

(No Model.)

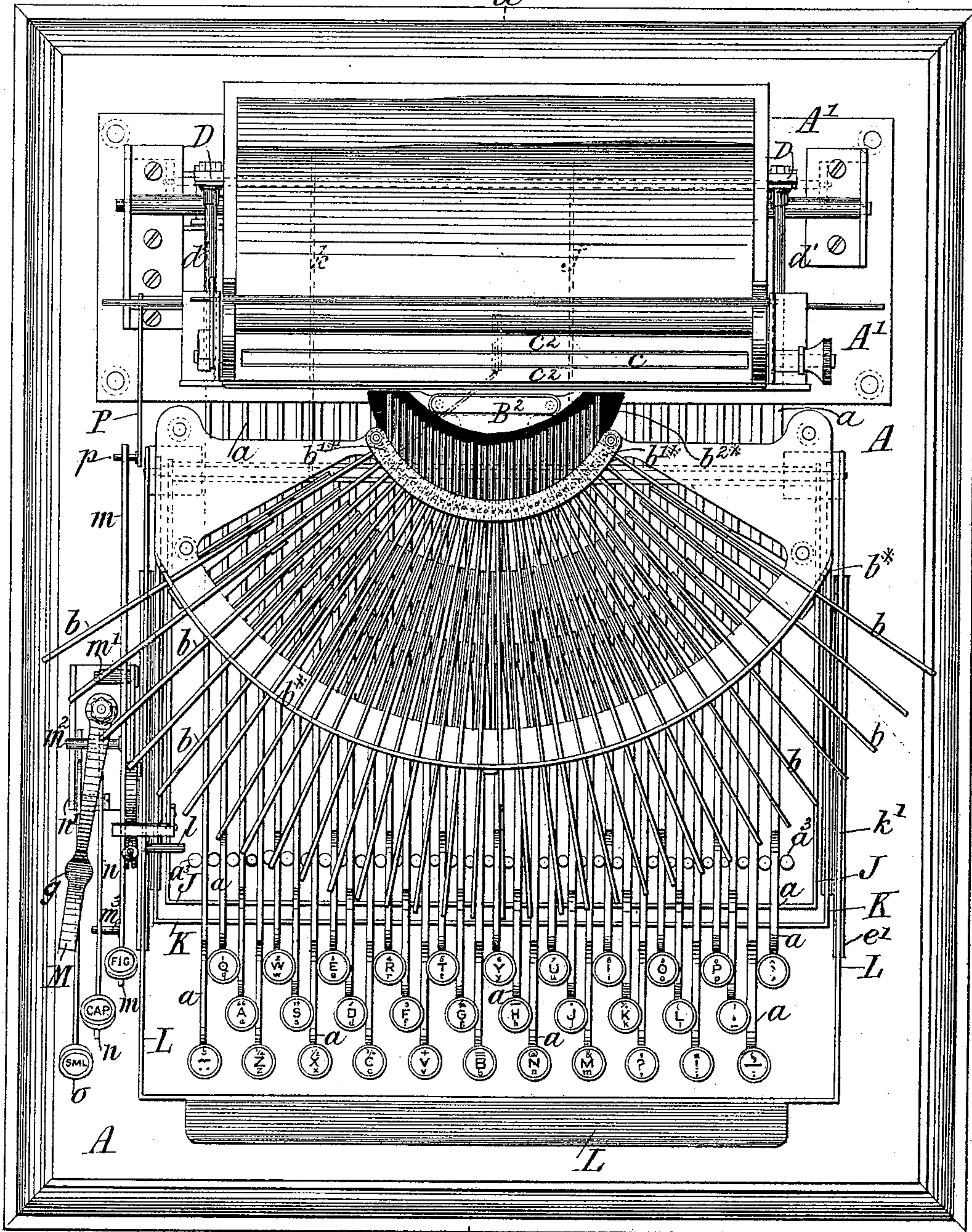
8 Sheets—Sheet 1.

J. N. MASKELYNE & J. N. MASKELYNE, Jr.
TYPE WRITING MACHINE.

No. 457,903.

Patented Aug. 18, 1891.

Fig. 1.



Witnesses:
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Kate C. Pemberton

Inventors;
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John Neil Maskelyne Jr.
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Rowland T. Griswold

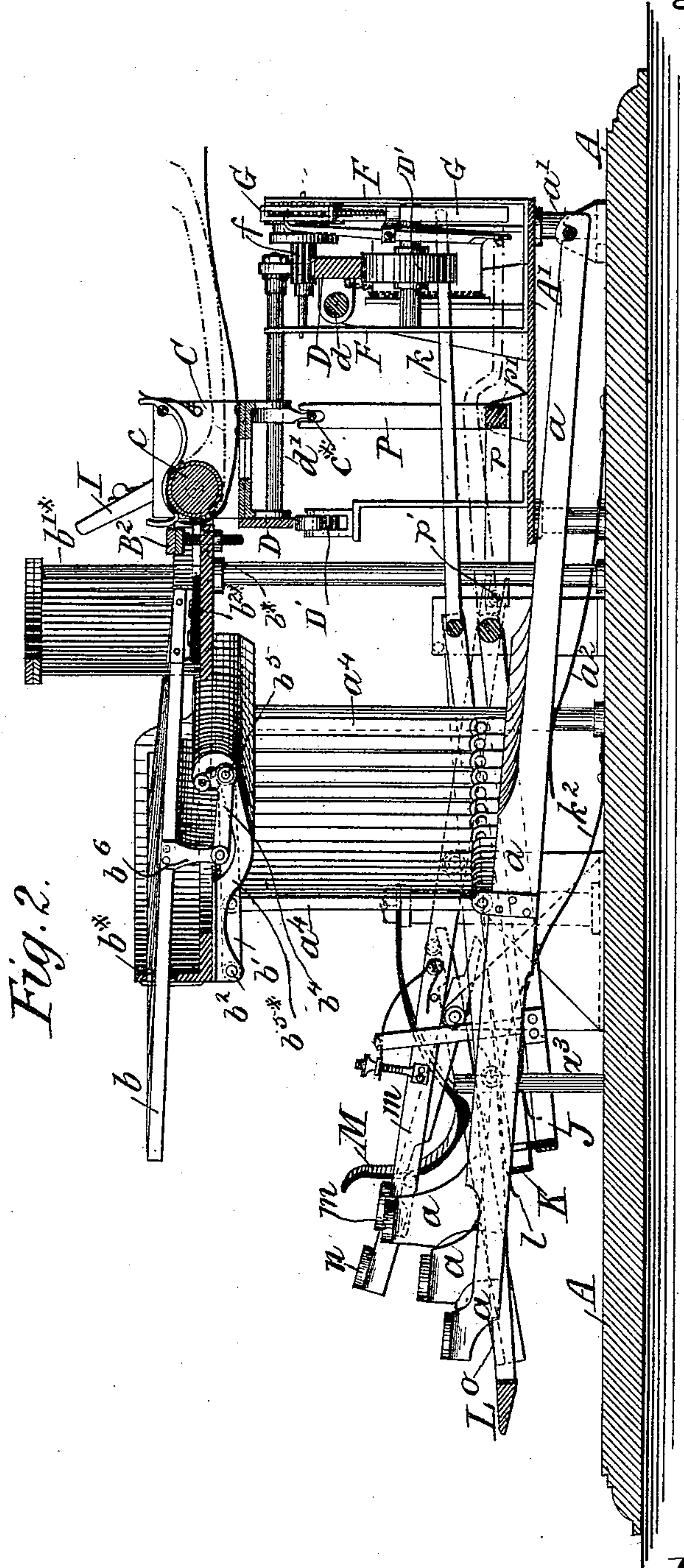
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8 Sheets—Sheet 2.

J. N. MASKELYNE & J. N. MASKELYNE, Jr.
TYPE WRITING MACHINE.

No. 457,903.

Patented Aug. 18, 1891.



