

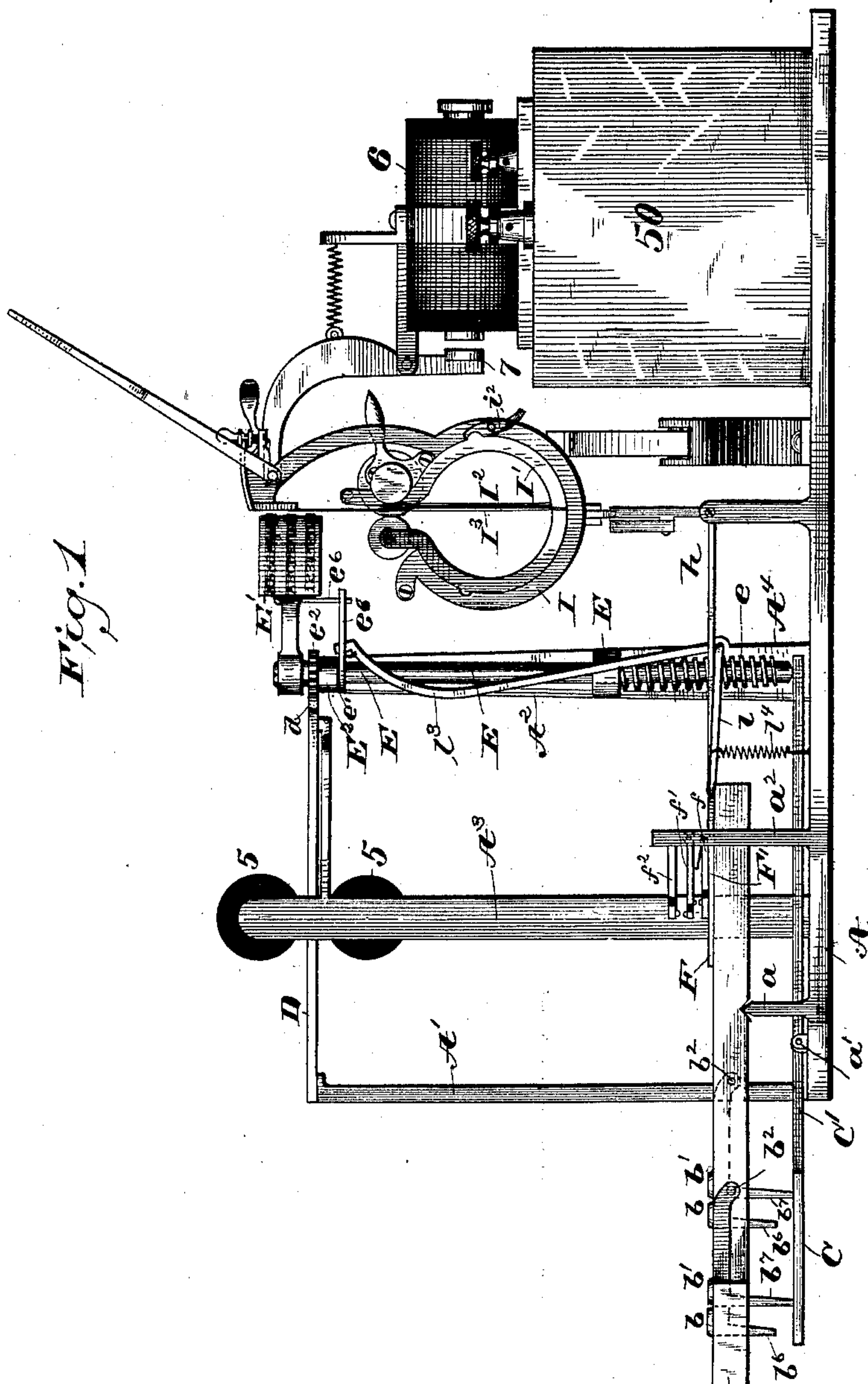
(No Model.)

4 Sheets—Sheet 1.

F. A. HEISS.
TYPE WRITING MACHINE.

No. 485,761.

Patented Nov. 8, 1892.



Witnesses

Est Walker

Wm. J. Little,

Inventor

F. A. Weiss

By his

Attorney

Attorney L. B. Seely

(No Model.)

