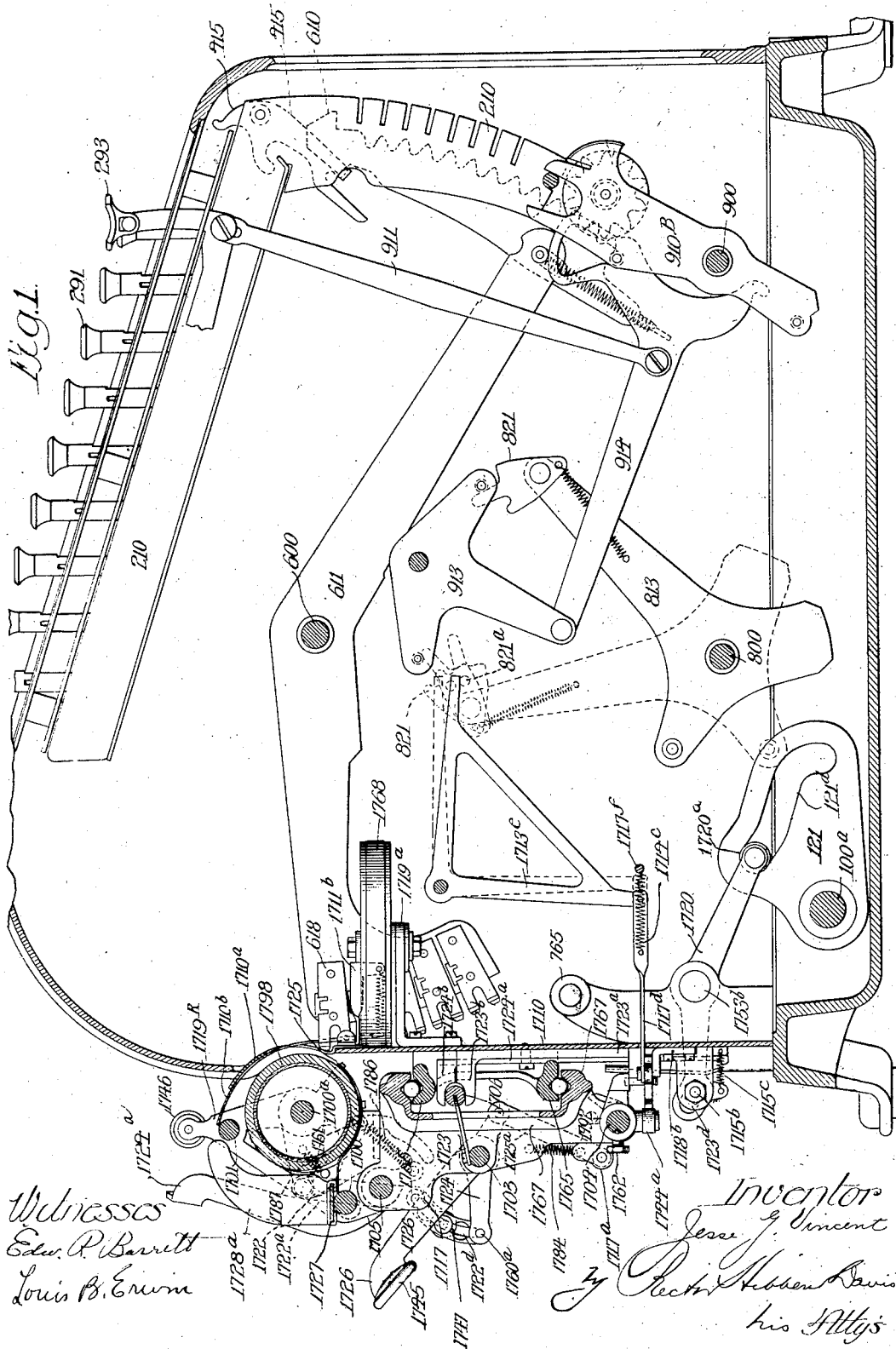


J. G. VINCENT.
CARRIAGE MECHANISM FOR ADDING MACHINES.
APPLICATION FILED AUG. 6, 1906.

929,056.

Patented July 27, 1909.

6 SHEETS—SHEET 1.



929,056.

6 SHEETS—SHEET 2.

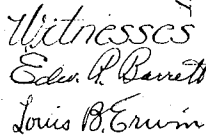
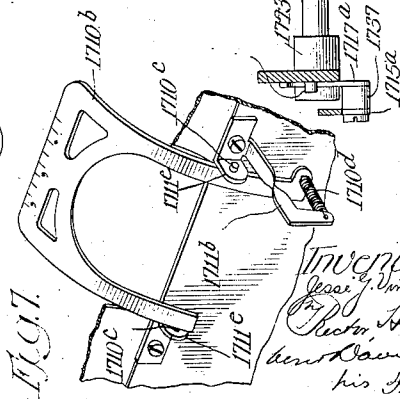
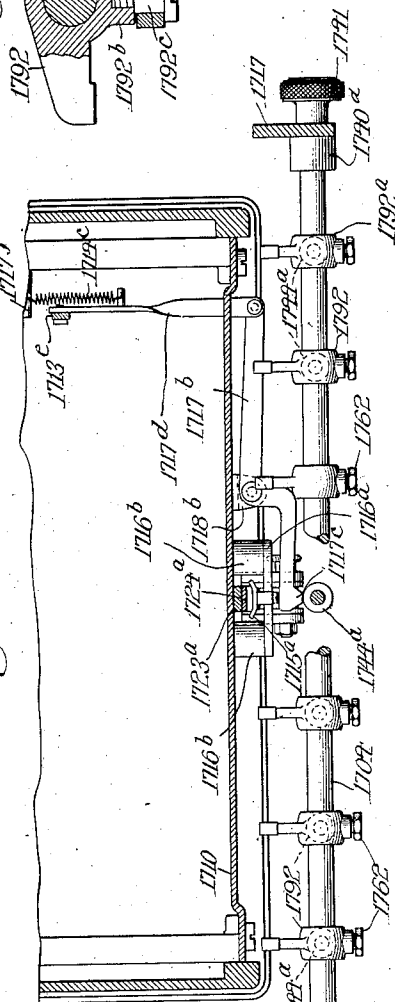
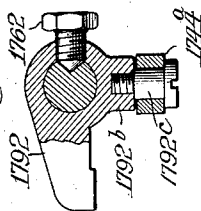


Fig. 3
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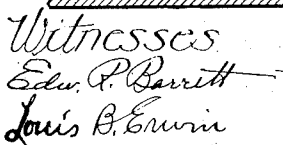
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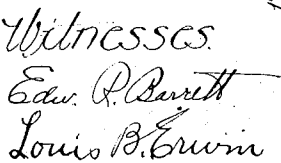
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6 SHEETS—SHEET 5.



