May 12, 1964 F. J. L. TURNER ETAL 3,132,797

PERFORATING APPARATUS

Filed Sept. 5, 1962

3 Sheets-Sheet 1

FIG.1

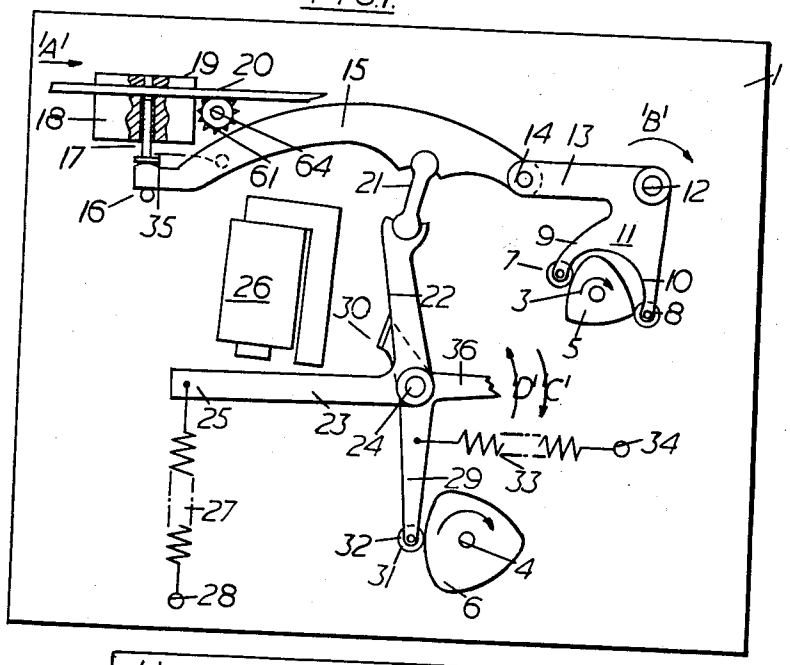

FIG.2

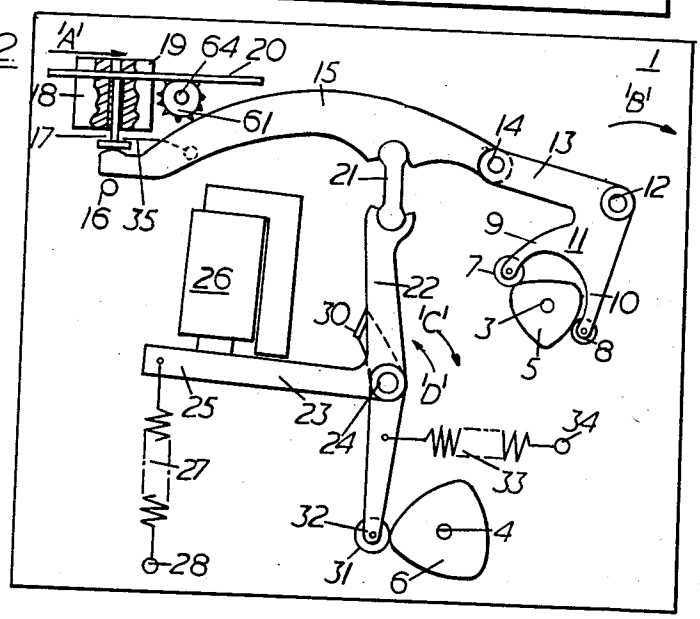

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FIG.3

