T. J. COO.

TYPE WRITING MACHINE.

APPLICATION FILED FEB. 10, 1909.

973,342.

Patented Oct. 18, 1910.

3 SHEETS—SHEET 1.

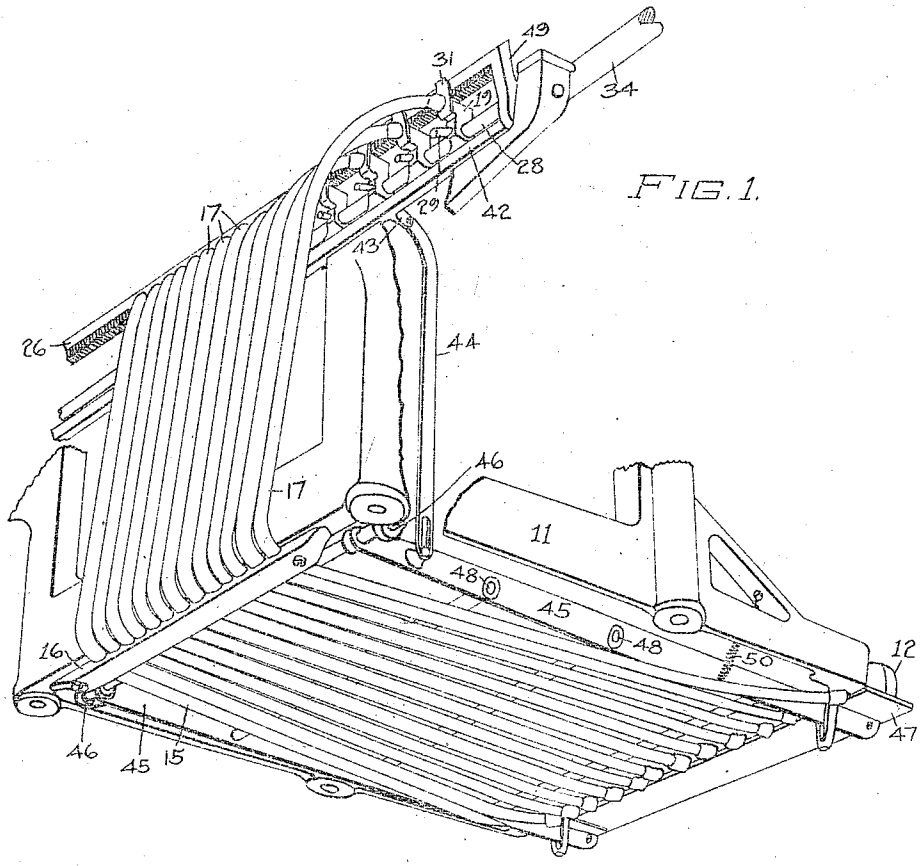


FIG. 1.

FIG. 2.

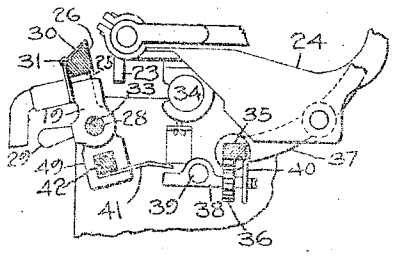
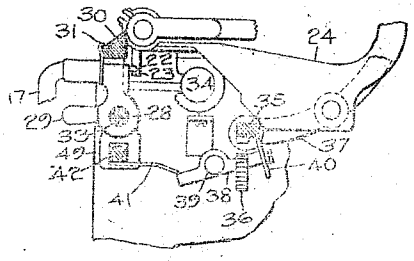


FIG. 3.



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3 SHEETS—SHEET 2.

FIG. 4.

