

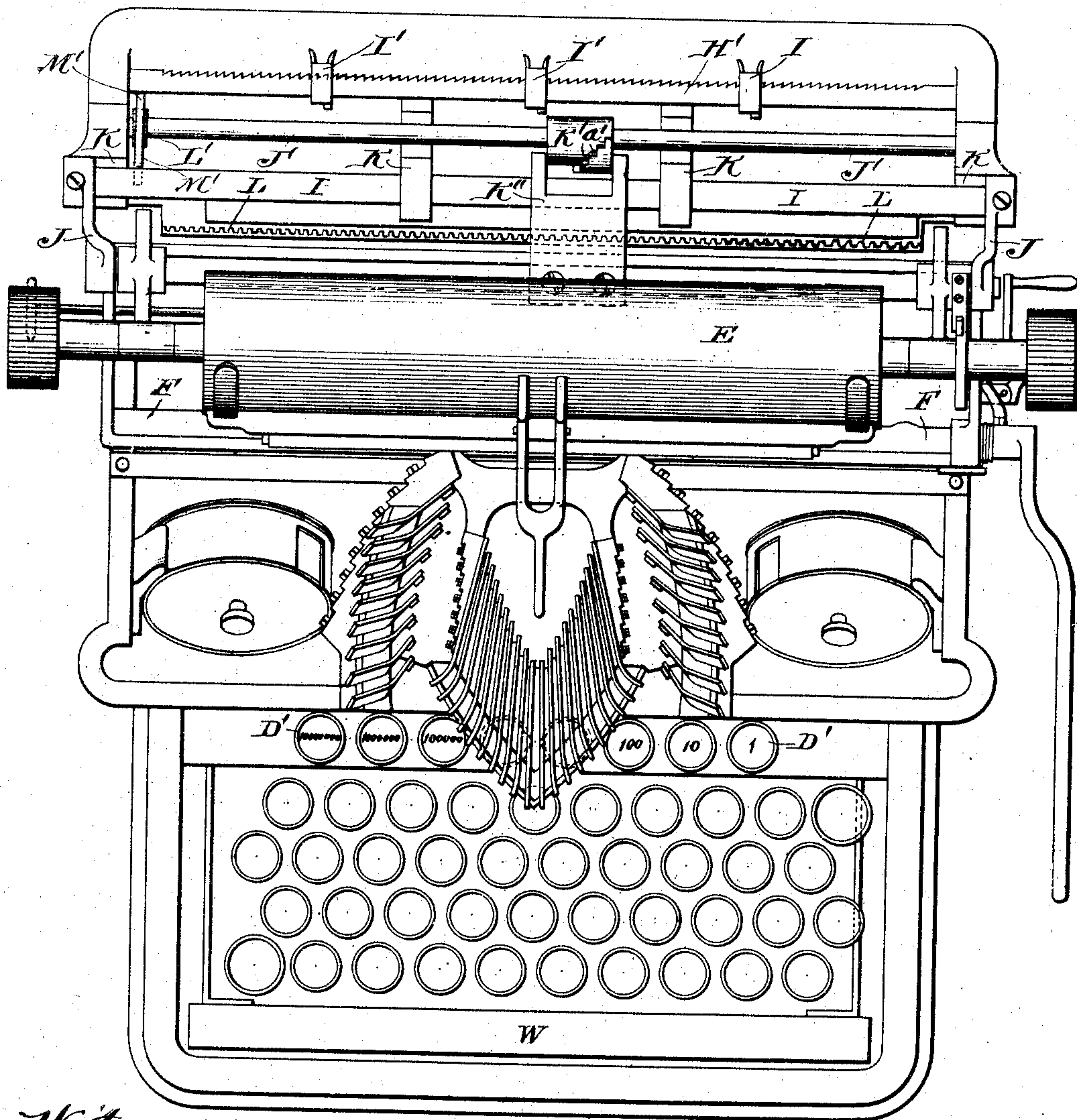
H. L. FISHER.

TABULATOR FOR TYPE WRITING MACHINES.

APPLICATION FILED JUNE 23, 1899. RENEWED APR. 8, 1903.

4 SHEETS—SHEET 1.

*Fig. 1.*

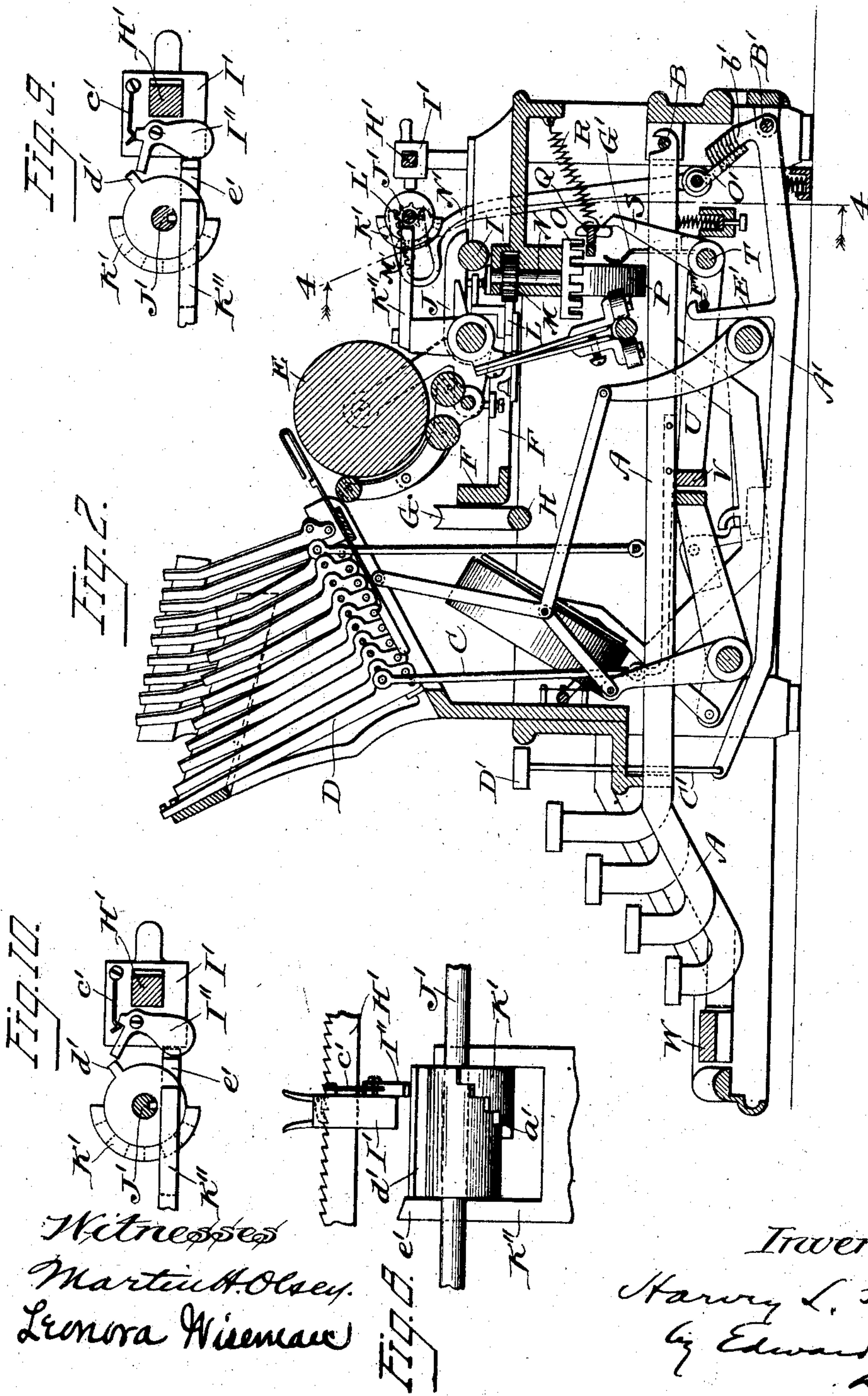


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4 SHEETS—SHEET 2.



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No. 874,058.

PATENTED DEC. 17, 1907.

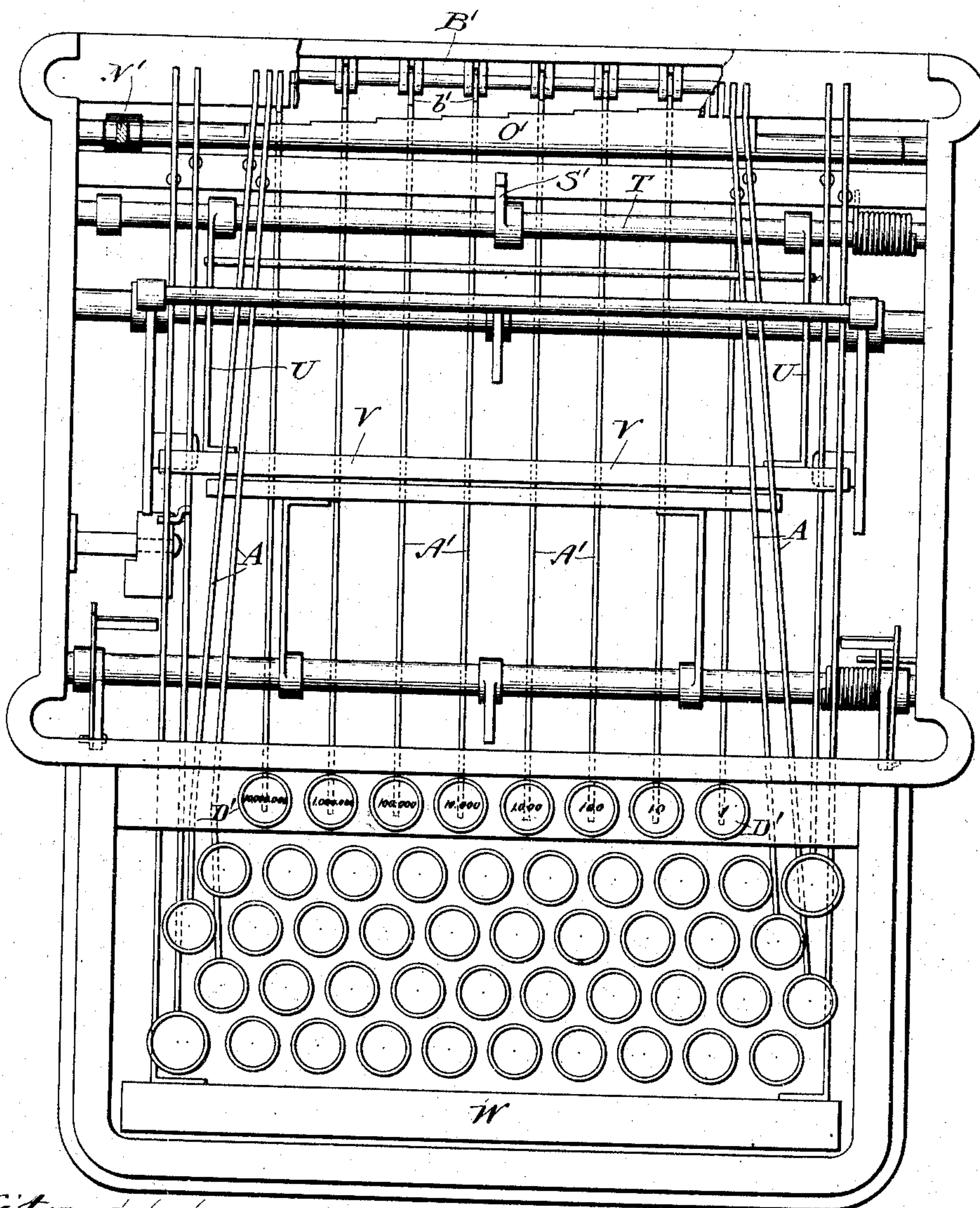
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4 SHEETS—SHEET 3.

