

No. 780,271.

PATENTED JAN. 17, 1905.

D. E. FELT.  
COMBINED TABULATING AND WRITING MACHINE.

APPLICATION FILED MAY 21, 1900.

5 SHEETS—SHEET 1.

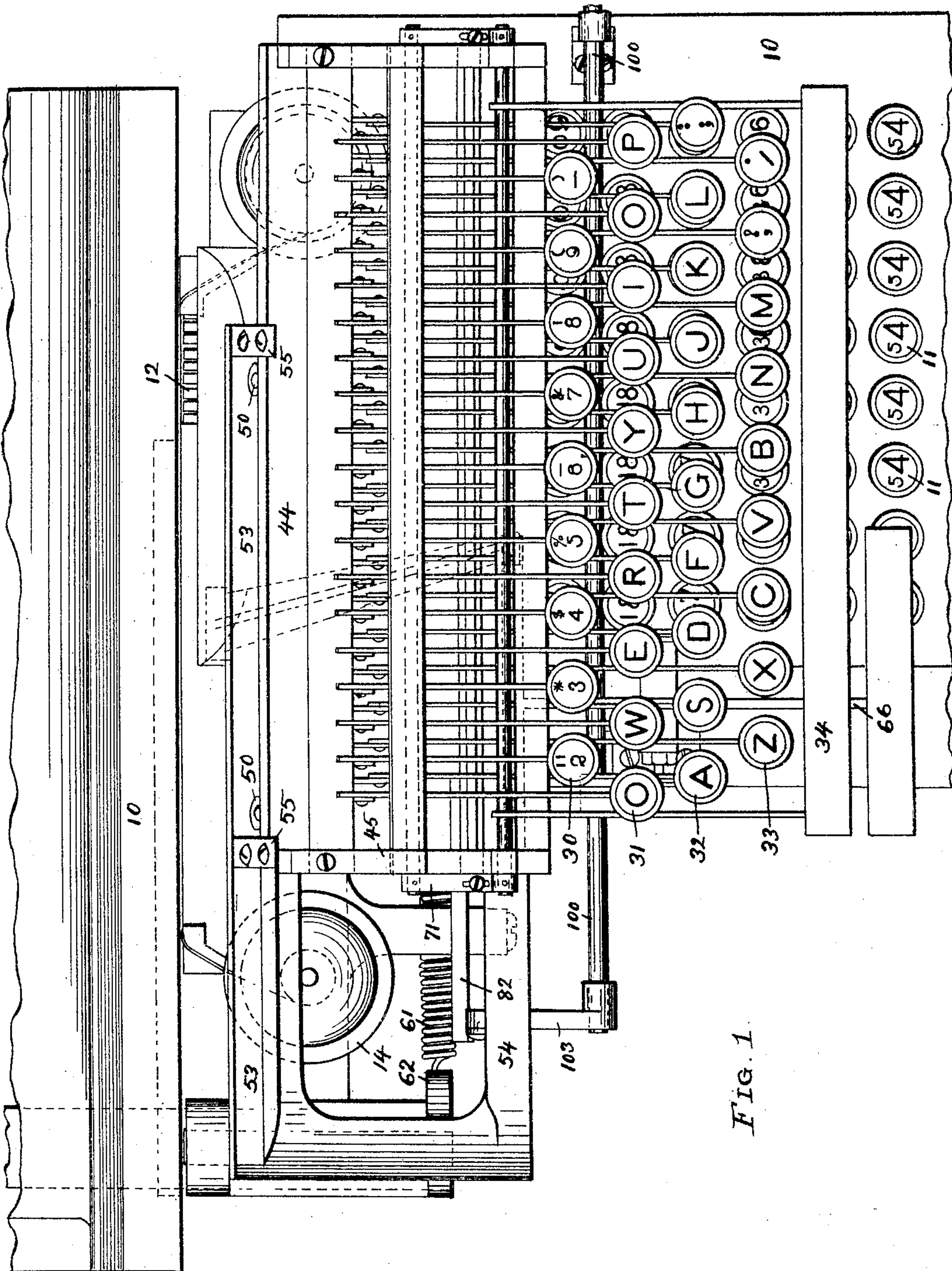


FIG. 1.

WITNESSES.

