

1,260,704.

Patented Mar. 26, 1918.
19 SHEETS—SHEET 1.

Fig. 1.

RESTAURANT CARD				
WAITE 31				
Oyster	50		50	
Fish	1 50		2 00	
Steak	2 00		4 00	
Potatoes	70		4 70	
Peas	50		5 20	
Salad				

Fig. 2.

RESTAURANT CARD				
WAITER 31				
Oysters	50		50	
Fish	1 50		2 00	
Steak	2 00		4 00	
Potatoes	70		4 70	
Peas	50		5 20	
Salad	75		5 95	
Ice Cream	25		6 20	

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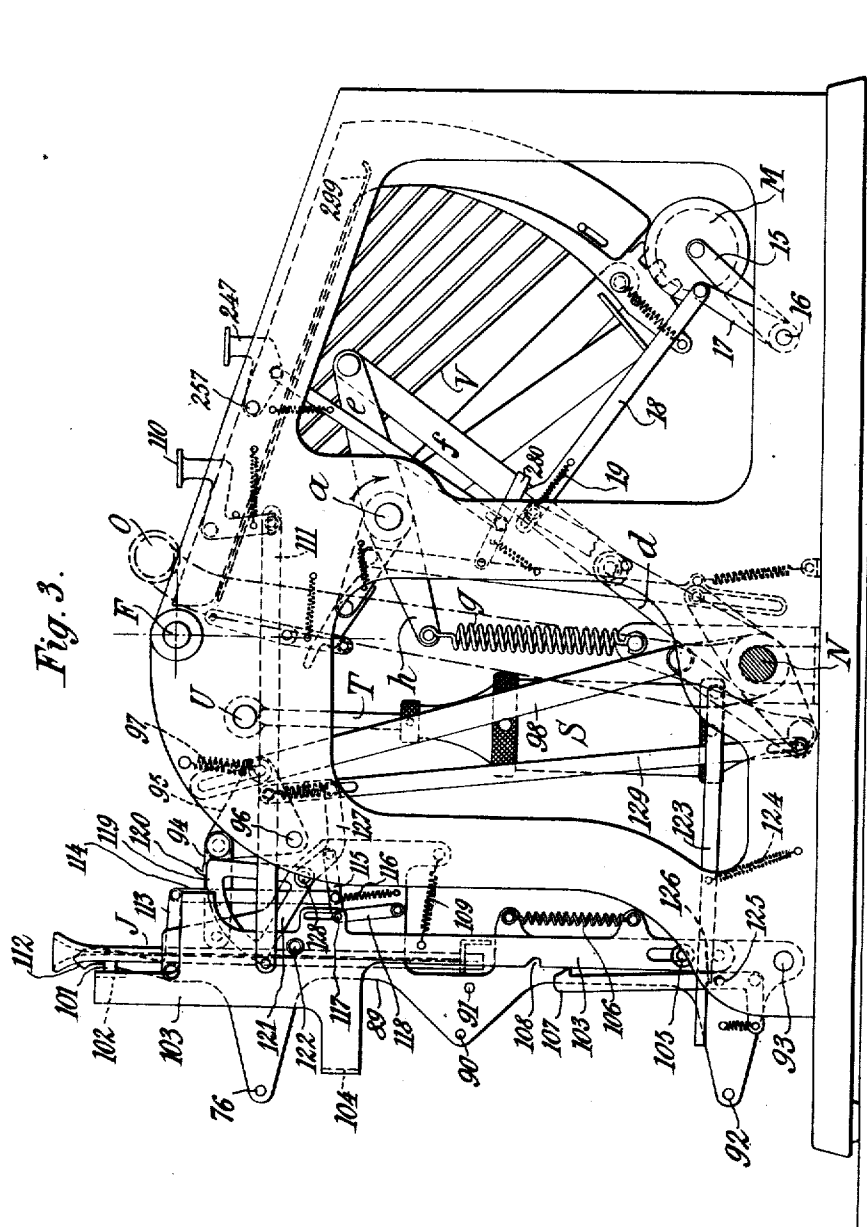
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J. R. PEIRCE.
MACHINE FOR CHECK MAKING, &c.
APPLICATION FILED FEB. 25, 1909.

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19 SHEETS—SHEET 2.



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19 SHEETS—SHEET 3.

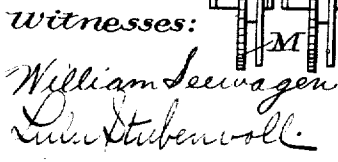


Fig. 4

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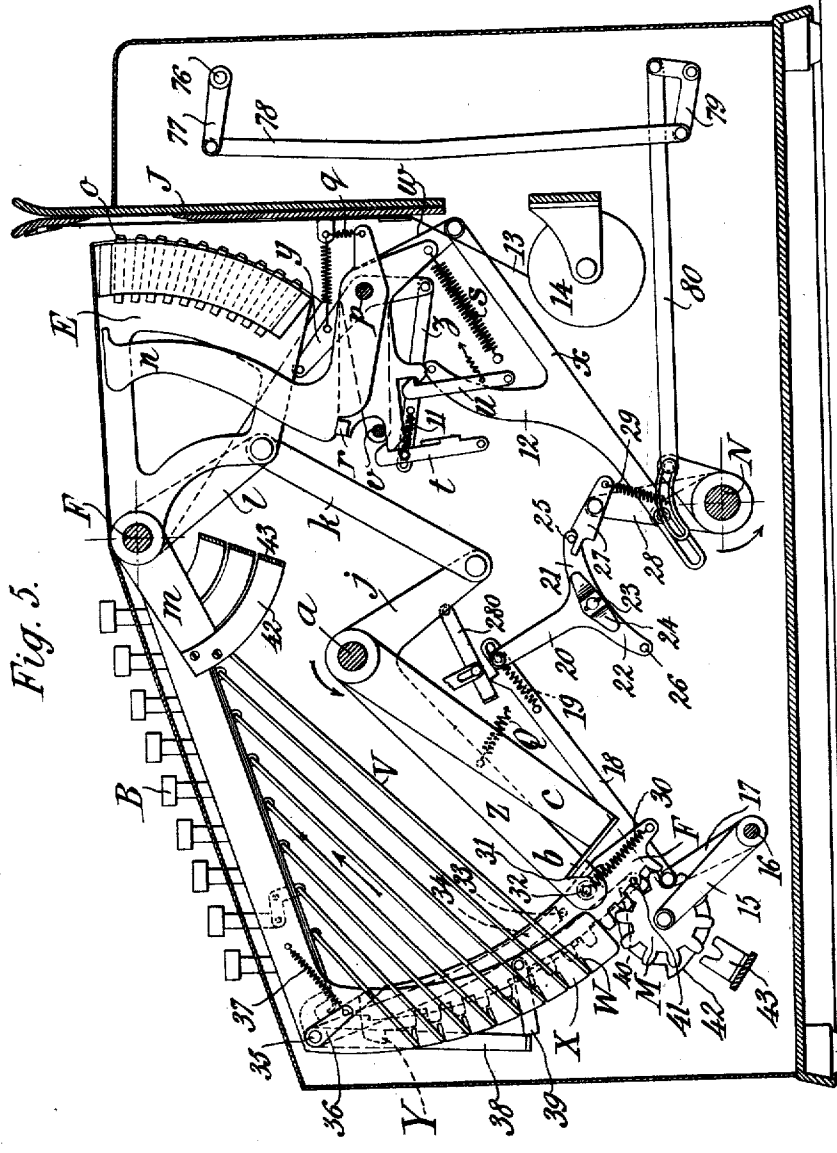


Fig. 5.

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19 SHEETS—SHEET 5.



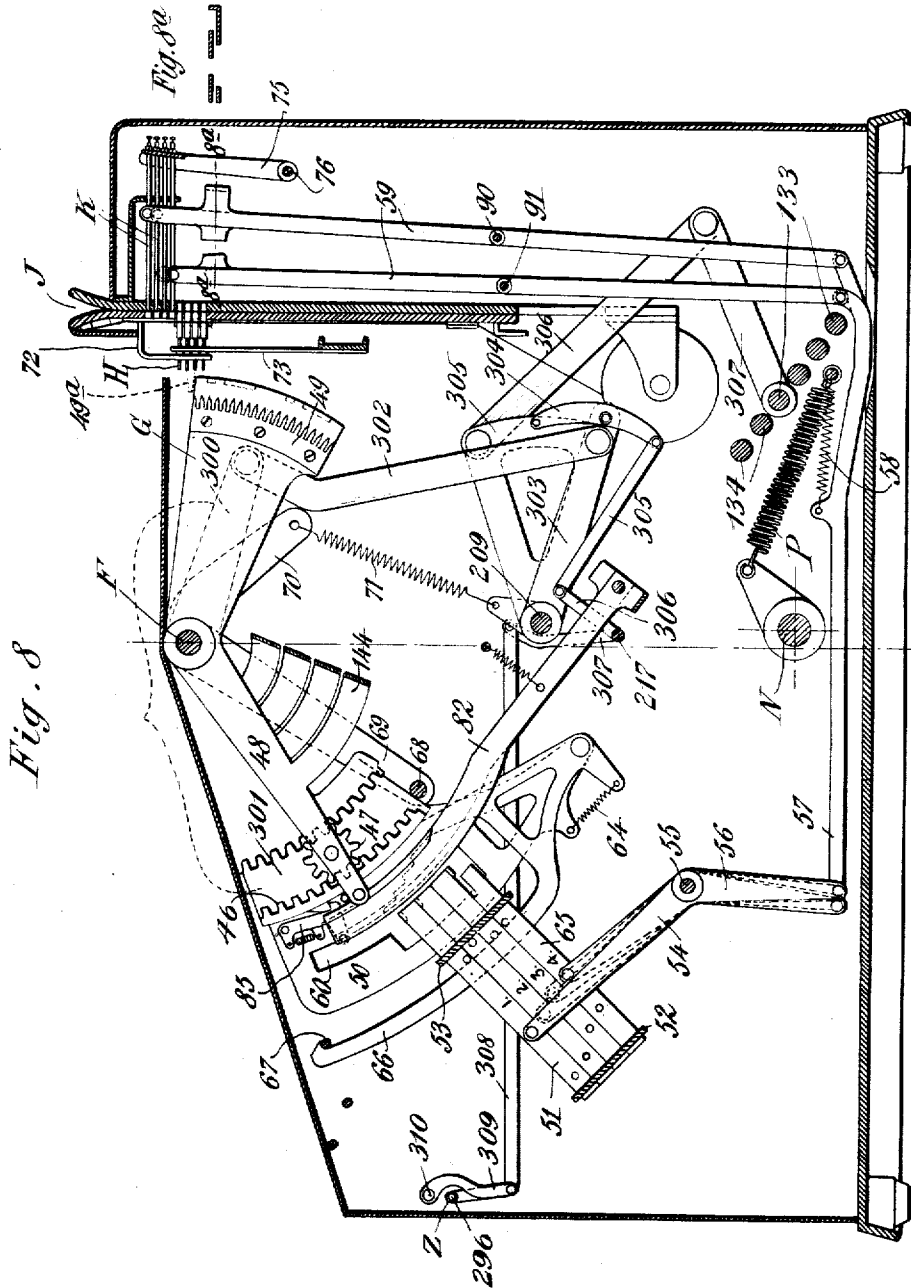
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19 SHEETS—SHEET 6.



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Patented Mar. 26, 1918.
19 SHEETS—SHEET 7.

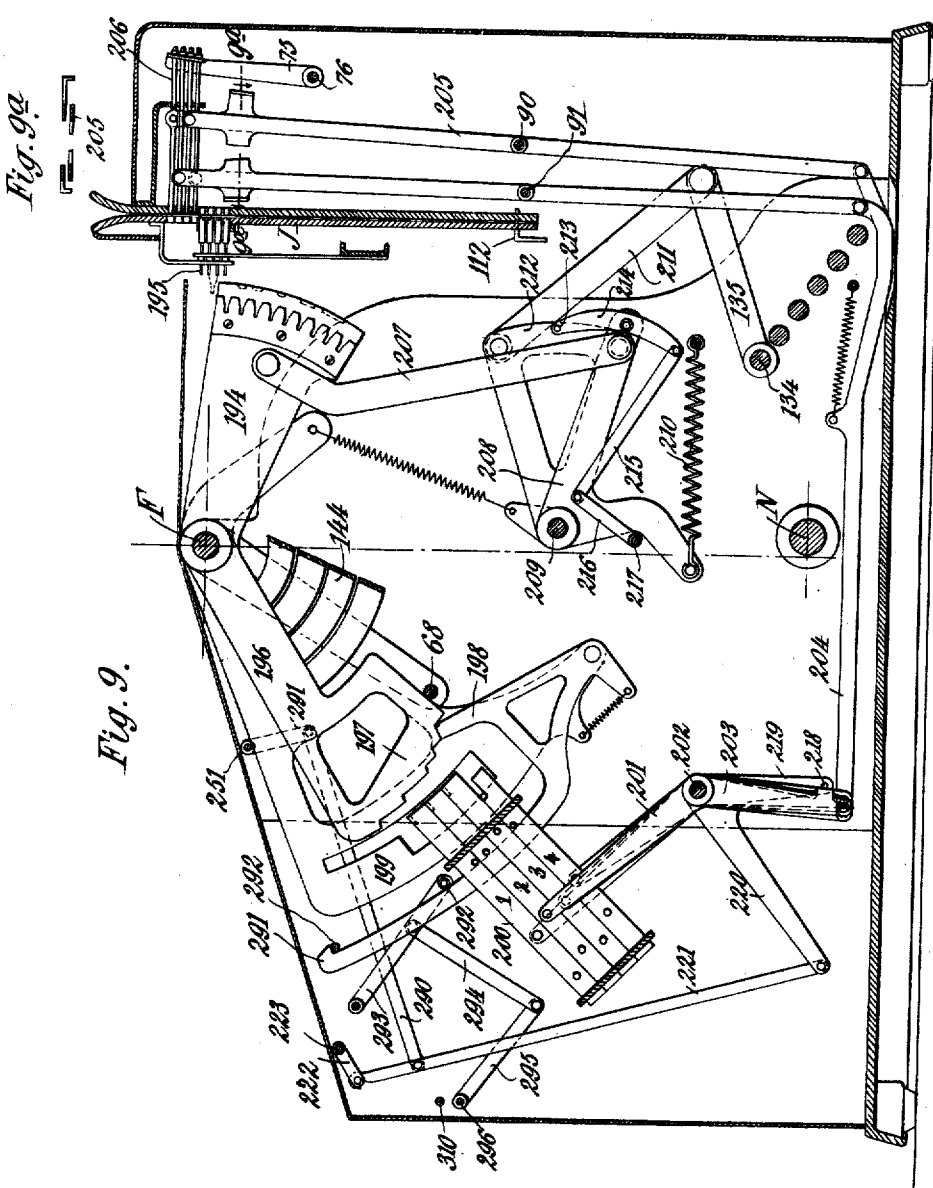
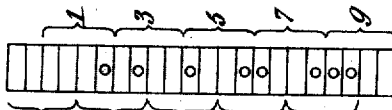


Fig. 9.