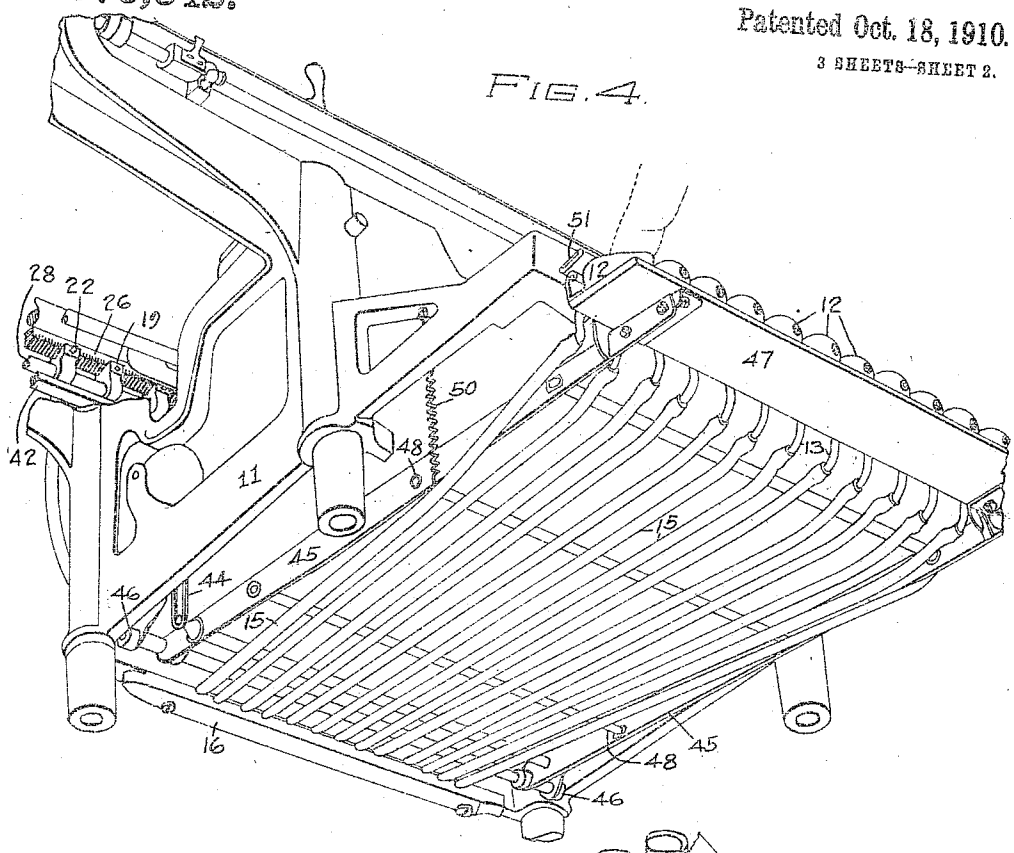
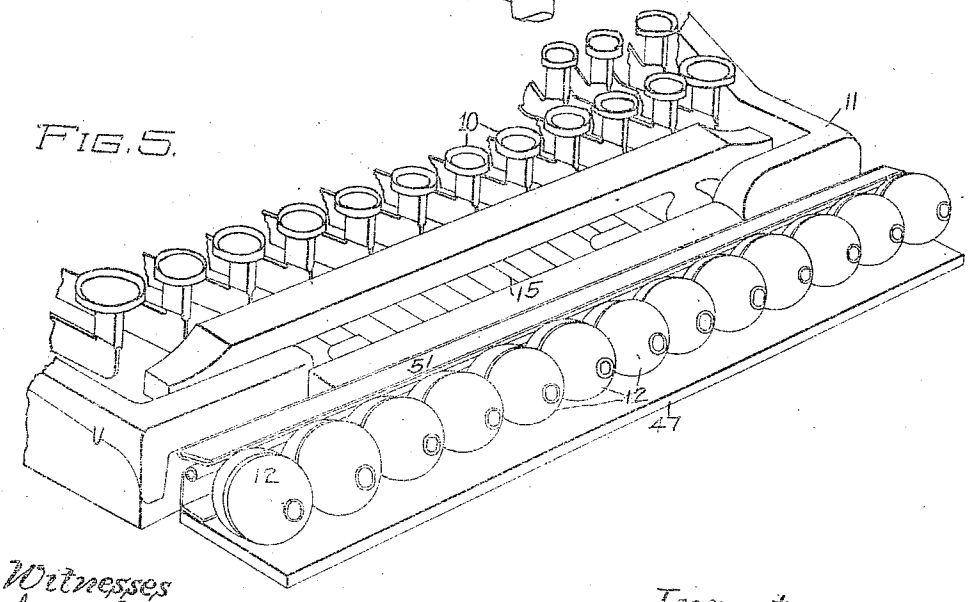


FIG. 5.



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3 SHEETS—SHEET 3.

FIG. 7

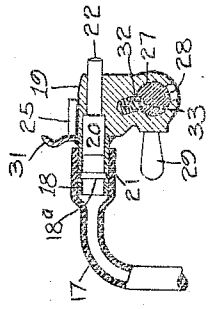

FIG. 8

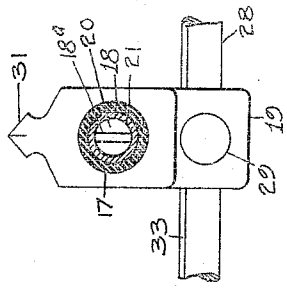

FIG. 6.

