

Oct. 12, 1926.

G. H. BAILLIE

1,602,874

MECHANISM FOR RECORDING BY SIMULTANEOUS PRINTING AND PERFORATING

Filed March 19, 1926

4 Sheets-Sheet 1

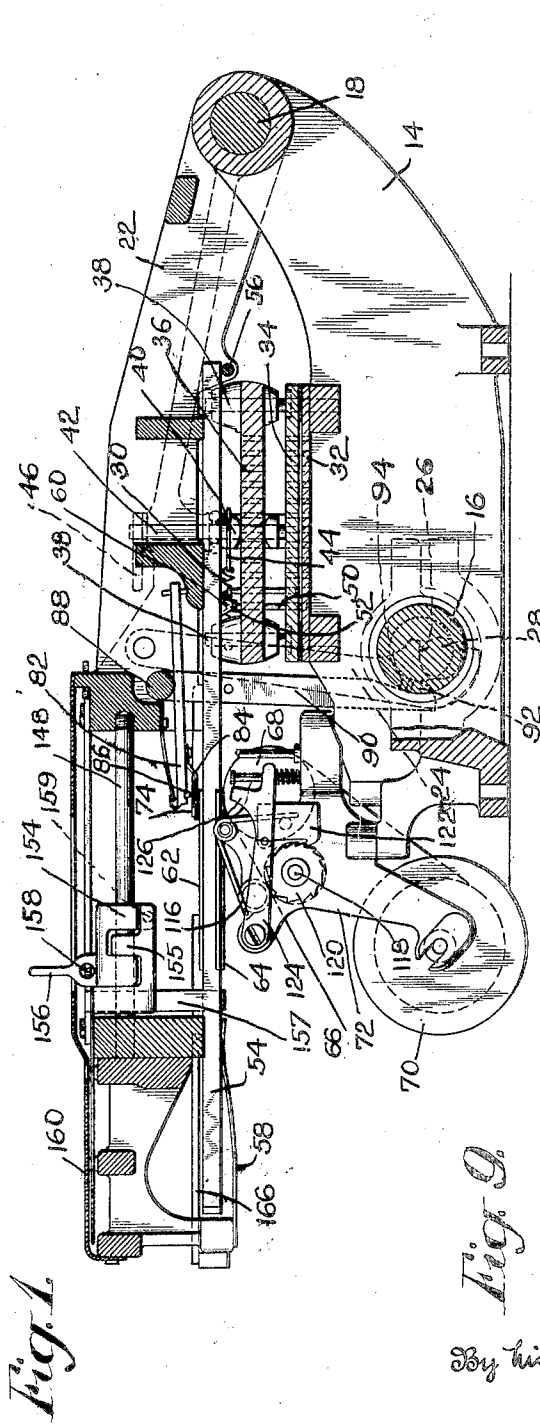


Fig. 1.

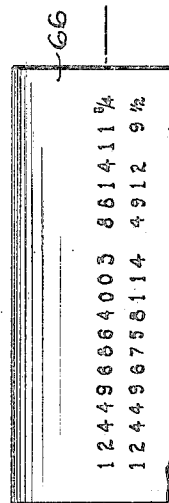


Fig. 10.

X Y											
0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	1	1	1	1	1	1	1	1	1
2	0	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9

Fig. 11.

