

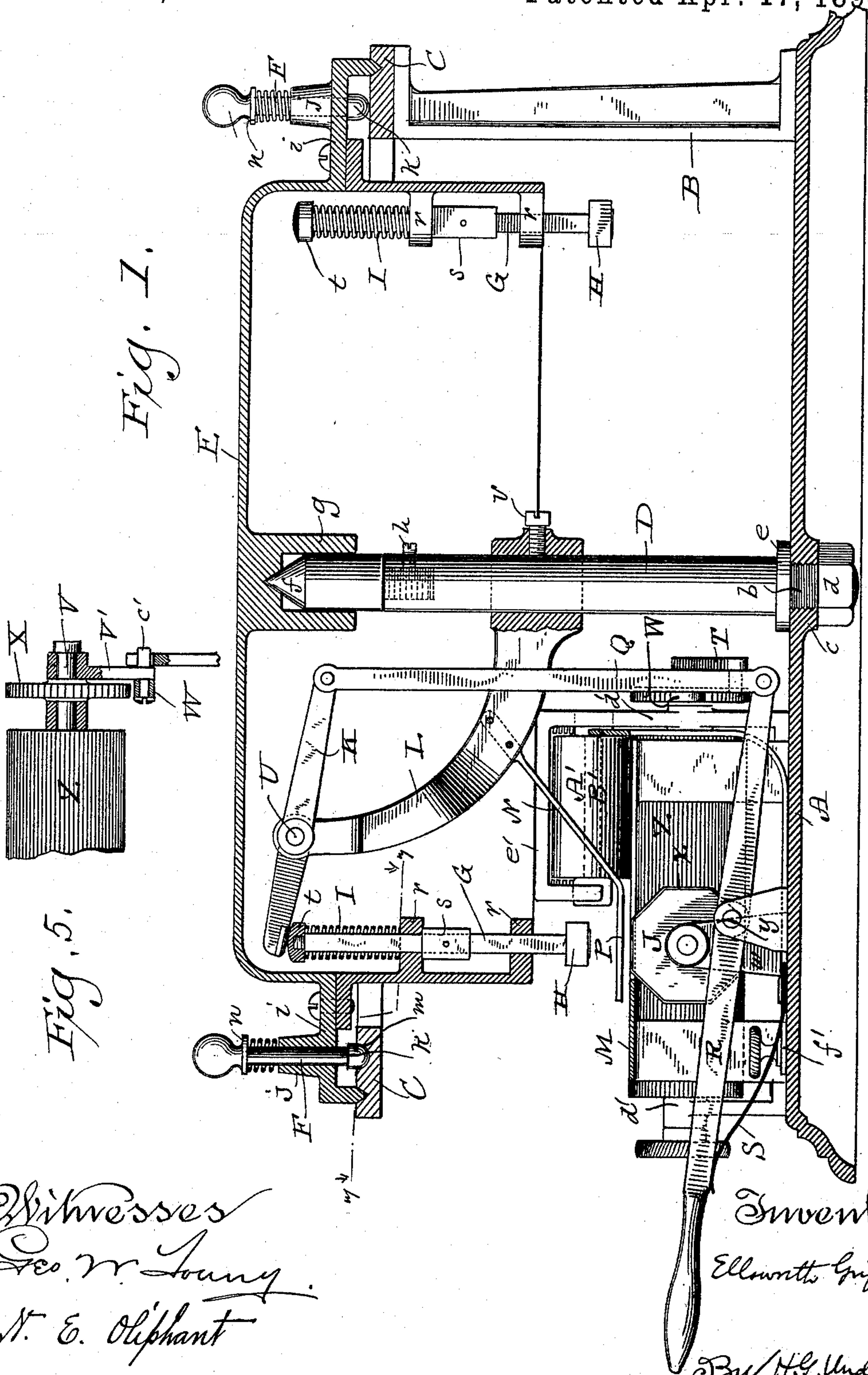
(No Model.)

4 Sheets—Sheet 1.

E. GRIFFIN.
WRITING MACHINE.

No. 518,499.

Patented Apr. 17, 1894.



