

No. 782,542.

PATENTED FEB. 14, 1905.

L. S. BURRIDGE.
TYPE WRITING MACHINE.
APPLICATION FILED NOV. 17, 1904.

4 SHEETS—SHEET 1.

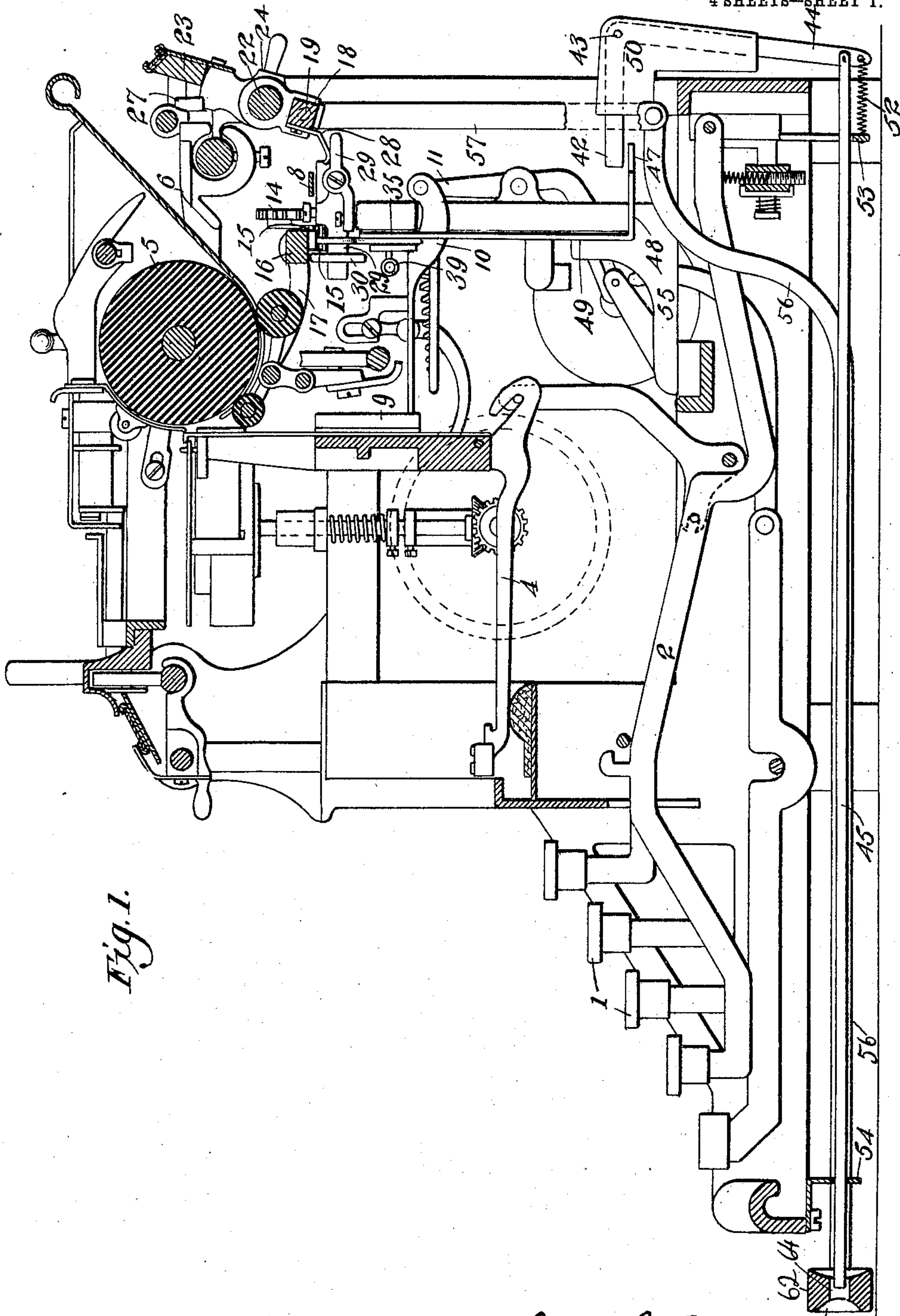


Fig. 1.

Witnesses
E. A. Hopman
C. W. Howell, Jr.