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UNITED STATES PATENT OFFICE.

THOMAS J. COO, OF TORONTO, ONTARIO, CANADA, ASSIGNOR TO UNDERWOOD TYPE-WRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

973,342. Specification of Letters Patent. Patented Oct. 18, 1910.

Application filed February 10, 1909. Serial No. 477,113.

To all whom it may concern:

Be it known that I, THOMAS J. COO, a subject of the King of Great Britain, residing in the city of Toronto, Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to tabulators of typewriting machines, and is in the nature of an improvement upon the devices disclosed in the United States Letters Patent No. 850,839. In said patent, a series of column stops was mounted upon the framework of the machine, and a cooperating stop was mounted upon the carriage; all of the column stops being normally out of use and so mounted that by pressing upon any stop it could be moved into effective position. Mechanism was also provided to enable the carriage to be released simultaneously with the movement of the selected column stop to effective position.

One of the principal objects of the present invention is to provide a column-stop mechanism of this character which can readily be applied to existing machines, in which the column stop bar is placed at the rear side of the machine, although so far as certain features of this invention are concerned, the location of the column stop bar is not material.

Another object is to make it more convenient to operate the column stops.

Instead of placing keys directly upon the column stops themselves, as in said patent, I provide a series of pneumatic keys at the keyboard of the machine, preferably arranged in front of the usual framework; and flexible tubes extending from these pneumatic keys to a series of pneumatic column stops. The latter are adjustable to different positions along the path of travel of the carriage, the flexibility of the connecting tubes permitting such adjustment.

Each pneumatic stop is preferably in the form of a piston having at one end a stop portion to engage the usual stop provided upon the typewriter carriage to arrest the same. This piston is mounted in a bore formed in a carrier; the carrier with its piston stop being adjustable along a rack and having a tooth to engage the rack and resembling in most respects the usual column stop of the well known Underwood typewriting machine; the principal difference being that instead of forming the stop directly upon the adjustable carrier as in the Underwood machine, it is movably mounted upon said carrier, so as to project therefrom at will into the path of the carriage stop.

The pneumatic keys or bulbs are mounted upon a depressible key bar arranged at the front of the machine and connected to the usual carriage-releasing mechanism, so that a single movement of the finger collapses any selected key or bulb to set its associated column stop, and also to depress said bar to release the carriage; the latter being arrested by the projected stop at the desired column of writing.

In the accompanying drawings, Figure 1 is a perspective rear bottom view of a portion of an Underwood front strike writing machine provided with the present improvements; the parts being in normal positions. Fig. 2 is a fragmentary sectional side elevation of the carriage-releasing devices in normal position. Fig. 3 is a view similar to Fig. 2, but showing the carriage released. Fig. 4 is a perspective front bottom view of the machine seen at Fig. 1; the manner of operating the tabulating mechanism being illustrated. Fig. 5 is a front perspective view of the keyboard of the typewriter, showing the tabulator keys and carriage releasing bar or key. Fig. 6 is a sectional side elevation of the tabulating mechanism, showing the parts in normal positions. Fig. 7 is a sectional view of a pneumatic stop and a carrier on a larger scale; the stop being shown projected to working position. Fig. 8 is a detail of the column stop partly in section.

In front of the keyboard 10 of an Underwood typewriting machine 11 is a row of pneumatic column stop keys 12, each in the form of a collapsible soft rubber bulb. Each bulb is provided on its rear end with an elbow shaped tube 13, which bends downwardly below the typewriter frame, and terminates in a nipple 14, over which is caught the end of a flexible rubber tube or conduit, which extends rearwardly at 15 beneath the machine, and is supported by a rack or guard 16 secured upon the bottom of the frame at its rear end, the tube extending thence upwardly in rear of the machine as

at 17, and caught over a nipple 18 projecting rearwardly from a stop carrier 19. A piston 20 is fitted in a bore 21 of the stop carrier, and terminates in a forwardly extending shank 22 which constitutes the column stop proper.

At Fig. 4 the operator's finger is shown as having collapsed one of the keys or bulbs 12, to drive the air through the tube 15, 17, to force forwardly the piston 20 from the piston-stop 18^a, and project the stop 22, as at Fig. 7; in which position the stop is in the path of the usual pendent stop or lug 23 provided upon the paper carriage 24, whereby the carriage may be arrested after running the desired distance.

Each of the carriers 19 resembles generally the usual column stop device of an Underwood typewriter, having a tooth or teeth 25 to engage a rack 26, and also having a perforation 27 to enable it to fit loosely upon a rod 28; and also provided with a handle 29, whereby the carrier may be turned backwardly about the rod to release the tooth 25 from the rack 26, to adjust the carrier along the rack; the rack having a scale 30 and the carrier having an index 31.