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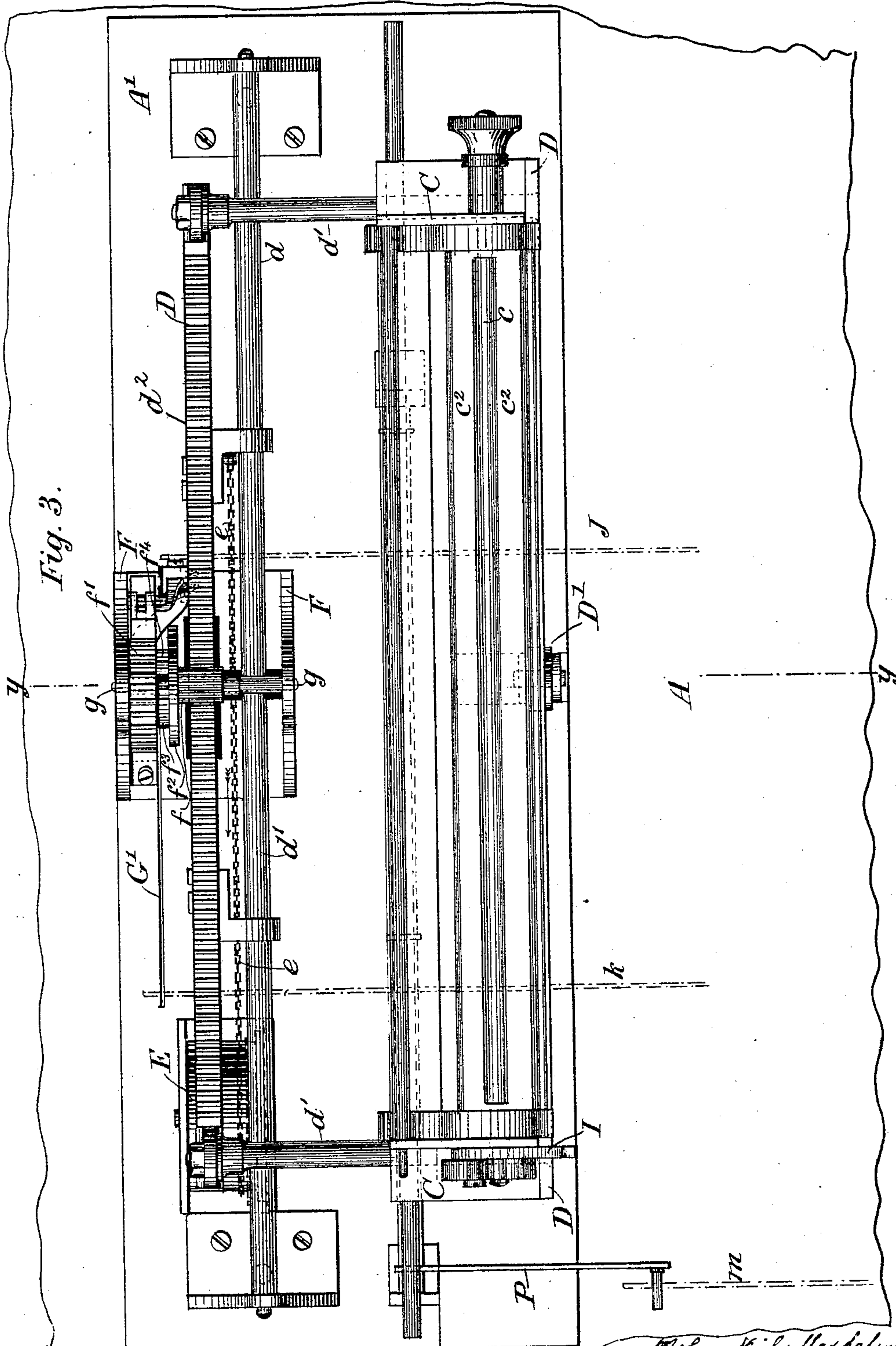
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8 Sheets—Sheet 3.

J. N. MASKELYNE & J. N. MASKELYNE, Jr.
TYPE WRITING MACHINE.

No. 457,903.

Patented Aug. 18, 1891.



John B. Tucker } Witnesses;
Kate S. Pemberton }

Inventory

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John Kirk Max Schyne jun
Esq Attorneys
Brown & Griswold

(No Model.)

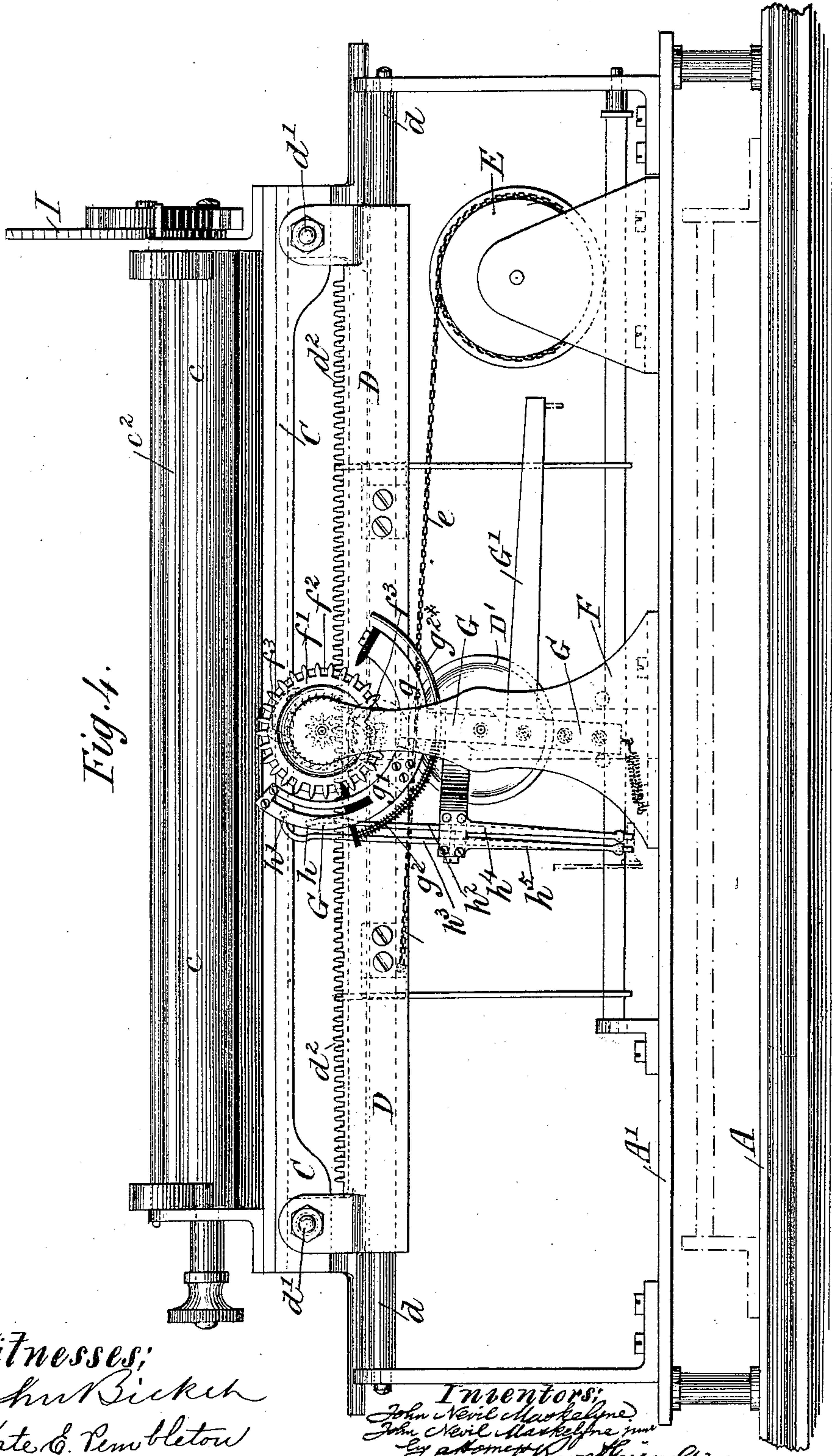
8 Sheets—Sheet 4.

J. N. MASKELYNE & J. N. MASKELYNE, Jr.

TYPE WRITING MACHINE.

No. 457,903.

Patented Aug. 18, 1891.



