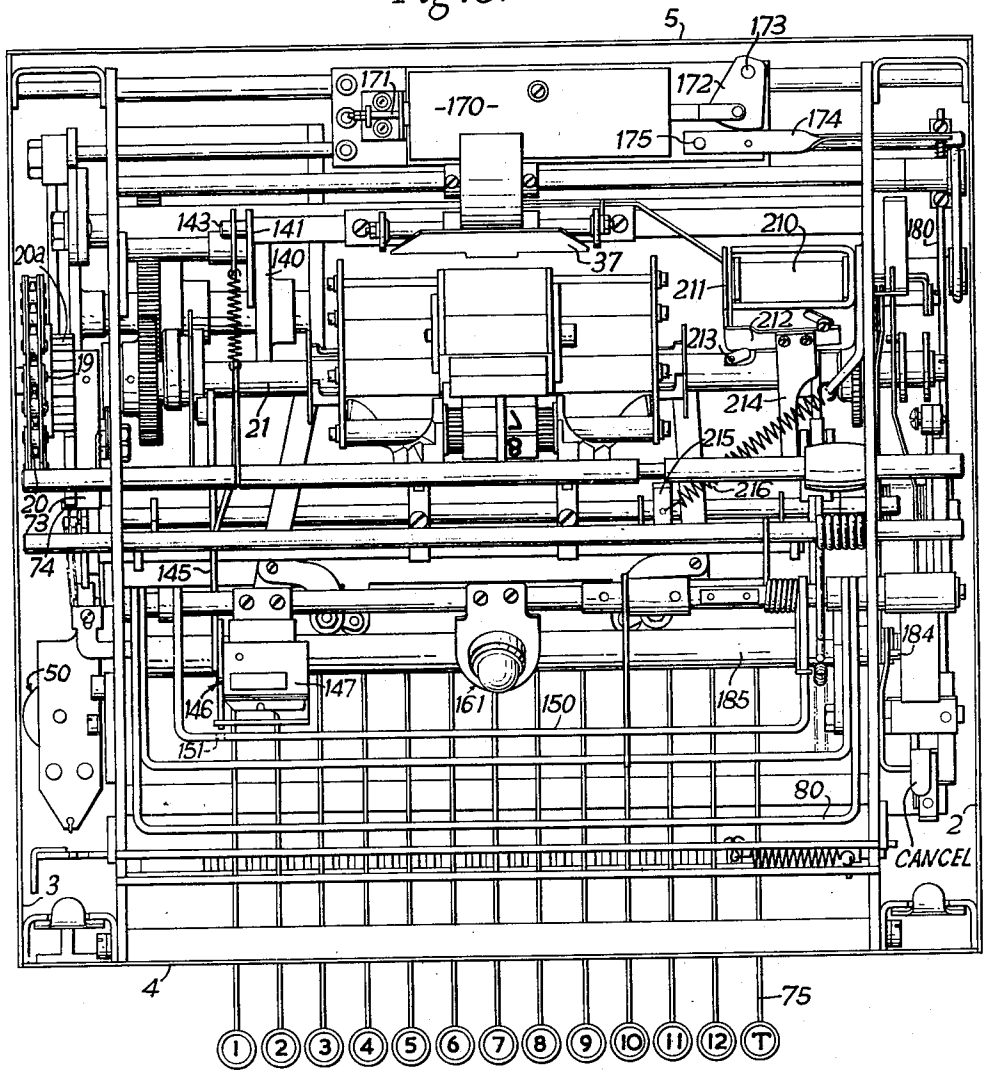
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Fig. 5.



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TICKET PRINTING AND ISSUING MACHINES