A spring detent or ball 32 engages a groove 33 in the rod 28, to hold the carrier in engagement with the rack 26. Flexibility of the tube or connection 17 permits adjustment of the carrier 19 along the rack 26 as far as desired.

The carriage 24 is drawn along upon a rail 34 by means of a spring (not shown) and has a rack 35 in mesh with a pinion 36, the latter forming part of the usual escapement devices. The rack is hinged upon a pair of arms 37, so that it may be lifted from the pinion 36, to permit the carriage to run along freely under the driving power of its spring. A releasing lever 38, Fig. 2, is usually pivoted at 39 upon the framework, and carries a roll 40, whereby it may lift the rack 35. This lever 38 is usually operated in said machine by an arm 41 fixed upon a rock shaft 42. Arms 43 are provided upon the rock shaft at the sides of the machine, and connected by pendent links 44 with a pair of levers 45 fulcrumed at 46 upon the framework, and carrying at their forward ends a transverse bar 47; tie-rods 48 connecting the levers 45 to form a depressible frame. The pneumatic keys 12 are mounted directly upon the bar 47, and the latter may be depressed either by pressure upon any bulb 12, as at Fig. 4, or without touching any bulb; movement being transmitted through the described connections to the rack 35 to lift the same from the escapement pinion 36. The carriage may thus be released to run until the engagement of the carriage stop or lug 23 with that column stop 22 which has been projected by the depressed pneumatic key 12.

It will be noted that as usual in the Underwood machine the rack 26 is secured upon arms 49 which extend up from the carriage-releasing rock-shaft 42, so that said rack 26 together with the rod 28 vibrates forward to the working position at Fig. 3 simultaneously with the projection of the column stop and the release of the carriage; and upon release of the key 12, said rack falls idly back to the Fig. 6 position. The suction in the tube 17 draws back piston 20 against internal stop-pin 18^a. The stop pin 18^a is placed within the nipple 18 to prevent the piston 20, during its back stroke, from reaching the end of said nipple.

A spring 50, Fig. 6, returns the release key or bar 47 to normal position, and it has sufficient tension to prevent said bar 47 from being depressed, without first collapsing one of the bulbs 12 upon said bar, so that the stop 22 must be set before the carriage is released.

A scale 51 may be placed immediately back of the keys 12, and suitably marked to enable the operator to select readily the proper key for arresting the carriage.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, a tabulating mechanism comprising a series of adjustable stops and pneumatic keys or means connected by flexible connections to said stops to enable the operator to set any stop independently of the others.

2. In a typewriting machine, a tabulating mechanism comprising a pneumatically operable adjustable stop, a pneumatic key, and a tube or conduit extending from the key to the stop and having a portion flexible to accommodate the adjustment of the stop.

3. In a typewriting machine, a tabulating mechanism comprising a series of adjustable pneumatically operable stops, a series of pneumatic keys arranged at the keyboard of the typewriter, and tubes extending from the keys to the stops to enable any key to set its stop independently of the others, said tubes having flexible construction to accommodate the adjustment of the stops.

4. In a typewriting machine, the combination with a carriage and a set of column stops, each adjustable independently of the others, of a set of column-stop keys, individual pneumatic connections between the keys and the stops, to enable any key to set its stop independently of the others, and a stop to coöperate with any of said column stops to arrest the carriage; said pneumatic connections being flexible to accommodate the adjustment of the stops.

5. In a typewriting machine, the combination with a carriage, of a tabulating

mounted, a pneumatic key, and a tube or conduit extending from the key to the carrier, to enable the key to set the stop, said carrier movable in the direction of travel of mechanism comprising a pneumatically operable stop, a carrier on which said stop is the carriage, and said tube or conduit flexible to permit such movement.

6. In a typewriting machine, the combination with a carriage of a tabulating mechanism comprising a series of pneumatically operated stops, individual carriers on which said stops are mounted, a series of pneumatic keys, and a series of tubes or conduits extending from the keys to the carriers to enable each key to set its stop, each of said carriers adjustable independently of the others in the direction of the travel of the carriage, and said tubes or conduits flexible to permit such adjustment.

7. In a typewriting machine, the combination with a carriage, of a tabulating mechanism comprising a series of pneumatically operated stops, individual carriers on which said stops are mounted, a series of pneumatic keys, and a series of tubes or conduits extending from the keys to the carriers to enable each key to set its stop, each of said carriers adjustable independently of the others in the direction of the travel of the carriage, and said tubes or conduits flexible to permit such adjustment; a rack being provided along which said carriers are adjustable, and each carrier having a tooth to engage the rack.