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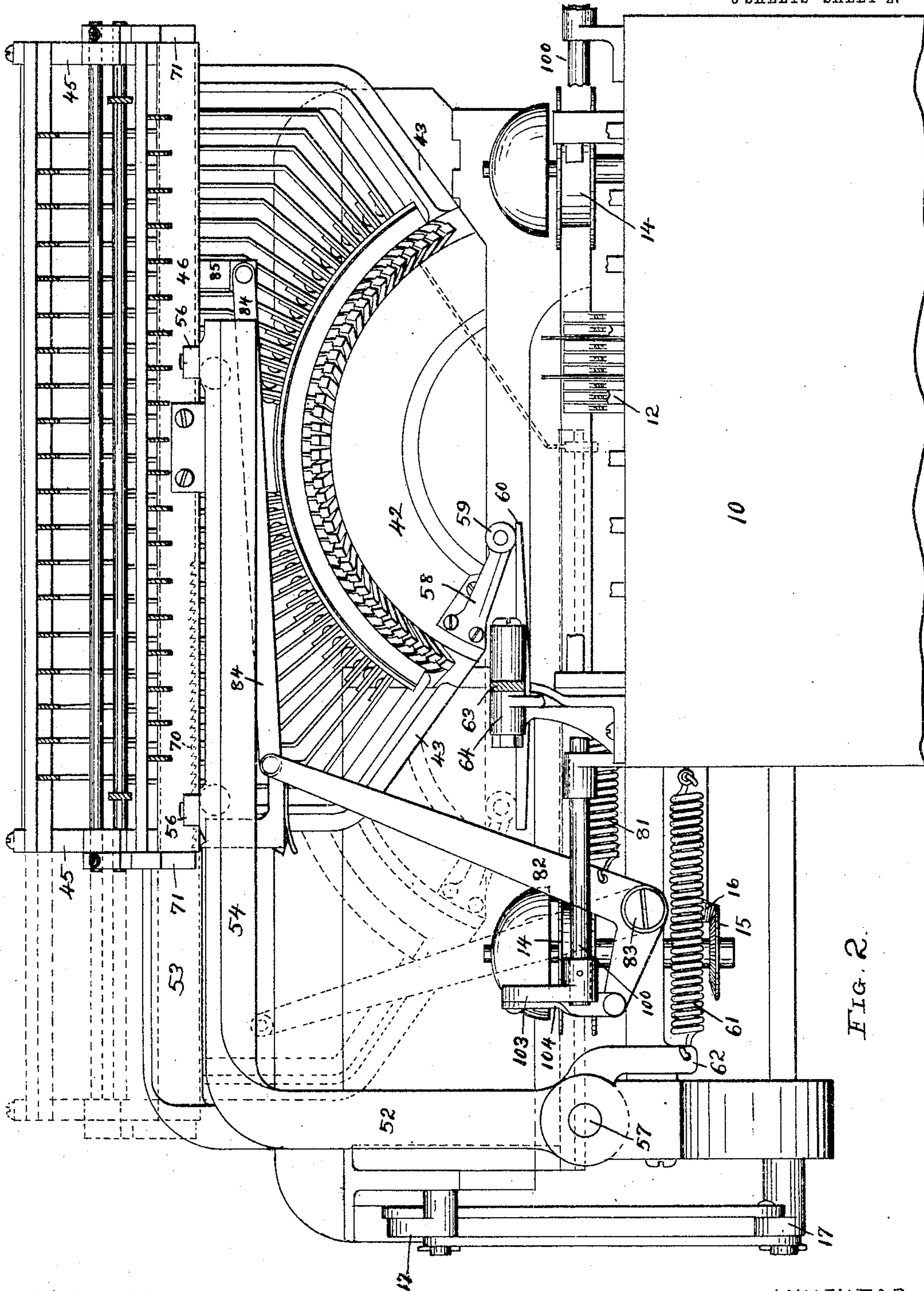


FIG. 2.

WITNESSES.

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6 SHEETS—SHEET 3.