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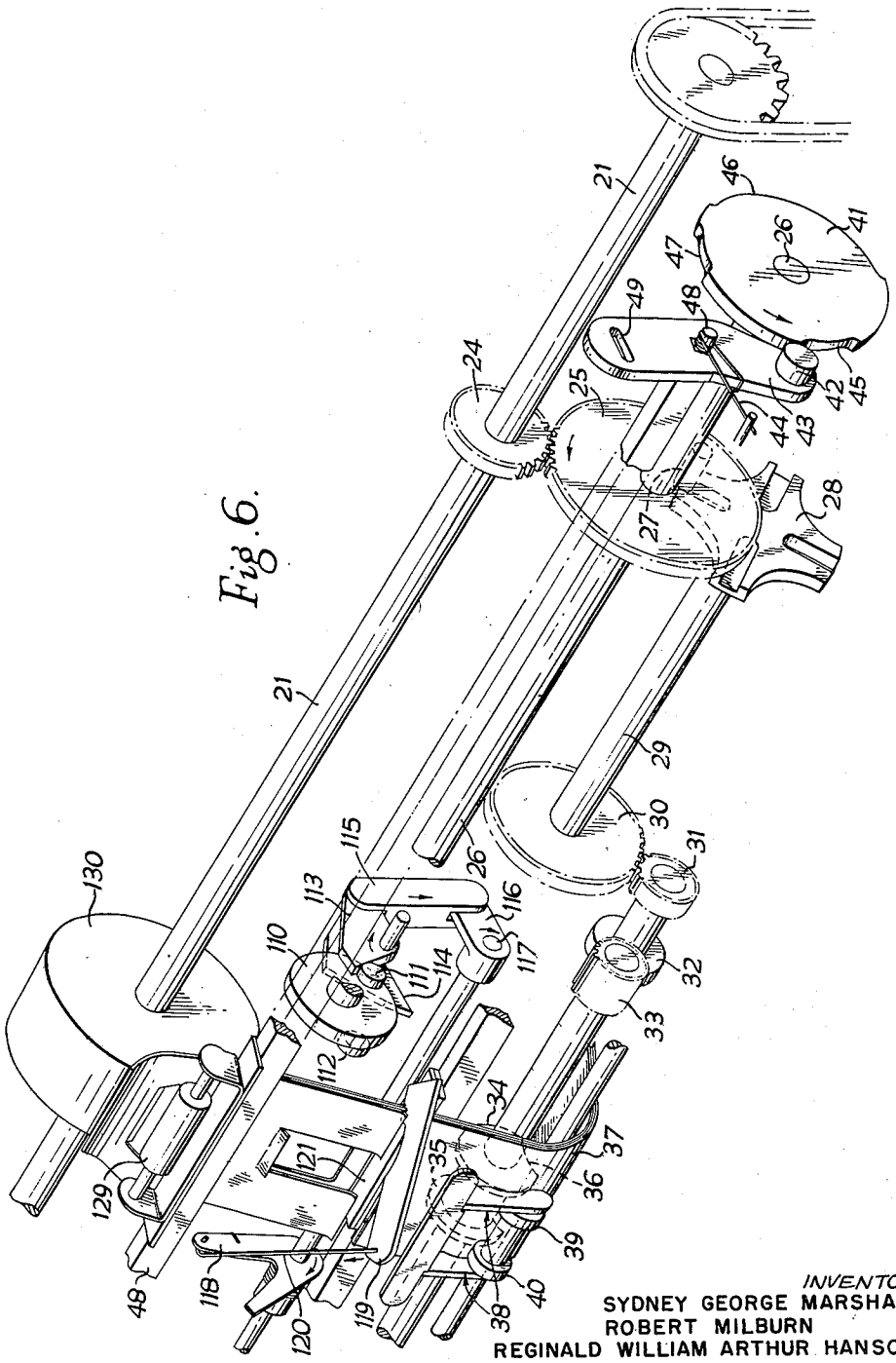


Fig. 6.

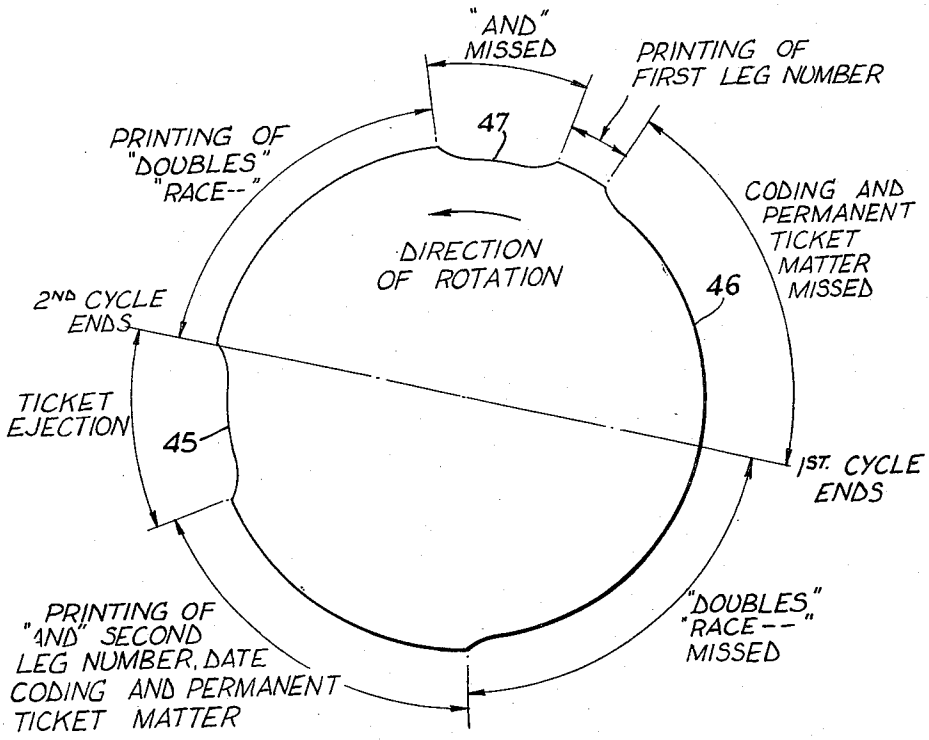
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Fig. 7.