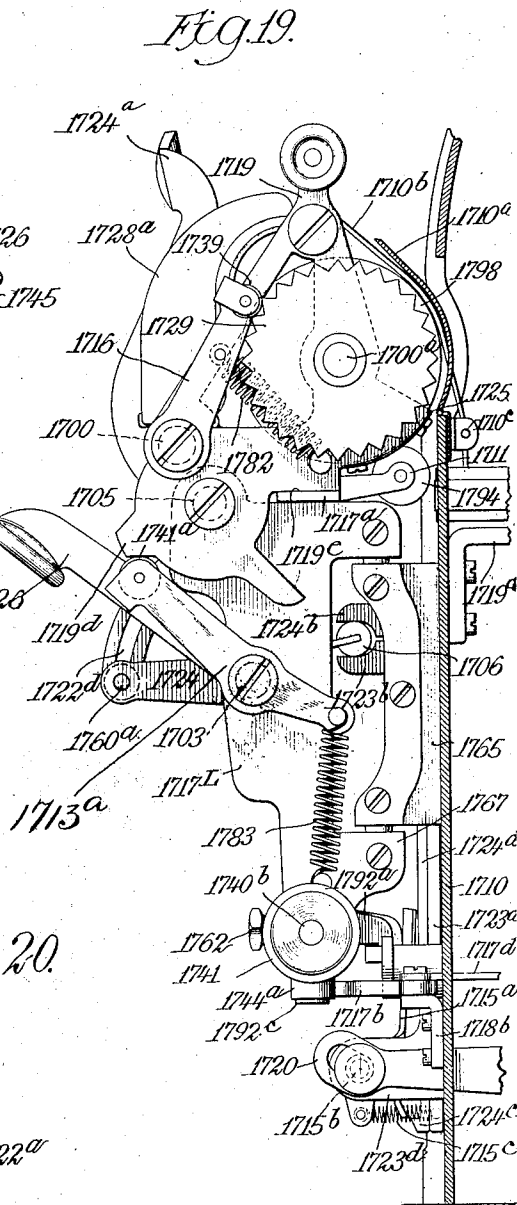
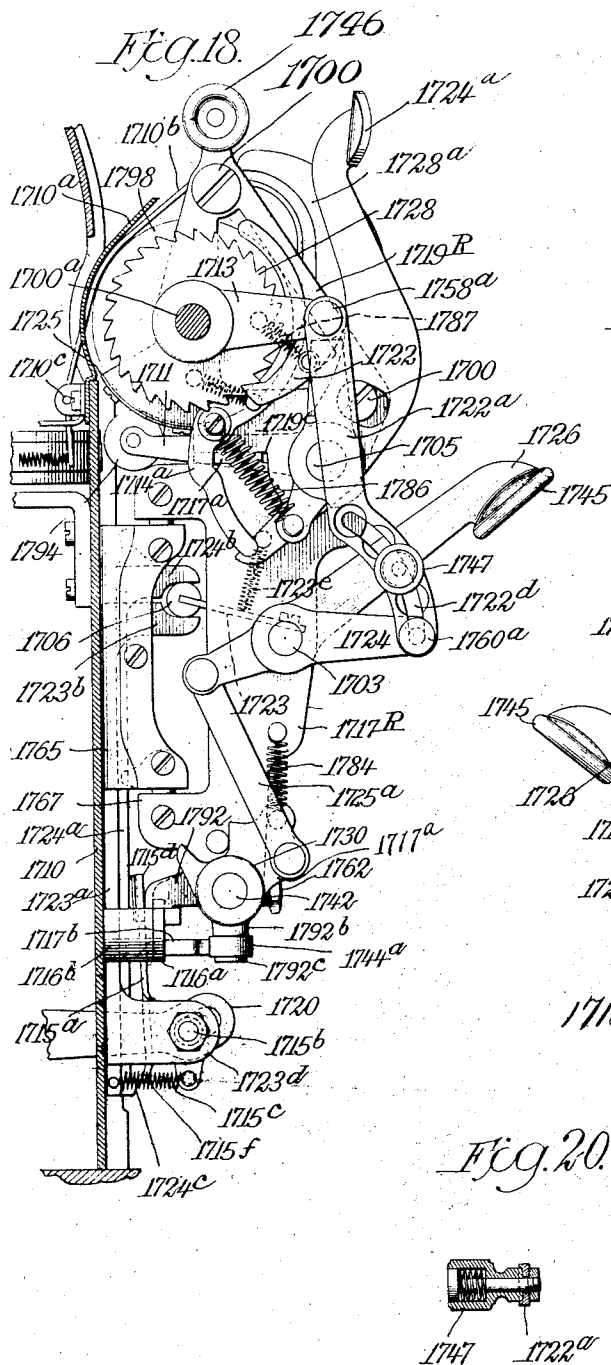
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CARRIAGE MECHANISM FOR ADDING MACHINES.
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6 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

JESSE G. VINCENT, OF DETROIT, MICHIGAN, ASSIGNOR TO BURROUGHS ADDING MACHINE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

CARRIAGE MECHANISM FOR ADDING-MACHINES.

No. 929,056.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed August 6, 1906. Serial No. 329,387.

To all whom it may concern:

Be it known that I, JESSE G. VINCENT, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Carriage Mechanism for Adding-Machines, of which the following is a specification.

The present invention relates more particularly to devices for facilitating the use of an adding machine for tabulating purposes and one of the objects is to provide improved means, simple in form and requiring comparatively few parts, whereby line spacing mechanism may be automatically disabled at a predetermined lateral adjustment of the paper carriage, said means being combined with instrumentalities for effecting automatic column spacing when the adding machine is operated with the line spacing mechanism so disabled.

Another object of the invention is to provide improved means of simple and durable character for automatically disabling the adding or accumulating mechanism of the machine as a result of positioning the paper carriage at a predetermined adjustment when an amount is to be printed but not added.

A further object of the invention is to provide for readily interchanging stop devices which determine the different lateral adjustments of the paper carriage for the purpose of facilitating the adaptation of the machine to different classes of work.

A still further object of the invention is to provide a gage which will automatically take up its proper position over the work when the platen is thrown back, such gage serving to definitely locate upon the paper the printing line and any columnar point therein.

With these and incidental objects in view the invention consists in certain novel features of construction and combinations of parts the essential elements whereof are recited in the appended claims and preferred forms of embodiment of which are illustrated in the accompanying drawings and described in detail hereinafter.

Of said drawings Figure 1 represents in left side elevation certain interior parts of an adding machine of the well-known Burroughs type together with additional parts employed in carrying out the present inven-

tion (the casing of the machine and certain cross-shafts and rods appearing in section), and also shows in section carriage mechanism at the rear of the adding machine including the improvements of the present invention; Fig. 2 shows the carriage mechanism in rear elevation together with the adding machine to which it is applied; Fig. 3 is a detail rear view of a certain stop device on the adding machine; Fig. 4 is an enlarged detail in horizontal section of certain connections for controlling the line spacing; Fig. 5 represents the carriage mechanism in top plan view with the platen thrown back, the casing of the adding machine being represented in horizontal section; Fig. 6 is a top plan view of certain stop mechanism together with devices for disabling the accumulator; Fig. 7 is a detail in perspective of the gage; Fig. 8 is an enlarged sectional detail of an adjustable stop; Fig. 9 is a vertical section from front to rear of the carriage mechanism and part of the adding machine looking from the right-hand side of the latter; Fig. 10 represents in vertical section some of the parts seen in Fig. 9 but in different relative positions; Fig. 11 is a perspective detail of one of the parts appearing in Figs. 9 and 10; Fig. 12 represents a top plan view of a modified form of stop device for the laterally shifting paper carriage, together with a horizontal section of the adding machine casing; Fig. 13 represents the same construction in section from front to rear; Fig. 14 represents a part of this construction in vertical cross-section; Fig. 15 represents in perspective detail one of the parts of this modified construction; Figs. 16 and 17 are sectional details of constructions for permitting interchange of the stop devices; Fig. 18 is an end elevation of the carriage mechanism viewed from the right-hand side of the machine, the casing of the latter appearing in cross-section; Fig. 19 is a similar view from the opposite side; and Fig. 20 is a sectional detail.

