

1,052,437.

5 SHEETS—SHEET 1.

Charles H. Krieger.

Adam Peir

Carl L. Nelson

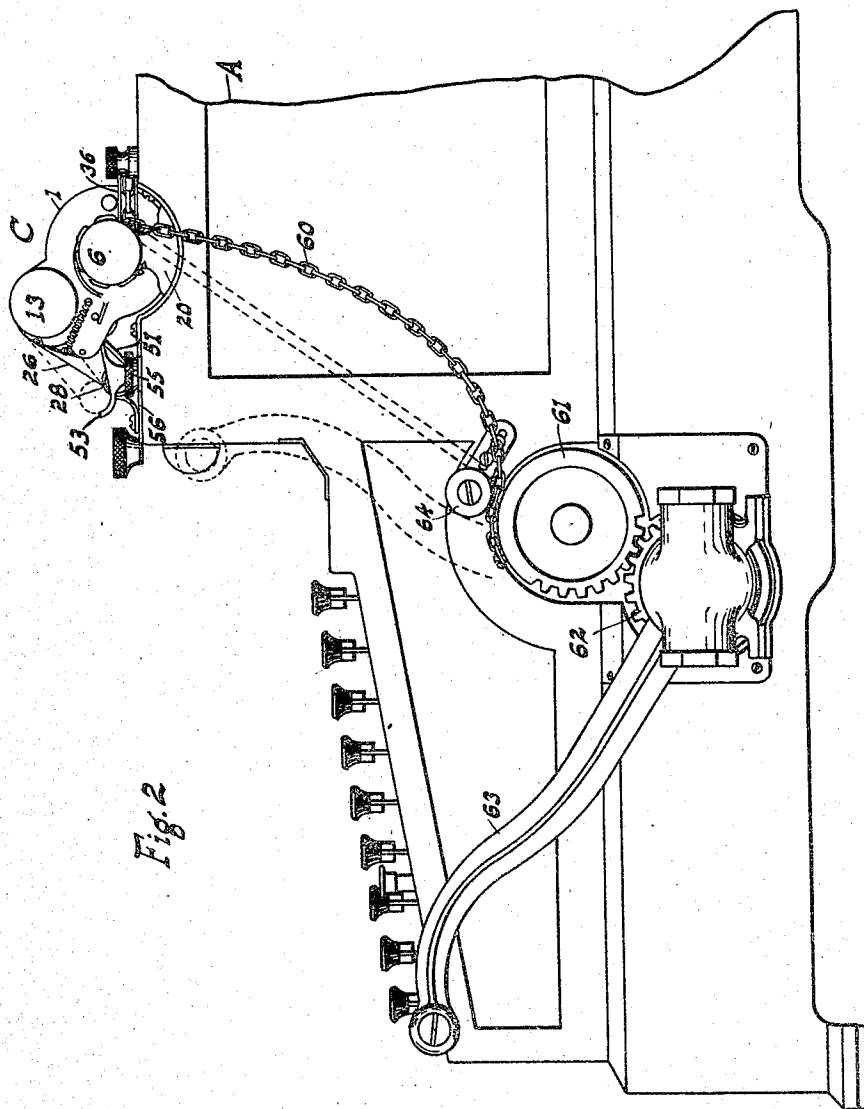
BY *Henry R. Reynolds.*
ATTORNEY

1,052,437.

C. L. NELSON.
CALCULATING MACHINE.
APPLICATION FILED MAR. 27, 1911.

Patented Feb. 4, 1913.

5 SHEETS—SHEET 2.



WITNESSES

Charles H. Kneen.
Adams Reis.

INVENTOR

Carl L. Nelson.