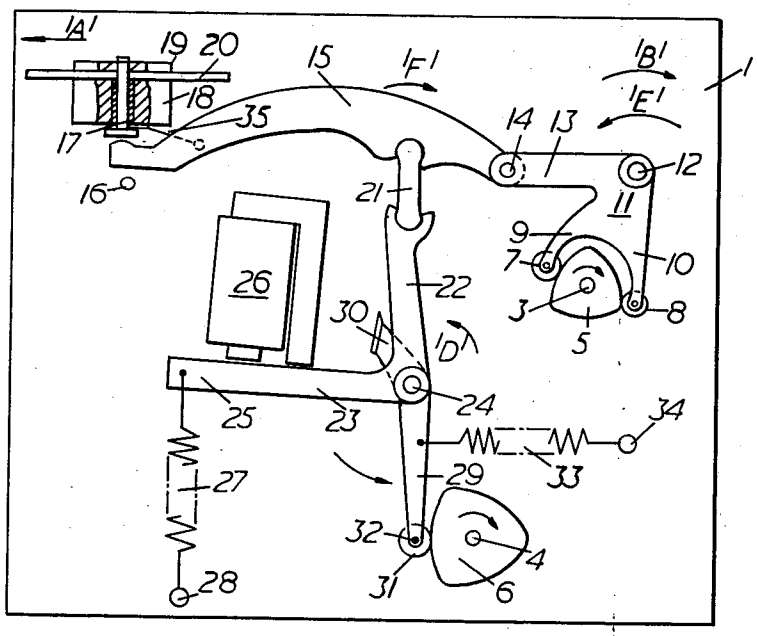

FIG.6

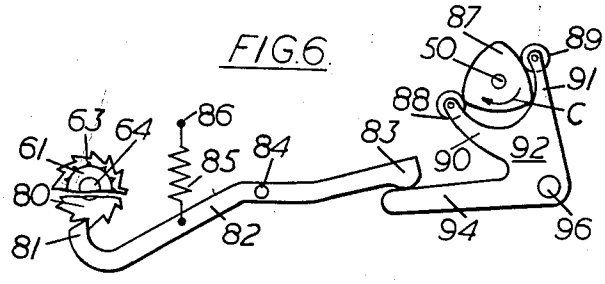

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FIG 4.

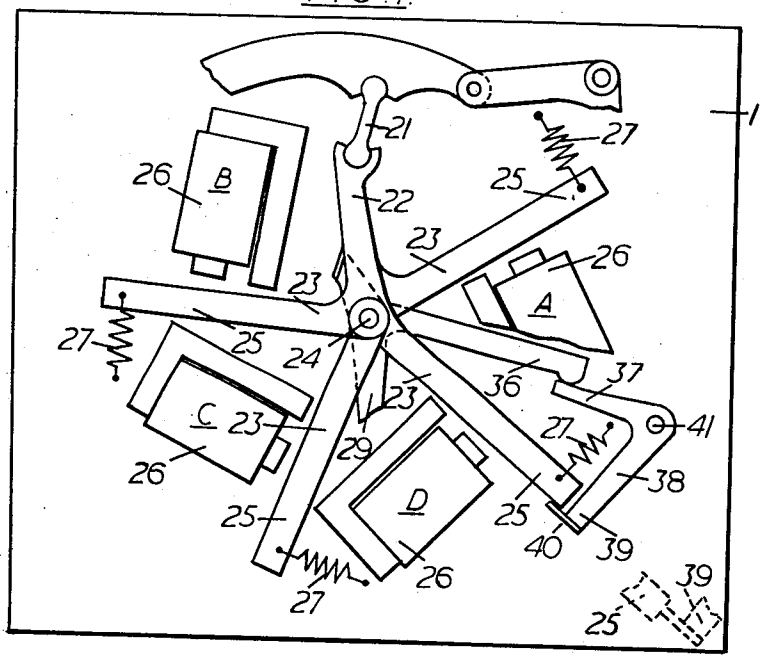
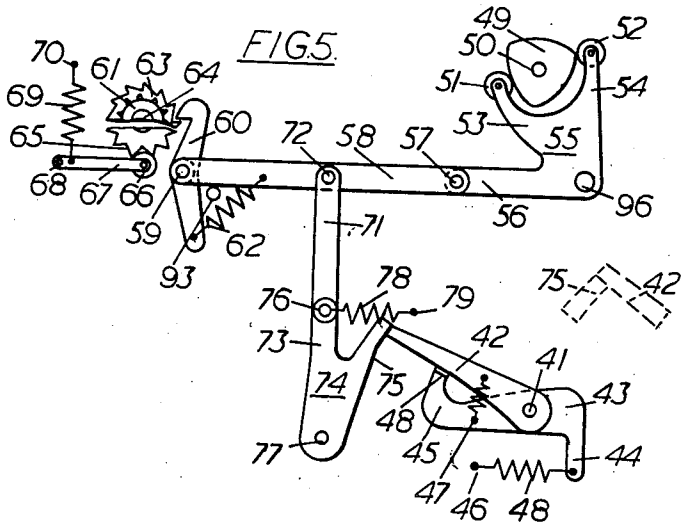


FIG 5.