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United States Patent Office 2,993,435 Patented July 25, 1961

2,993,435

TICKET PRINTING AND ISSUING MACHINES

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Filed Jan. 15, 1958, Ser. No. 709,053
4 Claims. (Cl. 101—66)

This invention is for improvements in or relating to ticket printing and issuing machines.

The object of the present invention is to provide a ticket printing and issuing machine, particularly adapted for employment with totalisator equipment, which will print certain letterpress matter common to all tickets issued by the machine and which will print on each ticket numbers which will vary in accordance with the selector key or selector keys depressed, such numbers corresponding, for example, to competitors in a race.

A further object of the invention is to provide a ticket printing and issuing machine by means of which it is possible to print a ticket, bearing data relating to a combination of contestants in a single race or in two races, in two separate phases, issuance of the ticket taking place after the second printing phase is completed.

A further object of the invention is to provide a ticket printing and issuing machine wherein the two separate printing phases are initiated by means of depression of any two keys or of two successive depressions of a single key of one set of keys.

A further object of the invention is to provide a ticket printing and issuing machine wherein the issuance of a ticket printed in the said machine in two separate phases is recorded at some time during the second printing phase, and specifically at the end of the second printing phase.

A further object of the present invention is to provide a ticket printing and issuing machine for employment in any form of betting which employs a multiplicity of combinations. There are many forms which such betting can take:

Forecast betting.—In Forecast betting the person making the bet has to forecast which two out of all competitors in a race will finish first and second, respectively.

Quinella betting.—In Quinella betting the person making the bet has to forecast or choose those two competitors which will be placed, in his opinion, first and second in the race regardless of the order in which the said two competitors pass the winning post.

Field betting.—In Field betting a named runner number is coupled with all other runners in a Forecast event or a named runner number in the first leg of a Doubles event with all runners in the second leg (namely, the field) and vice versa.

Doubles betting.—In Doubles betting the person making the bet has to forecast which two competitors in two separate races will win the said two races.

Machines of the general construction to which the present invention relates have been very fully described and illustrated in, for example, United Kingdom patent specifications No. 325,873, No. 330,264 and No. 332,942 and in three corresponding United States patent specifications No. 1,886,626, No. 1,886,769 and No. 2,020,594 and therefore such a machine will not be described or illustrated in as much detail as would be the case if these earlier specifications did not exist. However, whilst most but not all of the old mechanism is both described and illustrated herein, all mechanism in the machine which is the subject of the present invention which differs from that described and illustrated in the said earlier specifications will be described in such detail as is considered necessary to understand completely the operation of the machine.

The present invention will now be described with reference to the accompanying drawings, in which:

FIGURE 1 is a side elevation view of the left hand side of the machine with the side cover plate removed;

FIGURE 2 is a side elevation view of the machine from the left hand side thereof, illustrating those parts which are driven by the drive illustrated in FIGURE 1;

FIGURE 3 is a side elevation view from the right hand side of the machine with the side cover plate removed;

FIGURE 4 is a rear elevation view of the machine with the rear cover plate removed;

FIGURE 5 is a plan view of the machine with the top plate removed;

FIGURE 6 represents diagramatically and in perspective the ticket feeding and printing mechanism and mechanism ancillary thereto; and

FIGURE 7 illustrates the cam by means of which the printing operations are controlled.

Referring to the drawings, there is illustrated a ticket printing and issuing machine comprising a base plate **1**, side plates **2** and **3**, a removable front plate **4**, a back plate **5** and a two-part top plate **6**. A door **7** with a handle **8** is provided at the front of the machine below the front plate **4**, the said door **7** being hingedly mounted at **9** to one of the frame members of the machine. Some of the plates hereinbefore mentioned are either secured to such frame members whilst others are suspended upon rods which extend across the machine and which are mounted upon or in the frame members. It will be understood that the machine is composed of a plurality of vertical and horizontal frame struts or members, which are secured to each other, and frame plates secured to the said frame struts, but these are not further specifically described herein.

A motor **10**, for example a 50-volt D.C. motor, is mounted in any desired manner in the machine. Preferably the said motor is mounted within the outer casing or plates at the back of the machine and is secured by screws, bolts or the like to a plate **11** which is secured in turn to a pair of motor mounting plates **12** and **13** (FIGURE 4).