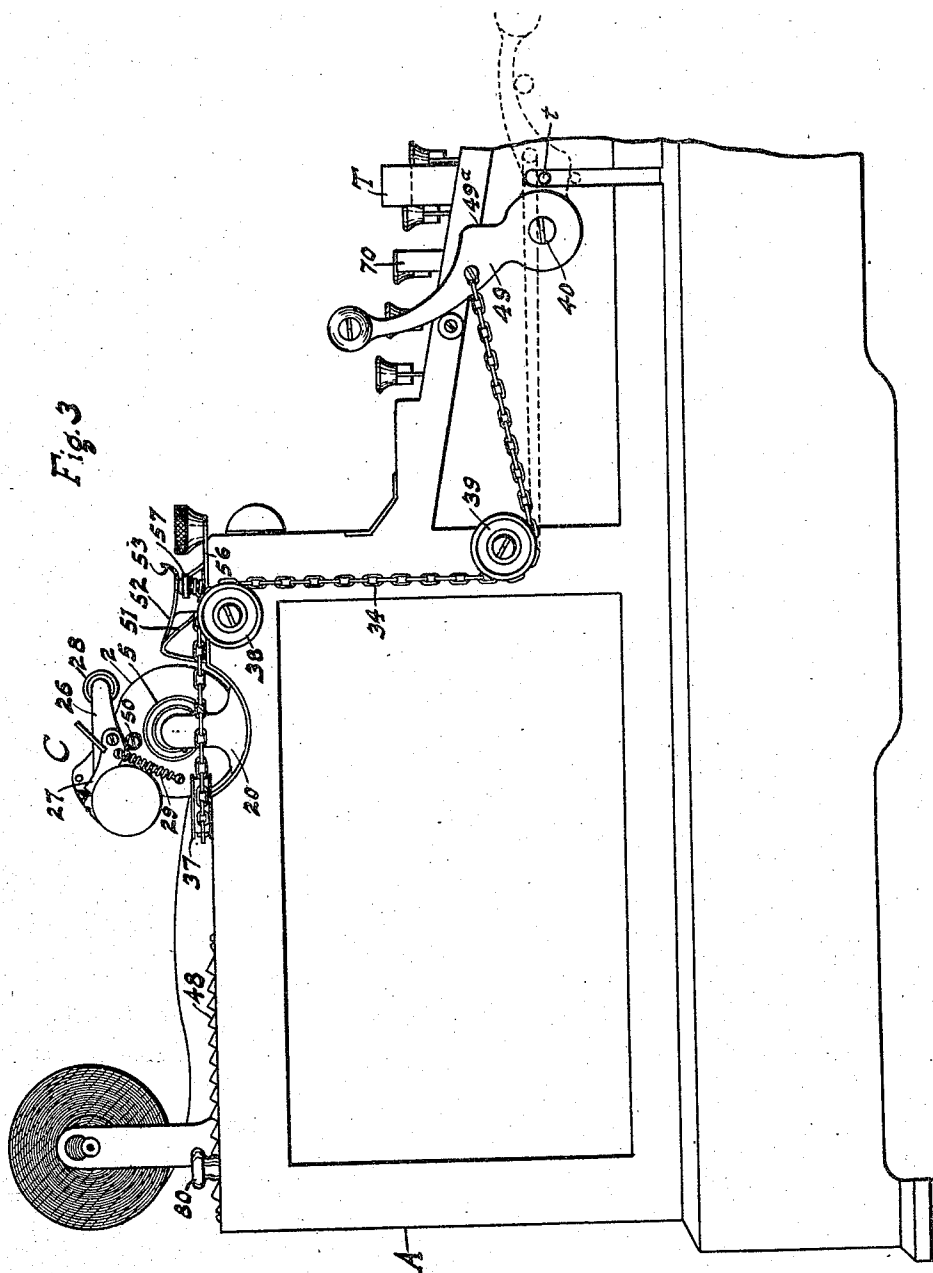
BY

Henry L. Reynolds.
ATTORNEY

C. L. NELSON.
 CALCULATING MACHINE.
 APPLICATION FILED MAR. 27, 1911.

Patented Feb. 4, 1913.
 5 SHEETS—SHEET 3.

1,052,437.