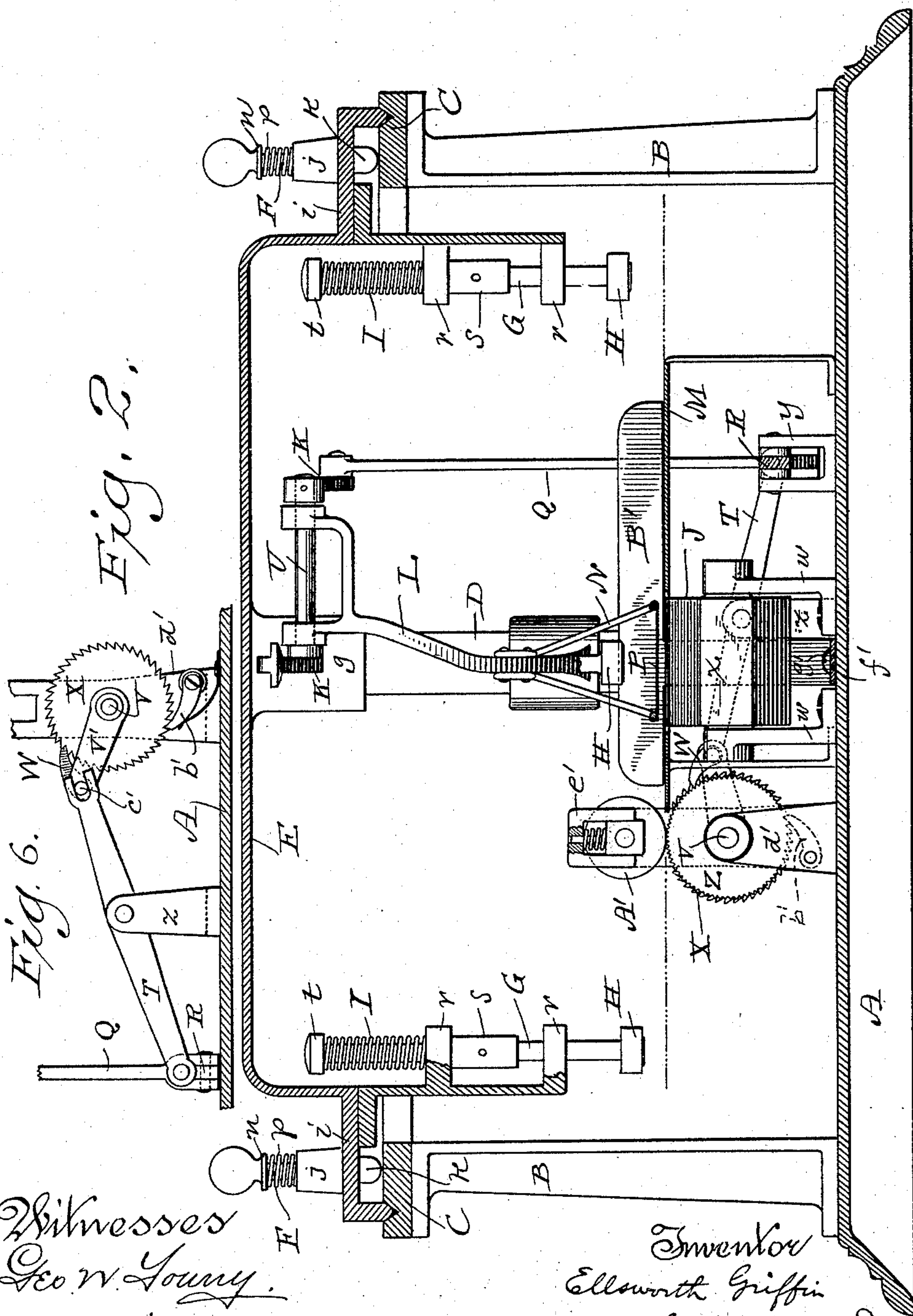
Witnesses
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N. E. Oliphant

Inventor
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Attorney

4 Sheets—Sheet 2.

No. 518,499.

Patented Apr. 17, 1894.



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(No Model.)

