

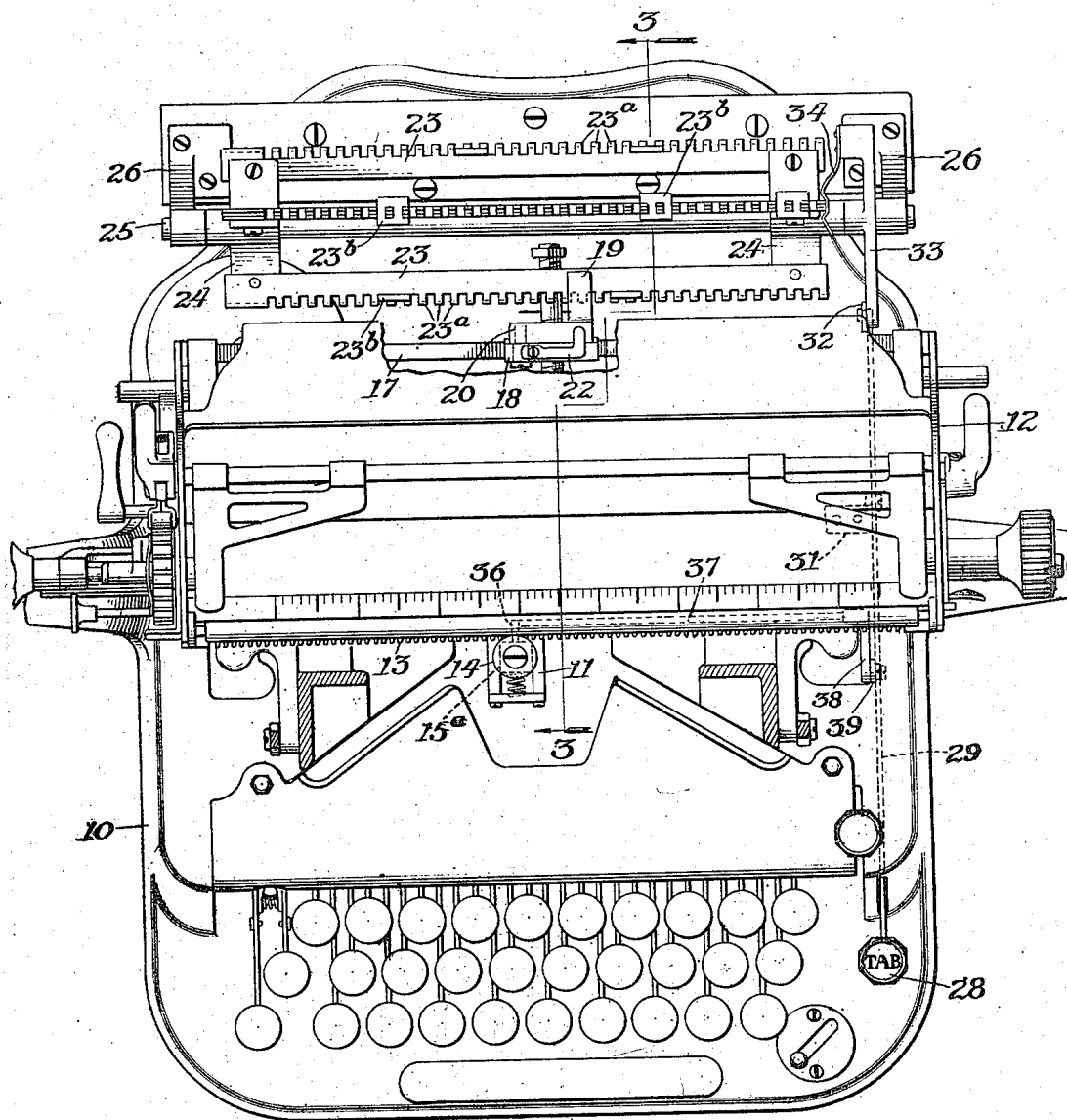
T. L. KNAPP.  
TABULATOR FOR TYPE WRITING MACHINES.  
APPLICATION FILED JULY 30, 1909.

965,530.