WITNESSES
Charles H. Kregen
Edmund Reis

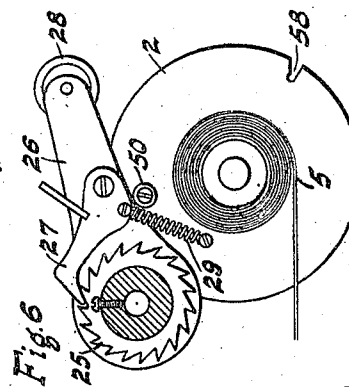
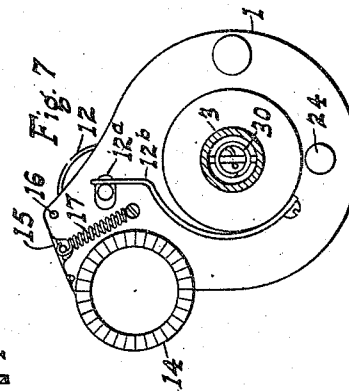
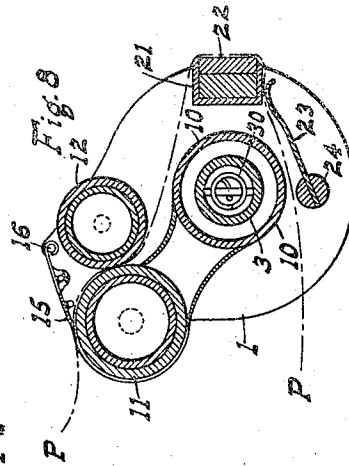
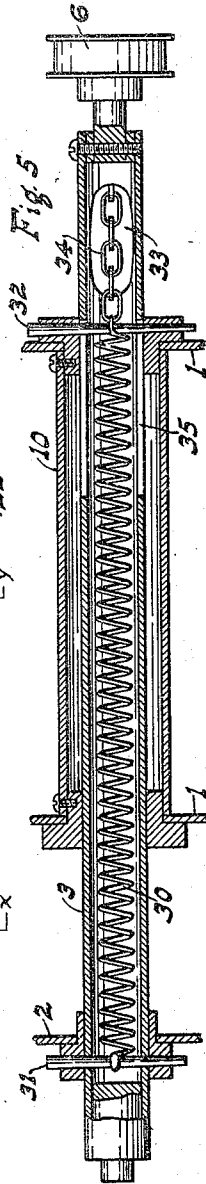
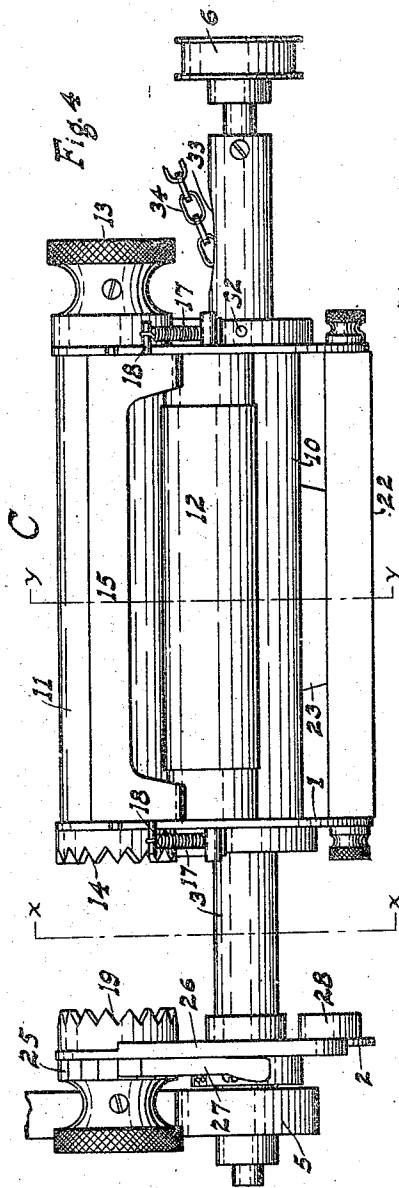
INVENTOR
 Carl L. Nelson.
 BY *Henry L. Reynolds*
 ATTORNEY

G. L. NELSON.
CALCULATING MACHINE.
APPLICATION FILED MAR. 27, 1911.

1,052,437.

Patented Feb. 4, 1913.

5 SHEETS-SHEET 4.



WITNESSES

Charles H. Kegan.

Adam Reis

INVENTOR

Carl L. Nelson.

BY Henry L. Reynolds
ATTORNEY

1,052,437.

5 SHEETS--SHEET 5.



INVENTOR

BY *Henry L. Reynolds*
ATTORNEY

UNITED STATES PATENT OFFICE.

CARL L. NELSON, OF SEATTLE, WASHINGTON.

CALCULATING-MACHINE.

1,052,437.

Specification of Letters Patent.

Patented Feb. 4, 1913.

Application filed March 27, 1911. Serial No. 617,274.

To all whom it may concern:

Be it known that I, CARL L. NELSON, a citizen of the United States, and resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Calculating-Machines, of which the following is a specification.

My invention relates to improvements in calculating machines, and comprises the novel parts and combinations of parts which will be hereinafter described and particularly pointed out in the claims.

The object of my invention is to improve and simplify the mechanism and operation of machines of this kind, particularly of those machines shown in my prior Patents No. 897,768 of September 1, 1908, and No. 933,486 of September 7, 1909.