The output shaft of the motor **10** is provided with a pinion **14** (FIGURE 1) which meshes with a gear wheel **15** with which there is associated a pinion **16**, the gear wheel **15** and the pinion **16** rotating as a unit. The pinion **16** meshes with a gear wheel **17** to which there is secured a pinion **18** which is connected by means of a driving cycle chain **19** to a clutch sprocket **20** rigidly connected to a sprocket wheel **20***a* which is mounted in the machine adjacent an arm which is keyed to a printing head spindle **21** (FIGURE 2). A tension sprocket **22** is mounted upon an arm or other support **23**, the tension sprocket being capable of rotating freely about the axis of the pivot thereof and being provided for the purpose of taking up any slack in the driving chain **19**.

Rigidly mounted upon the printing head spindle **21** (FIGURE 2) is a gear wheel **24** meshing with a gear wheel **25** which is mounted for rotation in the machine upon a layshaft **26**. The gear wheel **25** carries upon one face thereof a pin **27** which is so mounted upon the said gear wheel as to engage (as illustrated) one slot of a Geneva wheel **28**. The Geneva wheel is mounted at one end of a short shaft **29**, at the other end of which there is secured a gear wheel **30** meshing with a pinion **31** which is coaxial with and adjacent to a second pinion **32**, the pinion **32** always rotating with the pinion **31** when the pinion **31** is driven by the gear wheel **30**. The pinion **32** meshes with a pinion **33** (FIGURES 2 and 4) which is coaxial with a pair of knurled discs **34** and **35** (FIGURES 2 and 6) these two knurled discs each being provided with a cut-away portion **36** for a purpose hereinafter described.

A ticket-pulp guide **37**, which is constructed as two

separate portions hereinafter referred to as the "upper portion" and "lower portion," respectively, of the said guide **37**, is rigidly mounted in the machine and mounted on the lower portion of the said guide **37**, there is an assembly indicated generally by **38**, the essential part of the assembly consisting of a pair of ball races **39** and **40** which co-operate with the high portions of the knurled discs **34** and **35** to grip the ticket pulp at the desired time.

Mounted on the layshaft **26** is a pressure roller cam **41** (FIGURE 1) against the circumference of which there is arranged to bear a cam-follower roller **42** carried at one end of a cranked rocker arm **43** which is urged at all times in an anti-clockwise direction (as seen in FIGURE 1) by a spring **44**. The pressure roller cam **41** is provided with three portions **45**, **46** and **47** which are of reduced diameter and when, during one revolution of the said cam as hereinafter described, the rocker arm **43** rocks about the axis of its pivot rod **48**, such rocking movement is made possible by the provision of an arcuate slot **49** formed in the upper half of the cranked rocker arm **43**.

A solenoid indicated generally by **50** has a horizontally disposed lever **51** secured to the plunger thereof at approximately the mid-point of the lever **51**, and the said lever **51** is so mounted as to bear upon a knife edge or other contact surface indicated as to general position by **52** or may be alternatively pivotally mounted upon a spindle. The front end of the lever **51** has one end of a strong spring **53** anchored thereto, the other end of the spring being anchored to the framework of the machine or to the solenoid assembly, and the rear end of the lever **51** has secured thereto a catch member **54**. A clutch trip plate **55**, which is mounted for rocking movement about a spindle **56**, when in the rest position thereof bears against the catch member **54** (FIGURE 1) at the edge of a cut-away portion **57** under the influence exerted by a spring **58** which is anchored at one end to an arm **59** secured to or integral with the framework of the machine and at the other end thereof to a pin **60** or any other convenient means carried by the contact trip plate **55**. A knife switch **61** is mounted upon the spindle **56** at that side of the machine which is remote from the clutch trip plate **55**, the said knife switch being operable to bridge a pair of contacts **62** and **63** in order to start the motor **10**. The knife switch **61** is also provided at the rear end thereof with an arm **64** which is provided at the upper end thereof with a cam follower **65** which takes the form of a pin, the said cam follower being arranged to bear against a motor switch cam **66** which is mounted upon the printing head spindle **21**. A further cam follower **67**, carried upon an arm **68** pivotally mounted in the machine at **69**, also bears against the cam **66**, the arm **68** having secured thereto or being formed integral with a contact make-and-break lever **70** which is capable of making or breaking four pairs of contacts indicated generally at **71**.

Reverting to the clutch trip plate **55** in FIGURE 1, the rear edge of this plate is provided with an abutment or step **72** which, when the said plate **55** is in its position of rest, engages an arm **73** which is keyed to the spindle **21** and which carries a pivotally mounted spring-urged catch **74**, the arrangement being such that when the motor **10** is running and when the clutch trip plate **55** rocks in a clockwise direction about the spindle **56** as seen in FIGURE 1, the catch **74** is urged by the spring thereof (not illustrated) in a clockwise direction about the axis of its pivot (not illustrated) in order that a tooth (not illustrated) on the catch **74** will engage the sprocket wheel **20***a* and thereby ensure rotation of the printing head spindle **21**. This arrangement of parts has been fully described in greater detail in United Kingdom patent specification No. 325,873 and United States patent specification No. 1,886,626 and will not, therefore, be described further here.