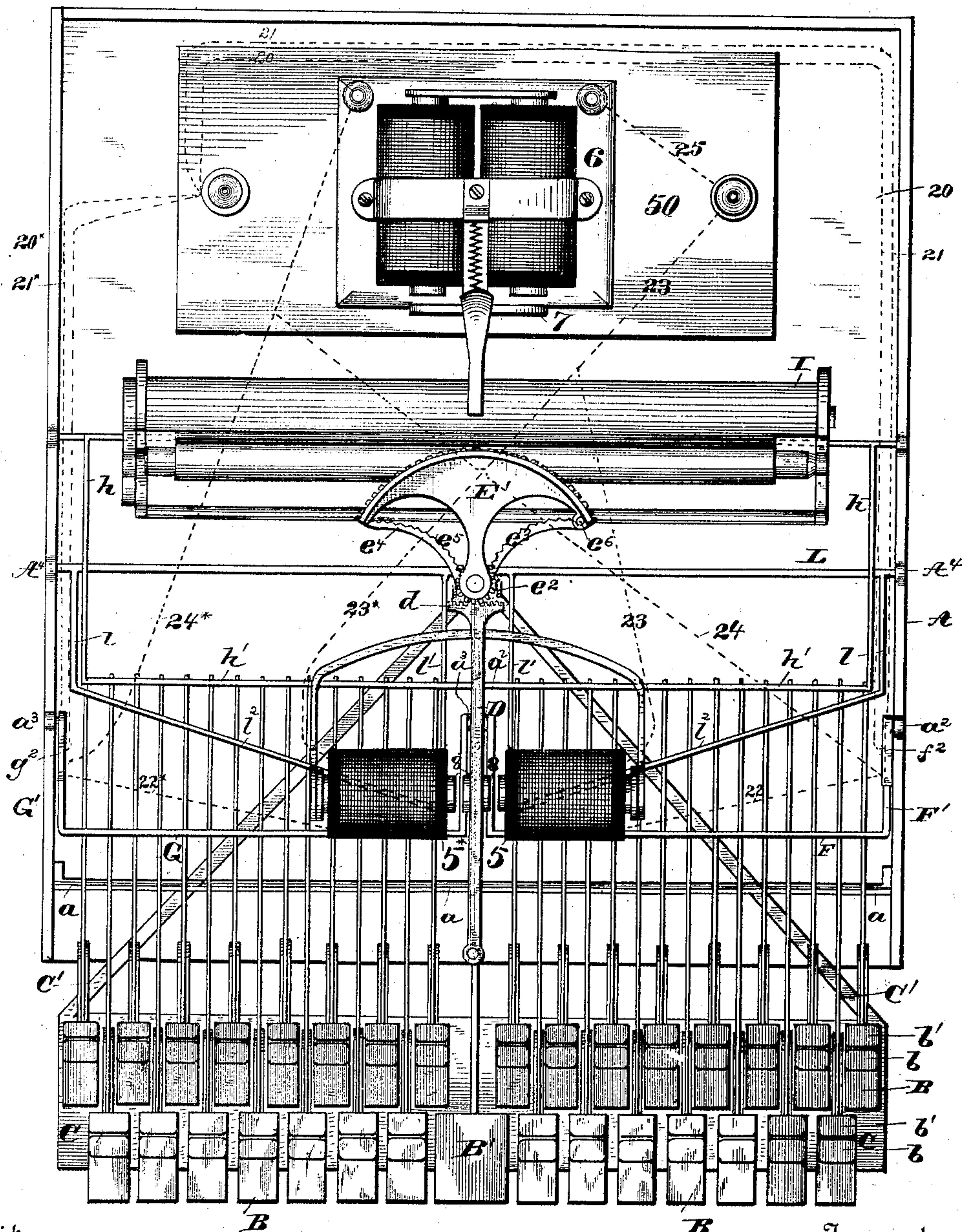
4 Sheets—Sheet 2.

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Fig. 2.