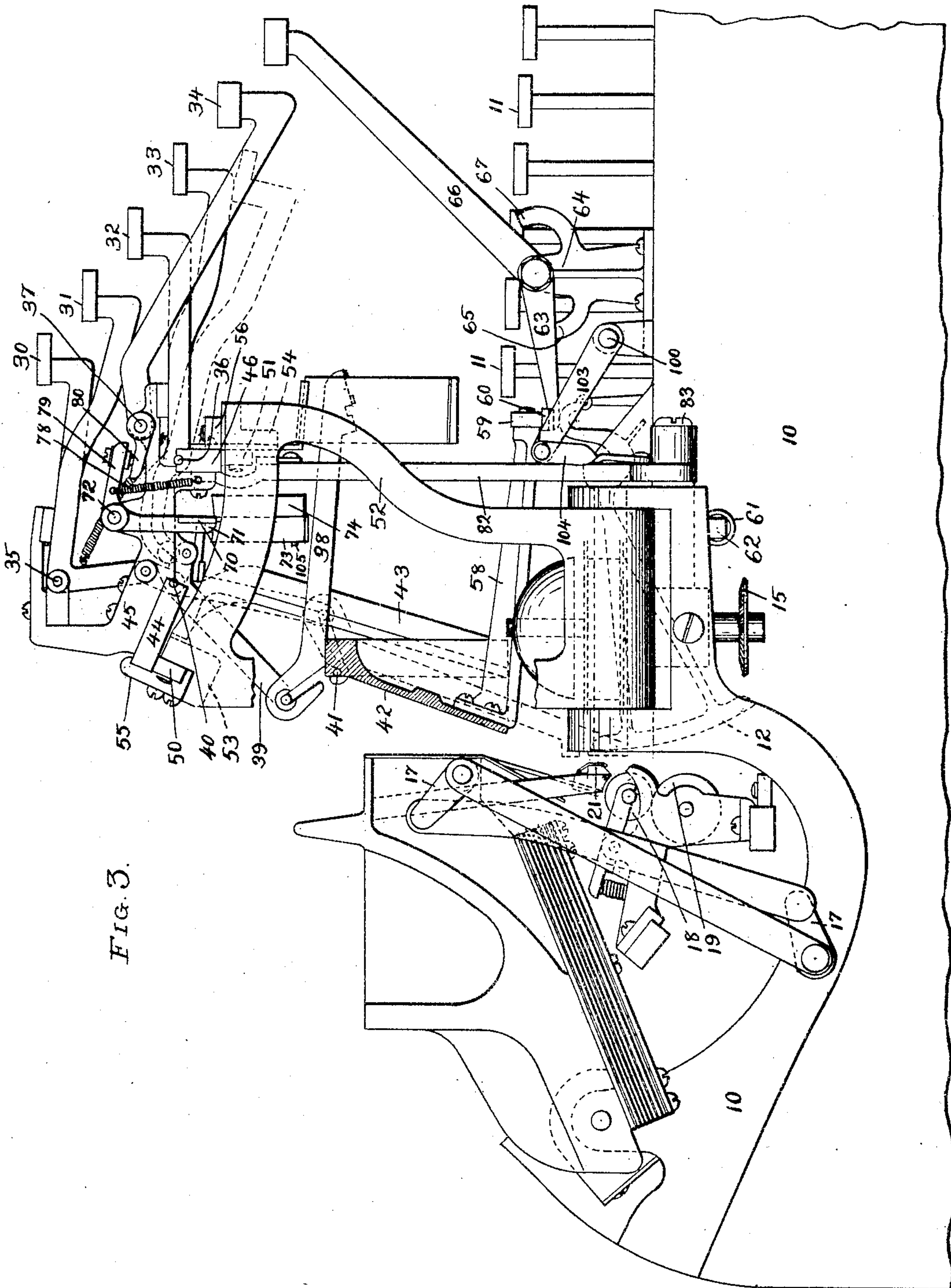


FIG. 3.

WITNESSES.