Patented July 26, 1910

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:  
*J. A. Alfreds*  
*W. B. Baggett.*

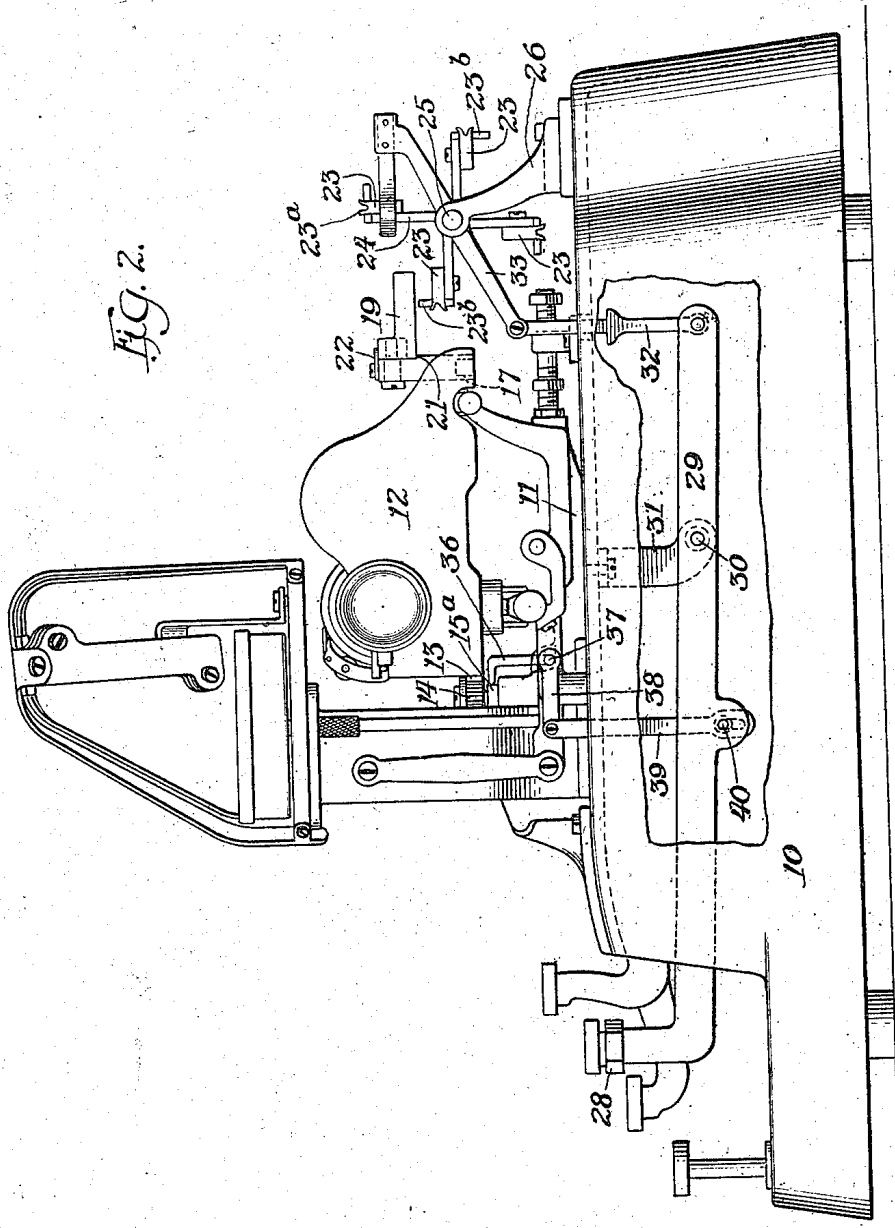
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

