

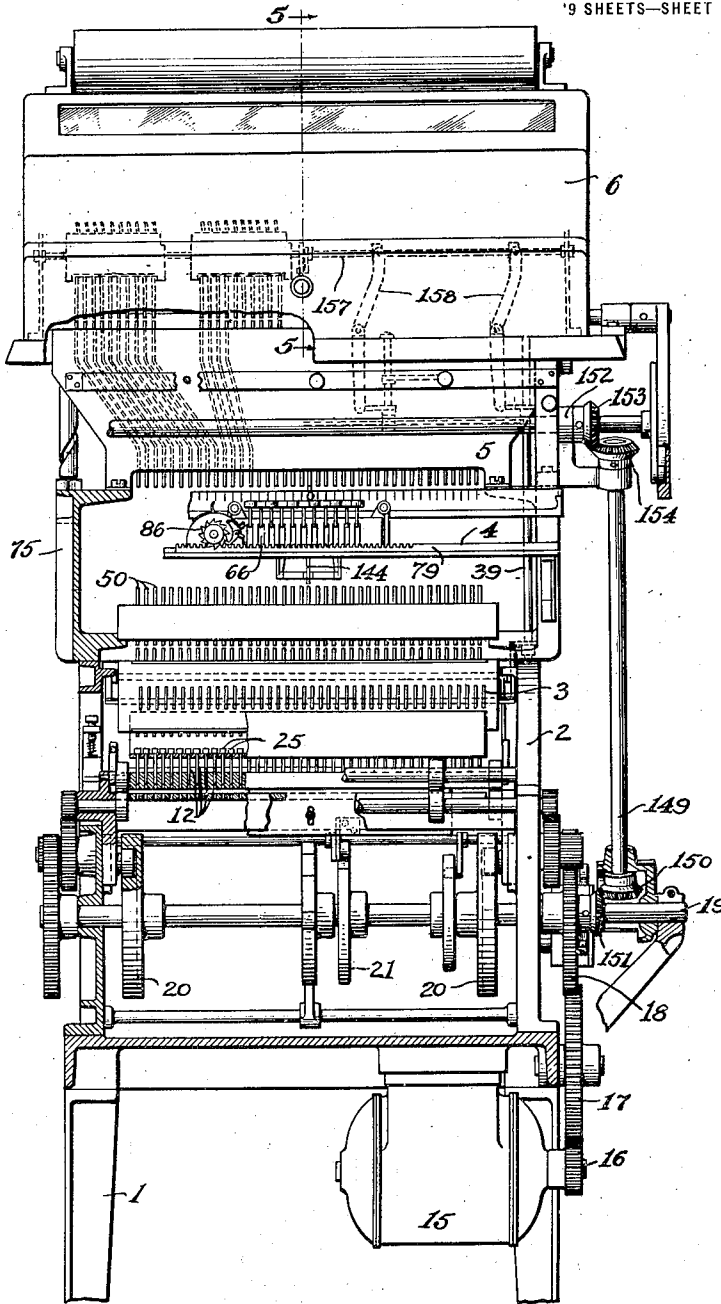
J. POWERS.
 COMBINED PERFORATING AND PRINTING TABULATOR MECHANISM.
 APPLICATION FILED FEB. 17, 1917.

1,388,299.

Patented Aug. 23, 1921.

'9 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

W. H. Whitman

H. D. Penney

Inventor:

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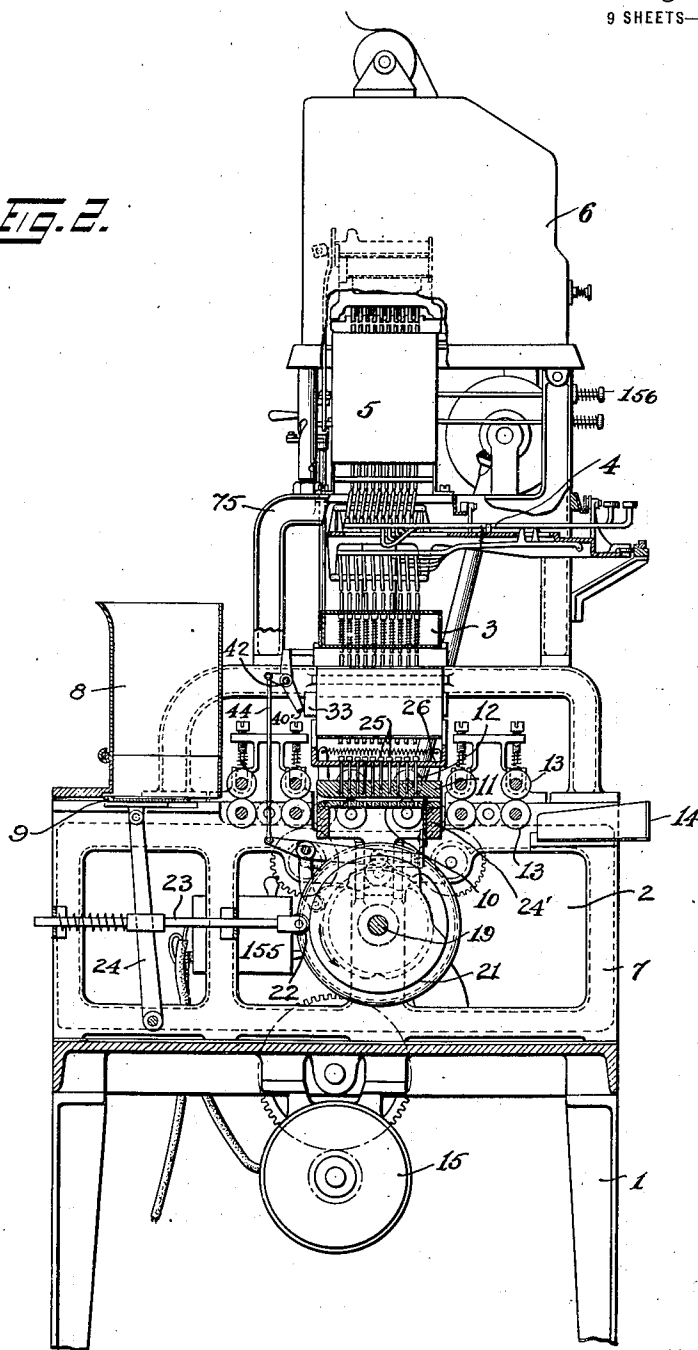
J. H. Richard

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 9 SHEETS—SHEET 2.

Fig. 2.



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9 SHEETS—SHEET 3.

FIG. 3.

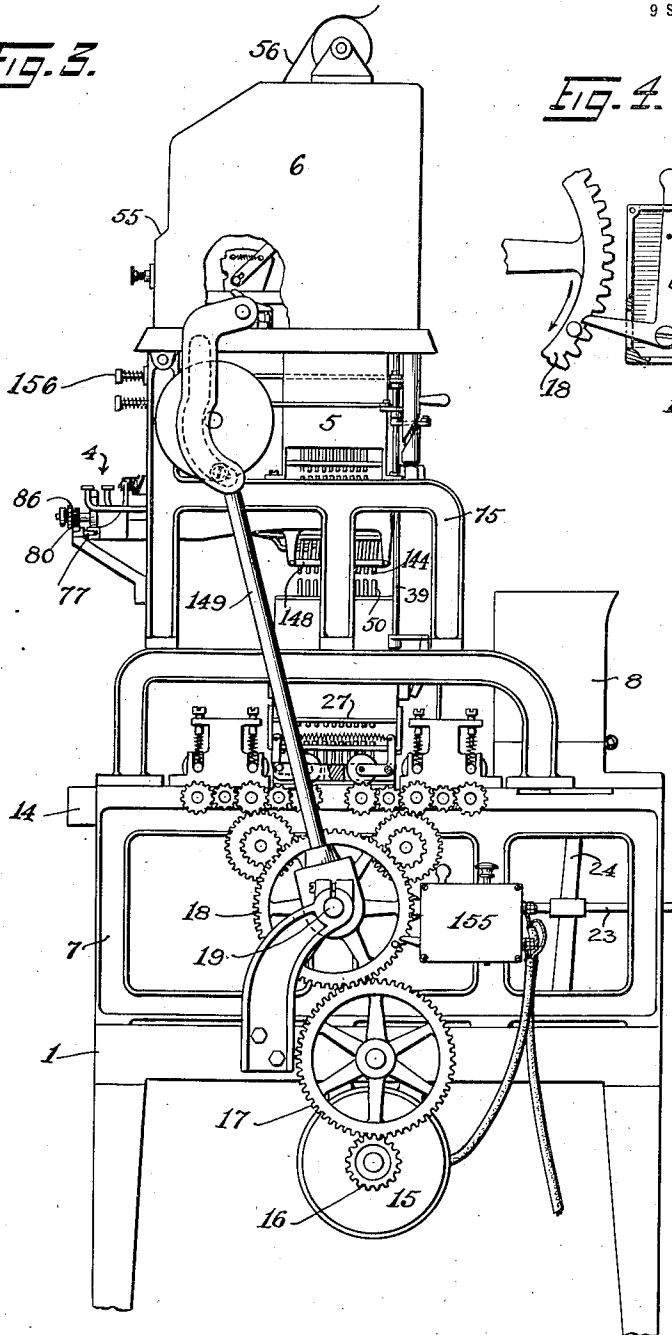
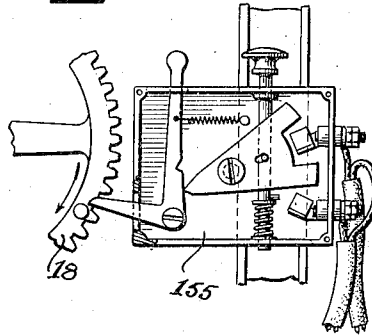