Witnesses

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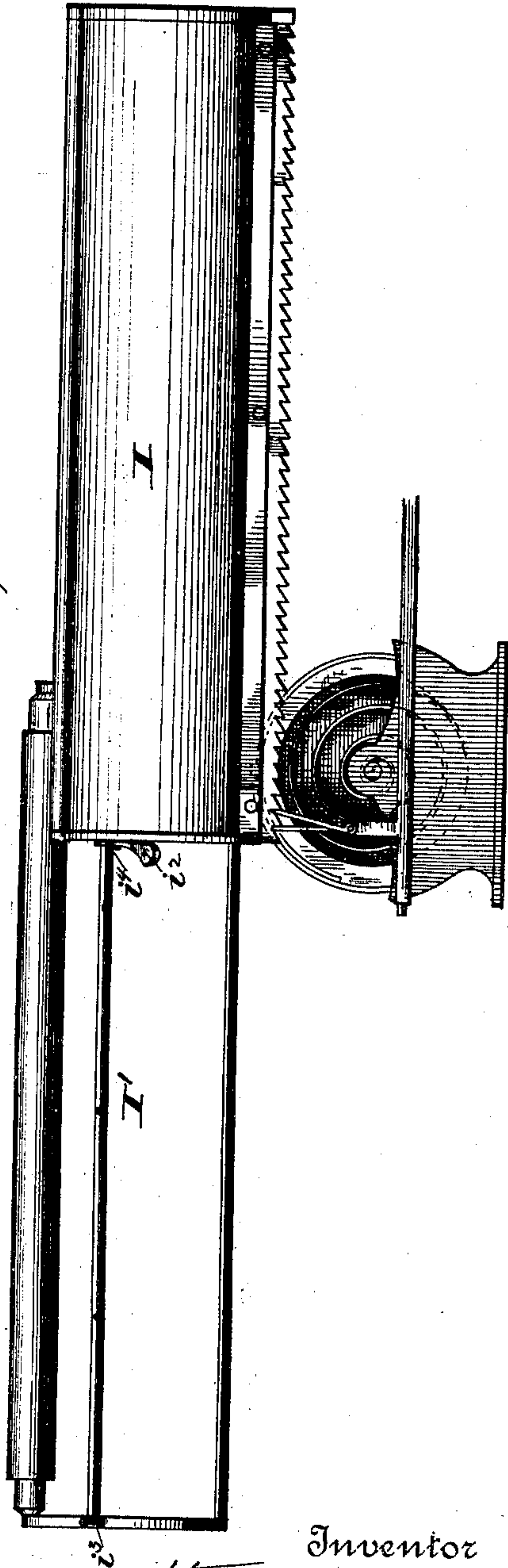