More specifically, the object of my invention is to provide an improved form of mechanism for controlling the printing platen and the paper carried thereby to bring the amount printed into plain view immediately after printing, and to shift the paperholding mechanism laterally of the line of feed to enable printing of extra matter thereon without affecting the usual printing or adding mechanisms and without feeding the paper.

The accompanying drawings illustrate, and the following specification describes, the embodiment of my invention in the form which is now preferred by me.

Figure 1 is a plan view of my machine, part of the keyboard and the front end of the casing being cut away. Fig. 2 is a side elevation of the machine, the rear part being cut away, showing the parts in the printing position. Fig. 3 is a side elevation of the opposite side of the machine. Fig. 4 is a plan view of the paper carriage, shifted into position for printing of supplemental matter at the left of the column. Fig. 5 is a longitudinal section through the central portion of said carriage, the parts being in the same position as in Fig. 4. Fig. 6 is an elevation of the left hand end of the carriage, the stem of the hand wheel being in section. Fig. 7 is a section and elevation upon the line X, X, of Fig. 4. Fig. 8 is a section of the carriage on the line Y, Y, of Fig. 4. Fig. 9 is a side elevation of the mechanism for controlling the dating mechanism and of the mechanism for throwing the hammers out of operation. Fig. 10 is a

plan view of the mechanisms shown in Fig. 9. Fig. 11 shows, in elevation, the means for controlling the action of the printing mechanism and for holding the carriage in the non-printing position. Fig. 12 shows, in plan, the mechanism for setting the dating type bar.

The machine as herein shown is, in most respects, similar in its construction to the machines shown in the prior patents of mine hereinbefore referred to. It differs from that shown in said patents in the immaterial point of having nine rows of keys and printing mechanisms instead of six. The design and construction of the carriage is however entirely different from that shown in either of said machines. In said machines the printing upon the paper strip was out of sight and could not be inspected except with considerable difficulty or without the strip having been fed forward a considerable distance. In the present invention, the figures printed upon the strip are normally in plain view, the carriage turning down for the printing operation, but immediately turning back to expose the figures printed.

The carriage, designated as a whole by the character C, is mounted upon a hollow shaft 3, which extends transversely of the machine and above the casing. This shaft 3 is journaled in bearings carried by standards 20 at each end of the shaft and at opposite sides of the casing A. Upon this shaft, at the left hand end, is secured a plate 2, upon which is mounted the paper-feed operating mechanism. Upon the same shaft is mounted the carriage C, which receives and feeds the paper. This is shown in section and elevation in Figs. 4, 5, 7 and 8. The frame of this carriage consists of the end plates 1, 1, and the connecting tube 10 which is secured to said end plates. In the end plates 1, 1, are journaled two paper feeding rollers 11 and 12, which are preferably covered with some good frictional material and receive the paper, represented by the broken lines P, P, between them.

The printing platen, herein shown as a flat bar, 22, of suitable material, is secured within a trough shaped holder 21 which extends between the heads 1, 1. The paper is held against this by a tension device consisting of a spring plate 23 which is supported by a bar 24 extending between the heads 1, 1. The paper, upon leaving the

feed rollers, passes beneath a plate 15 which is pivoted at 16 and is held down by springs 17 which engage projecting pins 18. The paper may be torn off against the edge of this plate.

The normal position of the carriage is as shown in Figs. 1 and 3 with its left hand end adjacent the plate 2, and the printing platen up, as shown in Fig. 8. The carriage as a whole, or that part which carries the paper feed mechanism, is movable lengthwise the shaft 3, into the position shown in Figs. 4 and 5. This is done when it is desired to print a date, or other matter, to the left of the column. This is done by the following mechanisms: The shaft 3 is hollow and has a spring 30 therein, one end being connected with a pin 31 which joins the shaft 3 and the bushing to which the plate 2 is secured, and the other end being connected with a similar pin 32, which passes through the bushing which carries the plate 1, at the right hand end of the carriage. The pin 32 passes through a guide slot 35 in the shaft 3, which slot defines the movement possible for the carriage upon the shaft 3. To the pin 32 is connected a chain 34, or other flexible connector, which passes out the hollow shaft through a hole 33, thence about a wheel 36, thence to the left hand side of the casing, about a wheel 37, thence forward and about wheels 38 and 39 on the side of the casing and is connected with a shifting lever 49 which is pivoted at 40. When lever 49 is in the position shown by full lines in Fig. 3 the carriage is in its normal position, that shown in Fig. 1. When the lever 49 is shifted to the position shown by dotted lines in Fig. 3, the carriage is shifted to the position shown in Figs. 4 and 5. The carriage is returned to and held in its normal position by spring 30. The end of the roller 11 next the plate 2 is provided with a ratchet or clutch device 14, the teeth of which are adapted to normally engage a like member 19, mounted to turn in the plate 2. Upon the opposite side of the plate 2 is a ratchet wheel 25, secured integral with the ratchet clutch 19. An arm 26 is pivoted upon the journal of the parts 19 and 25 and carries a pawl 27 engaging the ratchet wheel 25, the pawl and arm 26 being held down by a spring 29, and limited in this direction by a stop pin 50. Upon the left hand end of the shaft 3, outside the fixed plate 2, is secured one end of a spiral spring 5, the other end of which is secured to the casing, as shown at 51, Fig. 1. The tendency of this spring is to turn the carriage so that the printing surface 22 will swing under the shaft 3. Upon the opposite or right hand end of the shaft 3 is a pulley wheel 6 to which is secured a chain 60 which leads downward, beneath a guide wheel 64, and is secured to a wheel 61 which

