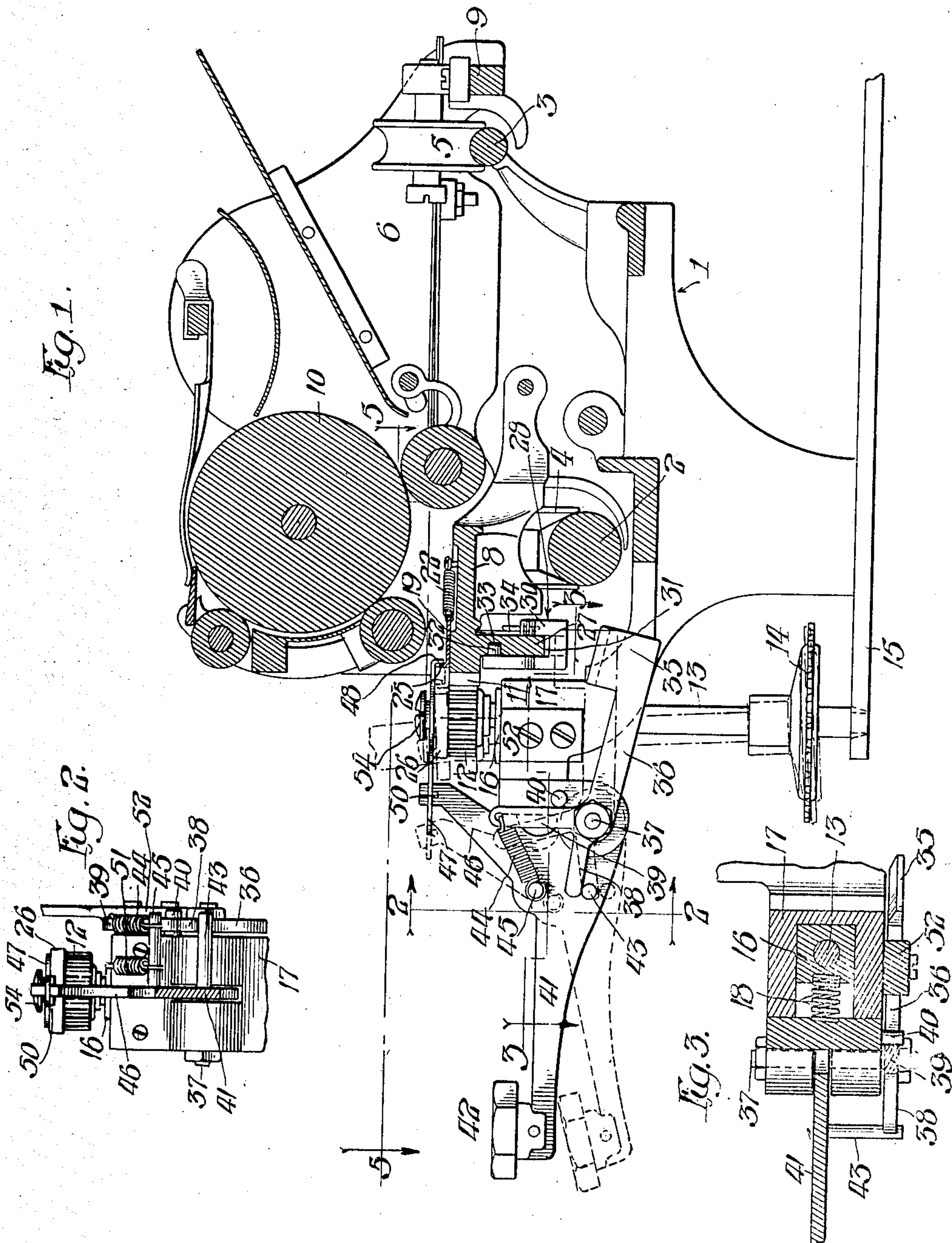


T. L. KNAPP & C. C. HARTING.  
 COLUMN STOP MECHANISM FOR TYPE WRITERS.  
 APPLICATION FILED NOV. 24, 1906. RENEWED AUG. 31, 1908.

916,720.

Patented Mar. 30, 1909.

3 SHEETS—SHEET 1.



Witnesses:  
 J. H. Alford.  
 G. R. Wilkins

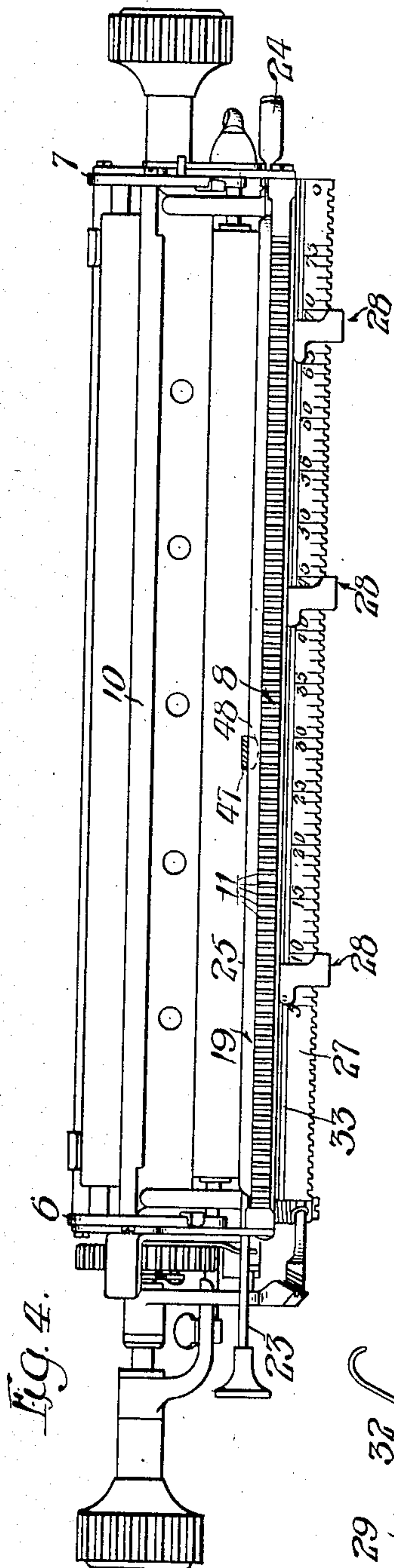
Inventors:  
 Theron L. Knapp  
 Clayton C. Harting  
 by Poole & Brown  
 Attys.

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3 SHEETS—SHEET 2.