The ticket printing and issuing machine described above is provided with a plurality of manually depressible keys **75** each of which is pivotally mounted upon a spindle **76** and each of which is held in the position of rest thereof by a spring **77**. Each key is formed with two abutments **78** and **79** arranged respectively above and below the axis of the spindle **76** which, when the key is depressed, are moved into the path of movement of setting bars **80** and **81** which are always urged towards one another by a spring or the like. The setting bars **80** and **81** rotate about the axes of spindles **82** and **83**, respectively. Further, in order to prevent more than one key at a time being depressed, a row of balls **84** is arranged adjacent the underside of the plurality of keys **75** so as to provide a total free space between all the balls equal to the thickness of the shank of any one key. Mechanism is provided whereby the setting bars **80** and **81** are returned to the positions of rest thereof. Such mechanism comprises a cam **85** on the printing head spindle **21**, a roller **86** carried by an arm **87** pivotally mounted in the machine at **88**, a pair of links **89** and **90** each connected to the arm **87** at one end thereof and each formed with a bifurcated portion at the other end thereof. The bifurcated portion of the link **90** is seen clearly in FIGURE 2, indicated by **91**, the said bifurcated portion **91** engaging a pin **92** on a short link **93** secured to the setting bar **81**. The link **89** is provided with a similar bifurcated portion engaging a pin on a short link secured to the setting bar **80** but these parts have not been specifically indicated. The mechanism described above in outline has been very fully described and illustrated in the various patent specifications referred to in the opening part of the present description and it is considered that it is therefore unnecessary to describe it more fully here.

The shank of each key **75** is provided with a cam **100** which is so disposed as to engage, when the key is depressed, one arm of a bell crank lever **101** which is mounted for rocking movement about a spindle **102**. When the key **75** is depressed, the cam **100** engages the bell crank lever **101** and rocks the said lever **101** in a clockwise direction as viewed in FIGURE 2, thereby making the pair of contacts generally indicated by **103**.

Referring to FIGURE 6 of the drawings, it will be noted that a disc **110** is mounted upon that end of the layshaft **26** which is remote from the pressure roller cam **41**. The disc **110** is provided with a pair of rollers **111** and **112**, the roller **111** being mounted upon one side of the disc **110** and in line with a trip arm **13**, and the roller **112** being mounted upon the other side of the disc **110** and in line with a return trip arm **114**. The trip arm **113** and the return trip arm **114** form a unitary structure which is pivotally mounted in the machine upon a spindle **114***a* (FIGURE 6) and pivotally connected to a link **115** which is in turn pivotally connected at the other end thereof to one end of a lever **116** keyed or otherwise secured to a spindle **117**. An arm **118** is secured to the spindle **117** and is connected to a pivotally mounted knife blade **119** by means of a length of wire **120**, the knife blade **119** being pivotally mounted at **120** upon an immovable or dead blade **121** which is mounted in any desired manner (a precise manner of mounting is not illustrated in FIGURE 6) on the ticket pulp guide **37**.

It will be noted from FIGURE 6 that the pivot rod **48** of the cranked rocker arm **43** is provided, at the end thereof remote from the said rocker arm, with an assembly which comprises essentially a roller **129** which is made from a hard but resilient material, such, for example, as rubber. The purpose of this roller **129** is, at the appropriate times in the machine cycle, to press the ticket pulp to be printed against the printing faces which have been diagrammatically illustrated at **130**.

Referring again to FIGURES 2 and 5, the machine is provided with a cam **140** (FIGURE 5) which is mounted on the layshaft **26** and which is of the type which is provided with a track (not illustrated) in one face thereof, the said track being engaged by a finger (not illustrated). In the present machine the track in the cam **140** is engaged by a finger carried upon the lower end of a rocking arm **141** (FIGURES 2 and 5) which is

pivotally mounted upon a spindle **142**. The upper end of the said rocking arm **141** carries a boss **143** which is adapted to be engaged at all times by a hook portion **144** of a link **145** which extends towards the front of the machnie and engages at **146** that part of the numerator **147** by which the total recorded by the numerator may be advanced by unity. The hook portion **144** has one end of a spring **148** anchored thereto, the other end of the spring **148** being anchored on the pivot rod **88**. Since the layshaft **26** performs one revolution to every two revolutions of the printing head spindle **21** and since recordal of the issuance of a ticket upon the numerator **147** is required only at some time during the second machine cycle (namely, during the second revolution of the printing head spindle **21**), the cam **140** with the track therein is so arranged on the layshaft **26** that the arm **141** is rocked in a clockwise direction (FIGURE 2) about the spindle **142** at the completion of the revolution of the layshaft **26**. Thus, recordal of the issuance of a ticket on the numerator **147** takes place only when printing of the whole ticket is complete and not when each half is printed.