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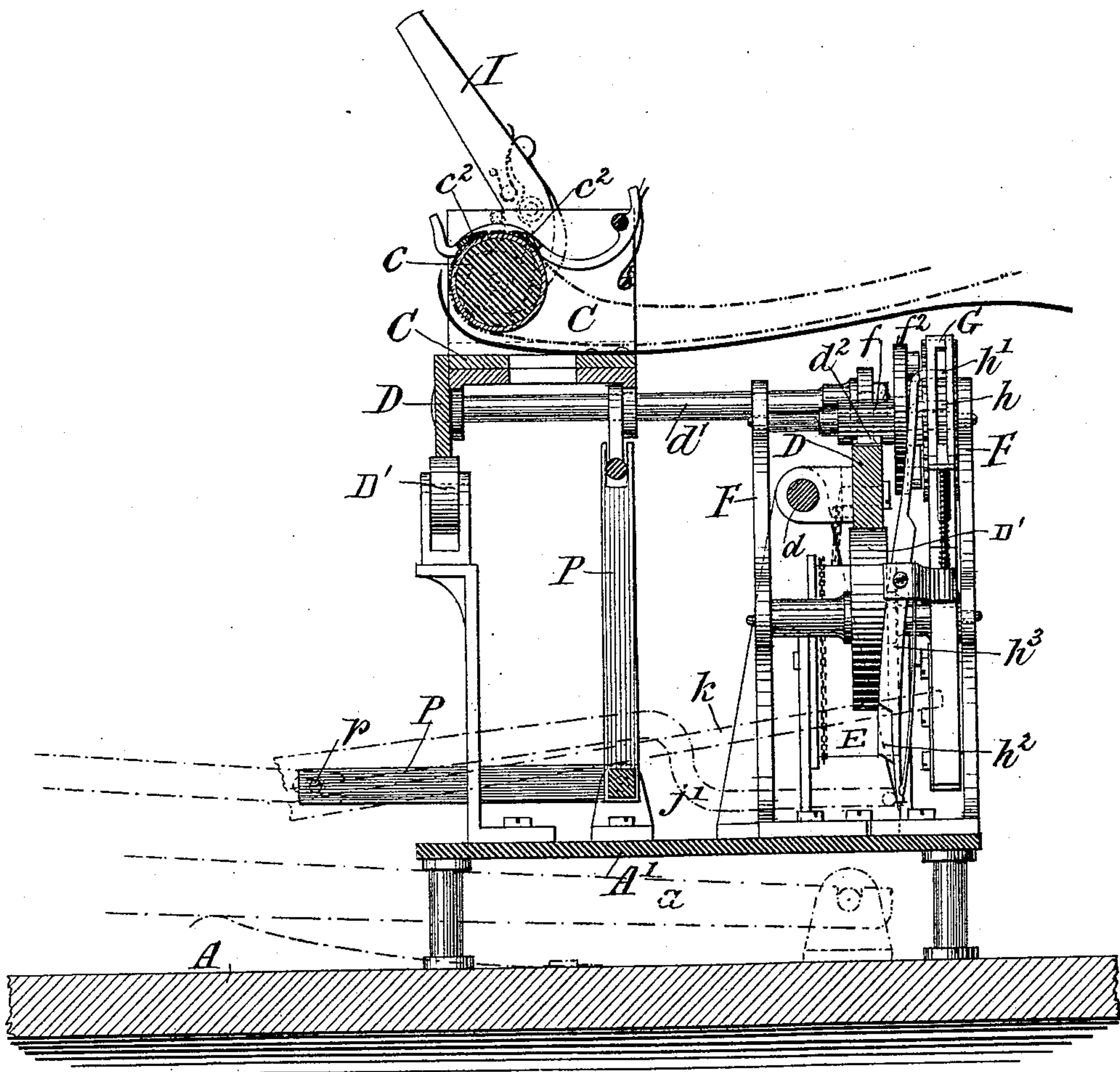
Inventors;
John Veril Markelbne.
John Veril Markelbne jun
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8 Sheets—Sheet 5.

No. 457,903.

Patented Aug. 18, 1891.

Fig. 5.



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(No Model.)

8 Sheets—Sheet 6.

J. N. MASKELYNE & J. N. MASKELYNE, Jr.
TYPE WRITING MACHINE.

No. 457,903.

Patented Aug. 18, 1891.

Fig. 6.

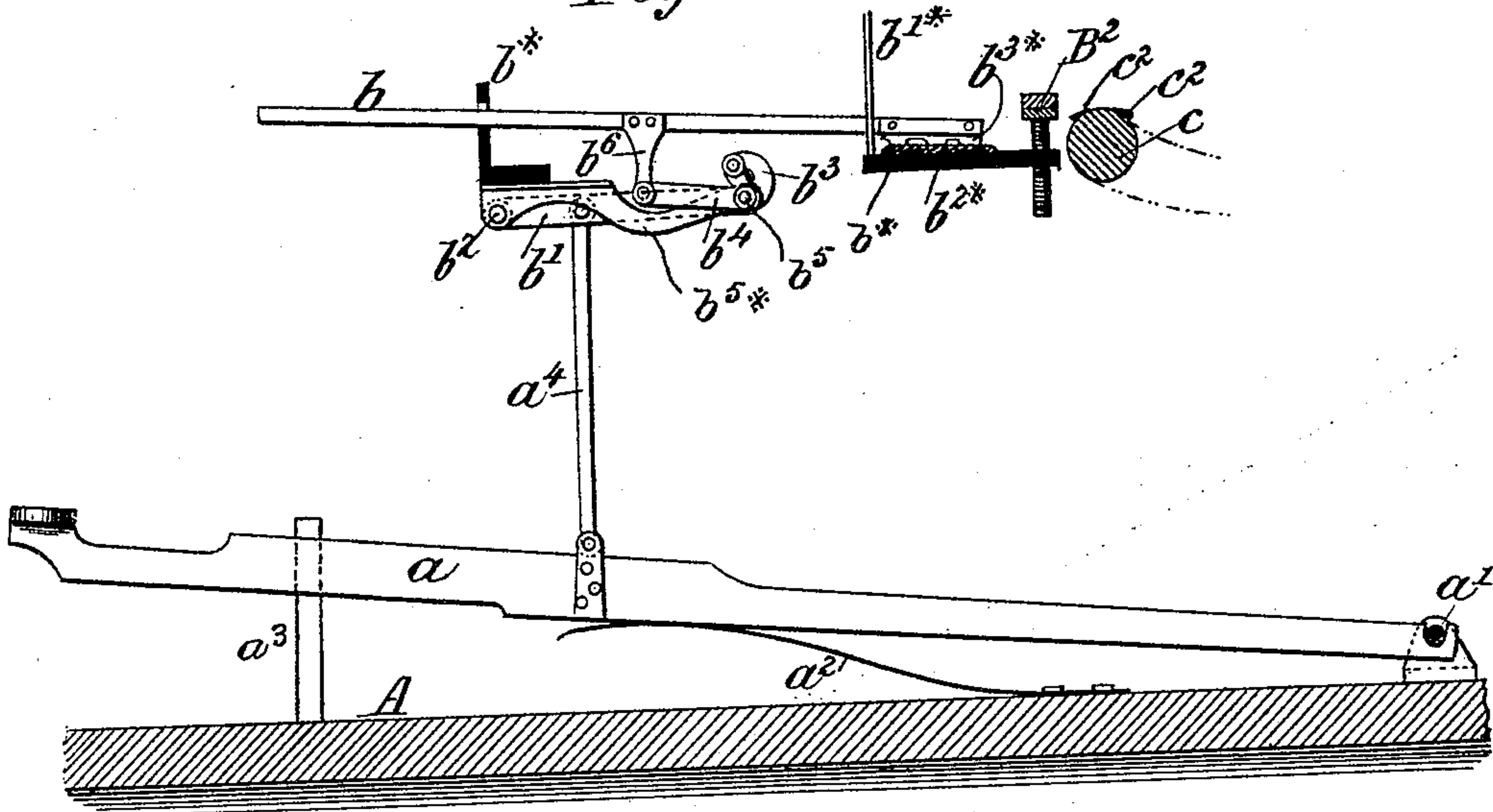


Fig. 7.