Witnesses:  
*J. H. Alfred*  
*E. R. Wilkins*

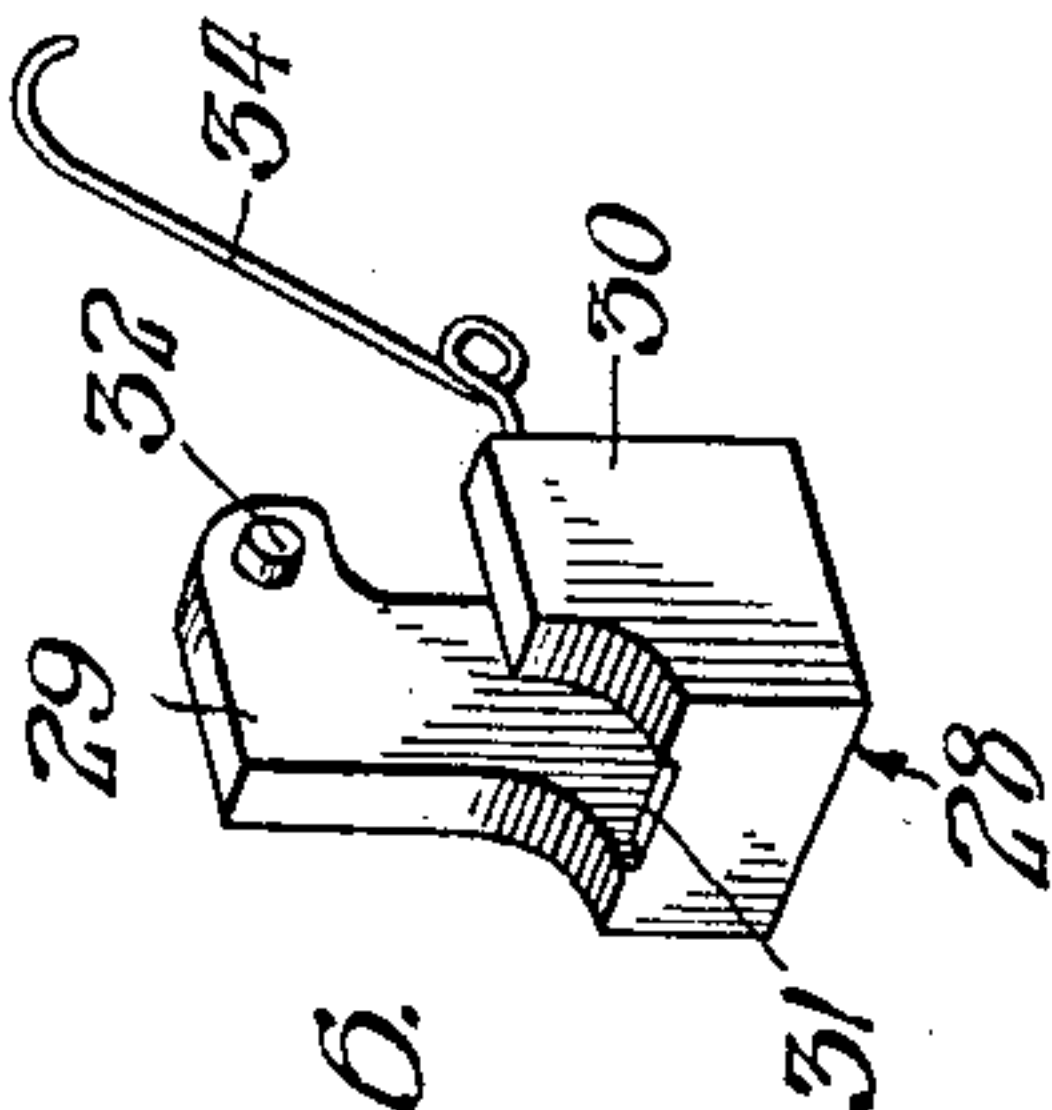


Fig. 6.

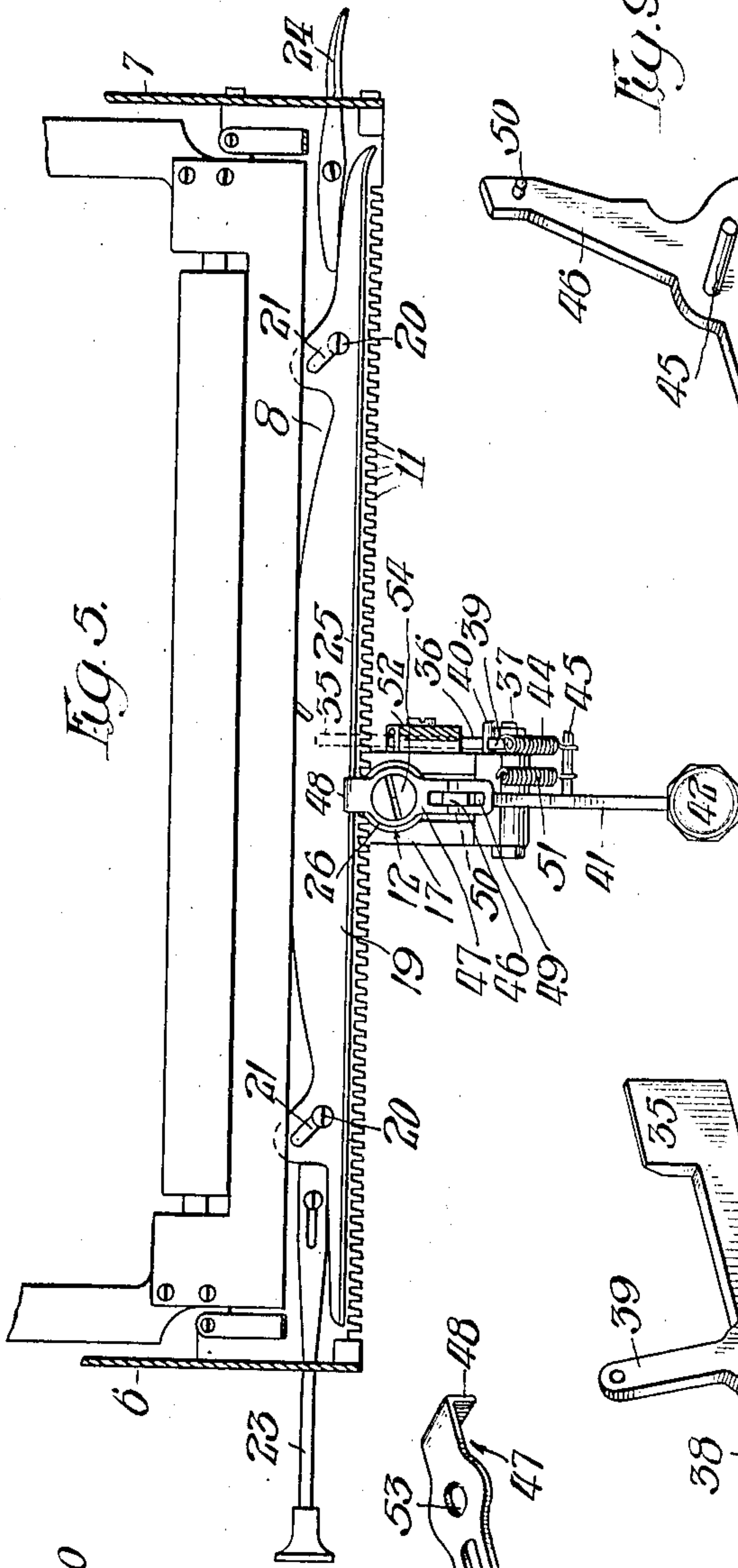


Fig. 5.

