J. T. HOWIESON.

RECORDING MECHANISM.

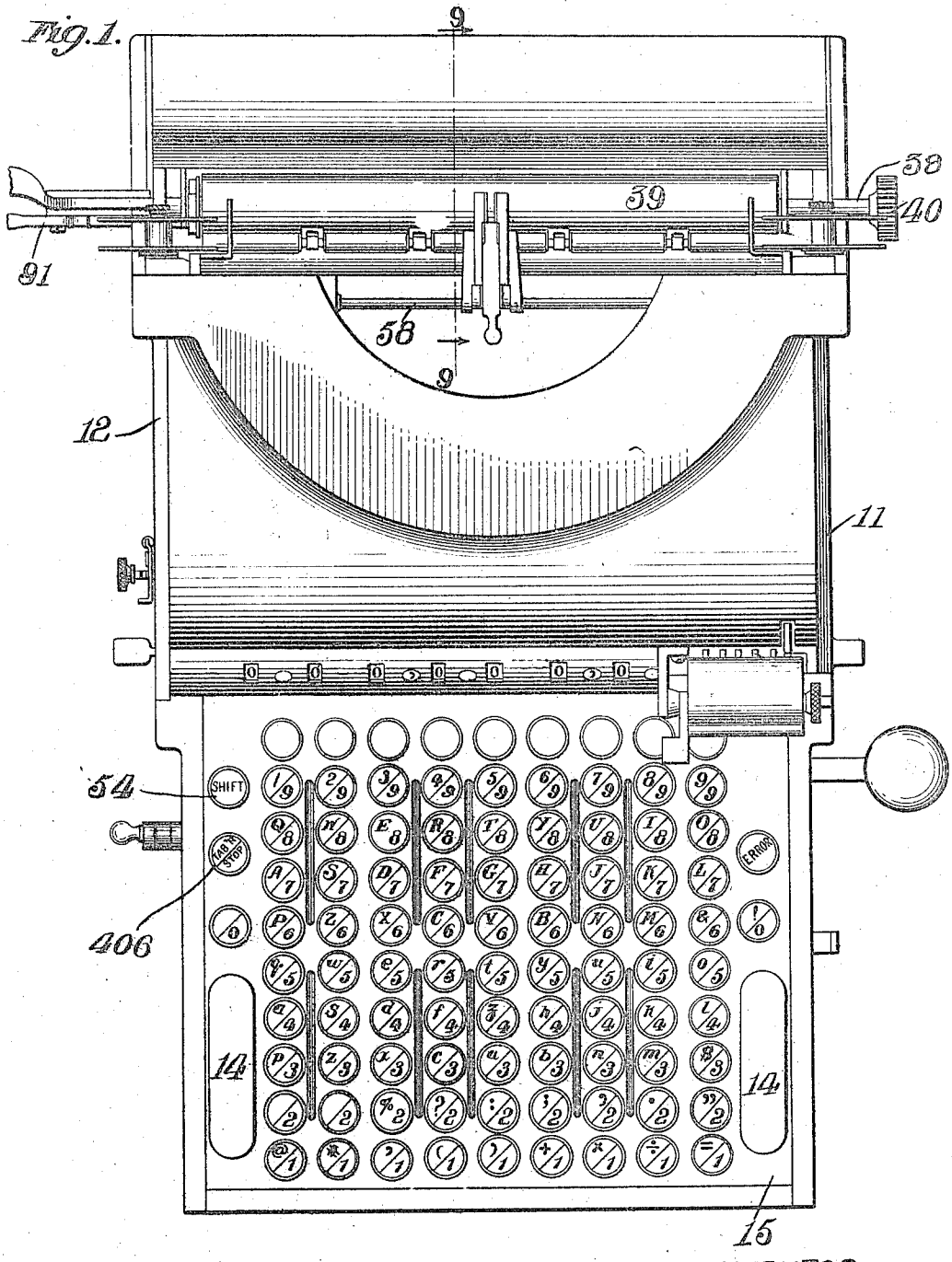
APPLICATION FILED MAR. 30, 1916.

1,260,543.

Patented Mar. 26, 1918.