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Fig. 9b



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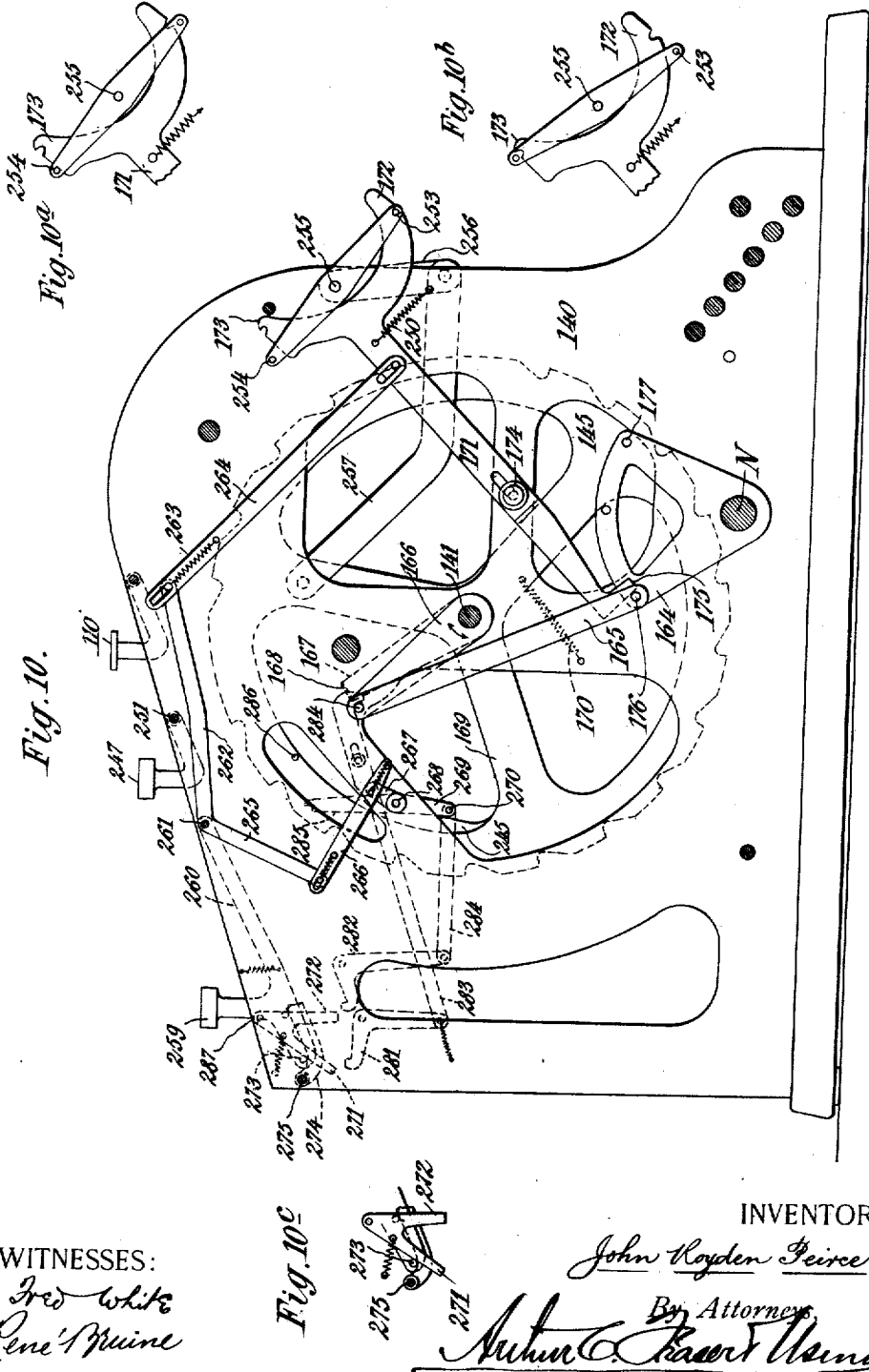
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1,260,704.

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19 SHEETS—SHEET 8.



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19 SHEETS—SHEET 9.

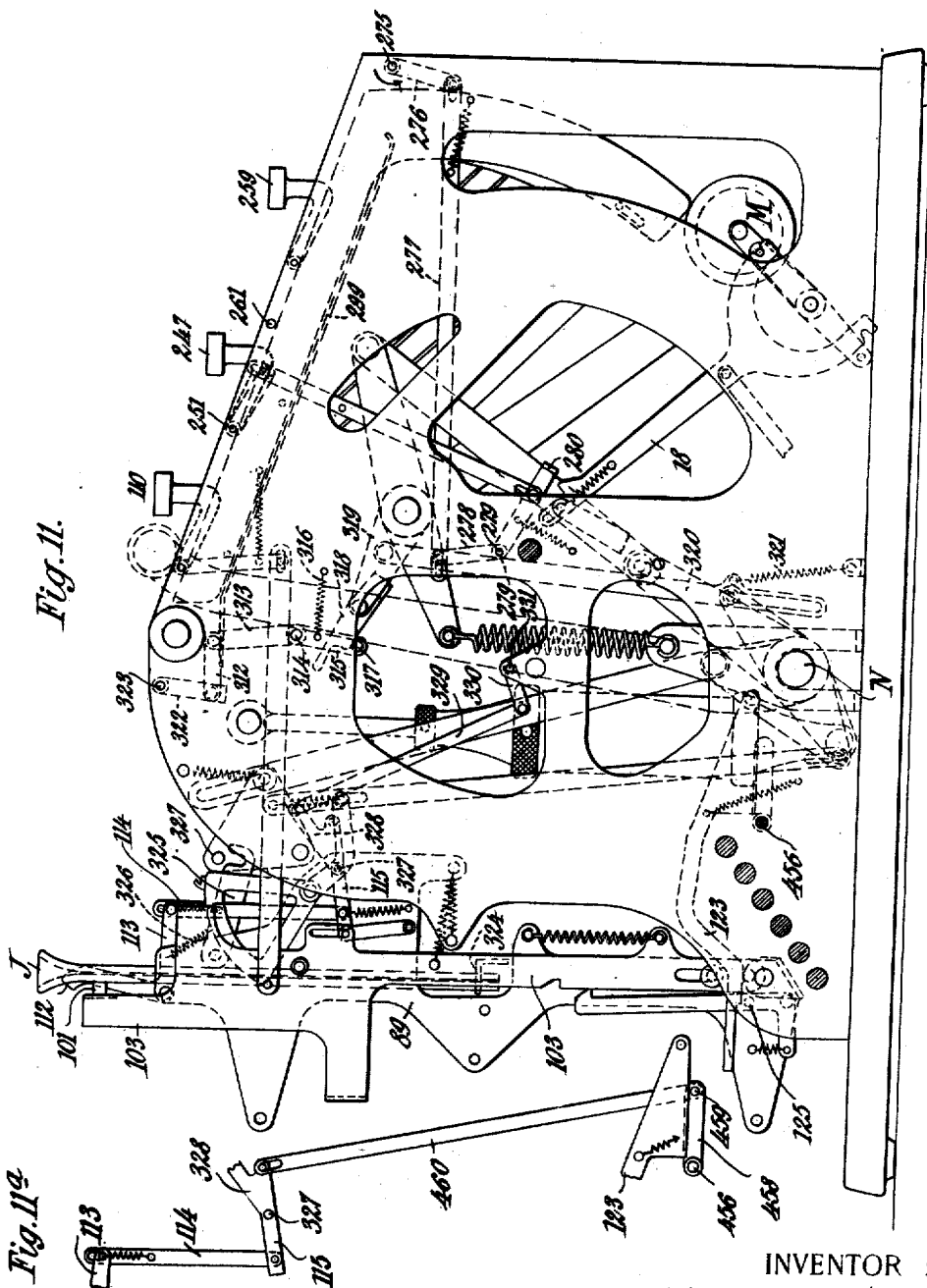


Fig. 11.

Fig. 11a.

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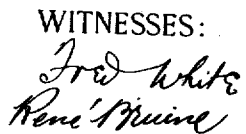
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19 SHEETS—SHEET 10.

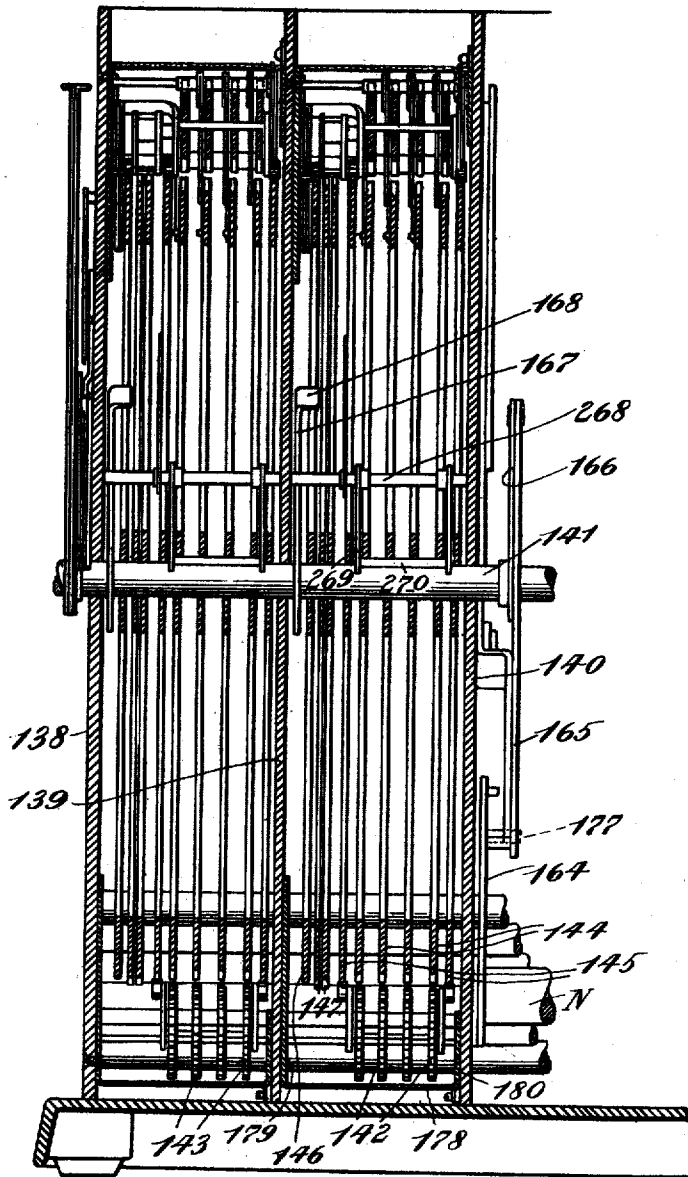


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1,260,704.

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19 SHEETS—SHEET 11.

Fig. 17.



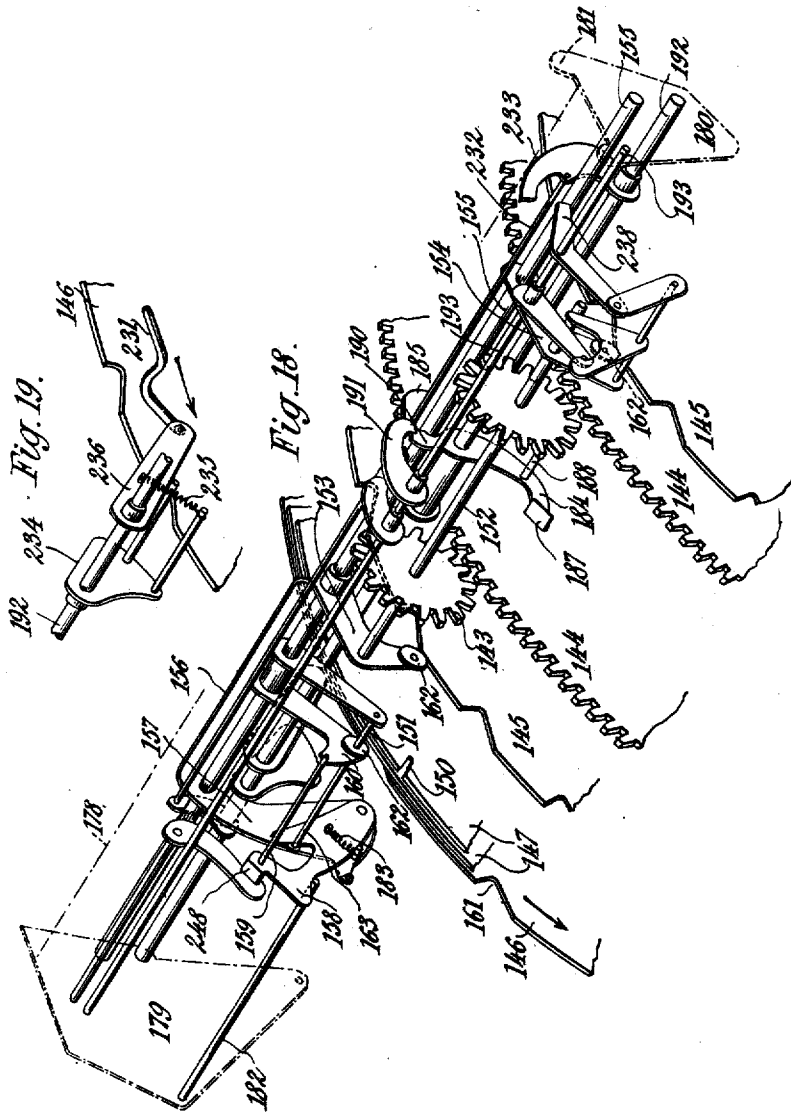
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19 SHEETS—SHEET 12.



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19 SHEETS—SHEET 13.

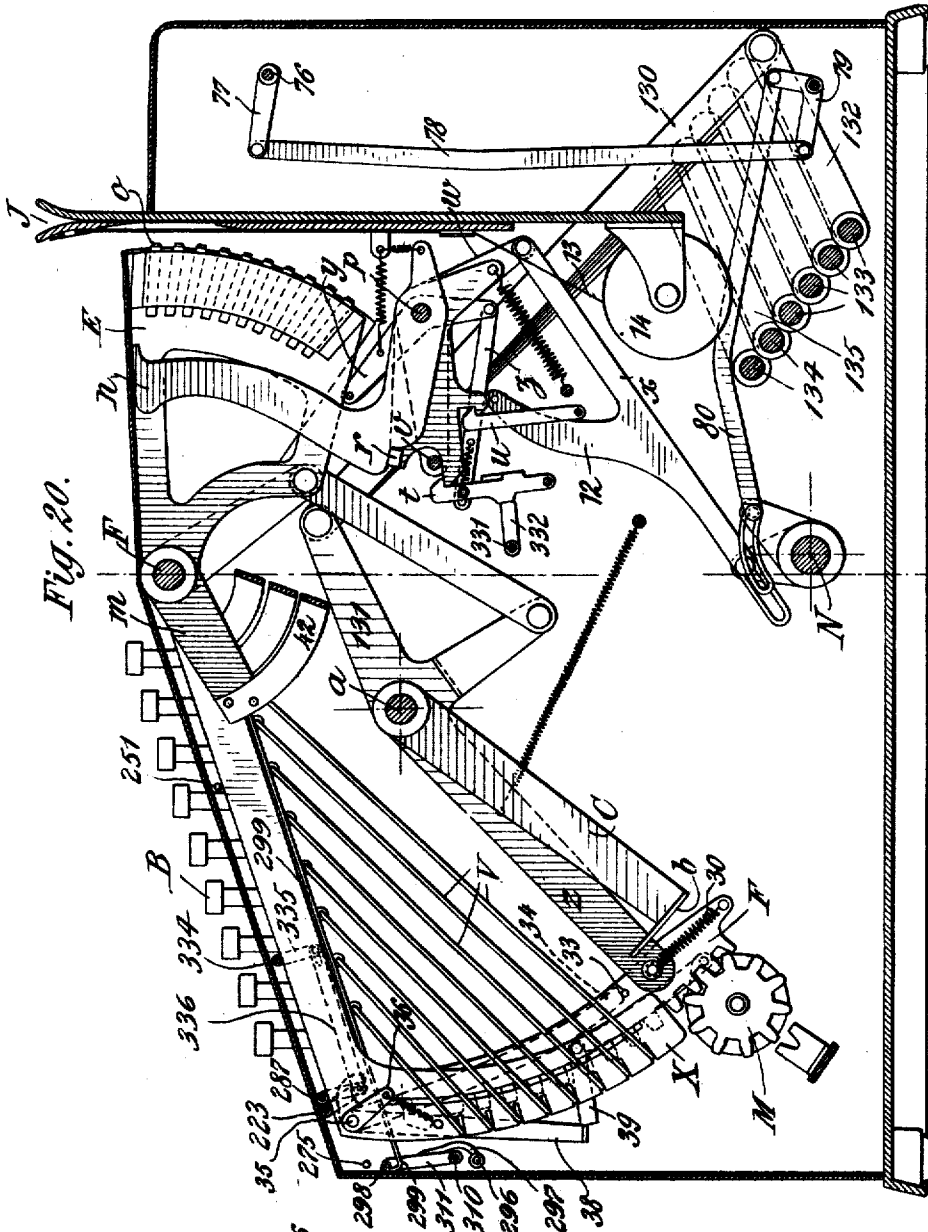
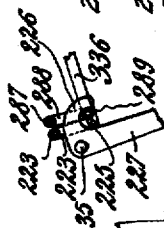


Fig. 20.

Fig. 21.