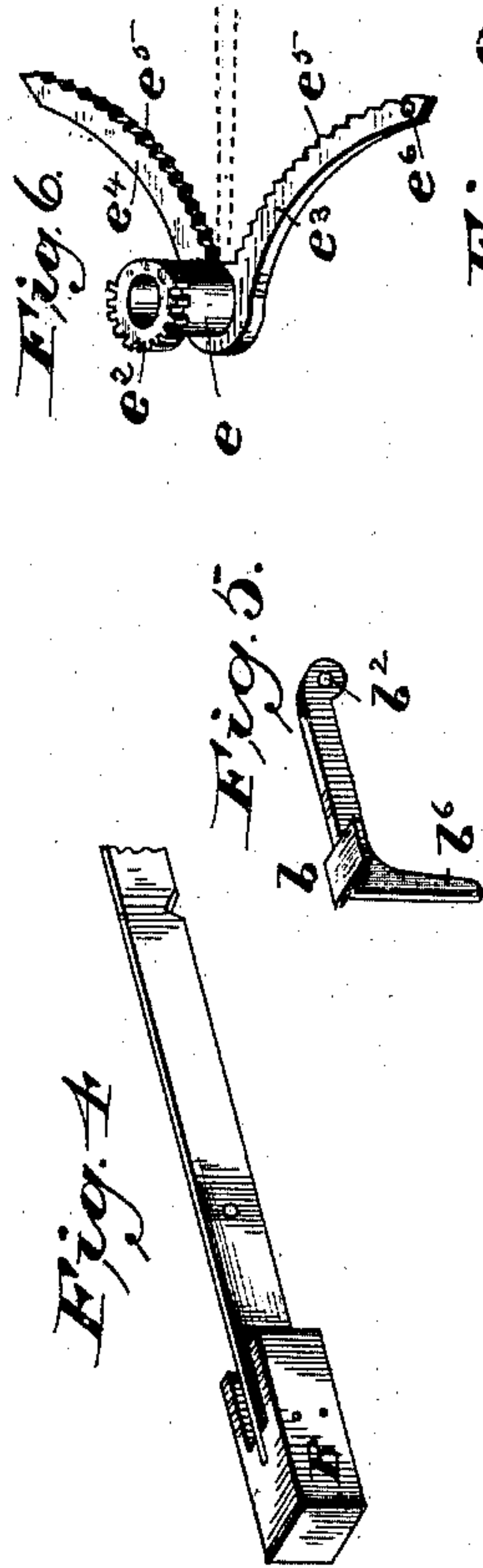
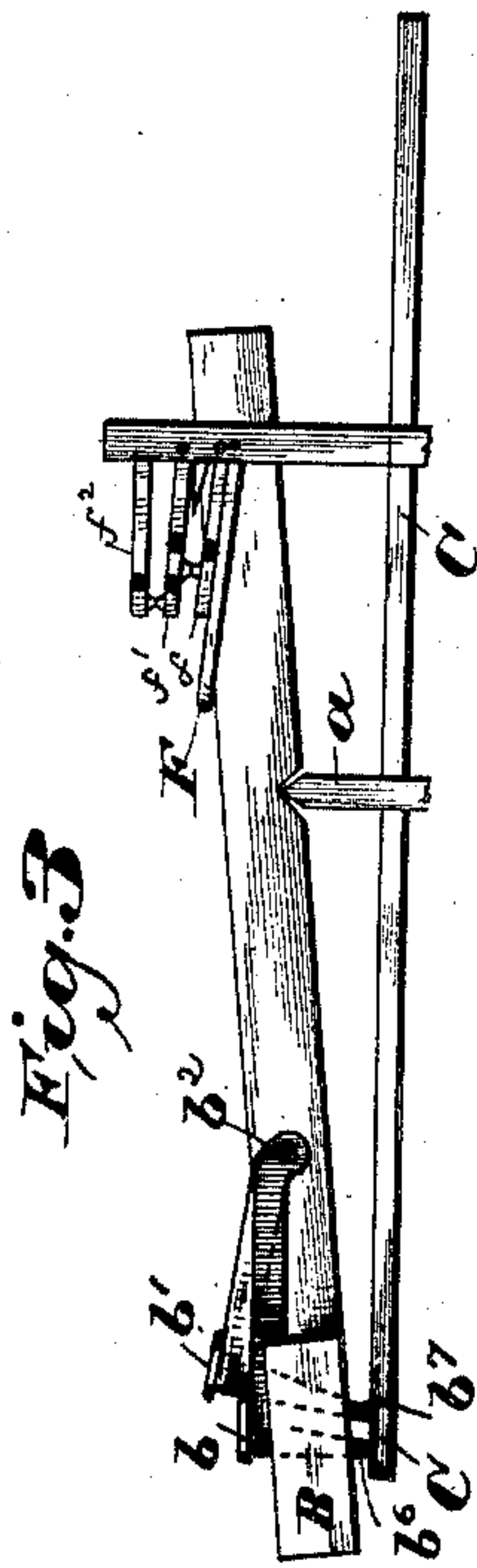