In FIGURES 2 and 5, there is illustrated a test key selector unit **150** which is provided with a hole **151** (FIGURE 5). When unity is added to the amount recorded in the numerator **147**, the link **145** moves towards the front of the machine (FIGURE 5) and the front end of the link **145** extends through the said hole **151**. When, however, the test key (clearly visible in FIGURE 5) is depressed, the test key selector unit **150** is lifted, the hole **151** in the said unit **150** is moved out of alignment with the front end of the link **145** and consequently, when the time comes for the said link **145** to be moved towards the front of the machine as hereinbefore explained, the front end of the link **145** will come into contact with the raised selector unit **150** before the degree of forward travel of the said link **145** (normally resultant upon the second depression of a "competitor" key **75**) has taken place. Arrest of the link **145** in this manner prevents recordal upon the numerator **147**, by the addition of unity to the amount already recorded thereon, of the issuance of a "Test" ticket. However, it will be appreciated that the printing of a "Test" ticket is performed in the same manner as is the printing of, for example, a valid Doubles ticket, namely, in two separate printing phases and the initiation of these two separate printing phases is achieved by depressing the test key twice in succession.

The machine is provided with an inking device indicated generally at **155**, the said device comprising the same parts as, and being adjustable towards and away from the print faces mounted upon the printing head spindle **21** in the same manner as have been fully illustrated and described in the patent specifications referred to earlier (see FIGURE 2).

The machine is also provided with a buzzer **160** and a light **161** (see FIGURES 2 and 5 respectively), these devices being provided as the means by which the machine operator is warned, after having depressed one competitor key **75** but before depression of another key or re-depression of the same key, that only one half of a valid ticket has been printed.

The means by which the machine is locked in the event of such locking becoming necessary or for any reason desirable, comprises a solenoid **170** of which the plunger **171** is pivotally connected at one end thereof to a cam **172** which is pivotally mounted at **173**. The cam **172** is arranged in constant engagement with a lever **174** which is pivotally mounted at **175**. The lever **174** is formed in such a manner that the surfaces of the two halves thereof lie in planes which are normal to one another, the cam **172** engaging an abutment roller depending from that half of the lever in which the pivot **175** is placed. When the solenoid **170** is energised, the plunger **171** is moved from left to right (as seen in FIGURE 5), the cam **172** is moved in an anti-clockwise direction about the pivot **173** and the lever **174** is allowed to move in an anti-clockwise direction about the pivot **175** under the influence of the spring hereinafter referred to with reference to FIGURE 3.

In FIGURE 3, there is illustrated a solenoid push rod **180** which, when it is moved from right to left, causes a latching unit **181** pivotally mounted at **182** to move in a clockwise direction about the said pivot **182**. As a result a step **183** formed in the latching unit **181** moves under a laterally disposed boss **184** which extends through a hole in the side plate, which is rigidly mounted upon and which moves with a key tube **185** (FIGURE 2). The key tube **185**, which extends completely across the machine, is provided with a slot **186** which is parallel to the axis of the said tube **185**. The slot **186** is so disposed in its rest position (illustrated in FIGURE 2) that when any key **75** in the machine is depressed the rearmost end **187** of the key shank enters the slot **186** and rotates the tube **185** in an anti-clockwise direction as seen in FIGURE 2 with the result that, whilst any one key remains depressed, any attempt to depress a second key **75** will be prevented both by the row of balls **84** previously described and by the fact that the end **187** of the shank of the second key **75** abuts the tube **185** and cannot enter the displaced slot **186**.

It will be appreciated, therefore, that, when the solenoid **170** is energised with consequent clockwise movement of the latching unit **181** about its pivot **182**, depression of any key **75** will rotate the key tube **185** in an anti-clockwise direction (FIGURE 2) and the boss **184** in a clockwise direction (FIGURE 3). This rotational movement of the boss **184** is halted by the step **183** engaging the boss **184** and arresting the key tube **185**. Thus, complete depression of any key **75** is prevented and the operations of the machine tripped by complete key depression are not initiated.

In FIGURE 3, a solenoid **190** is provided which is energised by means of an impulse sent thereto from equipment associated with a particular contestant in a race which has been declared a legitimate "non-runner." The solenoid **190** operates, in known manner, to restore mechanism to its rest position which has been temporarily displaced therefrom by key depression.

In FIGURE 3 there is illustrated a contact plate **200** carrying a contact **201**, the plate **200** being mounted upon the layshaft **26** which, it will be remembered, rotates through 180° during the first machine cycle and stops. Therefore, two contact arms **202**, **203** are provided which carry contacts at the free ends thereof, the said contacts being located in the path of travel of the moving contact **201** and 180° apart. A third arm **204** is provided for a purpose hereinafter explained. The arm **202** prepares the electrical circuit for the transmission and subsequent storage of intelligence relating to the "first leg" of the selected combination, the arm **203** prepares the electrical circuit for the transmission and subsequent storage of intelligence relating to the "second leg" of the selected combination and the arm **204** to be cancelled or destroyed.