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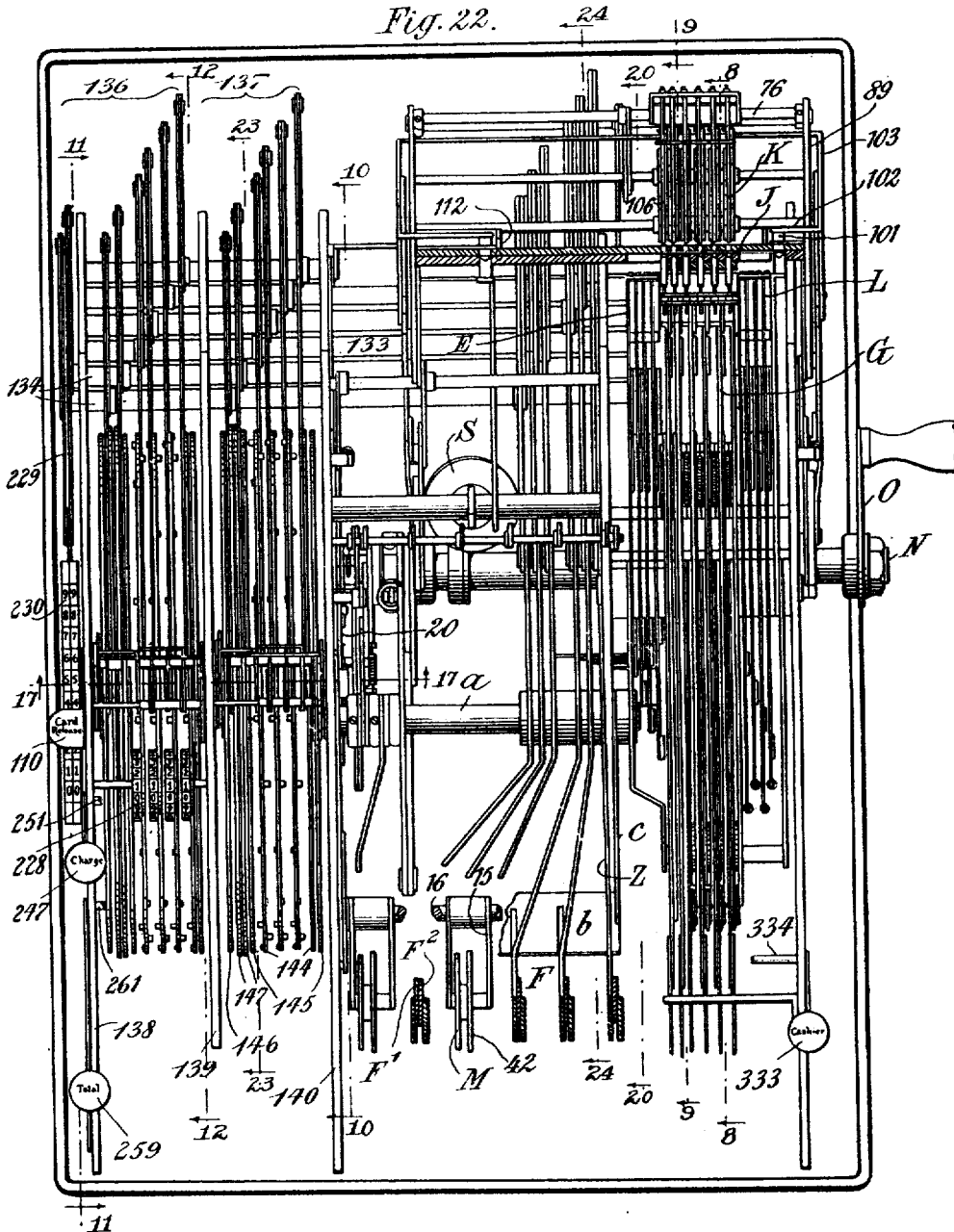
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Fig. 22.



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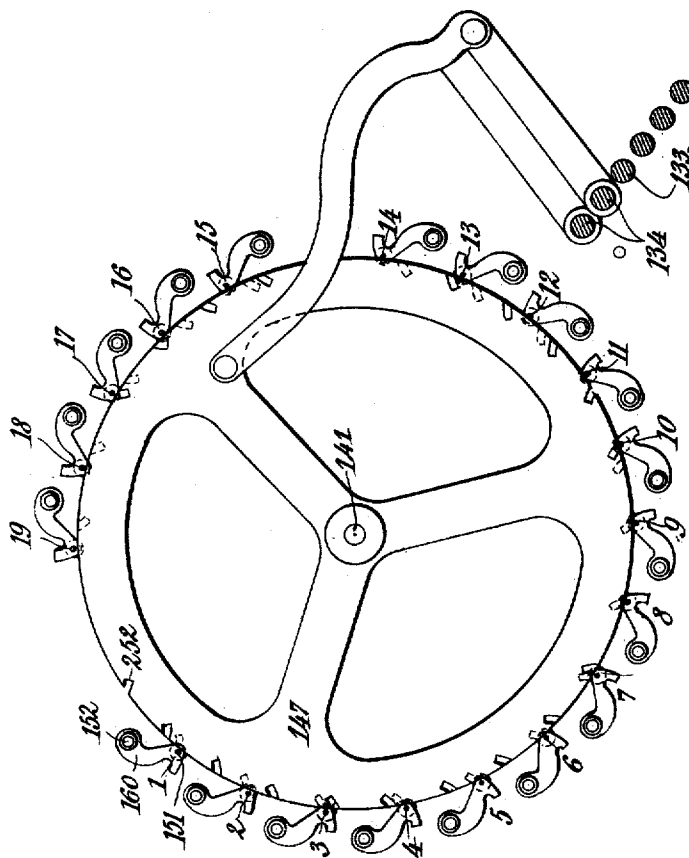
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19 SHEETS—SHEET 15.

Fig. 23.



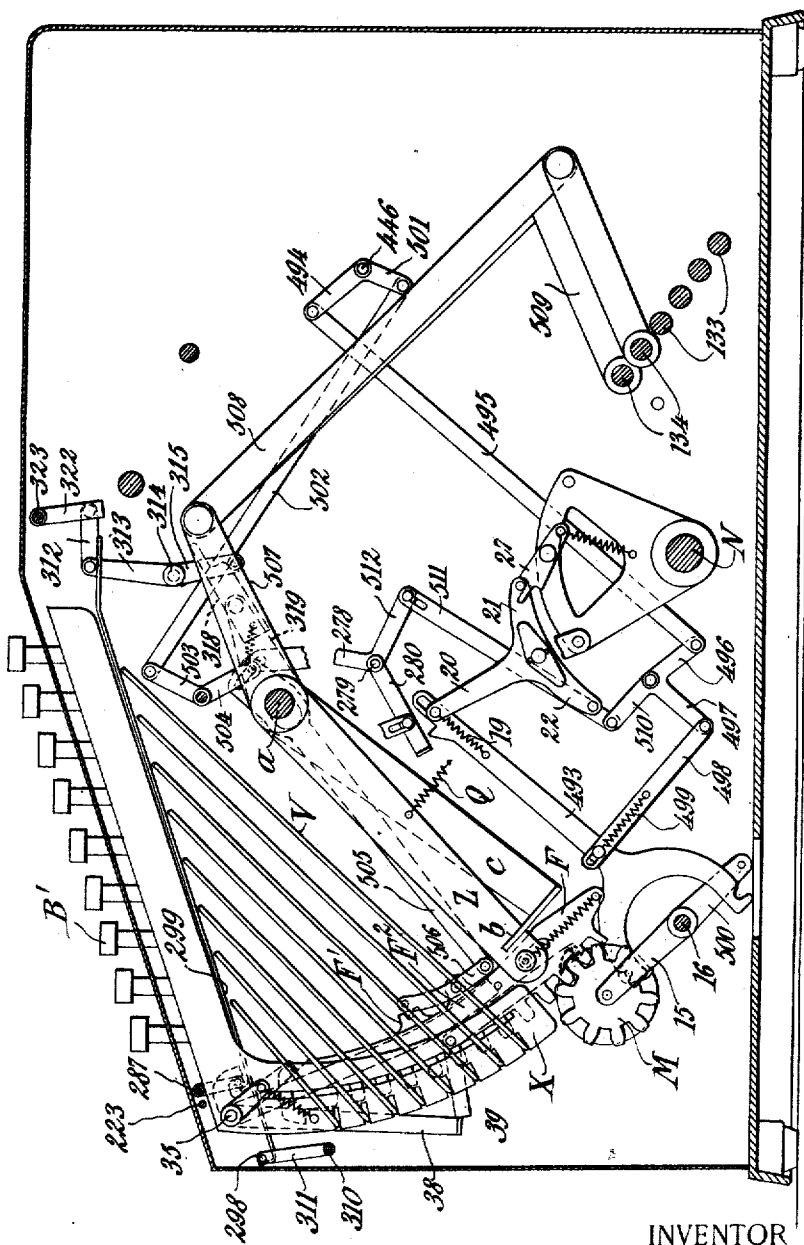
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19 SHEETS—SHEET 16.

Fig. 24.



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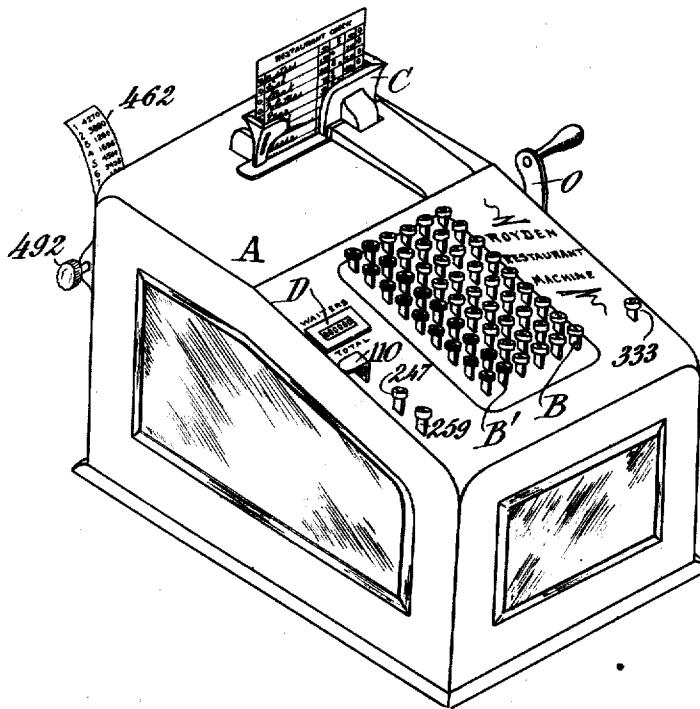
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19 SHEETS—SHEET 17.

Fig. 25.



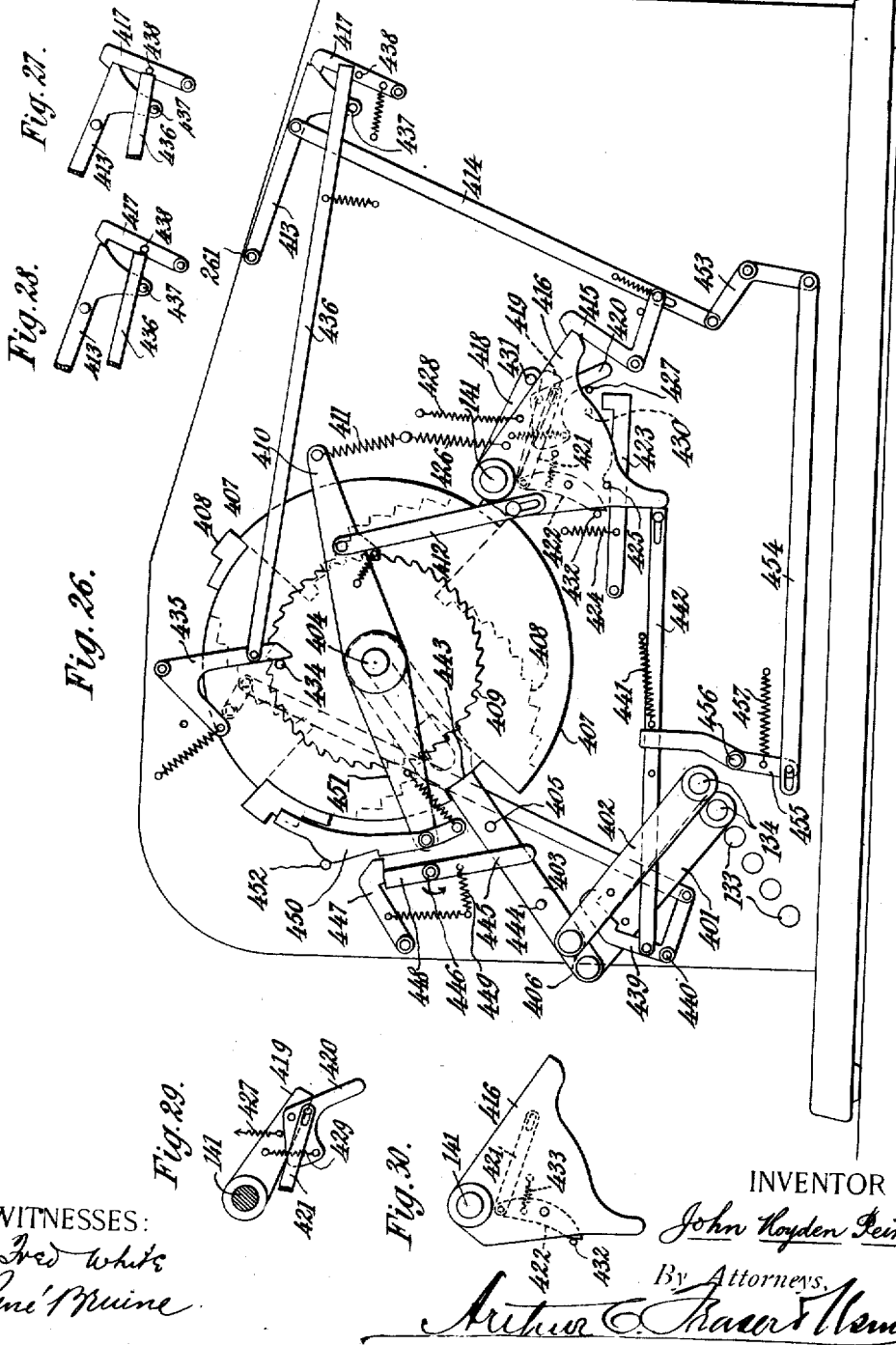
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APPLICATION FILED FEB. 25, 1909.

Patented Mar. 26, 1918.
19 SHEETS—SHEET 18.



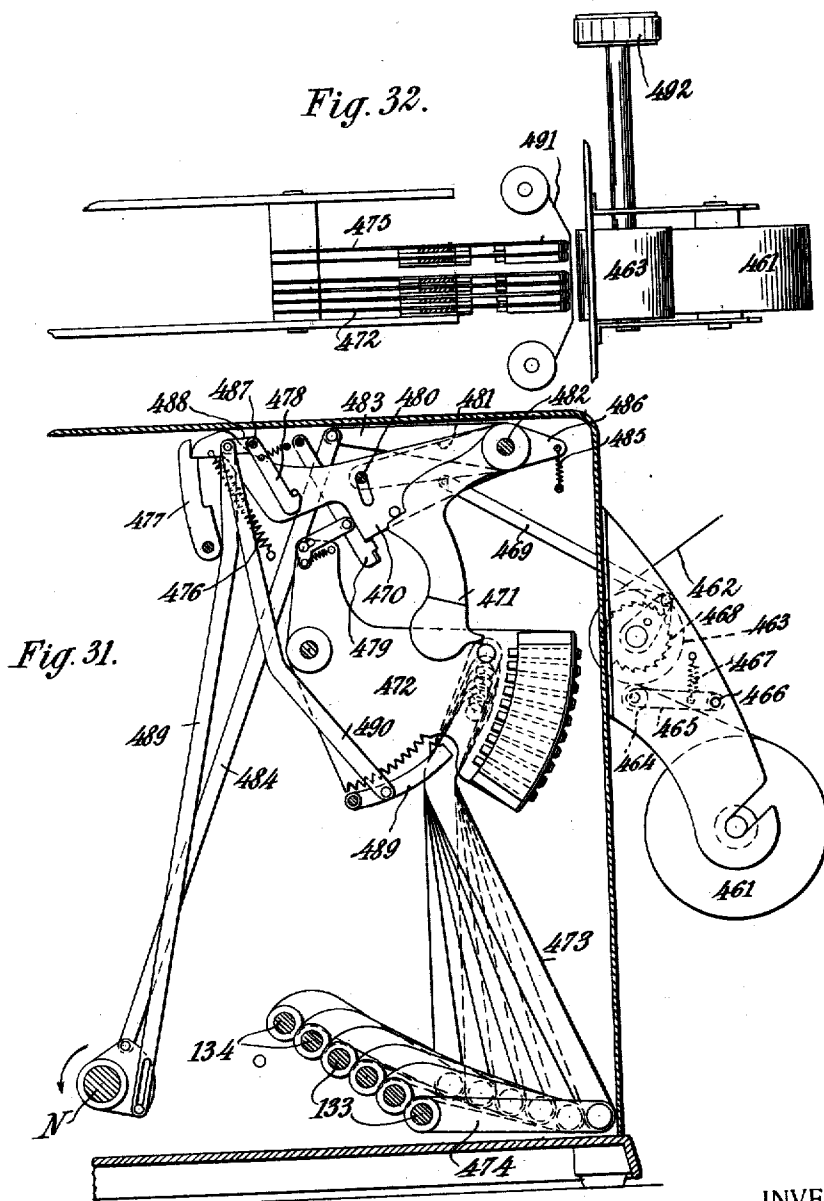
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19 SHEETS—SHEET 19.



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UNITED STATES PATENT OFFICE.

JOHN ROYDEN PEIRCE, OF NEW YORK, N. Y.

MACHINE FOR CHECK-MAKING, &c.

1,260,704.

Specification of Letters Patent.

Patented Mar. 26, 1918.

Application filed February 25, 1909. Serial No. 480,052.

To all whom it may concern:

Be it known that I, JOHN ROYDEN PEIRCE, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Machines for Check-Making, &c., of which the following is a specification.