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4 Sheets-Sheet 2

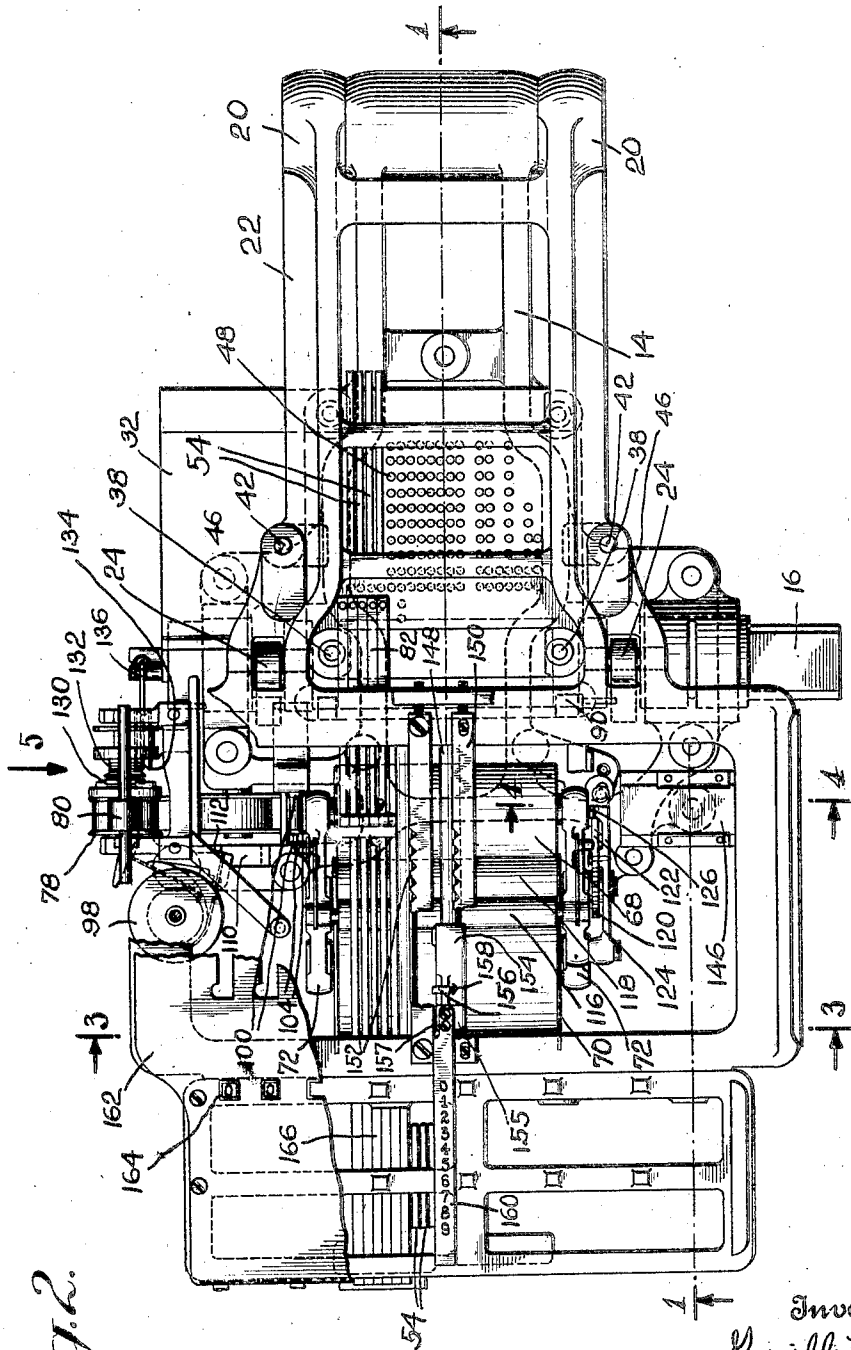


Fig. 2.

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Fig. 3.

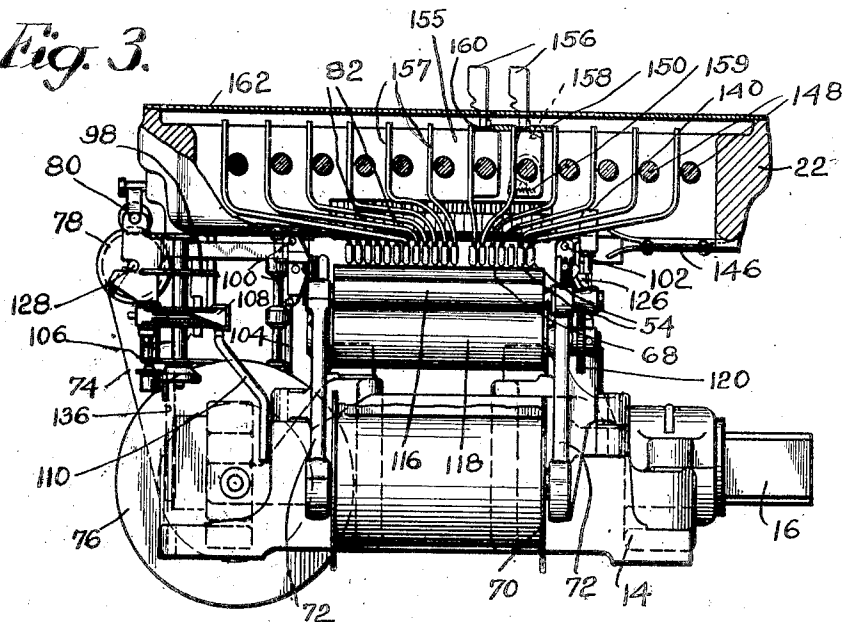
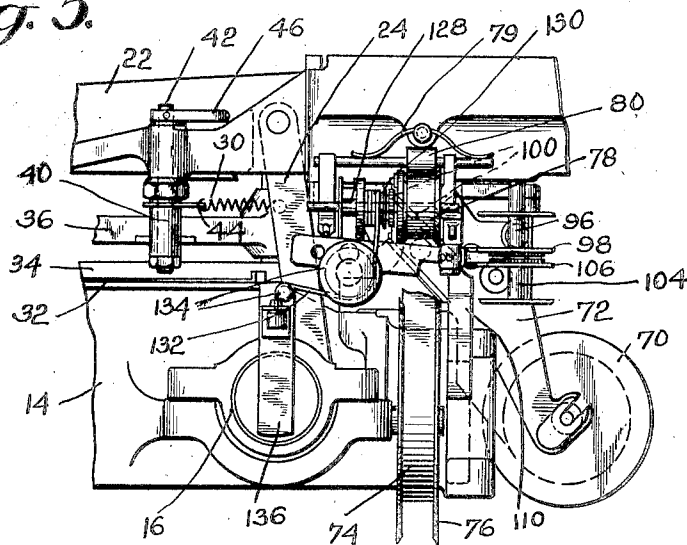


Fig. 5.