has a toothed segment, its teeth engaging with a similar toothed segment upon the pivot end of the main operating lever 63. This lever 63 is the same lever shown in my prior patents, by means of which the greater part of the mechanisms are operated. When the lever 63 is thrown down to the position shown in full lines in Fig. 2, the tension of the chain 60 upon the carriage is released, permitting the carriage to turn, under the action of spring 5, so as to swing the printing surface 22 downward, into position to receive the impression of the type. As the carriage swings downward, the roller 28 upon arm 26, engages one or the other of two trackways and stops 51 or 52, depending upon the adjustment thereof. The trackway 51 which is farthest toward the left is also the lowermost. The outer ends of each turns upward to form a stop 53, for the roller 28 to stop the swing of the carriage. The angular movement given to the arm 26 by engagement with the trackway 51 is sufficient to move the ratchet wheel 25 one tooth, this distance representing a single line feed of the paper. If it is desired to give the paper a double line feed, then the trackway 52, which is transversely adjustable by means of the arm 54 and clamping nut 55, is moved toward the left until it will engage the roller 28. As the direction of this trackway is different it will cause a double movement of the arm 26 corresponding to two teeth of the ratchet wheel 25 and to a two line feed of the paper. The return of the carriage is caused by the pull of the chain 60 upon the wheel 6 which is secured to the right hand end of the shaft 3. The size of the wheel 61 to which this chain is secured and by which it is actuated, is greater than that of the wheel 6, and the stops limiting the swing of the carriage are brought into action before the end of the swing of the lever 63. It therefore follows that a certain amount of slack is produced in the chain 60 at each movement of the lever 63. This is shown by the full-line position of the chain shown in Fig. 2. The taut position of the chain, or that occupied during rest when not printed and during the swinging movement, is indicated by the dotted lines. The duration of this slack movement coincides with the printing action and insures that the printing platen shall be at rest at the moment of printing.

There are times when it may be desirable to make use of the computing mechanism of the machine, cutting out the printing mechanisms. This would be desirable when doing multiplications by the method of repeating the factors. When this is desired I may cut out the printing mechanisms as follows: The plate 2 which is secured to shaft 3 has a notch 58 in position to be engaged by the end of a bar 56 mounted to

slide upon the top of the casing and to enter notch 58 to lock the carriage against turning. This bar is held in adjusted position by clamping bolt 57. When the carriage is thus locked in its upper or visible position, the operation of the printing mechanism is cut out. When the carriage is thus held out of printing position it is desirable that the hammers which cause the printing action be also cut out of operation. I secure this result by the following means: The bar 56 which engages the carriage to prevent its turning down to the printing position, has a pin or arm 59 projecting through a slot in the casing in position to engage an arm 40 of a rock shaft 4. This rock shaft has another arm 41 having a side extending foot 42 in position to engage an extension of the pivot pin 43 upon which the hook members 45 swing to engage the hammers. When the bar 56 is pressed backward to engage and lock the carriage, the rock shaft is actuated to throw down the arm 41, thus throwing all the hammer operating mechanisms down enough to prevent engagement with the hammers and to thus prevent operation of the printing mechanisms.