In restaurants it is common for the waiters to write on their checks the goods ordered, and after getting the goods to have the prices thereof stamped on the check by a clerk, so as to avoid error and save collusion between the waiters and the guests to cheat the restaurant. This invention provides machines for doing the work of such a clerk or any similar class of work, and for performing several supplementary accounting operations, the chief of which is the adding of the individual amounts printed and the carrying of the total always on the check, and this notwithstanding the fact that the waiter may receive or fill the order in sections at different times, and that the machine in the interval will have to be used for making out checks for other waiters. This operation is preferably insured by perforating the card in a manner to indicate according to any desired system the last total, and by using such perforations when the card is again put into the machine to properly influence the next total. The machine may also carry adding wheels which register the total of all the amounts recorded. The checks thus made out may also be used by the cashier in listing machines and in various other ways. The machine may also be arranged for keeping a separate total of the checks of each waiter; this individual account being listed on a ribbon of paper, or being simply registered in the machine where it can be inspected at any time; this mechanism being referred to as a distributing mechanism.

The accompanying drawings illustrate embodiments of the invention.

Figure 1 is a face view of a check made out with this machine.

Fig. 2 is a face view of a modified check.

Figs. 3 to 7 inclusive illustrate a simple type of apparatus.

Fig. 3 is a left-hand side elevation of a machine without the distributing attachment.

Fig. 4 is a plan, partly in horizontal section, of the same machine.

Fig. 5 is a longitudinal section through the amount printing portion of the same machine (approximately on the line 5—5 of Fig. 4).

Fig. 6 is a parallel section through the balance punching mechanism of the same machine (approximately on the line 6—6 of Fig. 4).

Fig. 6^a is a section on the line 6^a of Fig. 6.

Fig. 7 is a table illustrating the system of perforating adopted.

Figs. 8 to 24 inclusive illustrate a similar machine with a distributing attachment.

Fig. 8 is a longitudinal section (that is to say, from front to back) through the balance punching portion of the machine having a distributing attachment (approximately on the line 8—8 of Fig. 22).

Fig. 8^a is a section on the line 8^a of Fig. 8.

Fig. 9 is a sectional view on a plane parallel with that of Fig. 8 and just in the rear thereof (approximately on the line 9—9 of Fig. 22) for punching waiters' numbers.

Fig. 9^a is a section through the line 9^a of Fig. 9.

Fig. 9^b is a table illustrating the system of perforations for Fig. 9.

Fig. 10 is a side elevation of the right-hand side of the distributing mechanism (approximately on the line 10—10 of Fig. 22).

Figs. 10^a and 10^b are similar views of a part of the mechanism of Fig. 10 in different positions.

Fig. 10^c is a view in full lines of a part of the apparatus shown in dotted lines in Fig. 10.

Fig. 11 is a side elevation of the left-hand side of the check-making part of a machine (approximately on the line 11—11 of Fig. 22).

Fig. 11^a is a detail of Fig. 11.

Fig. 12 is a longitudinal section through the distributing mechanism, (approximately on the line 12—12 of Fig. 22) different planes of section being shown at different points of the circumference.

Fig. 13 is a front elevation of a portion thereof.

Fig. 13^a is a detail in perspective of Fig. 13.

Fig. 14 is a view of one of the distributing devices from the center of the machine.

Figs. 15 and 16 are respectively a front and a back elevation of one of the registering devices separated from the frame.

Fig. 17 is a vertical section through the distributing mechanism (approximately on the line 17—17 of Fig. 22).

Figs. 18 and 19 are details of the same in perspective.

Fig. 20 is a longitudinal section through the portion of the machine carrying the amount keys (approximately on the line 20—20 of Fig. 22).

Fig. 21 is a detail in full lines of devices appearing in dotted lines in Fig. 20.

Fig. 22 is a plan of the inside mechanism, partly in section.

Fig. 23 is a longitudinal section, showing the selecting rings in the distributing mechanism (approximately on the line 23—23 of Fig. 22).

Fig. 24 is a longitudinal section through the portion of the machine carrying the selecting keys (approximately on the line 24—24 of Fig. 22).

Fig. 25 is a perspective view of the machine with the listing mechanism at the right-hand side of the machine of Fig. 22.

Figs. 25 to 32, inclusive, illustrate a machine including the recording mechanism and also a listing mechanism.

Fig. 26 is a side elevation of the feeding and controlling mechanism of the listing portion of the apparatus looking at it from the left-hand side.

Figs. 27 and 28 indicate different positions of a detail of Fig. 26.

Figs. 29 and 30 are details of Fig. 26, separated for the sake of clearance.

Fig. 31 is an elevation of the interior parts of the listing mechanism, looking in a direction opposite to that of Fig. 26.

Fig. 32 is a plan of the mechanism of Fig. 31 partly in horizontal section.

The machine of Figs. 3 to 7 inclusive punches the cards and carries a continuous balance on each card, as shown in Fig. 1. The total of the amounts applied to the special checks is shown on a register in the machine.

The machine of Figs. 8 to 24 is provided with a number of registers for keeping separate accounts of the amounts collected by each of the waiters and makes a card like

that shown in Fig. 2, perforating the waiter's number in a column between the separate amount column and the balance column; and has means for selecting the proper register according to the card which is introduced and applying the amount to such register so as to distribute the several amounts upon the proper registers.

The apparatus of Figs. 25 to 32 has the registering and distributing mechanism above referred to and in addition a listing mechanism whereby at the end of a day a printed list can be made showing the identifying numbers of the various registers and the amounts registered thereon, and adding these amounts.

Style of check and manner of use.

The style of check illustrated in Fig. 1 shows simply the waiter's number and any other usual or suitable provisions, and is ruled in lines preferably of considerable vertical distance apart so as to be able to make a card which shall be compact in width, the making of a perforated record calling for a certain number of spaces which must be provided either in the width of the sheet or in the height of the spaces between the individual lines. The items of the order, such as oysters, fish, steak, etc., are written in by the waiter, and when he arrives at the clerk's desk he simply inserts the card in the pocket of the machine, shoving the card down until only its first line containing the word "Oysters" appears. The clerk then presses buttons for indicating the cost, and pulls the lever. This prints the cost in the first column and the last column, and perforates the intermediate column to indicate the same amount. The return of the handle of the machine feeds the check up one step so as to bring the next line containing the item "Fish" in view, whereupon the clerk presses the keys according to the amount and pulls the lever as before. The cost of the fish is printed in the first column, while the second and third columns record the cost of the fish plus the previous total. This operation is continued for as many items as are written on the check, and is repeated whenever new items are written there by the waiter and the check again put in the machine.

Where the machine is provided with a distributing mechanism a group of keys such as those indicated in black in Fig. 25 is provided for registering the individual numbers of the waiters. The card of this machine is shown in Fig. 2. The waiter's number is printed on the top of the check, and the clerk simply presses down the corresponding number in the black keys before making the regular entries on the check. The machine at the same time punches holes

in the margins of the check by means of which it is fed up step-by-step.

System of perforations.

5 The several numerals are represented by various combinations of perforations located in one or more of four certain spaces as indicated in each of the bracketed groups in Fig. 7. The four spaces for each decimal
10 place in the card indicated (Figs. 1 and 2) are arranged in a vertical column one above another and make up the width of one horizontal line on the card; a horizontal "line" being the space allowed for writing in one item, as "Oysters," or "Fish." In four spaces
15 there can be the ten different combinations necessary to represent the ten digits from 0 to 9, and any combination may be selected to represent any desired numeral.
20 The different combinations are preferably arranged in a certain order for convenience in the machine. The system will be understood from Fig. 7 which shows four spaces bracketed together for each numeral, so as
25 to show the particular combinations of perforated spaces which represent the several numerals from zero to nine. For convenience the successive spaces (in each group of four spaces) may be called No. 1, No. 2,
30 No. 3, and No. 4 from the uppermost to the lowest. The successive numerals 0, 1, 2, etc., are represented by combinations which overlap each other as indicated by the brackets at the margins of Fig. 7; that is
35 to say, in the system of Fig. 7, spaces Nos. 2, 3 and 4 of one figure (as 5) correspond with spaces 1, 2 and 3 of the next higher figure (as 6). It results from this arrangement that the punching plate has to be
40 shifted (for Fig. 7) only one-fourth of the height of a line in order to shift from one numeral to the next.

Referring to the embodiments of the invention illustrated, the casing A (which is
45 shown in Fig. 25 for the listing machine and is similar for the non-listing and the non-distributing type of Figs. 3 to 7) is of approximately the shape of that of a Burroughs adding machine, with keys B in rows
50 projecting out of the top of the machine near the front, and is provided with a pocket C at the rear right-hand side for receiving a card.

The amount-printing mechanism (Figs. 4 and 5) includes four sector-shaped type-carriers E pivoted on an upper shaft F and whose movements are controlled by certain racks at the front of the machine, which racks have a movement at each operation of
60 the machine limited in extent by the keys B. The racks are indicated at F, and are preferably offset laterally from the planes of the corresponding type-carriers in order to provide plenty of space.

The balance or total-punching mechanism 65 includes sectors G (Figs. 4, 6 and 8) carrying punching plates with suitable groups of perforations therein; and punches H arranged in vertical rows of four each which are held at a fixed height; the arrangement
70 of perforations, or rather of solid spaces in the punching plates, serving to resist backward movement of certain punches and to cause such punches to perforate the check when the pocket J carrying the check is
75 pressed forward against said punches. The movement of the punch-plate carrier G about the upper shaft F on which it is supported is the resultant of two movements, that of the type-carrying sectors E previously
80 referred to, and that of a previous-balance registering device whose movement is determined by means of feelers K located at the rear of the check and in position to be
85 advanced through the perforations upon the line above that which is being recorded.

The printing of the balance or total is effected by means of type-carrying sectors L (Fig. 4) similar to the carriers E for printing the amount, supported upon the same
90 upper shaft F and connected by cross-connections to the punching-plate carriers G so as to have the same movement as the latter carriers.

Certain adding wheels M (Figs. 4 and 5) 95 are provided which at each operation of the machine are rotated by means of the racks F and in accordance with the movements of said racks, so as to carry always the total of all the amounts recorded. These wheels
100 are thrown down out of the paths of their operating racks upon the advance movement of the machine, and are then thrown into gear with the rack so as to be turned
105 only by the return movement of the machine. This operation is effected through a three-armed lever 20, 21 and 22 hereinafter referred to.

The operating or main shaft N is located near the bottom of the machine running
110 transversely and provided with a handle O which is pulled forward slowly and allowed to return under the pull of a spring P (Fig. 6). The pull of the handle causes
115 generally the release of the sectors or of their immediate actuating devices from the resetting bar b hereinafter referred to, which are then drawn by individual springs to appropriate distances, the springs for actuating the type-carrying sectors E being
120 indicated at Q (Fig. 5) and those for actuating the punch-plate carriers, and the corresponding total-printing carriers being attached to rearwardly extending arms of the latter, as indicated at R in Fig. 4. For
125 clearness' sake only a portion of the length of the spring Q is shown in Fig. 5. It will be understood that the spring must be long

enough to effect the full movement of the type-carrying sector. Said operating shaft N also causes the movement of the adding wheels M into and out of operative position; 5 releases the printing hammers from their resetting mechanism so as to allow them to act when they are tripped; and presses in the pins K or feelers for ascertaining the previous total. The pocket J is pulled forward at the last part of the forward stroke 10 of the handle, and is returned at the beginning of the return stroke. The speed of the movement is preferably limited in both directions by means of a dash-pot S (Fig. 3) 15 attached to an arm on the shaft N and having its piston rod T supported by a short cross-rod U.

Amount printing mechanism.

20 I distinguish by the term "amount" the individual prices of the several items as distinguished from the total. This part of the mechanism is substantially the same as that of the well-known Burroughs adding machine. The keys B actuate levers which pull 25 the rods V whose lower bent ends extend through slots W in fixed guide plates X, the ends of said rods extending across between pairs of such plates X as indicated in Fig. 30 4, so that the racks F which are guided between said pairs of plates X and which have at their upper ends projections Y will be stopped in their downward movement by the striking of the projection Y against 35 the bent end of one of the rods U.

The racks F are moved downward by means of arms Z, one connected to each of said racks, pivoted upon an intermediate shaft a and normally pulled down by the 40 springs Q previously referred to. The arms Z are held from downward movement ordinarily by means of a slitted cross-bar b constituting a sort of comb between the teeth of which lie the lower ends of the arms Z, 45 the cross-bar b being carried by arms c fixed on the shaft a. The shaft is rotated to the left on the forward movement of the main shaft by means of arms d and e on the shafts and a connecting link f, Fig. 3, 50 and is retracted by means of a spring g connected to an arm h on the shaft a. The turning of the intermediate shaft a therefore permits the downward movement of the arms Z and the racks carried thereby.

55 The arms Z are connected with arms j which actuate the type-carriers E; being connected for this purpose by means of links k with the carriers E and also with arms l connected to separate sleeves on the shaft F 60 each of which sleeves is connected to one of the forward arms m which serve to transmit motion to the total-punching mechanism.

Each type sector is provided with a hammer n (Fig. 5) in line with the types o,

the hammers being pivoted on a cross-shaft p and held back by a spring q against a follower r also pivoted on the shaft p and pressed upward by a spring s and normally 70 restrained by a pair of pawls t and u. The followers r are normally held down by a resetting rod v extending across projecting portions of them and carried on an angle lever w whose opposite arm is connected to 75 a link x the opposite end of which is connected by a pin and slot to an arm on the main shaft N by which it is pulled forward during the advance movement of the shaft and raises the resetting rod v so as to release the followers therefrom. Each carrier 80 E has its lower edge bearing on a pin on the upper end of a lever y which is spring-pressed toward the rear and whose lower end is connected to a link z which is connected by a spring 11 and a pin-and-slot 85 connection to the pawl t. The link x has an upwardly projecting arm 12 carrying a pin adapted to strike the pawl u and disengage it on the forward movement of the link. The pawl t operates in the usual way 90 to prevent the action of the hammer and the printing of the numeral whenever that numeral is zero and is at the left of the amount to be printed. The pawl u serves to hold the follower down until the corresponding type carrier has had time to assume its final position, whereupon the pawl u is struck by the pin on the arm 12 and the follower is released and throws up the hammer which strikes the type. 100

The inking mechanism may be of any usual or suitable arrangement. Preferably a ribbon 13 (Figs. 5 and 6) is used passing from a spool 14 upward for the amount-printing mechanism and then across the top 105 of the balance-punching mechanism, and then downward (as indicated in Fig. 4) for the balance-printing mechanism to a similar spool.

Adding wheels.

110

The adding wheels M (Figs. 3, 4 and 5) are carried in frames 15 fixed on a shaft 16 which shaft carries an arm 17 connected to the lower end of a link 18 the upper end of 115 which is connected by a spring 19 and a pin-and-slot connection to one arm 20 of a three-armed lever 20, 21, 22 pivoted on a stud 23 projecting inward from the left-hand frame of the machine and which stud 120 carries a friction spring 24 for holding the three-armed lever impositively in either position to which it is set. At the ends of the arms 21 and 22 are pins 25 and 26 respectively by which the lever is tripped in one 125 direction or another. The tripping is effected by a double-action pawl 27 mounted on an arm 28 on the main shaft and having a spring 29 tending to return the pawl always to its central position. Starting from the 130

position of Fig. 5, when the shaft N is rocked forward the double pawl will first force up the pin 25 before the pawl can pass with its arm 28. At the end of the movement of the main shaft the double-action pawl will strike the pin 26 and will yield so as to bring the parts to the position opposite to that shown in Fig. 5. On the return action the pawl will act positively on the pin 26 to throw it up in order to permit the pawl and its arm 28 to pass backwardly. Thus the three-armed lever is used to effect a downward disengaging movement of the adding wheels M in the first part of the forward movement of the main shaft and to throw said adding wheels up into the position of engagement in the first part of the return movement, so that the wheels gear with the racks before the latter commence to move.

It may be desired to perform operations which are not to be registered on the adding wheels M, and for this purpose to hold the adding wheels out of gear throughout both the forward and the return movements of the shaft; or to hold the adding wheels M in gear with their racks during both the forward and the return movements of the shaft.