While the invention is illustrated and described in the present instance as applied to an adding machine of the well-known Burroughs type exemplified in the William S. Burroughs patents Nos. 504,963 and 505,078, issued September 12, 1893, it is nevertheless to be understood that the improvements of the present invention are capable of utilization in connection with adding machines of

other types and some of them in fact in machines which do not possess the functions of an adding machine.

Preliminary to a detailed description of the novel constructions for carrying out the present invention it will be desirable to describe at some length certain carriage mechanism which of itself does not constitute subject matter of the present invention.

In the drawings the reference numeral 1710 designates the back panel of a Burroughs adding machine which is open at the upper part for the projection therethrough of type in the printing operation. Secured across the back of this panel is a supporting bracket 1765 formed with race ways of ball bearings for the laterally shifting paper carriage 1767 formed with similar race ways, as shown in Figs. 1 and 9. This carriage has suitable end plates 1717^u and 1717^r which project rearwardly and upwardly and downwardly to provide bearings for rock rods or shafts 1703, 1704 and 1705 performing various functions as hereinafter described. The upper one of these rock shafts 1705 carries the platen cradle comprising end plates 1719^u and 1719^r and connecting cross rods 1700 and 1701. The usual platen roller 1798 is supported in this cradle upon a rotary shaft 1700^a and by rocking the cradle on the shaft 1705, preferably by means of the knobs or thumb nuts 1746, the platen may be moved into and out of printing position in rear of the above mentioned opening in the casing of the adding machine. The paper is introduced from the rear between gages 1728^a slidably mounted upon a cross bar 1727 of the cradle, and passes to the underside of the platen, being guided by a curved plate 1725, also carried by the cradle. The paper thence extends over the front side of the platen, where it is presented to the type, a suitable guide plate 1710^a being secured in the opening of the adding machine casing, appropriately apertured for the passage of the type and of such form as to cause the paper to hug the platen. When wide paper is used it passes up by the edge of said guide-plate, but a narrow strip, such as used when simply listing amounts and not tabulating, will be passed under the cross rod 1701 which carries a severing blade 1721.

The feed pressure of the paper against the platen is produced through the employment of several sections of rollers 1794, each section being movable independently of every other so as to insure the proper pressure of the paper against the platen roller throughout its width and hence uniform advance of the paper. Each set of rollers 1794 composing a section occupies an opening in the guide plate 1725 (Fig. 9) and is journaled in the outer ends of a pair of arms 1711 which in turn are journaled upon the shaft 1705 and pressed upwardly by springs 1780 encir-

cling the shaft and bearing at their rear ends against the underside of the cross rod 1700, while at their forward ends they embrace pins or studs on the arms 1711, respectively, (see Figs. 2 and 9). A series of collars 1734, (Fig. 2) one for each arm 1711, are secured to the rock shaft 1705, said collars having forwardly projecting fingers 1712 (Fig. 9) bearing upon the upper sides of studs 1752^b of said arms 1711, so that by turning the said shaft, which may be done by moving the finger lever 1724, all the pressure rollers may be withdrawn from contact with the platen roller, when it is desired to release the paper from the feed pressure. This finger lever projects in rear of the platen at a convenient location for manipulation by the right hand of the operator and is, of course, secured to the shaft 1705. A forward projection of said finger lever is connected by a spring 1786 with a stud on the cradle, (Fig. 18 and dotted lines, Fig. 1), said spring serving to hold the fingers 1712 normally elevated to permit the springs 1780 to have free play in pressing the feed rollers against the platen.

It is quite important, particularly in tabulating work, to hold the platen firmly to its printing position and to that end means are provided for supplementing the gravity of the parts usually relied upon to maintain the proper position of the platen. One end plate of the cradle is formed with a downward and rearward extension 1719^a (Figs. 9 and 19) whose rear edges extend concentrically with the pivot of the cradle and whose side edges extend tangentially thereof. A lever 1713^a is mounted to turn upon the left hand end of the rock shaft 1703 and a relatively strong spring 1783 connects the forwardly extending arm of said lever with a stud on the end plate of the carriage, for the purpose of forcibly thrusting the rearwardly extending arm of the lever in a forward direction. This rearwardly extending arm is formed as a hanger at its outer end and an anti-friction roller 1741^a is mounted in this hanger and bears against the edges of the rearward extension 1719^a. In the normal position of parts with the cradle rocked forwardly, said roller bears against the lower tangential edge of said extension and thereby causes the spring 1783 to exert a pressure holding the platen to its printing position. When the cradle is thrown back to remove the platen from its printing position the tension of this spring must, of course, be overcome as the lug or extension 1719^a forces its way past the roller. However, as soon as the concentric edge of the lug passes out of contact with the roller the latter will be pressed against the upper tangential edge of said lug so that the spring 1783 then exerts itself to hold the cradle in its extreme rearward position. It will be seen that said

spring serves as a means for automatically completing the rocking movement of the cradle in coming to its forward as well as its rearward position. These positions are determined by the abutment of radial shoulders 1719^a on the end plates of the cradle against laterally projecting flanges 1717^a of the end plates of the carriage.

The roller platen with its journal 1700^a is as usual rotatable in the cradle and the left hand end of said journal carries a V-toothed wheel 1729 (Fig. 19) engaged by an alining roll 1739 at the end of an arm 1716 pivoted on the left hand end plate of the cradle, said arm being drawn forwardly by a spring 1782 connected at one end thereto and at the other end to a stud projecting from said end plate, as shown in Fig. 19. The usual knob or thumb piece 1795 (Fig. 5) secured to the opposite end of the platen journal serves for turning the platen roller back and forth by hand.