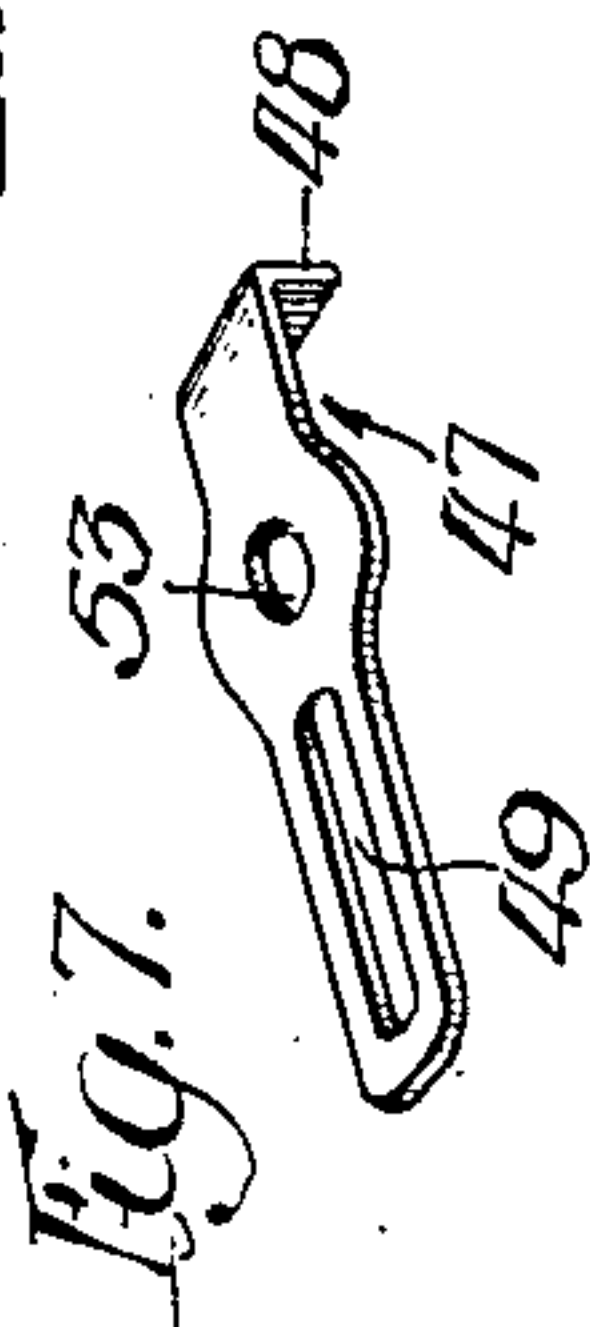


Fig. 7.

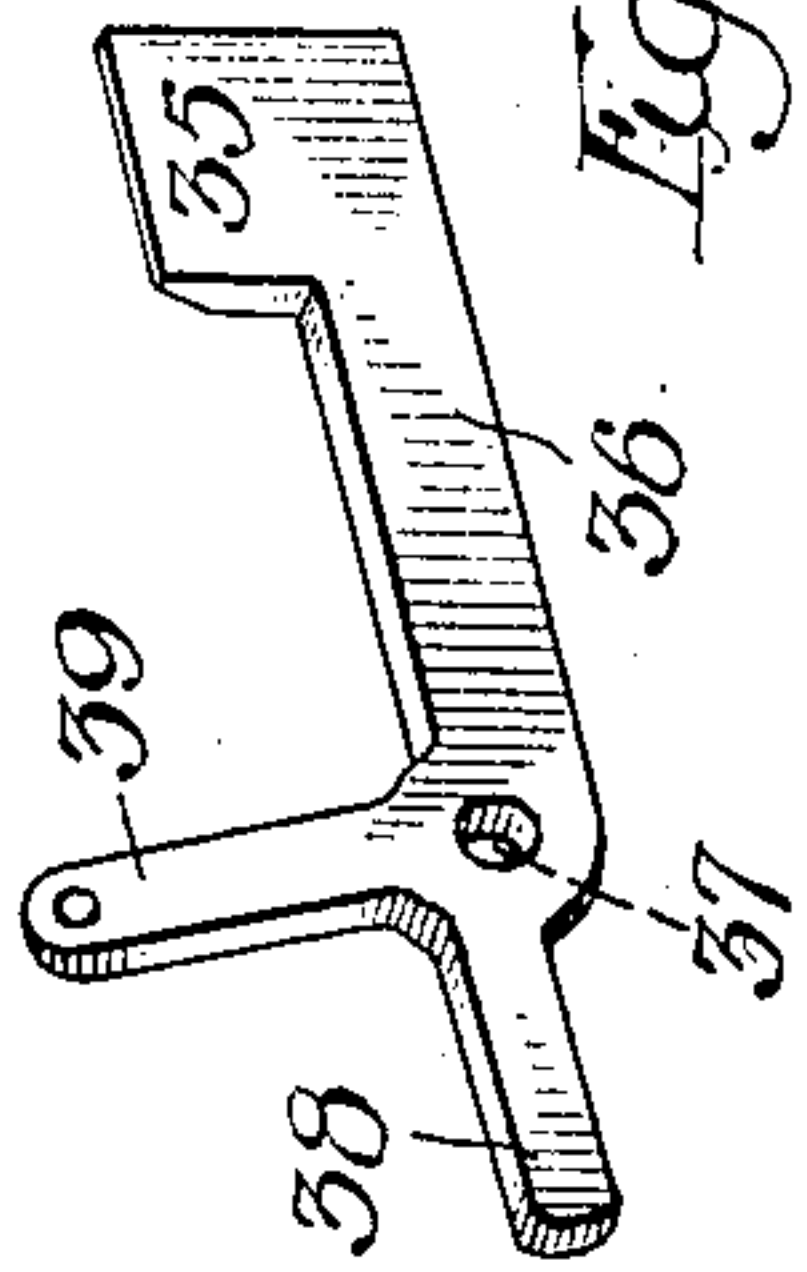


Fig. 8.