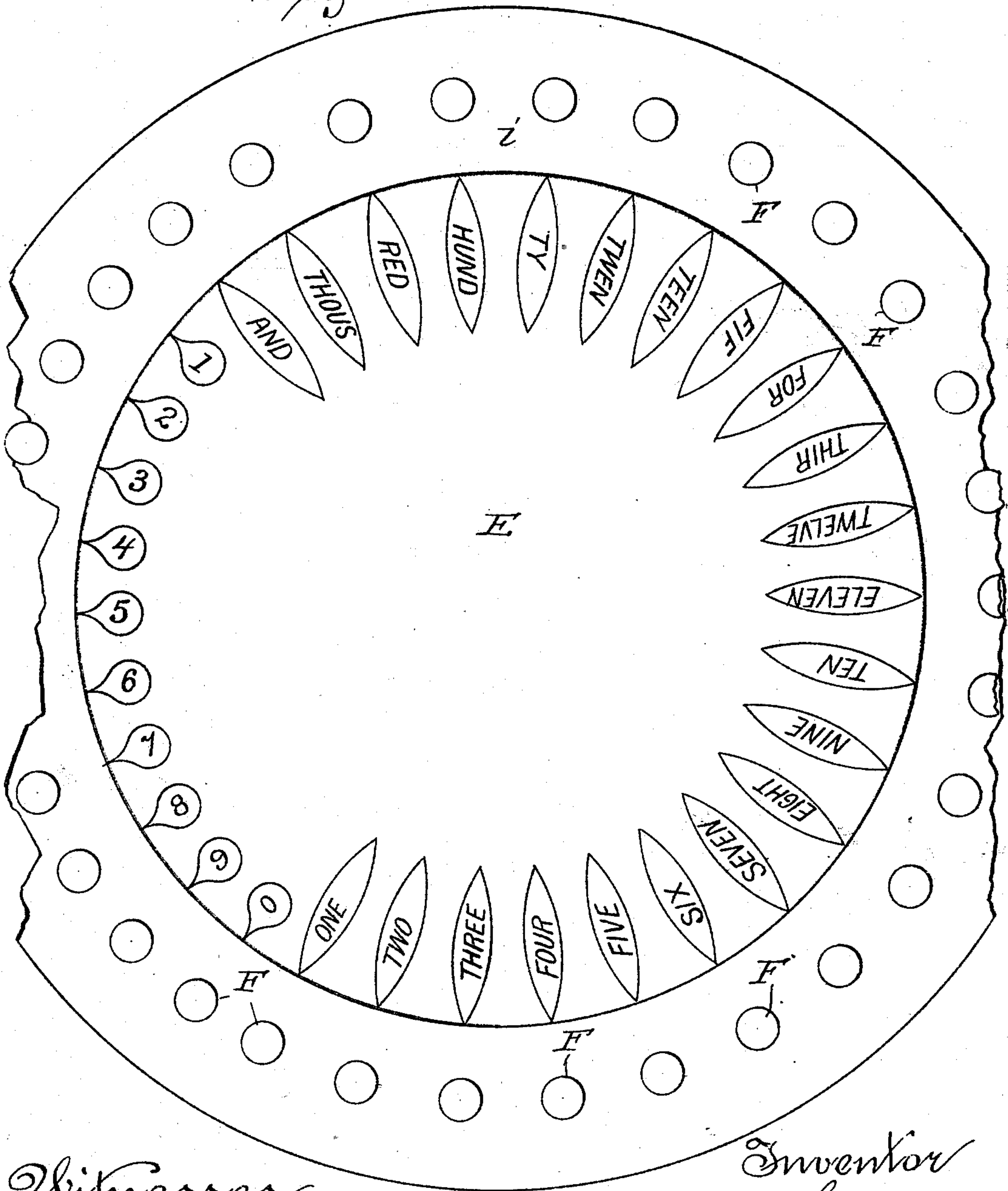
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Fig. 3.



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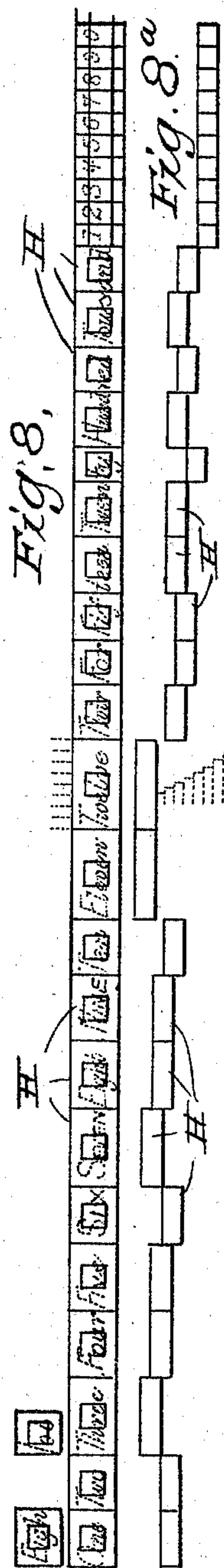
(No Model.)