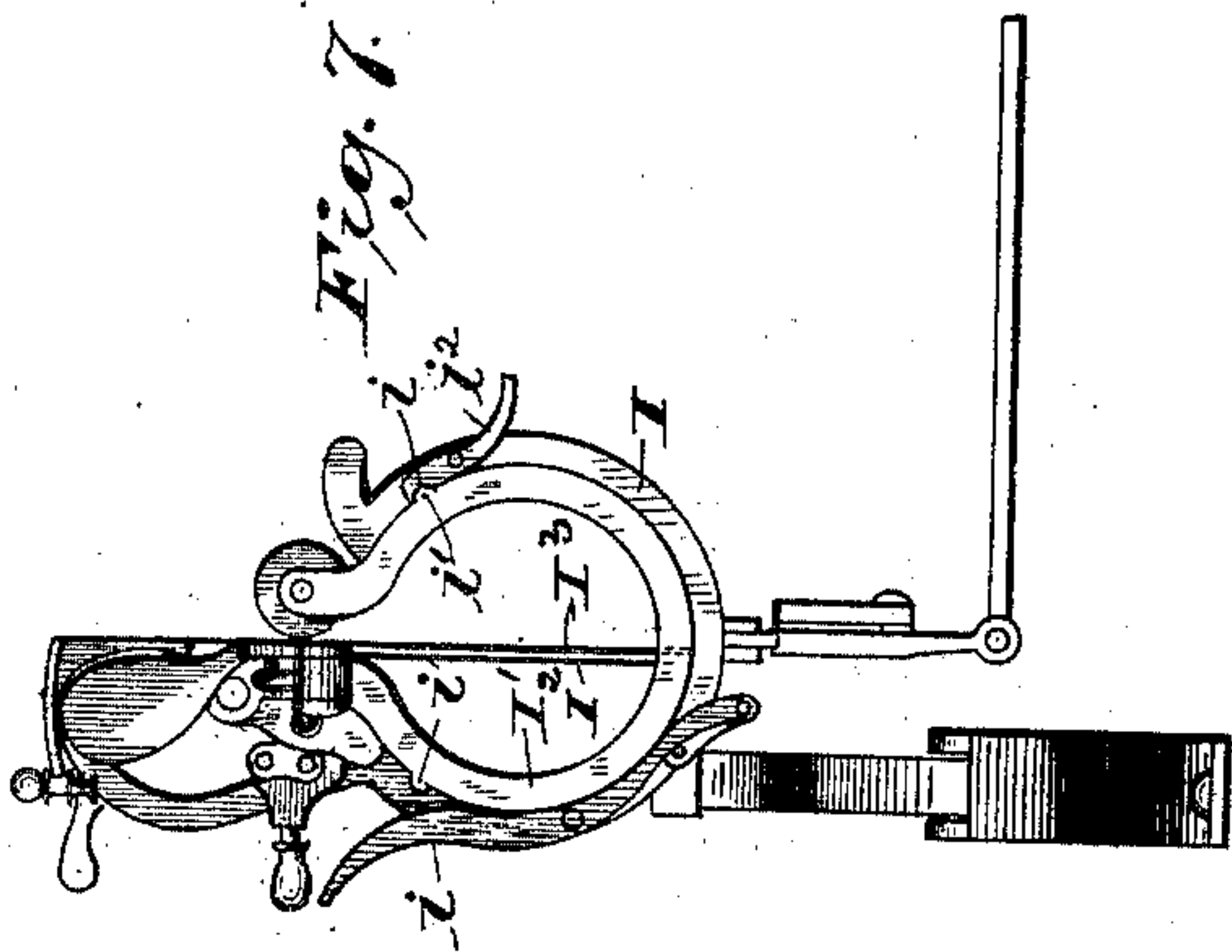
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4 Sheets—Sheet 3.