*Fig. 3.*



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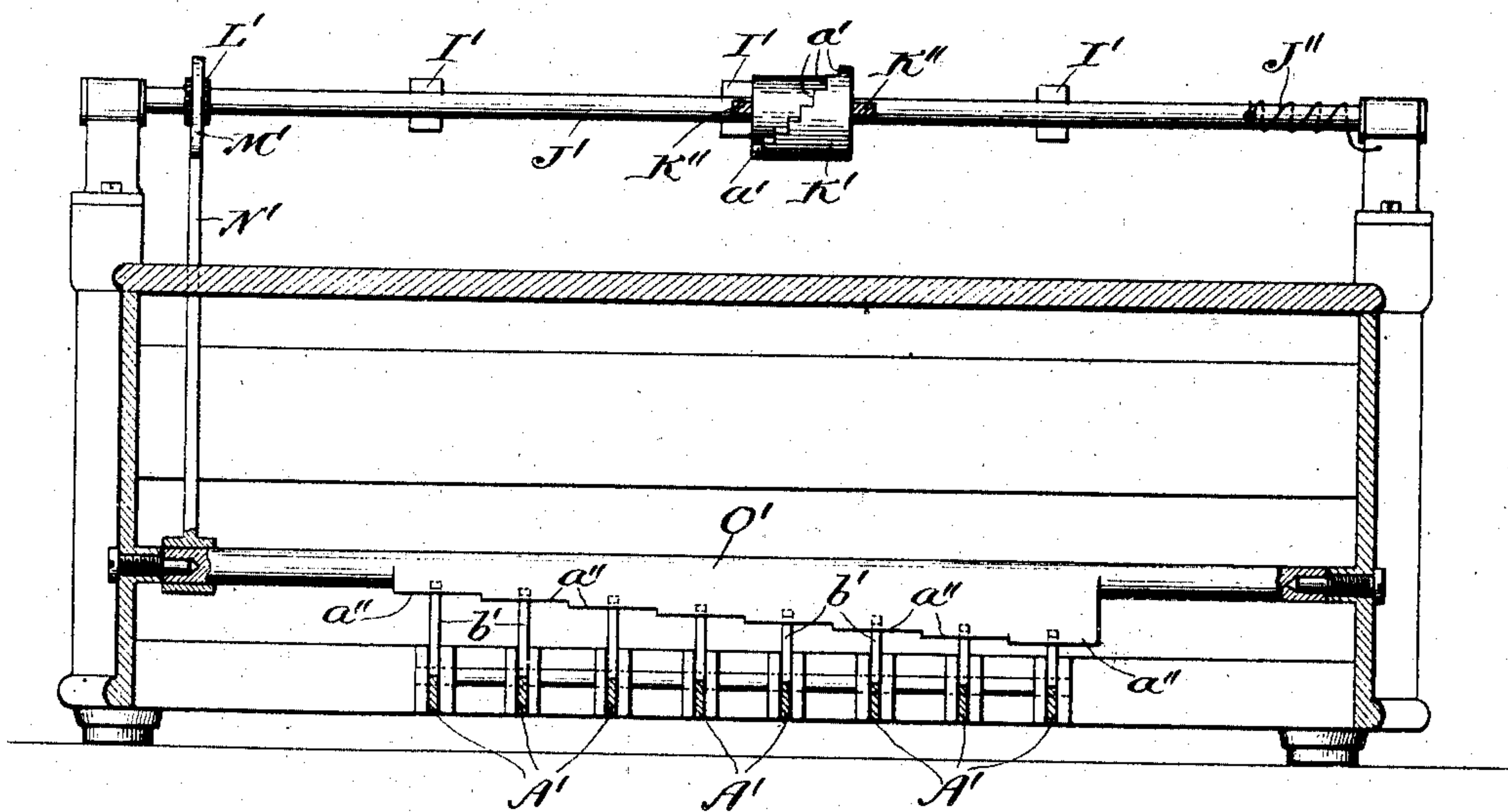
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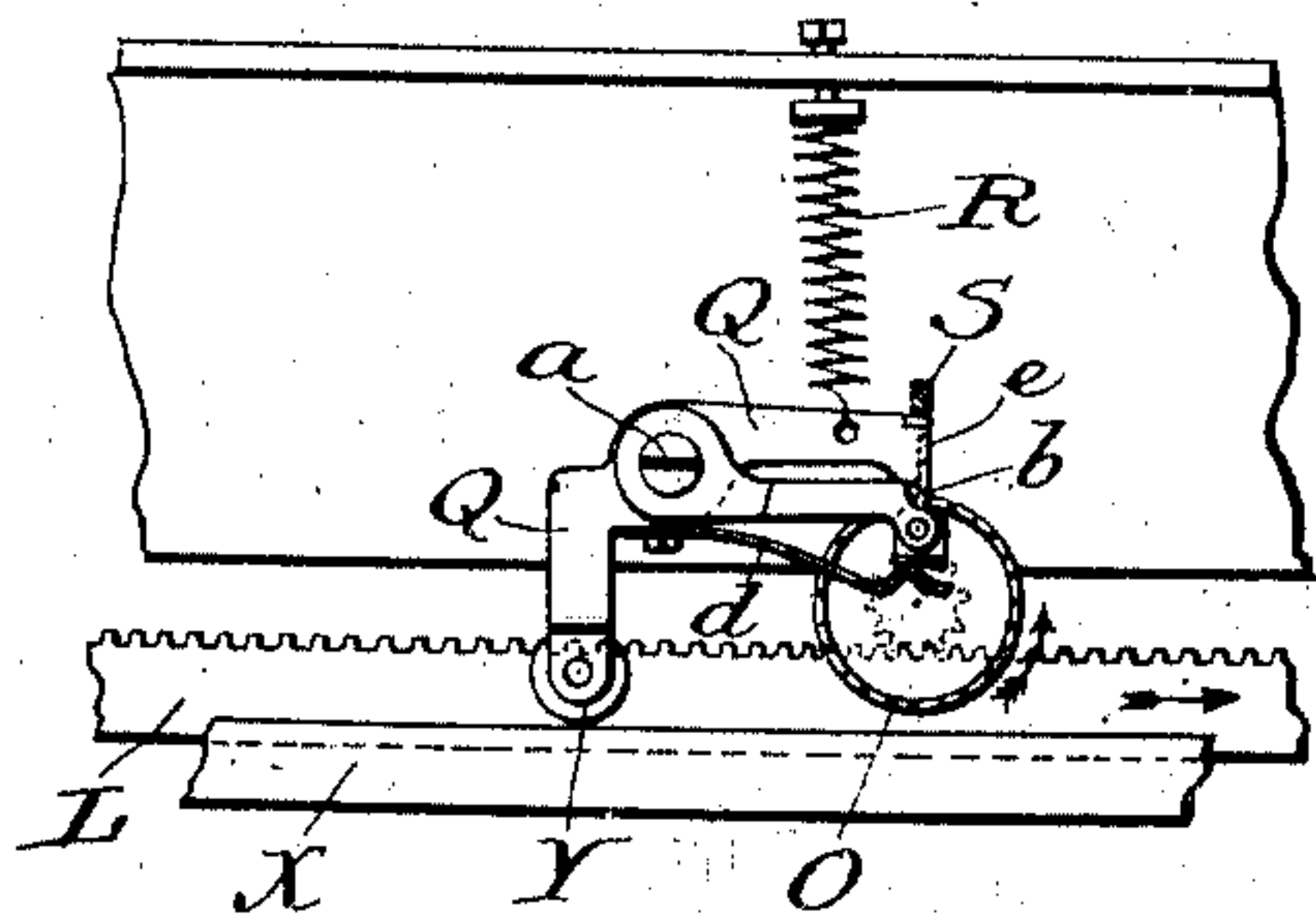
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4 SHEETS—SHEET 4.