4 Sheets—Sheet 4.

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Witnesses
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W. E. Oliphant

First National Bank of
Minneapolis 789
Pay To John Jones or order.
One Hundred and Twenty Five 00 Dollars
\$ 125

Fig. 11.

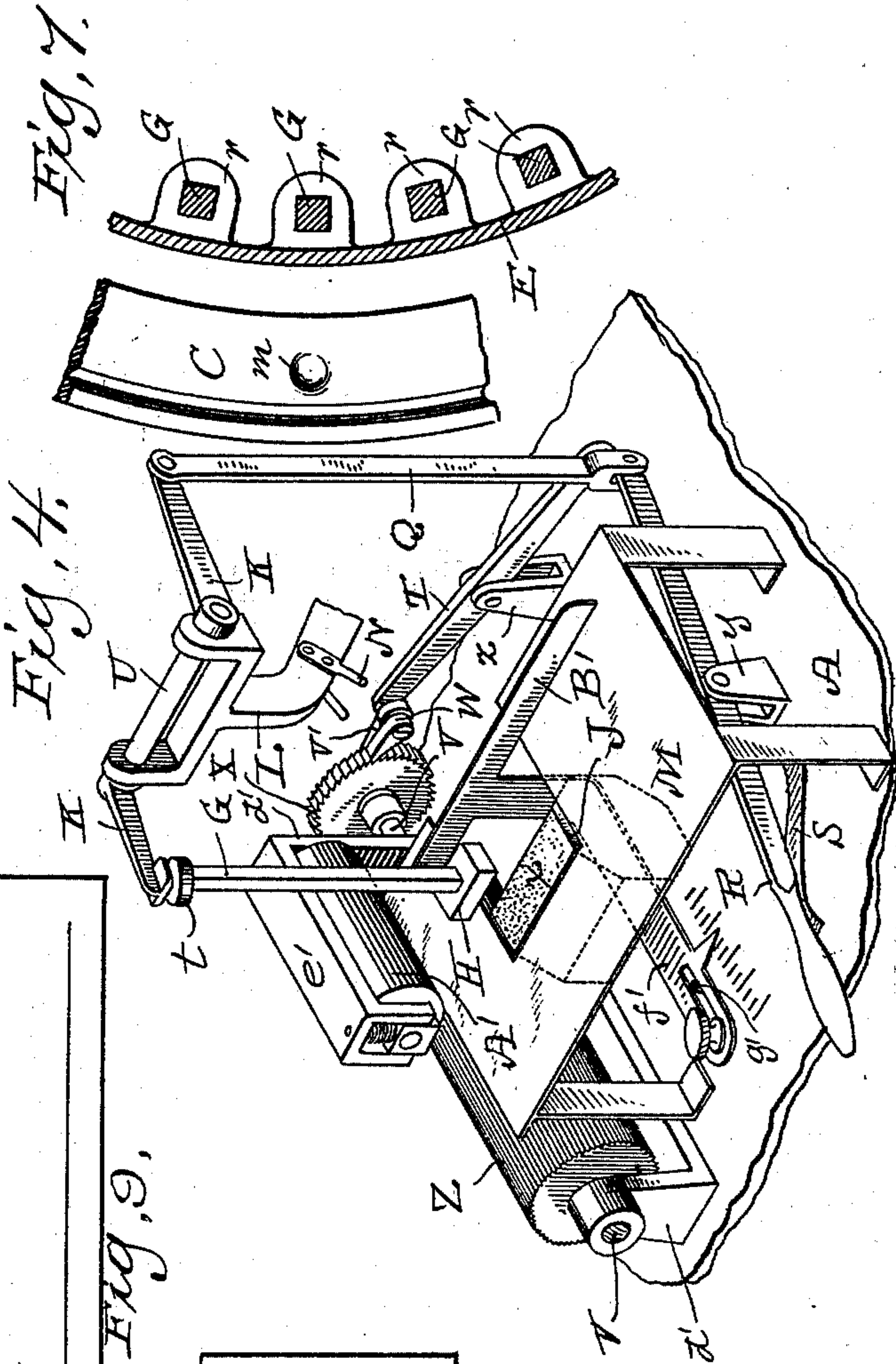
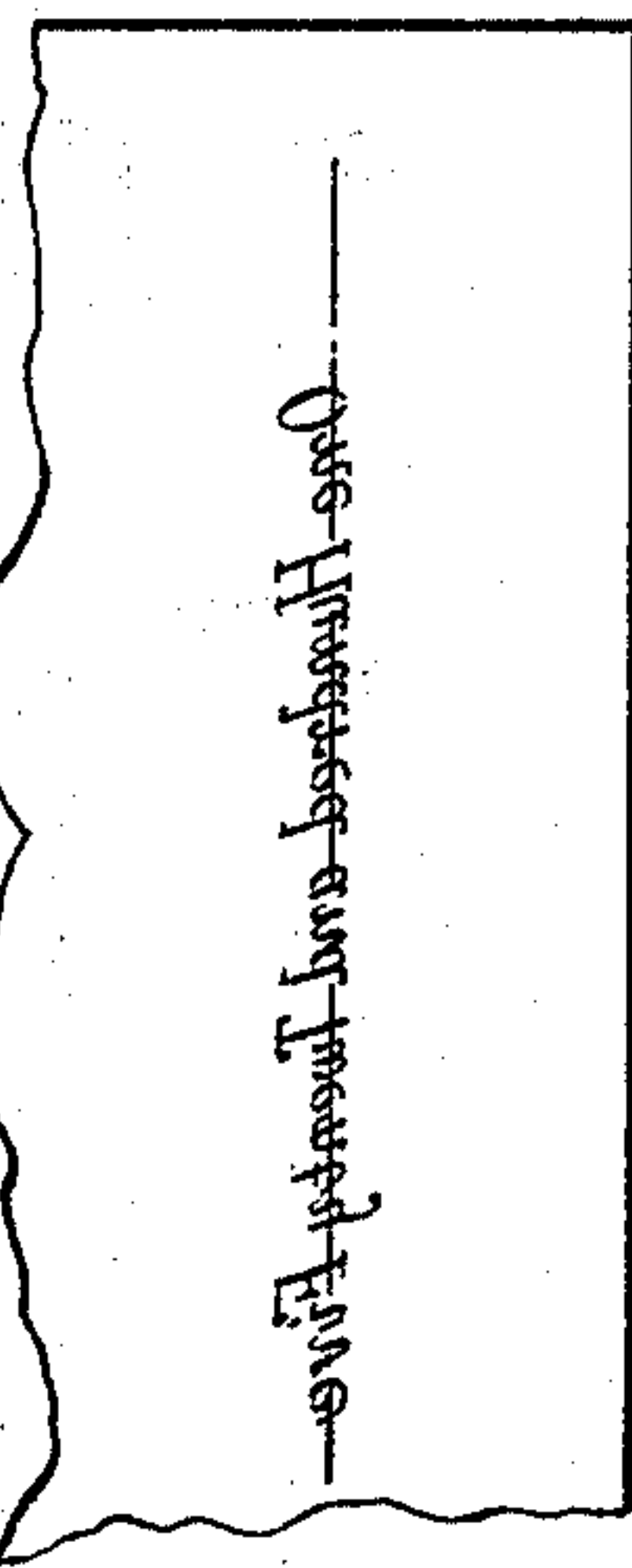