FIG. 4.



Witnesses:

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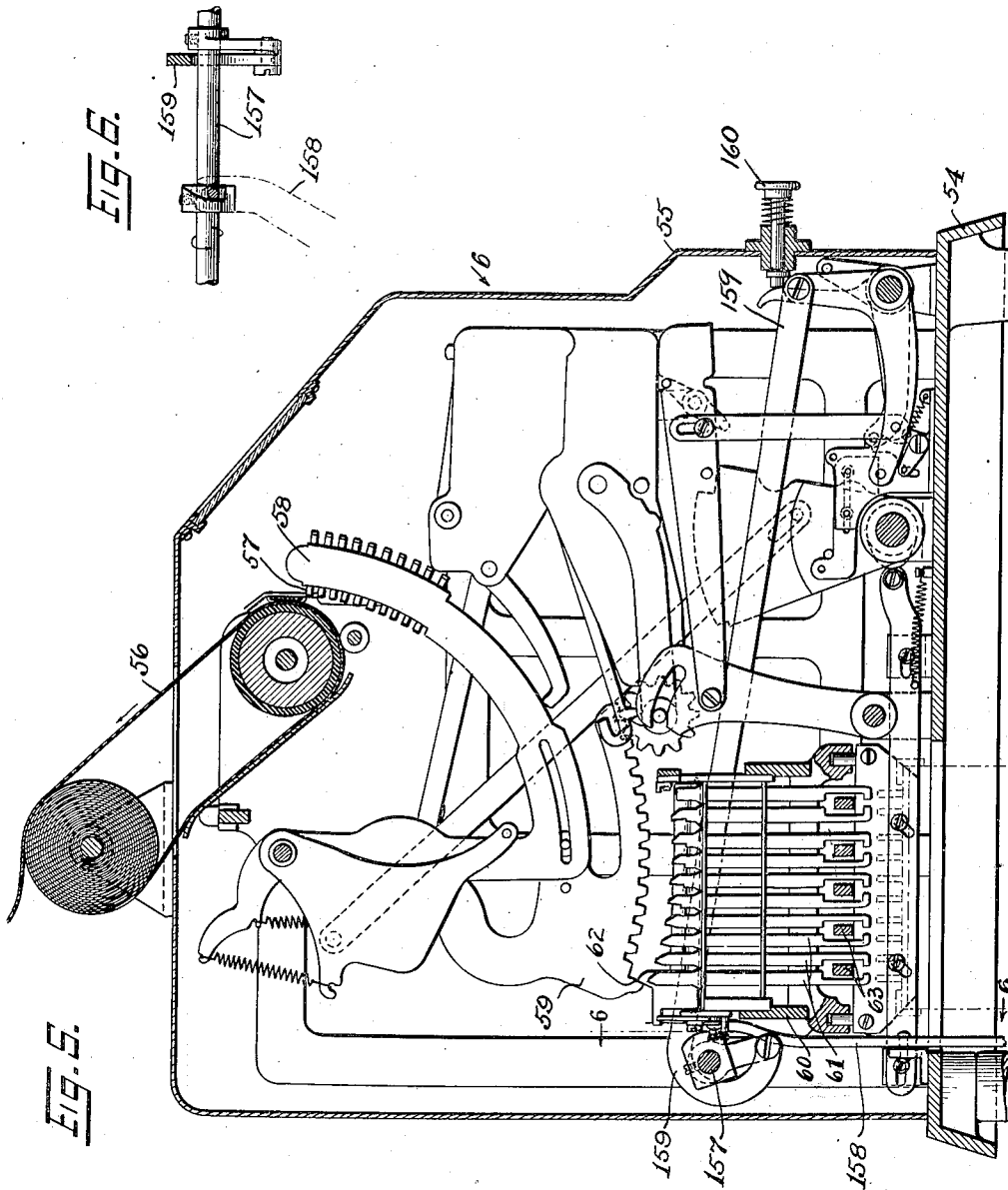
F. H. Richards

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9 SHEETS—SHEET 4.



Witnesses:

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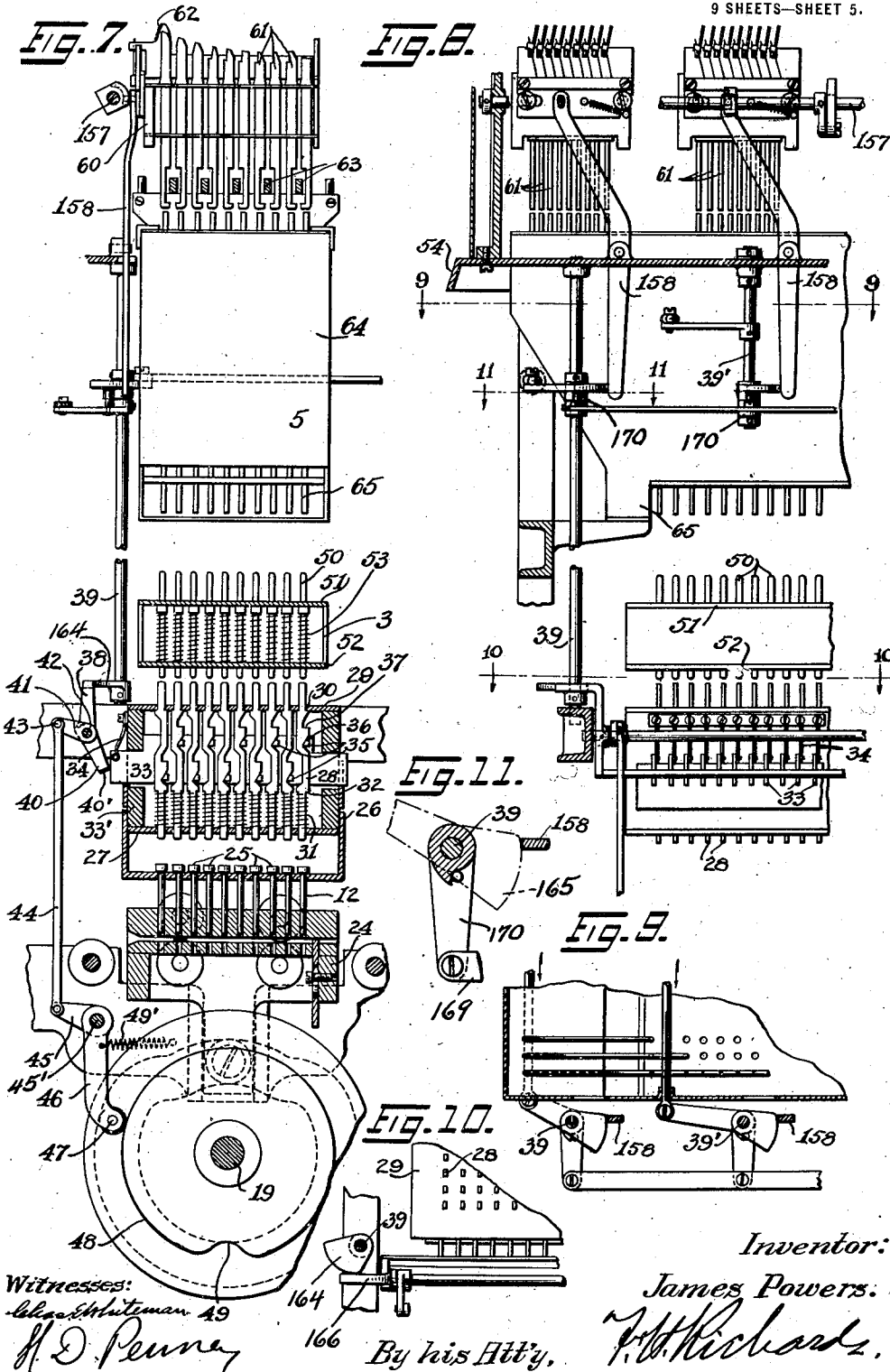
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9 SHEETS—SHEET 5.