The line spacing mechanism (Figs. 1, 2 and 18) comprises a ratchet wheel 1728 secured to the platen spindle 1700^a between the knob 1795 and the right hand end plate of the cradle, and a pawl 1722 carried by a pair of arms 1713 mounted to turn upon said journal, the pawl being held in engagement with the ratchet wheel by a spring 1787 connected at one end thereto and at the other end to one of said arms. A stud 1758^a forming the pivotal connection between the pawl and its supporting arms also constitutes a pivotal connection between said arms and a link or pitman 1722^a curved at its lower end in the arm of circle described about the rock shaft 1703. This curved part of the link or pitman is formed with a longitudinal slot 1722^a curved in the same arc and an abutment or tappet piece 1747 occupies said curved slot and is adjustable lengthwise thereof to vary the extent of the line spacing. An arm 1724 secured to the rock shaft 1703 carries a screw stud 1760^a at its outer end occupying the slot 1722^a. This screw stud acting against the tappet piece 1747 will thrust the link or pitman 1722^a upwardly and draw the pawl 1722 over one or more teeth of the ratchet wheel 1728 according to the adjustment of said tappet piece. On the return stroke of the arm 1724 the said screw stud acting against the lower end of the slot in the pitman draws the latter down and thereby causes the pawl 1722 to advance the platen a distance corresponding with the length of the tooth or teeth of the ratchet wheel over which the pawl has been retracted.

The oscillations of the actuating arm 1724 are produced through the medium of a series of forwardly extending arms 1723 secured to the rock shaft 1703 and united at their outer ends in a strip which enters the longitudinal slot of a rod 1706 in such manner as

to produce a rigid connection between the strip and the rod. The latter is round in cross section and is embraced by jaws 1723^b and 1724^b, the former projecting from the upper end of an upright bar 1723^a slidably mounted upon the adding machine panel 1710 by means of screw studs 1723^c (Fig. 9) secured in the latter and occupying slots of the bar. The latter has at its lower end a rearwardly projecting lug 1723^d receiving a bolt 1715^b which extends through the slotted rear end of a lever 1720 lying alongside of said lug and being pivoted intermediate its ends upon a screw stud 1753^b of a standard 765 within the adding machine casing, as shown in Fig. 9. The outer end of the forward arm of said lever carries a roll 1720^a occupying a cam slot 121^a of a plate 121 secured to a rock shaft 100^a of the adding machine, which rock shaft receives an oscillation in every operation of said machine resulting through co-action of the cam slot with the roll, in producing vibration of the lever and consequent reciprocation of the bar 1723^a which in turn may produce vibration in the shaft 1703 and the arm 1724. Lateral shifting of the carriage does not disturb these connections because the rod 1706 is arranged to slide between the jaws 1723^b and 1724^b and maintain its operative relation thereto under any lateral adjustment of the carriage.

The means here shown for determining the lateral position of the carriage are of the following description. On a pair of posts 1716^b projecting from the panel 1710 (Fig. 6) there is supported a cross bar 1716^a shouldered on its upper edge at the center, (Fig. 3), and the before mentioned rock shaft 1704 carries a series of stop fingers 1792 and 1792^a adjustable lengthwise thereof and adapted to be fixed at different positions by means of set screws 1762 engaging a longitudinal slot or groove 1704^b in said shaft, any one of these stop fingers being adapted to engage the shoulder of the cross bar 1716^a to determine the lateral position of the carriage. The latter is drawn to the left by a clock spring 1788 within a drum 1768 rotating in a stud 1768^b supported within the casing of the adding machine by a bracket 1719^a, one end of the spring being secured to the drum and the other to the stud. A steel strap or band 1768^a is secured at one end to the carriage 1767 and at the other end to said drum upon which said band winds as the carriage is impelled by the spring in a well-known manner. For the purposes of the present invention the jaws which embrace the round rod 1706 of the line spacing mechanism are made separable, the upper jaw 1724^b being part of a slide bar 1724^a slotted longitudinally to engage the same screw studs 1723^c which guide the slide bar 1723^a but the latter may move independently of

the slide bar 1724^a. Pivotally mounted upon the same pin 1715^b which connects the slide 1723^a and the lever 1720, is a dog 1715^a connected by a spiral spring 1715^c with said slide bar, said spring tending to force the lower end of the dog which is in the form of a catch 1715^f into engagement with the top side or shoulder of a projection 1724^c at the lower end of the slide bar 1724^a. When this catch is so engaged with said projection it will be obvious that the two slide bars will move as one and effect the line spacing through the connections previously described. On the other hand if this catch is disengaged from the projection the slide bar 1723^a will descend without carrying along the slide bar 1724^a and the latter will remain in its elevated position being so retained by a spiral spring 1723^c which connects one of the arms 1723 with a stud 1723^d on the carriage 1767. Hence under these last-named conditions the line spacing mechanism will not operate.

In order to bring about the above described disablement of the line spacing mechanism automatically by shifting of the paper carriage to a certain predetermined lateral adjustment, the upper end of the dog 1715^a is formed with beveled lateral wings 1715^e and two different lengths of stop fingers are provided for determining lateral positions of the carriage, a finger 1792 of the greater length projecting forwardly beyond the shouldered stop plate 1716^a so as to engage the beveled wings of the dog as illustrated in Fig. 9, but a shorter stop finger 1792^a not projecting beyond this stop plate so that no coöperative engagement takes place between such fingers and the dog. As before stated the stop fingers are longitudinally adjustable on the rod 1704 and as will hereinafter appear these stop fingers are removable from the rod, so that various arrangements and adjustments of the fingers can be brought about to suit different kinds of tabulating work to be done on the machine. Where an amount is to be printed and the carriage shifted laterally without changing the longitudinal position of the paper one of the longer stop fingers 1792 will be properly located upon the rod 1704 for determining the lateral position of the carriage when such an amount is to be printed and in the movement of the carriage to such position this stop finger will displace the dog in the manner described so as to prevent any line spacing in the ensuing operation of the adding machine.

The above described construction of dog and elongated stop fingers is utilized for the purpose of automatically releasing the carriage and permitting the spring to shift it to the next columnar position to the left. Of course as the slide bar 1723^a is moved

downwardly by the lever 1720 the dog is carried along with it. The displacement of the dog by its contact with the stop finger 1792 brings the end of the latter to bear against the central portion of the dog under the pressure of the spring 1715^c. In the downward movement of the dog its upper end passes below the stop finger and said spring carries the dog under the stop finger so that upon the upward movement of the slide bar 1723^a and consequently of the dog the upper end of the latter acting against the under-edge of the stop finger will lift the latter out of engagement with the shoulder of the stop plate 1716^a whereupon the carriage will be shifted until the next stop finger to the right comes up against said shoulder. As the dog continues its upward movement its lower end portion or catch 1715^f will slide over the inclined back of the catch projection 1724^c and then be drawn into engagement with the top shoulder thereof. Should the tabulating work be of such a character as to call for line spacing at the next operation, then the next stop finger to the right will be one of the shorter kind and consequently in the reciprocation of the slide bar 1723^a the line spacing mechanism will be operated, the parts thereof maintaining the relation illustrated in Fig. 10.