Fig. 10.



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UNITED STATES PATENT OFFICE.

ELLSWORTH GRIFFIN, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO WALTER W. POLLOCK, OF SAME PLACE.

WRITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 518,499, dated April 17, 1894.

Application filed February 12, 1892. Serial No. 421,273. (No model.)

To all whom it may concern:

Be it known that I, ELLSWORTH GRIFFIN, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Writing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its primary object to facilitate the making out of bank-checks, or analogous orders, as well as to guard against the raising of such orders; and to this end the said invention consists in certain peculiarities of construction and combination of parts to be hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings: Figure 1 represents a vertical longitudinal section of a machine constructed according to my invention, certain of the parts being in elevation; Fig. 2, a vertical transverse section of the machine with certain of the parts in elevation; Fig. 3, a plan view of a portion of said machine; Fig. 4, a perspective view illustrating a spacing and printing mechanism forming part of my invention; Figs. 5 and 6 detail elevations illustrating certain parts of the spacing mechanism; Fig. 7, a detail horizontal section taken on line 7—7 of Fig. 1. Figs. 8 and 8^a, are diagrams illustrating the scheme and operation of the printing characters employed in the machine illustrated by the preceding figures, and Figs. 9 to 11 inclusive are views that respectively represent a face, back, and section of a bank-check filled out on the aforesaid machine.