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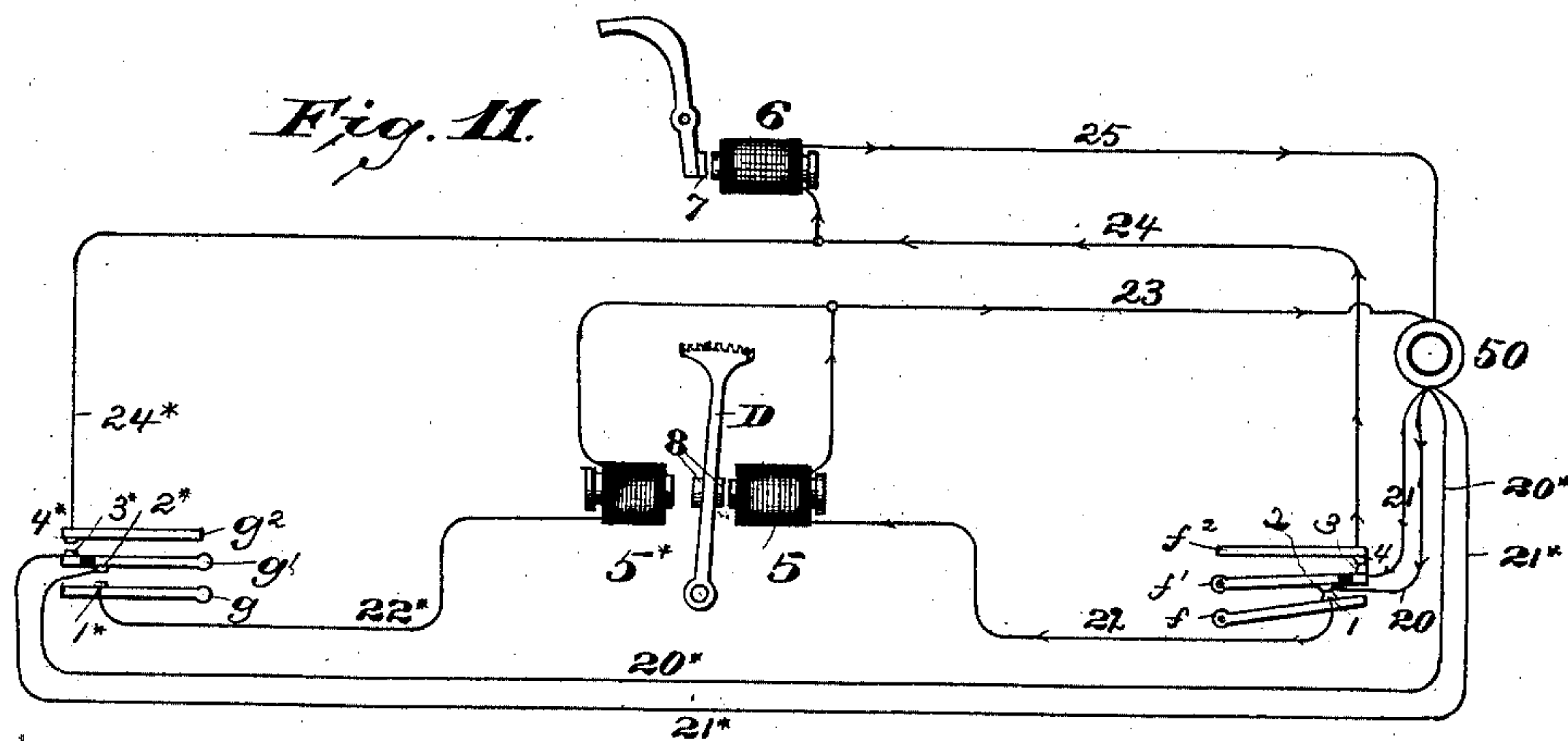