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9 SHEETS—SHEET 6.

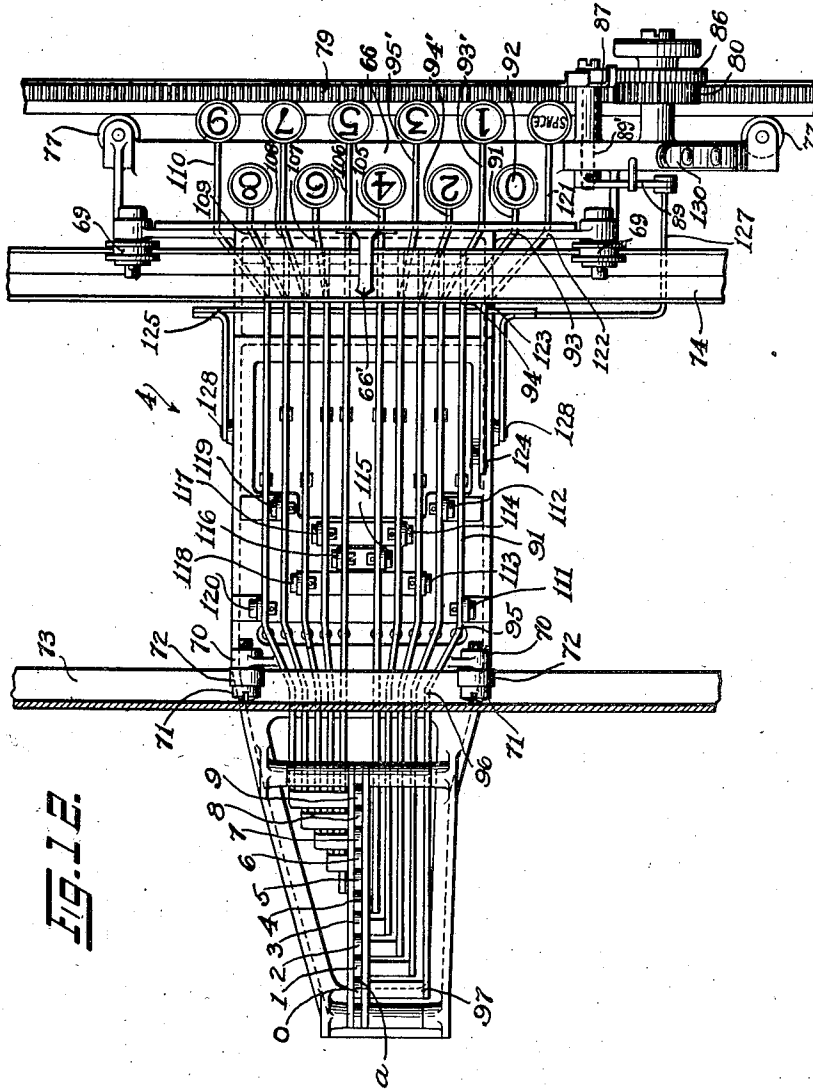


FIG. 12.

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 COMBINED PERFORATING AND PRINTING TABULATOR MECHANISM,
 APPLICATION FILED FEB. 17, 1917.

1,388,299.

Patented Aug. 23, 1921.

9 SHEETS—SHEET 7.

FIG. 15.

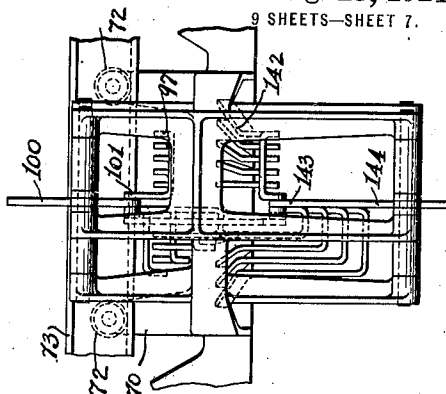


FIG. 14.

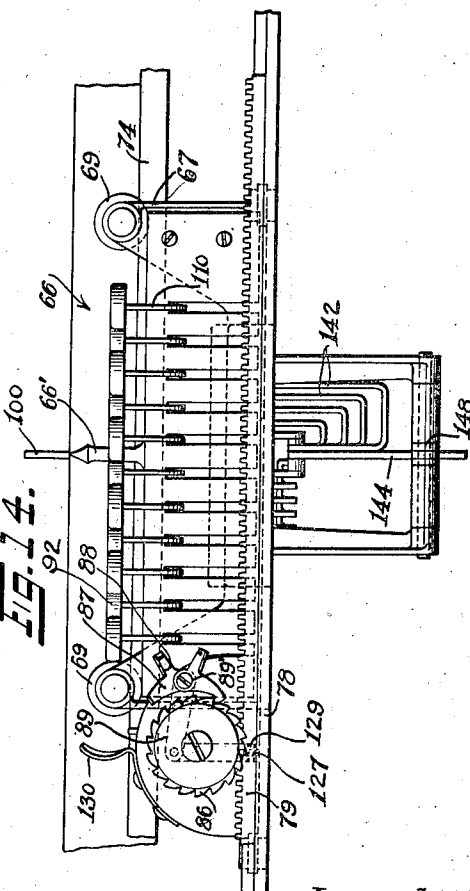
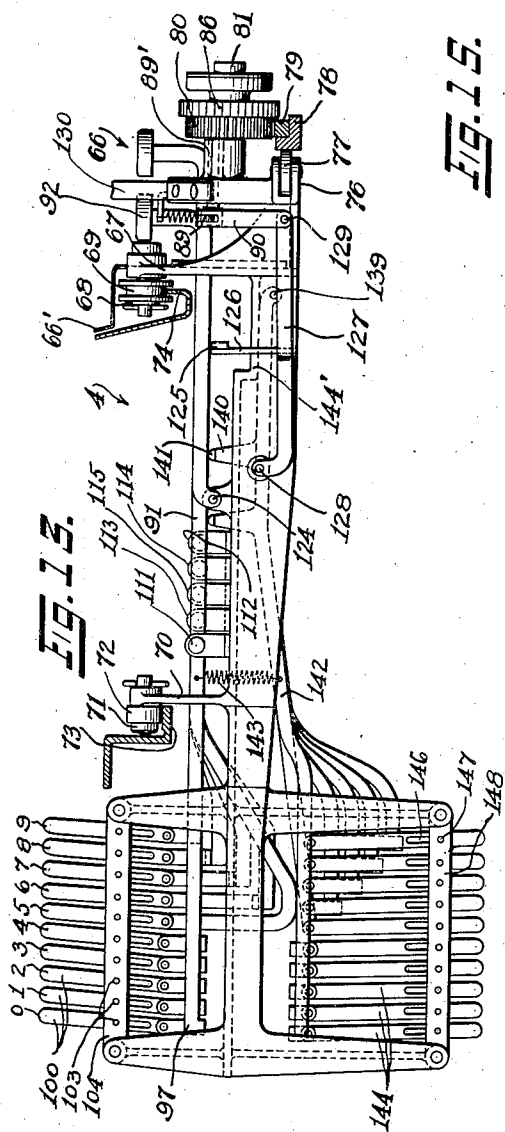


FIG. 13.