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4 Sheets-Sheet 4

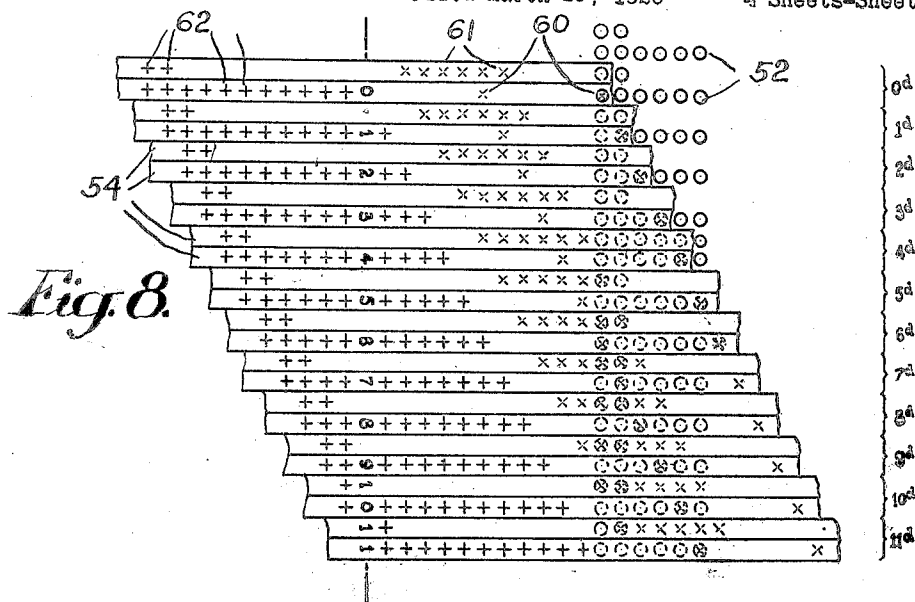


Fig. 6.

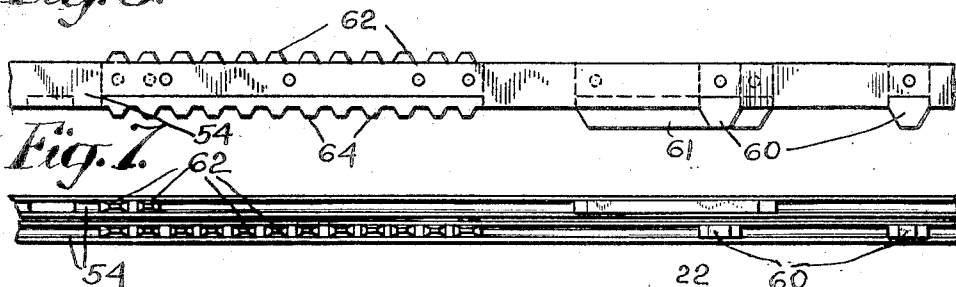
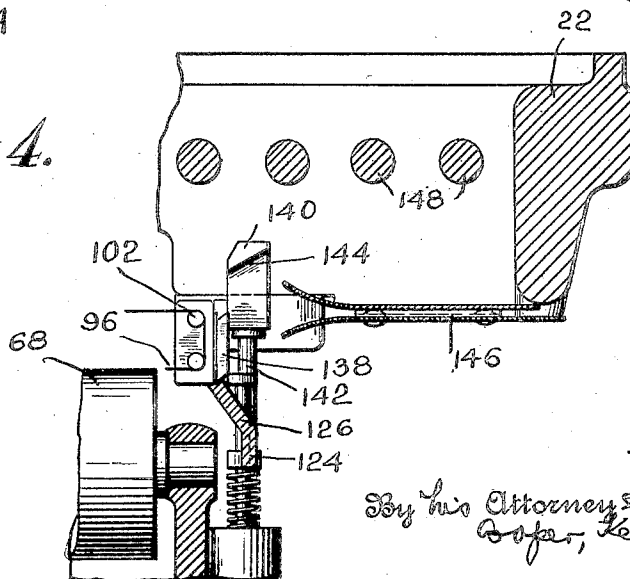


Fig. 7.



Fig. 4.



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UNITED STATES PATENT OFFICE.