Referring to FIGURE 5, a race change solenoid **210** is provided to the movable armature **211** of which there is secured a lever **212** which is pivotally mounted at **213**. A lever **214** is secured to the lever **212** which is capable of shifting to the left (as seen in FIGURE 5) a movable sleeve (not illustrated) to the other end of which there is secured a lever **215**. The lever **215** is provided with a toe at one end thereof (which is not illustrated) which is adapted at operative times to engage a star wheel (not illustrated) which is associated with the race numbering head, and the lever **215** is provided at the other end thereof with a spring **216** anchored thereto in any desired manner and also to the framework of the machine. When the solenoid **210** is energised and when the printing head spindle **21** is rotated, the race numbering head is

rotated and the machine prints and issues a ticket relating to the new race.

Certain parts of the machine described above have not been described in very great detail since the mechanisms illustrated are well known to the person skilled in the art and are incorporated in machines actually on sale at the present time.

Mention has been made in the above specification of electrical functions initiated by the operation of mechanical parts. Reference to co-pending patent application No. 232 of 1957 in the United Kingdom and to co-pending patent application Serial No. 705,180, filed December 26, 1957 in the United States of America should be made for such further details as may be essential to a complete understanding of the complete machine.

The operation of the machine is as follows:

It is assumed that the machine has been loaded with a reel of blank ticket pulp and the leading edge of the said pulp is led by hand upwardly in the machine and into the ticket pulp guide **37** and therein past the cut-away portions **36** of the two knurled discs **34** and **35**.

When an operating key **75** is depressed, the contacts **103** are made, thereby sending an impulse to the totalisator acceptance equipment which, in accordance with standard operating procedure in totalisator equipment and if the bet represented thereby is accepted, transmits a return impulse to the ticket issuing machine. Such return impulse energizes the solenoid **50** which causes the lever **51** to move downwardly (FIGURE 1) and thus releases the clutch trip plate **55**. The clutch trip plate **55** rotates the spindle **56** in a clockwise direction (FIGURE 1) which therefore causes the knife switch **61** (FIGURE 3) to move downwardly to short the two contacts **62** and **63** and start the motor **10**.

As soon as the motor **10** starts, the printing head spindle **21** is rotated because the clutch sprocket **20** and the associated sprocket wheel **20***a* are driven by the motor through the gear train comprising pinion **14**, gear wheel **15**, pinion **16**, gear wheel **17** and sprocket **18** and the driving chain **19** and because the catch **74** on the arm **73**, which is keyed to the printing head spindle **21**, has connected the said spindle **21** to the drive from the motor **10** by engaging the sprocket **20***a*. Rotation of the printing head spindle **21** drives the layshaft **26** through the medium of the meshing gear wheels **24** and **25**.

At the beginning of the machine cycle, the roller **111** on the disc **110** actuates the knife blade **119** to cause the said blade **119** in conjunction with the dead blade **120** (hereinafter referred to collectively as "the guillotine") to cut the ticket to length. It will be understood that the ticket pulp is fed upwardly towards the printing faces of the various printing cylinders, type wheels and the like (which have not been specifically described herein because of the full disclosure thereof in the specifications hereinbefore referred to) by the knurled discs **34** and **35** and the ball races **39** and **40** which co-operate to grip the said ticket pulp and it will also be seen from FIGURES 2 and 6 that the knurled discs **34** and **35** are driven from the layshaft **26** by means of the pin **27** on the gear wheel **25** engaging the Geneva wheel **28**, the gear wheel **30** and the pinions **31**, **32** and **33**.

The severed length of ticket pulp is now engaged by the printing faces hereinbefore referred to. It should be made clear at this juncture that the gear wheel **25** is provided with twice the number of teeth as that with which the gear wheel **24** is provided. Therefore, the printing head spindle **21** will make two revolutions to each complete revolution of the layshaft **26** and this enables the ticket printing and issuing machine constructed in accordance with the present invention to print a ticket in two separate stages, each stage being determinable in accordance with depression, in a certain order, of particular keys or with the depression of one key.

As soon as the severed length of ticket pulp is engaged as aforesaid, printing of the first half of the ticket commences. With reference particularly to FIGURE 7, assuming the machine has been set so as to print Doubles tickets relating to the tenth race and assuming that the operator depresses the key representing runner No. 8 to initiate the first machine cycle, the roller **42** on the rocker arm **43**, being located on that high portion of the cam **41** between the portions **45** and **47** of reduced diameter as can be seen from the drawings, will initially press the ticket pulp against the printing faces **129** to print "DOUBLES RACE—." Thereafter, the roller **42** falls on to the portion **47** of the cam **41** to ensure that the word "AND" is not printed, rides on to the high portion of the cam **41** between portions **47**, **46** to print the first leg number, "No.—," and thereafter falls on to the portion **46** and remains there. Thus, the ticket pulp has been so far printed as to read in total and in accordance with the assumed facts:

ROUBLES
RACE TENTH
NO. 8

When the printing head spindle **21** and the printing faces **130** mounted thereon come to rest at the end of the first machine cycle the cam **41** (FIGURES 1 and 6) will have been rotated through 180°.