As to the means here shown for automatically disabling the accumulating mechanism it will first be desirable to point out some of the parts in the regular Burroughs machine through which accumulation of items set up on the key-board is brought about. Referring to Fig. 1 the reference numeral 291 designates the usual amount keys which control the extent of movement of racks 610 normally upheld by latches 415. The adding wheels to which these racks impart movement are supported in a rocking frame 910 which is connected through a pitman 914 with a three-armed lever 913 carrying studs to be acted upon by a pawl 821 pivotally mounted on the end of a lever 813. For a detailed description of these parts and those with which they coöperate in performance of the usual functions of the Burroughs machine, reference may be had to said Patent No. 504,963. It will suffice for the purposes of the present specification to state that the lever 813 is rocked back and forth in each operation of the machine and its pawl 821 acting alternately upon the pins of the three-armed lever 913 will rock the latter back and forth thereby transmitting movement through the medium of the pitman 914 to the frame which carries the adding wheels. Normally the latter are in mesh with the racks 610 but at the commencement of an operation of the adding machine they are moved out of engagement with said racks and remain disengaged while said racks move downward to positions de-

terminated by the depressed keys 291. The downward movement of the racks is accompanied by movement of levers 611 so that type on plates 618 at the rear of such levers will be brought to the printing line in correspondence with the depressed keys. After the printing takes place in the manner set forth in said Patent No. 505,078, the lever 813 starts forward and the adding wheels are brought into mesh with the racks 610 so that when the latter move upward to normal position the adding wheels will be turned to the proper extent.

It will be obvious that the adding wheels will not be brought into mesh with the racks unless the pawl 821 maintains its operative relation with the three-armed lever 913. By the present invention it is proposed to provide a simple and effective form of means for disabling this pawl by the act of moving the paper carriage to a predetermined lateral position. Of course it will be understood that in many kinds of tabulating work it is desired to print numbers in a column without accumulating the total thereof. In the present instance the stop fingers 1792 and 1792^a are formed with bosses 1792^b tapped to receive screw studs 1792^c upon which are mounted rollers 1744^a as shown in Fig. 8. A stop finger will have this roller stud depending from it or not according to whether or not the amount to be printed when the carriage is in the position determined by such stop finger is to be excluded from the accumulation. The studs with their rollers can be readily attached to or removed from the stop fingers so that varying characters of tabulating work can be accommodated.

A horizontally vibrating lever 1717^b is pivoted intermediate its ends to a bracket 1718^b on the back of the adding machine and one arm of this lever is formed with a laterally projecting nose 1717^c (Fig. 6) for engagement with the roller 1744^a of any stop finger carrying this attachment. The other arm of said lever 1717^b is jointed to one end of a link 1717^a which is in turn jointed to the depending arm of a bell crank lever 1713^e whose horizontally extending arm projects above the path of movement of a laterally projecting stud 821^a on the pawl 821. This bell crank lever is pivoted on a suitable support within the adding machine and is normally held forward as to its depending arm and upward as to its horizontal arm by a spring 1714^c connected at one end to the link 1717^a and at the other end to a fixed stud 1717^f which constitutes a stop to limit the rearward movement of the link. This spring tends to thrust the nose 1717^c of the lever 1717^b into the path of the roller 1744^a. Thus, when the lateral shifting of the paper carriage brings the stop finger carrying said roller up against

the fixed abutment determining the position of the carriage, the roller acts against said nose, and thereby rocks the lever 1717^b and holds it displaced from normal position during the ensuing operation of the adding machine. This results in rocking the bell crank lever 1713^e and lowering its horizontal arm into the path of the stud 821^a on the pawl 821. Therefore said pawl is prevented from assuming its coöperative relation with the rear pin or stud of the three-armed lever 913 and consequently when the lever 813 is swung forward it fails to return said three-armed lever to its normal position and the adding wheels remain out of mesh with the racks 610. It follows that said racks return to normal without actuating said wheels and the amount which has been printed is not accumulated. Of course when the lateral position of the carriage is determined by a stop finger from which the roller stud is removed, the accumulation will take place as usual.

It has been already mentioned that provision is made for removing the stop fingers from the rod 1704. In this same connection provision is made for interchanging the rod with one designed to provide for changing the lateral adjustment of the carriage by hand, omitting the devices for automatically shifting the same. In Figs. 12 to 17 a stop construction of this modified character is illustrated together with constructions for facilitating the interchanging of stop rods. The modified stop rod 1709 is flattened on one side for the attachment by suitable screws of arms or lugs of a strip or plate 1712^b formed with the down-turned flange 1712^c notched at different points throughout its length as shown at 1712^d. The cross bar or plate 1716^a heretofore mentioned is provided with a rearwardly projecting lug 1763^a preferably square in cross section for engagement with one or another of the notches 1712^d. It will be seen that by rocking the rod the notched strip may be disengaged from said lug and the carriage moved to any lateral position desired. In the present instance as hereinafter more particularly explained the engagement between the notched strip and the lug is enforced by spring pressure.

The following described construction, illustrated in detail in Figs. 16 and 17, provides for the interchanging of the stop rods 1704 and 1709. Each rod is formed at the right-hand end with a cross slot 1742^e and at the left-hand end with a trunnion 1704^a. The cross slot is adapted to engage a tongue 1742^a on the end of a shouldered stub shaft 1742 and the trunnion is adapted to engage a step bearing in the headed end of a screw 1740. The stub shaft 1742 is journaled in a sleeve 1743 secured in the right-hand end plate 1717^a of the paper carriage, said

sleeve being interiorly shouldered to prevent lateral movement of the stub shaft. The screw 1740 engages the tapped opening of a somewhat similar sleeve 1740^a secured in the left-hand end plate 1717^u of the paper carriage. This last-named sleeve is turned out to provide for the head of the screw sliding therein and said screw is formed with a stem 1740^b to which is fastened a knob or thumb piece 1741. By turning the latter the screw can be so far withdrawn as to permit longitudinal movement of the stop rod sufficient to disengage its slotted end from the tongue 1742^a and its trunnion from engagement with the screw.

The rocking of the stop rod by hand is of course necessary in the construction shown in Figs. 12 to 15 but it is also desirable in the previously described construction where the devices for automatically rocking the rod are employed. The same manipulative devices serve in either case, being illustrated in Fig. 1 as applied to the same parts which in Figs. 12 to 15 hold the stop rod 1709.

These devices comprise a collar 1730^a secured on the outer end of the stub shaft 1742, a plate 1717^a secured to said collar, a link 1715^a coupled to the rearwardly extending portion of said plate, and a lever 1726 pivoted on the rock-shaft 1703 and jointed at its forward end to said link. The rearwardly and upwardly extending arm of this lever terminates at a convenient location in a finger-piece 1745 and it will be seen that by forward pressure upon the latter the stub shaft 1742 will be rocked in a direction to disengage the stop devices. A spring 1784 connected at one end to the plate 1717^a and at the other to the right-hand end plate of the carriage serves to enforce engagement between the stop devices. In the construction shown in Figs. 12 to 15 this spring forces the flange of the strip 1712^b against the lug 1763^a so that after a notch of said strip has been disengaged from said lug by manipulation of the lever 1726 and the carriage is shifted the said lever may be released and as the carriage is brought to the desired adjustment the appropriate notch of said strip will be automatically engaged with the lug. The spring of course performs much the same office when the first described form of stop rod is in the machine. Occasion will of course arise for positioning the paper carriage by hand even when the automatic shifting devices are present. It will be seen that the rocking of the stop rod 1704 by manipulation of the lever 1726 will lift out of engagement with the shoulder of the cross plate 1716^a any stop finger which is at the time bearing against the same. Then when the carriage has been brought to approximately the desired lateral position and the

lever 1726 is released the spring will bring the appropriate stop finger into position for engagement with said shoulder. When the stop rod 1704 is in use with the automatic line and column spacing devices, said spring serves the purpose of restoring the stop rod to its normal position after having been displaced by the action of the dog 1715^a against an elongated stop finger in the manner hereinbefore described. It is to be noted that the carriage in this construction can be freely moved to the right, the stop fingers riding over the inclined edge of the cross bar 1716^a to the left of its shoulder and any elongated stop fingers riding over the left-hand beveled wing of the dog. Thus, the carriage can be thrown to the right without necessarily manipulating the lever 1726. In the construction shown in Figs. 12 to 15, however, this lever must be held forward in order to move the carriage in either direction beyond one column space.