6 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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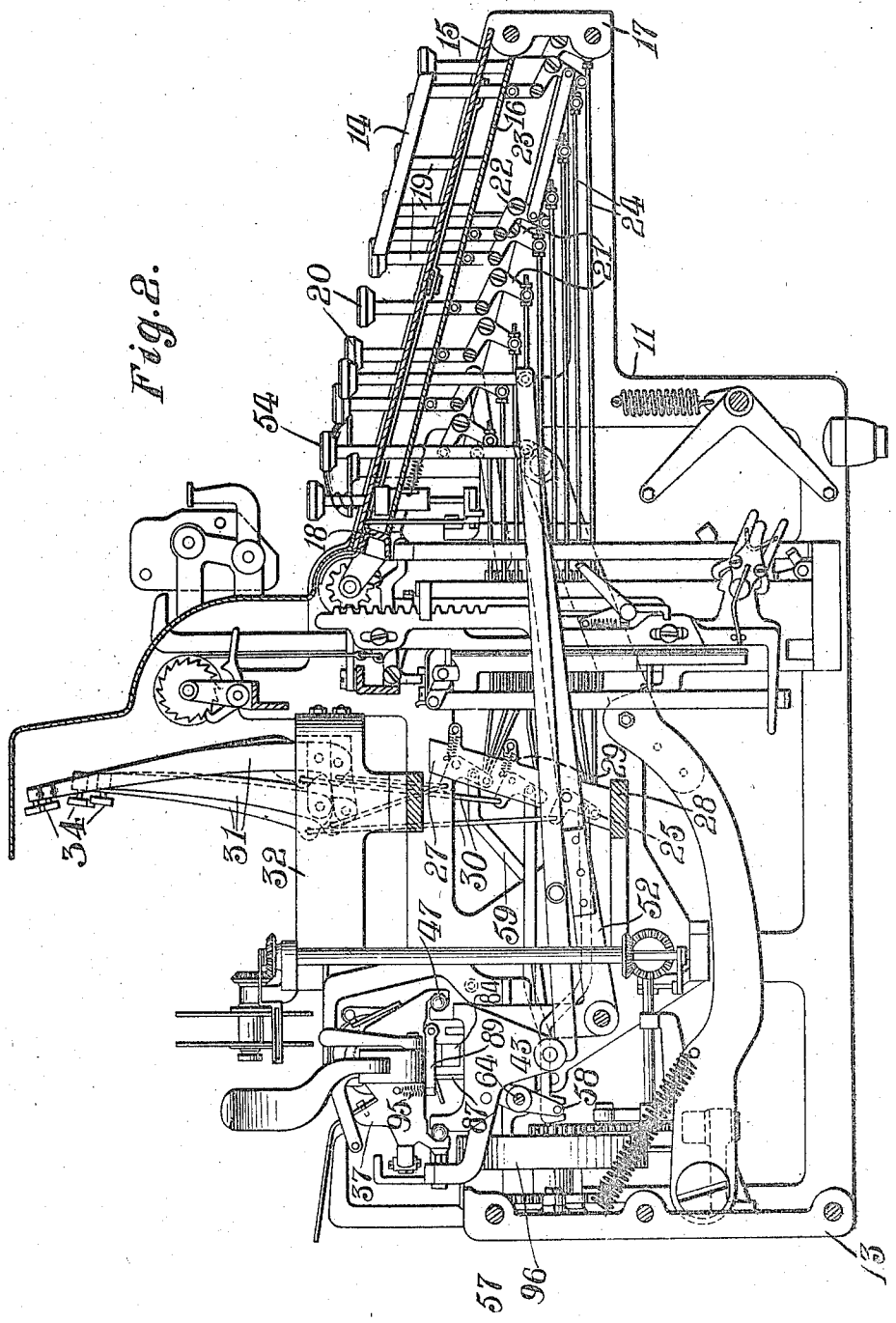
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6 SHEETS—SHEET 2.

Fig. 2.



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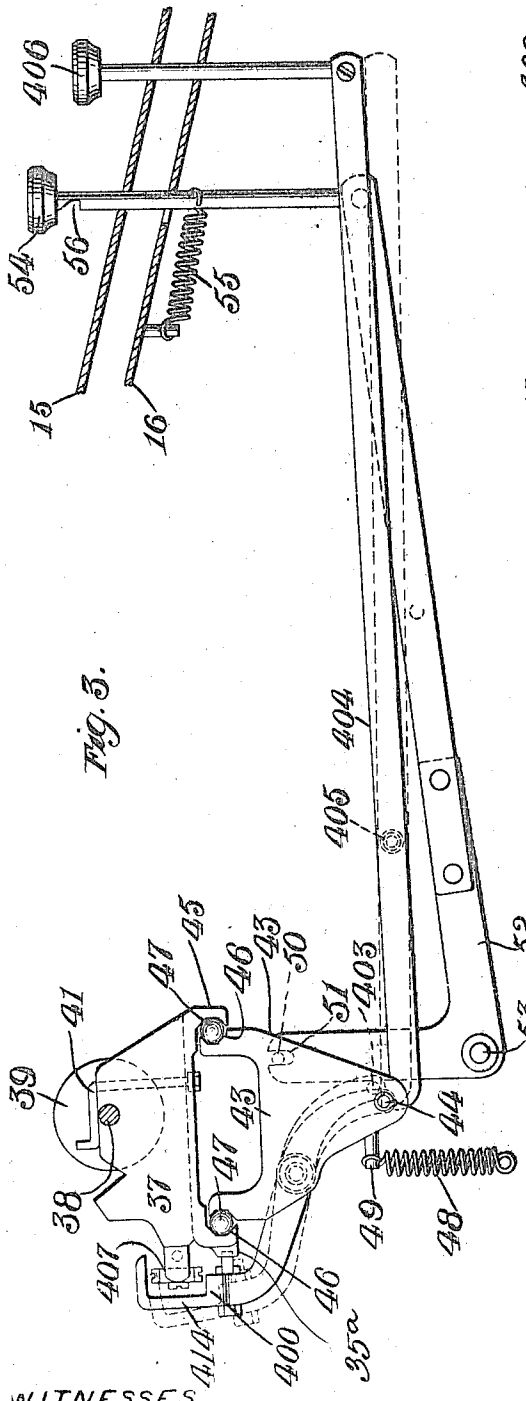


Fig. 3.

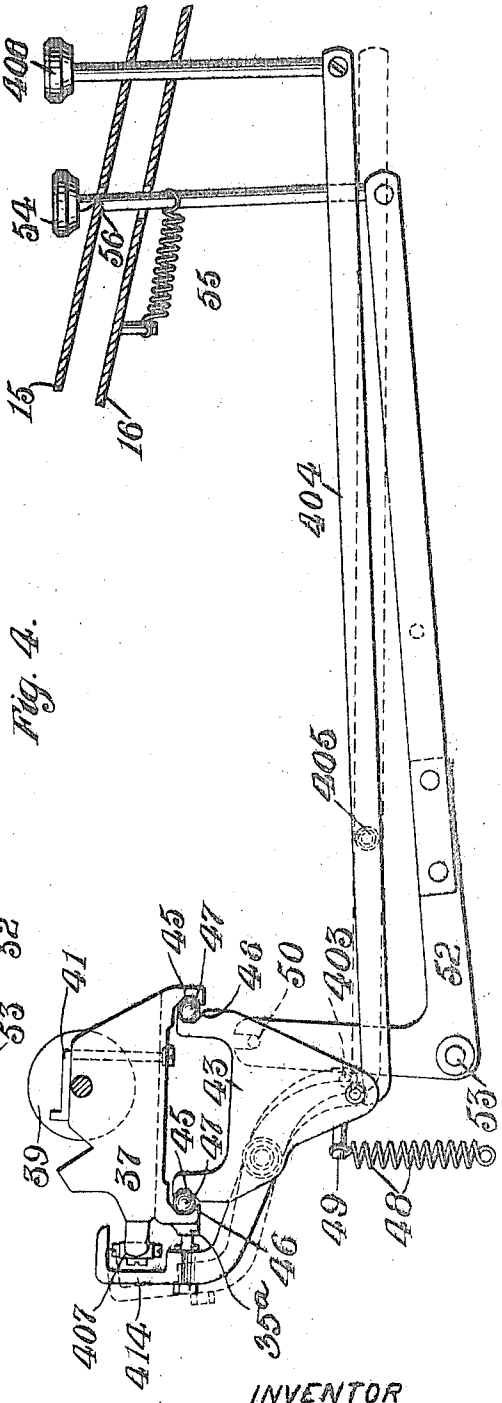


Fig. 4.