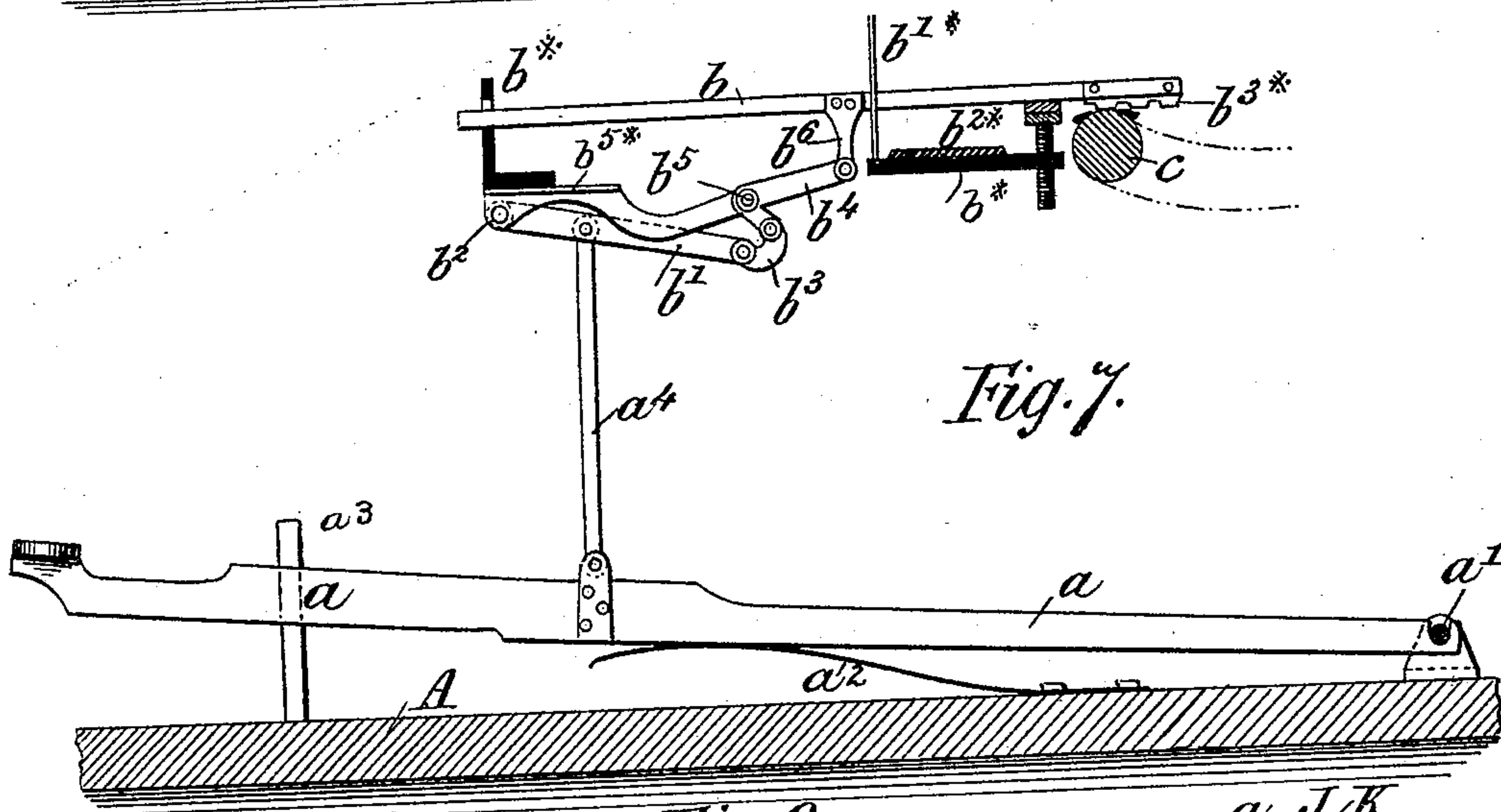
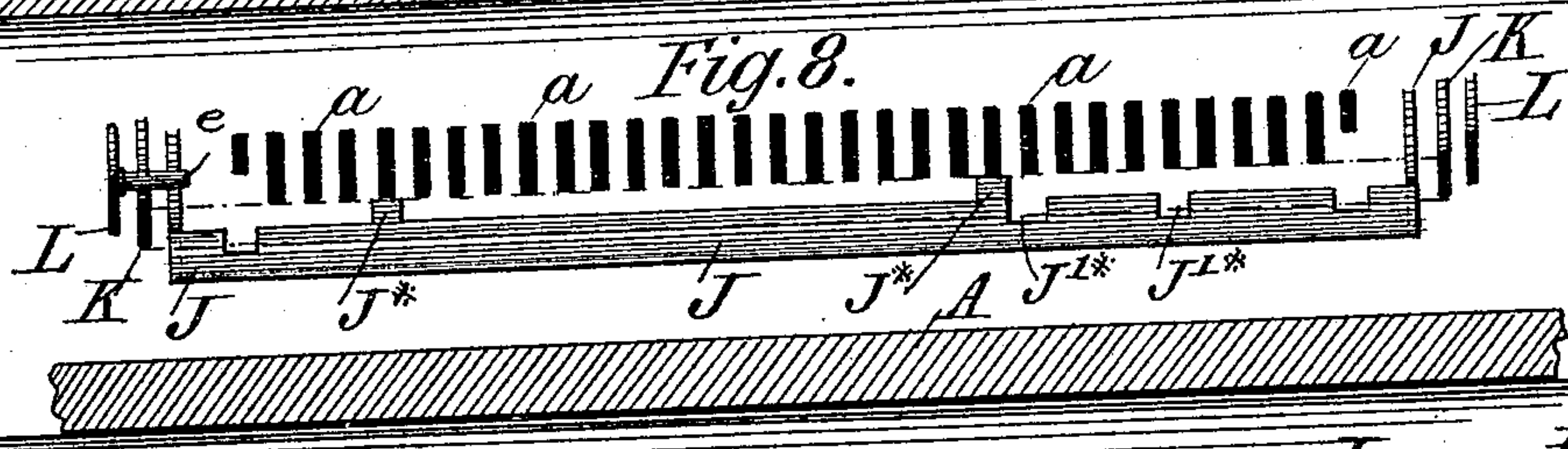


Fig. 8.