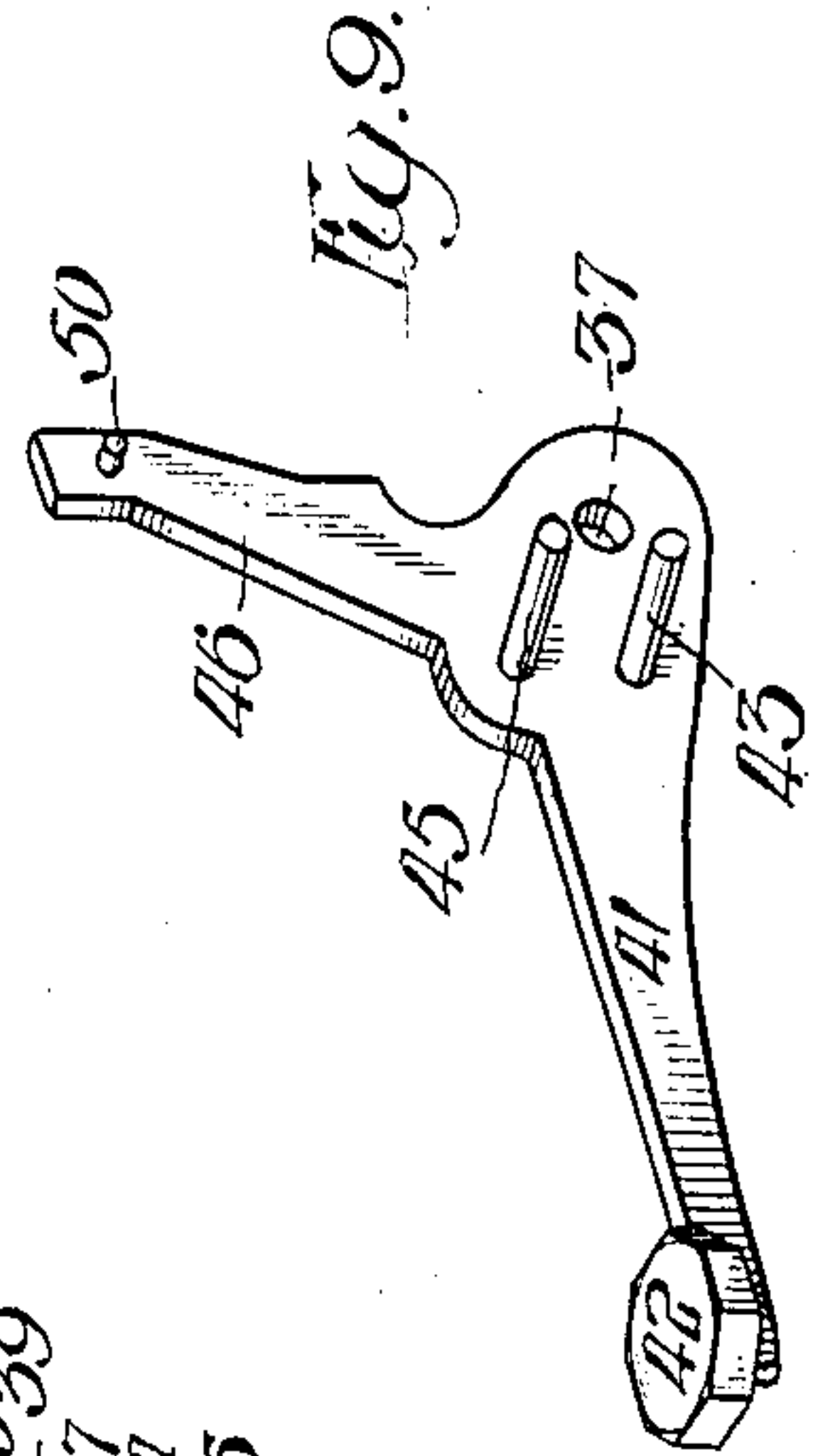


Fig. 9.

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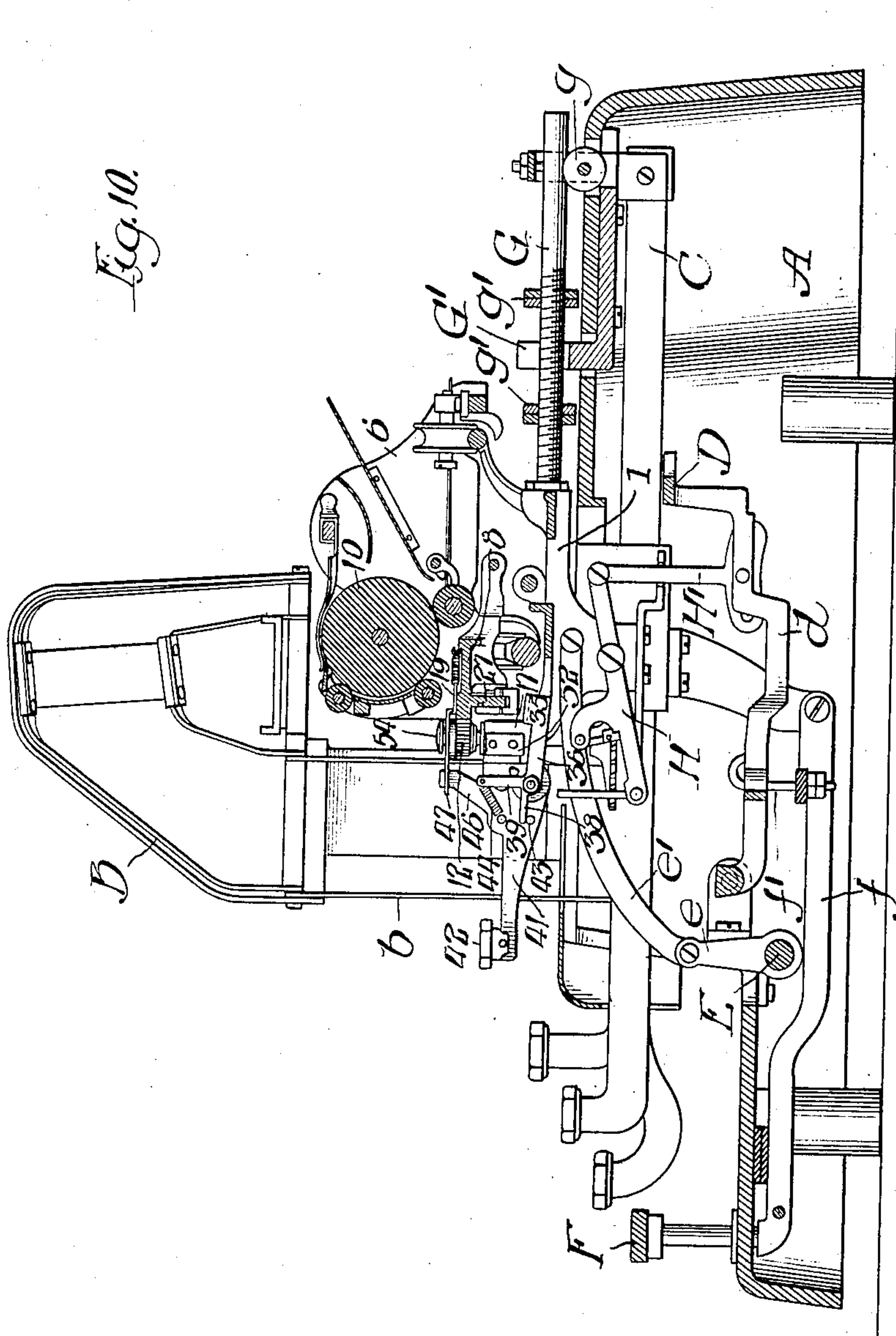
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3 SHEETS—SHEET 3.