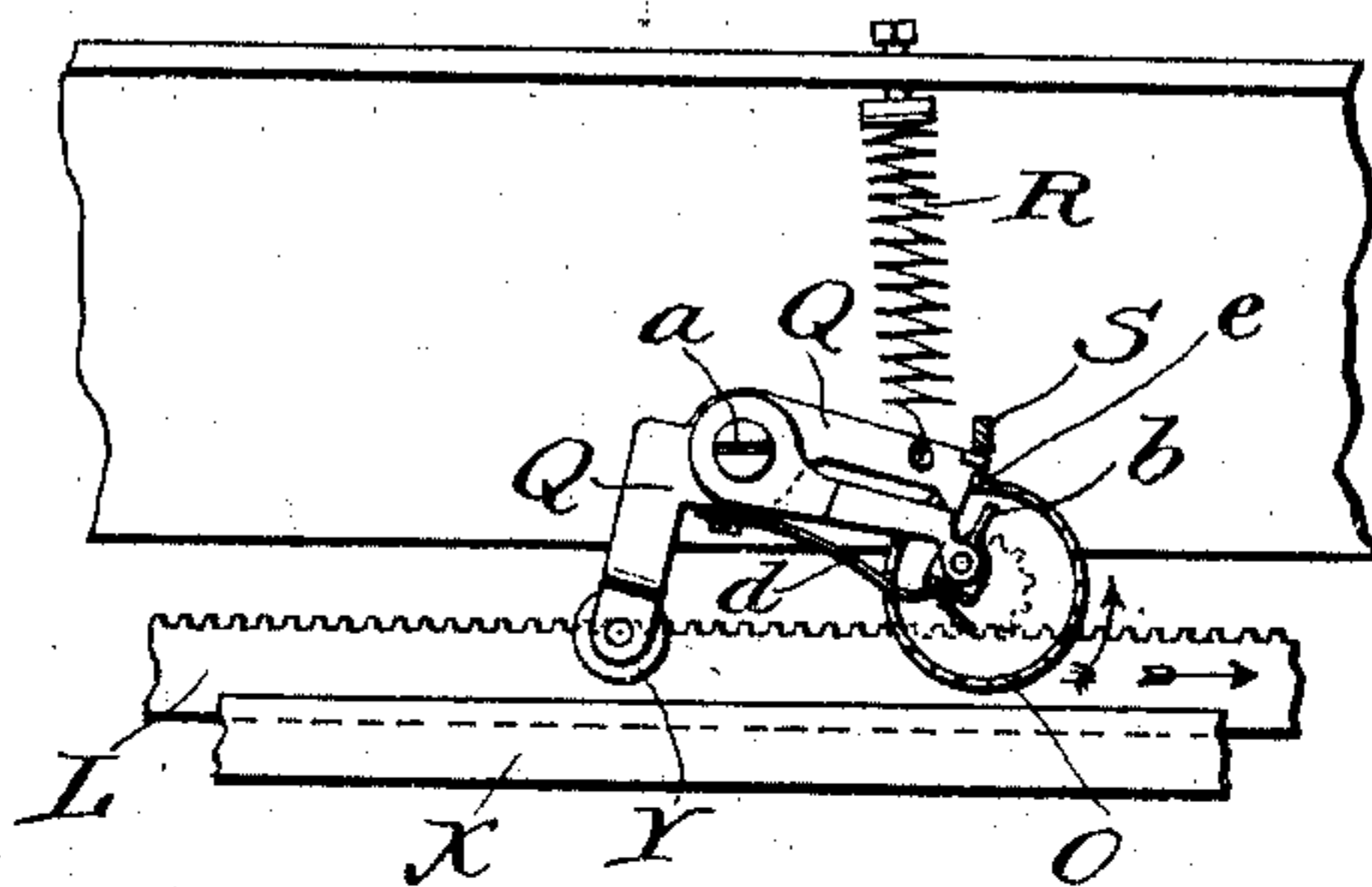
*Fig. 4.*



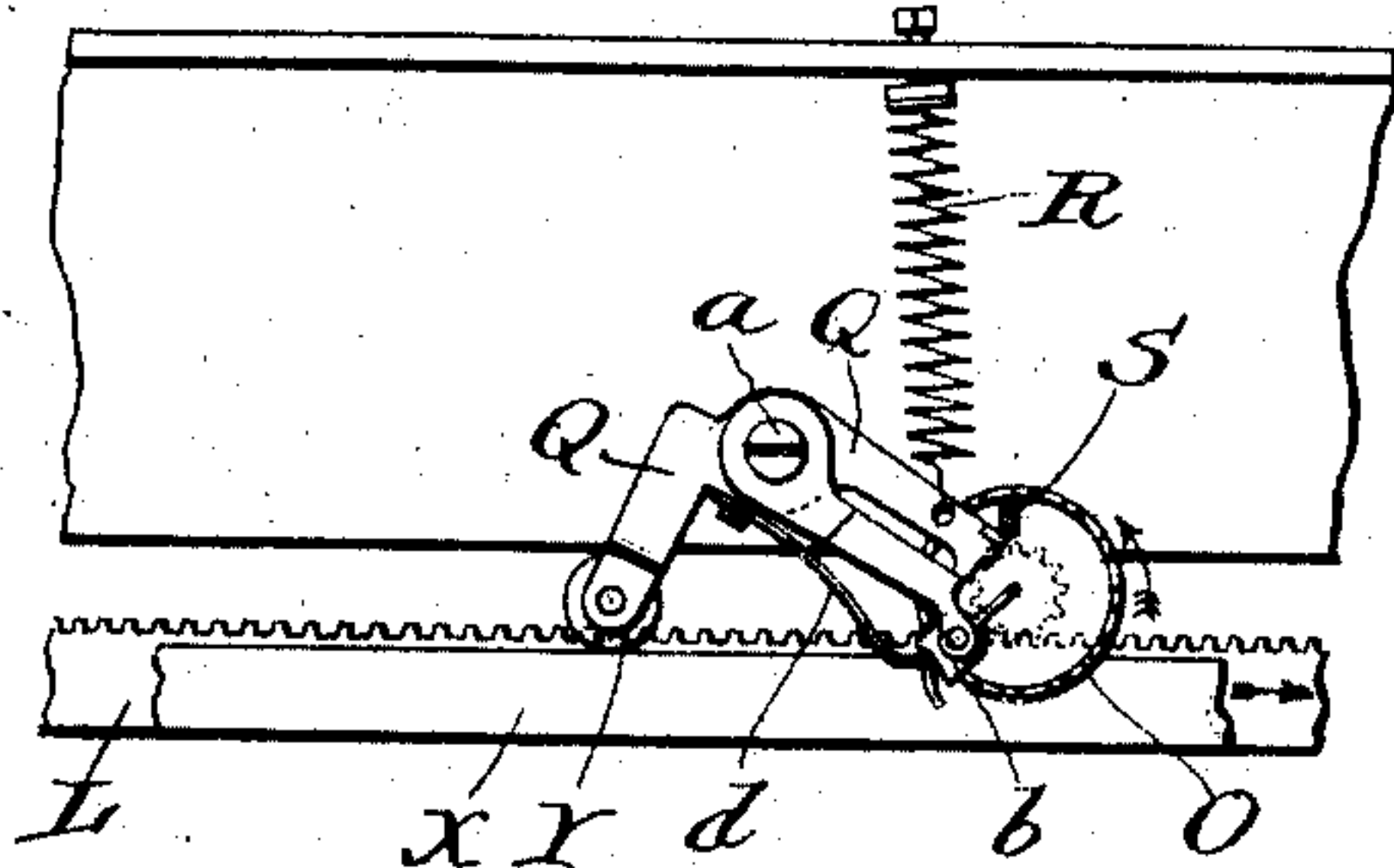
*Fig. 5.*



*Fig. 6.*



*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

HARVEY L. FISHER, OF CHICAGO, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO FISHER MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## TABULATOR FOR TYPE-WRITING MACHINES.

No. 874,058.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed June 23, 1899, Serial No. 721,551. Renewed April 8, 1903. Serial No. 151,680.

*To all whom it may concern:*

Be it known that I, HARVEY L. FISHER, a citizen of the United States of America, residing at Chicago, in the county of Cook, in the State of Illinois, have invented a certain new and useful Improvement in Tabulators for Type-Writing Machines, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to attachments for typewriting machines, commonly known as tabulators, whose purpose is to facilitate the listing of numbers, amounts, or other data, in proper order in vertical columns upon a sheet of paper, and it has for its object an improvement in devices of this character whose advantages over those now in use will be hereinafter pointed out in connection with an explanation of my invention by reference to the accompanying drawings, in which

Figure 1 is a top-plan view of a typewriting machine embodying my present invention; Fig. 2 a middle vertical section thereof; Fig. 3 a sectional plan-view beneath the type-bars and paper carriage, with all of the operating key-levers removed excepting two at each side of the machine, for the purpose of exposing the tabulator keys located beneath them and cooperating with the tabulating devices; Fig. 4 a vertical section approximately on the line 4—4 of Fig. 2; Figs. 5, 6, and 7 details of the escapement mechanism; and Figs. 8, 9, and 10 details of the stop mechanism.

The same letters of reference are used to indicate corresponding parts in all the views.

I have illustrated my invention in the present instance as adapted and applied to the typewriting machine shown and described in my pending application Serial Number 693,442, filed October 13, 1898, and it will be described with reference to such machine, although in its essential features it is applicable to a wide variety of typewriters.

The construction and operation of the machine illustrated in the drawings, excepting my present improvement, are fully described in my aforesaid pending application, and may be here briefly referred to.

A are the regular key-levers of the machine, fulcrumed at their rear ends at B and connected by rods or links C with their respective type-bars D whose type (not shown)

are adapted to strike upon the platen roller E mounted in the paper carriage F which is supported at its forward side by a roller G resting and traveling upon a transverse rod H, and at its rear side carries a rod I (secured to rearwardly extending arms J of the carriage) which rod rests and slides in suitable bearings K upon the framework of the machine, Fig. 1. At its rear side the paper carriage is provided with a rack-bar L which meshes with a pinion M fast upon a vertical shaft N, Fig. 2, which shaft has secured to its lower end an escapement wheel O, having vertically depending teeth. The paper carriage is pulled to the left by connection with a spring confined within a rotary barrel or casing P, as usual, and as it moves toward the left under the operations of the keys and pinion M and wheel O are turned in one direction, and when it is restored to right-hand position, preparatory to beginning a new line, they are turned in the opposite direction.

The escapement mechanism (which is the same as in my prior application but necessary to be explained here) cooperates with the toothed wheel O and is shown more particularly in Figs. 5, 6, and 7, which are detail bottom plan-views. As there shown the tension of the spring connected to the paper carriage is pulling the rack-bar L toward the right and tending to turn the escapement wheel O in the direction of the arrows. A bell-crank lever Q fulcrumed at *a* has pivoted to the extremity of one of its arms a short lever *b* widened out at one end and shaped at the other to form a tooth adapted to pass between the teeth of the escapement wheel O. A flat spring *d* secured at one end to the bell-crank lever Q and bearing at its opposite end against the wide end of the lever *b* tends to rock the latter to the position shown in Fig. 6, but when the opposite end of the lever is engaged with the escapement wheel O as in Fig. 5 the tendency of the latter to turn in the direction of the arrow overcomes the action of the spring *d* and holds the lever *b* in the position shown, with its toothed end abutting against a stop or shoulder upon the end of the bell-crank lever Q. A coiled spring R connected at one end to the framework and at its other to the bell-crank Q normally holds the parts in the position shown in Fig. 5. The bell-crank Q has



formed upon its upper surface a lug or tooth *e* (shown in dotted lines) which in the position of the parts shown in Fig. 5 is immediately adjacent and in line with the end of the lever *b*. If, now, the bell-crank lever be rocked to the position shown in Fig. 6 the end of the short lever *b* will be disengaged from the wheel *O* and rocked to the position shown in Fig. 6 by its spring *d*, but its place will be taken by the rigid tooth *e* upon the end of the bell-crank lever, as in Fig. 6, so that the wheel *O* cannot turn. When, now, the spring *R* is allowed to return the bell-crank lever to its normal position, Fig. 5, the rigid tooth *e* will be disengaged from the wheel *O* while the toothed end of the short lever *b* will pass outward through the next succeeding notch or space in the wheel *O*, Fig. 6, whereupon the force of the paper carriage spring, tending to turn said wheel in the direction of the arrow, will overcome the resistance offered by the spring *d* and swing the lever *b* back to the position shown in Fig. 5, thus permitting the escapement wheel to turn the distance of one tooth or space, and the paper carriage to advance a corresponding distance. In this manner and by these means at each rocking of the bell-crank lever from the position shown in Fig. 5 to that shown in Fig. 6, and return of it to the position shown in Fig. 5, the paper carriage will be advanced one unit of distance, or the space of one letter. The means for rocking the bell-crank lever from the position shown in Fig. 5 to that shown in Fig. 6 consist of an arm *S* whose upper end bears against the rear side of said lever (or a depending lug thereon Fig. 2), and whose lower end is fast upon a rock-shaft *T*, Figs. 2 and 3, which has secured to and projecting forwardly from its opposite ends two side arms *U* connected at their forward ends by a universal bar *V* underlying all of the key-levers *A* of the machine, as well as the side levers operated by the spacing bar *W* at the front of the machine, as explained in my aforesaid application. The depression of any one of the key levers *A* or of the spacing bar *W* serves to depress the universal bar *V* and throw the upper end of the arm *S* forward, thereby rocking the bell-crank lever *Q* from the position shown in Fig. 5 to that shown in Fig. 6, and upon then releasing the operated key-lever or spacing bar the spring *R* restores the bell-crank to normal position and permits the paper carriage to advance one space, as before explained.