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3,132,797

PERFORATING APPARATUS

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Claims priority, application Great Britain Sept. 8, 1961
2 Claims. (Cl. 234—110)

The present invention relates to improvements in perforating apparatus. Such apparatus may be used for perforating the elements of a signal combination in a tape.

Tape perforating apparatus is known in which a punch is provided for punching a series of feed holes in a tape, and in which the teeth of a sprocket wheel engage in the feed hole perforations to feed the tape past a row of punches which perforate the tape in accordance with the elements of successive signal combinations. In such apparatus the feed hole punch is operated irrespective of whether the tape is being fed or not and this results in unnecessary wear of the feed hole punch and die.

The present invention provides an arrangement in which the wear of a feed hole punch, and its associated die are reduced by effecting feed hole punching operations only at such times as the elements of a signal combination representative of a letter, figure or symbol are punched into a tape, or at such time that it is desired to effect feeding of the tape without perforating the tape with the signal combination elements.

According to one aspect of the invention therefore there is provided perforating apparatus including a plurality of punches, a punch operating member for each punch, means to move each of the said operating members into one of two positions, punch selecting means to hold the said members in one of the positions, and means to oscillate the members about either of the positions.

According to a further aspect of the invention there is provided perforating apparatus including a plurality of punches, a punch operating member for each punch, means for moving each punch operating member from one position to another including a crank member for each punch operating member, and a link member pivotally connecting respective crank and punch operating members, punch selecting means for each punch co-acting with the crank member particular thereto to hold the associated punch operating member in one of the said positions, and means for pivoting one or more of the punch operating members held in the said one position to cause a punch or punches to perform perforating operations.

An embodiment of the present invention is now to be described with reference to the accompanying drawings in which,

FIGS. 1 to 3 inclusive show side views of the operating mechanism for a single perforating punch at various stages in a perforating operation,

FIG. 4 shows a side view of the operating mechanisms for a number of perforating punches, and

FIGS. 5 and 6 show side views of a tape feeding mechanism which is operatively associated with the feed hole punching mechanism shown in FIG. 4.

Referring firstly to FIG. 1, the figure shows a side view of an embodiment of the tape perforating apparatus and for the sake of clarity, the operating mechanism for one punch alone will be described in conjunction with other mechanisms which are common to all punch operating mechanisms. The punch may be considered as that one which effects feed hole perforating operations. The arrangement of other punch operating mechanisms, which are exactly the same in design and function, is to be described later with reference to FIG. 4. The mounting for the apparatus as a whole is constituted by a plate **1**

through which there extend, via bearings therethrough, shafts **3** and **4** each of which is driven continuously in a clockwise direction, when the apparatus is operating by driving means (not shown). The shafts are arranged to rotate in synchronism and each accommodates thereon for rotation therewith a cam such as cam **5** on shaft **3**, and cam **6** on shaft **4**. The profile of cam **5** is continuously engaged by rollers **7** and **8** on arms **9** and **10** respectively of a cam follower **11** which is pivotally mounted on a spindle **12** affixed to the mounting plate **1**. An extending arm **13** of the cam follower **11** is pivotally linked by a pin **14** to one end of a member constituting a punch operating arm **15**. The other end of operating arm **15** is arranged to rest with its underside in engagement with a stop-pin **16** affixed to the plate **1**. The upper side of the latter mentioned end of punch operating arm **15** engages with the headed lower end of a perforating punch **17** which is carried for vertical movement in a punch stripper plate **18** and a die **19**, and which is biassed to move vertically downward by a leaf spring **35**, affixed at one of its ends to the plate **1** and engaging the upper side of the headed lower end of the punch **17**. The tape **20** is fed during punching operations between the stripper plate **18** and the die **19** as shown in the direction indicated by the arrow A.