Witnesses:

Wm. Whitman

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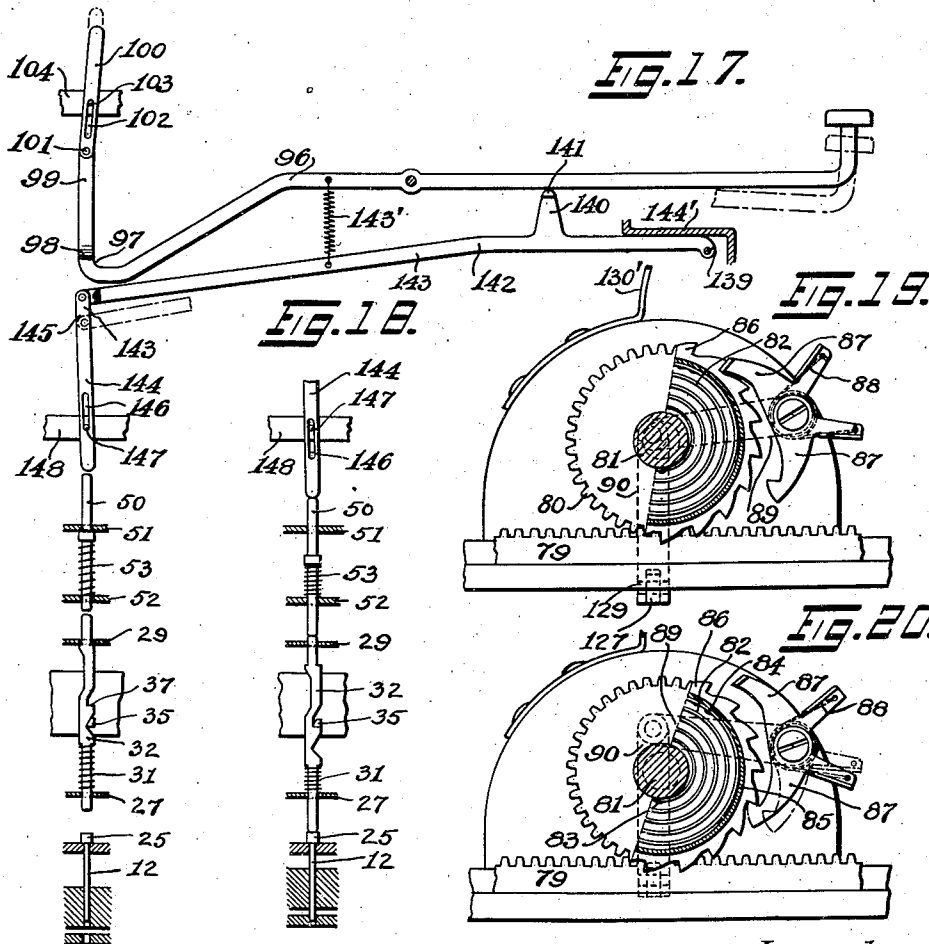
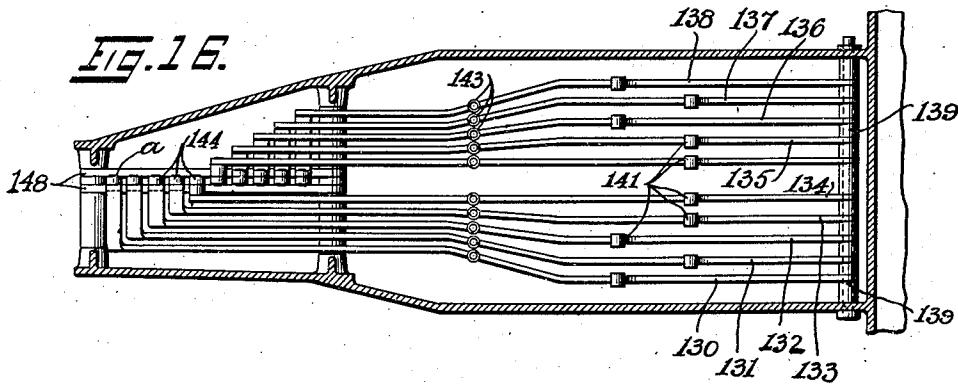
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J. POWERS.
 COMBINED PERFORATING AND PRINTING TABULATOR MECHANISM.
 APPLICATION FILED FEB. 17, 1917.

1,388,299.

Patented Aug. 23, 1921.

9 SHEETS—SHEET 8.



Witnesses:

Charles Whitman
H. D. Penney

Inventor:

James Powers:

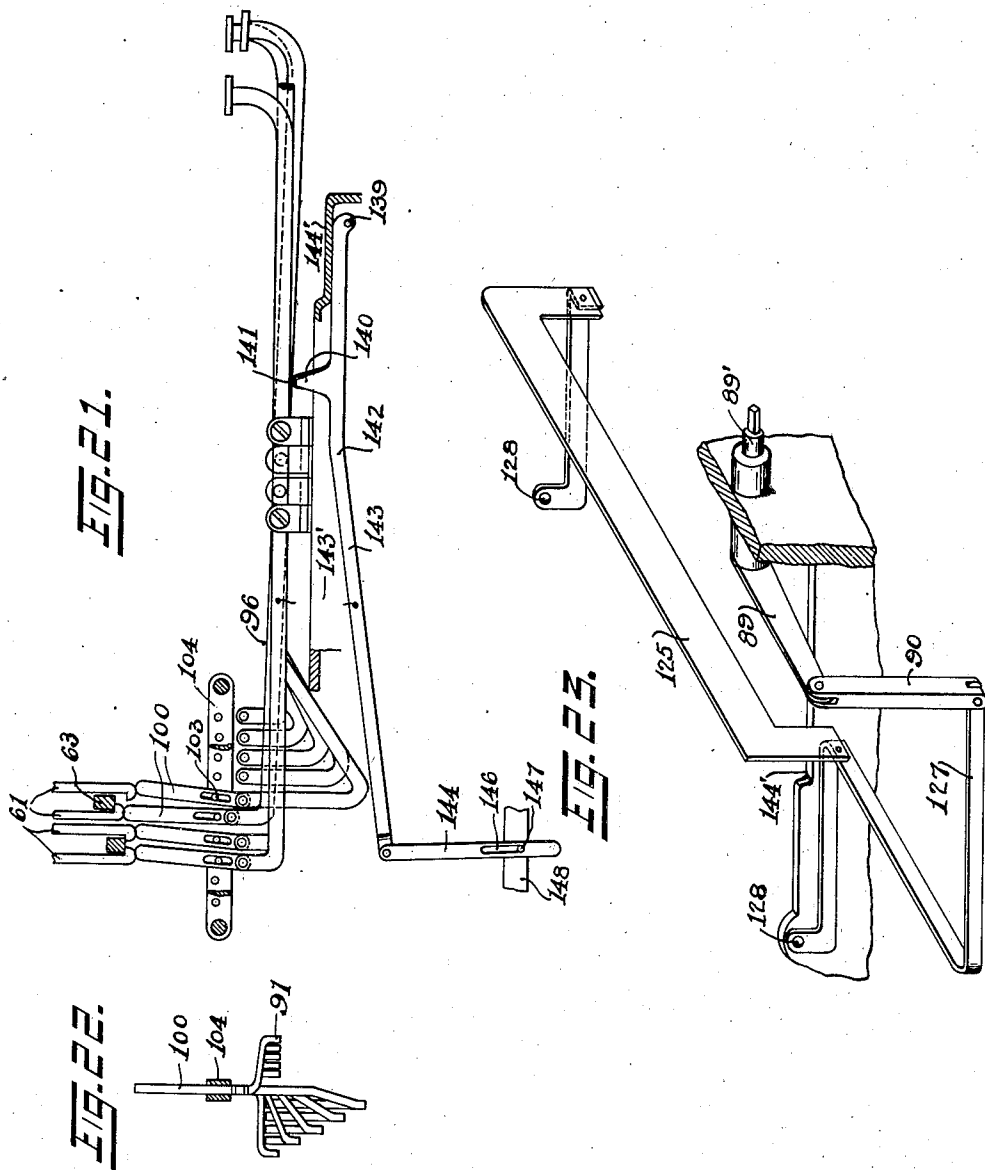
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J. POWERS.
 COMBINED PERFORATING AND PRINTING TABULATOR MECHANISM.
 APPLICATION FILED FEB. 17, 1917.

1,388,299.

Patented Aug. 23, 1921.