L. S. Burrige Inventor

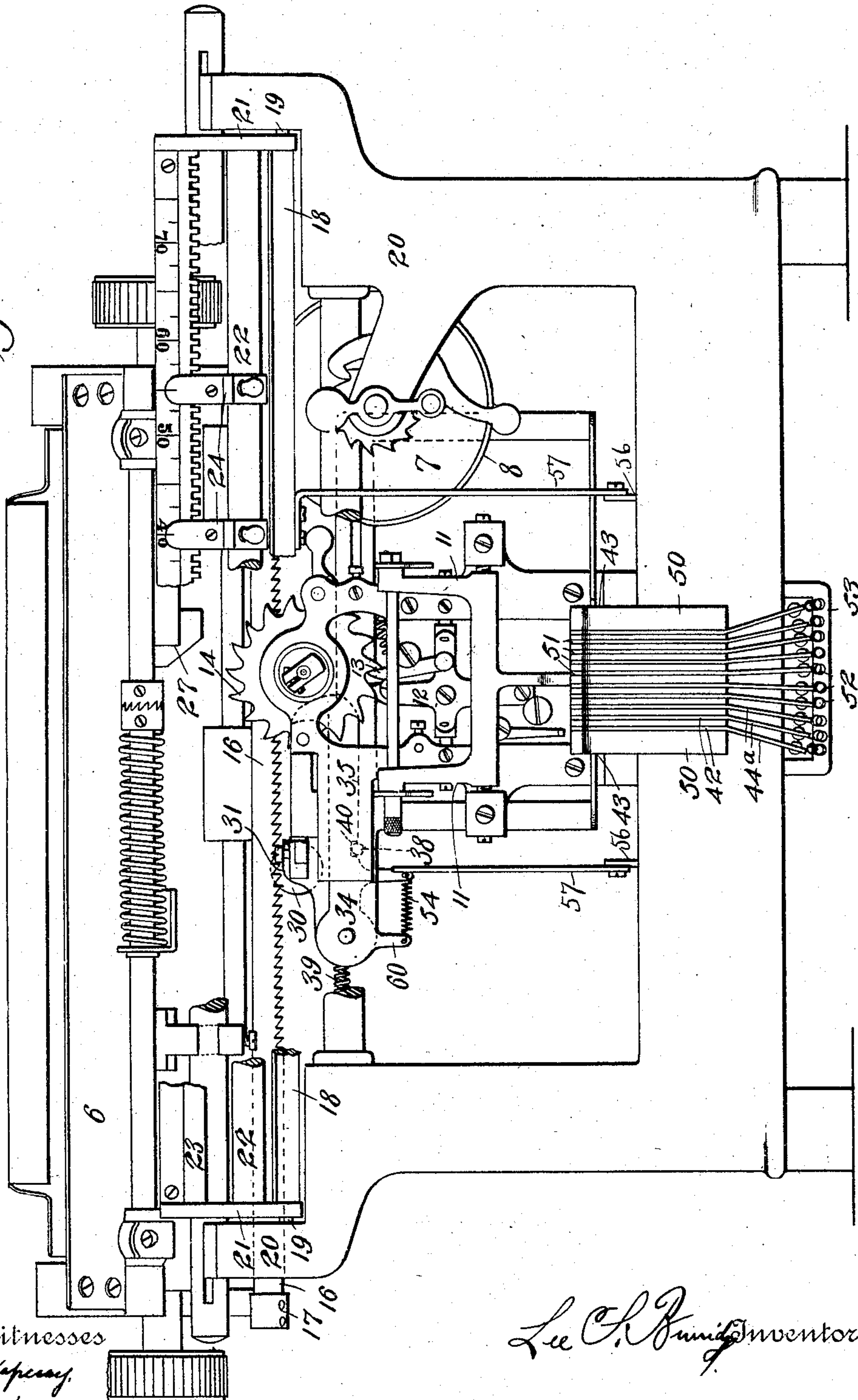
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4 SHEETS—SHEET 2.

Fig. 2.