The underside of the punch operating arm **15** is pivotally engaged at a point intermediate its ends by one end of a link member **21**. The other end of link member **21** pivotally engages one arm **22** of a crank member constituted by a bell-crank **23**. This bell-crank **23** is pivotally mounted on a spindle **24** affixed to the plate **1**, and has a second arm **25** extending therefrom to constitute the armature of an electromagnet **26** which acts as means for selecting a particular punch for operation. The second arm **25** is biassed to move in a direction away from the core of the electromagnet **26** by a tension spring **27** which is coupled at its ends to the second arm **25** and to a pin **28** affixed to the plate **1**. A setting arm **29** is pivotally mounted on the spindle **24** with a bent portion **30** at one of its ends engaging with the arm **22** of the bell-crank **23**, and with a roller **31**, rotatably mounted on a pin **32** at its other end, engaging with the periphery of the cam **6**. The setting arm **29** also incorporates a second arm **36**, the purpose of which is later to be described. The setting arm **29** is biassed to maintain the roller **31** thereon in engagement with the periphery of the cam **6** by a tension spring **33** which is coupled to the setting arm **29** and to a pin **34** affixed to the plate **1**.

The tension springs may be replaced by compression springs located with respect to the members with which they are associated so that they exert a thrust to maintain the members biassed in the same direction as they are biassed by the tension springs.

Operation of the feed hole perforating mechanism is now to be described with reference to FIGS. 1, 2 and 3.

In FIG. 2 the tape **20** is fed between the punch stripper plate **18** and the die **19** in the direction indicated by the arrow A by a sprocket-wheel **61** the teeth of which engage in feed hole perforations in the tape. Cams **5** and **6** are rotated in synchronism in the direction indicated by the arrows inscribed thereon. Rotation of cam **5** causes the cam follower **11** to oscillate about the axis of the spindle **12**, and in its oscillation in the direction indicated by the arrow B the end of the extending arm **13** of the cam follower is caused to move upward lifting the end of the punch operating arm **15** to which it is pivotally attached. During this lifting operation, the other end of the punch operating arm continues to rest on the stop pin **16**. Rotation of cam **6** in synchronism with cam **5** causes the setting arm **29** to oscillate also about the axis of the spindle **24**, and it is so timed, in its os-

cillation, to pivot in the direction indicated by the arrow C as the extending arm 13 on cam follower 11 moves to lift punch operating arm 15. Pivoting of the setting arm 29, about the axis of spindle 24 in the latter stated direction, and against the influence of tension spring 33 causes the bent portion 30 thereof to engage the arm 22 of the bell-crank 23 which is then caused to pivot in the same direction against the influence of tension spring 27. At the end of the pivoting cycle, the link member 21 is positioned substantially vertically between the punch operating arm 15 and the arm 22 of bell-crank 23 as shown, and the arm 25 of the bell-crank 23 has moved into contact with the core of electromagnet 26. If at this stage of operation an electric current signal is applied to the winding of the electromagnet 26 to indicate that a feed hole punching operation is to be effected, then the arm 25 of bell-crank 23 is held by the core of the electromagnet 26 against the influence of the tension spring 27. Continued rotation of cam 6 causes the setting arm 29 to pivot in the direction indicated by the arrow D (FIG. 3) under the influence of the tension spring 33 so that the bent portion 30 on the setting arm 29 is withdrawn from engagement with the arm 22 of the bell-crank 23. Whilst pivoting of the setting arm 29 has been taking place, synchronous rotation of cam 5 with cam 6 has caused the cam follower 11 to pivot in the direction indicated by the arrow E FIG. 3 to lower the arm 13. However, due to the retention of bell-crank 23 in the position to which it was pivoted and held by the energised core of electromagnet 26, the link member 21, disposed between the arm 22 of bell-crank 23 and punch operating arm 15, is maintained in a vertical position. Maintenance of the link member 21 in this vertical position causes it to act as a fulcrum, and punch operating arm 15 is caused to pivot about the upper end of the link member 21 in the direction indicated by the arrow F as arm 13 of cam follower 11 moves down. Pivoting of the punch operating arm 15 causes the left hand end thereof in contact with the punch 17, to move the punch upward against the influence of leaf spring 35 to effect punching of the tape as shown in FIG. 3.