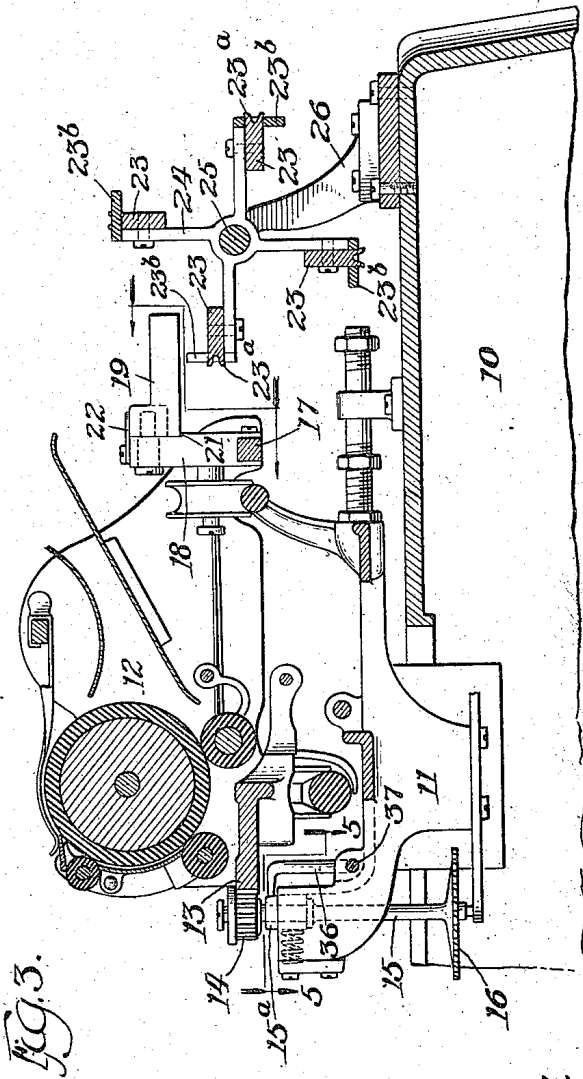


Fig. 3.

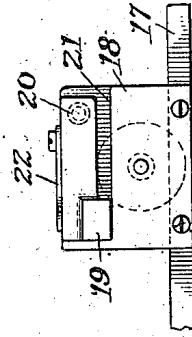


Fig. 6.

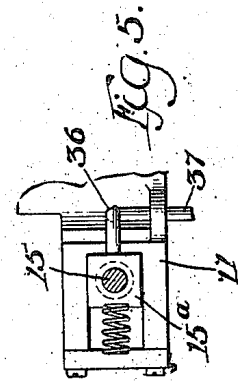


Fig. 5.

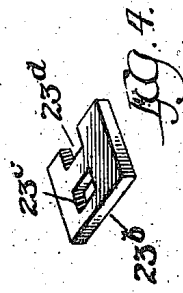


Fig. 4.

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# UNITED STATES PATENT OFFICE.

THERON L. KNAPP, OF WOODSTOCK, ILLINOIS, ASSIGNOR TO THE OLIVER TYPEWRITER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## TABULATOR FOR TYPE-WRITING MACHINES.

965,530.

Specification of Letters Patent. Patented July 26, 1910.

Application filed July 30, 1909. Serial No. 510,390.

To all whom it may concern:

Be it known that I, **THERON L. KNAPP**, a citizen of the United States, and a resident of Woodstock, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Tabulators for Type-Writing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to an improved tabulating or column-stop mechanism for typewriting machines by means of which the carriage is released from the control of the usual letter-spacing mechanism to permit of its movement under the force of its actuating springs to a predetermined point or points where its movement is arrested for the purpose of printing items or numbers in one or more vertical columns.

The invention relates particularly to the manner in which the stop-bars are mounted on the frame of the machine, and to an improved construction and arrangement by means of which a plurality of stop-bars, each with its stop-members adjusted for columns of different widths, are carried by the machine frame in such a way that any one of said stop-bars may be readily brought into active position.

My invention consists of the combination of parts hereinafter more fully described and particularly pointed out in the claims.

In the drawings:—Figure 1 is a top plan view of a typewriting machine showing my improved tabulating mechanism attached thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical section through Fig. 1 on the line 3—3 thereof. Fig. 4 is a perspective view of one of the stop-members. Fig. 5 is a horizontal section through the escapement shaft on the line 5—5 of Fig. 3. Fig. 6 is a rear elevation of the stop-arm and its supporting plate.

In illustrating and describing my invention, I have shown it as applied to a typewriting machine of the kind known as the "Oliver," but it will be apparent that it may, with equal readiness, be applied to other machines.

10 represents the base of the machine; 11 the shift-frame; 12 the paper-carriage; 13 the rack-bar, located on the paper-carriage;

14 the escapement pinion engaging said rack-bar; 15 the escapement-shaft; and 16 the escapement-gear. These parts are all of the usual or ordinary construction and form no part of my invention. They are fully illustrated in the drawings and need no further description.