9 SHEETS—SHEET 9.



Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES POWERS, OF NEW YORK, N. Y., ASSIGNOR TO POWERS ACCOUNTING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

COMBINED PERFORATING AND PRINTING TABULATOR MECHANISM.

1,388,299.

Specification of Letters Patent. Patented Aug. 23, 1921.

Application filed February 17, 1917. Serial No. 149,203.

To all whom it may concern:

Be it known that I, JAMES POWERS, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Combined Perforating and Printing Tabulator Mechanism, of which the following is a specification.

This invention relates to improvements in a combined perforating and printing tabulator mechanism, the principal element of which, consists in a unitary keyboard operator device, which will simultaneously operate both the perforating machine and the printing tabulator mechanism.

Another object of the present improvement is to devise a machine, which comprises as its constituting parts a perforating element, a tabulating and printing element and a keyboard arranged and constructed to operate with a single operation of each key thereof a corresponding unit of the perforating element and a corresponding unit of the tabulating and printing element.

A further object of the present improvement is to devise a keyboard constructed in such a manner, that a single movement of one of the keys thereof, will operate corresponding units in two different mechanisms of any construction, which are adapted to be operated by keys.

A still further object of the present improvement, is to devise a keyboard particularly constructed and arranged, whereby a single movement of one of the keys thereof, will operate a corresponding unit in a perforator and in a tabulating and printing mechanism. Other objects and advantages of the present improvement will be set forth in the following description and in drawings which illustrate one embodiment of my invention, and in which,

Figure 1, is a front elevation, partly in section, of a combined perforating, tabulating and printing mechanism, showing the unitary keyboard applied thereto;

Fig. 2, is a side elevation, partly in section, taken on the line 2—2 of Fig. 1;

Fig. 3, is a side elevation, partly in section, of Fig. 1, showing the driving mechanism for the machine;

Fig. 4, is a fragmentary side elevation of a kick off device for stopping the machine, once every revolution, and showing its connection with the said machine;

Fig. 5, is a vertical sectional view of the tabulator and printing element of the device, and is taken on the line 5—5 of Fig. 1;

Fig. 6, is a sectional view, taken on the line 6—6 of Fig. 5;

Fig. 7, is a fragmentary vertical sectional view of the punches of the perforator and the means for setting them up, and the means for controlling the sectors of the printing tabulator;

Fig. 8, is a fragmentary side elevation of the controlling means or setter baskets of the sectors of the printing tabulator;

Fig. 9, is a horizontal sectional view, taken on the line 9—9 of Fig. 6;

Fig. 10, is a horizontal sectional view taken on the line 10—10 of Fig. 8;

Fig. 11, is a horizontal sectional view, taken on the line 11—11 of Fig. 8;

Fig. 12, is a top plan view of the improved unitary keyboard mechanism for operating both the perforator and the printing tabulator;

Fig. 13, is a side elevation, partly in section, of the unitary keyboard mechanism shown in Fig. 12;

Fig. 14, is a fragmentary front elevation of the unitary keyboard mechanism shown in Fig. 12;

Fig. 15, is a fragmentary rear elevation of the unitary keyboard mechanism shown in Fig. 12;

Fig. 16, is a top plan view of that part of the unitary keyboard mechanism which operates the punch setters of the perforator;

Fig. 17, is a diagrammatic view of one of the main key bars, auxiliary key bars, punch setters, punch locks and punches in inoperative positions to each other;

Fig. 18, is a diagrammatic view, showing a punch setter and punch lock in the act of locking a punch;

Figs. 19 and 20, are side elevations, partly in section, of the spring operating device for moving the unitary keyboard framework or carriage;

Fig. 21, is a side elevation, partly in sec-

tion, of the main key bars and their operative connection with the setting means for the sectors of the printing tabulator;

Fig. 22, is a vertical sectional view, taken on the line 22—22 of Fig. 21;

Fig. 23, is a fragmentary enlarged perspective view of the levers for operating the pawls of the spring operating device of the keyboard mechanism.

A general description of the mechanisms here involved together with their relations to each other, will first be explained, reference being had to the drawings in which like reference numerals designate similar parts throughout the several figures.

A base 1, is provided constructed in any suitable manner and upon which is mounted a perforating mechanism 2, which is constructed in the manner substantially like, and illustrated in my copending application, Serial No. 71,819, filed Jan. 13, 1916, and needs no detailed description herein, other than reference particularly to the punch setting mechanism 3 thereof, a detailed description of which will be hereinafter set forth. Mounted above the punch setting mechanism 3, and supported upon the perforating mechanism 2, is my improved unitary keyboard operator 4 which has elements arranged to operate the punch setting mechanism 3, and elements to operate a sector bar operating mechanism 5, which sets the type and calculator elements in a printing tabulator 6, which is mounted above the unitary keyboard 4, and supported thereon. A detailed description of the unitary keyboard 4, will be hereinafter set forth, but reference is made herein to my U. S. Patent No. 1,236,481, issued August 14th, 1917, which gives a detailed description of the printing tabulator 6, of which no further explanation will be given except in connection with the sector bar operating mechanism 5 thereof.

The perforating mechanism.

This mechanism comprises a framework 7, which is mounted upon the base 1, and carries at one side a hopper 8 containing the cards to be perforated, which cards are fed, by means of an intermittently movable bottom 9, between the die plate 10 and guide plate 11, respectively, where they are perforated by means of the punches 12, and discharged by means of the rolls 13 into a receiving hopper 14. A motor 15, through gears 16, 17 and 18, drives a shaft 19, upon which, are mounted cams 20 that provide means for lifting the die plate 10 and guide plate 11 for perforating the cards passing between them. A cam 21 is also mounted on the shaft 19, upon which runs a roller 22, carried by one end of a reciprocating rod 23, which is arranged to rock a lever 24 to which

it is connected, and to this lever the reciprocating bottom 9, of the hopper is also connected, whereby a movement of the rod 23 will reciprocate the hopper bottom 9 for feeding a card.

A detailed description of the mechanism for setting up the punches of the perforating machine may be had by referring to my copending application, Serial No. 71,819, filed Jan. 13, 1916, but a general description of this mechanism will be given herein to show its coöperation with the other parts of the machine. This mechanism comprises a pin box 24', which is mounted in suitable vertical guideways, and upon the upper end of which, the die plate 10 is secured. Above this die plate 10, the guide plate 11 is mounted, and these two plates have a plurality of perforations in alinement with each other. In the perforations of the guide plate 11, the lower ends of the punches 12 extend, which are normally suspended by their heads 25, which rest on the top of a perforated plate 26, carried by the framework of the perforating mechanism. Between the plates 10 and 11, as heretofore described, the card to be perforated is disposed, which is fed thereto by the movable hopper bottom 9. Above the perforated plate 26, another perforated plate 27 is mounted, through which extend the lower ends of settable pins 28, whose upper ends extend through still another perforated plate 29, which is also secured to the framework of the perforating mechanism. The settable pins 28 are normally maintained in their raised position so that their shoulders 30 are in engagement with the under side of the plate 29, by means of springs 31, which are strained between the perforated plate 27 and shoulders 32, formed on the said settable pins. Means are provided for locking the settable pins 29, when they are pushed downward to the limit of their movement. These means comprise locking plates 33, (Fig. 7) which are slidably mounted in suitable guideways situated between the perforated plates 27 and 29. For normally maintaining the plates 33 in their left position, springs 34 are provided one of the ends of each of said springs being secured to one of the guideways 33' and the other end of each of said springs being secured to the left end of the plate 33. On one face of each of the said plates 33, a series of abutments 35 are provided, one for the settable pins 28, which abutments in the present instance are staggered to one another for convenience of arrangement, and which have an inclined cam face at its left end to coöperate with the cam face 36 of a settable pin 28. The lower face of each of the said abutments 35 is preferably perpendicular to the path of movement of the settable pins 28, and forms a stop to enter the recess 37,