Witnesses

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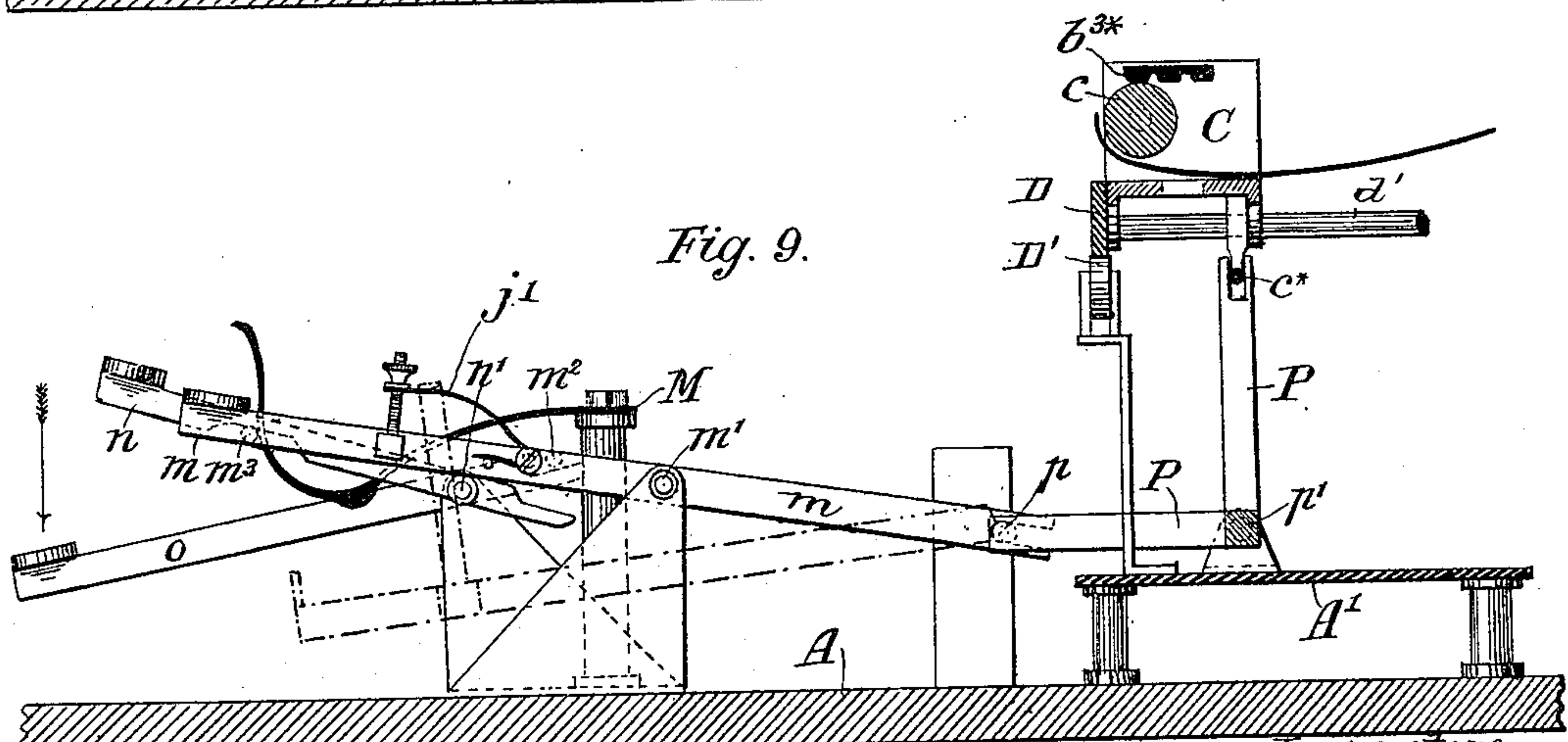
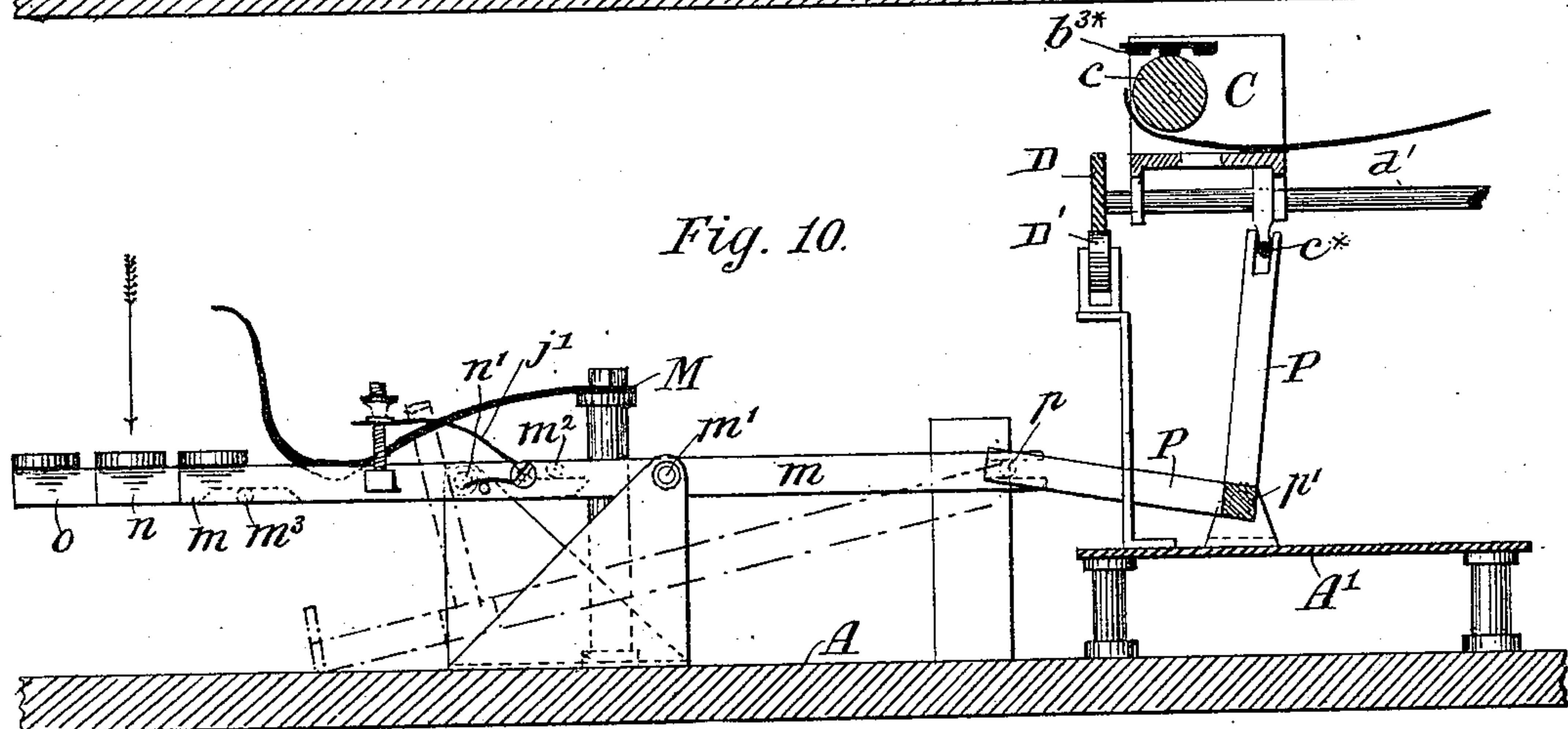
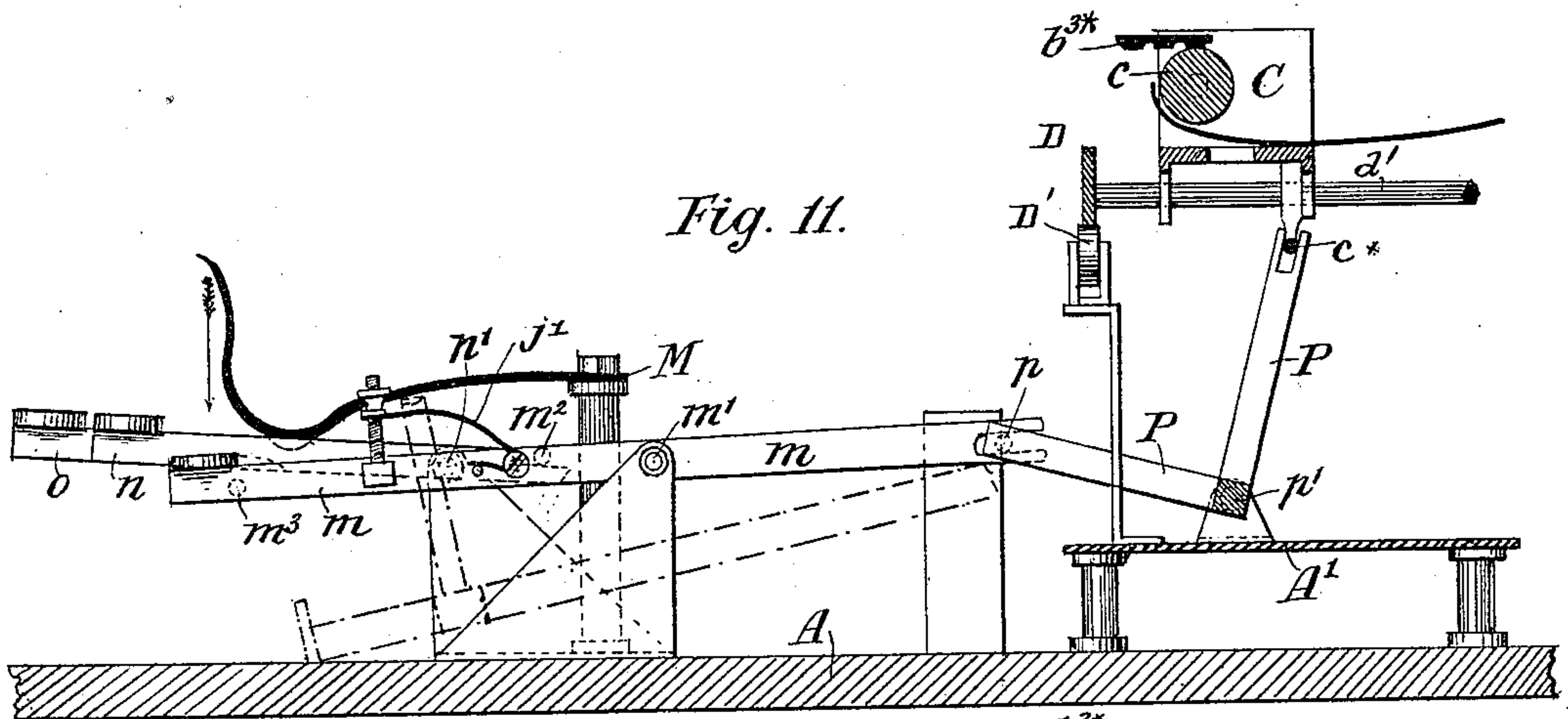
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J. N. MASKELYNE & J. N. MASKELYNE, Jr.
TYPE WRITING MACHINE.

No. 457,903.

Patented Aug. 18, 1891.



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(No Model.)

8 Sheets—Sheet 8.

J. N. MASKELYNE & J. N. MASKELYNE, Jr.
TYPE WRITING MACHINE.

No. 457,903.

Patented Aug. 18, 1891.