If the bell-crank lever *Q* be rocked forward beyond its normal limit of movement (Fig. 6) to the position shown in Fig. 7, so that the rigid tooth *e* is carried inside the escapement wheel, and the lever *b* and tooth *e* both thereby disengaged from said wheel, it will be seen that there is nothing to hold the paper carriage from movement under the

stress of the spring connected to it, so that it may proceed freely to the left-hand limit of its movement unless otherwise arrested. In my aforesaid pending application means are illustrated and described for rocking the bell-crank lever *Q* to the position shown in Fig. 7 for the purpose of disengaging the escapement mechanism to permit the carriage to be shifted freely back and forth when desired without manipulation of any of the key-levers or spacing bar, said means consisting of a backwardly and forwardly movable bar *X*, Figs. 5, 6, and 7, adapted to cooperate with a roller *Y* carried by the up-turned end of the bell-crank lever *Q* opposite that which coöperates with the escapement wheel *O*. The bar *X* normally occupies the position shown in Figs. 5 and 6, but when moved backward to the position shown in Fig. 7, by means illustrated and described in said application but not necessary to be referred to here, it will engage the roller *Y* on the bell-crank lever and rock the latter to the position shown in Fig. 7, whereupon the paper carriage is free to be slid in either direction. For the purposes of my present invention, however, I provide means for rocking the bell-crank lever *Q* to the position shown in Fig. 7 without operating the bar *X* and for a different purpose from that for which the bar *X* was provided. Such means consists in the present instance of the tabulator key-levers *A'* forming part of my novel tabulating attachment, which key-levers are fulcrumed at their rear ends at *B'*, Figs. 2 and 3, and at their forward ends have connected to them the lower ends of vertical rods or stems *C'* carrying at their upper ends the finger-buttons *D'* indicating the denominational value of each lever. Each of the levers *A'* is provided with an upwardly extending hooked arm *E'* adapted to engage a cross-rod *F'* connecting the side-arms *U* of the universal bar *V* which operates the escapement mechanism as heretofore described, and the adjustment of the parts is such that whenever any one of the tabulator levers *A'* is depressed to its limit of movement its hooked arm *E'* will swing the frame *U U V* downward a considerable distance further than it is depressed by the normal operations of the regular type levers *A*, with the result that the upper end of the arm *S* will be thrown forward beyond its normal limit of movement and carry the bell-crank lever *Q* to the position shown in Fig. 7, so that the paper carriage will be entirely released and be free to be drawn to the left by its spring for the purpose hereafter explained. For the purpose of preventing the paper carriage being drawn too suddenly and violently toward the left, however, I provide a brake device operated by the tabulator key-levers *A'* and consisting of a friction spring *G'*, Fig. 2, fastened at its lower end to the rock-shaft



T and bearing at its upper end against the rear side of the rotary spring barrel or casing P. When the shaft T is rocked forward by the operation of any one of the key-levers A' the upper end of the spring G' will be forced against the rear face of the spring barrel and prevent too rapid rotation of it under the action of the spring.

Secured in suitable supports upon the upper rear part of the framework, Figs. 1 and 2, is a transversely extending bar II', which may be called for convenience the "stop-bar" as it carries a number of adjustable stops I'. The bar II' is provided upon its rear side with ratchet teeth facing to the right and the stops I' are provided with spring catches or detents of any suitable construction to engage such teeth and lock the stops against movement toward the left without first disengaging such catches or detents. In the present instance the bar II' is shown provided with three of the stops I', which makes provision for tabulating in three vertical columns in any desired position upon the sheet of paper, according to the adjustment of the stops. The particular form of stops I' is not material to the broader scope of my invention, although the special construction illustrated in detail in Figs. 8, 9 and 10, and hereinafter described, or some equivalent construction, forms a subordinate but very important feature of my new tabulator.

Journaled at its opposite ends in suitable supports upon the framework, immediately in front of and parallel with the stop-bar II', is a rock-shaft J' upon which is mounted a graduated contact-piece K', in the present instance in the form of a section of a cylinder provided upon its left hand end or edge with a series of graduated steps or shoulders a' arranged in regular retreating order from left to right and front to rear, Fig. 4. These steps or shoulders a' correspond in number to the tabulator key-levers A' and are adapted to coöperate with the stops I' in the manner hereafter explained. The contact-piece K' is so mounted upon the rock-shaft J' as to turn with the latter, while free to slide longitudinally upon it, as by means of a longitudinal groove in the rock-shaft and a projection upon the contact-piece engaging said groove, or otherwise. Projecting from the rear side of the paper carriage F is a yoke or pair of arms K'' embracing or engaging the hub of the member K' in such a way as to cause the latter to move transversely of the machine with the paper carriage, and be slid back and forth along the rock-shaft J' as the paper carriage is moved in one direction or the other. The normal position of the rock-shaft J' is such that the contact-piece K' is held in the forward position shown in Figs. 1, 2, and 4, in which position the front end of the stops I' stand to the rear

of the transverse line of movement of the member K', Fig. 1, so that the paper carriage is free to be moved in either direction without regard to the stops I'. When, however, the shaft J' is turned rearward a greater or less distance the contact-piece K' will be projected into line with the front ends of the stops I', so that if the paper carriage be moved toward the left, with the piece K' in such position, the latter will come in contact with the first stop I' which stands in its path, and arrest the paper carriage. Now, by the means hereafter described, the several tabulator key-levers A' are arranged to coöperate with the rock-shaft J' in such manner as to turn the latter different degrees of distance according to the denominational values of such key-lever, with the result that when any given lever is operated the contact-piece K' will be turned to a point to bring the corresponding one of its steps or shoulders a' into line with the stops I'. It will be seen that when the contact-piece K' is turned rearward only far enough to bring its upper or rearmost step a' into line with the stops I' the paper carriage will be permitted a maximum movement to the left before it will be arrested by the contact of the piece K' with the first stop I' which stands in its path; while when it is turned rearward a greater distance, by the operation of some other key-lever A', another one of its steps a' at the left or in advance of its rearmost step will be brought into line with the stops I', with the result that the paper carriage will be arrested at an earlier point in its movement toward the left. There are in the present instance, as shown in Fig. 1 and 3, eight tabulator key-levers A', which may be taken to represent different denominations of value from units to tens of millions, or, where decimal amounts are being tabulated, units of cents to hundreds of thousands of dollars, respectively, reading in regular order from right to left; and the contact-piece K' is provided with eight steps or shoulders a' corresponding in relative position or order with the eight tabulator keys.

As will be understood from the foregoing explanation, whenever any one of the tabulator keys is operated the graduated contact-piece K' will be so turned as to bring its corresponding step or shoulder a' into line with the stops I', thus adjusting said contact-piece to proper denominational position, and inasmuch as the operation of such tabulator key will also serve (in the manner and by the means heretofore explained) to disengage the escapement mechanism and release the paper carriage, the result will be that the latter will be drawn to the left by its spring until it is arrested by contact of the member K' with one of the stops I', and as the contact point of the member K' with the first stop I' in its path will be the particular step or shoulder



$a'$  which corresponds to the particular tabulator key which has been operated the paper carriage will be arrested at a point for the printing to be effected in the denominational column of figures corresponding to the denomination of the tabulator key which has been operated. Thus, when the units tabulator key is operated the paper carriage will be released and drawn to the left by its spring and arrested by the first stop  $I'$  standing in the path of the member  $K'$ , at a point for the printing to be effected in the units column; if the second or tens tabulator key be the one operated the paper carriage will be arrested at one step or space earlier in its movement toward the left, in position for printing in the tens column; and so on throughout the series.

It remains now to describe the means which I have in the present instance provided for giving the contact-piece  $K'$  its different degrees of movement proportionate to the denominational values of the several tabulator keys. Any suitable means intermediate the tabulator keys and said contact-piece may be employed for this purpose, without departing from my invention, but the particular means illustrated in the drawings is as follows: Fast upon the rock-shaft  $J'$  near its left hand end is a pinion  $L'$  with which meshes a curved rack  $M'$  carried by the upper end of an arm  $N'$  whose lower end is secured to or formed integral with a pivoted frame  $O'$ , Figs. 1, 2 and 4. This frame  $O'$  is supported at its opposite ends by bearings upon the framework, and the lower edge of its depending portion (which is shown in the form of a flat plate) is provided with a series of steps or graduations  $a''$ , one in line with and adapted to cooperate with each of the tabulator key-levers  $A'$ . The levers  $A'$  are provided at their rear ends with upwardly and forwardly projecting arms or fingers  $b'$  of graduated lengths and adapted to engage the rear side of the pivoted frame  $O'$  near its lower edge and opposite its several steps or graduations  $a''$ . Owing to the different lengths of these arms  $b'$  of the key levers  $A'$ , and their engagement with the pivoted frame  $O'$  at different distances from the pivotal axis of the latter, it follows that the operations of the different levers will impart different degrees of movement to the frame  $O'$  and consequently, through the medium of the arm  $N'$  rack  $M'$  and pinion  $L'$ , to the rock-shaft  $J'$  and contact-piece  $K'$ , and the adjustment of the parts is such that by this means the operation of any tabulator key will serve to set the piece  $K'$  to position for its corresponding step or shoulder to contact with the first stop  $I'$  which stands in its path of movement.

As shown in Fig. 2, the upper ends of the fingers  $b'$  of the levers  $A'$  are curved concentrically with the pivotal axis of the levers

$A'$  and are of such width that after they have swung the frame  $O'$  forward the proper distance they will pass under its lower edge but still remain in engagement with it and prevent its return in advance of the key lever. In this manner the key levers  $A'$  are caused to impart the desired movement to the frame  $O'$  (and consequently to the rock-shaft  $J'$  and contact-piece  $K'$ ) at the beginning of their own movement and to hold the contact-piece in adjusted position while they complete their movement, their further movement serving to depress the universal bar  $V$  far enough to release the paper carriage and apply the brake-spring to the spring casing as before explained. The contact-piece  $K'$  is thus set or adjusted for engagement with the stops  $I'$ , by the operation of the tabulator key, before the paper carriage is released and permitted to move, and is maintained in such adjusted position until the carriage is released and completes its movement and is arrested by contact of the member  $K'$  with the first stop  $I'$  in its path, whereupon, on the release of the operated tabulator key, the member  $K'$  will be returned to normal position by the action of a spring  $J''$  applied to the rock-shaft  $J'$ , Fig. 4.