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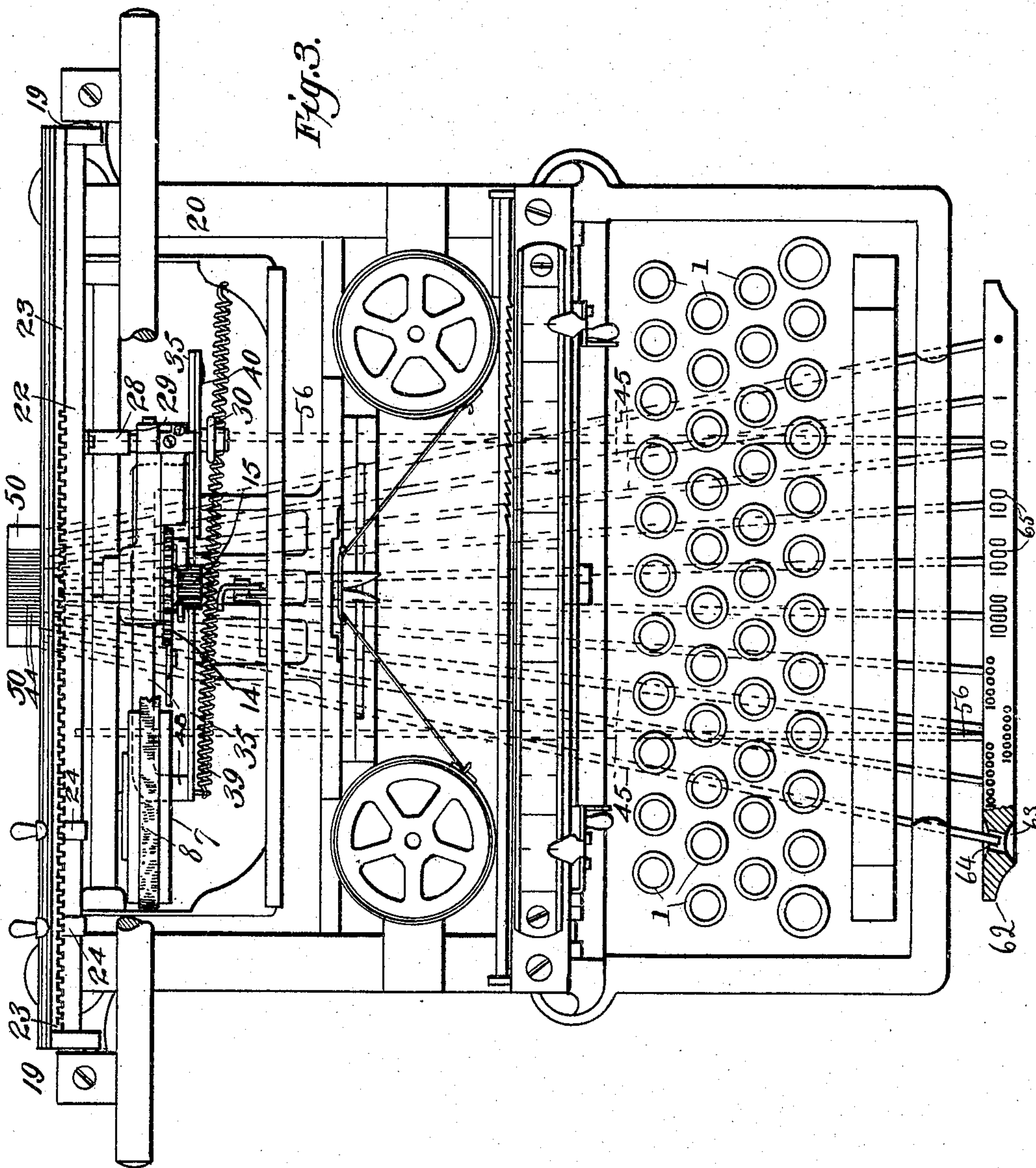
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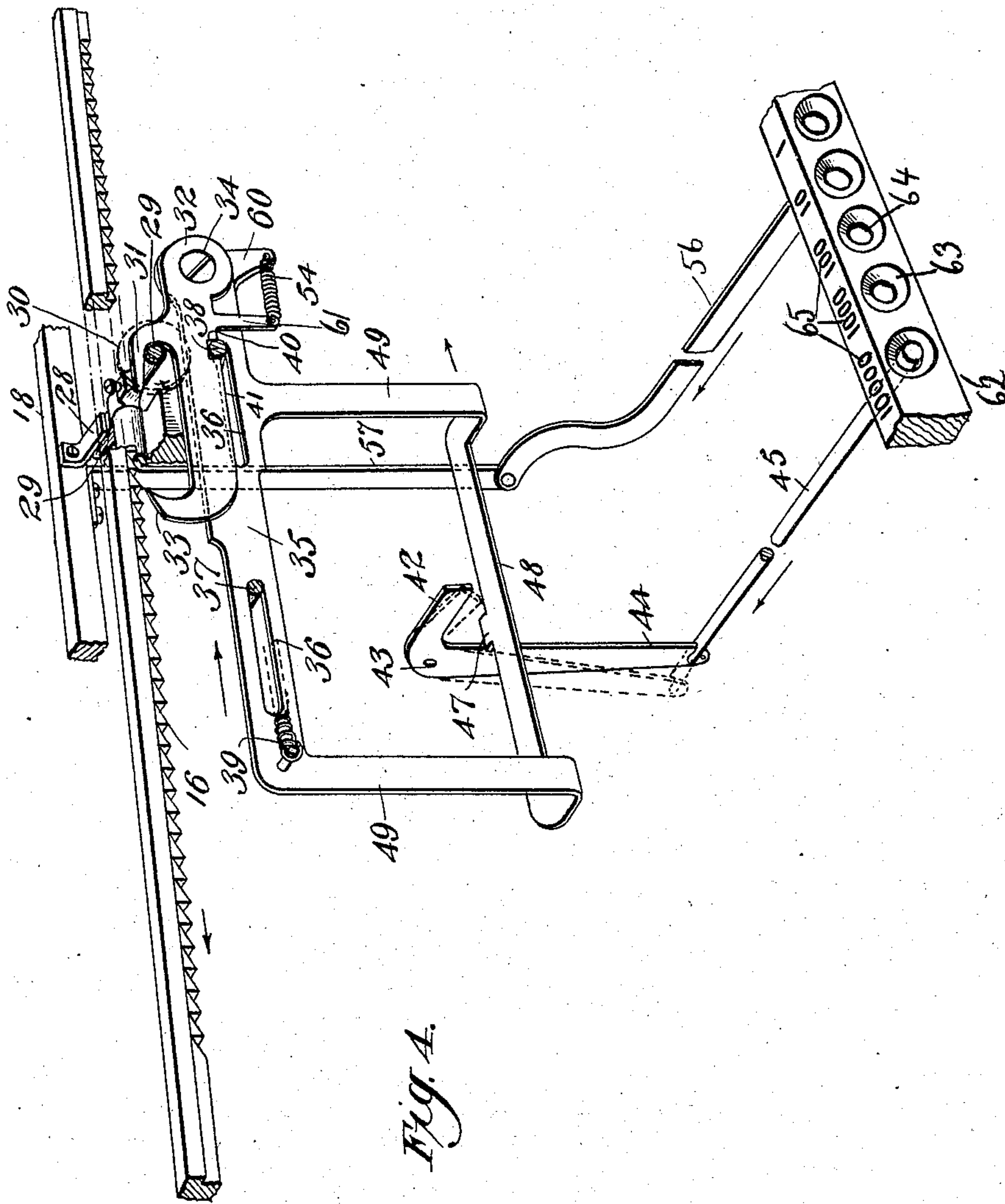


Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

LEE S. BURRIDGE, OF NEW YORK, N. Y., ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 782,542, dated February 14, 1905.

Application filed November 17, 1904. Serial No. 233,134.

To all whom it may concern:

Be it known that I, LEE S. BURRIDGE, a citizen of the United States, residing in the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to tabulating mechanism for type-writing and other machines in which means are provided for arresting the carriage after its release not only at the desired column of writing on the page, but also at the proper point in the column to begin writing a number of any given denomination.

The object of my invention is to simplify and improve the mechanism, particularly the portion thereof that is directly operated by the fingers. For the usual set of denomination-keys I substitute a single finger-bar and make suitable provision for enabling the finger when pressing said bar at any selected point to engage and operate a denomination-selecting device, the finger-bar being marked to indicate the several denominations.

I have applied my improvements to the type of tabulating mechanism illustrated in the patent granted to Carl A. Joerissen, May 12, 1903, No. 728,170, in which by the use of a column-stop mechanism the paper-carriage is advanced to the desired column and then by means of denomination-spacing mechanism the carriage is given an additional movement in the nature of denomination-spacing, so that the writing of the given number may begin at the proper point. In carrying out my invention I adapt the finger-bar to operate the carriage-releasing and column-stop mechanism so that when desired it may be operated without reference to the denomination-selecting devices, while at any time it may be operated in connection with any selected denomination device to give the carriage the proper denomination-spacing.