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T. H. Alfreds  
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# UNITED STATES PATENT OFFICE.

THERON L. KNAPP AND CLAYTON C. HARTING, OF WOODSTOCK, ILLINOIS, ASSIGNORS TO  
THE OLIVER TYPEWRITER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF  
ILLINOIS.

## COLUMN-STOP MECHANISM FOR TYPE-WRITERS.

No. 916,720.

Specification of Letters Patent.

Patented March 30, 1909.

Application filed November 24, 1906, Serial No. 344,943. Renewed August 31, 1908. Serial No. 451,028.

*To all whom it may concern:*

Be it known that we, THERON L. KNAPP and CLAYTON C. HARTING, citizens of the United States, and residents of Woodstock, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Column-Stop Mechanism for Type-Writers; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters 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 designed to effect the release of the carriage from the control of the usual letter-spacing devices and permit the carriage to move, under the action of its actuating spring, to a predetermined point or points, at which the movement of the carriage is arrested, for the purpose of printing a series of items or numbers in one or more vertical lines or columns upon the sheet.

The invention relates more particularly to that class of column stop devices in which the carriage is provided with one or more adjustable stops which are mounted, and are longitudinally adjustable, upon a longitudinal member of the carriage frame and which are adapted to operate in connection with a key-actuated stop-member which is movable into and out of the path of the stop or stops upon the carriage.

The invention is herein shown as applied to a typewriting machine of the kind known as the "Oliver" machine, but the features constituting the invention may be applied to machines of other kinds.

The invention consists in the matters hereinafter set forth and pointed out in the appended claims.

In the accompanying drawings illustrating our invention:—Figure 1 is a view in central vertical section of the shift-frame and paper-carriage of a typewriting machine embodying our invention. Fig. 2 is a vertical section, taken upon line 2—2 of Fig. 1. Fig. 3 is a horizontal section, taken upon line 3—3 of Fig. 1. Fig. 4 is a face or front view of a paper carriage of the machine showing the adjustable stops thereon. Fig. 5 is a horizontal section,

showing parts of the carriage and the stop-mechanism on the shift-frame, taken on line 5—5 of Fig. 1. Fig. 6 is a perspective view of one of the stops on the carriage. Fig. 7 is a view showing, detached from the other parts, the connecting bar forming part of the means for operating the carriage-release devices. Fig. 8 is a perspective view of the stop-lever on the frame of the machine. Fig. 9 is a perspective view of the key-lever by which said stop-lever is operated. Fig. 10 is a view in central vertical section of a typewriting machine provided with the shift-frame and paper-carriage illustrated in the preceding figures.

As shown in said drawings, A (Fig. 10) indicates the base-frame of a typewriting machine, and 1 indicates the frame by which the paper-carriage is immediately supported and which has shifting movement backwardly and forwardly on said base-frame and which is herein called the "shift-frame". The paper-carriage has endwise or letter-space movement on said shift-frame and said shift-frame has backward and forward movement on the paper-carriage to provide for shifting the platen in such manner as to bring the paper in position for receiving impressions from two or more types upon each type-bar of the machine. Fig. 10 of the accompanying drawings illustrates the parts mounted on the base-frame A and which are not directly concerned with the present invention, said parts being one of the type-bars B, the key-levers C, one of which is shown as connected with the type-bar B by a link b, the universal bar D and one of its supporting arms d, a rock-shaft E through which the shift-frame 1 is moved or actuated and which is provided with an upwardly extending arm e connected with the shift-frame by a link e', a spacing key F, one of the spacing-key levers, f, and a link f' by which motion is transmitted from the spacing-key to the universal bar D. Said shift-frame is shown in said Fig. 10 as provided with a rearwardly extending rigidly attached guide rod G which rests at its rear end on a guide-roller g mounted on the frame A, said guide-rod G being provided with stop-nuts g' g' adapted for contact with a standard G' on the base-frame A.

H indicates the escapement lever of the machine which is mounted on the shift-frame 1 and is operated from the universal



bar D by means of an upright rod H<sup>1</sup>. The parts above described correspond with the similar parts heretofore employed in what is known as the "Oliver" typewriting machine.

5 Said shift-frame is provided with front and rear horizontal guide rods 2 and 3, extending transversely of the machine, on which travel the supporting rollers 4 and 5 of the carriage during the endwise or letter-space movement

10 of the carriage. The frame of said carriage, as shown, consists of end plates 6 and 7 and forward and rear longitudinal frame bars or members 8 and 9 which extend between and rigidly connect said end plates. 10 indicates the paper roller or platen of the carriage

15 which is mounted on the end plates 6 and 7, in the usual manner. The said longitudinal front frame member 8 of the paper carriage constitutes the rack-bar thereof and is provided

20 on its front edge with a series of ratchet teeth 11 which are engaged by a gear pinion 12 mounted on the upper end of an upright shaft 13 mounted on the forward part of the shift-frame. Said shaft 13 has, at its lower

25 end, an escape wheel 14 which is part of the escape mechanism which is operated by the universal bar of the machine and by which is controlled the endwise or letter-space movement of the carriage under the action of

30 the carriage actuating spring. The escape wheel shaft 13 has a bearing at its lower end in a forwardly projecting arm 15 on the lower part of the shift-frame and at its upper end engages a bearing block 16 (Fig. 3) which is

35 adapted to slide horizontally in a guide slot formed in the upper end of a bracket 17, which is attached to and projects forwardly from the shift-frame. The sliding movement of the bearing block 16 in the said

40 bracket 17 permits the gear pinion 12 to be moved or shifted forwardly and backwardly into and out of engagement with the ratchet teeth 11 and said block is held at the inward limit of its movement by an expansively acting

45 coiled spring 18 applied between the outer face of said block and the outer end of the slot in the bracket 17.