Instead of employing a series of tabulator keys for setting the contact-piece, other means for turning the rock-shaft  $J'$  may be substituted and many of the advantages of my invention retained; and even where the tabulator keys are employed for adjusting the contact-piece they need not also perform the function of releasing the paper carriage, since independent means (as, for instance, a special key or handle connected to the universal bar  $V$ ) may be employed for the purpose.

The construction and arrangement of the parts above described constitute a complete tabulating attachment for type-writing machines superior in some respects to any tabulating attachment with which I am familiar, but a further feature of my invention, to be now described, greatly increases the convenience and facility of its use, and adds much to its value.

Under the construction which has been described if the paper carriage be set, by the operation of the fourth or thousands key, for instance, to print in the fourth or thousands column of figures (in any given column of numbers upon the page) it would be necessary to either print four figures or ciphers in such column of numbers, or to advance the paper carriage four steps in some manner, (as by the aid of the spacing bar  $W$ ), in order to carry the contact-piece  $K'$  entirely to the left of the stop  $I'$  by which it was last engaged, before operating another tabulator key to advance the paper carriage to the next succeeding column of numbers, since unless the contact-piece  $K'$  be thus carried



past and clear of the stop I' before another tabulator key is operated the operation of such second key would throw the member K' around into contact with the stop I' with which it had just been engaged, with the result that the paper carriage would not be released and advanced to the next stop as desired. In operating the machine under such construction, therefore, it would be necessary, after operating a given tabulator key and setting the paper carriage for printing in a given column of numbers, to make sure that the paper carriage had been spaced beyond the units column in such column of numbers (either by the necessary operations of the type key levers or by additional operation of the spacing bar,) before the tabulator key for advancing the paper carriage to the next stop, for the succeeding column of numbers, was operated. This would constitute an inconvenience in the operation of the tabulating attachment, but it is an inconvenience which is present in all tabulating attachments now in use, so far as I am aware. I have overcome the difficulty in my new attachment, however, and provided means whereby the only thing necessary in operation is to strike the proper tabulator key and thereby advance the paper carriage to the first stop, for the first column of numbers; then operate the necessary type levers to print the desired figures in such column of numbers (whether extending to the units column of figures or not); and then strike the proper tabulator key for advancing the paper carriage to the next stop, whereupon the carriage will be released and at once advanced to said stop and arrested at the proper point for printing in the desired column of figures, without any further manipulation. I accomplish this result in the present instance by the means illustrated in Figs. 8, 9, and 10 (Sheet 2), where, instead of the contact-piece K' being arranged to contact directly with the integral body of the stops I' the latter are provided with pivoted stop-pieces I'' pivoted to the sides of the stops I' and engaged by spring-latches c'. In the present instance each of these stop-pieces I'' is in the form of a bell-crank lever, having a weighted lower end which normally holds its upper arm in horizontal position and projected forward of the body of the stop I', Fig. 9. In this position of the stop-piece I'' its forwardly projecting arm is in position for co-operation with the graduated contact-piece K', and co-operates with it, to arrest the paper carriage, in the same manner as would a rigid projection upon the stop I', and as heretofore explained. The hub of the stop-piece K' is provided upon its side opposite the graduated stop-piece with a rib d' whose function is to throw the pivoted stop-piece I'' out of operative position after the paper carriage has been arrested by the engagement of

the contact-piece K' with the horizontal arm of the stop-piece I''.

When the stop-piece I'' is in normal position, Fig. 9, and the contact-piece K' (which is then at the right of the stop) is turned rearward to adjust it for engagement with the stop, the rib d' will be moved downward and forward below the horizontal plane of the forwardly projecting arm of the stop-piece I'', so that when the paper carriage and contact-piece K' move to the left the end of the rib d' will pass freely by the stop-piece I'', and when the paper carriage is arrested by contact of one of the steps or shoulders of the member K' with the projecting arm of the stop-piece I'', the rib d' will be beneath such projecting arm of the stop-piece I''. When the tabulator key is then released and the contact-piece K' returned to normal position, as heretofore explained, the rib d' will contact with the horizontal arm of the stop-piece I'', as the rib moves upward to normal position, and swing said stop-piece to the position shown in Fig. 10, in which position it will be engaged and held by the spring-latch c'. In such position the stop-piece I' is entirely out of the path of movement of the rib d' and contact-piece K' under any of their positions of adjustment, so that the stop-piece I' is out of coöperative relation with the contact-piece K'. Under such conditions, if a second tabulator key be operated while the contact-piece K' remains immediately in front of the stop by which it has been last arrested, the result will simply be that said contact-piece will be swung rearward to proper adjusted position for contact with the next stop in the series, and the paper carriage will be released and immediately move to the left until arrested in proper position by such succeeding stop. In Fig. 8, for instance, it may be assumed that as there shown the paper carriage was arrested in position to print in the fourth or thousands column of figures, by contact of the fourth shoulder or step of the contact-piece K' with the pivoted stop-piece I'', and that after being so arrested and the contact-piece K' returned to normal position three figures have been printed in the given column of numbers, in the thousands, hundreds, and tens columns of figures therein. The paper carriage will therefore have been advanced three spaces, but the contact-piece K' will not have been carried to the left out of line with the stop by which it was arrested. On the contrary, it remains in such position that if the coöperating stop were a rigid one it would be engaged by the upper or units shoulder upon the contact-piece K' if the latter were swung rearward by the operation of any tabulator key, and the result would be that the paper carriage would become locked against this same stop, instead of being advanced to the next stop. By the employ-



ment of the pivoted stop-piece I'', which in Fig. 8 has been swung out of operative position by the original return movement of the contact-piece K' to normal position, this difficulty is overcome, and the possibility of the paper carriage becoming relocked or arrested by the same stop, upon the operation of a second tabulator key, is removed.

When the paper carriage is moved to the right to initial position all of the stop-pieces I'' are disengaged from their latches c' and returned to operative position by the rearwardly extended end e' of the left-hand arm of the yoke K'', Fig. 8, which is beveled as shown to ride over the forward sides of the lower ends of the stop-pieces I'', Fig. 10, and force them back to the position shown in Fig. 9.

As will be readily understood, it results from the provision above described that the simple operation of any tabulator key will advance the paper carriage from one stop to the next, without the necessity for any other manipulation, so that the entire operation of tabulating consists simply in striking the proper tabulator key for the first column of numbers; then striking the necessary type-levers to do the desired printing in such column; then striking the proper tabulator key for the next column of numbers, and following it with the operation of the necessary type-levers for printing the desired figures in such second column; and so on, no matter how many stops may be employed and how many different columns of numbers may be printed.

While I have necessarily illustrated and described a specific construction and arrangement of parts accomplishing this result, I believe I am the first in the art to accomplish it in any manner and by any means whatsoever, and my invention is therefore not restricted in this respect to any particular details of construction and arrangement.

In the only tabulating attachment for typewriting machines which is now in practical use, so far as I am aware, the several stops corresponding to the different columns of numbers are located upon the paper carriage and move with it, and the paper carriage is arrested at different denominations in the several columns by projecting into the path of its stops the ends of the tabulator keys themselves (or extensions of their rear ends) which are grouped together at the rear side of the machine. One objection to this construction and operation is the fact that the right hand tabulator key in the series must necessarily represent the denomination of highest value in the series, since its operation will necessarily serve to arrest the paper carriage at an earlier point in its movement than will the operation of any succeeding keys at its left. Owing to this fact the tabulator keys are necessarily located in the re-

verse of their natural order, the units key being the left-hand key in the series and the key representing the highest denomination being the right hand key in the series. Inasmuch as the natural and ordinary arrangement of numbers indicating denominations of value is in increasing order from right to left, the reverse arrangement above explained is objectionable and confusing. Another and more serious objection to the last mentioned tabulating attachment, is the fact that if a second tabulator key of lower denominational value is operated without advancing the paper carriage beyond the column of figures represented by such denomination the operation of such second key will project its end or extension either into contact with or into the path of the stop on the paper carriage which has just been engaged with some tabulator key at the right of the one just mentioned, with the result of preventing the carriage from being advanced to position for the next succeeding column of figures.

Both of the foregoing objections to the tabulating attachments now in use are overcome in my novel attachment, in which the tabulator keys are not only arranged in their natural and regular order, and consequent confusion prevented, but no manipulation whatever is required in its operation except the successive operation of the proper tabulator keys to set the paper carriage and the proper type keys to effect the printing.

Having thus described my invention, I claim:

1. In a tabulating attachment for typewriting machines, the combination of a stop, a rock-shaft extending transversely of the machine, a contact-piece mounted upon said shaft to turn with it but movable longitudinally thereof with the paper carriage, and means for turning said shaft different degrees to adjust the contact-piece to different positions for engagement with the stop, substantially as described.

2. In a tabulating attachment for typewriting machines, the combination of a plurality of stops located on the frame of the machine, a rock-shaft extending transversely thereof adjacent said stops, a contact-piece mounted upon said rock-shaft to turn with the same but movable longitudinally thereof with the paper carriage, and means for turning said shaft different degrees to adjust the contact-piece to different positions for engagement with the stops, substantially as described.

3. In a tabulating attachment for typewriting machines, the combination of a stop, an adjustable contact-piece moving with the paper carriage and adapted to cooperate with said stop, and a series of tabulator keys cooperating with such contact piece to adjust the same to different positions for engage-



ment with said stop, substantially as described.

4. In a tabulating attachment for type-writing machines, the combination of a plurality of stops, an adjustable contact piece moving with the paper carriage and adapted to cooperate successively with said stops, and a series of tabulator keys cooperating with said contact-piece to adjust the same to different positions for engagement with said stops, substantially as described.

5. In a tabulating attachment for type-writing machines, the combination of a plurality of stops located on the frame of the machine and adjustable transversely thereof, a graduated contact-piece moving with the paper carriage and adapted to cooperate successively with said stops, and a series of tabulator keys cooperating with said contact-piece to set the same to different positions for engagement with said stops, substantially as described.

6. In a tabulating attachment for type-writing machines, the combination of a stop, a rock-shaft extending transversely of the machine, a graduated contact-piece mounted upon said shaft to turn with the same but movable longitudinally thereof with the paper carriage, and a series of tabulator keys cooperating with said rock-shaft to turn it and the contact-piece to different positions, substantially as described.

7. In a tabulating attachment for type-writing machines, the combination of a plurality of stops, a rock-shaft extending transversely of the machine, a graduated contact-piece mounted upon said rock-shaft to turn with the same but movable longitudinally thereof with the paper carriage, and a series of tabulator keys cooperating with the rock-shaft to turn the same different degrees to set the contact-piece for engagement with the stops, substantially as described.