In the accompanying drawings, Figure 1 is a vertical section taken from front to rear of an Underwood type-writing machine and one form of tabulator to which my improvements are applied. Fig. 2 is a rear elevation of the

machine. Fig. 3 is a plan omitting portions of the paper-carriage. Fig. 4 is a perspective view of parts of the tabulating mechanism.

Keys 1, operating through levers 2 and sub-levers 3, cause type-bars 4 to strike rearwardly against the front of a platen 5, mounted upon a carriage 6, which is propelled by a spring-barrel 7 and strap 8. Letter-spacing movements of the carriage are effected by a universal bar 9, frame 10, rigid therewith and pivoted to rock-arms 11, a pivoted dog carrier or rocker 12, connected to said arms 11 and carrying dogs 13, which work in and out of an escapement-wheel 14, which is connected to a small pinion 15, the latter being rotated by a rack 16, pivoted by arms 17 upon the carriage, so as to be capable of lifting out of engagement with the pinion and permit the carriage to run freely to the left under the tension of the spring 7.

The column-stop bar or frame comprises a square rock-shaft 18, mounted upon pivots 19 in the main frame 20, rock-arms 21, fixed upon and rising from said rock-shaft, and two rods 22 and 23, connecting and fixed to said rock-arms, one or more column-stops 24 being pivotally mounted upon rod 22 and adjustable therealong and rod 23 having rack-teeth 25 engageable by said column-stops. The latter are formed with stop portions 26, which upon rocking the bar forwardly move into the path of a cooperating stop 27, fixed upon the carriage so as to arrest the latter at the proper column. At the movement of the column-stop into the path of the carriage-stop 27 release of the carriage from the escapement mechanism is effected by a finger 28, fixed upon rock-shaft 18 and projecting forwardly to bear upon one arm of a lever 29, the other arm whereof carries a roll 30, engaging the under side of the rack 16 to lift the same. After the carriage is arrested by the engagement of its stop 27 with one of the column-stops 24 the column-stop bar rocks back to normal position, effecting disengagement of stops 27 and 24; but the rack is not permitted to reengage the escapement mechanism or the pinion 15 of the escapement mechanism until the carriage is given an addi-

tional spacing movement to adjust it to the proper denomination. The mechanism which effects the denomination-spacing movement of the carriage comprises a lug 31, formed upon a pawl 32 and hooking over the wheel-carrying arm of lever 29, said pawl having a tooth 33 to engage rack 16, but normally lying below the rack and out of use. This pawl is pivoted at 34 upon a slide 35, having horizontal guide-slots 36, whereby the slide is guided upon two fixed pins 37 38, said pins also limiting the movements of the slide in either direction. By spring 39 the slide may be retracted or moved oppositely to the letter-spacing movement of the carriage; but the pin 38 by engaging a notch 40, formed upon the under edge of the pawl, restrains the slide. The upward rack-lifting movement of lever 29, however, acts upon lug 31 to lift the pawl clear of pin 38, permitting slide and pawl to be retracted by spring 39, the lower edge 41 of the pawl riding upon said pin 38. Although the pawl-tooth 33 has thus been elevated, it is still clear of the rack, the latter having been lifted sufficiently by wheel 30 to clear the pawl. The slide and pawl cooperate to prevent reengagement of the rack with its pinion 15 until the desired denomination-spacing movement of the carriage is effected, and the extent of such movement is determined by the extent of the retraction of the slide by spring 39 from normal position, the carriage always operating to restore the slide to normal position from any point to which it may have been retracted and the rack 16 becoming reengaged to the pinion upon the instant that the slide reaches normal position. The retraction of the slide is variably limited by a series of stop-arms 42, extending forwardly from pivots 43, operating-arms 44, depending from said pivots, and rods 45, extending forwardly from said arms to the front of the machine convenient to the operator. By a rearward movement of any rod its stop is vibrated downwardly into the path of a lug 47, which projects rearwardly from a bar 48, connecting the lower ends of two pendent arms 49, formed upon the slide 35. The extent of the retraction of the slide is dependent upon which rod 45 is operated, the extreme right-hand rod being used for the decimal-point, the extreme left-hand rod for tens of millions, and the intermediate rods for intermediate denominations. The rods converge rearwardly to the stops which are mounted at letter-space intervals upon a single rod which extends between side pieces 50, the latter confining the stops and separators 51. The ends of arms 44 fan out at 44^a to connect to the rear ends of rods 45 and returning-springs 52 extend from arms 44 to the lower portion of a rod-guiding bracket 53. The front ends of the rods may be guided in a bracket 54. The side pieces or bracket 50 are attached to the usual bracket 55, which carries the carriage-escapement mechanism.