formed in the settable pins 28 and to co-operate with shoulders formed by the lower sides of the recess 37, the said recess being disposed directly above cam faces 36 of the settable pins 28. The arrangement of the pins 28 of the plates 33 is such that when a pin 28 is depressed, its cam face 36 will engage an abutment 35 to move one of the plates 33 rightward against the tension of the spring 34 until the said pin 28 has been depressed far enough so that the engaged abutment 35 is in alinement with the recess 37 of such settable pins 28, whereupon the tension of the spring 34 would draw the plate 33 leftward to snap the abutment 35 into the recess 37, whereby the settable pin 28 will be located in such depressed position until the plate 33 is actuated rightward to withdraw the abutment 35 from the recess 37, to permit the spring 31 to raise the said settable pin 28 to its normal upward position. Means is provided for actuating the plate 33 to release the pins 28 and this means consists of a bell crank lever 38 intermediately pivoted to a rod 42 carried by the frame work of the perforating machine, the lower end 40 of the said bell crank having a bar 40' in engagement with the end of each of the plates 33. A link 41 is fixed on the rod 42 and is pivoted at the point 43 to one end of a lever 44 which is pivotally connected to the arm 45 fixed on the rock shaft 45' carrying a lever 46 upon the lower end of which is secured a roller 47 which rolls over a cam 48, carried upon the shaft 19. After one card has been perforated it is desirable to raise all of the settable pins to their uppermost position and this is secured when the roller 47 rolls into the depression 49, of the cam 48, allowing the lever 44 to be pulled downward by means of a spring 49', thereby drawing the bar 40' carried by the bell crank, into engagement with the ends of the plates 33, and constraining them to move rightward against the action of the spring 34. The rightward movement of the plates 34, as heretofore described, will disengage the abutments 36 with the recesses 37, and permit the settable pins to be returned to their uppermost position. When the settable pins 28 are locked in their lowermost position, they are in engagement with or adjacent to the heads 25 of the punches 13 so that when the guide plate 11 and die plate 10 ascend with the card between them, all of the punches will ride up on the surface of the card, except those punches which are held down by means of the settable pins, which are locked down against them, and these locked punches will perforate the cards. The means for pushing the settable pins down for locking them, comprises plungers 50, mounted in parallel guide plates 51 and 52, and these plungers are normally held in their uppermost position by means of

springs 53, which are strained between the plates 51 and 52.

The improved unitary keyboard 4, is provided with members which are arranged to actuate these plungers 50, which set up a combination of punches for perforating the card. The specific construction of this unitary keyboard will be hereafter described.

Reference will now be had to the sector controlling mechanism 5 of the printing tabulator 6.

The sector controlling mechanism of the printing tabulator.

For a detailed description of this mechanism, reference is made to my U. S. Patent No. 1,236,481, issued August 14th, 1917, but such parts thereof will be hereafter set forth as are necessary to show its coöperation with the other elements of the complete mechanism. The device consists of a framework 54, which is secured to the top of the unitary keyboard mechanism 4, and to which is secured a housing 55, containing within it a printing tabulator 6. This printing tabulator comprises a revolving tape 56, upon which type 57 carried by sectors 58 are arranged to make impressions. The particular unit of type carried by the sectors 58 which is to strike the tape 56, is controlled by the sector controlling mechanism 5, which controls the movement of the segment 59, which is operatively connected with the type carrying segment 58. The sector controlling mechanism 5 comprises, essentially, a casing 60 within which are mounted a plurality of vertical movable stop pins 61. When any one of the pins is raised, by means hereinafter to be described, it will obstruct the movement of one of the sectors 59, the said sectors having an abutment 62 thereon, which will strike any of the stop pins 61, which is in its raised position. Means, consisting of a grating 63, is operatively connected to the driving mechanism of the complete machine, and is designed to return all the stop pins 61 to their lowermost position whenever the machine has made one complete revolution. The means for pushing the stop pins 61 upwardly to obstruct the oscillation of the sectors 59, comprises a casing 64 within which a plurality of vertically movable plungers 65 are mounted, which plungers extend outside of the casing 64 at the top and bottom thereof, as is clearly illustrated in Fig. 7 of the drawings. The upper ends of the plungers 65 are arranged to come in contact with the lower ends of the stop pins 61, and raise them as the plungers 65 are moved upwardly. The plungers 65 remain normally in their lowermost position, as is illustrated, and are held in said position by gravity. One element of the unitary keyboard mechanism 4 is arranged to come in contact with the lower ends of the plungers 65, and raise

them for the purpose of elevating the stop pins 61, for controlling the sectors 59 of the printing tabulator 6.

From the description given, up to the present, it will be apparent that plungers are arranged to operate the punches of the perforating mechanism and that plungers are arranged to operate the stop pins of the tabulator printing mechanism, and that both of these sets of plungers are arranged and adapted to be operated by the unitary keyboard operating mechanism. As is clearly shown, in the drawings, especially in Figs. 1, 2 and 3, the unitary keyboard mechanism is arranged intermediate the plungers for operating the tabulator printer and the plungers for operating the perforating mechanism.

A description will now be given of the unitary keyboard mechanism and its relative position and coöperation with the plungers for operating the tabulator printer and with the plungers for operating the perforating mechanism.

The unitary keyboard; operating mechanism for tabulator printer.

This mechanism comprises a framework 66 provided adjacent one end with a pair of upwardly extending ears 67 in the upper ends of which are mounted stub shafts 68 upon which are journaled grooved rollers 69. A pair of upwardly extending ears 70 are carried by the framework within the upper ends of which stub shafts 71 are mounted, upon which rollers 72 are journaled. The rollers 72, run on a track 73, and the rollers 69 on a track 74, the said tracks arranged parallel to each other and carried by a framework 75, which is arranged between the frameworks of the plungers for operating the perforating machine punches and the plungers for operating the stop pins of the tabulator printer. The end of the framework 66 is provided with horizontally bifurcated yokes 76, within which are journaled rollers 77 that are arranged to roll against an L-beam 78, arranged in front of the framework 66, parallel with the tracks 73 and 74, and carried by the framework 75. A rack bar 79 is fastened to the L-beam 78 in mesh with which is a gear 80, rotatable upon a stub shaft 81, fixedly mounted in the framework 66 adjacent one corner thereof. The shaft 81 is surrounded by a coil spring 82, having one end 83 connected to the said shaft, and its other end 84 connected to a spring casing 85. The action of the spring 82 is freed and retarded by means of a ratchet 86, secured to the gear 80 and the spring casing, and a pair of escapement pawls 87, held in normal relation by a spring 88 and are operated through their supporting shaft 89 and two pivotally connected levers 89 and 90 (Fig. 23) by the

action of the keys of the keyboard as will be hereinafter described.

Eleven key bars are mounted on the framework 66, and these bars will now be described in detail. A key bar 91 carrying at its outer end a key 92, marked on its upper face "0," extends rearwardly, being bent to the right at the point 93, and then straightened at the point 94, to be bent again to the right at the point 95, and then again straightened and bent downwardly at the point 96. At the point 97, the said bar 91 is again bent to the right and at the point 98 bent upwardly to form an upwardly extending portion 99. A short lever 100 is pivoted at the point 101 to the portion 99 of the bar 91, and is provided with a longitudinal slot 102 within which is fitted a pin 103 carried by two parallel bars 104 extending in a line longitudinal of the key bar and carried by the framework 66. Three other key bars 93', 94' and 95' carrying keys marked "1," "2" and "3" respectively are shaped in a manner similar to the bar 91 except that the bends to the right are gradually lessened in each key in the order noted, and that the portions 99 thereof fall one behind the other, but the length of the said portions 99 of all the keys is the same. This arrangement of the keys is shown in Figs. 12, 21 and 22, and the levers 100 are marked similar to the keys carried on the ends of the key bars to which they are pivoted. Two key bars 105 and 106, carrying keys marked "4" and "5" respectively have no bends to the right except when they reach the point 97 the key bar 105 is bent to the right, and the key bar 106 is bent to the left to be in the straight line with the key bars heretofore described. These bars 105 and 106 however have the bend 98, portion 99 and are pivotally connected to levers 100 in a manner similar to the other keys. Four key bars 107, 108, 109 and 110, carrying keys marked "6," "7," "8" and "9" respectively are shaped in a manner identical with key bars 93', 94' and 95', except that all the bends therein instead of being to the right as in the case of the latter bars, are bent to the left so that all the portions 99 thereof fall in a straight line behind the other key bars heretofore described.