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6 SHEETS—SHEET 4.

Fig. 5.

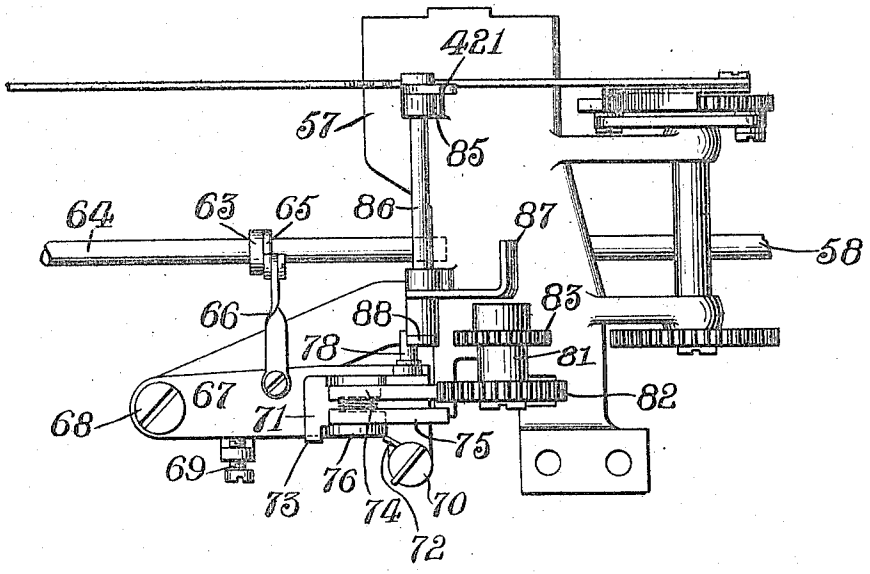


Fig. 6.

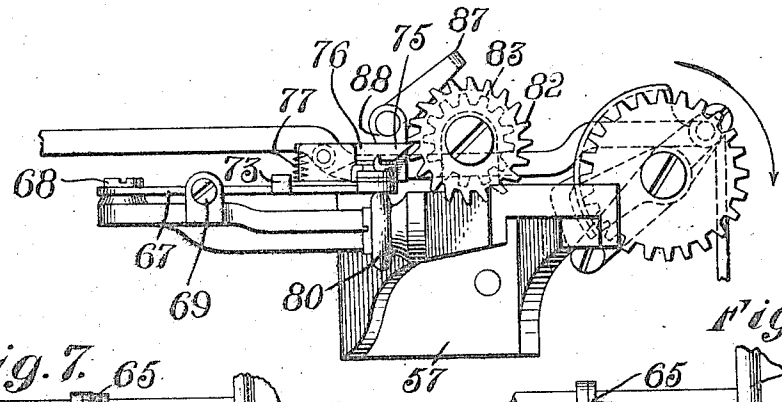


Fig. 7.

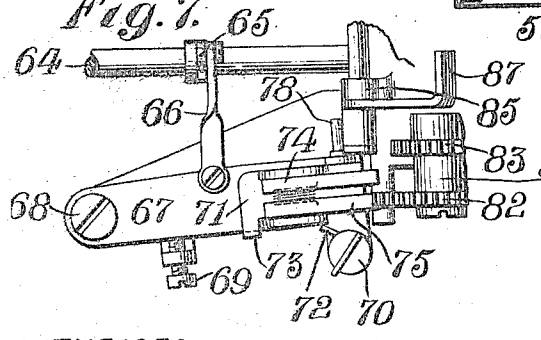
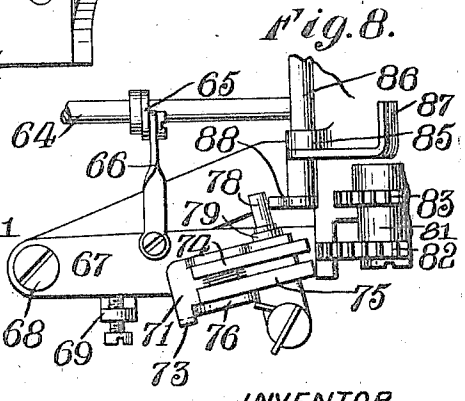


Fig. 8.