Referring now to FIG. 2, continued rotation of cam 5 causes cam follower 11 to pivot in the direction indicated by the arrow B. In consequence cam follower 11 causes the punch operating lever 15 to pivot in an anticlockwise direction about the upper end of link member 21 whereupon the left hand end of the punch operating lever 15 is lowered to permit the punch 17 to move downward, clear of the tape under the influence of leaf spring 35. If at this stage the electromagnet 26 is de-energised to indicate that no further feed hole punching operation is to be effected in the next operating cycle then the arm 25 of the bell-crank will no longer be retained against the core of the electromagnet. When the bent portion 30 of setting arm 29 is pivoted anticlockwise with the setting arm by cam 6 under the influence of tension spring 33, bell-crank 23 is permitted to pivot in the same direction under the influence of tension spring 27. The link member 21 is therefore moved out of the vertical to the position shown in FIG. 1 and punch operating arm 15 then pivots about pin 16 on which its left hand end rests as it is oscillated by cam 5 through its linkage with the cam follower 11. A further punching operation is only effected when electromagnet 26 is energised and punch operating lever 15 is pivoted clockwise about the upper end of link member 21 when the link member is in an upright position as shown in FIG. 2.

The tape perforating apparatus proper caters for nine punching positions of which one punching position is assigned to the feed hole punch. Thus there are nine punches such as 17 FIG. 1 together with their associated punch operating arms such as 15 all linked to the cam follower 11 which is arranged to be continuously engaged by the cam 5, link members such as 21, and bell cranks such as 23 biassed by springs such as 27. FIG. 4 shows a side elevation of the tape perforating apparatus proper catering for the nine punching positions. The bell-cranks 23 are all pivotally accommodated on the spindle 24. The nine punching positions may be considered as being in a line extending in numerical order outward from the mounting plate 1 and of which the feed hole punch position is the fourth of the nine positions.

At the position designated A, three electromagnets 26 are mounted side by side, and at positions B, C and D electromagnets 26 are mounted in pairs. The three electromagnets at position A are particular to the punches at the first, fifth and ninth punching positions. The two electromagnets at position B are particular to the punches at the second and sixth punching positions. The two electromagnets at position C are particular to the punches at the third and seventh punching positions, and the two electromagnets at position D are particular to the punches at the fourth and eighth punching positions, of which the punch at the fourth position is the feed hole perforating punch. The second arms 25 of the pairs of bell-cranks 23 at positions B, C and D are radially staggered with respect to the second arms of the three bell-cranks at position A, whilst the arms 22 of all bell-cranks 23 are arranged in alignment with respect to their associated link members such as 21. This arrangement of the bell-cranks 23 and electromagnets 26 permits the nine punches to be pitched 0.1" apart from each other in the line of punches.

It will readily be understood that each of the punches will be operated independently, and in the manner previously described for operation of the feed hole punch to effect a punching operation.

It is so arranged that if an electric current signal is applied to any one of the electromagnets particular to punches representative of the elements of a character then an electric current signal will also be applied to the electromagnet particular to the feed hole perforating punch, thus a feed hole perforating operation will be effected only at such times that the elements or elements of a character are punched into the tape. It is also arranged that an electric current signal can be applied, if it is so desired, to the electromagnet particular to the feed hole perforating punch if a blank space or blank spaces on the tape between character perforations is required when of course the other punches remain unoperated.

A tape feeding mechanism is operatively associated with the feed hole punching mechanism to effect feeding of the tape to a new punching position each time a feed hole perforating operation is effected. The feed hole punching mechanism and the tape feeding mechanism are linked by the provision of a second arm 36 extending from the second arm 29.

A tape feeding operation is performed between perforating operations, and the feed hole punch operating mechanism is linked to the mechanism of the tape feeding unit by a second arm 36 extending from the setting arm 29. The free end of the second arm 36 engages one arm 37 of a two armed lever 38 which is fixed to a spindle 41 pivotally supported in a bearing (not shown) in the mounting plate 1. The other arm 39 of the two arm lever 38 incorporates a bent portion 40 at one end thereof which is in close proximity to the end of the second arm 25 of the bell-crank 23 particular to the operating mechanism for the feed hole punch.

The contribution of two arm lever 38 in effecting a tape feeding operation as a result of a feed hole perforating operation is now to be described with reference to FIG. 4 and FIGS. 5 and 6 which show the tape feeding mechanism.