When a wheel passes from 9 to 0 it is necessary to carry 1 to the wheel of the next higher decimal place. This carrying is effected by permitting an additional movement of one step on the part of the rack of the next higher decimal place, this movement being accomplished by a spring 30 (Fig. 5) and a slot 31 in the rack engaging the pin 32 of the arm Z; the spring pulling the rack up a distance equal to the length of the slot, which corresponds with one step of the rack. Normally the racks are stopped in the position shown by means of pins 33 carried on the several racks and adapted to strike the ends of stops 34 pivoted on the shaft 35 near the top of the machine and provided with arms 36 pulled toward the rear by springs 37; and provided also with arms 38 extending downward and normally restrained by engaging the ends 39 of angle-levers the opposite arms 40 of which are provided with pins 41 projecting laterally into the paths of cam projections 42 carried by the adding wheels of next lower decimal places. Thus when any adding wheel M passes from 9 to 0 the projection 42 strikes the pin 41 and throws the arm 40 inward and the arm 39 downward, which removes the strain on the arm 38 and allows the spring 37 to pull the stop-arm 34 to the rear out of the path of the pin 33 carried by the rack of the next higher decimal place, whereupon this rack moves up one extra step as previously stated and adds 1 to the amount which would otherwise be carried on its adding wheel. To prevent rotation

of the adding wheels when they are out of gear with the racks, a fixed lock 43 is provided in position to engage the teeth of the several wheels when they are pressed down.

At the left beyond the three racks F in the plan, Fig. 4, are shown extra adding wheels M each of which is operated one step upon each tenth step of the adding wheel of the next lower decimal place.

Balance punching mechanism.

For transferring to this mechanism the movement of the amount type carriers the forward arms *m* of the latter previously referred to are provided with annular projections 42 (Fig. 5), which by means of transverse plates or bars 43 are connected to similar annular projections 44 (Fig. 6) from a member 45 consisting of racks which thus have downward angular movements corresponding to the upward movements of the several type carriers E.

In the same planes with the racks 45 are racks 46 which receive an angular movement corresponding with that of the previous total. Racks 46 are mounted on plates located between the plates 45 and supported on the shaft F. Between each pair of racks is a pinion 47 engaged with both said racks and carried on a forward arm 48 of a punching-plate carrier G. The movement of the center of the pinion 47 is the mean of the movements of the two racks 45 and 46; that is to say, it is one-half of the sum of these two movements. But of course, the punching-plate carrier must advance a number of steps equal to the total of these two movements, not one-half the total. This is provided for by making the distance between the successive steps of the punching-plate carrier only half as great, by overlapping each space for one-half its length upon the previous space, as above explained in connection with Fig. 7. The movement of the carrier therefore corresponds with the sum of the movements of the two racks 45 and 46. The usual or any suitable registering plate 49 is provided on each of the punching-plate carriers. The control of the previous-balance rack 46 is effected by first dividing the nine digits into groups and then into individuals. The individual controlling device 50 (supported on the shaft F) has its movements limited by rods 51 (Nos. 1, 2, 3 and 4) sliding in fixed guiding plates 52 and 53 and connected with the arms 54 on sleeves on a shaft 55, the several sleeves having downward arms 56 connected with the several horizontal links 57 which are drawn to the rear separately by springs 58 and which at the rear actuate levers 59 (Figs. 6 and 8, Nos. 1, 2, 3 and 4) the upper ends of which are attached to the feelers K (Nos. 1, 2, 3 and 4). The first three of the rods 51 are provided

130

with small flanges on their rear ends to limit in succession the movement of the member 50. The downward movement is limited by the top of the slot 60 striking the flange on the first of the rods 51. The downward movement is caused by springs pulling the pinion-carrying arms 48 downward as previously explained. Besides the downward movement of the member 50 there is possible a further downward movement of the rack 46 relatively to the part 50. To effect this the plate carrying the rack 46 is provided with a stepped extension 61 the steps of which are adapted to strike a stop 62 pivoted on a stud 63 on said member 50, pressed toward the rear by a spring 64, and pulled forward a desired number of steps by means of pins 65 on the rods 51 projecting laterally into the plane of an arm 66 connected to the stop 62. This arm 66 is hooked at its upper end over a stop rod 67 so as to prevent movement until one of the rods 51 is actuated. Normally the parts carrying the racks 46 are held up by a resetting rod 68 carried on arms 69 pivoted on the upper shaft F and connected with arms 70 at the opposite side of said shaft pulled downward by springs 71. The punches H are held against substantial longitudinal movement by shoulders thereon between holding plates 72 and 73.

The resetting or retraction of the feeders K is effected by means of a plate 74 through which they pass and which is mounted on arms 75 on a shaft 76 which at the end of the return movement of the shaft is swung backwardly by means of the connections shown in Fig. 5, namely, arms 77, links 78, levers 79, and links 80 connected by a pin and slot to an arm on the main shaft N.

When the sum of the movements of the two racks 45 and 46 of any one decimal place is greater than 9, there must be a carrying operation to the next higher decimal place. This is effected by permitting the rack 46 of the next higher decimal place to move forward one extra step relatively to the plate 50 upon which it is carried. For this purpose an extension of the arm 48 carries a pin 81 extending to the left and bearing upon the inside curve of an arm 82 of the group constituting the mechanism of the next higher decimal place pivoted at its lower end and pressed inward by a spring 83. The outer end of the arm 82 has a shoulder along its outer edge, indicated by a dotted line, engaging a pin 84 on a pawl 85 normally engaging a projection 86 on the outer edge of the rack 46 of the next higher decimal place. When the pinion-carrying arm 48 of the lower decimal place moves sufficiently far it strikes a shoulder 87 on the arm 82 and forces the arm outward. Whatever the position of the higher rack 46, its pin 84 will be pushed out to free the pawl 85 from the projection 86

and to allow the rack with said projection to move forward one step (beyond the position to which it would be moved if there were no figure to be carried from the next lower place); at the end of which it is stopped by a pin 88 carried on the plate 50, thus adding an extra one in the next higher decimal place. On the return movement the resetting rod 68 restores the parts to their original position.

The pocket J is carried between a pair of vertical side arms 98 which carry the shaft 76 and also the pivots 90 and 91 for the levers 59, and the shaft 92 for the levers 79; these side arms 89 being pivoted upon a shaft 93 near the bottom and at the rear of the machine. These side frames are connected by links 94 with triangular levers 95 pivoted at 96, said levers being connected to springs 97 and being connected by pin-and-slot connections to links 98 the lower ends of which are connected to upward arms on the shaft N; so that at the end of the pin-and-slot movement, that is to say, after the greater part of the forward movement of the operating shaft, and after the punching-plate carriers are set in position, the triangular lever 95 is pulled down and the pocket pulled in to cause the punches to pass through the check. In the initial part of the return movement of the main shaft the triangular levers are released and their springs pull them upward to throw the pockets backward so as to release the check from the punches and permit it to be fed upward to the next line.

Feeding mechanism.

At the sides of the pocket (Fig. 4) are provided feed punches 99 which make the holes in the sides of the check by which it is positively and accurately fed up line by line. These punches 99 are carried upon sectors or braces 100 and 101 supported at their forward ends upon the shafts U and F respectively, and are held always in suitable holes in the walls of the pocket. When the pocket is advanced to punch the balance or total the feed punches 99 also pierce the check and likewise are withdrawn on the backward movement of the pocket.

The check is lifted by means of lifting pins 101 projecting from the rear, working in slots in the back wall of the pocket, and adapted to receive an upward movement to lift the check, a backward movement to free itself, and then a downward and forward movement to enter the feed-holes in the next lower line of the check. The feed-pins 101 are carried on lateral arms 102 supported in the sides of a lifting frame which is composed of two side arms 103 and a cross-arm 104 connecting them together and holding them more or less rigidly relatively to each other. The arms 103 are pivotally and slid-

ably supported from the pocket-carrying arms 89 by means of pins 105 carried on the latter and passing through slots in the lower ends of the arms 103. Springs 106 hold the feeding frame up relatively to the pocket-carrying frame, and a spring pawl 107 engages a notch 108 to hold it down; while springs 109 tend to draw it inward. A key 110, by the connection illustrated to a link 111, the forward end of which is connected to one of the side arms 103 of the feeding frame, is adapted to press the feeding frame back to permit the withdrawal of the check at any time. For holding the check in place frictionally certain friction arms 112 are provided at the top of the pocket, being pivoted upon the side arms 89 of the pocket and connected with arms 113 which are connected by means of links 114 to an arm 115 which is normally pulled down by a spring 116 so that the end of the arm 115 lies against a pin 117 on the end of an arm 118, which pin is guided in a slot in the side arm 103 of the feeding frame. Thus normally the feeding frame is held to the rear so that the lifting pins shall not extend into the pocket. As soon as the check is inserted into the pocket however it forces back the friction arms 112, which causes the lifting of the arms 115 and frees the pins 117 and the lifting frame to permit the latter to move inward. After each lifting operation the sector 119 (pivoted on a portion of the side frame 89) swings downward and a lateral projection 120 carried thereby engages the edge of the feeding frame arm 103 so as to press the latter outward. This operation is followed by the engagement of the arm 121 of the same lever with a pin 122 carried by the arm 103 resulting in a pressing of said arm 103 downward to the position corresponding with the next line; and the spring pawl 107 holds it so during the forward movement of the main shaft and the greater part of the return movement. At the end of the return movement a rod 123 which is connected to an arm on the main shaft and which is held down by a spring 124 upon a pin 125 carried by said pawl 107, is moved to the rear and strikes said pin with a shoulder 126 on the rod, throwing out the pawl 107. In the meantime the lifting pins 101 have entered the new feeding holes in the check because of the inward movement of the side arms following the retraction of the lever 119, 121. (It will be observed that as long as the check is in the pocket the stop 115 for preventing the inward movement of the pins is rendered inoperative.) The feeding pins having entered the new holes in the check, and the pawl 107 being withdrawn, the spring 106 lifts the arm 103 at each side of the machine. The movement of the lever 119, 121 is effected by means of an arm 127 on the shaft 128

of said lever, which arm is connected by a spring and a pin and slot with the upper end of the rod 129, whose lower end is connected to an arm upon the rear side of the shaft N, so that as soon as the shaft is moved forward the rod 129 is thrust upward and tends to give to the lever 119, 121 the movement previously described. The arm 127 is also connected to the arm 115, and in the normal operation of the machine pulls the latter to the rear and out of the path of the pin 117, so as to allow the feeding pins to enter the pocket.

The machine of Figs. 8 to 24 includes the mechanism of the simple type of machine shown in Figs. 3 to 7 plus an attachment for distributing and registering the amounts of the several waiters, and the proper connections between the card punching and printing mechanism and the distributing mechanism.

Machine with distributing attachment.

This machine makes a card such as is shown in Fig. 2, with an extra column located preferably between the amount column and the perforated total column, and in which the waiter's number is repeated in perforations on each line. The perforations on the first line are made by the selecting keys or by hand or by a separate punching machine to correspond with the waiter's number, and the machine repeats the perforations in each successive line automatically. In the distributor there are a number of registers, one for each waiter, and the perforations in the waiter's number column of the check select the appropriate register automatically (that is, without volition on the part of the operator), so that when the amount is recorded it is added to that particular register.

The movements added to the several registers are the movements of the racks F, or rather of the arms Z which actuate said racks, since there is no carrying operation performed before the movements are transmitted to the registers; each rack moving always less than ten steps. The carrying operations are performed on the registers themselves when these pass from 9 to 0. The movements of the arms Z are transmitted by means of links 130, Fig. 20, connected to arms 131 each of which is connected with one of the arms F; the links 130 at their rear ends being connected to arms 132 on shafts 133 which extend transversely across to the distributing part of the apparatus. The several shafts 133 therefore transmit to the distributing mechanism movement corresponding with the amounts to be printed. Two supplementary shafts 134 transmit movements corresponding to the waiter's number. The use of two shafts of this sort corresponding with two decimal places

adapts the machine for any number of waiters up to ninety-nine. A single shaft or a greater number of shafts may of course be employed as occasion demands. The shafts 134 are rocked by arms 135 controlled from the part of the machine (Fig. 9) which duplicates the waiter's number on the check, and which is hereinafter more fully described.

The plan (Fig. 22) indicates the position of the distributing mechanism at the left of the apparatus. It is divided into two blocks 136 and 137 arranged alongside of each other so as to have the height and length of the machine substantially the same for this part as for the check-making part. The distributing mechanism however might be arranged in a single block of greater height and of the width only of one of the blocks 136 and 137. Partitions 138, 139 and 140 support the principal parts, which are a simple shaft 141, a circular series of registers each indicated as a whole by the numeral 142, and each carrying four pinions 143, four circular operating racks 144, two main throw-off rings 145, a supplementary throw-off 146 and two intermediate selecting rings 147.

Selecting mechanism.

At each operation of the machine the two selecting rings 147 are turned independently of each other through the shafts 134, arms 148, and links 149, turning to the left in the figures shown, until notches 150 in the edges of said rings, indicated in Figs. 17 and 18, register with each other and with a selecting pin 151 carried by one of the registers. This selecting pin is then drawn into the notches, which movement draws the pinion 143 of the register into engagement with the racks 144. This action takes place at the end of the forward stroke of the handle of the machine. At the beginning of the rearward stroke the pin 151 is lifted out of the notches 150 to permit the backward movement of the selecting sectors 147, but the pinions 143 remain in gear with the racks until the end of the backward movement, and thus have added to them the amount printed.

At the end of the backward movement they are thrown out of gear. The mechanism for obtaining the movements described will be best understood from Fig. 18 in which the distances apart of the several elements of the mechanism are exaggerated so as to make the operation clear. Two pinions 143 are shown instead of the four which are preferably used. All the pinions are mounted on a shaft 152 carried at opposite ends in arms 153 and 154 keyed on a shaft 155 the rocking of which lifts and lowers the pinions. The arm 153 is connected by a lateral connecting member 156 with an arm 157 which carries a pivoted setting piece 158 which is

provided with a lateral pin 159 overlying the end of one of the arms 160 which carry the selecting pin 151. While the selecting pin 151 rides on the edges of the selecting sectors 147 it holds up the lateral pin 159 and likewise the arm 157 and the several pinions. At the end of the stroke however when the selecting pin 151 drops into the notches 150 it releases the pin 159 and the member 157, and the pinions drop into gear with their operating racks. The throw-off rings 145 and 146 at the end of the stroke arrive with notches 161 in radial line with rollers 162 on the pin 151, and on the arms 153 and 154, so that only at the end of the stroke can these arms fall inward and the pinions go into gear with the racks. At the end of the movements of the racks the main throw-off plates 145 move backward, and by reason of the inclined edges of the notches 161 lift the arms 153 and throw off the pinions from engagement with their racks.

The action of the supplementary throw-off ring 146 however is slightly different. Its backward movement occurs at the very beginning of the backward stroke of the machine, and it lifts the pin 151 out of the notches 150 so as to allow the selecting rings to move backward. This upward movement of the pin 151 however does not effect the arm 157 on the shaft which supports the pinions, because upon the downward movement of the pin 151 a lateral extension 163 thereof has already engaged a cam edge of the setting piece 158 and forced the latter inward to such an extent that the lateral pin 159 passes beyond the upwardly projecting portion of the arm 160 so that said arm 160 can be lifted without encountering the pin 159 and without any effect on the setting piece 158 or the arm 157 or the pinions.

Actuating the throw-off rings.

This mechanism is shown best in Figs. 10 and 17. A sector 164 is carried on the main shaft N, and is connected by a link 165 to an arm 166 on the shaft 141 on which all the throw-off rings are pivoted. This shaft carries an arm 167 having at its end a flange 168 extending into the plane of the supplementary throw-off ring 146 alone, and in such a position that toward the end of the movement of the main shaft it strikes an arm 169 of the supplementary throw-off ring and moves the latter down to position to permit the dropping of the registers into engagement with the racks. In the first part of the return movement of the main shaft the flange 168 is lifted, and the supplemental throw-off ring is drawn back to its starting point by means of a spring 170. Thus is obtained the quick forward and backward movement of the supplemental throw-off ring at the end of the advance

stroke and while the selecting rings are substantially stationary in their advanced positions.

The regular throw-off rings 145 are normally given a forward movement at the end of the advance of the main shaft to throw the registers into gear; and a rearward movement at the end of the return to throw out the registers. This operation is varied however under certain conditions herein-after referred to, and is effected through a reversing fork 171 having arms 172 and 173, the former of which alone is operative under ordinary conditions. The fork 171 is pivotally supported with slight friction at 174, and has at its lower end an arm 175 which is adapted to be struck upon opposite sides by pins 176 and 177 carried at opposite ends of the arc 164 carried on the main shaft. The arms 172 and 173 are notched, and are adapted alternatively to engage pins 253 and 254 carried at opposite ends of a cross arm on the shaft 255, which has an arm 256 connected by a link 257 to the regular throw-off rings 145. With the fork in the position shown in Fig. 10 the pin 177 at the end of each forward stroke will cause a forward movement of the throw-off rings; and the pin 176 at the end of each return of the main shaft will cause a return movement of the rings.

Total key and mechanism controlled thereby.

The fork 171 is normally held in the position of Fig. 10 by means of a light spring 250. When a total is to be taken from any one of the registers and indicated or recorded, the total key 259 is first pressed, and this acting through the arm 260, shaft 261, and arm 262, will pull the stronger spring 263, and through the link 264 exert an upward pressure of the fork 171, releasing it from the pin 253 and bringing it up to such a position that at the end of the advance of the main shaft the pin 254, remaining stationary, will be caught by the arm 173 of the fork as the latter is advanced by the pin 177. While the fork is in this position therefore there is a reversal of the movement of the regular throw-off rings 145.