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MECHANISM FOR RECORDING BY SIMULTANEOUS PRINTING AND PERFORATING.

Application filed March 19, 1926, Serial No. 96,103, and in Great Britain November 25, 1924.

This invention relates to apparatus for manually recording statistical data or the like by printing and punching, and especially to apparatus which is used for recording transactions in multiple shops, cooperative stores and similar institutions.

One object of the invention is to provide a machine which will record a number of sales or other transactions in triple form, and namely, a separate and distinct punched record sheet for each transaction whereby the punched record sheets can be arranged in any desired order, sorted into batches of different category and dealt with individually, a printed record of each and every transaction on a single blank, such as a roll of paper, and a further printed record of each transaction on a separate and distinct sheet, for example, a cut-off or torn-off length of paper tape.

A further object of the invention is to provide a machine which makes a punched record of each transaction, preferably on separate blanks one for each transaction, and two separate printed records by a single printing operation.

According to one feature of the invention the machine comprises a punching mechanism having means for supporting in punching position a blank for one of a number of separate record sheets, for example, Hollerith cards, two printing mechanisms each of which has means for supporting a separate sheet to be printed and a manual actuating means common to the punching and printing mechanisms. One of the two sheets or record receiving elements to be printed may be a sheet which is moved to receive a number of successive impressions in column form and the other may be a sheet which receives successive impressions on different parts thereof and is moved to deliver each part after printing into position for severing.

A further feature of the invention consists in a machine having punching mechanism for making a punched record, two related sets of type elements movable together to bring any related pair of type elements into printing position, manual actuating means common to the punching mechanism and the type elements, means for supporting two record blanks or record receiving elements, one in a position to receive impressions from one

set of type elements and the other to receive impressions from the other set, and a single operating means for concurrently causing related impressions to be made on both blanks.

Preferably the two related sets of type elements are secured to opposite sides of the same type bar and one record blank is located at one side and the other at the other side of the bar. Each blank is supported by a platen, and the printing of both blanks is brought about by moving one platen towards the other.

According to a further feature of the invention a machine for printing two separate records of a number of sales or other transactions, one of which is or is to be a series of separate record slips one for each transaction, comprises two printing mechanisms key-actuated in common and consisting of a row of movable type bars carrying type elements on opposite sides thereof, means for feeding a record blank past one set of type elements in a direction transverse to the printing line and means for feeding the other blank, namely, that for the series of separate record slips, past the other set of type elements in a direction along the printing line.

The type bars, or each of them when a row thereof is employed, may have secured to it a punch actuating member for cooperation with any one of a column of stationary punches, or may be provided with a single punch secured thereto, whereby the said member or punch is brought into any one of several different punching positions by the movement of the type-bar into its different positions when the type-setting mechanism operates; and the aforesaid transverse movement of the type-bar thereupon causes a hole to be punched in the card or strip which is to be perforated in a position corresponding to the digit or other character printed.

A further feature of the invention consists in a construction whereby amounts in a non-decimal system (for example the duodecimal system of shillings and pence) may be printed in the usual characters (that is to say, in the case of pence by the numbers 0 to 11) and simultaneously recorded by perforations in a record-card arranged for the decimal system.

According to this feature of the invention a single type-bar having type-elements corre-

sponding to the units of the non-decimal system (for example 0-11 pence) in numerical order is provided with punch-operating members co-operating with punches in two columns in one of which there are punches corresponding to a portion only of the said units (for example 0-5 pence) and in the other a single punch for punching a hole in the "one" position; and the value assigned to the unit of this column is equal to the remainder of the units—in the example six-pence. The said punch operating members are so arranged that, as the type bar is moved to successive printing positions in numerical order, the punches in the first column are operated in succession without operation of the punch in the second column and thereafter the punches in the first column are again operated in succession together with the single punch in the second column. Thus the assigned values of the holes punched in the two columns at each operation is equal to the number printed at that operation.

Broadly I will refer to the record material herein shown as record strips which receive printed impressions as record elements, or record receiving elements, it being understood that the term "element" is not limited to record material drawn off from a roll and initially being in the form of a continuous strip.

These and other features of the invention will be apparent from the ensuing description of a preferred embodiment thereof (given by way of example) taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a side elevation in section on the line 1-1 of Fig. 2, with parts omitted for clearness.

Fig. 2 is a plan with certain parts omitted and others broken away.

Fig. 3 is a front sectional elevation on the line 3-3 of Fig. 2.

Fig. 4 is a detail sectional view taken on the line 4-4 of Fig. 2 and to a larger scale.

Fig. 5 is a side elevation of part of the machine, looking in the direction of the arrow 5 in Fig. 2.

Fig. 6 is a side elevation of a pair of type bars fixed together which are used for recording pence.

Fig. 7 is a plan of Fig. 6.

Fig. 8 is a diagram showing the manner in which the parts shown in Figs. 6 and 7 operate.