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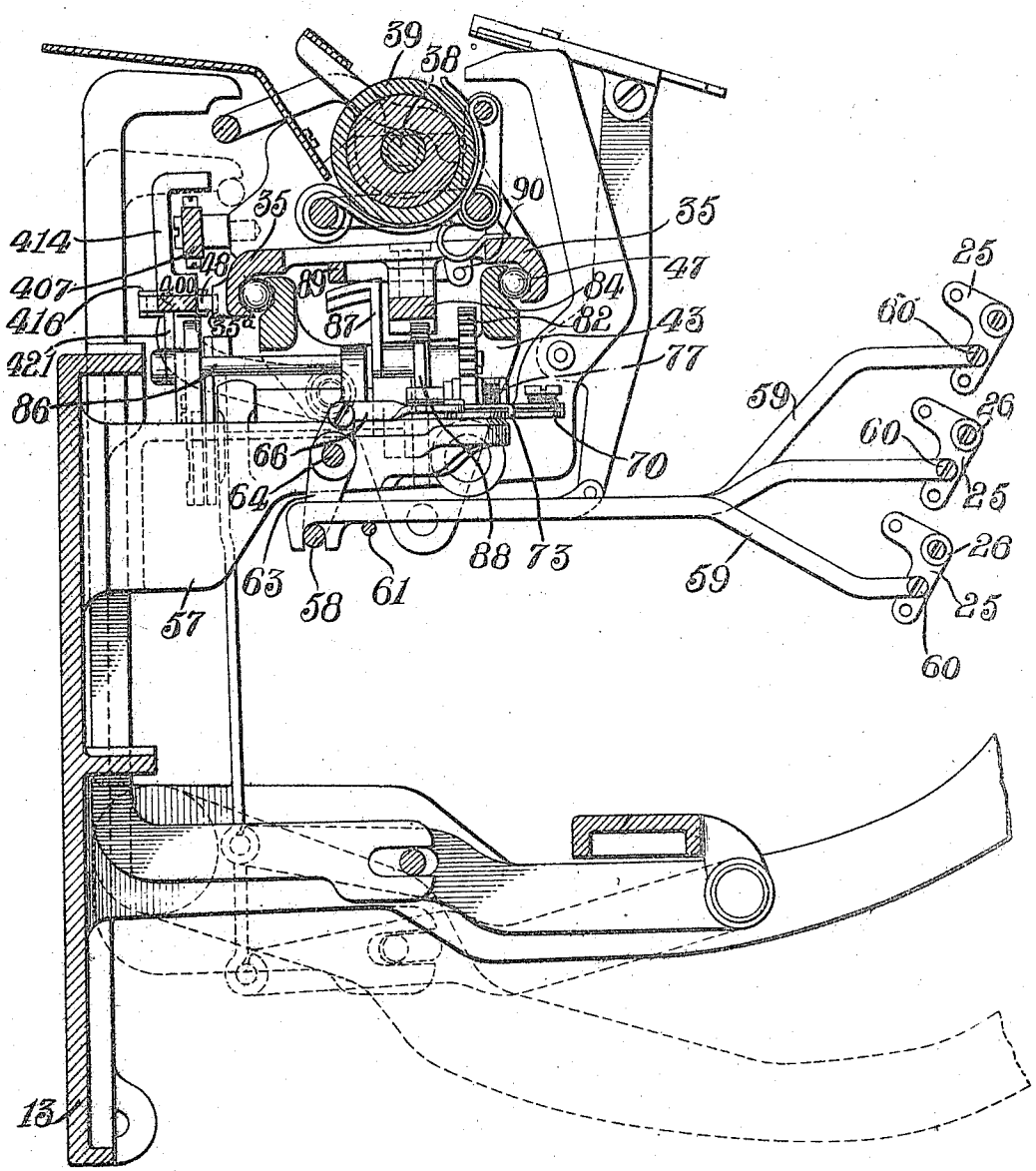
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6 SHEETS—SHEET 5.

Fig. 9.



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6 SHEETS—SHEET 6.