19 indicates the release bar of a carriage which is arranged horizontally above the

50 frame bar 8 and adapted to slide thereon in a horizontal plane. Said release bar is provided with oblique slots 21 engaged by studs 20 which rise from said frame bar 8. Said release bar is held at the rearward limit of

55 its movement by a coiled spring 22 and is operated to shift the same forward against the action of said spring 22 by means of an endwise sliding trip-rod 23 arranged longitudinally at the left-hand end of a carriage,

60 and adapted to act upon the left-hand end of the release bar in such manner as to throw the same forwardly and forward the left when pressure is applied to the outer end of said trip-rod. A pivoted lever 24 is also

65 located at the right-hand end of the carriage

and is adapted to also act upon the release bar to throw the same forward against the action of the spring 22. Said release bar is provided at its forward edge with an upturned or vertical, marginal flange 25 which

70 has bearing contact with a rotative ring or roller 26 mounted on the escape wheel shaft 13 above the gear pinion 12. When said release bar 19 is in its retracted position, the pinion 12 remains in engagement with the

75 ratchet teeth on the carriage frame, but when said release bar is thrown forward the pinion is forced outwardly or forwardly far enough to disengage it from the said ratchet teeth and thereby release the carriage from the

80 escape mechanism, by which letter-space movement thereof is controlled.

So far as described, the parts are constructed in the same manner as in the "Oliver" typewriting machines as heretofore

85 constructed.

The front frame member or rack-bar 8 of the paper-carriage is provided with a depending, longitudinal flange 27, which preferably extends the entire length thereof. Said

90 flange is provided at its lower edge with a plurality of notches and preferably bears on its front face a scale, marked to correspond with the letter-space movements of the carriage. Mounted on said flange 27 are ad-

95 justable stop-members 28. Each of said stop-members, as clearly seen in Fig. 6, consists of a metal block provided in its upper part with a notch to receive the flange 27 and having at its lower part an upwardly extend-

100 ing tooth 31 adapted for engagement with the notches on the lower edge of the said flange. In the particular form of the stop-member shown, the same consists of two parallel separated plates 29 and 30 joined by

105 a transverse connecting part on the upper edge of which is formed the tooth 31. The plate 29 is located in contact with the front face of the flange 27 and is provided near its upper edge with a stud 32 which projects

110 rearwardly therefrom and is adapted to engage a longitudinal groove 33 formed in the front face of the flange 27. The plate 30 engages the rear face of the flange 27 and is

115 provided with a spring arm 34 which projects upwardly and toward the left and is adapted to bear at its free end upwardly against the lower surface of the rack-bar 8. The stud 32 is located at a distance toward

120 the left from the tooth 31, so that the upward pressure of the free end of the spring-arm 34 against the rack-bar 8 tends to turn or rotate the stop-member about the stud 32 in a direction to lift the tooth 31 or hold the

125 same in engagement with one of the notches in the lower edge of the flange 27. To shift or move the stop-member on the flange 27, its right hand end is drawn downwardly to release the tooth 31 from the notch engaged thereby and the stop-member is then slid

130



along the flange to the desired point thereon. When the stop-member is released its said right hand end is, by the action of the spring 34, thrown upwardly to bring the said tooth 5 into engagement with another notch of the flange.

35 indicates a key-actuated stop on the shift-frame, which is movable vertically thereon to bring it into and out of the path of 10 the stop-members 28 on the carriage. Said stop 35 is attached to the rear or inner end of a lever 36, arranged to extend from front to rear of the machine or at right angles to the path of the carriage and pivoted to the 15 bracket 17 of the shift-frame, preferably at the right hand side thereof. Said lever 36 is shown as mounted on a pivot-rod 37 which is inserted horizontally through the bracket 17 and projects beyond the right hand face of 20 said bracket to form a journal or bearing for the said lever. At this forward end, the lever 36 is provided with two rigid arms 38 and 39 arranged at an angle to each other. The arm 38 constitutes a forward extension of 25 said lever and the arm 39 projects upwardly from the pivotal axis thereof. Said arm 39 is adapted for contact at its rear edge with a stud 40, which projects from the right hand face of the bracket 17 and constitutes a stop 30 to limit the downward movement of the inner or rear end of the lever. A stop is provided to limit the upward swing of the lever 36 when the stop-member 35 is in its elevated position, or in the path of the stop-members 35 28; said stop, as shown in the drawings, consisting of a block 52, attached to and projecting from the right-hand face of the bracket 17, and against the lower surface of which the said lever 36 is adapted to bear 40 when the said lever 36 is in its elevated position.

41 is a key-lever mounted on the bracket 17 so as to swing on an axis concentric with the pivot of the lever 36 and projecting forward from said bracket. Said key-lever is 45 conveniently mounted on the pivot-rod 37 at the left-hand side of the lever 36; its rear end being inserted in a vertical slot formed in the bracket to receive the same. Said key-lever is provided at its outer end with a key 50 42 by which it may be operated. Said key-lever is provided with a stud 43 which projects from the right-hand face thereof in position to engage the under side or lower edge 55 of the arm 38 on the lever 36. Said key-lever 41 is connected with the upwardly extending arm 39 of the lever 36 by means of a contractile coiled spring 44 connected at one end with said arm 39 and at its opposite end 60 with the key-lever at a point forward of said arm. The spring is conveniently connected with the key-lever by means of a stud 45 affixed to and projecting from the right-hand side of said key-lever. Said spring 44 tends 65 to draw the upper end of the arm 39 forward

and to hold the arm 38 in contact with the stud 43 on the key-lever. Said key-lever 41 is provided with a lifting spring by which its front end is held normally elevated; said lifting spring, as shown in the drawings, consisting of a contractile coiled spring 51 which is 70 connected at one end with the stud 45 and at its other end with the bracket 17 (Fig. 2). The key-lever 41 is provided at its rear or pivoted end with an upwardly extending, 75 rigid arm 46, the upper end of which is connected with a horizontally arranged connecting bar 47, through the medium of which motion is transmitted from the key-lever to the release bar 19 of the paper-carriage. 80 Said plate 17, as clearly seen in Fig. 1, is arranged above the level of the gear pinion 12 and the said release bar 19 and at its rear end is provided with a downwardly extending vertical lug or flange 48 which hooks over and 85 bears against the inner or rear face of the front marginal longitudinal flange 25 on the release bar 19. The said bar 47 is provided with an aperture 53 through which passes a screw-stud 54 which is inserted into the upper 90 end of the shaft 13 and serves to retain thereon the ring or collar 26. The said aperture 53 is made larger than the stud 54 so as to permit a slight relative movement between the connecting bar and the said shaft. 95 The upwardly extending arm 46 of the key-lever 41 is connected with said bar 47 in a manner to afford lost motion between said arm and bar, the parts for this purpose being constructed as follows: The bar 46 is provided 100 at its forward end with a longitudinal slot 49 through which the upper end of the arm 46 of the key-lever upwardly projects; the front and rear edges of the arm 46 being adapted for contact with the opposite ends of 105 the slot 49, which is made long enough to afford the desired extent of lost motion between the key-lever and the said bar. Said arm 46 of the key-lever is shown as provided, below the bar 47, with a transverse pin 50 110 which serves to support the outer end of the bar.