The total key by turning the shaft 261 also swings the arm 265 downward, and through the link 266 exerts a downward spring pressure on the arm 267 of the shaft 268 (see also Fig. 17) which carries arms 269 with a pin 270 between them which by the pressing of the total key are pressed outward and serve to prevent backward movement of the operating racks by engagement with the zero stops 245 thereon. In case the zero stop 245 is in the way of the pin 270 the latter of course cannot be moved to operative position, and an initial movement of the racks forward and back is given

in order to insure that any rack which by a previous carrying operation has been moved beyond the zero point, shall first free the stop-pin 270 by the forward movement of the rack, and then shall strike said pin 270 with its zero stop 245 on the return movement of the rack. In taking totals therefore the handle of the machine is pulled twice, first to reset all the racks so that they are absolutely stopped at zero, and cannot have any carrying movement, and second, to accomplish the actual taking off of the total from the register to the racks.

The pressing of the total key 259 serves to swing the arms 271, 272 by means of a pin on the arm 260 engaging the forward inclined edge of the arm 271. The arm 271 in turn carries a pin 273 engaging an arm 274 on a shaft 275, turning said shaft in the direction of the arrow, the motion of said shaft being transmitted (Fig. 11) by means of an arm 276 and a link 277 to an arm 278 on a shaft 279 which carries an arm 280 for holding down one of the links 18 by which the regular adding wheels M are moved downward or upward. As long as the arm 274 is held down therefore the regular adding wheels M are held out of engagement with their racks. This position is locked preferably by a pair of alternate locking levers 281 and 282; which, during the totaling operation, are alternately unlocked but are not both unlocked until the end of the operation. The lock 281 is released by the link 283 which has a hook lying in position to be engaged by a pin 284 on the end of the arm 166 by which the central shaft is turned. At the end of each rearward movement of the main shaft therefore the hook 281 is withdrawn. The hook 282 is connected by a link 284 with the pin 270 previously referred to, and on the shaft 268 there is provided an arm 285 which is thrown inward whenever the total key is pressed. While this arm is thrown inward a pin 286 on the first regular throw-off ring 145 swings over the end of said arm and holds it down and prevents its return even though the total key may be thereafter lifted.

The locking arms 271 and 272 are on a shaft 287 (see Figs. 20 and 20^a) which serves to release the racks F of the amount keys so as to allow these racks to move freely. The unlocking is effected by means of arms 288 carried on the shaft 287 and carrying a pin 289 engaging the arms 226 of the several locks which normally hold up the racks.

Cashier's key.

At the right of the machine (Fig. 22) is a key 333 which when pressed rocks a shaft 334 which extends across to the amount keys

(Fig. 20) and there carries an arm 335 connected by a pin and slot to a link 336 which is connected to the pin 225 by which the amount racks F are set free. The pressing of the cashier's key therefore will set free the amount racks, so as to permit the amount shafts 133 to take their motion from the check by the mechanism indicated in Fig. 8.

Individual registers and carrying mechanism.

Each of the registers is a separate unit comprising, as shown in Figs. 15, 16 and 17, an inclosing plate forming a back 178 and sides 179 and 180 between which all the movable parts are carried. These units may be introduced or removed as a whole, and are thus easily insertible in appropriate positions between the fixed walls 138, 139 and 140 of the apparatus. Any suitable means of fastening may be provided. The machine is thus adapted to carry a smaller or greater number of registers at will. For the greatest accuracy and security it is preferable to provide the end plates 180 with outwardly projecting ears 181 which may be screwed to the fixed walls 140 and 139 as the latter are assembled in building up the machine, the opposite plates 179 being fastened by countersunk screws or pins passing through the walls 139 and 138.

The said wall 179 carries an inwardly-projecting pin 182 engaging the inner edge of the setting piece 158, and this edge is so shaped that when the setting piece 151 is dropped and permits the arm 157 to drop and carry with it the setting piece 158 and the latter is pressed back by the pin 163, it will be held back by the pin 182 even after the setting pin and the arm 160 have risen, and in fact until the arm 157 (together with the pinions) has risen to its starting position, whereupon its spring 183 gives it the necessary lateral movement. The rocking of the shaft which carries the pinions in order to pull the pinions into engagement with their racks, is effected by means of a spring 189 on the end of the arm 157.

The "carrying" to the next higher decimal place when a pinion passes from 9 to 0, is effected by the tripping of the arm 184 of a three-armed lever having a stop-arm 185, which when not tripped serves to engage a pin 186 carried on the rack 144. When however a lip 187 on the tripping arm is struck by a pin 188 of the pinion of the next lower decimal place as the latter passes from 9 to 0, the tripping arm 184 is lifted and the stop-arm 185 depressed out of the path of the pin 186; and the rack moves one step beyond its usual stopping point and carries the pinion one step farther. The stop-arm 185 for any given pinion 143 extends beyond the next pinion when the registers are placed as close together as possible, and in

that case to avoid interference the alternative three-armed carrying devices are offset from each other in the manner indicated in Fig. 13, other parts of the mechanism being omitted from this figure for the sake of clearness. Furthermore the three-armed levers in the same plane as indicated in Fig. 12 are arranged to control pins 186 and 186^a which are offset from each other radially, the outer pins 186^a being also arranged to pass clear under the arms 185 with which they do not coact. The third arm 190 of the carrying device is used to lock the same by means of a hook 191 under certain conditions hereinafter referred to. The three-armed carriers 184, 185 and 190 are mounted on shafts 192, and the hooks 191 are mounted on shafts 193 both of which are supported in the side walls of the register.

After taking off a total from one of the registers and throwing the register out of gear, it is necessary to reset the three-armed carrier. For this purpose the supplemental throw-off ring 146 is provided with cam grooves 131 which on every forward stroke reset the carrier of any register whose carrier has just been used; that is to say, it tends to reset all carriers. Each carrier is reset by a resetting pin 232 which moves over and strikes the arm 190 of the carrier. The resetting pin 232 is shown at the bottom of Fig. 12 in its relation to the carrier, and at the top of said figure in its relation to the mechanism by which it is controlled. It is carried on a pair of arms 233 mounted on the shaft 192 of the carrier. These arms are fixed on the shaft 192, upon which is fixed also an arm 234 connected by a spring 235 to an arm 236 which is loose on the shaft 192 and which carries a pin entering the cam slot 231 in the throw-off ring.

The retraction of the three-armed carrying device however is not desired when a register is in engagement with the racks. In taking off totals from the registers it happens that one of the registers is in engagement at the time that the throw-off ring is actuated. In order to avoid resetting of the carrier by the movement of the throw-off ring under these conditions the forward arm 154 in which is carried one end of the pinion shaft 152, and which drops into the notches in the principal throw-off ring 145 and remains there until the end of the operation, is connected through a link 237 to the forward arm of a lever 238 whose rear arm is thus thrown upward in line with the projecting end of one of the arms 233, and thus prevents the resetting movement of the latter.

Pins 193 serve the double purpose of pivots for the lever 238 and as locks to prevent the rotation of the pinions when the registers are thrown out; in addition to their use as shafts for the hooks 191 previously referred to. These hooks engage

the ends of the arms 190 when the latter are reset by the pins 232 as just explained. The carriers are tripped into operative position by the throwing out of the hook 191 and the resulting action of the springs 239. The hooks 191 are fast on the shafts 193, and these shafts carry arms 240 projecting in approximately the opposite direction from the hook 191, and adapted to be pulled inward when the hooks are to be thrown out. The inward pull is effected by means of a pawl 241 engaging the end of each of the arms 240 and pivoted at its lower end upon the arm 154 which is depressed when the wheels drop into gear.

The operating racks 144 are connected to the arms 148 by which they are actuated, each by means of a link 242 having at its upper end a slot in which is a pin 243 on the rack, a spring 244 being also arranged to connect the parts and tending normally to hold the pin in the lower end of the slot. A zero stop or projection 245 is arranged to hold the parts in the position of Fig. 12 as hereinafter described. When this zero stop or one of the carrying arms 185 does not hold the parts in the position of Fig. 12, then the spring 244 pulls the rack around one step farther until the pin 243 strikes the bottom of the slot.

Auxiliary register.

There is preferably used an auxiliary register which is indicated at 246 (Fig. 12) and which is dropped into engagement with the rack by the pressing of the "charge" key 247 for special purposes hereinafter referred to. The slotted selecting rings 147 are provided with registering slots in position to drop the auxiliary register into place whenever the selecting rings are not moved. The register is held out of engagement however in the usual operation of the mechanism by means of a lip 248 on its setting piece 158, and which lip is caught by a hook 249 connected by a link 250 with an arm on the shaft 251 which is actuated by the key 247; the pressing of the key serving to withdraw the hook 249 and release the setting piece 158 and the arm 157, so as to allow the register to go into gear. The arrangement of the notches in the selecting rings 147 is indicated in Fig. 23, the unit ring being in front and the tens ring in the rear, so that the notches of the latter are indicated in dotted lines. The setting pin 151 is indicated for only one of the registers. The notches 252 are for the auxiliary register and are in line with each other when the selecting rings are unmoved. The relative arrangements of the other notches are clear, so that the movements of the unit plate will bring into line with each other slots located at successive points from 1 to 9, and the movements of the unit ring one step and the tens ring

nine steps will give combinations from 10 to 19 inclusive; thus providing for the arranging of nineteen registers in one section controlled by a single pair of selecting rings.

The pressing of the charge button 247 also throws out the unlocking connection of the selecting racks by which these racks are unlocked when the selecting is to be controlled from the check and not from the keys. The unlocking connection as previously explained is by means of the hook 221 (Fig. 9). This hook is connected near its upper end to a link 290 which is connected to an arm 291 on the shaft 251 which is turned to the left when the charge button is pressed, and thus disconnects the upper end of the hook 221 from the pin on the end of the arm 222.

Two operating means for selecting shafts.

The connections from the carriers 194 by which they actuate the selecting shafts 134 are capable of being broken, but are normally locked together as follows:—Each carrier 194 is connected by a link 207 to an arm 208 pivoted on a shaft 209 pressed upwardly by a spring 210 to move the carrier 194 upward as desired. The arm 135 on the selecting shaft is connected by a link 211 to a sector 212 on the same shaft 209 and provided with a notch in its center adapted to be engaged by a locking pin 213 carried on a lever 214 pivoted intermediate of its ends upon the arm 208 and connected by a link 215 to an arm 216 on a shaft 217 which is adapted to be rocked to throw the locking pin 213 into or out of engagement with the notch in the sector 212. When in engagement as in ordinary use as a restaurant machine the carriers 194 actuate the selecting shafts. When the lock is out of engagement the selecting shafts are operated by the keys, and the punching-plate carriers 194 are idle. The mechanism for actuating the selecting shafts from the keys is substantially the same as that shown in Fig. 20 whereby the actuating shafts 133 are controlled by the keys.

As long as the mechanism of Fig. 9, for controlling the selecting shafts from the check is locked, it is only necessary to unlock the racks of the selecting keys so that they may move idly with the selecting shafts. This is insured by means of a rod 218 extending across the several arms 203 which move to the rear when the feelers 206 enter holes in the check, the rod 218 being carried on one arm 219 of a lever the other arm 220 of which is connected to a link 221 the upper end of which hooks over an arm 222 on a shaft 223, which, as shown best in Fig. 20^a, carries an arm 224 with a pin 225 engaging an arm 226 of a lever whose opposite arm 227 ordinarily holds up the several racks F of the selecting mechanism.

Thus when the selecting shafts 134 are actuated from the check the racks corresponding to the selecting keys are idle and will be moved down and up by the selecting shafts 134 to which said racks are connected. Whenever the selecting shafts are to be operated from the keys however instead of from the check it is necessary to reverse the operation by permitting the mechanism of Fig. 9 to swing idly as the selecting shafts 134 are rocked by the mechanism controlled by the selecting keys. For this purpose the plate 199 is normally suspended by a hook 291 from a pin 292, and the hook is withdrawn whenever a selecting key is pressed; and the entire mechanism is thus left free to move with the selecting shaft. The hook 291 is pulled out by means of a pin 292 on an arm 293 connected by a link 294 to an arm 295 on a shaft 296 which extends across to the section of the machine carrying the selecting keys, and is there provided with an arm 297 (Fig. 20) having a pin 298 extending up into the path of a hook on the end of a locking slide 299, such as is common in this type of machines, and which slide is automatically shifted upward whenever a key is pressed, and holds the key down until the handle is operated.

The mechanism shown at the right of Fig. 9 for breaking the connection between the selecting shafts and the punching plate carrier 194 will not ordinarily be necessary. A permanent connection may be and will preferably be provided for simple restaurant machines. For cashiers' machines as hereinafter described, it is preferable to retain the breakable connection shown.

In the plan (Fig. 22) there is indicated a cross-section of what I have called the "racks", this section being through the corresponding part of the mechanism controlled by the selecting keys. Their only function as racks is to control the adding wheels M. Their principal function in the machine is as movable stops for limiting the movement of the type carriers and punch carriers by cooperation with the key-actuated stops V. In the present case plain (untoothed) plates or bars F' are provided cooperating with the key-actuated stops V, as in the case of the amount keys, and alongside of them are arranged racks F² which serve merely to perform the carrying operations between the wheels M of successively higher decimal places, and which are beyond the similar adding wheels M which are actuated directly by the racks F of the amount mechanism.

Two operating means for amount shafts.

In Fig. 8 there are indicated arms 300 which are connected with the plates or arms 301 which carry the racks 46 and which

move through an arc determined by the entry of the feelers K into the perforations of the last perforated balance; and a connection from the arms 300 to the amount shafts 133, which connection is also breakable but which when unbroken permits of the operation of these shafts 133 from the check. The connection in this case is of the same sort as for the selecting shafts 134. Where the machine is to be used as a simple restaurant machine this connection is entirely omitted, since in that case it is never desired to operate the amount shafts from the check. The connection is by means of links 302 and an arm 303 to a locking lever 304 which actuates a sector 305 connected by a link 306 and arm 307 to the appropriate amount shafts 133; the locking lever 304 being actuated by a link 305 connected to an arm 306 on the same unlocking shaft 217.

When the shaft 217 is rocked to the left it unlocks both the connections of the selecting shafts (Fig. 9) and those of the amount shafts (Fig. 8). The unlocking shaft 217 is provided with an arm 307 connected by a link 308 to an arm 309 on a cross-shaft 310 which as shown in Fig. 20, is provided with an arm 311 carrying a pin which is engaged and moved forward by any one of the slides 299 which slide up in order to lock the keys of the amount portion of the machine. When therefore any amount key is pressed the slide immediately moves up to lock it, and at the same time rocks the shaft 310 and unlocks the breakable connection shown in Fig. 8 so as to allow the amount shafts to be operated under control of the amount key alone.

The mechanism for actuating the slides 299 which lock down the selecting and amount keys is not new in itself. Its operation is sufficiently indicated in Fig. 11. The slides are connected at their upper ends to links 312 normally pressed backward by an arm 313 on a shaft 314 which is provided with an arm 315 pulled forward by a spring 316 and having at its lower end a pin 317 by which it is forced back to restore the locking plates to their downward position to release the keys, after which it jumps forward again. The pin is acted upon by a spring pawl 318 carried on an arm 319 connected to a link 320 pulled down by a spring 321 and lifted at the end of a return movement by means of a pin carried on an arm on the main shaft N and working in a slot in the lower end of the link 320. On the forward movement of the main shaft the pawl 318 engages the pin 317, and at the end of the rearward movement of the shaft the pawl first throws back the pin 317 and then slips over it, allowing it to come forward again under the pull of its spring 316.

The links 312 are supported from arms 322 arranged at suitable intervals on a shaft 323, so that they all move together in the resetting operation.

5 *Pocket and related parts.*

The pocket J is supported from side bars 89, and the feeding pins 101 are supported from side bars 103, and these parts are operated, all substantially as previously described in connection with Fig. 3. In both styles of apparatus there are provided also initial feeding devices consisting of angle pieces 324 mounted on the feed arm 103 and entering vertical slots in the bottom of the pocket J. These initial feeding devices support the lower edge of the check when it is put in a pocket for the first time, and feed it up one step by the upward movement of the side arms 103 when there has been no feed perforation made in the check, so that the feed pins 101 cannot operate. In the subsequent operations the feeding devices 324 are below the lower edge of the check, and only the regular feed pins 101 are used.

It is desirable to avoid oscillating the pocket when there are no punching operations to be performed. Consequently in the apparatus of Fig. 11 the connection by which the pocket is oscillated is made breakable. The link 325 by which the pocket is connected to the triangular lever 95 is a hook which is connected to a spring 326 normally holding it in engagement with the pin 327 on the triangular lever; and the hook is pressed downward by a pin on the link 114 or is released by the lifting of said link which occurs when the friction arms 112 are pressed back by the insertion of a check in the pocket. When there is no check in the pocket there is no reciprocation of the pocket back and forth.