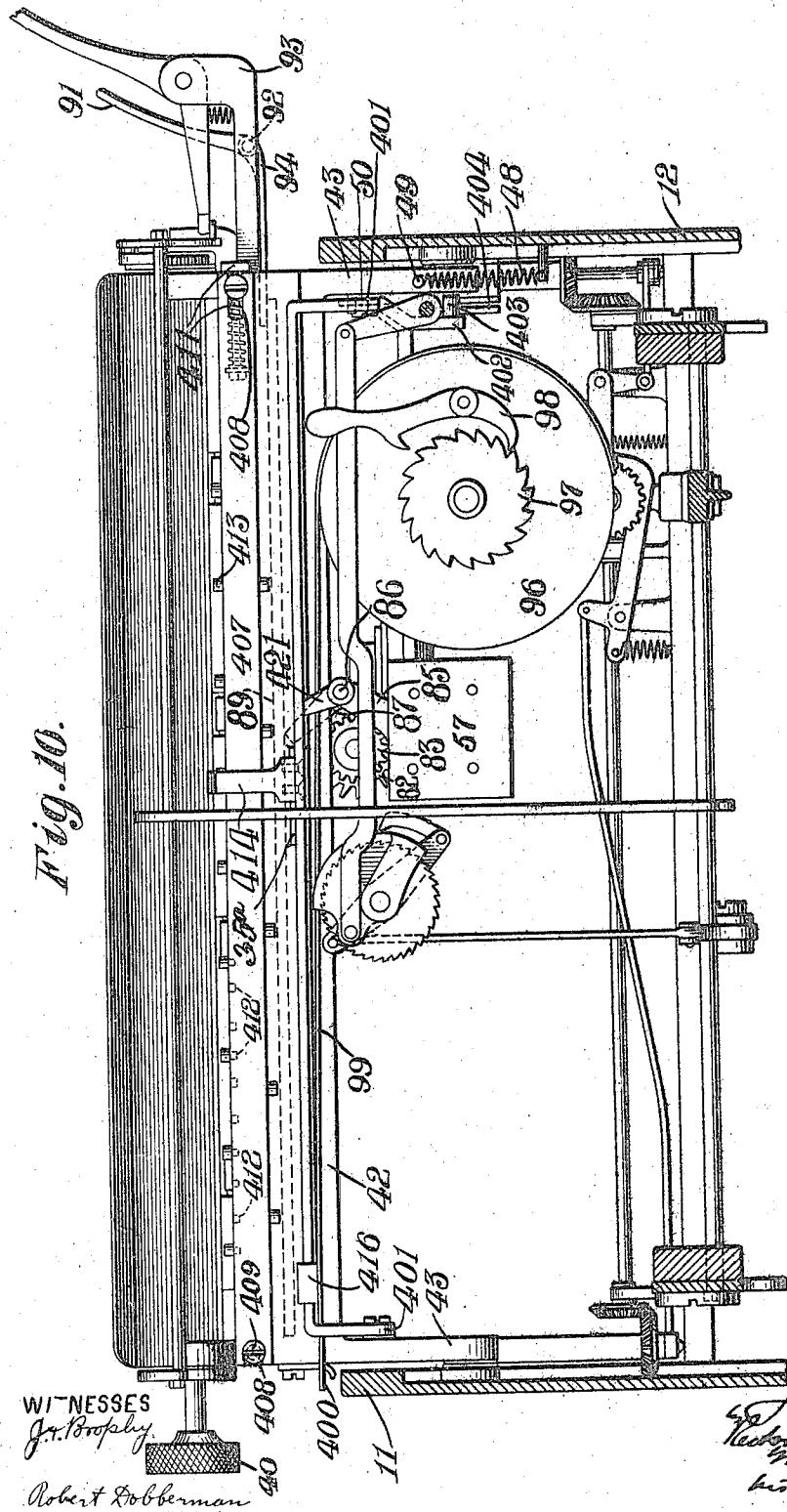


Fig. 10.

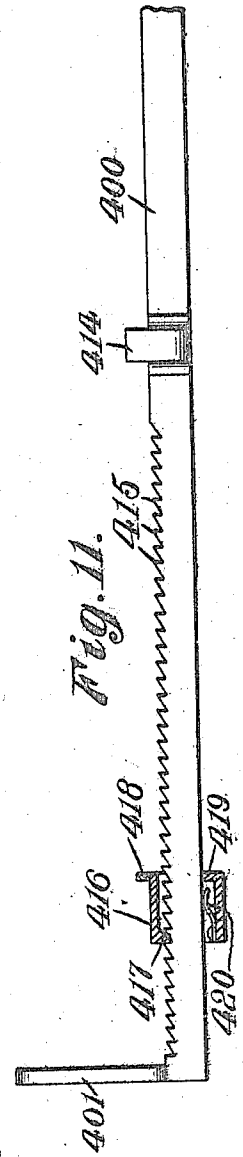


Fig. 11.

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UNITED STATES PATENT OFFICE.

JOHN T. HOWIESON, OF NEW YORK, N. Y.

RECORDING MECHANISM.

1,260,543. Specification of Letters Patent. Patented Mar. 26, 1918.

Original application filed July 29, 1901, Serial No. 70,060. Divided and this application filed March 30, 1916. Serial No. 87,728.

To all whom it may concern:

Be it known that I, JOHN T. HOWIESON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Recording Mechanism, of which the following is a specification.

This application is a division of my application filed July 29, 1901, Serial No. 70,061, series of 1900, for improvement in calculating machines. That prior application discloses a combined adding and typewriting machine and claims various features which have more especially to do with the adding or registering function of the machine, and combined adding and typewriting functions. The present application pertains more especially to those features which are or may be mechanically independent of the adding or registering department of the machine. Thus the present invention relates especially to control of a laterally shiftable paper carriage, as to margin setting and tabulating shift.

In embodying the latter feature according to the present disclosure I provide for disabling the escapement mechanism which ordinarily controls propulsion of the carriage by its spring, and I bring into play tabulator stop devices which include a reversible and interchangeable bar whereby I greatly facilitate a change of tabulation control from that suited to one sort of accounting work in hand to a condition suited to another.

In the drawings which accompany and form part of this specification, Figure 1 represents a top plan view of the complete machine; Fig. 2 represents a left side elevation of same with the casing partly in section and partly removed altogether along with the left side frame piece; Figs. 3 and 4 are similar side elevations of the tabulator devices together with the carriage and carriage-track and means for shifting the latter; Fig. 5 is a top plan view on an enlarged scale of escapement mechanism; Fig. 6 is a front elevation of the same mechanism; Figs. 7 and 8 are similar plan views of part of what appears in Fig. 5, and they illustrate different conditions in operation of the machine; Fig. 9 is a vertical section taken substantially on the line 9—9 of Fig. 1; Fig. 10 is a rear elevation of the machine; Fig. 11 is a detail plan view of one of the tabulator stop elements appearing in Fig. 10, together with sectional illustration of a margin stop piece carried by it.

The key board and key mechanism.

As shown more particularly in Figs. 1 and 2 of the drawings, the machine has the two side frames 11 and 12 and the end or rear frame 13 which may be more or less open but adapted to support and practically inclose the working parts therewithin. The key board, here shown, is a double key board, containing in the present instance eighty-three writing keys besides having additional keys such as the shift key, error key, tabulator-stop key, as well as a top row of nine carriage-shift keys. Obviously the number of keys may be varied as desired but the key board herein illsutrated is designed as capable of satisfying all commercial and practical purposes. For instance, for ordinary figuring the machine is capable of calculating up to 999,999,999 and for money figuring it is capable of accommodating to an amount represented by $9,999,999.99, the first two banks of keys counting from the right hand of the machine being used for cents, that is hundredths of a dollar, and the remaining keys for the dollars. There are consequently nine banks of keys, and two side banks for the shift key, margin stop key, error key, and two keys for ciphers for the calculating mechanism and such other characters desired. Provision is made for operating the machine on the upper and lower case principle, as will be hereinafter more particularly explained, and consequently each key button bears two characters, corresponding with the type on its coöperating type bar, having for upper case work all the letters of the alphabet, both small letters and capitals, as well as other characters such as punctuation, etc., and also the figures 1 to 9 for ordinary typewriting; while for lower case work the buttons in each of the nine banks of keys bear the numbers 1 to 9, the machine being shifted to upper case for typewriting purposes. In each bank the keys are numbered from 1 to 9, as to lower case, beginning at the front, and consequently all the keys numbered 1, as to lower case, are comprised in the first row, the keys numbered 2 being in the second row and so

on up to 9. On either side the key board has a spacing key 14.