When the operator depresses another key **75** representing the second leg of the "doubles" combination, a further machine cycle is initiated as hereinbefore described. Let it be assumed that the operator depresses the key representing runner No. 24. The printing head spindle **21** rotates but, owing to the fact that the roller **42** of the rocker arm **43** is still in engagement with the portion **46** of the reduced diameter of the cam **41** the matter previously printed (namely, "DOUBLES" and "RACE—") is not printed again. Thus, when the roller **42** rides up on to the high portion of the cam **41** between the portions **46**, **45** the word "AND" is printed first, the second leg member is then printed and thereafter the date, any coding material and permanent ticket matter is printed:

AND
NO. 24
DATE
CODING
PERMANENT TICKET MATTER

The complete printed ticket is then fed upwardly in the machine by the delivery roller and ejected.

Ejection or issue of the complete printed ticket takes place during the last 20° (approximately) of rotation of the cam **41** during the second machine cycle about its axis (see FIGURE 7). From previous description it will be obvious that, when the roller **42** falls on to portion **45** of the said cam, the roller **129** will be moved away from the position in which the said roller presses the ticket pulp against the printing faces **130**. When the roller **129** is thus moved the completely printed ticket will fall against an ejection roller (illustrated but not labelled) which is being driven by spring belting (also illustrated but not labelled) and the ticket is flicked by the ejection roller out of the machine so as to lie upon the top plate of the machine. This method of ticket ejection is well known in the art and will not, therefore, be further described.

It will be appreciated that once only during each revolution of the gear wheel **25** will the pin **27** engage the Geneva wheel **28**. This happens in the latter part of the second machine cycle (during approximately the last one-eighth of the second machine cycle) and ensures that fresh ticket pulp is fed upwardly in the ticket pulp guide **37**, but not severed by the guillotine, only when the upper part of the guide **37** is cleared or substantially cleared of the ticket just printed or being printed.

What we claim as our invention and desire to secure by Letters Patent of the United States is:

1. A ticket printing and issuing machine comprising

means for feeding a ticket strip, a printing device settable to a plurality of alternative printing positions, printing cycle governing means the position of which determines when said ticket strip receives a printing impression from said printing device, driving means of which the drive is transmitted to both the printing device and the printing cycle governing means, the said printing cycle governing means being driven at one half of the speed at which the printing device is driven, and a set of keys each operable both to set the printing device to a particular printing position and to initiate a machine cycle, depression of a first key setting the printing device to a particular printing position and initiating a first machine cycle to effect printing of certain data on said ticket strip as determined by said first key and by said printing cycle governing means, depression of a second key setting the printing device to a second particular printing position and initiating a second machine cycle to effect printing of certain other data on said ticket strip as determined by said second key and by said printing cycle governing means.

2. A ticket printing and issuing machine as claimed in claim 1, wherein the printing device is mounted upon a spindle and wherein the printing cycle governing means is mounted upon a shaft, the drive from the driving means being transmitted to the spindle and in turn to the shaft, the arrangement being such that when the spindle has completed one revolution the shaft has completed one half of a revolution.

3. A ticket printing and issuing machine as claimed in claim 2, wherein the printing cycle governing means comprises a cam mounted upon the said shaft, and a pivot rod at one end of which is carried a cam follower and at the other end of which is carried a roller; the cam being provided with high portions and low portions and

the arrangement being such that when the cam follower is riding upon a high portion of the cam the printing device causes a printing impression to be made upon the ticket strip and that when the cam follower is riding upon a low portion of the cam the ticket strip is located in a position outside the surface of revolution generated by the printing device.

4. A ticket printing and issuing machine adapted to perform two separate machine cycles in order to print and issue a single ticket, which comprises a printing device, a single set of depressible keys each operable to set the printing device to a particular printing position and to initiate a machine cycle, printing cycle governing means, driving means of which the drive is transmitted to the printing device and to the printing cycle governing means, the printing device performing two successive revolutions as a result of two successive key depressions for each revolution performed by the printing cycle governing means and printing a different part of a single ticket strip in each of said two successive revolutions, the said printing cycle governing means determining the dispositon of printed matter printed on said ticket strip by the printing device during a single revolution of said printing cycle governing means and causing issue of the ticket printed, and means for registering the total number of tickets printed by the printing device.

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