FIG. 5 is a side elevation of one part of the tape feeding mechanism which is located behind the mounting plate 1 through which spindle 41 (FIG. 4) extends. Spindle 41 pivotally accommodates thereon and has affixed thereto respectively a lever 42 and another two armed lever 43. The lever 43 is biassed to move in a

clockwise direction by a tension spring 48 which is affixed, at its ends, to one arm 44 of the two armed lever 43 and to a pin 46 affixed to the mounting plate 1. Lever 42 is biassed to move into engagement with a bent portion 48 of another arm 45 of the two armed lever 43 by a tension spring 47 affixed at its ends to both levers. A feed cam 49, driven by a shaft 50 in synchronism with cams 5 and 6 (FIGS. 1 to 3), engages rollers 51 and 52 continuously, with its periphery. Rollers 51 and 52 are mounted on arms 53 and 54 respectively of a cam follower 55, which is pivotally mounted on a spindle 96 affixed to the mounting plate 1. An extending arm 56 of the cam follower 55 is pivotally linked by a pin 57 to one end of a lever 58. Lever 58 is in turn pivotally linked by a pin 59 at its other end, to a pawl 60. The pawl 60 is biassed by a tension spring 62, affixed at its ends to one end of the pawl 60 and to the lever 58, to cause a tongue at the other end of the pawl to engage with the toothed periphery of a racket wheel 63. The ratchet wheel 63 is affixed to a spindle 64 which extends through a bearing (not shown) in the mounting plate 1. The spindle 64 also accommodates thereon and has affixed thereto behind the ratchet-wheel, a star-wheel 65 which is engaged, between teeth thereof, by a roller 66 rotatably mounted on one end of a lever 67. Lever 67 is in turn pivotally mounted at its other end, on a pin 68 affixed to the mounting plate 1. The roller 66 is biassed to engage the star-wheel 65 by a tension spring 69 affixed at its ends to a pin 70 affixed to the mounting plate 1 and the lever 67. A tape-feed sprocket-wheel 61 is also accommodated on and affixed to spindle 64. The sprocket-wheel however is located on the front of the mounting plate 1 as shown in FIGS. 1 to 3 and arranged to engage feed hole perforations in the tape made by the perforating punch. An arm 71 is pivotally connected to the lever 58 by a pin 72 and to one end of an arm 73 of a forked lever 74 by a pin 76. The forked lever 74 is, in turn, pivotally mounted on a pin 77 affixed to the mounting plate 1. The arm 71 and forked lever 74 are biassed to move to the right about the axes of pins 72 and 77 under the influence of a tension spring 78 affixed at its ends to the pin 76 and to a pin 79 affixed to the mounting plate 1. The other arm 75 of the forked lever 74 is arranged to be engaged by the end of the arm 42 on spindle 41 when the two armed lever 43 is pivoted in an anti-clockwise direction by spindle 41.

FIG. 6 shows a side elevation of another part of the tape feeding mechanism. For the sake of clarity these two units have been shown separately. In practice these pairs are mounted side by side behind the mounting plate 1 and share shafts 50 and 64 and pins 96 which are common to both. Shaft 50, as well as accommodating thereon cam 49 of FIG. 5, also accommodates a cam 87. The profile of cam 87 is arranged to be continuously engaged by rollers 88 and 89 on arms 90 and 91 respectively of a cam follower 92 which is pivotally mounted on the spindle 96 affixed to the mounting plate 1. An extending arm 94 of the cam follower 92 continuously engages one end 83 of a pawl lever 82 which is pivotally mounted on a pin 84 affixed to the mounting plate 1. The end 83 of the pawl lever 82 is biassed to engage continuously the extending arm 94 of the cam follower under the influence of a tension spring 85 which is affixed at its ends to the pawl lever 82 and to a pin 86 affixed to the mounting plate 1. Pivoting of the pawl lever 82 about the axis of the pin 84 causes the tongue 81 of the pawl lever to be moved into or withdrawn from the path of a second ratchet-wheel 80 affixed to the shaft 64.

The operation of the latterly described parts of the tape feeding unit are now to be described with reference to FIGS. 1, 3, 4, 5 and 6. Feeding of the tape 20 (FIG. 1) by the sprocket-wheel 61 is only permitted when a feed hole perforating operation has been effected by the feed hole punching mechanism, and a feed hole perforating operation is only effected when a character is performed in the tape 20.