In order to provide means for printing a date when desired, I have provided a special dating type bar. This bar, 44, lies at the extreme left of the type bars, and has the types for printing the months thereon, as indicated in Fig. 10. This bar is free from such control as is employed in connection with the other type bars. It is mounted to slide from front to rear and is controlled in position wholly by hand. It has a side extending arm 8 to which is secured a hand button 30 the shank of which extends upward through a slot 83 in the casing, and carries a pointer 82 adapted to indicate upon a scale 48 on top of the casing, the month which is in position to print. Within the casing a bar 81 is provided with holes 84 adapted to receive a locking pin carried by the arm 8 to secure the dating bar in accurate adjustment for printing. When it is desired to print a date the dating type bar is set in position to indicate the month. The day of the month is printed by using the two rows of keys at the left. It is therefore necessary, when a date is to be printed, that the computing mechanism be cut out of action, to prevent vitiating the totals.

The mechanism employed for printing from the date bar is of the same type as is employed for printing from the other type bars, and the same as is shown and described in my prior patents referred to. Detailed description of these is therefore not considered necessary. This mechanism comprises a hammer 46 and a hammer depressing hook 45. The depressing hook 45 employed in connection with the date bar is, however, not controlled by the same mechanism

as is employed for controlling the same parts in connection with the type bars. The means for controlling this is as follows: Mounted to have a limited reciprocation from front to rear alongside the hammer which acts upon the dating type bar, is a bar 76 which has a side projection 78 adapted to engage the hook 45 to bring it into engagement with the hammer 46 when bar 76 is drawn forward. Bar 76 has a notch 77 receiving the end 75 of an arm 74.

This arm 74 is an extension of the vertical arm 73, which is pivoted at 72 to the casing and has a horizontal arm 7 extending forward, its end being turned upward and extending out of the casing top as bar 70, in position to be engaged by the same hand which throws the lever 49. By depressing the end 70 of this lever the hammer depressing hook 45 will be brought into engagement with its hammer, so that when the main lever 63 is operated, the hammer will be depressed and the date printed.

The lever 7 has a finger 71 which extends over the lever T, which lever is the totaling lever described and shown in said patents. This lever controls the vertical position of the adding or computing wheels. In an intermediate position of this lever these wheels are held out of engagement with both the upper and lower rack bars. See lines 100 to 126, page 14 of Patent No. 897,768, and lines 101 to 112 page 3 of Patent No. 933,486. The depression of lever 7 throws the adding wheels out of action, thus preventing adding in any figures which may be printed. It also secures engagement of the hammer depressing hook for the hammer which prints the date. This lever 7 will remain down only while held. Its return will occur as soon as released, by the action of a spring 79 attached to the rear end of the bar 76.

When the carriage is shifted toward the right to print a date, it is desirable that the figures used for this purpose shall have no effect upon the adding mechanism. I secure this result as follows: The totaling lever T has a pin *t*, projecting through a slot in the casing in position to be engaged by the shoulder 49^a of the lever 49 so as to depress the lever T to its intermediate position. In this position the adding wheels are in their intermediate position, in engagement with neither the upper or lower rack bars, and operation of the printing mechanism will not affect the total.

What I claim as my invention is:

1. In an adding machine, in combination, adding mechanism, a printing mechanism, a paper holding and feeding carriage mounted to oscillate about the axis, a spring acting to swing said carriage in one direction, and means for swinging said carriage in the opposite direction, actuated from the printing

operating mechanism, said means having a slack connection adapted to produce a pause in the swing of the carriage before the printing action occurs.

5 2. In an adding machine, the combination with the printing and adding mechanisms, of a shaft extending transversely of the machine, a carriage mounted to slide lengthwise and to turn with said shaft, a paper
10 feed roll and printing platen mounted upon said carriage, a step-by-step feed device mounted upon the shaft independent of the carriage, a rotative connection between said
15 step-by-step feed device and the feed roll engageable and disengageable by endwise movement of the carriage, a stop engaging the step-by-step feed device and limiting the
20 swing of the carriage, and means for shifting the carriage along its shaft to change the point of printing thereon.

3. In an adding machine, in combination,

adding mechanism, printing mechanism, a shaft extending transversely of the machine, a carriage mounted upon said shaft and having paper holding and feeding mechanisms, a spring connected with said shaft
25 to turn it into printing position, a stop limiting the turning action of said spring, a chain connected with said shaft to turn oppositely to the spring, and a main operating
30 lever connected with said chain and giving it an excess movement, whereby there is a pause in the swing of the carriage before printing.

In testimony whereof I have hereunto
35 affixed my signature at Seattle, Washington, this 20th day of March, 1911.

CARL L. NELSON.

Witnesses:

G. A. SPENCER,
H. L. REYNOLDS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."