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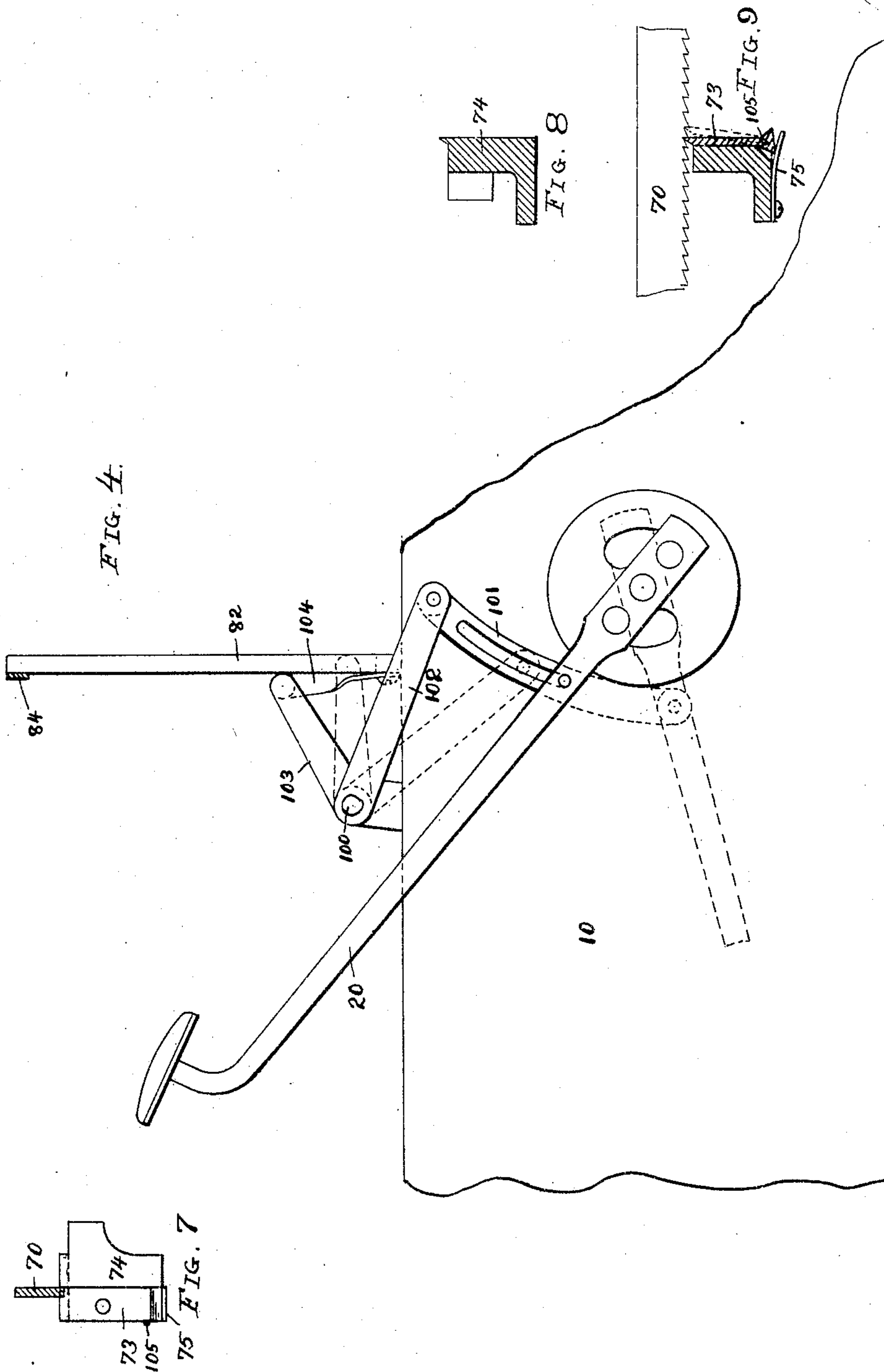
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WITNESSES.

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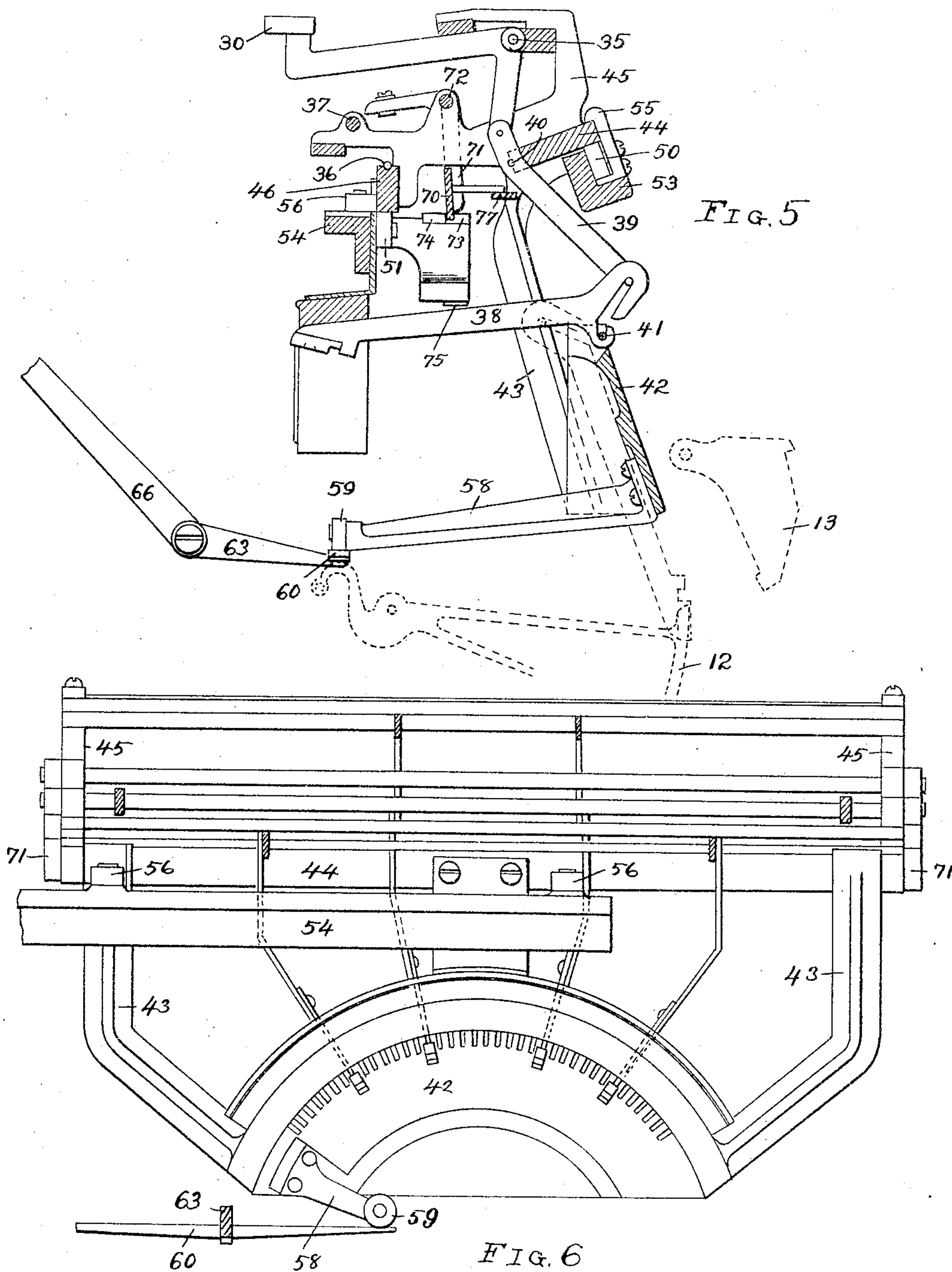
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5 SHEETS—SHEET 5.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