Pendent arms 57 are fixed to the rock-shaft 18, and a pair of links or rods 56 extend forwardly therefrom and at their front ends are connected by a finger-bar 62, extending horizontally across the machine in front of the keyboard and provided with a series of finger-cups or depressions 63. At the bottom of each of these cups the bar is perforated at 64, these perforations being in register with the rods 45 and the latter preferably projecting somewhat into the perforations so that when the finger is placed in any of the finger-cups to press the bar back the tip of the corresponding rod 45 will be encountered during the backward movement of the finger-bar, thereby setting the corresponding stop 42. Upon its top surface the finger-bar is provided with marks "65" to indicate the several denominations, one mark over each finger-cup.

In operation the finger is inserted in the cup beneath the required denomination-mark and the finger-bar pressed back, together with the rod 45, that registers with the perforation or recess 64 in said cup, the remaining rods 45 not being affected. By this movement of rod 45 its stop 42 is set in position to intercept the lug 47 on the slide 35. By the movement of the finger-bar the arms 57 are swung back and shaft 18 is rocked, whereby column-stop 26 is moved forwardly into the path of carriage stop or lug 27 in position to intercept the latter and arrest the carriage at the proper column. At the same time the arm 28 moves downwardly and vibrates lever 29, whose forward arm by means of roll 30 lifts the rack 16 out of engagement with pinion 15, thus permitting the carriage to run freely along under the tension of spring 7. Simultaneously with said disengagement of the rack the lever 29 operates upon lug 31 to lift pawl 32 and unlatch slide 35 from pin 38, permitting spring 39 to draw back the slide until its lug 47 is arrested by projected stop 42. All of this is effected by the backward stroke of the finger-bar and the accompanying rod 45, the rack remaining in its elevated position and the column-stop 26 in the path of stop 27 so long as the finger-bar and rod 45 are held back. Upon the release of these two members from pressure the rock-shaft 18 is by means of the usual spring 58 returned to normal position, disengaging column-stop 26 from carriage-stop 27, thereby permitting the spring 7 to draw the carriage still farther, while lever 29 is relieved from the control of arm 28, so that rack 16 is no longer held up by wheel 30, but may drop. The rack, however, does not reengage with pinion 15, being intercepted by the tooth 33 of pawl 32, said tooth having originally been elevated by lever 29 and having since ridden upon pin 38. The rack, therefore, rests upon the pawl-tooth, and the pawl or its bottom edge 41 rides upon the pin 38, and in this condition the carriage and rack run along, together with the pawl

and slide, until the latter is arrested by the contact of the ends of slots 36 with pins 37 38, at which moment the notch 40 in the pawl directly overlies pin 38, permitting the pawl to drop, together with the rack, the latter re-engaging pinion 15. A spring 59 may assist the downward movement of the pawl, said spring being caught upon ear 60, formed upon the slide and catching in arm 61, depending from the pawl. By reason of the foregoing operation the carriage is arrested at the proper point to begin the writing of a number having a denomination corresponding to that of the operated rod 45, the stroke of the carriage effected by the release of said rod and finger-bar being equal to that of the slide 35, which was made at the pressing back of these parts. The finger-bar may at any time be operated independently of the denomination-rods 45 to release the carriage and secure its arrest at the desired column, and, if desired, the right-hand rod 45 and its stop may be omitted, so that when the finger-bar is operated by inserting the finger in the finger-cup marked "." or by pressing the bar elsewhere outside of the remaining finger-cups the carriage will jump to the point in the column for writing the decimal-point, the length of the carriage movement being determined by the length of the slots 36 in slide 35.

While both the carriage-releasing and the column-stop mechanism are operable by the finger-bar in the particular tabulating mechanism described, still the finger-bar, with its perforations or recesses, is not limited to such use.

It will be seen that the rods 45 are independently operable, each having means for effecting the arrest of the carriage at a different point from the other rods. It is not essential in all cases that the rods project into the bar and when they do so project is not always important that the front vertical face of the bar should stand forward of the tips of the rods, as shown. So long as the finger may contact simultaneously with both the finger-bar and one of the rods it is not necessary that they occupy the precise relation shown.