Fig. 14

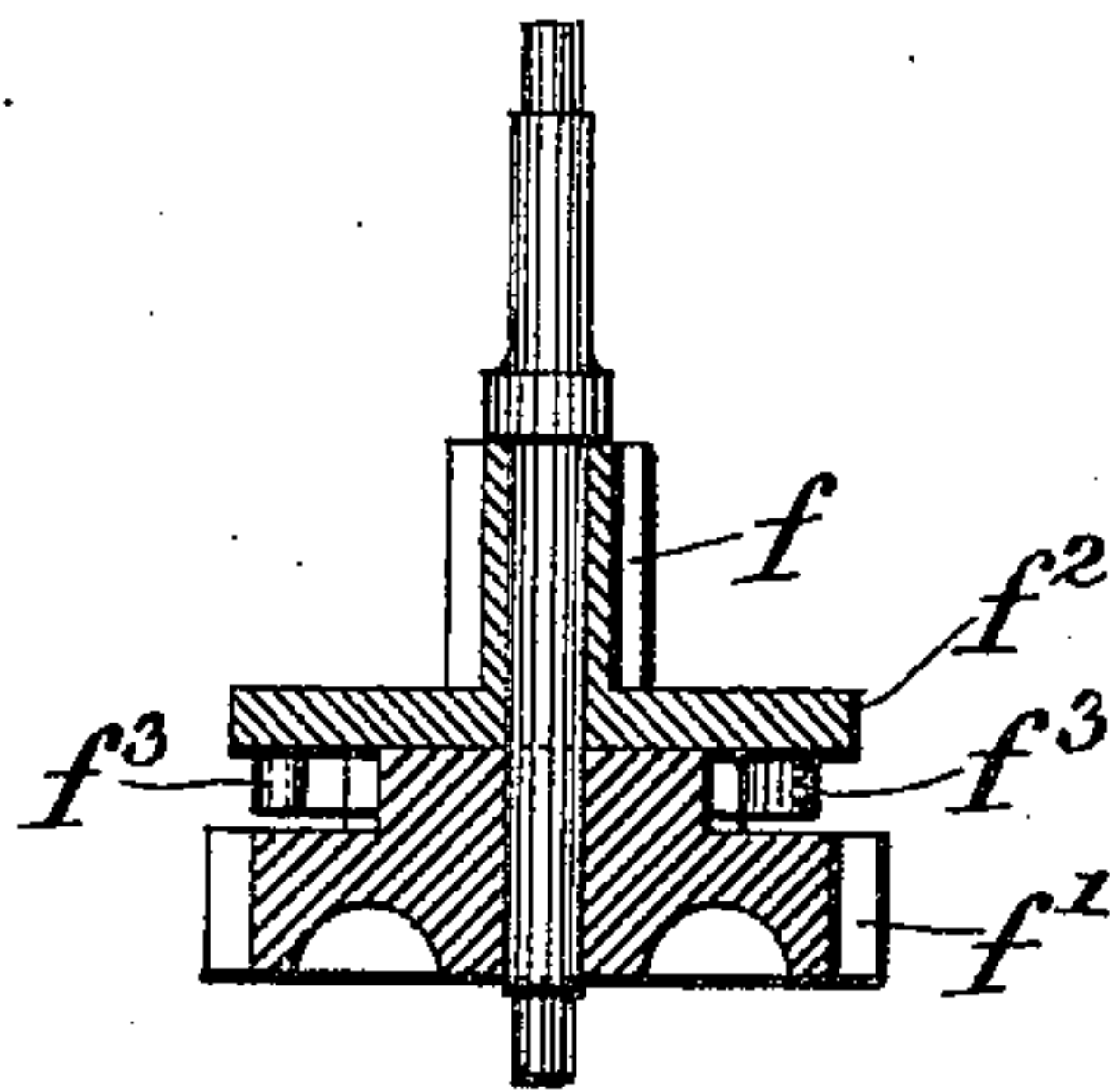


Fig. 13

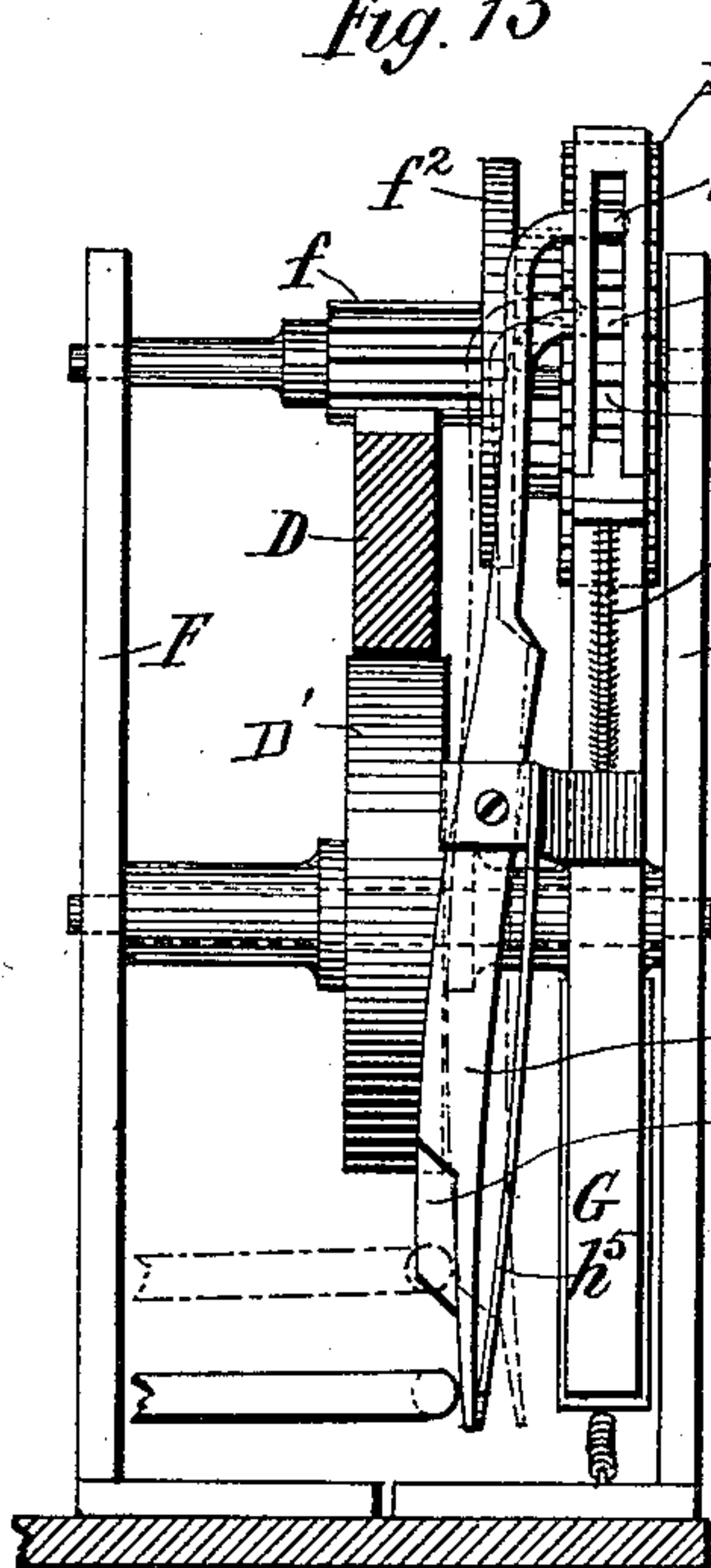
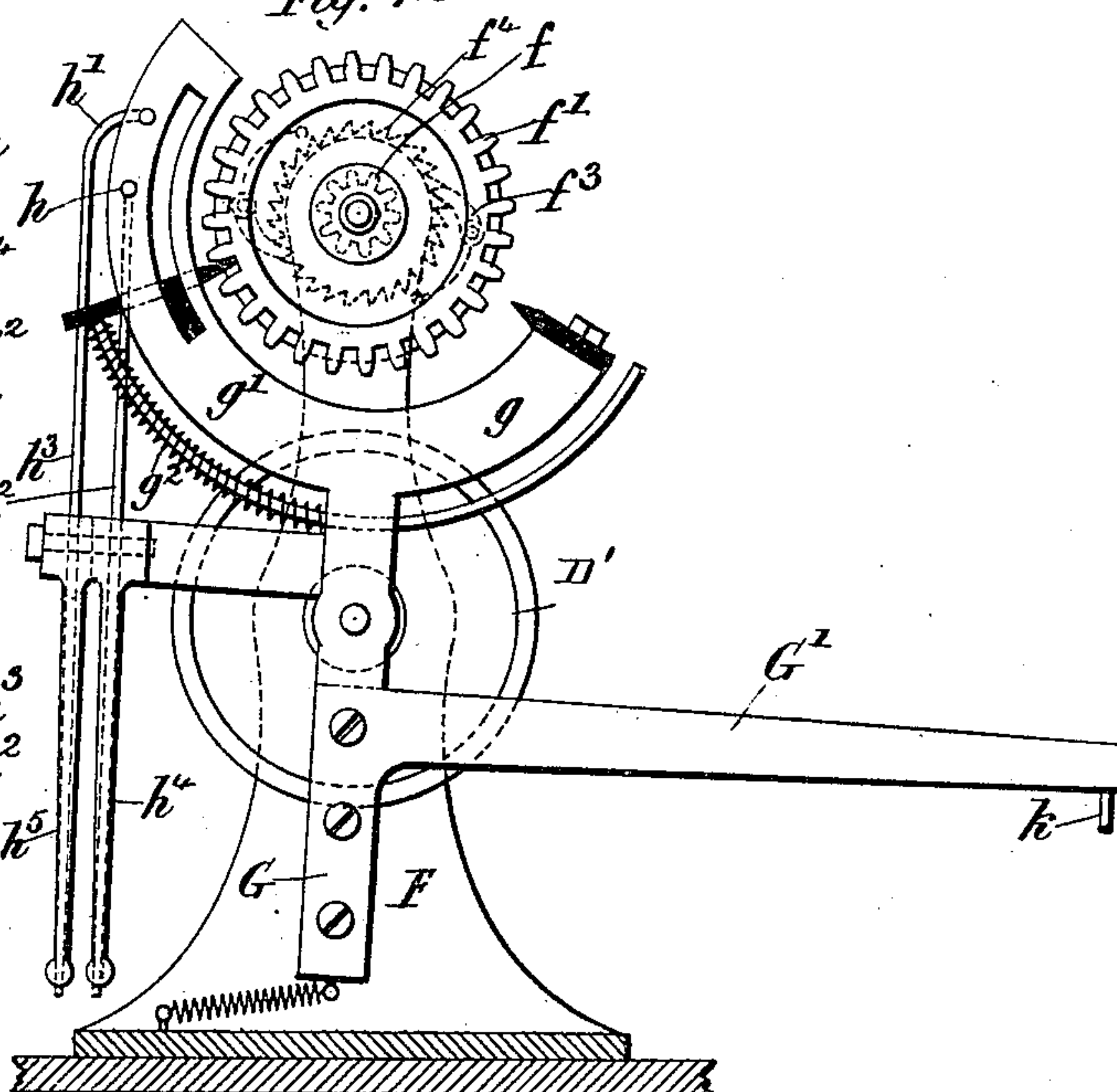


Fig. 12



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Olundgren

Inventors:

John Nevil Maskelyne

John Nevil Maskelyne, Jr.

by their attorneys

Rowntree & Griswold

UNITED STATES PATENT OFFICE.