17 indicates the rear bar of the paper-carriage frame, and 18 an upstanding plate secured thereto.

19 is a stop-arm which is in the form of an angular bar pivotally attached to the plate 18, as indicated at 20, and limited in its downward movement by means of a shoulder 21, formed in the face of the plate 18. A flat spring 22, secured to the top of the plate 18 and engaging the top of the stop-arm 19, normally holds said bar in its lowermost position while at the same time permitting it to be raised from said position when required, as will presently appear.

23 indicates the stop-bars, of which there are shown four in the drawings attached hereto. These stop-bars are in the form of flat bars which, in the preferred construction, are secured at their opposite end to spiders 24 keyed to a shaft 25. Said shaft is journaled in standards 26 secured in any suitable manner to the base of the machine. To these stop-bars are adjustably secured the stop-members or blocks 23<sup>b</sup> which are adapted to be brought into position for engagement by the stop-arm 19 in the operation of tabulating with the machine.

The stop-bars are brought into operative position by means of a tabulating key indicated by the numeral 28 (see Fig. 2). Said tabulating key is formed at the end of a lever 29 fulcrumed at 30 on a depending bracket 31 secured to the base of the machine. The rear end of the said lever 29 is pivotally connected to a link 32, the other end of which is pivotally connected to a rock-arm 33 loosely mounted on the shaft 25.

34 indicates a flat spring secured to the upper end of the arm 33 and formed to engage one end of one of the bars 23 to maintain the set of bars in fixed position relative to said rock arm, which normally holds the set of bars in such position that one bar is just below the path of the stop arm 19. It is apparent that upon the depression of the tabulating key 28 the rear end of the lever 29 will be raised and with it the forward end of the rock-arm 33, thus rocking the

shaft 25 through a small angle to raise the bar 23 to active position with its stop-members in the path of the stop-arm 19.

To release the paper-carriage from the letter-spacing mechanism, upon the operation of the tabulating key, is provided the following construction: The escapement-shaft 15 is journaled near its upper end in a spring retained block 15<sup>a</sup>, the spring normally holding the pinion in engagement with the rack 13.

36 indicates a rock-arm adapted to engage the block 15<sup>a</sup> and push it out of its normal position to release the pinion from engagement with the rack. Said rock-arm is mounted on a rock-shaft 37 and at one end of this rock-shaft is secured an arm 38 which is pivotally connected to a link 39, the later being connected by a pin and slot indicated at 40 to the lever 29 forward of its fulcrum point. It is apparent that the depression of the tabulating lever will cause the rock-arm 36 to be rocked forward to disengage the pinion 14 from the rack 13.

The stop-members are preferably secured to the stop-bars in the following manner: The stop-bars 23 are provided on their outer edges with teeth 23<sup>a</sup> which are bifurcated in the direction of the length of the bar and the bifurcations slightly spread apart at their ends, as indicated more clearly in Fig. 2. Said teeth are spaced apart a distance equal to double the pitch of the rack teeth on the rack-bar 13.

23<sup>b</sup> indicates the stop-members which are in the form of flat plates (see Fig. 4) and are provided with openings or holes 23<sup>c</sup>, 23<sup>d</sup>, which are of a size to enable the teeth 23<sup>a</sup> to be forced through them. The one hole 23<sup>d</sup> is open-sided, and the other hole 23<sup>c</sup> is spaced from the opposite edge of the stop-block a distance equal to its width, and the two holes themselves are separated by the same space. It is apparent that by this arrangement, and with the pitch of the teeth 23<sup>a</sup> double that of the teeth on the rack-bar of the letter-spacing mechanism, that by reversing the stop-block one of its edges may be made to correspond with the location of any of the teeth of the rack-bar, that is to say, to register with any letter space of the machine.

It is apparent from the above description that the stop-members or blocks may be adjusted to different widths on the several stop-bars to suit the requirements of the work of the office in which the machine is used, and that when any particular column-spacing provided on one of these bars, is desired, the bar having that particular spacing of the stop-members may be brought into position below the stop-arm 19 by rotating the shaft 25. Much time and annoyance is thus saved. In rotating the shaft 25 in order to bring any particular stop-bar into

position, the stop-arm 19 may be raised to permit the stop-bars to pass it.