DORR E. FELT, OF CHICAGO, ILLINOIS, ASSIGNOR TO COMPTOGRAPH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## COMBINED TABULATING AND WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 780,271, dated January 17, 1905.

Application filed May 21, 1900. Serial No. 17,377.

*To all whom it may concern:*

Be it known that I, DORR E. FELT, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in a Combined Tabulating and Writing Machine, of which the following is a specification.

This invention is an improved construction of combined type-writing and tabulating machine. It is designed to enable the operator not only to list a series of numbers in a column and to add them and then to note their sum at the foot of the column, but also to enable him at the same time to write names or short descriptions opposite each number listed in the column or a suitable title or heading to the list or to note on the list such other memoranda as may be needed to accompany the list.

The invention has been devised more particularly for use by banks and mercantile and manufacturing houses in the listing and adding of collections, securities, accounts, bills, invoices, &c., and is fully set forth below and shown in the accompanying drawings, in which—

Figure 1 is a partial plan, Fig. 2 a partial front elevation, and Fig. 3 a partial vertical section, of a machine embodying my invention. Fig. 4 is a detail vertical section. Fig. 5 is a section of the type-writer printing mechanism. Fig. 6 is a detail section showing an elevation of the type-writer carriage, and Figs. 7, 8, and 9 are details.

In describing the invention I do not use the term "type-writer" as including the tabulating-machine, which, in a sense, is a type-writer, because it employs movable type operated indirectly by keys in connection with an ink-ribbon and impressing devices; but I use the term as applying only to the part of the machine which corresponds both in construction and in the character of the work done by it to the ordinary type-writer.

The invention may be applied to any tabulating-machine; but I have shown it and prefer to use it in connection with the tabulating-machines devised by me and of which one

form is shown in the patent to me, No. 644,287, of February 27, 1900.

Referring to the drawings, 10 represents the frame, 11 the keys, 12 the type-segments, 13 the hammers for impressing the paper upon the type, 14 the ribbon-spools, 15 16 the gears for actuating the spools, 17 the motion-transmitting levers, 18 19 the paper-feed rolls, and 20 the line-printing lever of the tabulating-machine, and for a full understanding of these parts it is only necessary to refer to my said patent. The tabulating-machine is also provided with means for feeding the paper line by line, for positioning the type-segments, for operating the hammers, &c.; but as all these and other necessary features of such machines are shown and illustrated in my said patent I do not deem it necessary to describe or show them here. The paper-rolls may or may not have the lateral movement described in my patent by which on the completion of a column the rolls are shifted so as to carry the paper laterally with respect to the type, and thus present a fresh portion of the paper for the printing of another column parallel with the first. The machine may or may not have any means for returning the paper after the printing of a column, so as to bring its top to the printing-center, though such means are very desirable.

The paper-rolls do not have the character-spacing lateral-feed movements employed in all other type-writers, and the paper consequently is not shifted with the striking of each key. Instead of this I mount the type-writer upon a shifting carriage, which is fed laterally at each stroke of any of its keys, as will be better understood later on. The type-writer used by me is not a complete machine of that kind, as it does not embody either a paper-carriage nor any paper-controlling means nor any ink-ribbon or means for controlling the same, as all those devices are present in the tabulator. It may embrace all the characters used in the ordinary type-writer, including upper and lower case, and should in any event be provided with the characters needed for the writing to be done. The paper moves from between the rolls 18 and 19 in front of the



type-hammers and also in front of platen 21, so located as to receive the impact of the type of the type-writer, and as the printing-center required by the type-writer is a shifting one and moves laterally with each character struck I make this platen of a length corresponding to the length of the lateral movement permitted by the type-writer, so that it will be present to receive the impacts of the type in all positions of the type-writer.