JOHN NEVIL MASKELYNE AND JOHN NEVIL MASKELYNE, JR., OF LONDON,
ENGLAND.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,903, dated August 18, 1891.

Application filed July 24, 1889. Serial No. 318,507. (No model.)

To all whom it may concern:

Be it known that we, JOHN NEVIL MASKELYNE and JOHN NEVIL MASKELYNE, Jr., both of the Egyptian Hall, Piccadilly, London, in the county of Middlesex, England, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification.

This invention relates to an improvement in type-writing machines with the view to remedy many defects which are now apparent in the machines at present before the public. Each type-lever is preferably furnished with three characters or types—for instance, a capital, a small letter, and a numeral—and to enable these severally to operate as required the carriage whereon the paper is held is either advanced or retired lengthwise of the machine. Besides this backward and forward movement the paper-carriage has a traveling movement in the direction of the line of writing, the traveling from right to left during the writing being effected automatically by a spring-drum controlled by the spacing-escapement, and the travel in the other direction for moving the paper-carriage back to begin a new line is effected by a hand-lever-operating pawl-and-ratchet mechanism.

The machine consists of a base plate or table whereon the keys for operating the type are pivoted. This base-plate carries also another and smaller plate, upon which is mounted the escapement and other mechanism connected with the spacing and the traveling of the carriage. The guides for the traveling carriage are also arranged on this plate. Pivoted alongside the type-keys are levers, by means of which the change from large to small letters, or vice versa, or to figures, is effected. Pivoted also to brackets carried upon the main base-plate are frames, three in number, by means of which automatic spacing between the letters (and other spacing which is from time to time requisite and is effected by hand) is performed. These frames are situated one within the other, the front bars of the inner and middle frames lying below the keys, so as to come into contact therewith when the keys are depressed, one of the bars being notched here and there, where required, to escape contact. The outer

frame is arranged to depress the other two, and by this means the full spacing between the words, for instance, is effected. The type-keys, preferably thirty-two in number, are supported by springs and rise and fall between suitable guides. Each key is connected by link mechanism to one of a series of rods which carry the type. These type-rods pass through guides which permit of a considerable tipping or rising movement at the end which carries the type, followed by an advance movement, so as to lift the type from the inking-pad and press it onto the paper to be printed, from whence it is returned by the spring below the key. The type-rods are set radially in a segment of a circle, in order that the impress of all the types may be at a given spot, as in type-writers generally. This will necessitate, in order to bring the writing uniform, setting the type on one side of the machine at varying inclinations to the line of the type-rods in one direction, while on the opposite side of the machine the varying inclinations will be in the opposite direction, the central type-rods having their type with but little inclination either way. The paper to receive the printing lies upon a curved plate, and is passed beneath and around a rubber-coated roller, upon which it is held by a pair of metal strips, between which strips the blow of the type falls. The levers for moving the paper-carriage backward and forward to receive the proper character desired to be printed are three in number, suitably pivoted on the base-plate near the front of the machine. The tail of one of these levers is connected with a bell-crank lever, the rocking of which advances or retires the carriage, as required. The other two levers are in connection with the first, and are so arranged that by their depression or otherwise the rocking of the first lever is controlled, so as to limit the movement of the carriage. A spring is provided, by means of which any one of these levers can be held depressed and the machine set to print in a uniform character, to be varied only when required by shifting the spring or by depressing one of the other levers by hand.

In the accompanying drawings, Figure 1 is a plan view of the machine. Fig. 2 is a lon-

itudinal section on the line $x x$ of Fig. 1. Fig. 3 is a plan view, drawn on an enlarged scale, of the paper-roller and its mechanism, the paper-shelf being removed the better to show the underlying parts. Fig. 4 is a back elevation, and Fig. 5 a section, on the line $y y$ of Fig. 3. Figs. 6 and 7 are detail views of the keys, type-rods, and connecting-links, shown detached and in two positions, Fig. 6 showing the type in the normal position, and Fig. 7 in the position taken when the key is depressed to print. Fig. 8 is a cross-section of the key-levers, showing also the front bar of the inner frame. Figs. 9, 10, and 11 show detached and in three positions the operating parts connected with the shifting of the paper-carriage. Figs. 12 and 13 are back and side views of the escapement enlarged; and Fig. 14 is a sectional plan of the escapement-wheel, ratchet-disk, and pinion.

Similar letters of reference indicate similar parts throughout.

A is a bed-plate, and b^* a smaller plate secured above the plate A by suitable standards. a (see Fig. 1) are the keys for operating the printing-type, the depression of which will cause the printing of one of the characters or symbols with which each is provided. The keys a are pivoted at a' , as seen best at Figs. 6 and 7, to the bed-plate A and supported from below by springs.

$a^2 a^3$ are guide-rods for the keys a .

a^4 are link-rods, pivoted to the keys a and forming part of the link mechanism between the keys a and the type-rods b , by which mechanism the latter are operated. This mechanism, which is best shown in Figs. 6 and 7, consists of, besides the rod a^4 , the lever b' , pivoted near the middle of its length to the end of the link a^4 . One end of the lever b' is fulcrumed at b^2 to the fixed top plate b^* , while the other is pivoted to the link-piece b^3 , which is itself pivoted to the tail of the bell-crank lever b^4 . The lever b^4 has its fulcrum b^5 on the fixed bracket b^{5*} , which is secured under the plate b^* , and the said lever is pivoted to the bracket b^6 on the type-rod b . The plate b^* has an upturned rim in front, and this rim has in it slots to receive the front portions of the type-rods b and restrict the upward movement of the said rods, and a series of upright rods b'^* are provided upon the rear portion of the plate b^* to guide the type-rods.

b^2 is the ink-pad whereon the type b^{3*} (which are suitably secured to their rods) normally rest. c is the rubber roller whereon the printing takes place. This roller c is mounted in a carriage C, which forms part of the carriage D, which is capable of a traveling movement across the machine upon a guide-rod d and friction-rolls D' , suitably carried in brackets fixed upon the table A'. (See Figs. 2, 3, and 5.) The carriage C is also capable of a shifting movement upon the guide-rods $d' d'$ of the carriage D.

E is a spring-drum, which is always draw-

ing, by means of the chain e , the carriage D in the direction of the arrow, Fig. 3—that is to say, toward the left-hand side of the machine.

d^2 is a rack bolted to the back part of the carriage D.

In gear with the rack d^2 is a pinion f , loose on the shaft of the escapement-wheel f' , mounted in the standard-brackets F. f^2 is a disk loose upon the same shaft, but fast with the pinion f .