Preferably also the hammers are restrained from action when there is no card in the pocket. For this purpose the arm 115 which is depressed in the absence of a check in the pocket, and which is mounted on a shaft 327 on one of the side frames of the pocket, lifts an arm 328 on said shaft and a link 329 whose lower end is connected to an arm 330 on a shaft 331 which extends across into the machine as shown in Fig. 20, and which carries arms 332 holding the hammer-locking pawls *t* in engagement.

Besides the means for perforating the waiters' cards and carrying the amounts thereof on separate registers the machine may include mechanism by which at the end of a day a printed list or other record may be made of the amount credited to each of the waiters. Such a listing mechanism is shown in Figs. 25 to 32, inclusive, it being understood that the check-making and reg-

istering mechanism is the same as in the types of the machine previously described, only the listing or recording mechanism and its connections being added.

Recording mechanism.

Besides registering and indicating the totals of the several waiters, the machine may be used for recording these totals upon separate cards, one for each waiter, which are successively introduced into the pocket J.

Or by means of the comparatively simple additional mechanism hereinafter described (Figs. 25 to 32) the totals of the successive waiters or the individual items and waiter numbers as they are registered in the machine may be listed upon a ribbon or sheet of paper. Supposing the handle of the machine actuated by a motor, it is only necessary for the operator to press the total key and start the motor, whereupon the machine will print in succession the totals for the several registers upon a ribbon, and the grand total at the end.

This making of a listing ribbon is especially convenient where only a single machine is employed in a restaurant. Where however a number of machines are employed, as in wine-cellar, kitchen, cigar-stand, etc., it may be preferred to take off the totals for the several waiters in each department on single cards, keeping these properly arranged in a drawer so as to facilitate the adding of any given waiter's account for all of the several departments.

In taking off a list of the totals on the several registers the successive registers are selected in regular order, from 1 to 40 in the present case, by appropriate actuation of the selecting shafts 134. These shafts on their left-hand ends are provided with fixed arms 401, 402 corresponding to the units and the tens places respectively. The tens arm 402 is provided with link 403 supported by a slot from a shaft 404 and carrying a lateral pin 405 which serves as a stop to limit the upward movement of the link. The unit arm 401 is provided with a similar link 406 having a stop-pin immediately opposite the pin 405. When the handle of the machine is actuated the shafts 134 are turned by springs in the direction to throw the links 403 and 406 up. A series of stops is provided, so placed that the unit link 406 is permitted to move up one, two, three, etc., steps to nine, after which the tens link 403 is permitted to move up one step only, after which again the unit link moves in succession from one to nine steps; thus waiters or registers numbers 1 to 9 and 10 to 19 are selected in succession, the operation being repeated for as many waiters as desired; the present machine indicating forty.

The stops which are interposed in positions to limit the movements of the links 403 and 406 consist of two disks 407 and 408, the former provided with steps ten spaces long adapted to come into the path of the pin 405, and the disk 408 being provided with steps one space long arranged in series of ten each to one of the steps on the disk 407, and arranged to lie in the path of the corresponding stop-pin on the unit link 406. The links 403 and 406 are located between the tens disk 407 and the units disk 408.

The disks are carried on the shaft 404 rigidly, and this shaft is rotated by means of a ratchet wheel 409 and a pawl carried on an arm 410 pivoted on said shaft and normally pulled down by a spring 411 and held up by a link 412. In the operation of listing totals the shaft of the machine is pulled forward twice for the reasons above referred to in describing the taking off of a total on an indicator. The selecting mechanism of Fig. 26 however is actuated but once for each of the alternate movements of the handle of the machine. The motion is communicated to the link 412 from the shaft 141, shown also in Fig. 10.

When the operator depresses the total key he unlocks the mechanism for transmitting the motion of the shaft 141 alternately to the stop-disks. The depression of the key turns the shaft 261 which through an arm 413 depresses a link 414 and removes a locking hook 415 from a plate 416 which is connected by a pin and slot with the link 412 through which the movement of the stop-disks is controlled. When the arm 413 is depressed it is caught by a hook 417 and held down in the manner shown in Fig. 27, so as to hold the locking hook 415 inoperative until the listing of all the totals is completed; so that the operator may at once lift his finger from the total key.

The arm 416 which controls the movement of the stop-disks is under control of an arm 418 fixed on the shaft 414; through intermediate mechanism which causes only alternate movements of the arm 418 to be transmitted to the arm 416. Between these two arms is a third arm 419, shown separately in Fig. 29, carrying a pivoted releasing member 420 connected with lost motion through a link 421 to a lever 422 which is pivoted on the adjacent face of the arm 416. A pivoted stop 423 held up by a spring 424 has a shoulder engaging a pin 425 on the inner face of the arm 416 so as to prevent its yielding to the upward pull of its spring 426. The releasing arm 420 is held in the inoperative position shown by means of a pin 427 on the frame of the machine, but at each alternate operation strikes the end of the locking arm 423 and depresses it so as to release the arm 416, allowing the latter to move upward under the influence of its

springs, which releases the arm 410 by which the ratchet is actuated and allows the stop-disks to move one step. On the succeeding operation the releasing arm 420 is returned to its inoperative position, and the arm 416 is caught by the locking arm 423 so as to have no effect upon the stop-disks. To secure this operation the intermediate arm 419 moves upward under the influence of its spring 428 each time that the arm 418 moves upward, and carries with it the releasing arm 420, so that the latter tends to swing inward over the stop-pin 427 under the influence of its spring 429. A second stop-pin 430 is provided for limiting such movement of the releasing arm 420. The main arm 418 carries a laterally projecting pin 431 overlying both the arms 419 and 416, so that on the downward movement it restores these arms to the position illustrated. The releasing arm 420 is moved back and forth alternately by its spring and the link 421 and lever 422. The latter when the arm 416 is depressed strikes a stop-pin 432 on the frame of the machine so as to pull the link 421 to the rear, and, when the arms 418 and 419 move upward on the next stroke without the arm 416, to permit the releasing arm 420 to be pulled backward by its spring. On the other hand when the arm 416 has been released so as to move upward with the arms 418 and 419, then the lever 422 is not actuated by the stop-pin 432, but is pulled by its strong spring 433 with sufficient force to press the releasing arm 420 outward to its inoperative position. Thus the swinging of the releasing arm 420 to its operative position causes the arm 416 to swing upward on the next operation, which upward movement swings the releasing arm 420 to its inoperative position, which insures that the arm 416 shall not move upward on the succeeding operation.

The total button is released after a complete rotation of the stop-disks 407 and 408. For this purpose the ratchet 409 carries a pin 434 which strikes a swinging arm 435 connected to a pusher 436 which, after the depressing of the total button, rests on the pin 438 carried by the hook 417. The pin 434 therefore at each operation causes the pusher 436 to push the hook 417 forward to release the arm 413 and the push-button which controls it; the parts being withdrawn by springs to their normal position.

The alternate movements are so timed that there is an actuation of the selecting mechanism upon the first of each two movements of the handle of the machine, after which the selecting shafts and their arms 401, 402 are returned to the starting position. The particular register having been selected, and the links 406 and 403 withdrawn, the stop-disks 407 and 408 are given their next step forward during the second of each pair of

operations of the handle; this being accomplished by the movement of the arm 416, as above explained. This movement of the arm 416 on the second operation of the handle is utilized to release a pawl or hook 439 which engages pins on the arms 401 and 402 and prevents any movement of the selecting mechanism during this second operation of the handle; the hook 439 being pivoted at 440 and being drawn inward by a spring 441 connected to a slide 442 the end of which is struck by the arm 416 and pressed backward to hold the hook inoperative except when the arm 416 is raised.

After the stop-disks 407 and 408 have moved through forty steps they bring into operative position a portion 443 in which both the disks are stepped to a depth of fifty or more, and the link 403 is allowed to move so far inward that a pin 444 thereon strikes an arm 445 on a grand total shaft 446, turning the latter to an operative position in which it is held by a hook 447 engaging an opposite arm 448 on the said shaft. The mechanism for effecting the listing of the grand total through this shaft is described hereinafter. After this operation has been effected the hook 447 is lifted, permitting the spring 449 to return the grand total shaft to its inoperative position. The lifting of the hook is accomplished by means of a pawl 450 pivoted on an arm 451 which oscillates with the opposite arm 410, the pawl being pressed outward by a spring at its lower position, and drawn inward as it moves upward, by means of a fixed pin 452 engaging a cam surface on the pawl. When the grand total shaft 446 is moved to operative position the racks F of the several amount keys, as well as the racks F² which are designed primarily for carrying operations on the main adding wheels of higher decimal places than are represented by the amount keys, are released, and at the proper time brought into engagement with the main adding wheels, so as to take off the grand total which is always registered thereon.

Where a total is to be taken on a card in the recording-sheet pocket, as above described, and which I call a "cumulating total card" since such cards will ordinarily be used for accumulating a waiter's totals in the several departments; it is desirable to avoid the ordinary feeding operation, and also the oscillating movement of the pocket by which the card is ordinarily punched. These movements are suppressed through connections to the total key shown in Fig. 26. The link 414 actuates an angle-lever 453 connected to a link 454 which is connected by a pin and slot to an arm 455 on a shaft 456, the shaft being turned by a spring 457 whenever the total key is pressed to permit such operation. The shaft 456 extends through to the part of the machine illus-

trated in Figs. 11 and 11^a, where it carries an arm 458 carrying a pin 459 which underlies a portion of the pivoted link 123 by which the recording sheet is caused to receive an upward feed upon the first operation of the machine. When the shaft 456 turns, the pin 459 lifts the link 123 so that on the rearward movement of the handle the shoulder on the link 123 no longer comes into engagement with the pin 125, and there is no release of the side frame 103 to cause the upward movement of the card in the pocket.

The upward movement of the arm 458 also causes, through a link 460, an upward movement of the arm 328 previously referred to, and a downward movement of the link 114 and a consequent downward movement of the link 325 to an inoperative position, so that it no longer engages the pin 327 and the pocket is not oscillated when the handle of the machine is worked.

When the selecting has been done then on the second forward movement of the handle the amount shafts 133 are turned in the manner previously described for indicating totals of the individual registers. The listing of those individual totals is controlled very simply by direct connections with these amount shafts 133, as indicated in Figs. 31 and 32. A roll of paper 461 is supported at the back of the machine, from which the paper 462 runs over a platen 463 against which it is held frictionally by a roller 464 which serves at the same time as a brake for the platen; the roller being mounted on an arm 465 pivoted at 466 and held up by a spring 467, and the platen being rotated by means of a ratchet wheel 468 operated by a pawl carried on an arm on the shaft of the platen which arm is connected by a link 469 to a follower 470 for actuating the hammers 471, the feeding operation following immediately upon the stroke and rebound of the hammers.

The types are carried upon a sector 472, one for each decimal place, which sectors are connected by links 473 to arms 474 on the respective shafts 133, so that the sectors move a distance corresponding to the movements of the several amount shafts 133. The selecting sectors 475 are similar to the amount sectors 472 and move through distances corresponding to the movements of the selecting shafts 134 (and utilizing these selecting shafts also for the printing of the grand total, as hereinafter described, in which operation there is no particular waiter's number and no selecting operation). The followers 470 which actuate the hammers are pulled down by springs 476, and are restrained by three sets of hooks 477, 478 and 479, and are reset by a resetting rod 480 passing through slots in the several followers and carried on arms 481 fixed on the

shaft 482 which carries a fixed arm 483 by means of which it is oscillated through a connecting link 484 connected at its lower end to an arm on the operating shaft N.

5 The rebound of the hammers is effected by means of springs 485 connected to arms 486 of the several hammers.

The hooks 477 lock the followers against movement during the first of each pair of
10 operations of the handle of the machine, notwithstanding the withdrawal of any of the other follower-restraining hooks. The hooks 478 are on a shaft 487 which is connected by an arm 488 and a link 489 to the operating
15 shaft N so that only at the end of a forward movement of the handle, after the type-carrying sectors have been elevated to their proper positions, are the hooks 478 withdrawn to permit the operation of the ham-
20 mers. The hooks 479 are of a known type connected with each other in such a way that no one of them shall be withdrawn unless that of the next lower decimal place has been first withdrawn; thus serving to sup-
25 press the operation of the hammers and to insure blank spaces in all decimal places higher than those of the amount actually printed.

The sectors 472 are held accurately in
30 their printing positions before the operation of the hammers, by means of toothed members 489^a which are swung upward to engage notches in the respective sectors 472 before the release of the hammers, by means
35 of links 490 connecting the members 489 with the arm 488.

The ink-carrying ribbon 491 and the hand feeding wheel 492 of the platen are indicated in Fig. 32.

40 In making cumulative total cards the card is blank when introduced into the machine of the first department, and this machine should have the stepped plates 407 and 408 to select and punch the waiters'
45 numbers in succession in the cards. In the remaining machines into which the cards are introduced to record the totals of the other departments; however, the selecting is under control of the perforations made in the cards
50 by the first machine; consequently the selecting plates 407 and 408 are unnecessary in any machine except the first. The cards may be punched by keys or by separate machines or by hand before introducing them
55 into the first machine, so as to avoid the need of the selecting plates also in the first machine, if preferred.

By omitting or suppressing the operation of the selecting mechanism of Fig. 26
60 and also the hooks 477 of Fig. 31 which suppress the hammers on alternate operations of the handle, the listing mechanism will operate for each operation of the handle, the appropriate register being selected
65 by the waiters' card if previously perforated

to correspond with his number or, if not, by the mechanism for perforating the waiter's number in the card. That is, the printed list will be a check list and will show the waiters' numbers and the amounts of each
70 separate transaction in the order in which they are put in the machine.

Grand total recording.

In recording or listing the grand total 75 the shaft 446 (Fig. 26) is first turned in the direction of the arrow in the manner previously explained. This shaft 446 extends through to the portion of the machine carrying the selecting keys, as indicated in Fig. 80
24, and serves a double purpose. It causes the upward movement of the main adding wheels M into gear with their racks at the proper instant; and for the wheels M of
85 higher decimal places than those which are directly controlled by the operating keys it connects each pair of members F' F² (see Fig. 22) so that the totaling motion of the rack F² shall cause a similar motion of the non-
90 toothed member F' which is connected through the arm Z to the shafts 134. Thereupon these shafts, which are normally used only for selecting purposes, are used to actuate the two higher decimal places of the
95 recording mechanism.

In this case instead of the simple link previously described for swinging the frame carrying the adding wheels, there is employed a forked member 493 similar to the fork 171 of Fig. 10 and serving a similar
100 purpose. Before an ordinary operation the parts stand in the position of Fig. 24, and the forked member 493 serves as a simple link connection from the upper arm 15 of the
105 shaft 16 to the arm 20 of the three armed lever, so that upon the beginning of the forward movement the wheels are depressed out of engagement with their racks; and upon the beginning of the return movement
110 the spring 19 is put under tension so as to draw the wheels up into engagement with their racks as soon as or whenever the link 493 is released to permit such upward movement.

When a grand total is to be taken off said 115 wheels the shaft 446 acting through an arm 494, link 495, arms 496 and 497 and link 498 and spring 499, exerts a downward pull upon the forked link 493, so as to bring the lower fork against a pin on the lower arm
120 500 of the wheel-carrying shaft 16. This occurs on the first forward movement of the main operating shaft N, and after the adding wheels M have been thrown down. On the first return movement of the operat-
125 ing shaft the link 493, pulled down by the mechanism above described, is drawn upward lengthwise by the arm 20 to bring the lower notched arm of said link into engagement with the pin on the arm 500, this be- 130

ing an idle stroke as far as the adding wheels are concerned. At the beginning of the next forward stroke the link 493 is depressed, causing the elevation of the adding wheels M and the holding of them in engagement with their racks until the end of this forward stroke. At the beginning of the second return stroke they are thrown out of engagement.

10 The tying of the members F' and F^2 together is effected through the shaft 446 by means of an arm 501, link 502, arm 503 and an arm 504 connected to a link 505 supported by a slot upon the shaft a , and this link is connected to a locking lever 506 pivoted upon one of said members, as F^2 , and having a pin adapted to enter a notch in the other F' , so as to lock the two together.

20 Now on the second forward stroke of the main operating shaft when the arms Z are released and are pulled downward by their springs Q, they pull with them the racks engaging all the adding wheels M, and they cause the amount shafts 133 to turn accordingly through the connections previously described, and the selecting shafts 134 to turn accordingly through arms 507, links 508, and arms 509.

30 The turning of the grand total shaft 446 serves also to lift the arm 280 which when depressed restrains the upward movement of the link 493, the connection being by way of the arm 496 previously referred to and an arm 510, link 511, and arm 512, the latter carried on the shaft 279 previously referred to.

Use of registers in computing continuous balance.