The key board here shown, is preferably composed of two parallel inclined plates 15 and 16 secured at their front end to the front strip 17 of the machine frame and at their rear end supported on a cross rail or bar 18. These plates are provided with registering holes corresponding in number to the number of keys on the key board and receiving the key stems whereby such plates act as guides for these stems. Each key comprises a stem 19 with a button 20 at the upper end above the key board and communicating with an arm of a bell crank 21 which is located below the key board and is free to turn on a stud 22 secured on an angle piece or strip 23 fastened on to the under side of the key board plate 16, there being one of such strips for each bank of keys. The other arm of the bell crank is connected, in the present instance, to a horizontal wire or rod 24 extending rearwardly of the machine, in coöperative relation with certain parts of the calculating mechanism. The rear end of each of these rods is connected to the downwardly extending arm of its proper bell crank 25 which is loosely pivoted to a rod 26 arranged between standards 27 that rise from an arc 28 extending between and secured to the side frames. Each of these bell cranks 25, and consequently the rods and keys connected thereto, are held in normal position by suitable springs, such as the coiled springs 29 secured at one end to the bell cranks. Each of the nine banks of keys has its own standard except the two end standards which accommodate ten keys, all of said parts being arranged within small compass without interfering with the proper operation of each other. The upper arm of each bell crank is connected by means of a rod or wire 30 to its proper type bar 31, each of which bars has a hanger secured to the arc 32 which is fastened to the two side frames 11 and 12. Each type bar has a type block 34 having, in the present instance, two characters, which, when a key is operated, strikes upon the top of the platen at the printing point so that the typewriter works on the upper and lower case principle and also prints visibly.

General construction of carriage and carriage shift.

The carriage comprises a frame 35, with end bearings 36 and 37 in which the shaft 38 of the platen 39 bears, one end of which shaft has the usual hand wheel or knob 40 for turning the platen by hand. Small bent arms 41 rotatably secured in the end bearings serve to normally hold the platen in place, as shown clearly in Figs. 3 and 4. Obviously when these arms 41 are turned at an angle of ninety degrees from that there shown, the platen is free to be removed by raising it bodily from its bearings. The carriage is mounted on the supporting frame 42 having end portions 43 which are pivoted to the side frames 11 and 12 by means of studs or screws 44 so that the entire supporting frame together with the carriage which it supports, rocks on a pivotal axis substantially at the lowermost point of such carriage supporting frame. The carriage preferably has a ball-bearing connection with its supporting frame and to this end the long sides of the carriage are flanged or extended downward and provided on their inner faces with longitudinal ball-ways or grooves 45, while the carriage supporting frame has at its upper ends outer ball-ways or grooves 46, said ways receiving a series of balls 47.

The carriage supporting frame is held to its normal rearward position by means of a spring 48 connected at one end to the machine frame and at the other end to a pin 49 fastened to the carriage supporting frame at the rear of its pivotal point. This supporting frame has a second pin 50 which is engaged by a slot 51 in the end of a vertical arm of a bell crank 52 which is pivoted at 53 to one of the side frames, in the present instance, to the left hand side frame. The horizontal arm of this bell crank extends forwardly underneath the key board and is there pivoted to the shift-key 54 which, when depressed, rocks the bell crank and throws the carriage supporting frame and consequently the carriage to its forward or upper case position for typewriting purposes. In order to maintain said forward position of the carriage the shift key, which is normally rearwardly pressed by means of a spring 55 fastened thereto, is provided just below the button with a notch 56 so that when the shift key is depressed the notch will engage underneath the top plate 15 of the key board, the key being drawn rearwardly by the spring to cause said engagement. This position is maintained until the shift key is released at the will of the operator by drawing the button forward so as to permit the spring 48 to restore all the parts just described to normal or lower case position. In the drawings, Fig. 3 represents such normal position in which it is observed that the shift key is at its normal or raised position with its notch 56 above the key board plate, while Fig. 4 represents the parts in shifted position, the shift key having been depressed and held in that condition by the engagement of its notch with the key board plate.

The escapement mechanism.

The escapement mechanism about to be described is mounted upon or carried by a main bracket 57 secured to the rear end frame 13 substantially centrally thereof and extending forwardly beneath the carriage

as clearly illustrated in Fig. 9, and is operated by a universal bail mechanism. This bail mechanism comprises a lower rod 58 extending from side to side of the machine just beneath such main bracket and is engaged by the hook-shaped end of the rearwardly extending rods or strips 59 which are connected to and actuated by the key mechanism hereinbefore described. For this purpose these rods or strips 59 are pivoted to the lower arm of their respective bell cranks 25 at the point 60 so as to be operated at every movement of such bell cranks. A cross rod 61 may, if desired, be used for the purpose of supporting the free ends of said strips 59 and thereby relieve the universal bail of the strain of their weight. Each bell crank has its own strip 59 which consequently corresponds in number to the number of writing keys on the key board, the spacing key being also connected thereto but in a direct manner. The depression of one of these writing keys, or of either of the spacing keys, will therefore pull this rod 58 forwardly, and by reason of its connection with the escapement mechanism, to be described, will cause a one space movement of the carriage just as soon as the key is released. The rod 58 is hung at the lower end of two brackets or hangers 62 and 63, the former being at one of the side frames and the latter toward the center of the rod 58. Both hangers are secured to the rock shaft 64 having bearings respectively in the main bracket 57 and in the left hand side of the frame 12. An arm 65 extends upwardly from this rock shaft and is connected to a rod or link 66, which, extending forwardly, is pivoted to and actuates a plate 67 which, in the present case, has a movement in a horizontal plane. This plate 67 is pivoted upon the main bracket at the point 68 and a set screw 69 mounted in said bracket is preferably provided to serve as an adjustable stop for the movement of such plate. Upon a stud 70 screwing onto this plate is a pawl frame or bracket 71 which is held in normal position by a spring 72 coiled around the stud. This pawl frame has a downwardly projecting lip or flange 73 which determines the normal position thereof by acting as a stop. Pawls 74 and 75 are pivoted intermediate of their lengths between upwardly extending parallel sides 76 of the pawl frame. The pawl 74 is the live pawl and the pawl 75 the dead pawl. Around the pivot between these pawls is a coiled spring whose ends engage under the pawl in advance of their pivotal points. A coiled spring 77 is arranged beneath the outer end of the dead pawl and normally tends to force that end upward and the opposite end downward. A pin or stud 78 projects laterally from the pawl frame in the direction of the rock shaft 64 and is preferably provided with a roller 79 bearing upon the top face of the plate 67 and designed to afford freedom of movement to such frame. To likewise permit the plate 67 to operate freely and also to support its outer end, a banking roller 80 is secured to the main bracket and underneath such plate.