8. In a typewriting machine, the combination with a carriage, of a tabulating mechanism comprising a series of stops, individual carriers on which said stops are mounted, each carrier being adjustable independently of the others, each stop being movable independently of its carrier into and out of effective position, and keys connected to said stops, to set any stop independently of the remaining stops.

9. In a typewriting machine, the combination with a carriage, of a tabulating mechanism comprising a series of stops, individual carriers on which said stops are mounted, each stop being movable independently of its carrier into and out of effective position, keys connected to said stops, to set any stop independently of the remaining stops, each of said carriers adjustable independently of the others in the direction of the travel of the carriage, and connections extending from the keys to the stops having sufficient flexibility to permit such adjustment.

10. In a typewriting machine, a tabulating mechanism comprising an adjustable carrier, a pneumatically operated piston in said carrier and connected to a key by a flexible connection, and a stop projected by said piston.

11. In a typewriting machine, a tabulating mechanism comprising a pneumatically operated piston connected to a key, and a carriage stop upon the end of said piston.

12. In a typewriting machine, the combination with a carriage, of a tabulating mechanism comprising a carrier movable along the path of travel of the carriage, a piston fitted in a bore in said carrier, a pneumatic key, a tube extending from the key to said bore, and a carriage stop on the end of said piston, said tube being flexible to permit the movement of the carrier.

13. In a typewriting machine, the combination with a carriage, of a tabulating mechanism comprising a carrier movable along the path of travel of the carriage, a piston fitted in a bore in said carrier, a pneumatic key, a tube extending from the key to said bore, and a carriage stop on the end of said piston, said tube being flexible to permit the movement of the carrier; a stop being provided to limit the return of the piston to normal position.

14. In a typewriting machine, a tabulating mechanism comprising a pneumatically operated piston connected to a key, and a stop projected by said piston; said stop in the form of a reduced shank formed on the piston to project from said carrier.

15. In a typewriting machine, the combination with a carriage, of a tabulating mechanism comprising a carrier movable along the path of travel of the carriage, a piston fitted in a bore in said carrier, a pneumatic key, a tube extending from the key to said bore, and a carriage stop on the end of said piston, said tube being flexible to permit the movement of the carrier; a stop being provided to limit the return of the piston to normal position and constructed to prevent the piston from reaching the end of the bore in said carrier.

16. In a typewriting machine, the combination with a carriage, of a tabulating mechanism comprising a carrier movable along the path of travel of the carriage, a piston fitted in a bore in said carrier, a pneumatic key, a tube extending from the key to said bore, and a carriage stop on the end of said piston, said tube being flexible to permit the movement of the carrier; a stop being provided to limit the return of the piston to normal position and contained in a nipple projecting from the body of the carrier, said flexible tube caught over said nipple.

17. In a typewriting machine, the combination with a carriage, an escapement mechanism therefor, and a carriage-releasing mechanism, of tabulating mechanism comprising a series of pneumatically operated stops, individual carriers on which said stops are mounted, a row of pneumatic keys, a series of flexible tubes extending from the keys to the carriers to enable each key to set

its stop, each of said carriers adjustable independently of the others in the direction of travel of the carriage, a key-bar upon which said keys are supported, and a connection from said depressible key-bar to said releasing mechanism.

18. In a typewriting machine, the combination with a carriage, an escapement mechanism therefor, and a carriage-releasing mechanism, of tabulating mechanism comprising a series of pneumatically operated stops, individual carriers on which said stops are mounted, a row of pneumatic keys, a series of flexible tubes extending from the keys to the carriers to enable each key to set its stop, each of said carriers adjustable independently of the others in the direction of travel of the carriage, a key-bar upon which said keys are supported, and a connection from said depressible key-bar to said releasing mechanism; said pneumatic keys in the form of collapsible rubber bulbs.

19. In a typewriting machine, the combination with a carriage, an escapement mechanism therefor, and a carriage-releasing mechanism, of tabulating mechanism comprising a series of pneumatically operated stops, individual carriers on which said stops are mounted, a row of pneumatic keys, a series of flexible tubes extending from the keys to the carriers to enable each key to set its stop, each of said carriers adjustable independently of the others in the direction of travel of the carriage, a key-bar upon which said keys are supported, and a connection from said depressible key-bar to said releasing mechanism; said pneumatic keys in the form of collapsible rubber bulbs; and said key-bar supporting said bulbs and mounted upon a pair of levers forming a frame which is connected to the carriage-releasing mechanism.

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