Referring by letter to the drawings, A represents the base of my machine and fast on this base are suitable standards B that serve as supports for a circular track C, the latter being rigidly secured to the standards by any suitable means. The base A is also shown as provided with a center-post D having a screw-threaded lower end *b* run down through a correspondingly threaded nipple *c*, on said base, to engage a set-nut *d*, whereby an annular shoulder or flange *e*, on the post is brought and held against the upper side of the aforesaid

base, but any other suitable means may be employed to rigidly secure said post in place. The upper end of the center-post D is shown in the form of a conical bearing *f* for engagement with a socket *g* that depends from the center of a circular shell E, and in order to compensate for wear, said bearing may constitute a vertically adjustable section of said post.

By dotted lines in Fig. 1, I have shown the upper, or conical, section *f* of the post as having a screw-threaded socket-connection with the adjacent section, and in this instance a set-screw *h* is employed to retain the first of these post-sections in the position to which it may be vertically adjusted, but I do not wish to be understood as limiting myself to the exact construction shown and described, as means for compensating for wear on certain parts of the machine.

The shell E is shown as provided with a circumferential right-angle flange *i*, and the lower edge of the vertical portion of this flange engages a corresponding groove in the circular track C, above described, the engaging flange-edge and track-groove being preferably V-shaped in cross-section to increase the bearing surface between the two. The flange *i* of the shell E is provided with a series of guides *j* arranged at suitable intervals apart, and loose in these guides are a corresponding series of pins F having shouldered lower ends in the form of knobs *k* for individual engagement with a single corresponding recess *m* in the circular track C to hold said shell against rotation on its bearing. Each of the stop-pins F is provided with a flange *n* adjacent to its upper end, and a spiral spring *p* is interposed between this flange and the guide for said pin. By the expansive force of the springs *p* the stop-pins F are automatically held up in their guides *j* clear of the circular track C, the upward movement of said pins being limited by their shouldered lower ends coming into contact with the under side of the shell-flange *i* above described.

Arranged within the shell E are upper and lower guides *r* for a series of vertical bars G that form the shanks of a corresponding series of die-blocks H, each of the latter being

faced with a design representing an arbitrarily selected number, letter, syllable or word, and for the sake of convenience in description the bars and die-blocks are sometimes
 5 taken collectively and included under the general term "type bars." Stops *s* are arranged on the type-bars between the guides for the same, and these stops are of variable length for the purpose hereinafter described.
 10 Each type-bar has its upper end provided with a head *t* and this head opposes a spiral-spring *I* supported on the upper one of the guides for said type-bar, the latter being limited as to movement, in either direction, by
 15 means of its stops *s* coming into contact with one or the other of said guides. The type-bars correspond in number to the pins *F*, above described, and each of the latter is relative to one of the former. Each of the
 20 pins *F* is designated by a representation of the number, letter, syllable or word on its relative type-bar, and these arbitrary designations are preferably indexed on the shell *E*, as clearly illustrated in Fig. 3. The recess
 25 *m* in the circular track *C* is arranged to come immediately in front of the operator of the machine, and to bring any one of the type bars in line therewith, the relative one of the pins *F* is pressed upon and the
 30 shell *E* swung around until automatically stopped by the drop of said pin, under pressure, into said recess, whereby said type-bar is positioned over a platen *J* and under an impact device in the form of a lever *K* that is
 35 provided with a fulcrum-pin *U* arranged in bearings on an arm *L*, the latter being sleeved onto the post *D* and made fast thereto by a set-screw *v* or other suitable means. The platen *J* is preferably a polygonal block trun-
 40 nioned in standards *w* on the base *A*, and I prefer to cover said platen with an inking-ribbon *x*, for the purpose hereinafter described. The platen is positioned so as to have any one of its faces register with a slot
 45 in a paper-support *M* that is mounted on the base *A* and said platen is turned on its trunnions from time to time to bring a new portion of the ribbon uppermost.

Attached to the arm *L* is a support *N* for
 50 another ribbon *P*, arranged above the platen *J*, and the lever *K* fulcrumed to said arm is connected, by means of a link *Q*, with a hand-lever *R*, the fulcrum for the latter being a supporting device *y* on the base *A* of the ma-
 55 chine. The block *J*, when covered with the ribbon *x* becomes an inking platen, while at the same time this platen and the inking ribbon *P* constitute what is hereinafter termed a duplex inking mechanism. A flat-spring *S*
 60 opposed to the hand-lever *R*, acts to automatically return the same to its normal position, and pivotally connected to the link *Q* is one end of another lever *T* that is fulcrumed in a support *z* on the machine-base *A*
 65 the other end of this lever being slotted or forked, as illustrated in Figs. 5 and 6, to en-

gage a lug *c'* extended laterally from an arm *V'* loose on a shaft *V*, the latter being arranged in bearings *d'* on said base.