40 Instead of perforating the continuous balance on the check and utilizing the previous perforated balance to compute the next, individual registers may be used for this purpose. In such use it is only necessary to set registers back to zero after the completion of each check. The perforating of the check would be unnecessary, and even the printing of the total could be allowed to await the completion of the check, whereupon the register could be set back to zero. Such a system would require a separate register for each check in use; and where a large number of checks is used the perforating system is to be preferred. But for special applications the use of individual registers in place of the perforated balance is advantageous.

Uses of the machine.

60 The machine is capable of use in various ways and in various businesses where checks of the kind described are to be made out and individual registers are to be kept and the amounts thereof recorded.

Referring first to the form of machine shown in Figs. 3 to 7 the waiter introduces a

card which is provided only with the feeding perforations at the side and the names of the items, "Oysters," "Fish," etc., on successive lines. The clerk presses first the amount corresponding to oysters, 50¢; next the amount corresponding to fish, \$1.50; and so on. The machine prints in the first column the individual amount, in the last column the continuous total; and punches in the intermediate column the continuous total; the perforated total on any line, together with the keys corresponding to the individual amount impressed on the next lower line operate the mechanism described for computing the next total and the turning of the handle of the machine then perforates and prints this next total in the second and third columns.

Referring to the distributing machine of Figs. 8 to 24, and also to the recording machine of Figs. 25 to 32 the operations on the card are substantially the same, the only addition being the perforating, in a column between the column of individual amounts and the column of perforated balances, of a column showing the waiter's number upon each line of the check. The holes punched in the waiter's number column control the selection of the register for the next operation on the same card automatically (that is, without volition on the part of the operator) and also cause the repetition of the waiter's number in the next line. The amount keys which are depressed determine the extent of movement of the racks which actuate the registers. The distributing mechanism is thus controlled in part from the check and in part from the keys, and the black keys will not be used. (These keys may be arranged to punch the waiter's number on the first line of the card, if desired, but it is not thought necessary to illustrate such mechanism. Like the amount mechanism illustrated it acts by throwing out the check-control from the mechanism for punching the waiter's number upon the first pressing of any selecting key, and allows such punching mechanism to be actuated by the selecting shafts which are controlled by selected keys and racks as in the amount mechanism).

The distributing mechanism will then show at any time on the various registers the amounts credited to the several waiters.

Referring to the listing machine of Figs. 25 to 32, this permits the owner to make a printed list or record of the positions of the several registers at any time. To do this it is only necessary for the operator to press the total key and start the motor which continuously actuates the main shaft of the machine. Thereupon the machine will automatically and in a determined order select the several registers in succession and will transfer the amounts thereon to the print-

ing listing mechanism and will print in successive lines the number of the register and the amount thereof; until all the registers have been selected, and their amounts recorded, whereupon the machine will print the total of these amounts.

The necessary manipulations of the machine being explained, the operation of the various parts of the mechanism under such manipulation will be as follows. In this explanation reference is made to the complete machine with the distributing and listing mechanisms, and the operation of the non-listing machine of Figs. 8 to 24 and the non-listing and non-distributing machine of Figs. 3 to 7 will be understood therefrom. The waiter puts the check in the machine. The operator presses the selecting keys (unless the waiter's number is punched on the first line of the check), presses the amount keys, and pulls the handle. Sector-shaped carriers 194 carry punching plates similar to that illustrated in Fig. 7 serving as stops for the inner ends of punches 195 so as to force certain combinations of the latter through the check when the bracket J is advanced. Each of these carriers 194 is provided with a forward arm 196 carrying at the end a stepped member 197 whose movement is limited by a stop 198 carried on a swinging member 199 which also is allowed to move to a distance limited by slides 200, these slides being drawn forward by means of arms 201 on a shaft 202 connected with lower arms 203 which by means of horizontal links 204 are connected to rear levers 205 whose movement or failure to move is determined by the entrance or failure of the feeling pins 206 to enter the perforations of the previous line. The arrangement is such that any combination of feelers 206 entering the perforations of the previous line causes such a movement of the levers 205 and of the slides 200 as will limit the movements of the members 199 and 197 and the upward movement of the carrier 194 to such a point as to reproduce exactly the same combination of perforations with the punches 195. The punching plate for this mechanism does not need to carry more than one series of numerals on it from 0 to 9, and there is no carrying operation from one decimal place to another. Its movements however are by full steps instead of half steps as in the total punching mechanism of Fig. 8.

The particular register being selected by the check, and the amount printed on the check being carried to the distributor, it will be understood that the several registers of the distributor will carry always the amounts chargeable to the several waiters. When it is desired to see the total charge to any one waiter, the indicator 228 (Figs. 12 and 22) being always in gear with the racks 144 and these racks performing a subtract-

ing operation upon the pinions of the particular register which is in gear, turning each of said pinions back to zero, where the racks are stopped by the pins 188 thereof striking the shoulders on the inner ends of the flanges 187 of the carrying devices; there will consequently be an operation of the dials of the indicator 228 such as to show the total taken off from the register. At the same time the selecting shafts 134 are connected by arms 148 and links 229 to arms 230 having a circular outer face on which are indicated the several numbers from 0 to 9, so that at the window D (Fig. 25) are indicated the waiter's number as well as his total.

In this totaling operation the operator simply presses the total key 259 and the appropriate selecting key, and then pulls the handle forward twice. The pressing of the key frees the amount racks, which are held free by the alternate arrangement of Fig. 10; holds out the common adding wheels M throughout the operation; and throws in the zero stop pin to stop the register-operating racks. (The pressing of the selecting keys has already determined the movement of the selecting rings.) The pressing of the total key has also reversed the fork 171 to the position of Fig. 10^a. On the first advance of the handle, the amount rack F being free, the amount shafts are turned by the springs Q through a complete movement, and the register-operating rack likewise. Until the end of this first advance there is no movement of the main throw-off rings 145 because the fork 171 is not in engagement with either of the pins 253 and 254. At the end of this first advance the fork is drawn down by the pin 177 and springs into engagement at its upper end with the pin 254, the main throw-off rings being still unmoved.

On the return movement the register-operating racks are drawn back to zero and absolutely stopped there. At the end of the first return the fork is actuated by the pin 176, and gives to the main throw-off rings 125 a forward movement which permits the selected register to drop into engagement.

On the next forward stroke the racks take the total off the selected register and transmit it to the indicator as described. If we suppose the total key still held down then at the end of the second advance, the fork, being still in engagement with the pin 254, retracts the main throw-off ring and throws out the register while it is at zero. This is called taking off a grand total. If on the other hand the total key is lifted before the end of the second advance; that is to say, before the main throw-off rings have thrown the register out of gear; then the fork will return to the position of Fig. 10, but, as shown in Fig. 10^b, the pin 253 will not be engaged by said fork; so that the movement

of the fork when it is struck by the pin 177 at the end of this second advance, will not actuate the throw-off rings to throw out the register, but will merely cause the fork to snap into engagement with said pin 253. During the second return therefore the racks will restore the register to the position corresponding with the amount which was taken off it, after which restoration the pin 176 will strike the fork and throw out the register, restoring the parts to the position of Fig. 10. This is called taking off a subtotal, since new amounts impressed upon the register will begin not from zero but from the amount already registered.

The above described operation is that of the machines which print the checks. In large restaurants there will be a number of such machines at the desks of the various clerks who fill out the checks. The cashier for the entire restaurant will have a machine from which the keys may be omitted or at any rate in which the keys are not ordinarily used. The amounts are registered under control of the checks previously perforated by the several clerks' machines. This machine being at the cashier's desk where the waiter usually delivers his check and pays for it, the check is simply introduced into the pocket and the lever pulled, whereupon the machine correctly selects the waiter's register and registers thereon the total amount of the check. Before pulling the handle the cashier presses the "cashier's button." This serves to free the amount racks so as to leave the amount shafts free to rock under control of the punched total in the check. The locks of Figs. 8 and 9 remain locked. The selecting shafts as well as the amount shafts are actuated from the check. The total on the card is thus transferred to the selected register.

The totals of the individual waiters may be taken off from the individual registers and transferred to the indicator as previously described under use as a restaurant machine. In fact the distributing of the amounts and the taking off of selected totals is a feature which may be used in connection with the machine in all fields of usefulness to which it is applicable as far as I am aware.

In some restaurants it is customary for the waiter to buy cigars or cigarettes from the cashier. In such case the cashier will use the machine as a restaurant machine for entering the amount of the check. But he will not add this amount either to the common adding wheels of the machine or to the waiter's individual register, since it is a part of the total which is afterward to be applied to these adding wheels and this register. In this case he will press the charge button, and the machine is preferably provided with the auxiliary register described in order to take account of these special items. He will also

put in the check and pull the lever as in the ordinary operation.

The pressing of the button throws out the unlocking connection to the selecting racks so that these racks remain locked; the throwing out of this connection being by means of the link 290 (Fig. 9). The throwing in of the auxiliary register is due to the turning of the shaft 251 (Fig. 12). The common adding wheels M are also locked in their lowered unengaged position by the mechanism shown in Fig. 11. Now when the handle is pulled, the shaft 296 having been turned by the pressing of the amount key and having broken the connections shown at the right in Figs. 8 and 9, there is no movement of the selecting shafts 134 and consequently there is no register thrown in except the auxiliary register (the racks controlled by the selecting keys being still locked as above explained). The amount shafts 133 will be operated by the mechanism of Fig. 20 as in the ordinary use of the restaurant machine.

The provision of a charge button and the mechanism connected therewith is also optional, and a supplementary feature which may be applied not only to machines designed for use as cashiers' machines but also to machines designed for use as restaurant machines or as cash registers or for various other uses.

The machine may also be used as a cash register, in which case the pocket is unnecessary. The clerk will press the keys and pull the lever as in ordinary cash registers, each clerk pressing the black keys corresponding to his individual number so as to select the register upon which the amount is to be added.

Use of cash registers.

In this use the machine is supposed to be operated by a number of clerks each of whom presses his own number in the selecting keys, presses the proper amount keys, and pulls the handle.

The selecting keys throw out the control of the selecting shafts from the card by withdrawing the hook 291 at the left of Fig. 9, so that the selecting shafts operate only under control of the keys. The pressing of the amount keys actuates the shaft 310 at the left of Fig. 9 so as to break the connection shown at the right (by which the amount shaft would otherwise be controlled by a check) and actuates the amount shafts directly from the amount keys, or rather under control of such keys.

The amounts for the various clerks are separately totaled and registered, and may be taken off on the indicator as previously described.

The total adding wheels M are also actuated at each card-punching operation, so as

to register the total of all items punched in the cards. The machine thus acts as either a distributing or a non-distributing cash register in combination with means for perforating cards in accordance with the several amounts registered. In printing amounts on the cards the machine also makes a readable record for visual observance by the customer in addition to the perforated part of the card which serves as a key or tool for physically controlling distributing or accounting devices.

Various mechanisms of the above described machines are not claimed in the present application, being substantially identical with mechanisms described in my previous application, Serial No. 479,189 filed February 20, 1909.

Though I have described with great particularity of detail various embodiments of the invention, yet it will be understood that the invention is not restricted to the particular details and combinations described. Various modifications in detail and in the arrangement and combination of the parts and the order of the steps may be made by those skilled in the art without departure from the invention. By "a machine of the class described," therefore, I mean to include not only the entire machine with the various attachments and modifications described, but also the various unitary parts or subcombinations of mechanism described.

In this application I make no claim to the card control of the mechanism, but I do not thereby waive my right to claim the same in a separate application, the claims of the present application being for the registering and calculating devices whether controlled by cards or not.

What I claim is:

1. In a machine of the class described a plurality of registers, a plurality of operating racks therefor and an indicator in gear with the operating racks of the several registers so as to indicate the total of any one of said registers when it is turned back to zero by said racks.

2. A distributing mechanism of the class described having registers, selecting sectors controlling said registers to determine which of them shall be operated and operating sectors actuating said registers and moving with said selecting sectors.

3. In a machine of the class described punching-plate carriers each having an arm carrying a pinion, an amount rack and a previous-balance rack, both engaging said pinion and both moving forward in the same direction to convey the sum of their movements to said carrier.

4. In a machine of the class described punching-plate carriers each having an arm carrying a pinion, an amount rack and a previous-balance rack, both engaging said

pinion and both moving forward in the same direction to convey the sum of their movements to said carrier, and means for "carrying" to a next higher decimal place by permitting an extra movement of one of said racks when said pinion passes from 9 to 0.

5. In a machine of the class described a pocket, mechanism for recording successive amounts upon and successively feeding a check in said pocket, a register for automatically accumulating such amounts, and means for recording a total of the several previous records on the check and suppressing such feed in recording such total.

6. In a machine of the class described an amount printing mechanism, a distributing mechanism adapted to distribute amounts under different classifications, and amount shafts connected at one point to said amount printing mechanism and at another point to said distributing mechanism and conveying the movement of one mechanism to the other.

7. In a machine of the class described a selecting mechanism for determining the classification of a given entry, a distributing mechanism for making entries under the selected classification, and selecting shafts connected at different points to said mechanisms for conveying the movement of one to the other.

8. In a machine of the class described a distributing mechanism including a circular series of registers containing pinions, circular operating racks adapted to operate said registers, throw-off rings for disengaging said registers from said racks and selecting rings for disengaging said registers from said racks.

9. In a machine of the class described a distributing mechanism including registers, a selecting ring having notches into which parts of determined registers enter, and a main throw-off ring for withdrawing the selected register from its notch at the end of an operation thereof.

10. In a machine of the class described a distributing mechanism including a selecting ring having notches into which parts of determined registers enter, a main throw-off ring for withdrawing the selected register from its notch at the end of an operation thereof, and a supplementary throw-off ring for withdrawing only said part of the selected register promptly so as to permit a prompt return of the selecting ring.

11. In a machine of the class described a distributing mechanism including registers and parallel sectors for selecting, operating and setting said registers said sectors being fixed in location in the machine.

12. In a machine of the class described an operating handle, registering mechanism, a throw-off ring for rendering said registering mechanism inoperative and mechanism for giving said throw-off ring an advance

movement at the end of one movement of the operating handle of the machine and for giving it a return movement at the end of an opposite movement of said handle, and a supplementary throw-off ring receiving an advance at the end of said one movement of the handle and a return at the beginning of said opposite movement of the handle.

13. In a machine of the class described an operating handle, registering mechanism, a throw-off ring for rendering said registering mechanism inoperative and mechanism for giving said throw-off ring an advance movement at the end of one movement of the operating handle of the machine and for giving it a return movement at the end of an opposite movement of said handle, and means for reversing the movement of said throw-off ring relatively to that of said handle in taking off a total from one of said registers.

14. In a machine of the class described total adding wheels movable into and out of operative position, means for moving the total adding wheels out of operative position, and levers 281 and 282 adapted to alternately lock said means to hold said wheels out of operative position until they are both released.

15. In a machine of the class described total adding wheels, a total key and mechanism controlled thereby for holding the total adding wheels out of operation after the total key is released.

16. In a machine of the class described individual registers having wheels, racks for operating said wheels and "carrying" levers operated by the passing of the wheels from 9 to 0, the carrying levers of successive registers being off-set relatively to each other.

17. In a machine of the class described individual registers having wheels, racks for operating said wheels and "carrying" levers operated by the passing of the wheels from 9 to 0, the carrying levers of successive registers being off-set relatively to each other both laterally and radially.

18. In a machine of the class described a main register, an auxiliary register, a selecting device normally in position to select said auxiliary register and adapted to be moved to select said main register, and means for holding said auxiliary register out of its normal position in the usual operation of the machine.

19. In a machine of the class described selecting shafts, key-controlled mechanism and check-controlled mechanism and means

for connecting each of said mechanisms to said shafts.

20. In a machine of the class described individual registers, means for recording the totals of said registers automatically in a determined order of succession upon a continuous list, and means for recording said totals upon separate cards.

21. In a machine of the class described individual registers, automatic selecting mechanism and a total key, means controlled thereby for locking and releasing said selecting mechanism, and means for holding said locking and releasing means in the releasing position until the completion of the operation of said selecting mechanism.

22. In a machine of the class described individual registers, automatic selecting mechanism and a total key, means controlled thereby for locking and releasing said selecting mechanism, and means for holding said locking and releasing means in the releasing position until the completion of the operation of said selecting mechanism and then automatically shifting it to its locking position.

23. In a machine of the class described mechanism for utilizing only the alternate operations of the machine, including an operating arm 418, an operated arm 419 adapted to be moved down by the arm 418, means for locking said arm 419 down, and means controlled by the upward movement of the arm 418 when the arm 419 is held down for releasing said arm 419 on the next downward stroke of the arm 418.

24. In a machine of the class described a handle, selecting mechanism actuated upon the first of each two successive operations of the handle, and stops controlling the selection and which are moved during the second of said two operations of the handle.

25. In a machine of the class described amount registering devices, selecting shafts and amount shafts for operating said registering devices, and means for causing said selecting shafts to operate amount registering devices.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN ROYDEN PEIRCE.

Witnesses:

DOMINGO A. USINA,
THEODORE T. SNELL.