Referring next to the gage which assists in locating a printing line on the paper and columnar points therein, this comprises a plate 1710^b whose rear edge is formed with graduations and is designed to lie against the paper on the platen when the latter is thrown back out of printing position as shown in Fig. 5. Said plate is curved or arched and formed with legs pivoted at 1710^c respectively to brackets 1711^c secured to the inner side of the panel 1710 just below the opening therein through which the type plates 618 are projected in the printing operation, the open space in the plate between these legs providing for the free passage of the type. One of the legs is elongated and the bracket to which it is pivoted has a forwardly extending arm 1711^b with a depending lug supporting one end of a spiral spring 1710^a the other end of which is attached to the extremity of said elongated leg. This spring being connected to the plate below its pivot tends to press the upper portion of the plate rearwardly. The relation of parts is such that when the platen and its cradle are in normal position the gage plate bears with its legs against a portion of the platen or the paper thereon, the graduated part of the plate being above the platen as shown in Figs. 1 and 9. However, when the cradle is rocked and the platen carried rearwardly the points of contact between the gage plate and the paper on the platen change so that when the platen reaches its rearmost position the graduated edge of the plate bears against the surface of the platen or the paper thereon as illustrated in Fig. 5 along a line where the type strike when the platen is rocked forward without being turned in its bearings. It will thus be seen that this gage automatically positions itself to assist the operator in locating the

printing line and by means of its graduations locating a particular columnar point therein.

It will now be seen that the above described constructions are well calculated to accomplish the objects primarily stated. At the same time it is to be understood that these constructions are susceptible of considerable modification without departure from the spirit and scope of the invention. Consequently in claims which follow the essential elements are cited without limitation to details of construction.

What is claimed is:

1. In a machine of the character described, the combination with mechanism comprising adding elements, actuators therefor, and devices for effecting coöperative relationship between said adding elements and actuators, of means for disabling said devices, a laterally shifting carriage, and a detachable roller stud carried thereby and operating the said disabling means.

2. In a machine of the character described, the combination with mechanism comprising adding elements, actuators therefor, and devices for effecting coöperative relationship between said adding elements and actuators, of means for disabling said devices, a laterally shifting carriage, a column stop thereon, and a roller stud detachably secured to said column stop and operating the said disabling means.

3. In a machine of the character described, the combination with mechanism comprising adding elements, actuators therefor, and devices for effecting coöperative relationship between said adding elements and actuators, of means for disabling said devices, a laterally shifting carriage, a stop rod carried thereby, a column stop longitudinally adjustable on said rod, and a roller stud detachably secured to said stop and operating the said disabling means.

4. In a machine of the character described, the combination with mechanism comprising adding elements, actuators therefor, and devices for effecting coöperative relationship between said adding elements and actuators, of spring-held means for disabling said devices comprising levers vibrating in planes at right angles to each other and a connecting link, a laterally shifting carriage, and a detachable roller stud carried thereby and acting against one of said levers; substantially as and for the purpose described.

5. In a machine of the character described, the combination with mechanism comprising adding elements, actuators therefor, and devices for effecting coöperative relationship between said adding elements and actuators, of spring-held means for disabling said devices comprising levers vibrating in planes at right angles to each other and a connect-

ing link, a laterally shifting carriage, a column stop thereon, and a roller stud detachably secured to said column stop and operating the said disabling means.

6. In a machine of the character described, the combination with mechanism comprising adding elements, actuators therefor, and devices for effecting coöperative relationship between said adding elements and actuators, of spring-held means for disabling said devices comprising levers vibrating in planes at right angles to each other and a connecting link, a laterally shifting carriage, a stop rod carried thereby, a column stop longitudinally adjustable on said rod, and a roller stud detachably secured to said stop and operating the said disabling means.

7. In a machine of the character described, the combination with mechanism comprising adding elements, actuators therefor, and devices for effecting coöperative relationship between said adding elements and actuators, of spring-held means for disabling said devices comprising levers vibrating in planes at right angles to each other and a connecting link, one of said levers having a laterally projecting cam-nose, a laterally shifting carriage, and a detachable roller stud carried thereby and acting against the said cam-nose; substantially as and for the purpose described.

8. In a machine of the character described, the combination with mechanism comprising adding elements, actuators therefor, and devices for effecting coöperative relationship between said adding elements and actuators, of spring-held means for disabling said devices comprising levers vibrating in planes at right angles to each other and a connecting link, one of said levers having a laterally projecting cam-nose, a laterally shifting carriage, a column stop thereon, and a detachable roller stud carried thereby and acting against the said cam-nose; substantially as and for the purpose described.

9. In a machine of the character described, the combination with mechanism comprising adding elements, actuators therefor, and devices for effecting coöperative relationship between said adding elements and actuators, of spring-held means for disabling said devices comprising levers vibrating in planes at right angles to each other and a connecting link, one of said levers having a laterally projecting cam-nose, a laterally shifting carriage, a stop rod carried thereby, a column stop longitudinally adjustable on said rod, and a detachable roller stud carried thereby and acting against the said cam-nose; substantially as and for the purpose described.

10. In a machine of the character described, the combination of a laterally shifting carriage, column stop fingers of different

lengths carried thereby and means cooperating with the longer finger only to produce column spacing.

11. In a machine of the character described, the combination of a laterally shifting carriage, detachable and interchangeable column stop fingers of different lengths carried thereby, and means cooperating with the longer finger only to produce column spacing.

12. In a machine of the character described, the combination of a laterally shifting carriage, column stop fingers of different lengths carried thereby and adjustable longitudinally thereof and means cooperating with the longer finger only to produce column spacing.

13. In a machine of the character described, the combination of a laterally shifting carriage spring drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a movable stop finger on the carriage adapted to engage said abutment and project beyond the same, and a vertically reciprocating dog for engaging the projecting portion of said stop finger.

14. In a machine of the character described, the combination of a laterally shifting carriage spring drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, stop fingers of different lengths movably mounted on the carriage and adapted to separately engage said abutment, the longer finger projecting beyond the same, and a vertically reciprocating dog for engaging the projecting portion of such finger; substantially as and for the purpose described.