Pivotaly connected to the loose arm *V'* is
 70 a gravity pawl *W* that engages a ratchet wheel *X* fast on the shaft *V*, and a preferably corrugated roller *Z* is also fast on said shaft in opposition to a spring-controlled pressure-roller *A'* loose in a frame *e'* that forms part
 75 of one of the bearings for the aforesaid shaft. A spring-controlled detent *b'* employed to lock the ratchet-wheel *x* against reverse movement is best illustrated in Fig. 6.

Movable on the paper-support *M* in rear of
 80 the platen is a gage *B'* having a slotted right-angle shank *f'* adjustable on the base *A*, a set-screw *g'* being employed to hold said gage-shank in its adjusted position. The gage be-
 85 ing adjusted to stand the proper distance from the platen the bank-checks or other money orders are successively laid upon the support to extend between the rollers *A'*, *Z*, and have the line or space on which the
 90 amounts are written come immediately over the platen of the machine.

By a suitable scheme of printing characters, the machine may be organized to print the designations of any amount from one up-
 95 ward, the machine shown being organized to print amounts in numerals and letters from one to nine hundred ninety nine thousand nine hundred ninety nine inclusive, the type
 100 scheme consisting of representations of the Arabic notation 1 to 0 inclusive, the words one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, syllables thir, for, fif, teen, twen, ty, hund, red, thous, and, eigh, and the character $\frac{\text{ }}{00}$, the last two type be-
 105 ing shown in the diagram view, Fig. 8.

If numerals designating the amount of a check or order are to be printed, the gage *B'* is set so that, as a blank form is positioned on the machine, the space for said numerals
 110 will come immediately over the platen, to receive the impact of the type representing said numerals. However in practice, it may be preferable to write the numerals, as a guide for the operator of the machine in filling out
 115 the body of the check or order with the amount expressed in words.

To express the amount of a check or order in printed words, the gage *B'* is adjusted to permit the proper line or space on said check or order to align over the platen. A blank
 120 form being positioned on the support *M*, the operator swings the shell *E* on its pivot, as above described, to bring the desired type-bars into successive register with the platen, and as each of these type-bars is brought
 125 over the printing point the hand-lever *R* is actuated to cause an upward movement of the link *Q* and consequent push of the lever *K* upon said type-bar, thereby causing an impact of the same against said platen, inter-
 130 posed ribbons and blank-form. The impact of the type-bar and the arrangement of the

ribbons cause the desired character to print on both sides of the form at the same time and this form is embossed to a greater or less extent as may be desired, according to the force with which said type-bar is impacted. The printing and embossing are clearly illustrated in Figs. 9 to 11 inclusive, and by printing on both sides of the form and embossing the latter, I guard against raising of the denominations thereon.

As previously stated, the stops *s* on the type-bars are variable as to length, and the length of each is such that its movement in either direction is proportionate to the surface length of its printing face, whereby I provide for correct spacing, through the medium of the pawl-and-ratchet mechanism above described in connection with the feed rollers *A'*, *Z*, for the blank forms. For instance, the word "Twelve" has a stop of such length as will permit of a movement proportionate to the total of eight spaces, of equal arbitrary length, as indicated by dotted lines in the diagram Fig. 8, two spaces being allowed for the capital letter beginning the word, five for the remaining letters in said word and one for the distance designed to come between the word and its predecessor, or successor. The matter of provision for spacing before or after a word is one of preference in the organization of the machine, but the type representing suffix syllables are always so cut as to join flush with a preceding word or syllable. When a type-bar is impacted, the lever *T* is tilted on its fulcrum in a direction to permit of the pawl *W* slipping past as many of the teeth on the ratchet-wheel *X* as correspond to the number of spaces occupied by the numeral, letter, syllable or word to be printed, the distance between each two of said teeth being equal to that included in one of said arbitrary spaces. The printing, by a type-bar having been effected, the hand-lever, *R*, is released, and automatically returned to its normal position, by the power of its spring. By this return movement of the hand-lever, the lever *T* is actuated to cause the pawl *W* to operate the ratchet-wheel *X*, whereby the roller *Z* is partially rotated and the form on support *M* automatically moved a distance equal to the total of the spaces corresponding in number to that of the teeth, on said ratchet-wheel, over which said pawl has previously slipped, and thus said form is positioned for the impact of another type-bar. In the meantime the first type-bar is returned to its normal position by the expansion of the surrounding spring *I*, the latter having been previously compressed by the downward movement of said type-bar.