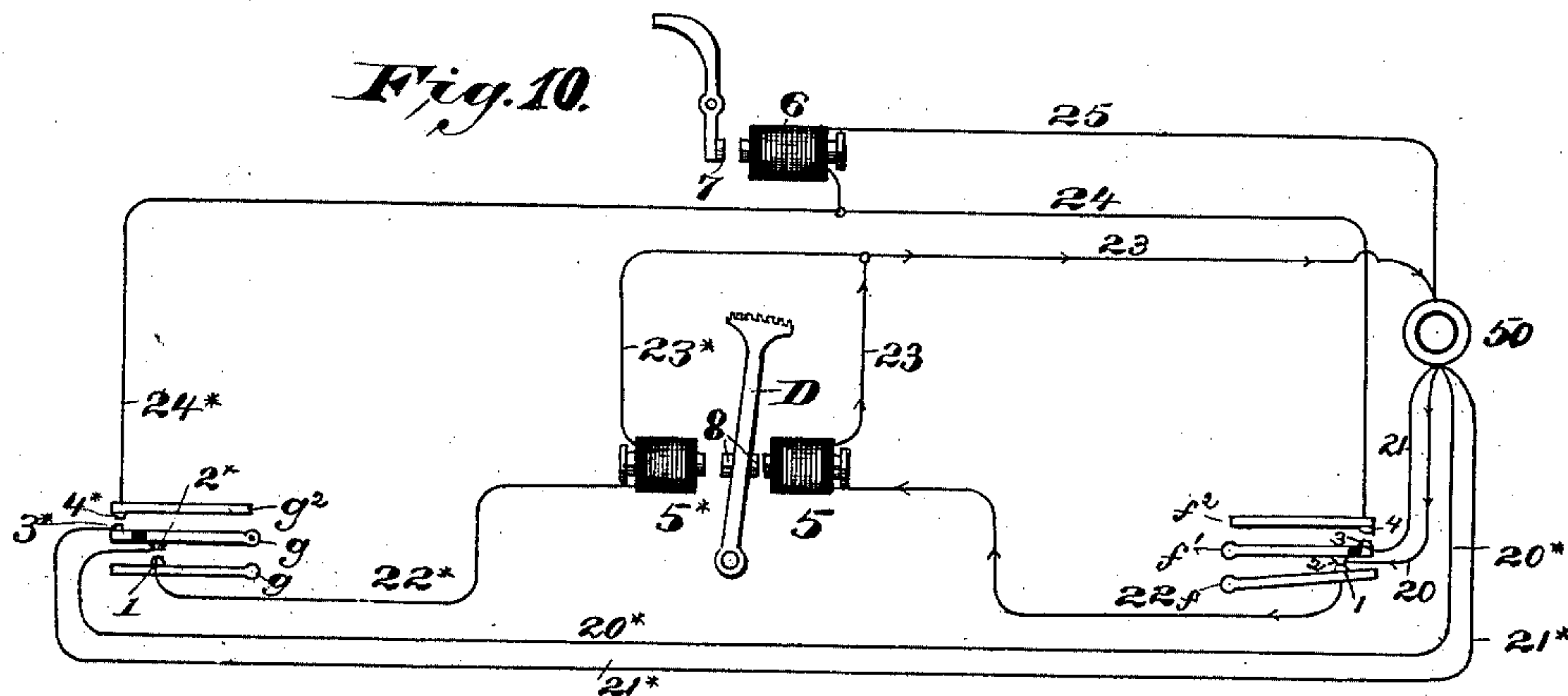
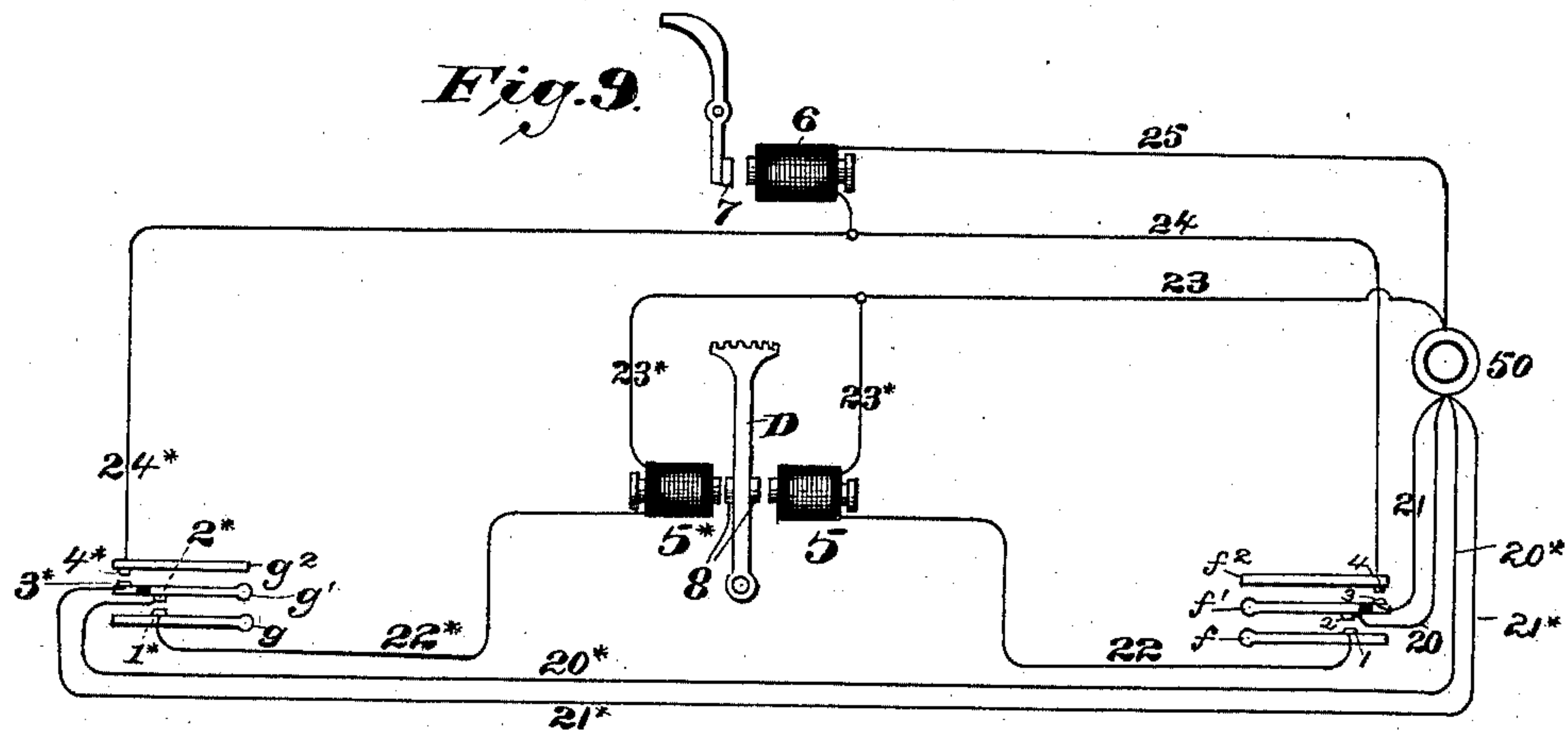
(No Model.)