The character-keys of the type-writer are shown at 30, 31, 32, and 33 and the spacing-key at 34. The keys 30 and 31 and all others in the same rows with them are pivoted on pivots 35, the keys 32 and 33 and all others in the same rows with them are pivoted on pivot 36, and the space-lever is pivoted at 37. All the character-keys are connected to the type-lever 38 by intermediate levers 39, which are pivoted at 40, and the type-levers swing on pivot 41. All the keys mentioned and their type-levers and connections are supported by a carriage, of which the curved portion 42, the upwardly-extending arms 43, the longitudinal bar 44, end pieces 45, and longitudinal bar 46 are the main features. In the end pieces the pivots 35 and 36 are supported, and the type-lever pivot is supported in said curved portion. These parts are in the main similar to corresponding parts of a well-known type-writer.

The carriage carrying the keys and type of the type-writer is laterally movable, as already intimated, and to this end it is supported by rollers 50 and 51 upon horizontal arms 53 and 54, formed on the upright or frame 52, said arms extending longitudinally of the machine. Said rollers are pivoted on said arms, and the rollers 50 are in contact with bar 44 of the type-writer frame and rollers 51 in contact with bar 46 of the same frame. A bracket 55, attached to horizontal arms 53, is extended above bar 44 and bent over onto said bar, so as to confine the latter and prevent any loss of position by the writer-carriage when it and its support are tipped up, as they may be, as will be now explained. A roller 56, mounted on arm 54 and turning on a vertical pivot, bears against the side face of bar 46, thus confining the carriage in one direction.

The upright frame 52 is pivoted on pivot 57 in such manner as to permit the type-writer carriage and its supporting-arms 53 and 54 to be swung in changing from lower to upper case letters. Said pivot is stationary, and the carriage and support are sustained in their normal position by the arm 58, attached to the curved part of the carriage-frame, as best seen at Fig. 2, and having a roller 59 bearing on a track 60. This track equals in length the movement allowed the carriage, and consequently the carriage is uniformly held in the proper horizontal plane while writing. A spring 61, stationarily secured at one end and having its other end attached to an arm 62,

projecting downward from the upright 52, exerts its power in such manner as to assist in raising the carriage when changing from one case to the other. To this end it is made nearly strong enough to lift the carriage, so that but little power is required of the operator in operating the shifting lever hereinafter mentioned. The track 60 is supported on the end of a lever 63, pivoted in the pillow-block 64, located at the side and in front of the track and prevented from a downward movement by the stop 65. An upward extension 66 of lever 63 serves as the key or lever by which the operator shifts the type-writer for the printing of upper-case characters, and a stop 67 limits this movement of the lever. An escapement is also provided for the type-writer at each stroke of the keys. It consists of a rack 70, supported by the swinging arms 71 from a pivot-rod 72, supported in the ends 45 of the carriage, and pawls 73 and 74 engaging the rack alternately. The pawls are stationarily located, and one of them, 73, is adapted to yield to the rack in the direction of the latter's movement to the extent of a tooth-space, being held to its support or companion pawl by a spring 75, and the other pawl is fixed. The rack is swung in one direction by a longitudinal bar 77, extending across the series of key-levers and in such relation thereto as will cause the latter when struck to move the bar, so that the latter will in turn move the rack sufficiently to carry the rack from one pawl to the other. The return swinging movement of the rack is caused by the spring 78, attached to a stationary part of the machine at one end and to a horizontal arm 79, rigid with one of the rack-carrying arms at the other end. This arm 79 also serves to operate the rack when the spacing-lever is struck, as it is positioned so as to be operated by the foot 80 on said lever. The feed of the carriage is due to the tension of a spring 81, as hereinafter explained.

As will be understood from the drawings, the type-writer is movable from the position indicated by the broken lines in Fig. 2 to that given in full lines in the same figure, and such movement is received in the step-by-step pulsations allowed by the escapement and due to said spring 81. This spring is attached to a stationary part of the machine at one end and to an elbow-lever 82 at the other end. This lever is pivoted at 83, and one arm of it extends upward and is joined by a connecting-bar 84 and a leg 85, depending from the carriage, so that the latter will feel the power of the spring and yield to it whenever permitted to do so by the escapement.