8. In a tabulating attachment for type-writing machines, the combination of a rock-shaft extending transversely of the machine, a graduated contact-piece mounted thereon to turn with the same but movable longitudinally thereof with the paper carriage, a movable frame geared to said rock-shaft, a series of tabulator keys cooperating with said frame to impart different degrees of movement to it and consequently to the rock-shaft and contact-piece, and a relatively fixed stop adapted to cooperate with such contact-piece, substantially as described.

9. In a tabulating attachment for type-writing machines, the combination of a rock-shaft extending transversely of the machine, a graduated contact-piece mounted thereon to turn with the same but movable longitudinally thereof with the paper carriage, a movable frame geared to said rock-shaft, a series of tabulator keys cooperating with said frame to impart through it different de-

grees of movement to the rock-shaft and contact-piece, and a relatively fixed stop adapted to cooperate with said contact piece, substantially as described.

10. In a tabulating attachment for type-writing machines, the combination of the stop-bar II', the transversely adjustable stops I' mounted thereon, the rock-shaft J', the graduated contact-piece K' splined thereon and movable longitudinally thereof with the paper carriage, the pinion L' fast upon said rock-shaft, the frame O' having the arm N' carrying the rack M' meshing with the pinion L', and the tabulator key-levers A' cooperating with the frame O', substantially as described.

11. In a tabulating attachment for type-writing machines, the combination of the stop-bar II', the transversely adjustable stops I' mounted thereon, the rock-shaft J', the graduated contact-piece K' splined thereon and movable longitudinally thereof with the paper carriage, the pinion L' fast upon said rock-shaft, the graduated pivoted frame O' having the arm N' carrying the rack M' meshing with the pinion L', and the tabulator key levers A' provided with the fingers b' cooperating with the steps or graduations a'' of the frame O', substantially as described.

12. In a tabulating attachment for type-writing machines, the combination of a stop, an adjustable contact-piece moving with the paper carriage and adapted to cooperate with said stop, and means for adjusting said contact-piece to different denominational positions and releasing the paper carriage by a single operation, substantially as described.

13. In a tabulating attachment for type-writing machines, the combination of a plurality of stops, an adjustable contact piece moving with the paper carriage and adapted to cooperate successively with said stops, and means for adjusting said contact-piece to different denominational positions and releasing the paper carriage by a single operation, substantially as described.

14. In a tabulating attachment for type-writing machines, the combination, with the fixed frame of the machine and the transversely movable paper-carriage, of stop devices embodying a graduated contact-piece moving with the paper-carriage and a suitable stop cooperating therewith to arrest the paper-carriage at different denominational positions, and a plurality of tabulator keys cooperating with said stop devices and with the escapement mechanism of the machine for releasing the paper-carriage and arresting it at the desired denominational position, substantially as described.

15. In a tabulating attachment for type-writing machines, the combination, with the fixed frame of the machine and the transversely movable paper-carriage, of stop de-



vices embodying a graduated contact-piece moving with the paper-carriage and a plurality of stops cooperating therewith to arrest the paper-carriage at different denominational positions in successive columns, and a plurality of tabulator keys cooperating with said stop devices and with the escapement mechanism of the machine for releasing the paper-carriage and arresting it at the desired denominational position in the successive columns, substantially as described.

16. In a tabulating attachment for typewriting machines, the combination, with the fixed frame of the machine and the transversely movable paper-carriage, of stop devices embodying a contact-piece moving with the paper-carriage and a plurality of stops adjustable transversely of the machine and cooperating with said contact-piece to arrest the paper-carriage at different denominational positions in successive columns whose positions are determined by the transverse adjustment of said stops, and a plurality of tabulator keys cooperating with said stop devices and with the escapement mechanism of the machine for releasing the paper-carriage and arresting it at the desired denominational position in the successive columns, substantially as described.

17. In a tabulating attachment for typewriting machines, the combination of a stop, an adjustable contact-piece moving with the paper carriage and adapted to cooperate with said stop, and a series of tabulator keys cooperating with said contact piece and with the escapement mechanism of the machine, to set said contact piece for engagement with the stop and to release the paper carriage, substantially as described.

18. In a tabulating attachment for typewriting machines, the combination of a plurality of stops, an adjustable contact piece moving with the paper carriage and adapted to cooperate successively with said stops, and a series of tabulator keys cooperating with said contact-piece and with the escapement mechanism of the machine, to set said contact piece for engagement with the stops and to release the paper carriage, substantially as described.

19. In a tabulating attachment for typewriting machines, the combination of a plurality of stops located on the frame of the machine and adjustable transversely thereof, a graduated contact-piece moving with the paper carriage and adapted to cooperate successively with said stops, and a series of tabulator keys cooperating with said contact-piece and with the escapement mechanism of the machine, to set said contact-piece for engagement with the stops and to release the paper carriage, substantially as described.

20. In a tabulating attachment for typewriting machines, the combination, with the

fixed frame of the machine and the transversely movable paper-carriage, of a rock-shaft, stop-devices controlled by said rock-shaft for arresting the paper-carriage at different denominational positions, and means cooperating with said rock-shaft and with the escapement mechanism of the machine for releasing the paper-carriage and turning said rock-shaft to adjust said stop devices to arrest the paper-carriage at the desired denominational position, substantially as described.

21. In a tabulating attachment for typewriting machines, the combination of a stop, a rock-shaft extending transversely of the machine, a graduated contact-piece mounted upon said shaft to turn with the same but movable longitudinally thereof with the paper carriage, and means for turning the rock-shaft to adjust the contact-piece for engagement with the stop and for releasing the paper carriage, substantially as described.

22. In a tabulating attachment for typewriting machines, the combination of a plurality of stops, a rock-shaft extending transversely of the machine adjacent said stops, a graduated contact-piece mounted upon said shaft to turn with the same but movable longitudinally thereof with the paper carriage, and means for turning the rock-shaft different degrees to adjust the contact piece for engagement with the stops, and for releasing the paper carriage, substantially as described.

23. In a tabulating attachment for typewriting machines, the combination, with the fixed frame of the machine and the transversely movable paper-carriage, of stop devices cooperating with the paper-carriage to arrest the same at different denominational positions, a rock-shaft controlling the adjustment of said stop devices, and a plurality of tabulator keys cooperating with said rock-shaft and with the escapement mechanism of the machine for releasing the paper-carriage and adjusting the stop devices to arrest it at the desired denominational position, substantially as described.

24. In a tabulating attachment for typewriting machines, the combination, with the fixed frame of the machine and the transversely movable paper-carriage, of stop devices embodying a graduated contact-piece moving with the paper-carriage and a suitable stop cooperating therewith to arrest the same at different denominational positions, a rock-shaft controlling the adjustment of said stop devices, and a plurality of tabulator keys cooperating with said rock-shaft and with the escapement mechanism of the machine for releasing the paper-carriage and adjusting the stop devices to arrest it at the desired denominational position, substantially as described.

25. In a tabulating attachment for type-



writing machines, the combination, with the fixed frame of the machine and the transversely movable paper-carriage, of stop devices embodying a graduated contact-piece moving with the paper-carriage and a plurality of stops cooperating therewith to arrest the paper-carriage at different denominational positions in successive columns, a rock-shaft controlling the adjustment of said stop devices, and a plurality of tabulator keys cooperating with said rock-shaft and with the escapement mechanism of the machine for releasing the paper-carriage and arresting it at the desired denominational position in the successive columns, substantially as described.

26. In a tabulating attachment for type-writing machines, the combination of a stop, a rock-shaft extending transversely of the machine, a graduated contact-piece mounted upon said shaft to turn with the same but movable longitudinally thereof with the paper carriage, and a series of tabulator keys cooperating with the rock-shaft and with the escapement mechanism of the machine, to turn the rock-shaft to set the contact-piece for engagement with the stop and to release the paper carriage, substantially as described.

27. In a tabulating attachment for type-writing machines, the combination of a plurality of stops, a rock-shaft extending transversely of the machine adjacent said stops, a graduated contact-piece mounted upon said shaft to turn with the same but movable longitudinally thereof with the paper carriage, and a series of tabulator keys cooperating with said rock-shaft and with the escapement mechanism of the machine, to turn the shaft to set the contact-piece for engagement with the stops and to release the paper carriage, substantially as described.

28. In a tabulating attachment for type-writing machines, the combination of a plurality of stops located on the frame of the machine and adjustable transversely thereof, a rock-shaft parallel with and adjacent to said series of stops, a graduated contact-piece mounted upon said rock-shaft to turn with the same but movable longitudinally thereof with the paper carriage, and a series of tabulator keys cooperating with the rock-shaft and with the escapement mechanism of the machine, to turn the shaft to set the contact-piece for engagement with the stops and to release the paper carriage, substantially as described.

29. In a tabulating attachment for type-writing machines, the combination, with the escapement mechanism of the machine and the universal bar or frame through the medium of which the regular type-key-levers of the machine operate such escapement mechanism to advance the paper carriage step by step, of a series of tabulator

keys cooperating with said universal bar and escapement mechanism for the purpose of entirely releasing the paper carriage through the medium of such universal bar whenever any one of such tabulator keys is operated, substantially as described.

30. In a tabulating attachment for type-writing machines, the combination, with the escapement mechanism of the machine and the universal bar or frame through the medium of which the regular type-key-levers of the machine operate such escapement mechanism to advance the paper carriage step by step, of a series of tabulator keys cooperating with said bar and escapement mechanism and operating to give such universal bar an abnormal degree of movement for the purpose of entirely disengaging the escapement mechanism from the paper carriage, substantially as described.

31. In a tabulating attachment for type-writing machines, the combination, with the escapement mechanism of the machine and the universal bar V through the medium of which the regular type-key levers A operate said escapement mechanism, of the tabulator key-levers A' cooperating with the bar V and operating to give the same a greater degree of movement than that normally given it by the type-levers A, for the purpose of entirely disengaging the escapement mechanism from the paper carriage, substantially as described.

32. In a tabulating attachment for type-writing machines, the combination, with the escapement mechanism of the machine and the universal frame U U V through the medium of which the type levers A operate said escapement mechanism, of the tabulator key levers A' provided with the hooked arms E' cooperating with the rod F' of said frame to disengage the escapement mechanism from the paper carriage, substantially as described.

33. In a tabulating attachment for type-writing machines, the combination of the stop-bar H', the transversely adjustable stops I' mounted thereon, the rock-shaft J', the graduated contact-piece K' splined thereon and movable longitudinally thereof with the paper carriage, the pinion L' fast upon said rock-shaft, the frame O' having the arm N' carrying the rack M' meshing with the pinion L', the escapement mechanism of the machine and the universal bar or frame for actuating the same, and the tabulator key-levers A' cooperating with the frame O' and with said universal bar or frame, substantially as described.

34. In a tabulating attachment for type-writing machines, the combination, with the paper-carriage, the escapement mechanism and the universal bar or frame for operating said mechanism, of a brake-device actuated by said universal frame and cooperating



with the paper-carriage, and a series of independent tabulator keys cooperating with said universal frame to operate the brake-device through the medium of said frame, substantially as described.

35. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, the escapement mechanism and the universal bar or frame for operating said mechanism, of a brake device actuated by said universal frame and engaging the casing or rotary barrel of the paper carriage spring and a series of independent tabulator keys cooperating with the universal frame to force the brake device against the spring barrel and release the paper carriage, substantially as described.

36. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, the escapement mechanism and the universal bar or frame for operating said mechanism, of a brake spring secured to said universal frame and bearing against the casing of the paper carriage spring, and a series of tabulator keys cooperating with said universal frame to force said brake spring against the spring casing and release the paper carriage, substantially as described.

37. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, of a stop for arresting the same, means for automatically throwing said stop out of cooperative relation with the paper carriage after the latter has been arrested by the stop, and means operated by the return movement of the carriage to restore the stop to its normal relation with the paper carriage, substantially as described.

38. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, of a plurality of stops for arresting it at different points, and means for automatically throwing each stop out of cooperative relation with the paper carriage after the latter has been arrested by such stop, to permit free movement of the carriage to the next succeeding stop, substantially as described.

39. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, of a plurality of stops for arresting it at different points, means for automatically throwing each stop out of cooperative relation with the paper carriage after the latter has been arrested by such stop, to permit free movement of the carriage to the next succeeding stop, and means operated by the return movement of the paper carriage to restore the stops to normal relation to the paper carriage, substantially as described.

40. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, of a stop normally standing in the path of said carriage, to arrest the same, and means for automatically with-

drawing said stop from the path of the carriage after the latter has been arrested by the stop, substantially as described.

41. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, of a stop normally standing in the path of said carriage, to arrest the same, means for automatically withdrawing said stop from the path of the carriage after the latter has been arrested by the stop, and means operated by the return movement of the carriage to restore the stop to its normal position, substantially as described.

42. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, of a stop normally standing in the path of said carriage, to arrest the same, means for automatically withdrawing the stop from the path of the carriage after the latter has been arrested by it, a latch for holding the stop in withdrawn position, and means operated by the return movement of the carriage to disengage the stop from the latch and restore it to normal position, substantially as described.

43. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, of a plurality of stops normally standing in the path of the paper carriage, to arrest the same at different points, and means for automatically withdrawing each of said stops from the path of the carriage after the latter has been arrested by it, substantially as described.

44. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, of a plurality of stops normally standing in the path of the paper carriage, to arrest the same at different points, means for automatically withdrawing each of said stops from the path of the carriage after the latter has been arrested by it, and means operated by the return movement of the paper carriage to restore the stops to normal position, substantially as described.

45. In a tabulating attachment for type-writing machines, the combination, with the paper carriage, of a plurality of stops normally standing in the path of said carriage, to successively arrest the same at different points, means for automatically withdrawing each stop from the path of the carriage after the latter has been arrested by it, a latch cooperating with each stop to hold it in withdrawn position, and means operated by the return movement of the carriage to disengage the stops from their latches to restore them to normal position, substantially as described.

46. In a tabulating attachment for type-writing machines, the combination, with the paper carriage and its escapement mechanism, of a plurality of stops for successively arresting the carriage at different points, and a series of tabulator keys cooperating with



the escapement mechanism and with the stops to release the paper carriage and advance it successively from one stop to another without the necessity for other manipulation, substantially as described.

47. In a tabulating attachment for type-writing machines, the combination, with the paper carriage and its escapement mechanism, of a plurality of tabulator keys cooperating with said mechanism to release the paper carriage, a plurality of stops for successively arresting the carriage at different points, and means for automatically throwing each stop out of cooperative relation with the paper carriage after the latter has been arrested by it, whereby the paper carriage may be advanced from one stop to another by operation of the tabulator keys, substantially as described.

48. In a tabulating attachment for type-writing machines, the combination, with the paper carriage and its escapement mechanism, of a series of tabulator keys cooperating with the escapement mechanism to release the paper carriage, a plurality of stops normally standing in the path of the paper carriage to successively arrest the same at different points, and means for automatically withdrawing each stop from the path of the paper carriage after the latter has been arrested by such stop, substantially as described.

49. In a tabulating attachment for type-writing machines, the combination, with the paper carriage and its escapement mechanism, of a series of tabulator keys cooperating with the escapement mechanism to release the paper carriage, a plurality of stops normally standing in the path of the paper carriage to successively arrest the same at different points, means for automatically withdrawing each stop from the path of the paper carriage after the latter has been arrested by such stop, and means operated by the return movement of the paper carriage to restore the stops to normal position, substantially as described.

50. In a tabulating attachment for type-writing machines, the combination of a stop, an adjustable contact-piece moving with the paper carriage and adapted to cooperate with said stop, means for adjusting said contact-piece to different positions for engagement with said stop, and means operated automatically by said contact-piece to throw the stop out of cooperative relation with said contact-piece after the latter has been engaged by the stop, substantially as described.

51. In a tabulating attachment for type-writing machines, the combination of a plurality of stops, an adjustable contact piece moving with the paper carriage and adapted to cooperate successively with said stops, means for adjusting said contact piece to different positions for engagement with said

stops, and means operated automatically by said contact-piece to throw each stop out of cooperative relation with said contact-piece after the latter has engaged the stop, substantially as described.

52. In a tabulating attachment for type-writing machines, the combination of a plurality of stops normally standing in the path of the paper carriage, an adjustable contact-piece moving with the paper carriage and adapted to cooperate successively with said stops, means for adjusting said contact-piece to different positions for engagement with said stops, and means for automatically withdrawing each of said stops from the path of the contact piece after the latter has engaged the stop, substantially as described.

53. In a tabulating attachment for type-writing machines, the combination of a plurality of stops normally standing in the path of the paper carriage, an adjustable contact-piece moving with the paper carriage and adapted to cooperate successively with said stops, means for adjusting said contact-piece to different positions for engagement with said stops, and means operated automatically by the contact-piece to remove the stop from the path of the contact-piece after the latter has engaged the stop, substantially as described.

54. In a tabulating attachment for type-writing machines, the combination of a plurality of stops, an adjustable contact piece moving with the paper carriage and adapted to cooperate successively with said stops, means for adjusting said contact piece to different positions for engagement with said stops, means for automatically withdrawing each stop from the path of the contact-piece after the latter has engaged the stop, and means operated by the return movement of the carriage to restore the stops to normal position, substantially as described.

55. In a tabulating attachment for type-writing machines, the combination of a plurality of stops, an adjustable contact piece moving with the paper carriage and adapted to cooperate successively with said stops, a series of tabulator keys cooperating with said contact-piece to adjust the same to different positions for engagement with said stops, and means for withdrawing each stop from the path of said contact-piece after the latter has engaged the stop, substantially as described.

56. In a tabulating attachment for type-writing machines, the combination of a plurality of stops, an adjustable contact piece moving with the paper-carriage and adapted to cooperate successively with said stops, a series of tabulator keys cooperating with said contact-piece to adjust the same to different positions for engagement with said stops, and means operated automatically by said contact-piece to withdraw each stop



from the path of the contact-piece after the latter has engaged the stop, substantially as described.

57. In a tabulating attachment for type-  
5 writing machines, the combination of a plu-  
rality of stops, an adjustable contact piece  
moving with the paper carriage and adapted  
to cooperate successively with said stops, a  
series of tabulator keys cooperating with said  
10 contact-piece to adjust the same to different  
positions for engagement with said stops,  
means for automatically withdrawing each  
stop from the path of the contact-piece after  
the latter has engaged the stop, and means  
15 operated by the return movement of the pa-  
per carriage to restore the stops to normal po-  
sition, substantially as described.

58. In a tabulating attachment for type-  
writing machines, the combination of a plu-  
20 rality of stops, an adjustable contact piece  
moving with the paper carriage and adapted  
to cooperate successively with said stops, a  
series of tabulator keys cooperating with said  
contact-piece to adjust the same to different  
25 positions for engagement with said stops,  
means operated automatically by the con-  
tact-piece after the latter has engaged each  
stop to remove the latter from its path, and  
means operated by the return movement of  
30 the paper carriage to restore the stops to nor-  
mal position, substantially as described.

59. In a tabulating attachment for type-  
writing machines, the combination, with the  
paper carriage and stop devices for arresting  
35 the same, of a series of independent tabulator  
keys representing different denominations of  
value and cooperating with the stop-devices  
to adjust the same to different denomina-  
tional positions and arranged with the keys  
40 of successively higher values in regular order  
from right to left, substantially as described.

60. In a typewriting machine and tabu-  
lating mechanism, the combination of a car-  
riage, escapement mechanism therefor, tabu-  
45 lating devices for arresting the carriage at  
different denominational positions, said de-  
vices including a movable stop, a series of  
key levers for moving said stop to different  
extents, a universal bar which is operable by  
50 any of said key levers, and intermediate con-  
nections between said universal bar and the  
escapement to release the carriage after the  
said stop has been moved to the arresting  
position.

61. In a typewriting machine and tabu-  
lating device, the combination of a carriage,  
rotatable denominational stops, means for  
rotating said denominational stops to bring  
them to different denominational positions,  
60 a cooperating tabulating stop, and means  
for releasing the carriage when the denomi-  
national stops are rotated.

62. In a typewriting machine and tabu-  
lating device, the combination of a carriage,  
65 a rock-shaft which extends in the direction

of the travel of the carriage, a plurality of  
denominational stops carried by said rock-  
shaft and located at different points around  
the same, a tabulating stop which cooper-  
ates with the denominational stops, said 70  
tabulating and denominational stops being  
adjustable relatively one to another, and  
means for rocking said rock shaft.

63. In a typewriting machine and tabu-  
lating device, the combination of a carriage, 75  
a rock-shaft which extends in the direction  
of the travel of the carriage, a plurality of  
segmentally arranged denominational stops  
carried by said rock-shaft, a tabulating stop  
which cooperates with the denominational 80  
stops, means for rocking said rock shaft, and  
means for releasing the carriage when the  
rock shaft actuating means are operated.

64. In a typewriting machine and tabu-  
lating device, the combination of a power 85  
driven carriage, a movable stop rod, a plu-  
rality of denominational stops secured to  
said stop rod, a cooperating tabulating stop,  
and means for releasing the carriage when  
said stops are in operative relation. 90

65. In a typewriting machine and tabu-  
lating device, the combination of a power  
driven carriage, a plurality of denomina-  
tional stops, a cooperating tabulating stop, a  
plurality of keys for moving said denomina- 95  
tional stops to different extents transversely  
of the travel of the carriage, and means for  
releasing the carriage when the denomina-  
tional stops are actuated.

66. In a typewriting machine and tabu- 100  
lating device, the combination of a power  
driven carriage, a tabulating stop, a plural-  
ity of spirally and radially arranged denomi-  
national stops, a plurality of keys for rotat-  
ing said denominational stops to different 105  
positions, and means for releasing said car-  
riage when the denominational stops are ro-  
tated.