Fig. 9 is a view of part of a "Hollerith" card perforated in the machine.

Fig. 10 is a representation of a part of a paper sheet on which two printed records have been made, the upper one being the counterpart of the perforated record shown in Fig. 9.

Fig. 11 is a view of a separate printed slip bearing a record which is also the counterpart of that shown in Fig. 9.

The machine illustrated in the drawings comprises a base 14 having bearings for a transverse horizontal operating shaft 16 and at its rear upturned end a boss through which extends transversely a horizontal pivot pin 18, the ends of which engage holes in two opposed lugs 20 on a frame 22 which extends forwardly over the base. A pair of links 24 are pivoted to the frame 22 immediately above the shaft 16, these links being formed with a half journal 26 at their lower ends to engage crank pins 28 on the shaft 16. The links are held in engagement with the crank pins by springs 30.

A handle (not shown) moving between stops is secured to the right hand end of the shaft 16, and it will be appreciated that if the handle is rocked the frame 22 will be rocked up or down about the pivot pin 18. A spring (not shown) secured to the handle maintains the frame in its uppermost position, and the stops are so arranged that when the handle is at its forward limit of movement, with the frame in its lowest position, the crank pins 28 are at or near their lower dead center. This is the position illustrated in Fig. 1.

Secured to the upper face of the base 14 is a die plate 32 surmounted by a stripper plate 34. The die plate extends beyond the base on the left hand side, as shown in Fig. 2, and the lower left hand edge of the stripper plate is bevelled or rounded to facilitate the insertion of a "Hollerith" card blank 35 by hand from the left, suitable stops being provided to locate the blank correctly.

A lifter plate 36 is mounted above the stripper plate to slide on vertical guide pins 38 secured to the base, and the right and left hand edges of this lifter plate are engaged by jawed members 40 secured to vertical spindles 42 rotatably mounted in the frame 22. Arms 44 secured to these spindles serve as anchorage for the springs 30 previously mentioned, the tension of these springs tending to maintain the jawed members 40 in engagement with the lifter plate as shown in Fig. 1. The upper ends of the spindles 42 are provided with finger levers 46 which enable the jawed members to be turned out of engagement with the lifter plate for the purpose to be described.

The die plate, stripper plate and lifter plate have nineteen columns of holes 48 in which are located punches 50 provided with shouldered ends 52 which engage the upper surface of the lifter plate 36 when the frame 22 is in its uppermost position, whereby the lower ends of the punches are held clear of the space between the die plate and the stripper plate.

As shown in Fig. 2, there are eleven col-

umns of ten holes each and one of twelve holes, these twelve columns constituting a "field" separated by a blank column from a "pounds" field consisting of two ten hole columns. The adjoining column, for tens of shillings, has only two holes in the "nought" and "one" positions. The remaining columns are a ten hole column for units of shillings, a two hole column with holes in the "nought" and "one" position (the latter having the value six-pence as will be explained) a six hole column for 0 to 5 pence, and finally a three hole column for farthings.

There are nineteen type bars 54 supported on the underside of the frame 22 by a transverse bar 56 at their rear ends and by leafsprings 58 at their forward ends. Each type bar is located immediately above and parallel to one of the columns of punches, and carries a downward projection 60 which engages and depresses one or other of the punches in the appropriate column, according to the position to which the type bar has been moved, when the handle is rocked to depress the frame 22. The position of this projection is such that when the bar is in its normal forward position, the "nought" punch is depressed. In the case of the type bar appropriated to the twelve hole column the projection is of course located over the first punch in the column, two hole spaces below the nought, as shown in Fig. 1.

Each type bar carries a double set of type characters, one set 62 on the upper edge and the other 64 on the lower edge, the characters of each pair occupying the same position along the bar being identical. The spacing of these type characters is the same as the spacing of the punches in the columns, and (with the exception of the "pence" type bars) the characters are numerals in such consecutive order that when a bar is in position to depress a punch having a certain assigned numerical value, the corresponding numeral character is at the printing line.

The lower type characters print upon a paper sheet 66 supported upon a roller platen 68 and supplied from a roll 70 the spindle of which is supported in slotted lugs 72 fixed to the base 14, as shown in Fig. 1.

The upper type characters print upon a paper strip 74 (Fig. 1) which is supplied from a roll 76 by means of feed rolls 78, 80 which push it along the printing line above the type bars and beneath a series of spring supported resilient pivoted platen bars 82. There are two "dummy" platen bars one on each side of the series, which carry a strip supporting plate 84 having a slot extending laterally from end to end of the printing line to enable rubber blocks 86 carried by the platen bars to press the paper strip down upon the type.