The type-writer and the tabulator are adapted to print on the same line, the former at the beginning of the line, and the line-spacing feed of the paper is done by the line-spacing mechanism of the tabulator. The type-writer keys are located in a higher plane than the



tabulator-keys, as seen at Fig. 3, in order to permit their being moved over the latter, and I prefer that they be located enough higher than the tabulator-keys, so that they will not interfere with the operating or observance of the tabulator-keys when thus moved over the latter.

The type-writer carriage is returnable upon the striking of the line-printing lever by means of the following connections between said lever and the carriage. The lever 20 is connected to a shaft 100, extending transversely of the machine, by an arm 101 and crank 102, and the shaft also carries a crank 103, which is joined to the elbow-lever 82 by a connecting-bar 104, so that when the shaft 100 is rocked by the lever to cause the taking of an impression from the tabulator-type segments the elbow-lever 82 will also be operated and made to carry the type-writer carriage back to the left and to its normal position. The escapement does not interfere with this movement, inasmuch as its movable pawl 73 is pivoted at its bottom on pivot 105, and its spring 75 is adapted to yield and allow it to swing far enough so that the rack may pass freely over it in the return movements.

Among manufacturers the terms "tabulator" and "tabulating-machines" are now generally understood as referring to machines capable of writing the amounts listed in two or more vertical columns or rows, and it will be understood that my invention applies not only to such machines, but also to those adapted to write only a single column of amounts in connection with the text applying thereto, both classes of machine being equally within my claims.

I claim—

1. The combination with a tabulating-machine, of a type-writer mounted upon a laterally-movable carriage, and having its keys located in a plane above those of the tabulator, whereby the type-writer keys are permitted to move over the tabulator-keys, and a paper-holder common to said tabulating-machine and the type-writer, substantially as specified.

2. The combination with an adding and listing tabulator operated by a series of keys, arranged in columns, and having a printing mechanism for printing simultaneously all of the characters to represent a single amount, and constructed to print the several amounts according to Arabic notation beneath each other in a column, of a key-operated type-writer mechanism for printing text in connection with the amounts in the column and constructed to print such text character by character in succession, and a single paper-support for supporting a single sheet of paper upon which all of the printing is to be done, substantially as specified.

3. The combination with a listing and self-adding tabulator for printing amounts in a

column and adding the same, said printing and adding mechanism being stationary with respect to movement across the paper, of a type-writing mechanism for writing text in connection with said column, and which is made self-moving across the paper, and paper-holding means common to said tabulator and text-writing mechanism, substantially as specified.

4. The combination with the key-operated listing and self-adding mechanism for adding and printing a list of numerals in a column upon a sheet of paper and printing the total thereof, of a key-operated type-writing mechanism bodily movable step by step for writing text in connection with said column, and a single paper-support common to both, whereby the text and the column of amounts may be printed on the same sheet of paper and the total automatically added and printed, substantially as specified.

5. In a self-adding tabulator, the combination with a listing and adding mechanism comprising a set of keys arranged in columns and connected to and controlling the operation of mechanism for printing numerals in the order of Arabic notation and adding the same, of a key-actuated type-writing attachment for printing text, and a paper-support to receive the paper upon which the matter is printed, the listing and adding mechanism being stationary with respect to movement across the paper, and the text type-writer mechanism being self-movable across the paper, substantially as specified.

6. The combination with a self-adding listing-machine for printing and adding a series of numbers in a column, each number having all its characters printed simultaneously, of a type-writing mechanism for printing text upon the same sheet of paper, constructed to print the text character by character in succession, with an automatic feed from character to character, and an automatic return to the beginning of the line, the latter being set in operation by the act of printing the numerals, substantially as specified.

7. A listing and adding machine operated by keys arranged in columns, and having an adding mechanism, a stationarily-located printing mechanism adapted to print all the characters embraced in an amount at one impression and to print the amounts in vertical columns, a paper-carrier, feeding devices for feeding the paper from line to line actuated at each impression of said printing mechanism, and a key-operated printing mechanism printing text letter by letter upon the paper in connection with the amounts printed thereon, said text-printing mechanism having a feed movement across the paper, substantially as specified.

8. An adding and listing machine operated by keys and having an adding mechanism, a stationarily-located printing mechanism



adapted to print complete amounts embracing a plurality of characters at each impression, a laterally-feeding key-operated printing mechanism printing text letter by letter in successive impressions, a paper-support which is stationary as to location while the printing is being done and which supports the paper so it may be printed upon by both said printing mechanisms, and paper-feeding mechanism for feeding the paper from line to line, substantially as specified.