67. In a typewriting machine and tabu-  
lating device, the combination of a carriage, 110  
a tabulating stop, a stop rod, a plurality of  
spirally, radially and segmentally arranged  
denominational stops carried by said stop  
rod, and a plurality of keys for moving said  
stop rod to turn any of the denominational 115  
stops into a position to cooperate with the  
tabulating stop.

68. In a typewriting machine and tabu-  
lating device, the combination of a power  
driven carriage, a tabulating stop, a stop 120  
rod, a plurality of radially, spirally and seg-  
mentally arranged denominational stops  
carried by said stop rod, and a plurality of  
keys for moving said stop rod to turn one of  
the denominational stops into a position to 125  
cooperate with the tabulating stop, and  
means for releasing the carriage when any  
one of said keys is actuated to move the de-  
nominational stops.

69. In a typewriting machine and tabu- 130



lating device, the combination of a power driven carriage, a tabulating stop, a rock shaft, denominational stops carried by said rock shaft, a pinion on said rock shaft, a rack which meshes with said pinion, key actuated means for moving said rack to different extents to bring different denominational stops into coöperation with the tabulating stop, and means for releasing the carriage when the key actuated means are actuated.

70. In a typewriting machine and tabulating device, the combination of a power driven carriage, escapement mechanism therefor, a tabulating stop, a rock shaft, spirally arranged denominational stops carried by said rock shaft, a pinion carried by the rock shaft, a rack which meshes with said pinion, a universal frame connected thereto, key levers which act on said frame at different points for variably moving said rack and rotating the denominational stops to different positions, a carriage release mechanism, and a second universal bar connected therewith and adapted to be actuated by said key levers.

71. In a tabulating attachment for typewriting machines, the combination, with the fixed frame of the machine and the transversely movable paper-carriage, of a set of rotatable graduated contact devices movable with the paper carriage, a plurality of stops coöperating therewith to arrest the paper-carriage at different denominational positions in successive columns, an escapement mechanism for said paper carriage and means coöperating with said stop devices and the escapement mechanism of the machine for releasing the paper-carriage and arresting it at the desired denominational position in the successive columns.

72. In a tabulating attachment for typewriting machines, the combination, with the fixed frame of the machine and the transversely movable paper-carriage, of stop devices embodying a graduated contact-piece moving with the paper-carriage and suitable stops coöperating therewith to arrest the paper-carriage at different denominational positions in successive columns, and a plurality of tabulator keys coöperating with said stop devices and with the escapement mechanism of the machine for releasing the paper-carriage and arresting it at the desired denominational position in the successive columns.

73. In a tabulating attachment for typewriting machines, the combination, with the fixed frame of the machine and the transversely movable paper carriage of a rotary shaft, a sleeve provided with a spiral series of steps mounted thereon to turn with the same but movable longitudinally thereof, means for turning said shaft to adjust said sleeve to arrest the paper-carriage at the desired denominational position, and stops

on the framework to coöperate with said sleeve.

74. In a tabulating attachment for typewriting machines, the combination with the fixed frame of the machine and the transversely movable carriage of a rotary shaft, a sleeve provided with a spiral series of steps mounted upon the said shaft to turn with the same but movable longitudinally thereof, a gear wheel on the said shaft, and means for engaging the said gear wheel to turn the said shaft to adjust said sleeve to arrest the paper-carriage at the desired denominational position.

75. In a tabulating attachment for typewriting machines, the combination with the fixed frame of the machine and the transversely movable paper-carriage, of a rotary shaft, a graduated contact piece mounted upon the said shaft and a segment held pivotally upon the said frame in engagement with the said shaft, and means for rocking the said segment to adjust the contact piece to arrest the carriage at the desired denominational position.

76. In a tabulating attachment for typewriting machines, the combination with the machine of a segment held pivotally thereon, column stops, a rod driven by the said segment provided with suitable means for engaging said column stops to arrest the paper-carriage at a predetermined point.

77. In a typewriting machine, the combination of a paper carriage, a sleeve connected to travel therewith and provided upon its periphery with a series of spirally arranged steps, a shaft upon which said sleeve is adapted to travel and with which it is adapted to turn, a series of finger keys operatively connected with said shaft to turn the same different distances, and means on the framework for engaging said spirally arranged steps and variably arresting the paper carriage.

78. The combination, in a typewriter, of a segment held pivotally therein, column stops, and a rod driven by the said segment and carrying suitable means adapted to engage the said column stops to stop the typewriter carriage at a predetermined point.

79. As an attachment for typewriting machines having a carriage feed mechanism, the combination of the rotary carrier arranged on an axis parallel with the movement of the carriage and having stops, and means independent of the feed mechanism for turning the carrier.

80. The combination of the carriage, a step-by-step feed mechanism therefor, a rotary stop carrier having a helically arranged series of tabulating stops independent of said feed mechanism and corresponding in distance apart to the steps of said feed mechanism, and means for operating said carrier.



81. In a typewriting and tabulating mechanism, the combination, with a carriage, of a column stop, a spiral series of denomination stops, a pinion connected to said series of denomination stops, a rack for engaging said pinion, and a key connected to said rack.

82. In a typewriting and tabulating mechanism, the combination, with a carriage, of a column stop, a spiral series of denomination stops, a pinion connected to said denomination stops, a series of keys for operating said pinion, and means, including a stepped member, for enabling different adjustments of said pinion and denomination stops by said keys.

83. In a typewriting and tabulating mechanism, the combination, with a power driven carriage, of a column stop, a spiral series of denomination stops, a pinion connected to said series of denomination stops, a rack for engaging said pinion, a key connected to said rack, and a carriage releasing mechanism operable by said key.

84. In a tabulating device for typewriting machines, the combination of a platen carriage having a stop device to arrest its movement, a stepped stop mounted on the frame and arresting the movement of the carriage at different points, a series of keys and means intermediate said keys and stop moving said stepped stop to different distances so as to set a selected step on said stop in position to be engaged by the stop device on the carriage, a carriage release device, and means whereby the release device is actuated at the end of the movement of the mechanism by which said stepped stop is operated.

85. A tabulating mechanism for typewriting machines, comprising a fixed stop supported by the frame of the machine but adjustable lengthwise thereof, and a single variable stop mounted to travel with the carriage, and having connections whereby it is shifted by the carriage parallel with the plane of adjustment of the fixed stop, and means including keys on the front of the machine for changing the position of said variable stop.

86. A tabulating mechanism for typewriting machines comprising a stop in fixed position relatively to the frame of the machine, a revoluble and slidable sleeve having a spiral flange adapted to co-act with said stop to limit the travel of the carriage, connections whereby said sleeve travels with the carriage, and means for varying the position of said sleeve on its axis.

87. A tabulating mechanism for typewriting machines comprising a sleeve having a spiral stepped flange, a support on which said sleeve may slide, connections between the carriage and sleeve whereby the two will travel in unison, a stop to co-act with the said flange and limit the travel of the car-

riage, and means for rotating said sleeve on its axis.

88. A tabulating mechanism for typewriting machines including in its construction a shaft supported by the frame, a sleeve having a spiral flange and having a splined connection with said shaft, means whereby the sleeve will travel along the shaft in unison with the movements of the carriage, a pinion secured to said shaft, a rock-shaft having a segmental rack meshing with said pinion and means under the control of the operator to oscillate the rock-shaft to a greater or lesser extent.

89. A tabulating mechanism for typewriting machines comprising one or more fixed stops, a variable stop comprising a single stepped spiral flange having a longitudinal space between its ends to permit said spiral to pass a fixed stop when said spiral is in normal position, and means for partially rotating said spiral and releasing the carriage, the said spiral being connected with the carriage to travel in unison therewith.

90. A tabulating mechanism for typewriting machines comprising a shaft, a sleeve splined thereon and having a spiral flange, a connection between the carriage and the sleeve whereby the travel of the former will slide the latter on said shaft, a stop adapted to be engaged by said flange, and means for rotating said shaft and sleeve and releasing the carriage.

91. A tabulating mechanism for typewriting machines comprising a shaft, a sleeve splined thereon and having a spiral flange, a connection between the carriage and the sleeve whereby the travel of the former will slide the latter on said shaft, a stop adapted to be engaged by said flange, a pinion on said shaft, a rock-shaft having a segmental rack engaging said pinion, means for actuating the rock-shaft to greater or lesser extent, and connections whereby such actuation of the rock-shaft will release the carriage.

92. A tabulating mechanism for typewriting machines comprising a pair of co-acting stops one of which is connected with the frame of the machine but adjustable lengthwise thereof and the other with the carriage, one of said stops comprising a rotary member having a single spiral flange, and means for rotating said member on its axis and releasing the carriage.

93. A tabulating mechanism for typewriting machines comprising a pair of co-acting stops one of which is connected with the frame of the machine but adjustable lengthwise thereof and the other with the carriage, one of said stops comprising a rotary member having a single stepped spiral flange, and means for rotating said member on its axis and releasing the carriage.

94. In a typewriting machine and tabulat-



ing mechanism, the combination of a carriage, a series of segmentally arranged denominational stops, a tabulating stop which is adapted to cooperate with the denomination stops to arrest the carriage, and means for turning the series of denominational stops and the tabulating stop relatively one to the other.

95. In a typewriting machine and tabulating mechanism, the combination of a carriage, a series of segmentally arranged denominational stops, a tabulating stop which is adapted to cooperate with the denomination stops and arrest the carriage, means for turning the series of denomination stops and the tabulating stop relatively one to another, and means controlled by said turning means for releasing the carriage.

96. In a typewriting machine and tabulating mechanism, the combination of a carriage, a tabulating stop, and denominational stops which are spaced apart to provide a free movement of the tabulating and denominational stops past one another.

97. In a typewriting machine and tabulating mechanism, the combination of a carriage, a tabulating stop, segmentally arranged denominational stops, which are spaced apart to provide a free movement of the tabulating and denominational stops past one another, and means for bringing one of said denominational and tabulating stops into the path of the other.

98. In a typewriting machine and tabulating mechanism, the combination of a carriage, a tabulating stop, and spirally arranged de-

nominal stops which have a space between the terminal stops to provide a free movement of the tabulating and denominational stops past one another.

99. In a typewriting machine and tabulating mechanism, the combination of a carriage, a tabulating stop, a series of radially arranged denominational stops which are spaced apart to permit the denominational and tabulating stops to pass one another, and means for interposing one of said stops in the path of the other.

100. In a typewriting machine and tabulating mechanism, the combination of a carriage, a tabulating stop, a series of denominational stops, a plurality of key levers for effecting a relative movement to different positions between said tabulating and denomination stops, a pivoted universal frame also operated by said key levers, and means connected to said frame for releasing the carriage after a stop has been moved to the selected position.

101. In a typewriting machine and tabulating device therefor, the combination of a carriage, radially and segmentally arranged denominational stops, a cooperating tabulating stop, key-actuated means for moving the denominational stops into the path of the tabulating stop to arrest the carriage, and means for releasing the carriage when the stops are moved into cooperative relation.

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