I have illustrated a bank-check calling for one hundred and twenty five dollars, and to print the words representing this amount, the type-bars for "one," "hund" "red" "and" "twen" "ty" "five" would be successively

brought to the printing point by the proper adjustment of the rotative shell *E*, the hand-lever *R* being operated to cause an impact of said type-bars and automatic movement of the check-form necessary to the proper spacing of the type-written matter thereon. If the check is to call for the fraction of a dollar and the form is provided with a " $\frac{100}{100}$ " mark, as is sometimes the case, the hand lever *R* is actuated to operate the pawl-and-ratchet spacing-mechanism until said mark is brought to the printing point, after which the type-bars corresponding to the numerator of the fraction are brought to said printing point and impacted as above described, the numeral type in the present machine being so positioned as to print a certain space above the line for the amount expressed by words. If the check form be not provided with the " $\frac{100}{100}$ " mark I employ the type-bar designed to print the character " $\frac{\quad}{00}$ " this type-bar being impacted after those necessary to express the numerator of the fraction.

By the employment of a machine such as I have described, the making out of bank-checks and other money-orders in large numbers for various amounts is materially facilitated inasmuch as the designating of said amounts is purely mechanical and very rapidly performed in comparison to the doing of the same work by pen and ink, or by type-writing machines of the ordinary construction.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A writing-machine having movable type of different reading lengths, suitable means for impacting the type at a common printing point, other suitable means for regulating the travel of each type in proportion to its reading length, a paper support, and a variable spacing-mechanism cooperative with the type, substantially as set forth.

2. A writing-machine having movable type of different reading lengths, suitable means for regulating the travel of each type in proportion to its reading length, a paper support and feed-rollers, a pawl-and-ratchet mechanism governing the movement of the feed-rollers, a platen, an impact device for the type at a common printing point, and a lever-mechanism controlling the pawl-and-ratchet mechanism and impact device, substantially as set forth.

3. A writing-machine having movable type certain of which express an assemblage of letters forming syllables and words, suitable means for impacting the type at a common printing point, stops arranged to regulate the travel of each type in proportion to its reading length, a variable spacing mechanism cooperative with the type, a paper support, and a platen, substantially as set forth.

4. A writing machine having a pivotal shell, a series of type that are movable on the shell and having different reading lengths, suit-

able means for regulating the travel of each type in proportion to its reading length, an impacting-mechanism for the type, a variable spacing-mechanism cooperative with said type, a paper support, and a platen, substantially as set forth.

5. A writing-machine having a horizontal circular track recessed at a certain point, a vertical center post provided with an adjustable section in the form of a bearing, a rotative shell supported on the bearing and provided with a flange movable on the track, spring-controlled stop-pins carried on the flange, a series of type-bars loose on the shell, an impacting-mechanism for the type-bars, suitable mechanism for automatically returning said type-bars to their normal position after impact, a paper support, and a platen, substantially as set forth.

6. A writing-machine having a center-post provided with an arm, a shell having pivotal connection with the post and carrying vertically reciprocative type-bars, an impact-lever fulcrumed on the post-arm and positioned to come over any type-bar brought to the printing point, a hand-lever linked to the impact-lever, a pair of feed-rollers one of which is provided with a ratchet, another lever controlled by the link connecting those aforesaid,

and a pawl connected to the latter lever and positioned to engage said ratchet, a paper support, and a platen, substantially as set forth.

7. A writing machine for designating on bank-checks or analogous orders in numerals and letters any amount from one to nine hundred ninety nine thousand nine hundred ninety nine inclusive, the same comprising a series of movable type-embraced in a scheme that essentially consists of the ten characters of the arabic notation, words one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve; syllables thir, for, fif, teen, twen, hund, ty, red, thous, eigh, and the character $\frac{1}{100}$; suitable means for impacting the type at a common printing point, other suitable means for regulating the travel of each type in proportion to its reading length, a paper-support, and a variable spacing mechanism co-operative with the type, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

ELLSWORTH GRIFFIN.

Witnesses:

N. E. OLIPHANT,
JOHN E. WILES.