The parts are so proportioned that when

the frame 22 is in its lowermost position the lower type characters are close to, but not actually in contact with the paper 66. A bail 88 surmounting the platen bars 82 is provided with depending arms 90 having upwardly facing shoulders 92 at their lower ends which, when the crank pins 28 are approaching their dead centers, are engaged by projections 94 on the shaft 16 and thereby pulled down. These projections are 90°, or thereabouts, behind the crank pins, and consequently further movement of the shaft will have very little effect on the frame 22, but will move the bail 88 through a considerable distance, the dimensions of the parts being such that when the handle reaches the limit of its movement the bail has forced the platen bars down to press the platen blocks 86 on to the upper type characters (the strip 74 being between the platen blocks and the type) and has moved the type bars against the pressure of the springs 58 to press the lower type faces against the paper 66. The resilience of the platen bars ensures that the impression of the type characters upon the strip shall be uniform throughout the series. An ink ribbon 96 extends from a spool 98, over guide pins 100, along the upper printing line beneath the paper strip, over guide pins 102 (Fig. 4), along the lower printing line above the paper 66 and over guide pins 104 to a second spool 106. Ribbon feeding means indicated at 108 are provided, such means being operated by a cam arm 110 fixed to the base 14 and a rocking arm 112 cooperating therewith and pivoted to the frame 22.

The paper 66 passes behind and over the platen 68 and between feed rolls 116, 118, the upper one 116 of which is spring pressed against the lower 118. A ratchet wheel 120 is secured to the lower feed roll 118 and a pawl 122 pivoted to a spring raised arm 124 engages with the teeth of this ratchet wheel. An upward extension 126 of the arm 124 is engaged by the lower edge of a strip severing knife (hereinafter to be described) when the frame 22 is depressed, thus moving the arm and the pawl downwards. When the frame rises, the pawl turns the ratchet wheel, and with it the feed roll 118, thus pulling the paper forward one line space.

The feed rolls 78, 80 (see Fig. 5) which as previously mentioned feed the strip 74, are rotated as follows: The lower feed roll 78 (upon which the upper roll is pressed by means of a spring 79) is mounted loosely upon a spindle 128. This spindle is urged in a counter clockwise direction (as viewed from the front) by means of a spiral spring and is connected to the roll 78 by means of a ratchet and pawl used that the roll will be driven when the spindle turns in a clockwise direction. A suitable detent pawl is provided to prevent the roll from being

turned back by friction. A drum 130 is secured to the spindle 128, and a length of gut or other cord 132 is attached to and wound round this drum in a clockwise direction, passed over guides 134 and secured detachably to the extremity of an arm 136 attached to the shaft 16. As shown in Fig. 4, the shaft is in the position which it occupies when the frame 22 is in its lowest position—that is to say, the handle has been pulled forwards, or to the right in this figure, and, during this movement the cord has been “wound in” by the spiral spring, the roll 78 being stationary. After printing, the handle is released, the shaft 16 will turn anti-clockwise as seen in Fig. 5, and the cord will be pulled to rotate the drum 130 clockwise as viewed from in front (from the right in Fig. 5) thus feeding the strip forward to move the printed portion clear of the type bars and bring a fresh length thereof into printing position.

When this feeding movement is complete the printed portion of the strip is severed by means of a knife 138 (see Fig. 4) having an upwardly directed cutting edge secured to the frame 22, cooperating with a knife 140 secured by means of a post 142 to the base 14, this knife having its cutting edge 144 directed downwardly. It is the knife 138 the lower edge of which actuates the paper feeding arm 124 as previously described.

The two knives are so located that their edges meet to sever the strip at the extreme end of the upward movement of the frame 22. The severed slip bearing the printed record is received by a tray 146 from which it is removed by hand. When it is desired to remove the punches for sharpening, or to attend to any of the mechanism, the links 24 are moved by hand, against the tension of the springs 30, out of engagement with the crank pins 28, the arms 90 are also moved forwardly to clear the shoulders 92 from the projections 94, the jawed members 40 are turned out of engagement with the lifter plate, and the cord 132 is detached from the arm 136. The frame 22 can then be swung up to any desired height, thus giving access to the punches and other parts carried by the base.

The means whereby the type bars are set will now be described. Above the printing position there are secured in the frame 22 twelve guide rods 148 arranged parallel to the type bars, but with wider spacing. Above and slightly to the right of each guide rod is a bar 150 provided with notches 152 spaced apart by distances equal to those separating the punches and the type characters. Mounted on each guide rod is a slider in two parts, one part 154 having an up-standing finger piece 156 and a wedge shaped detent 158 to engage in the notches 152, and the other part 155 having secured to

it a bent metal strip 157 the lower end of which is passed through a slot in the type bar to which the slider is allocated, whereby the type bar will accompany the slider when the latter is moved. A compression spring 159 urges the part 154 in a clockwise direction as viewed from the front. Attached to each slider and extending forwardly, is a scale of numbers 160, and a cover plate 162 secured to the top of the frame 22 is provided with windows 164 through which the numbers can be seen, the nought being visible when the bar is in its extreme forward position.