15. In a machine of the character described, the combination of a laterally shifting carriage spring drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, detachable and interchangeable stop fingers of different lengths movably mounted on the carriage and adapted to separately engage said abutment, the longer finger projecting beyond the same, and a vertically reciprocating dog for engaging the projecting portion of such finger; substantially as and for the purpose described.

16. In a machine of the character described, the combination of a laterally shifting carriage spring drawn in one direction, a fixed abutment to hold such carriage against the tension of the spring, stop fingers of different lengths movably mounted on the carriage and adjustable longitudinally thereof and adapted to separately engage said abutment, the longer finger projecting beyond the same, and a vertically reciprocating dog for engaging the projecting portion of such finger; substantially as and for the purpose described.

17. In a machine of the character described, the combination of a laterally shifting carriage spring drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having a stop finger adapted to engage said abutment, and project beyond the same, and a vertically reciprocating dog for engaging the projecting portion of such finger; substantially as and for the purpose described.

18. In a machine of the character described, the combination of a laterally shifting carriage spring drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having stop fingers of different lengths adapted to separately engage said abutment, the longer finger projecting beyond the same, and a vertically reciprocating dog for engaging the projecting portion of such finger; substantially as and for the purpose described.

19. In a machine of the character described, the combination of a laterally shifting carriage spring drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having detachable and interchangeable stop fingers of different lengths adapted to separately engage said abutment, the longer finger projecting beyond the same, and a vertically reciprocating dog for engaging the projecting portion of such finger; substantially as and for the purpose described.

20. In a machine of the character described, the combination of a laterally shifting carriage spring drawn in one direction, a fixed abutment to hold such carriage against the tension of the spring, a rock rod on the carriage having stop fingers of different lengths adjustable longitudinally thereof and adapted to separately engage said abutment, the longer finger projecting beyond the same, and a vertically reciprocating dog for engaging the projecting portion of such finger; substantially as and for the purpose described.

21. In a machine of the character described, the combination of a laterally shifting spring-drawn carriage, a fixed abutment, a stop movably mounted on said carriage, and combined line spacing and carriage releasing mechanism having provisions for disablement for line spacing by contact with said movable stop when the latter comes against said fixed abutment, and for then displacing said stop to cause lateral movement of the carriage.

22. In a machine of the character described, the combination of a laterally shifting spring-drawn carriage, a fixed abutment, a stop movably mounted on said carriage, and combined line spacing and carriage-

releasing mechanism comprising separable jaws, means for reciprocating one of said jaws, and a dog reciprocating with the same and movable into and out of driving engagement with the other jaw and yieldingly held in such engagement therewith, said dog adapted to be displaced by said stop when the latter is brought to bear against the fixed abutment and in ensuing reciprocation to take under the stop and displace the same.

23. In a machine of the character described, the combination of a laterally shifting spring-drawn carriage, a fixed abutment, a stop movably mounted on said carriage, and combined line spacing and carriage-releasing mechanism comprising a reciprocating slide bar having a jaw, a second slide bar mounted independently of the first and having a companion jaw and a catch projection, a dog pivotally mounted on the first mentioned bar and formed at one end as a catch to engage said projection of the second named bar and having at the other end a lateral bevel for engagement with the carriage stop, and a spring enforcing engagement of the dog with the catch projection, said stop by co-action with the bevel of the dog in lateral movement of the carriage disengaging the dog from said projection against the stress of said spring.

24. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, stop fingers of different lengths movably mounted on the carriage and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism having provisions for disablement for line spacing by contact with the longer one of said movable stops when the latter comes against said fixed abutment, and for then displacing said stop to cause lateral movement of the carriage.

25. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, stop fingers of different lengths movably mounted on the carriage and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising separable jaws, means for reciprocating one of said jaws, and a dog reciprocating with the same and movable into and out of driving engagement with the other jaw and yieldingly held in such engagement therewith, said dog adapted to be displaced by the longer one of the said stops when the latter is brought to bear against the

fixed abutment and in ensuing reciprocation to take under the stop and displace the same.

26. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, stop fingers of different lengths movably mounted on the carriage and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising a reciprocating slide bar having a jaw, a second slide bar mounted independently of the first and having a companion jaw and a catch projection, a dog pivotally mounted on the first mentioned bar and formed at one end as a catch to engage said projection of the second named bar and having at the other end a lateral bevel for engagement with the longer one of said carriage stops, and a spring enforcing engagement of the dog with the catch projection, said stop by co-action with the bevel of the dog in lateral movement of the carriage disengaging the dog from said projection against the stress of said spring.

27. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, detachable and interchangeable stop fingers of different lengths movably mounted on the carriage and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism having provisions for disablement for line spacing by contact with the longer one of said movable stops when the latter comes against said fixed abutment, and for then displacing said stop to cause lateral movement of the carriage.

28. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, detachable and interchangeable stop fingers of different lengths movably mounted on the carriage and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising separable jaws, means for reciprocating one of said jaws, and a dog reciprocating with the same and movable into and out of driving engagement with the other jaw and yieldingly held in such engagement therewith, said dog adapted to be displaced by the longer one of the said stops when the latter is brought to bear against the fixed abutment and in ensuing reciprocation to take under the stop and displace the same.

29. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, detachable and interchangeable stop fingers of different lengths movably mounted on the carriage and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising a reciprocating slide bar having a jaw, a second slide bar mounted independently of the first and having a companion jaw and a catch projection, a dog pivotally mounted on the first mentioned bar and formed at one end as a catch to engage said projection of the second named bar and having at the other end a lateral bevel for engagement with the longer one of said carriage stops, and a spring-enforcing engagement of the dog with the catch projection, said stop by coaction with the bevel of the dog in lateral movement of the carriage disengaging the dog from said projection against the stress of said spring.

30. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, stop fingers of different lengths movably mounted on the carriage and adjustable longitudinally thereof and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism having provisions for disablement for line spacing by contact with the longer one of said movable stops when the latter comes against fixed abutment, and for then displacing said stop to cause lateral movement of the carriage.

31. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, stop fingers of different lengths movably mounted on the carriage and adjustable longitudinally thereof and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising separable jaws, means for reciprocating one of said jaws, and a dog reciprocating with the same and movable into and out of driving engagement with the other jaw and yieldingly held in such engagement therewith, said dog adapted to be displaced by the longer one of the said stops when the latter is brought to bear against the fixed abutment and in ensuing reciprocation to take under the stop and displace the same.

32. In a machine of the character de-

scribed, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, stop fingers of different lengths movably mounted on the carriage and adjustable longitudinally thereof and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising a reciprocating slide bar having a jaw, a second slide bar mounted independently of the first and having a companion jaw and a catch projection, a dog pivotally mounted on the first mentioned bar and formed at one end as a catch to engage said projection of the second named bar and having at the other end a lateral bevel for engagement with the longer one of said carriage stops, and a spring enforcing engagement of the dog with the catch projection, said stop by co-action with the bevel of the dog in lateral movement of the carriage disengaging the dog from said projection against the stress of said spring.

33. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having a stop finger adapted to engage said abutment and projecting beyond the same, and combined line spacing and carriage-releasing mechanism having provisions for disablement for line spacing by contact with said stop finger when the latter comes against said fixed abutment, and for then displacing said stop finger to cause lateral movement of the carriage.

34. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having a stop finger adapted to engage said abutment and project beyond the same, and combined line spacing and carriage-releasing mechanism comprising separable jaws, means for reciprocating one of said jaws, and a dog reciprocating with the same and movable into and out of driving engagement with the other jaw and yieldingly held in such engagement therewith, said dog adapted to be displaced by said stop finger when the latter is brought to bear against the fixed abutment and in ensuing reciprocation to take under the stop finger and displace the same.

35. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having a stop finger adapted to engage said abutment and project beyond

the same, and combined line spacing and carriage-releasing mechanism comprising a reciprocating slide bar having a jaw, a second slide bar mounted independently of the first and having a companion jaw and a catch projection, a dog pivotally mounted on the first mentioned bar and formed at one end as a catch to engage said projection of the second named bar and having at the other end a lateral bevel for engagement with the said carriage stop finger, and a spring enforcing engagement of the dog with the catch projection, said stop finger by co-action with the bevel of the dog in lateral movement of the carriage disengaging the dog from said projection against the stress of said spring.

36. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having stop fingers of different lengths adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism having provisions for disablement for line spacing by contact with the longer one of said movable stop fingers when the latter comes against said fixed abutment, and for then displacing said stop finger to cause lateral movement of the carriage.

37. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having stop fingers of different lengths adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising separable jaws, means for reciprocating one of said jaws, and a dog reciprocating with the same and movable into and out of driving engagement with the other jaw and yieldingly held in such engagement therewith, said dog adapted to be displaced by the longer one of the said stop fingers when the latter is brought to bear against the fixed abutment and in ensuing reciprocation to take under the stop finger and displace the same.

38. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having stop fingers of different lengths adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising a reciprocating slide bar having a jaw,

a second slide bar mounted independently of the first and having a companion jaw and a catch projection, a dog pivotally mounted on the first mentioned bar and formed at one end as a catch to engage said projection of the second named bar and having at the other end a lateral bevel for engagement with the longer one of said carriage stop fingers, and a spring enforcing engagement of the dog with the catch projection, said stop finger by co-action with the bevel of the dog in lateral movement of the carriage disengaging the dog from said projection against the stress of said spring.

39. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having detachable and interchangeable stop fingers of different lengths adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism having provisions for disablement for line spacing by contact with the longer one of said movable stop fingers when the latter comes against said fixed abutment, and for then displacing said stop finger to cause lateral movement of the carriage.

40. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having detachable and interchangeable stop fingers of different lengths adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising separable jaws, means for reciprocating one of said jaws, and a dog reciprocating with the same and movable into and out of driving engagement with the other jaw and yieldingly held in such engagement therewith, said dog adapted to be displaced by the longer one of the said stop fingers when the latter is brought to bear against the fixed abutment and in ensuing reciprocation to take under the stop finger and displace the same.

41. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having detachable and interchangeable stop fingers of different lengths adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising a reciprocating slide bar having a jaw, a second slide bar mounted independently of the first and

having a companion jaw and a catch projection, a dog pivotally mounted on the first mentioned bar and formed at one end as a catch to engage said projection of the second named bar and having at the other end a lateral bevel for engagement with the longer one of said carriage stop fingers, and a spring enforcing engagement of the dog with the catch projection, said stop finger by co-action with the bevel of the dog in lateral movement of the carriage disengaging the dog from said projection against the stress of said spring.

42. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having stop fingers of different lengths adjustable longitudinally thereof and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism having provisions for disablement for line spacing by contact with the longer one of said movable stop fingers when the latter comes against said fixed abutment, and for then displacing said stop finger to cause lateral movement of the carriage.

43. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having stop fingers of different lengths adjustable longitudinally thereof and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising separable jaws, means for reciprocating one of said jaws, and a dog reciprocating with the same and movable into and out of driving engagement with the other jaw and yieldingly held in such engagement therewith, said dog adapted to be displaced by the longer one of the said stop fingers when the latter is brought to bear against the fixed abutment and in ensuing reciprocation to take under the stop finger and displace the same.

44. In a machine of the character described, the combination of a laterally shifting carriage spring-drawn in one direction, a fixed abutment to hold said carriage against the tension of the spring, a rock rod on the carriage having stop fingers of different lengths adjustable longitudinally thereof and adapted to separately engage said abutment, the longer finger projecting beyond the same, and combined line spacing and carriage-releasing mechanism comprising a reciprocating slide bar having a jaw, a second slide bar mounted independently of the

first and having a companion jaw and a catch projection, a dog pivotally mounted on the first mentioned bar and formed at one end as a catch to engage said projection of the second named bar and having at the other end a lateral bevel for engagement with the longer one of said carriage stop fingers, and a spring enforcing engagement of the dog with the catch projection, said stop finger by co-action with the bevel of the dog in lateral movement of the carriage disengaging the dog from said projection against the stress of said spring.

45. In a machine of the character described, the combination with the laterally movable carriage, of interchangeable rocking stop rods for determining the lateral position of the carriage.

46. In a machine of the character described, the combination with the laterally movable carriage, of a stop rod for determining the lateral position of the carriage, a rocking holder in the carriage for one end of the rod with provisions for separable rotative engagement therewith, and a holder in the carriage for the opposite end of the rod with provisions for separable engagement therewith.

47. In a machine of the character described, the combination with the laterally movable carriage, of a stop rod for determining the lateral position of the carriage, a rocking holder in the carriage for one end of the rod with provisions for separable rotative engagement therewith, and a holder in the carriage for the opposite end of the rod with provisions for separable engagement therewith and for longitudinal movement to disengage the rod from both holders.

48. In a machine of the character described, the combination with the laterally movable carriage, of a stop rod for determining the lateral position of the carriage, a rocking holder in the carriage for one end of the rod with provisions for separable rotative engagement therewith, and a holder for the opposite end of the rod in the form of a screw engaging a portion of the carriage and supplying a step bearing for the rod, said screw adapted to be turned back to permit removal of the rod; substantially as described.

49. In a machine of the character described, the combination of a laterally shifting spring-drawn carriage, a fixed abutment, a stop movably mounted on said carriage, and combined line spacing and carriage-releasing mechanism comprising a reciprocating slide bar having a jaw, a second slide bar mounted independently of the first and having a companion jaw and a catch projection, a dog pivotally mounted on the first mentioned bar and formed at one end as a catch to engage said projection of the second named bar and having at the other end lat-

eral bevels for engagement with the carriage stop, and a spring enforcing engagement of the dog with the catch projection, said stop by co-action with one bevel of the dog in lateral movement of the carriage disengaging the dog from said projection against the stress of said spring and the other bevel permitting reverse movement of the carriage substantially as described.

10 50. In a machine of the character de-

scribed the combination of a laterally shifting carriage, column stop fingers of different dimensions carried thereby, and means co-operating with the finger of one dimension to produce column spacing.

JESSE G. VINCENT.

Witnesses:

O. C. KREIS, Jr.,
SWAN MACAULEY.