The main bracket has bearings 81 for a shaft on which is secured a ratchet wheel 82 and a pinion 83, the latter being continually in mesh with the rack 84 on the under side of the carriage, as is clearly illustrated in Fig. 9. The pawls 74 and 75 coöperate with said ratchet wheel and together therewith constitute the escapement mechanism proper for the carriage. When a writing, numbering or spacing key is depressed, the resulting movement imparted to the universal bail shifts the plate 67 as well as its two pawls 74 and 75 in the direction of such bail, that is, rearwardly, thereby releasing the live pawl from its normal engagement with the ratchet wheel and bringing the dead pawl into engagement with such wheel in the same space heretofore occupied by the live pawl. Upon a release of the depressed key, the parts will assume their normal position whereby the dead pawl will be released from the ratchet wheel and the live pawl caused to enter the space in such wheel immediately above that theretofore occupied by it, thereby permitting the ratchet wheel to move one tooth and advance the carriage one space.

In order to release the pawls from engagement and permit the carriage to be shifted by hand, the following arrangement is provided: The main bracket has lugs 85 in which bears a shaft 86 having near one end an upwardly extending arm 87 bent over at its top and also having at its end adjacent to the stud 78 a downwardly extending arm 88. This stud 78 projects in the path of this arm 88 so that when the latter is moved by the rocking of the shaft 86, the stud and consequently the pawl frame of which it forms a part, is forcibly shifted laterally on the stud 70 as a pivot, so as to take the position illustrated in Fig. 8. At this time both pawls are shifted out of engagement with the ratchet wheel so that such wheel is free to move in either direction, thereby permitting the carriage to be freely moved by hand. For operating this arm 87, a release bail 89 is arranged beneath and longitudinally of the carriage with its bent ends pivoted to lugs 90 on either end of the carriage and on the under side thereof. A release lever 91 pivoted at 92 on the extension 93 of the carriage has its arm 94 extended inward above the release bail (dotted lines Fig. 10) which is upwardly spring-held by a spring 95 (dotted lines Fig. 2). Obviously when this releasing lever is shifted inward toward the carriage, which operation is performed by hand, the release

bail is depressed, or rocked downward and the movement thereof is communicated to the arms 87 and 88 and to the frame carrying the pawls 74 and 75 which are thereby released from engagement with their ratchet wheel.

The tension for moving the carriage is supplied by the spring barrel 96 (Fig. 10) provided with the ratchet wheel 97 and pawl 98, the band 99 of which barrel is connected to the carriage.

The tabulator mechanism.

As shown, a bail 400, extending parallel to the carriage, is pivoted to the carriage-supporting frame by means of studs 401 engaging its side members and entering into said frame. The left-hand side member of the bail has an extension 402 projecting substantially downward beyond the pivotal point and provided with a laterally extending pin or stud 403 which is on the same center or axis as the center or axis on which the carriage carrying frame oscillates, the purpose of which arrangement will be hereinafter made apparent. A lever 404 is pivoted at 405 on one of the side frames of the machine, in the present instance on the left-hand side frame, and extends from the keyboard rearwardly, terminating immediately below and adjacent to said pin 403. The forward end of such lever is provided with a key 406 for convenience termed the tabulator key, which, when depressed, raises the rear end of the lever 404 upwardly, by whose contact with said pin the bail 400 is moved rearwardly and downwardly into the position indicated by the dotted lines in Figs. 3 and 4. The object of having this pin 403 on the same axis as the carriage carrying frame is to always insure the same throw of the bail, whether the carriage has been shifted to either upper or lower case position.

A strip or rack 407, which will be hereinafter termed the jumper rack, is suitably mounted on the carriage frame, preferably in such manner as to be readily removable and reversible. In the present instance, both ends of the jumper rack are provided with slots 408 to receive studs 409 screwing into the carriage frame. The left-hand slot (right-hand as the parts are viewed from the rear in Fig. 10) is elongated and the stud 409 has extending through it a spring-pressed pin 411 with its head overlapping and bearing against the left-hand end of the jumper rack. This construction provides for the ready insertion or removal or the reversal of the jumper rack. Both edges of the jumper rack have a series of holes 412 arranged at predetermined or regular intervals and screw-threaded to receive studs or stop pins 413. A less number of these stop pins than the number of holes is used, these stop pins being adapted to be set or changed by the operator to different positions, that is to different holes in the jumper rack according to the amount of jump required by such operator. Substantially at the center point of the length of the cross bar of bail 400 which I shall term the margin rack and extending over the top of the jumper rack, is a substantially U-shaped dog 414 adapted to coöperate with the jumper rack in the manner hereinafter stated.

As clearly shown in Fig. 11 substantially one-half of the forward edge of the margin rack is provided with rack teeth 415 corresponding in spacing to the spaces indicated on the paper scale hereinafter described. To coöperate with these rack teeth an adjustable margin stop is provided, such stop consisting, in the present instance of a substantially rectangular shell 416 having one end of one side bent inward to form a tooth 417 adapted to engage the rack teeth, and with the opposite end bent laterally to form a stop 418 for a lug 35ª on the carriage to abut. One end of the other side of the shell is bent inwardly at 419 to bear against the smooth rearward side of the margin rack. In order to normally keep the tooth 417 in engagement with the rack, suitable tension may be provided and such tension, in the present instance, is afforded by a leaf spring 420 adapted to bear against said margin rack and thereby normally keep said tooth in engagement with the rack teeth. By pressing upon the stop and slightly twisting the shell against the tension of the spring, the tooth 417 can be released from engagement and the shell or margin stop adjusted along the margin rack to any predetermined point thereon.