$f^3 f^3$ are pawls carried by the disk f^2 and engaging with the teeth of the ratchet-wheel f^4 , carried by the escapement-wheel f' . Thus the escapement-wheel f' and the pinion f are locked together as regards their rotation in one direction, which in this case is against the direction of the travel of the carriage D, pulled by the chain e , and so long as the escapement-wheel is held the movement of the carriage D to the left of the machine is restrained. The movement of the escapement-wheel is, in the first instance, controlled by the escapement device G, (see Fig. 4,) which consists of a pair of curved arms $g g'$, carried on a rocking stem pivoted in the brackets F. The arms $g g'$ embrace the escapement-wheel and are provided with pallets for taking into the teeth thereof. The arm g' of the escapement device is slotted to form a guide for part of the block that carries the pallet, the pallet or its block being also connected with the compression-spring g^2 , carried by the curved guide-rod g^{2*} . Normally the pallet carried by the arm g' is in engagement with the escapement-wheel; but on rocking the escapement device by means of the lever G' , fixed to the stem, the pallet on the arm g is made to take into the escapement-wheel and the other pallet is disengaged, whereon the latter is pressed upward along its guide by means of the compression-spring g^2 until stopped, in a manner to be presently explained. It is then in a position to take into a tooth of the escapement-wheel higher up, when the escapement device is rocked back again. On the return movement of the escapement device being completed the spring-drum E, acting through the rack upon the carriage which it pulls and the pinion in gear therewith, tends to rotate the escapement-wheel against the pressure of the spring g^2 , and, being more powerful than the said spring g^2 , the latter is forced to give way and the carriage D is allowed to travel until the pallet in engagement with the wheel f' comes to the lower end of its guide in the arm g' . It will thus be seen that the travel of the carriage D; and with it the paper thereon, is limited in accordance with the length of the guide in the arm g' and the number of the teeth on the wheel f , which the pallet of the arm g' is allowed to pass when the rocking of the escapement permits the said pallet to move. The guide in the arm g' is crossed by two stops $h h'$, which when in position block the path of the rising pallet; but on their removal the whole length of the guide is open,

and consequently on the rocking of the escapement device the pallet within the arm g' is free to rise to the full length of the guide, and thereby advance some four teeth of the escapement-wheel. The stops $h h'$, which are arranged to pass through holes transversely across the guide in the arm g' , are carried on the heads of a pair of levers $h^2 h^3$, fulcrumed on a bracket-piece of the stem G , and retained in action by springs $h^4 h^5$ at the back thereof.

J, K, and L are three rectangular rocking frames arranged one within the other, (see Fig. 1,) and by means of these frames the escapement or spacing mechanism just described is operated. The front bars of the inner and middle frames J and K immediately underlie the operating-keys a , so that the depression of the latter depresses the former. The middle frame K is depressed with every key that is pressed, except the end keys, which print symbols not requiring spacing. In this case the key-levers are thinned (see Fig. 8) to escape contact with the frame. The depression of the frame K causes its tail k to rise and strike the lever G' , which thereon rocks the escapement device and permits the wheel f' to advance two teeth and no more, the stops $h h'$ still remaining in position to block the pallet in the arm g' . The front bar of the frame J lies a little below the bar of the frame K, and is in addition recessed on its upper edge. (See Fig. 8.) The depression of the keys, except those overlying these recesses, causes also the depression of this frame J, the effect of which is to raise a tail j and cause the same to bear on a cam-face on the tail of the lever h^2 , thereby rocking it and removing the stop h from the blocking position in the guide of the arm g' . (See Fig. 4.) The removal of this stop permits the spring-pallet of the escapement device to pass a third tooth of the wheel f' , and allows the slightly-lengthened travel of the paper-carriage. This will give sufficient spacing for the small letters, generally. Where there are wider letters, however, such as m and w , there are projections J^* on the front bar of the frame J, (see Fig. 8,) which will give an additional depression to the frame and cause its tail to come into contact with the cam-faces on both of the levers $h^2 h^3$, before mentioned, and by rocking the latter remove the stops h and h' and render the whole of the guide open for the pallet of the arm g' to rise and pass a fourth tooth of the wheel f' , permitting, consequently, a still greater travel of the paper-carriage. The narrow letters, such as i and l , which demand but little space, are actuated by the keys opposite the recesses J^* in the bar, and in this case the depression of the frame J is avoided. The spacing at the end of each word is effected by the depression of the frame L by hand, which causes, by the pin l , the depression of both the other frames, and thereby permits an advance of the escapement-wheel four teeth, the full amount. The differential spacing just described is used

only when the small letters are being employed. When capitals or figures are in use, the full spacing is adopted, and in this case the frame J takes a depressed position, in the manner presently described.

On the left of the machine (see Fig. 1) are three levers $m n o$, by means of which the machine is set to print either small letters, capitals, or figures, or perhaps any other characters for which the machine may have been constructed. The lever m rocks upon a pin m' , Fig. 1, and extends to the back of the machine, (see Figs. 9, 10, and 11,) where its end takes onto a pin p , carried by the bell-crank lever P, fulcrumed at p' to a lug on the table or plate A' . The tail of the bell-crank lever P is forked to embrace a pendant rib or rail c^* , carried by the paper-carriage C, which may thus be caused by the rocking of the lever P to advance and retire, as desired, to present the printing-surface to one or other of the type arranged one behind the other on the type-rods. As indicated in the drawings, the depression of the figure-lever m shifts the carriage C to its most backward position, by means of the utmost rocking of which the bell-crank lever P is capable. (See Fig. 11.) The capital lever n is a shorter lever pivoted at n' and having its end underlying the pin m^2 of the lever m . The main portion of the lever n overlies the pin m^3 of the same lever m . Thus the depression of the lever n causes or permits the depression of the rear end of the lever m only to a limited extent, and raises or lowers it (according to the position it has previously held) to the position shown in Fig. 10, thereby bringing the carriage C into the middle position. The lever o for small letters, which is shown depressed in Fig. 1 by the spring g , is also pivoted at n' , and has the effect, on depression, of tipping the rear end of lever m downward, whereby the bell-crank lever is rocked to bring the carriage C into the position of Fig. 9. The depression of the frame J, before alluded to, when the small letters are not being employed, ensues immediately on the rear end of the lever m , taking either of the positions shown in Figs. 10 and 11, for the support of this frame J is by the spring j' , connecting it with the lever m . (See Figs. 9, 10, and 11.) The other frames K and L are permanently supported by springs k^2 and l' .

The action of the machine is as follows: Supposing the operator to be using the small letters. He sets the machine, as shown in Fig. 1, with the spring M upon the lever o . He then proceeds to depress the keys required. The depression of a key causes the link a^4 to pull downward the lever b' and with it the link-piece b^3 , which topples over the cranked lever b^4 from the position shown at Fig. 6 to that of Fig. 7, and thereby raises and projects forward the type-rod, and finally presses the type down upon the paper between the strips $c^2 c^2$, covering the impression-roll c . B^2 is an adjustable damper to

prevent too hard a blow of the type. On releasing the key it is raised again by the spring a^2 beneath the key-lever, and the type-rod is thereby returned to its normal position with the type resting on the inking-pad. The depression of the key has also the effect of depressing the frame J or K, or both, in the manner already described, for the purpose of giving the proper space for the letter used. If it be desired to introduce a capital letter or figure among the small letters, this can be done by depressing either the lever m or n , the effect of which is to change the position of the paper-carriage C and to raise the lever o against the pressure of the spring M, which again depresses the lever o , as soon as the finger of the operator releases the lever m or n . On changing the position of the spring M onto one or other of the levers m or n , capital letters or figures only are printed in the manner that has been already described. On the completion of a word the depression of the lever L will give the proper spacing. On the completion of a line, which the operator can watch as he writes, it becomes necessary to return the paper-carriage D, which has traveled step by step across the machine to its former position and to advance the paper one line. This is easily effected by the handle I, (see Fig. 4,) by means of which the carriage D can be run back, the pawls $f^3 f^3$ passing readily over the teeth of the ratchet-wheel f^4 , and the paper may be advanced one line by the ratchet connection existing between the handle I and the impression-roll. A milled head is provided on the journal of the impression-roll at the opposite end to more readily advance the paper when required.

I claim—

1. In a type-writer, the combination, with operating-key and radially-arranged type-bars, of connecting-link mechanisms for communicating movement to the type-bars, the said link mechanism consisting of a pull-rod jointed to the operating-key, a pivoted lever connecting with the pull-rod, and a bell-crank lever jointed to the type-bar to a fixed

point and to the pivoted lever, substantially as set forth.

2. In a type-writer, the combination of a paper-carriage, means for drawing the carriage constantly in one direction, a rack upon the carriage, a controlling-pinion in gear with the rack, an escapement-wheel having a ratchet connection with the pinion and rocking frame, a pallet and spring-pallet carried by the arms of the rocking frame, cam-faced levers for limiting the movement of the spring-pallet, operating-keys, and rocking frames beneath the operating-keys having an engagement upon the pallet-frame and cam-faced levers when rocked by the depression of the keys or frame, substantially as set forth.

3. In a type-writer, the combination of a rocking lever m , a paper-carriage mounted so as to move in the direction of the length of the machine, a bell-crank lever in connection with the rocking lever m for giving the carriage its movement, and levers $n o$, pivoted at the same point and adapted to strike stops on the lever m and thereby operate the latter, substantially as set forth.

4. The herein-described type-writer, comprising the series of operating-keys, a series of radially-arranged type-rods linked to the keys, a paper-carriage, mechanism for giving traveling motion to the paper-carriage, an escapement device for controlling and regulating the said carriage motion, mechanism for giving the paper-carriage advancing and retarding movement lengthwise of the machine, such mechanism consisting of a series of levers $m n o$, a bell-crank lever p , frames situated beneath the keys for operating the escapement device, and a frame for operating the escapement by hand when required, all arranged and operating substantially as shown and described.

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