The key-lever 41 is held normally in its elevated position by the spring 51; the upward movement of the outer end of said key-lever 115 under the action of said spring being limited by contact of the rear edge of the arm 46 with the forward end of the bracket 17. In the normal or elevated position of said key-lever 41, the upper end of its arm 120 46 stands in a position intermediate between the ends of the slot 49 in the connecting bar 47 (Fig. 5), so as to leave said bar 47 free to be moved forwardly with the upper end of the escape-wheel shaft 13 when the latter is 125 swung forwardly to disengage the pinion 12 from the carriage rack in the usual operation of the carriage release devices. When said key-lever 41 is depressed by downward pressure of the finger on the key 42, the lever 36 130



and the stop-member 35 thereon are swung or moved with the key-lever to lift the stop-member into the path of the stop-members 28, 28, on the carriage, such movement of the lever 36 with the key-lever 41 resulting from the fact that the spring 44 which connects the arm 39 of said lever 36 with the key-lever, acts to retain the arm 38 on said lever 36 in contact with the stud 43 on the key-lever. The movement of said lever 36 with the key-lever 41 continues until the upward movement of said lever 36 is arrested by its contact with the lower surface of the block 52; which occurs when the stop-member 35 is elevated sufficiently to bring it into the path of the stops on the carriage frame. The upper end of the arm 46 of the key-lever, is so arranged with respect to the outer end of the slot 49 in the connecting bar 47 that the key-lever will be moved downwardly far enough to bring the stop-member 35 to its elevated or carriage arresting position before the arm 46 comes into contact with the outer end of said slot 49 in the connecting bar. When, in the downward movement of the key-lever 41, its arm 46, in the forward movement of the latter, strikes the outer end of said slot 49 in the bar 47, the said bar will be drawn or shifted outwardly or forwardly by the action of the key-lever, and the said bar, by its engagement of its hooked inner end with the flange of the release bar 19, will draw the latter forward and said release bar, by its action on the roller 26, will draw forward the upper end of the shaft 13, thereby releasing the pinion 12 from the carriage rack-bar and leaving the carriage free to travel or move toward the left until its movement is arrested by contact of one of the stops 28 with the stop-member 35. The downward movement of the key-lever may continue until the carriage release bar 19 reaches the forward limit of its movement, when further downward movement of said key-lever will be arrested.

A typewriting machine equipped with column-stop or tabulating mechanism such as is above described may be operated for ordinary writing in the usual manner without interference by reason of the presence of said mechanism. When it is desired to do tabulating work or to write a series of items or numbers in one or more columns on a sheet, one or more of the stop-members 28 are applied to the carriage and located at the required position or positions thereon according to the desired lateral location on the sheet of the column or columns to be written. Then upon depressing the key-lever 41, the carriage will be released and run to the position determined by the first or left-hand column stop, when the desired item may be printed in the column. When the printing of that item is completed, the key-lever 41 may again be depressed and the carriage will

be released and allowed to run freely to the position determined by the second stop, and the writing in the second column may be likewise effected. Similarly, the carriage may be released and stopped in position for printing a third or any other number of columns on the sheet.

We claim as our invention:—

1. In a typewriting machine, the combination with a base-frame, a shift-frame movable backwardly and forwardly thereon, a paper-carriage movable on said shift-frame, letter-spacing mechanism for controlling the movement of the carriage on the shift-frame and column-stop mechanism for releasing said carriage from the letter-spacing mechanism and arresting its movement at a desired point embracing a key-lever for operating said column-stop mechanism mounted on said shift-frame. 85

2. In a typewriting machine, the combination with a base-frame, of a shift-frame having backward and forward movement on said base-frame, a paper-carriage movable endwise on said shift-frame, said paper-carriage being provided with a rack-bar, letter-spacing mechanism embracing a rotative gear-pinion which is mounted on the shift-frame and is movable into and out of mesh with said rack-bar, and column-stop mechanism for arresting the movement of the carriage at a desired point, embracing a key-lever for operating said column-stop mechanism, said key-lever being mounted on the shift-frame and having operative connection with said gear-pinion. 95 100

3. In a typewriting machine, the combination with a base-frame, of a shift-frame having backward and forward movement on said base-frame, a paper-carriage movable endwise on said shift-frame, said paper-carriage being provided with a rack-bar, letter-spacing mechanism embracing a rotative gear-pinion which is mounted on the shift-frame and is movable into and out of mesh with said rack-bar, a release bar on the carriage adapted to act on said gear pinion, and column stop mechanism for arresting the movement of the carriage at a desired point embracing a key-lever for operating said column-stop mechanism, said key-lever being mounted on the shift-frame and having operative connection with said release bar. 105 110 115

4. In a typewriting machine, the combination of a base-frame, a shift-frame mounted to move backwardly and forwardly on said base-frame, a paper-carriage movable endwise on said shift-frame, letter-spacing mechanism for controlling the movement of the carriage on the shift-frame, and column-stop mechanism for releasing the carriage from the letter-space mechanism and arresting the movement of such carriage at a desired point, embracing a column-stop adjustable endwise on the carriage, a movable 120 125 130



stop-member on the shift-frame, and a key-lever for operating the column-stop mechanism mounted on said shift-frame.

5. In a typewriting machine, the combination of a base-frame, a shift-frame mounted to move backwardly and forwardly on said base-frame, a paper-carriage movable endwise on said shift-frame and provided with a rack-bar, letter-spacing mechanism embracing a rotative gear pinion which is mounted on the shift-frame and is movable into and out of mesh with said rack-bar, and column-stop mechanism embracing a column-stop adjustable on the carriage, a movable stop-member on the shift-frame, and a key-lever mounted on said shift-frame and having operative connection with said stop-member and with the said gear-pinion.