To move a type bar into position to print and punch a number other than zero, the finger piece 156 is pressed to the left to disengage the detent 158 from the notch 152 in which it is held by the spring 159, and the slider is pushed forward (carrying with it the type bar to which it is connected) until the desired number of the scale 160 appears in the window. The finger piece is then released, and the spring 159 causes the detent to engage in the appropriate notch, thus correctly positioning and holding the type bar. When all the type bars have been thus adjusted, the handle is pulled and the perforated and printed records are made as previously described.

It will be seen that there are nineteen type bars but only twelve sliders. One slider—the second from the right—is attached to two type bars which are fixed together as will be described. Thus the six type bars on the left of the series are not connected to any slider. These are for numbers or other characters which it is desired to print and punch unchanged on all records made during a day, week or other period. They are adjusted separately at the beginning of such period and are held in position by means of spring detents 166 engaging in notches (not shown) in the upper edges of the type bars.

As previously mentioned, the second and third type bars counting from the right are used for printing and punching pence, and are permanently fixed together and connected to a single slider having a number scale from 0 to 11. These connected type bars are shown in Figs. 6 and 7, and it will be seen that the second type bar (the lower one in Fig. 7) which prints the units of pence (and therefore has the characters 0, 1, 2, 9, 0, 1) is provided with two projections 60, so located that the rear projection (the right hand one in Figs. 6 and 7) is in position to punch 0, 1, 2, 3, 4, 5 when the type characters 0, 1, 2, 3, 4, 5, respectively, are at the printing line while the other projection is in position to punch these same holes 0, 1, 2, 3, 4, 5 when the type characters 6, 7, 8, 9, 0, 1, respectively, are at the printing line. There being only six punches in this column, the complete series 0-5 will thus be repeated

twice if the type bar is moved through the twelve successive positions.

The other of the two type bars (the third in the series) is provided with two pairs of type characters only, both of which print "1", and they are opposite the 0 and 1 characters on the second type bar just described. Thus when the bars are in their eleventh and twelfth positions 10 and 11 respectively, will be printed.

In place of a projection 60 which operates only one punch at a time, the third bar carries an extended projection 61 which extends over six hole spaces and is so located that it does not encounter a punch in the positions corresponding to the printing and punching of 0 to 4 pence. When the bars are in the "5" position, however, this projection 61 engages and depresses the 0 punch in the third column. When in the "6" position the projection engages the 1 punch in the third column. The hole thus punched is assigned in the value 6 pence. There being no other punches in this column, both punches will be depressed in all ensuing positions of the bars except the last. But in all positions in which these punches are operated, the left hand projection on the second type bar is punching holes in the "repeat" series 0 to 5. Thus the total value of the holes punched will be respectively, 5d. (5 and 0), 6d. (6, 0 and 0), 6d. (6, 1 and 0)—11d. (6 and 5), which agrees with the numbers printed at the corresponding positions of the bars. The whole series of positions is represented in Fig. 8, the crosses representing the punch operating projections, the circles the punches in columns 2 and 3, the vertical chain line towards the left of the figure the printing line, and the numbers along that line the numbers printed at the corresponding positions.

Figs. 9, 10 and 11 represent respectively a record card, a section of a list of printed records, and a record slip having a row of numbers which is the counterpart of the row last printed on the list (the upper row) and the counterpart also of the perforations in the card. It will be seen that each successive printed record on the list is placed above the one last printed. For the purposes of the present invention this is not a disadvantage, but it will be obvious to those skilled in the art that if a reverse arrangement of successive records is desired a modification of the paper feeding mechanism will effect such reversal.

The type bars are U-shaped in cross section, and gaps for the reception of the type blocks, the punch operating projections and the metal strips which connect them to the sliders, are made by removing metal at the bottom of the U, as will be clear from an inspection of Figs. 6 and 7.

The machine described herein is not pro-

vided with accumulating means. If it is desired to incorporate an accumulator for adding the various items, the accumulator wheels could conveniently be connected to the manually operated sliders in a manner which will be evident to those skilled in the art.

Alternatively the machine may be constructed as an attachment to a cash register or other recording or registering device.

What I claim is—

1. A machine of the class described comprising in combination, a punching mechanism having means for supporting in punching position a blank for one of a number of separate records which are to be perforated by the machine, for example, Hollerith cards, two printing mechanisms, each printing upon its own distinct record material which is supplemental to and different from the blank which receives the perforated record, and means associated with each printing mechanism for separately supporting the individual record materials which are to be printed upon thereby, and a manual actuating means common to the printing and punching mechanisms.