The key bars 91, 93', 94', 95', 105, 106, 107, 108, 109 and 110 are pivotally connected to the framework 66 at the points 111, 112, 113, 114, 115, 116, 117, 118, 119, 120 respectively. A key bar 121 carrying a key marked "Space" is bent to the right at the point 122, then straightened at the point 123 and pivoted to the framework 66 at the point 124. Beneath all the key bars is a bar 125 extending parallel to the tracks 73 and 74, and carried by vertically disposed members 126 arranged on opposite sides of the framework 66 and connected at their

lower ends to levers 127 extending longitudinally of the framework, said levers 127 being pivoted to the said framework at the point 128, their other ends pivotally connected at 129 to the lever 90 which through the medium of the lever 89 and rod 89' operate the pawls 87. It is to be understood that all the levers 100 are arranged beneath the proper push rods 65 for operating the proper stop pins 61, so that a movement of a key on the keyboard will depress a key bar, lifting one of the levers 100 into engagement with a push rod 65, lifting said push rod and setting the corresponding stop pin 61, which will cause the sectors 58 through the medium of the sectors 59 to mark on the ribbon 56 the same number struck by the key and at the same time operating the proper digit in the calculating mechanism of the tabulator 6. The operation of one of the keys also depresses the bar 125 (Fig. 23) which through the medium of the levers 127 and 129 releases the pawls one notch and allows the coil spring to rotate the gear 80 thereby moving the entire keyboard and its framework one predetermined space to the right. The spring is rewound upon the return of the framework which is accomplished manually by means of a finger rest 130' carried by the framework 66. An index 66' is provided on the framework 66 to indicate the position of the keyboard and in what column the numbers are set up on the perforator and the printing tabulator.

Unitary keyboard, operating mechanism for perforating machine.

This part of the keyboard which is arranged to operate the perforating machine comprises a plurality of auxiliary key bars mounted beneath the key bars of the keyboard heretofore described and which bars are adapted to operate the plungers 50 which set up the punches of the perforating machine. A plurality of these keybars numbered 130 to 138 inclusive on Fig. 16, of the drawing, have one end pivotally mounted upon a common pivot bar 139. These bars are shaped in a manner similar to the main key bars, that is, some being shaped to the right and left so that their outer ends are arranged in a straight line one behind the other. The auxiliary key bar 130 is arranged directly beneath the main key bar 93', the auxiliary key bar 131 beneath the main key bar 94' and etc., this arrangement continuing with all the key bars. Vertical abutments 140 are made integral with each auxiliary key bar and carry rests 141 on their upper ends in contact with the lower side of the main key bar above it.

At the point 142 the auxiliary key bars are bent downwardly and their outer ends provided with a short downwardly extending

portion 143 instead of the upwardly bent portions 99 with which the main key bars are provided.

Coil springs 143' connecting each main key bar and each auxiliary key bar normally keep the rests 141 in engagement with the main key bars, the upward movement of the said auxiliary and main key bars being regulated by a horizontal abutment 144' carried by the frame work 66 which arrests the upward movement of the auxiliary key bars. A lever 144 is pivoted at 145 to the lever 143 and is provided on its other end with a longitudinal slot 146 within which is mounted a pin 147 carried between parallel guide plates 148 carried by the framework 66 and extending longitudinally of the auxiliary key bars. The outer ends of the levers 144 are arranged to contact with the upper ends of the plungers 50 for depressing them and setting the punches of the perforating mechanism as has been heretofore described. Whenever one of the main key bars of the key board is depressed, as for instance, the key bar 93', the auxiliary key bar 130 directly beneath it will be depressed through the medium of the abutment 140 being in contact with the main key bar, transmits the downward movement of the main key bar 93' to the auxiliary key bar 130.

A drive shaft 149 having a bevel gear 150 on one end in mesh with a bevel gear 151 on the shaft 19 transmits the motion of the said shafts to the drive shaft 152 of the printing tabulator through the medium of meshing bevel gears 153 and 154. Due to this arrangement, the printing tabulator 6 and the perforating machine 2 operate in unison. An automatic stop switch 155 which is described in detail in my Patent No. 1,177,651, dated April 4, 1916, provides means for stopping the machine after every revolution at which time one card has been perforated by the perforating machine and one set of figures set up on the tabulator 6 and printed thereby on the tape 56.

The operation of the complete machine.

In operating my combined perforating and printing tabulator machine the punches of the perforating machine are set up and also the type controlling means of the printing tabulator. This is accomplished in the following manner: The different keys of the keyboard are pressed by the operator which through the medium of the levers 99 carried by the main key bars, and the levers 144 carried by the auxiliary key bars, simultaneously operate the corresponding stop bars of the printing tabulator and the lock bars for the corresponding punches of the perforating machine. In operating the keys, the keyboard is propelled from left to right so that different numbers may be placed in different columns, both on the cards and on

the tape 56. After all of the desired data for one card has been transmitted through the keyboard to the printing tabulator and perforating machine, the starting switch 155 is pushed by the operator which starts the motor 15, which, through the gearing heretofore described simultaneously operates the printing tabulator of the perforating machine. This operation of the machine prints data set up by the keyboard on the tape 56, sets the calculator elements of the tabulator and punches this data on the card which is fed into the perforating machine. After one revolution of the machine, at which time the printing and punching operation has been completed, the automatic stop mechanism of the switch 155 steps in and cuts off current to the motor and stops the machine at the same time returning the stop bars 61 of the printing tabulator by means of the automatic action of the shaft 157 and the bar 159. At the same time, the lock pins 28 of the perforating machines are returned by means of the arm 44 controlling the plates 33 to their normal neutral position. The stop bars 61 of the printing tabulator may also be set back manually by means of a shaft 157 operated by the push button 160 and bar 159. A detailed description of the set back mechanisms 157 and 158 is given in my U. S. Patent No. 1,236,481, issued August 14th, 1917. The frame work 66 of the keyboard is returned to the extreme limit of its leftward movement by means of the handle 130' carried by the said frame work.

It often happens that it is desired to restore manually both the stop bars 61 and lock pins 28 at the same time. This is done by pressing the knob 156 (Fig. 3) thereby rotating the vertical shaft 39 and swinging the lower cam 164 (Figs. 7 and 10) and the upper cam 165.

When thus swung the lower cam 164 engages the arm 166 of the bell-crank lever 38 and presses the bar 41 against the plates 33 thus moving the plates rightward and releasing the pins 28. At the same time, the upper cam 165 engages the levers 158 slides the slide plate 168 and releases the stop pins as described in my said Patent No. 1,236,481.

The main vertical shaft 39 is provided for endmost tabulating unit. For each additional unit there is provided a special shaft 39' connected to the shaft 39 by means of the link bar 169 and levers 170.

From the foregoing description it will be seen that the invention herein, resides primarily in a unitary keyboard mechanism which is designed and arranged to simultaneously set up a desired combination of punches of a perforating machine and a desired combination of type and calculator units of a printing tabulator mechanism.

Having described my invention, what I claim is:

1. In an apparatus of the character described, the combination of an accounting machine comprising settable stops; a perforating machine comprising settable members; key members; and means actuated by the actuation of the key members for causing the key members to be brought from operative relation with certain of said stops and settable members to operative relation with others thereof.

2. In an apparatus of the character described, the combination of an accounting machine comprising a plurality of groups of movable stops arranged one behind the other and held against horizontal movement and adapted to be raised to stopping position; a perforating machine comprising a plurality of groups of settable members; a carriage; main key members on said carriage; auxiliary key members on said carriage and operated by said main members; devices on the main members adapted to register with the stops of one of said group; devices on said auxiliary members and adapted to register with the settable members of one of said groups; and means actuating by the actuation of the main key members for moving said carriage horizontally for moving said devices from registration with one of said groups to another group.

3. In an apparatus of the character described, the combination of an accounting machine comprising groups of movable stops arranged one behind the other; a perforating machine comprising a plurality of groups of settable members; a carriage; key members on said carriage and adapted to operate said stops and members of certain of said groups; and means actuating by the actuation of the key members for moving said carriage for moving said key members from operative relation with certain of said groups to other groups thereof.

4. In an apparatus of the character described, the combination of an accounting machine comprising a number of series of movable stops; a perforating machine comprising a number of series of settable members; a carriage; main key-bars on said carriage; auxiliary key-bars on said carriage and operated by said main bars; devices on the main levers and adapted to register with the stops of any one of said series; devices on said auxiliary levers and registering with the settable members respectively of any one of said series; and means controlled by the key-bars for moving said carriage for moving said devices from registration with one of said series to the adjacent series.