When the tabulator key is depressed the margin rack is thrown rearwardly and downwardly as hereinbefore described, which action swings the upper free end of the jumper dog 414 into the path of movement of the pins on the jumper rack. Simultaneously, the under side of the bail or margin rack presses downwardly against an upwardly extending arm 421 (see Figs. 5, 9 and 10) secured to the end of the shaft 86 which carries the finger 88, that throws the escapement pawls out of engagement with their ratchet wheel, as hereinbefore described. The escapement wheel being now free from its pawls, the carriage is free to jump or move until the jumper dog on the margin rack contacts with a pin on the jumper rack. By merely shifting the positions of these pins or studs, the amount of jump of the carriage and the particular point at which the carriage is to be stopped can be regulated by the operator. Furthermore, for convenience, where the machine is being employed for two different

kinds of tabulating work the jumper rack may have the stop pins adjusted on one edge in a certain manner and the stop pins arranged on the opposite edge in a different manner so that when the operator wishes to adjust his machine, all that will be required is to simply reverse the position of the jumper rack.

As hereinbefore stated the margin stop may be set at any desired position on the margin rack and the carriage will stop when it abuts against the stop 418 under backward movement. Should occasion arise for typing in the margin the bail may be swung rearward and the carriage moved farther back.

I claim:

1. In a machine of the class described and having a laterally shiftable carriage, a margin rack comprising a bail having its cross bar formed with rack teeth on one edge and an adjustable stop device on said cross bar coöperating with said teeth, and means for rocking the bail to shift its cross bar and stop device into and out of position of interference with said carriage.

2. In a machine of the class described and having a laterally shiftable carriage, a margin rack device comprising a bail having its cross bar formed with rack teeth on one edge, an adjustable stop thereon comprising a shell having a tooth engaging the rack teeth and tension means for normally maintaining engagement of said tooth, and means for rocking the bail to shift its cross bar and said stop into and out of position of interference with said carriage.

3. In a machine of the class described and having a laterally shiftable carriage, a margin rack device comprising a bail having its cross bar formed with rack teeth on one edge, an adjustable stop on said cross bar comprising a shell having a tooth engaging the rack teeth and a spring for maintaining such engagement, and means for rocking the bail to shift its cross bar and said stop into and out of position of interference with said carriage.

4. In a machine of the class described and having a laterally shiftable carriage, a margin rack device comprising a bail having its cross-bar formed with rack teeth, an adjustable stop on said cross bar comprising a shell having a tooth engaging the rack teeth and a stopping flange and a bearing flange, and a spring between the shell and rack, and means for rocking the bail to shift its cross bar and said stop into and out of position of interference with said carriage.

5. In combination with a laterally shiftable carriage and its supporting frame pivoted on an axis beneath such carriage, a stop rack pivoted on said frame and adapted to be rocked into and out of position of interference with said carriage, a stud or projection connected to said rack and arranged on the same axis as the pivotal points of the frame, and means for actuating said stud and consequently its rack.

6. The combination of a laterally shiftable carriage and its supporting frame oscillating on an axis substantially at its lowermost point, a pivoted bail constituting a stop device and having an extension beyond the pivotal point on one side and a stud or projection arranged on said extension and normally positioned in axial alinement with the axis of said frame.

7. The combination of a laterally shiftable carriage and its supporting frame oscillating on an axis substantially at its lowermost point, a bail pivoted to said frame and constituting a rack or stop device, an extension on one end of the bail and extending downward below its pivotal point, a pin or stud on said extension arranged in axial alinement with the axis of said frame.

8. The combination of a laterally shiftable carriage and its supporting frame arranged to oscillate on an axis substantially at its lowermost point, a bail pivoted on said frame at a plane above its axis and constituting a stop device, an extension on the bail projecting beyond the pivotal point, a pin or stud arranged on said extension normally in axial alinement with the axis of said frame, and means for actuating said pin.

9. The combination of a laterally shiftable carriage and its supporting frame arranged to oscillate on an axis substantially at its lowermost point, a bail pivoted on said frame at a plane above its axis and constituting a stop device, an extension on the bail projecting beyond the pivotal point, a pin or stud arranged on said extension normally in axial alinement with the axis of said frame, and means for actuating said pin, said means comprising a lever, one of whose arms is adapted to contact with and move said pin and whose other end extends to the key-board, and a key for operating said lever.

10. The combination of a laterally shiftable carriage and its supporting frame oscillating on an axis below such carriage, a stop device pivoted on said frame above its axis and adapted to be rocked into and out of position of interference with said carriage, an extension on said device, and key mechanism controlling the movements of said extension.

11. The combination of a laterally shiftable carriage and its supporting frame oscillating on an axis below such carriage, a stop device pivoted on said frame above its axis, an extension on said device and having a stud or projection arranged in axial alinement with the axis of said frame, and a key controlled lever adapted to contact with said pin and thereby swing said device.

12. In a machine of the class described, the combination with the carriage of a jumper rack mounted thereon and having a series of adjustable stops, a pivoted carriage supporting frame on which such carriage is mounted, a bail pivoted on said frame and having a dog adapted to be projected into the path of movement of the stops for said racks, a pin arranged on said rack in axial alinement with the pivotal axis of the carriage supporting frame, and means for operating said bail by actuation of said pin.

13. In a machine of the class described, the combination, with the carriage supporting frame and its carriage, of a jumper rack having a series of adjustable pins along its opposite edges and slotted at its ends, studs on said carriage received by said slots, tension mechanism for normally holding the slots in engagement with said studs and an operating bail and dog coöperating with said jumper rack.

JOHN T. HOWIESON.

Witness:
WALTER CHEATHAM.

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