2. A machine of the class described comprising in combination, a punching mechanism for making a perforated record, two related sets of type elements movable together to bring any related pair of type elements into printing position, manual actuating means common to the punching mechanism and the type elements, means for supporting two record receiving elements, each of which is distinct from the other and from the aforementioned perforated record, said means having provisions for supporting the respective record elements one in a position to receive impressions from one set of type elements and the other in position to receive impressions from the other set, and a single operating means for causing related impressions on both record receiving elements and for effecting a punching operation.

3. A machine of the class described comprising in combination, a punching mechanism for making perforated records, type bars and two related sets of type elements disposed on opposite sides thereof, manual actuating means common to the punching mechanism and type elements, means comprising separate platens for supporting record receiving elements upon opposite sides of the type bars whereby one record receiving element receives impressions from one set and the other from the other set of type elements, and a single operating means for moving one platen toward the other for concurrently causing related impressions to be made upon both record receiving elements.

4. A machine for printing two separate records of a number of sales or other trans-

actions, one of said records comprising a series of separate record slips one for each transaction, said machine comprising two printing mechanisms key-actuated in common and consisting of a row of movable type bars carrying type elements on opposite sides thereof, means for feeding a record element past one set of type elements in a direction transverse to the printing line and means for feeding the other element, namely that for the series of separate record slips past the other set of type elements in a direction along the printing line.

5. A machine according to claim 1, provided with means for feeding one of the elements to receive a series of successive impressions in column form and with means for feeding the other element to receive a series of impressions on different parts thereof and to deliver each said part after printing into position for severing.

6. A machine for printing two separate records of a plurality of sales or other transactions, one of which is a separate series of separate record slips one for each transaction, said machine comprising two printing mechanisms key-actuated in common and consisting of a row of movable type bars carrying separate type elements on opposite sides thereof, a plurality of columns of standard punches, punch selector means connected to each type bar for cooperation according to the adjusted position therewith with any one of a column of said punches, means for feeding a record element past one set of type elements in a direction transverse to the printing line and means for feeding the other element for the separate record slip past the other set of type elements in a direction along the printing line.

7. A machine according to claim 4 in which means is provided for causing impressions to be made on both record elements in one operation.

8. A machine of the class described comprising in combination, punching mechanism for making a perforated record, two related sets of type elements disposed upon opposite sides of common type bars, means comprising separate platens for supporting record elements upon opposite sides of the type bars, manual actuating means common to the punching means and type bars, a single operating means for moving one platen toward the other for concurrently causing related impressions to be made upon both record elements, the aforesaid movable platen being resiliently connected to the common operating means and being composed of a plurality of sections one for each type bar.

9. A machine according to claim 4 in which a plurality of platens are provided for making impressions upon the elements,

with means for moving one platen towards the other for causing impressions to be made at both elements at one operation, the aforesaid movable platen being composed of a plurality of sections one for each type bar, with a common actuator common to all the sections and resiliently connected thereto.

10. A machine for printing two separate records of a number of sales or other transactions, one of said records comprising a series of separate record slips one for each transaction, said machine comprising two printing mechanisms key-actuated in common and consisting of a row of movable type bars carrying type elements on opposite sides thereof, a base, punches carried thereby, punch selectors connected to the type bars and cooperating with said punches, a frame in which the aforesaid type bars are adjustably mounted, means for moving said frame up and down to operate the punches, means for feeding a record element past one set of type elements in a direction transverse to the printing line and means for feeding the other element, namely that for the series of separate record slips, past the other set of type elements in a direction along the printing line.

11. A machine according to claim 10 in which the frame is pivoted to the base for the purpose described.

12. A machine according to claim 3 in which a base is provided for supporting one of the platens and in which a movable frame is provided for supporting the other platen.

13. A machine according to claim 4 wherein two platens are provided for the respective record receiving elements, the machine having a base supporting one of the platens and a movable frame supporting the other platen.

14. A machine according to claim 3 wherein the means for moving one platen towards the other comprises a link and in which a frame is provided in which the type bars are mounted, means for moving said frame and means connected to said frame moving means for actuating said link at the time when the frame is at the end of its downward travel.

15. A device for printing amounts in a non-decimal system, for example a duodecimal system, and simultaneously recording said amounts by perforations in a record blank arranged for the decimal system, comprising a settable member, for example a type bar, provided with type characters corresponding to the units of the non-decimal system, for example 0 to 11, in numerical order and further provided with punch selecting members cooperating with punches in two columns in one of which there are punches corresponding to a portion only of said units, for example 0 to 5, and in the other a single punch for punching a hole

in the 1 position, the value assigned to this hole being equal to the remainder of the units, for example, 6, the said punch selecting members being so arranged that as the type bar or like member is moved to successive printing positions in numerical order, the punches in the first column are operated in succession without operation of the punch in the second column and thereafter the punches in the first column are again operated in succession together with the single punch in the second column. 10

In testimony whereof I hereto affix my signature.

GRANVILLE HUGH BAILLIE.