5. In an apparatus of the character described, the combination of an accounting machine comprising a number of series of stops arranged one behind the other and adapted to be raised to stopping position; a perforating machine comprising series of

settable members adapted to be lowered to set position; a keyboard carriage; main key-bars on said carriage and having their rear ends arranged in series one behind the other; 5 auxiliary key-bars on said carriage and operated by said main bars and having their free ends arranged one behind the other; devices secured to said rear ends of the main key-bars and adapted to register with the 10 stops of any one of said series of stops; devices secured to said free ends of the auxiliary key-bars and registering with the settable members respectively of any one of said series of settable members; and means 15 controlled by the main key-bars for moving said carriage horizontally for moving said devices from registration with one of said series to the adjacent series of stops and settable members.

20 6. In an apparatus of the character described, the combination of an accounting machine comprising a plurality of series of vertically movable stops arranged one behind the other and held against horizontal 25 movement and adapted to be raised to stopping position; a perforating machine comprising a plurality of series of settable members in alinement with said stops respectively, and adapted to be lowered to set position; a keyboard carriage horizontally 30 movable transversely to said series; main key-bars fulcrumed on said carriage and having their rear ends upturned and arranged in series one behind the other; auxiliary key-bars fulcrumed on said carriage 35 and operated by said main bars and having downturned rear ends arranged one behind the other; upwardly pointing short levers pivoted to the upturned ends of the main levers and adapted to register with the stops 40 of any one of said series; downwardly pointing short levers pivoted to the downturned ends of said auxiliary levers and registering with the settable members respectively of 45 one of said series; and means controlled by the main key-bars for moving said carriage horizontally for moving said short levers from registration with one of said series to the adjacent series.

50 7. In an apparatus of the character described, the combination of an accounting machine comprising settable stops; a perforating machine comprising settable members and manipulating means for simultaneously 55 causing the release of the stops and settable members.

8. In an apparatus of the character described, the combination, of an accounting machine comprising settable stops; a perforating machine comprising settable members 60 and unitary means for causing the release of the stops and settable members.

9. In an apparatus of the character described, the combination of an accounting 65 machine comprising settable stops; means

for holding the stops in set position; a perforating machine comprising settable members; means for locking the members in set position; means arranged to set said stops and members; means for automatically operating said holding means for releasing the 70 stops; means for automatically operating said locking means for releasing the settable members; and a manually operated means for operating the locking means and the 75 holding means.

10. In an apparatus of the character described, the combination of an accounting machine comprising settable stops; means for holding the stops in set position; a perforating machine comprising settable members; means for locking the members in set position; a carriage; key members on said carriage and arranged to set said stops and settable members; means for operating said 85 machines; means for automatically operating said holding means for releasing said stops; means for automatically operating said locking means for releasing the settable members; additional means for releasing 90 said holding means; a shaft; upper and lower devices thereon for operating said additional means and the releasing means; and means for actuating said shaft.

11. In an apparatus of the character described, the combination of an accounting 95 machine comprising settable stops; means for holding the stops in set position; a perforating machine comprising settable members adapted to be moved to set position; 100 means for locking the members in set position; a carriage; main key members on said carriage and arranged to set said stops; auxiliary key-members on said carriage and operated by said main members and arranged 105 to operate said settable members; means for operating said machines in unison; means for automatically operating said holding means for releasing the stops; means comprising a bell crank for automatically 110 operating said locking means for releasing the settable members; manually operated means for operating the holding means; additional means for operating said holding means and comprising a slide plate; an operating lever for operating the slide plate; 115 a vertical shaft; upper and lower cams thereon for operating said operating lever and bell crank lever respectively; and means for rotating said shaft. 120

12. In an apparatus of the character described, the combination of an accounting machine comprising vertically movable settable stops adapted to be raised to stopping position; means for holding the stops in 125 raised position; a perforating machine comprising settable members adapted to be lowered to set position; means for locking the members in set position; a carriage movable transversely to said series; main key-bars 130

fulcrumed on said carriage and arranged to raise said stops; auxiliary key-bars fulcrumed on said carriage operated by said main bars and arranged to operate said settable members; means for operating said machines in unison; means for automatically operating said holding means for releasing the stops; means comprising a bell crank for automatically operating said locking means for releasing the settable members; manually operated means for operating the holding means without operating said locking means; additional means for operating said holding means and comprising a slidable plate; an operating lever for operating the slide plate; a vertical shaft; upper and lower cams thereon for operating said operating lever and bell crank lever respectively; and manipulating means for rotating said shaft.

13. In an apparatus of the character described, the combination of an accounting machine comprising settable stops; a perforating machine comprising settable members; means for automatically releasing the settable members and manually operated means for releasing the stops.

14. In an apparatus of the character described, the combination of an accounting machine comprising settable stops; a perforating machine comprising settable members; means for automatically releasing the stops; and means for automatically releasing the settable members; and manually operated means for releasing both stops and settable members.

15. In an apparatus of the character described, the combination of an accounting machine comprising settable stops; a perforating machine comprising settable members; means for operating said machines in unison; means for automatically releasing the stops; and manually operated means for releasing both the stops and the settable members.

16. The combination with a perforating machine and a printing tabulator, of a key board device arranged to operate both of said mechanisms, said key board device comprising a framework, a plurality of main key bars mounted therein, a plurality of auxiliary key bars arranged adjacent to the main key bars, abutments carried by the auxiliary key bars, resilient means arranged to keep the abutments of the auxiliary key bars in contact with the main key bar whereby a movement of the main key bars will operate the auxiliary key bars.

17. The combination with a perforating machine and a printing tabulator of a key board device arranged to operate both of said mechanisms, said device comprising a framework, a plurality of main key bars mounted in said framework, a plurality of auxiliary key bars arranged adjacent to the

main key bars, means for normally holding the auxiliary key bars in operative connection with the main key bars whereby a movement of the main key bars will operate the auxiliary key bars.

18. The combination with a perforating machine and a printing tabulator, a key board device arranged to operate both of said mechanisms, said device comprising a movable framework, resilient means carried by the framework for moving it, a plurality of key bars carried by the said framework, said key bars arranged to control the resilient moving means for the framework.

19. The combination with a perforating machine and a printing tabulator, of a key board device arranged to operate both of said mechanisms, said key board device comprising a movable framework, means for moving the framework, a plurality of key bars mounted in said framework, said key bars arranged to control the moving means for the framework.

20. The combination with a perforating mechanism and a printing mechanism, of a key board device arranged to operate both of said mechanisms, a track carried by said mechanisms, said key board device comprising a framework movably mounted on said track, means for moving the said framework, a plurality of key bars mounted within the framework and arranged to control said moving means.

21. The combination with a perforating mechanism and a printing mechanism, of a key board device arranged to operate both of said mechanisms, a track mounted between the said mechanisms, said key board device comprising a framework movably mounted on said track, means for moving the said framework, and a plurality of key bars mounted in said framework and arranged to control said moving means.

22. The combination with a perforating machine and a printing tabulator, said mechanisms arranged one above the other, of a guideway mounted between the said mechanisms, a key board device comprising a framework movably mounted in said guideways, means for moving the said framework, a plurality of key bars mounted in said framework and arranged to control said moving means.

23. In a mechanism of the class described, a perforating mechanism having a plurality of punches, means for locking said punches in operative position, means for operating said locking means, a printing tabulator arranged above the perforating machine, means for setting said mechanism, and means for operating said setting means, and a key board mechanism arranged between the operating means for the locking mechanism of the perforating machine and the operating means for the setting mechanism

of the printing tabulator, said key board device having members arranged to operate both of said operating means.

24. In a mechanism of the class described,
5 a perforating machine having a plurality of punches, means for setting said punches, a printing tabulator arranged above the perforating machine, means for setting said
10 printing tabulator and a key board mechanism arranged between the perforating machine and the printing tabulator and having elements arranged to operate the setting
means of both of the said mechanisms.

25. In a mechanism of the class described,
15 a perforating machine having a plurality of

punches, means for setting said punches, a printing tabulator arranged above the perforating machine, means for setting the said printing tabulator, a key board device comprising a framework having a plurality of
20 main key bars arranged to operate the setting means of the printing tabulator, a plurality of auxiliary key bars arranged to operate the setting means of the perforating machine, the auxiliary key bars operated by
25 the movement of the main key bars.

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Witnesses:

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