6. In a typewriting machine, the combination with a base-frame, a shift-frame mounted to move backwardly and forwardly on the base-frame, a paper-carriage movable endwise on said shift-frame, letter spacing mechanism embracing a rack-bar on the paper-carriage, and a rotative gear-pinion which is mounted on the shift-frame and is movable into and out of mesh with said rack-bar, a movable stop-member on the shift-frame adapted to be shifted into and out of the path of the column-stop on the carriage, and a key-lever mounted on the shift-frame, said lever being connected with said movable member by means affording lost motion between the stop-member and the key-lever, and the said key-lever being connected with the said gear-pinion by means affording lost motion between said gear-pinion and the key-lever.

7. In a typewriting machine, the combination with a paper-carriage provided with a rack-bar, and letter spacing mechanism embracing a rotative gear-pinion movable toward and from said rack-bar, a column-stop adjustable longitudinally on the carriage, a pivoted arm carrying a stop-member, a key-lever for operating said pivoted arm having limited oscillatory movement relative to said arm, said key-lever being pivoted below the level of the said gear-pinion and having an upwardly extending rigid arm, a lifting spring for said key-lever, and means for actuating said gear-pinion from said upwardly extending arm on said key-lever adapted to afford lost motion between said parts.

8. In a typewriting machine, the combination with a paper-carriage, letter-spacing mechanism, a column-stop adjustable longitudinally on the carriage, a stop-member movable into and out of the path of said column-stop, a pivoted arm carrying a stop-member and which is movable to carry said stop-member into and out of the path of said column-stop, a key-lever pivoted concentric-

ally with said arm, a lifting spring for said key-lever, contacting stops on said pivoted arm and key-lever acting to hold the stop-member out of the path of the column-stop when the key-lever is elevated, a spring applied between said key-lever and stop-carrying arm, tending to hold said stops in contact with each other and to afford movement of the stop-carrying arm with the key-lever when the latter is depressed, and releasing means for disconnecting the carriage from the letter-spacing mechanism connected with said key-lever by means affording lost motion between the key-lever and the releasing means.

9. In a typewriting machine, the combination with a paper-carriage provided with a rack-bar, letter-spacing mechanism embracing a gear-pinion which is movable into and out of mesh with the rack-bar, a column-stop adjustable longitudinally on the carriage, a pivoted arm carrying at its rear end a stop-member adapted by the swinging of said arm to be moved into and out of the path of said column-stop, a key-lever pivoted concentrically with said stop-carrying arm, said key-lever being pivoted below the level of the gear-pinion and provided with an upwardly extending rigid arm, a lifting spring for said key-lever, contacting stops on said arm and key-lever acting to hold the stop-member of said arm in its depressed position when the key-lever is elevated, a spring applied between said key-lever and arm tending to hold said stops in contact with each other and to afford movement of the arm with the key-lever when the latter is depressed, and operative connections between the said upwardly extending arm on the key-lever and the said gear-pinion, affording lost motion between said parts.

10. In a typewriting machine, the combination of a base-frame a shift-frame mounted to move backwardly and forwardly on said base-frame, a paper-carriage movable endwise on said shift-frame and provided with a rack-bar, letter-spacing mechanism embracing a rotative gear-pinion which is mounted on the shift-frame and is movable into and out of mesh with said rack-bar, a release bar on the carriage adapted to act on said pinion to release the same from the rack-bar, and column stop mechanism embracing a column-stop adjustable on the carriage, a movable stop-member on the shift-frame and a key-lever mounted on said shift-frame and having operative connection with said stop-member and with the release bar.

11. In a typewriting machine, the combination with a base-frame, a shift-frame mounted to move backwardly and forwardly on said base-frame, a paper-carriage movable endwise on said shift-frame, letter-spacing mechanism, a longitudinally ar-



ranged release bar on the carriage, the lateral movement of which effects the release of the carriage from the letter-spacing mechanism, an adjustable column stop on the carriage, a movable stop member adapted to be shifted into and out of the path of said column stop, a key-lever for actuating said stop-member, and a connecting bar through which motion is transmitted from the said key-lever to the release bar and which has sliding engagement with said release bar.

12. In a typewriting machine, the combination of a base-frame, a shift-frame mounted to move backwardly and forwardly on the base-frame, a paper-carriage movable endwise on said shift-frame, letter-spacing mechanism embracing a rack-bar on the paper-carriage and a rotative pinion engaging said rack-bar, a longitudinally arranged release bar on the carriage, which has lateral movement thereon to effect the release of the pinion from the said rack-bar, a movable stop member adapted to be shifted into and out of the path of the column stop on the carriage, a key-lever for operating said movable stop-member, connected with the latter by means affording lost motion between the stop and key-lever, and a connecting bar operated by the key-lever and having sliding engagement with the said release bar.

13. In a typewriting machine, the combination with a paper-carriage provided with a rack-bar having forwardly facing teeth, and letter-spacing mechanism embracing an upright shaft provided with a gear-pinion movable toward and from the rack-bar, a longitudinally arranged release-bar mounted to slide laterally on the carriage in a horizontal path and adapted to act on said shaft to release the gear-pinion from said rack-bar, a retracting-spring for the release-bar, a column-stop adjustable longitudinally on the carriage, a pivoted arm carrying a stop-member, a key-lever for operating said pivoted arm, having limited oscillatory movement relative to said arm, said key-lever being pivoted below the level of the release-bar

and having an upwardly extending, rigid arm, a lifting spring for said key-lever, and a horizontally arranged connecting-bar engaged at its forward end with the said arm on the key-lever by means affording lost motion between the arm and bar and provided at its rear end with a forwardly facing shoulder engaging a rearwardly facing longitudinal surface of the release bar.

14. In a typewriting machine, the combination with a paper carriage provided with a rack-bar having forwardly facing teeth and letter-spacing mechanism embracing an upright shaft provided with a gear-pinion which is movable toward and from the rack-bar, of a longitudinally arranged release-bar on the carriage, having movement thereon forwardly and rearwardly in a horizontal plane, a column-stop adjustable longitudinally on the carriage, an arm pivotally supported at its forward end and having at its rear end a stop-member adapted by the swinging of said arm to be moved into and out of the path of said column-stop, a key-lever pivoted concentrically with said arm, a lifting-spring for said key-lever, contacting stops on the said arm and key-lever acting to hold the rear end of said arm in its depressed position when the key-lever is elevated, a spring applied between the key-lever and arm tending to hold said stops in contact with each other and to afford movement of the arm with the key-lever when the latter is depressed, and a connecting bar engaged with the key-lever by means affording lost motion between said parts and having sliding engagement with the said release-bar.

In testimony, that we claim the foregoing as our invention we affix our signatures in the presence of two witnesses, this 20th day of November A. D. 1906.

THERON L. KNAPP.  
 CLAYTON C. HARTING.

Witnesses:

A. J. MULLEN,  
 F. A. DANIELS.