Having thus described my invention, I claim—

1. The combination with a carriage, of a tabulating mechanism comprising a finger-bar having a series of perforations, a carriage-releasing and column-stop mechanism operable by said finger-bar, and a denomination mechanism including a series of independently-operable rods mounted in register with said perforations, each rod having means for effecting the arrest of the carriage at a different point from the other rods; the rods being so related to the finger-bar that the finger, in operating the same, contacts with and operates one of the rods, and the bar being provided with marks at said perforations for indicating the several denominations.

2. The combination with a carriage, of a car-

riage-releasing and column-stop mechanism comprising a finger-bar, and a denomination mechanism comprising a series of denomination-selecting rods; the finger-bar being marked at intervals to indicate the several denominations, and being so related to the rods that when finger-pressure is applied to the bar at any selected mark, the finger contacts with and operates the corresponding rod.

3. The combination with a carriage, of a carriage-releasing and column-stop mechanism comprising a bar provided with a series of finger-cups and with a perforation at each cup, and a denomination mechanism comprising a series of independently-operable denomination-selecting rods in register with said perforations; said finger-cups being so related to said denomination-rods that the finger, when inserted in any cup for operating the bar, engages the corresponding denomination-rod.

4. The combination with a carriage, of a carriage-releasing and column-stop mechanism comprising a bar provided with perforations and having marks at said perforations to indicate different denominations, and a denomination mechanism comprising a series of independently-operable denomination-selecting rods having their ends extending into said perforations; said bar and said rods being so related that the finger, when placed over or in any selected perforation for operating the bar, engages the corresponding rod.

5. The combination with a carriage, of a carriage-releasing and column-stop mechanism comprising a finger-bar having perforations or recesses, marks at said perforations to indicate different denominations, and denomination-selecting devices extending into said perforations and independently operable; said bar and said selecting devices being so related that the finger, when placed over or in any selected perforation for operating the bar, engages the corresponding selecting device.

6. The combination with a carriage, of a column-stop and carriage releasing bar or frame, a finger-bar operatively connected to said bar or frame, and denomination-selecting devices ranging along said finger-bar so that any one of them may be operated by the finger pressing on said finger-bar.

7. The combination with a carriage, of a column-stop and carriage-releasing bar or frame, operating-arms connected to said bar or frame, links connected to said arms, a finger-bar fixed upon said links, denomination-selecting devices ranging along said finger-bar so that any one of them may be operated by the finger pressing on said finger-bar, and means upon the latter to indicate the several denominations.

8. The combination with a carriage and a rack, of escapement mechanism, a set of rods, a set of stops controlled by said rods, a column-stop bar pivoted upon the framework, a finger-bar having perforations into which the tips of said rods extend, means connecting

said finger-bar to said column-stop bar, a co-operating stop upon the carriage, carriage-releasing means operable by said column-stop bar, and means for additionally spacing the carriage, after its arrest by the column-stop, to an extent predetermined by the operation of the selected rod; said finger-bar being provided with marks to indicate the several denominations.

9. The combination with a carriage, rack, and escapement mechanism, of a set of rods extending from front to rear of the machine, a set of stops at the rear of the machine controlled by said rods, a rearwardly-movable finger-bar at the front of the machine and having perforations or recesses to receive the tips of said rods, means controlled by said finger-bar for releasing the rack from the control of the escapement mechanism and for arresting the carriage at a predetermined column when so released, and means for additionally spacing the carriage, after such arrest, to an extent predetermined by the operation of the selected rod; means being provided upon said finger-bar to indicate the several denominations.

10. The combination with a carriage, carriage-releasing devices, and column-stop devices, of a finger-bar operatively connected

to said carriage-releasing and column-stop devices so as to be capable when operated of releasing the carriage and arresting it at the proper column, and a set of denomination-spacing devices operable independently of one another; said finger-bar being operable independently of said denomination-spacing devices, and the latter ranging along the finger-bar.

11. The combination with a carriage, of a series of denomination-selecting devices, a finger-bar extending along said series, and means for enabling said finger-bar to cooperate with any of said denomination-selecting devices for releasing the carriage and arresting it at the required denominational position, by simultaneous operation of the finger-bar and the denomination-selecting device; said finger-bar being so related to said denomination-selecting devices that as a consequence of the finger being placed upon the bar at any suitable selected point for operating the bar, the corresponding denomination-selecting device is engaged and operated by the finger.

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Witnesses:

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