9. An adding and listing machine wherein are combined an adding mechanism, a stationarily-located listing or printing mechanism for printing the amounts added in columns, a laterally-moving printing mechanism comprising types and operating-keys and acting to print text in connection with said amounts, a support for the paper common to both said mechanisms, and a lever acting both to cause the printing of the amounts and to return the text-printing mechanism to its starting position, substantially as specified.

10. An adding and listing machine wherein are combined an adding mechanism, a stationarily-located listing or printing mechanism for printing in columns the amounts added, a laterally-moving printing mechanism operated by keys and acting to print text in the same horizontal line with the amounts, a stationarily-located support for the paper common to both printing mechanisms and means for feeding the paper vertically, substantially as specified.

11. An adding and listing machine wherein are combined an adding mechanism, a stationarily-located listing or printing mechanism for printing in columns the amounts added, a laterally-moving printing mechanism operated by keys and acting to print text in the same horizontal line with the amounts, a stationarily-located support for the paper common to both printing mechanisms, an inking ribbon also common to both printing mechanisms, and means for feeding the paper vertically, substantially as specified.

12. The combined tabulating and writing machine, wherein are combined means for supporting the paper, a stationarily-located numeral-printing mechanism and a type-writing mechanism comprising types and keys and laterally movable relative to said numeral-printing mechanism, substantially as specified.

13. In a tabulating and type-writing machine the combination of sets of types, mechanism for bringing types of different sets into the same printing-line, impression devices for causing printing by different types simultaneously, another series of printing-types, means for causing individual impressions by the latter types, a paper-holding device cooperating with all of said types, a support for the said sets of types, a support for said series of types independent of the first support, and means for causing a movement of one of said

supports relative to the other, substantially as set forth.

14. The combination of several sets of types, each set having several types any one of which is adapted to be brought into a line of printing common to all of said sets and said sets of types being arranged along the line of printing, a paper-holding means, mechanism for causing all of the types of said sets, which have been brought into the line of printing, to be impressed simultaneously, a carriage movable in the direction of the line of printing relative to said paper-holding means, printing-types and actuating devices therefor on said carriage, and means for feeding the carriage, to supplement, by the printing-types on the carriage, the printing done by said sets of type, substantially as set forth.

15. The combination of a supporting-frame, the key-operated listing and self-adding mechanism mounted on said frame for adding and printing a list of numerals in a column upon a sheet of paper and printing the total thereof, said mechanism embodying a separate series of keys for each denomination, a key-operated type-writing mechanism on said frame for writing text in connection with said column, and a paper-support common to the two writing mechanisms, whereby the text and column of amounts may be printed on the same sheet of paper and the total automatically added and printed, substantially as specified.

16. The combined adding and text-writing machine wherein are combined a numeral-printing mechanism and a text-printing mechanism, both said mechanisms comprising types and keys and one of them being movable with respect to the other, and a support for a single sheet of paper upon which all the printing is done.

17. The combination of a keyboard adding and listing mechanism and a keyboard word-type-writer mechanism, arranged side by side, and adapted to print in the same horizontal line upon the paper, the keyboard of one machine being in a higher plane than and movable over the keyboard of the other.

18. The combined adding and listing machine and type-writer writing upon the same sheet of paper, and embodying type-writer printing devices which are bodily movable during writing by them, and means for returning them automatically to normal position.

19. The combination of a keyboard adding and listing mechanism and keyboard word-type-writer mechanism, one of said mechanisms moving during printing by it over the other mechanism, and being automatically returned to its normal position by the other mechanism.

20. The combination of a keyboard adding and listing machine and keyboard type-writing machine arranged side by side, one of



said machines moving over the other and being automatically returned to its normal position.

21. The combination of a keyboard adding and listing mechanism and a keyboard word-type-writing mechanism, one of said mechanisms being movable with respect to the other, and being automatically returned to normal position by the other.

22. The combination of a keyboard adding and listing machine and keyboard word-type-writing machine arranged side by side, one of said machines moving over the other and being also automatically returned to its normal position upon the actuation of the printing mechanism of the other.

23. The combination of a keyboard adding and listing machine and keyboard word-type-writing machine arranged side by side, one of said machines changing its position while printing, and having means for returning it automatically to its normal position.

24. The combination of a keyboard adding

and listing machine, a keyboard word-type-writer both adapted to print on the same horizontal line upon the paper, means for supporting the paper, the relative positions of said type-writer and said paper-support being changed while writing, and means for restoring them automatically to their initial relative position in readiness for the next line.

25. The combination of a keyboard adding and listing machine, a keyboard word-type-writer both adapted to print on the same horizontal line upon the paper, means for supporting the paper, the relative positions of said type-writer and said paper-support being changed while writing, and a lever and connecting means adapted by a single movement of the lever to restore the type-writer and support to their initial relative positions in readiness for the next line.

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Witnesses:

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