Referring now to FIG. 5, the forked lever 74 and arm 71 form a toggle joint, and these two members are maintained substantially "erected" in the positions shown by the end of a lever 42 engaging with the arm 75 of the forked lever 74. In this condition of arm 71 and forked lever 74, and when lever 58 is oscillated about the axis of the pin 72 by the action of cam 49 and its follower 55, pivoting of lever 58 in a clockwise direction during the first half cycle of oscillation causes the tongue of the pawl 60 to ride over a tooth of the ratchet-wheel 63, i.e. anticlockwise around the periphery of the ratchet-wheel 63. At the termination of the first half cycle of oscillation the tongue of the pawl 60 is in positive engagement with the radial face of the tooth, so that, during the next half cycle of oscillation of lever 58 in an anticlockwise direction, movement of the pawl tongue downwards causes the ratchet-wheel 63 to rotate through one tooth position in the clockwise direction. Since sprocket-wheel 61 is affixed to the shaft 64, as is ratchet-wheel 63, the sprocket-wheel rotates, and through engagement of its teeth with feed hole perforations in the tape, the tape is fed toward the punches of the punching mechanism between punching operations.

It will be readily understood therefore that with the forked lever 74 and arm 72 in the positions shown a tape feeding operation will be effected for each complete cycle of oscillation of lever 58. When as is latter to be described, the end of lever 42 is moved out of engagement with the arm 75 of the forked lever 74, the toggle joint formed by levers 72 and 74 "collapses" under the tension applied to the levers by spring 78. This "collapse" causes forked lever 74 to pivot in a clockwise direction about the axis of pin 77 and in doing so causes arm 71 to pivot lever 58 about the axis of pin 57 in an anticlockwise direction. As a result, the left hand end of the lever 58 rests on a pin 93 affixed to the mounting plate 1 and lever 58 is then oscillated under the action of cam 49 and follower 55 about the point of engagement between the lever 58 and the pin 93 on which the lever rests. Thus no feeding action takes place. During this non-feeding oscillation of lever 58, the toggle joint formed by forked lever 74 and lever 71 is alternately "erected" and "collapsed" until such time that the end of lever 42 is again brought into the path of arm 75 of the forked lever 74 so as to engage it and maintain the joint in an "erected" condition. As long as the joint is maintained in the erected condition by arm 42 and lever 58 is oscillated, then tape feeding operations will be effected.

The decision as to whether, or not, a tape feeding operation is to be effected is determined by the condition of an electromagnet at position D (FIG. 4) which electromagnet is particular to the feed hole perforating punch.

The method of effecting a tape feeding operation is now to be described with reference to FIGS. 4 and 5. At this stage the end of lever 42 (FIG. 5) is disposed in a position clear of the path of arm 75 of the two armed lever 74 and thus no tape feeding operations are effected. When the setting arm 29 (FIG. 4) is pivoted in a clockwise direction about the axis of spindle 24 in the manner previously described with reference to the punch operating mechanisms, all the arms 25 of the bell-cranks 23 are pivoted in the same direction to bring them in contact with the core of their respective electromagnet 26. As the setting arm 29 pivots so does its second arm 36 the end of which, through its engagement with the arm 37 of the forked lever 38, causes this lever and its other arm 39 to pivot in an anticlockwise direction to rotate shaft 41 to which it is affixed. As this pivoting action takes place the arm 39 of the two-armed lever 38 is moved out of the path of the arm 25 of the bell-crank 23 particular to the feed hole perforating punch. If, at the end of this pivoting movement, the electromagnet 26 particular to the feed hole perforating punch is energised to effect a feed hole perforating operation then the arm