While I have shown herein certain details of mechanical construction and certain arrangements of parts it is to be understood that I do not limit myself to such, but that they may be modified in various ways without departing from the spirit of the invention.

I claim as my invention:—

1. In a typewriting machine, in combination with the machine-frame, the paper-carriage, and letter-spacing mechanism, a tabulating-key, a stop-arm located on the carriage, a plurality of stop-bars, stop-members secured to said stop-bars, a rotatable carrier for said stop-bars located adjacent the path of said stop-arm, a rock-arm adjustably connected to said carrier, mechanism intermediate said rock-arm and said tabulating-key adapted to bring one of said stop-bars into active position, and means actuated by said tabulating-key for releasing the carriage from the letter-spacing mechanism. 75
2. In a typewriting machine, in combination with the machine-frame, the paper-carriage, and letter-spacing mechanism, a tabulating-key, a stop-arm located on the paper-carriage, a plurality of stop-bars, stop-members adjustably secured to said stop-bars, a rotatable carrier for said stop-bars located adjacent the path of said stop-arm, a rock-arm adjustably connected to said carrier and actuated by said tabulating-key, adapted to swing one of said stop-bars into active position, and means actuated by said tabulating-key for releasing the carriage from the letter-spacing mechanism. 80
3. In a typewriting machine, in combination with the machine-frame, the paper-carriage, and the letter-spacing mechanism, a tabulating key, a stop-arm member, a rotatable carrier member, one of said members being mounted on the machine frame and the other on the paper-carriage, a plurality of stop-bars secured to said carrier member, stop members secured to said stop-bars, mechanism actuated by said tabulating key adapted to swing the rotatable carrier member to bring one of said stop bars into active position, and means actuated by said tabulating key for releasing the carriage from the letter-spacing mechanism. 85
4. In a typewriting machine, in combination with the machine-frame, the paper-carriage, and the letter-spacing mechanism, a tabulating-key, a stop-arm member, a rotatable carrier member, one of said members being mounted to move with said paper-carriage, and the other being mounted on the machine-frame, a plurality of stop-bars secured to said carrier-member, stop-members secured to said stop-bars, mechanism actuated by said tabulating key adapted to pro- 90

duce relative movement between one of said stop bars and said stop-arm to bring the movable one of the two into active position, and means actuated by said tabulating key for releasing the carrier from the letter-spacing mechanism.

5 5. In a typewriting machine, in combination with the machine frame, the paper-carriage, and letter-spacing mechanism, a tabulating key, a stop-arm located on the carriage, a plurality of stop-bars, stop-members adjustably secured in said stop-bars, a rotatable carrier for said stop-bars located at the rear of the paper-carriage adjacent to the path of said stop-arm, a rock-arm loosely mounted on said carrier, a spring-arm secured to said rock-arm and having spring engagement with one of said stop-bars, mechanism intermediate said tabulating key and said rock-arm adapted to swing the same on its axis, and means actuated by said tabulating key for releasing the carrier from the letter-spacing mechanism.

10 20 25 30 6. In a typewriting machine, in combination with the machine frame, the paper-carriage, and letter-spacing mechanism, a tabulating key, a spring controlled stop-arm pivotally mounted at the rear of the paper-carriage, a plurality of stop-bars, stop-members adjustably secured to said stop-bars, a rotatable carrier for said stop-bars located adjacent to the path of said stop-arm at the

rear of the paper-carriage, a rock-arm pivotally mounted on said carrier, a spring-arm connected with said rock-arm and having spring engagement with said carrier, mechanism intermediate said rock-arm and said tabulating key adapted to rock the same, and means actuated by said tabulating key for releasing the carriage from the letter-spacing mechanism. 35 40

7. In a tabulating mechanism for typewriters, a stop-bar, bifurcated teeth formed on one edge of said stop-bar, the bifurcations of said teeth being separated at their ends a greater distance than at the base, and a stop-member comprising a plate having openings formed therein, one of said openings having four sides, and the other having three sides, and the spaces between said openings, and between said four-sided opening and the edges of the plate, and said openings themselves all being of equal width, and the bifurcated teeth of said stop-bar being adapted to be sprung within said openings. 45 50 55

In testimony that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 26th day of July A. D. 1909.

THERON L. KNAPP.

Witnesses:

BART C. YOUNG,  
L. T. QUINLAN.