23 is retained in its pivoted position. When setting lever 29 with its second arm 36 is pivoted in a reverse direction, the two armed lever 38 is retained in its pivoted condition through the bent portion 40 on the arm 39 engaging with the end of the retained arm 25 of the bell crank 23. This condition of the arms 25 and 39 is shown in dotted lines. The pivoting of the shaft 41 by two armed lever 38, in an anticlockwise direction causes a two armed lever 43 (FIG. 5) on the other side of the mounting plate 1, to pivot in the same direction. At the commencement of the pivoting movement the forked lever 74 and arm 71 are in the "collapsed" condition and lever 42, freely and pivotally arranged on shaft 41, has its free end disposed with respect to the end of arm 75 of forked lever 74 as shown in dotted lines. When the forked lever 74 and arm 71 are again "erected" during the oscillation of lever 58, the arm 75, of the forked lever 74, is drawn leftward away from the end of lever 42 which lever then pivotes in an anticlockwise direction to re-engage the bent portion 48 of two armed lever 43 under the influence of tension spring 47. This pivoting action of lever 42 then disposes its free end into the position shown to engage the arm 75 of the forked lever 74. The toggle joint formed by levers, 71 and 74 is then prevented from "collapsing" and as long as the electromagnet 26 at position D (FIG. 4) is energised tape feeding operations will be effected; one feeding operation being effected for each tape feed hole perforated in the tape. De-energisation of the electromagnet 26 at position D, particular to the feed hole perforating punch, will permit the arm 25 of the associated bell-crank 23 to be returned to its rest position in an anticlockwise direction and under the influence of its associated tension spring 27. This occurs when setting arm 29 is subsequently pivoted in an anticlockwise direction, under the action of its associated cam 6 (FIG. 1) and tension spring 33. When this pivoting of setting arm 29 takes place its second arm 36 pivots in the same direction and permits two-armed lever 36, spindle 41, two-armed lever 43 (FIG. 5) and arm 42 to pivot in the same direction under the influence of the tension spring 48 affixed to the mounting plate 1 and two armed lever 43. This pivoting action causes the end of lever 42 to move clear of arm 75 of forked lever 74, and cyclic "collapse" and "erection" of the toggle joint formed by levers 71 and 74 is permitted whereupon tape feeding operations are terminated.

Each time a tape feeding operation is effected and the sprocket-wheel 61 is rotated, the star-wheel 65 is likewise rotated since it is on the same shaft 64. The star-wheel 65 is rotated against the influence exerted on it by roller 66, on lever 67, which roller is maintained in engagement with the periphery of the star-wheel 65 by the action of tension spring 69 on the lever 67 pivotable on the pin 68. The action of the roller 66 resting between teeth of the star-wheel 65 after each tape feeding operation assists in maintaining a correctness of pitch between succeeding feed holes perforated in the tape, and thus the pitch between successive characters perforated in the tape.

The action of the tension spring 85 (FIG. 6) and cam 87, by way of cam follower 92, on the pawl lever 82 is such that the pawl lever is oscillated about the axis of pin 84 to cause the tongue 81 of the pawl to be cyclically

disposed into and withdrawn clear of the path of the teeth of the ratchet-wheel 80.

The tongue 81 is withdrawn from engagement with a tooth of the ratchet wheel 80 just before each tape feeding operation takes place, and is disposed into the path of the teeth just before the termination of each tape feeding operation to engage a succeeding tooth of the ratchet-wheel. This arrests rotation of shaft 64 after each feeding operation, prevents over-run of the tape, and reduces the spring tension which would normally be required of tension spring 69 (FIG. 5) to locate the roller 66 in effective contact with the star-wheel 65 at the termination of each of the tape feeding operations.

It will readily be understood that the perforating apparatus could be used for the perforation and feeding of card or the like, of long or short length, used for the storage of information in the form of code perforations.

What we claim is:

1. Perforating apparatus for perforating a tape comprising: a continuously driven cam; a cam follower in operative relationship with said cam, said cam follower oscillating continuously due to the movement of said cam; a plurality of punch operating members linked to said cam follower in a first position; means for causing desired ones of said punch operating members to assume a second position; a plurality of punches one for each punch operating member; means for mounting said punches for reciprocal movement into and out of the tape to be perforated so that punch operating members in said second positions will cause their associated punches to reciprocate and perforate said tape; tape feeding means for moving said tape through said mounting means; feed hole perforating means cooperating with said tape feed means to perforate feed holes in said tape; and means responsive to the positioning of all said punch operating member in said first position to stop said tape feeding and said feed hole perforating means.

2. Tape perforating apparatus for perforating a tape moved between a die and stripper comprising: a cam; means for continuously rotating said cam; a cam follower in operative relationship with said cam, said cam follower oscillating continuously due to the movement of said cam, a plurality of punch operating members linked to said cam follower in a first position, means for causing desired ones of said punch operating members to assume a second position; a plurality of punches, each associated with one punch operating member and positioned in said die so that movement of said punch operating members in said second position causes said punches to oscillate into and out of said stripper, means for stepping said tape through said die and stripper, means cooperating with said stepping means to perforate feed holes in said tape, and means responsive to the positioning of all said punch operating members in said first position to stop said stepping means and said feed hole perforating means.

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