4 Sheets—Sheet 4.

F. A. HEISS.
TYPE WRITING MACHINE.

No. 485,761.

Patented Nov. 8, 1892.



Witnesses

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Wm. J. Little,

Inventor

F. A. Heiss
By his Attorney *L. W. Kelly*

UNITED STATES PATENT OFFICE.

FRANK A. HEISS, OF PORT JERVIS, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 485,761, dated November 8, 1892.

Application filed April 4, 1889. Serial No. 305,960. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. HEISS, a citizen of the United States, residing at Port Jervis, in the county of Orange and State of New York, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of type-writing machines in which the type or characters are carried on the periphery of a type wheel or sector which by the depression of the appropriate key is oscillated to bring a determined letter or character opposite the impression devices.

One object of my invention is to dispense with the multiplicity of mechanical parts now employed to effect the operation of this class of machines.

A further object of the invention is to secure a uniform stroke or impact on the type whether the keys are operated with a light or heavy touch.

A further object of the invention is to operate the type-wheel and impression devices through the agency of a storage or other electric battery the current of which is controlled from the keyboard.

A further object of the invention is to enable me to actuate the type-wheel and other operative parts of the machine by a slight depression of the keys.

With these and minor objects in view the invention consists in novel features of construction and combinations to be claimed in the clauses at the close of this specification.

In the accompanying drawings, Figure 1 is a side elevation of a type-writing machine embodying my improvements. Fig. 2 is a plan view of the same. Fig. 3 is a detail representing one of the keys depressed. Fig. 4 is a detail perspective of a part of one of the keys. Fig. 5 is a similar view of one of the upper-case or numeral keys. Fig. 6 is a perspective view of the type-wheel collar. Fig. 7 is an end view of the paper-carriage. Fig. 8 is a front elevation of the paper-carriage extended. Figs. 9, 10, and 11 are diagrammatic illustrations of the electric circuits.

Above the bed A of the machine are keys B, supported upon a fulcrum or fulcrums a , rising from the bed. These keys B, I prefer to arrange in two series separated by a central spacing-key B', and in order to economize lateral space I prefer to arrange the keys of the keyboard in two banks, as shown. In order to provide for the printing of upper-case letters, numerals, &c., I construct the keys in three parts—namely, the key proper B, an upper-case key b , consisting of a strip of metal formed at its forward end to overlap the key B and secured at its rear end to the shank of said key by a horizontal pivot b^2 , and a numeral-key b' , constructed and arranged in a manner similar to the upper-case key and secured to the other side of the key proper by the same pivot b^2 .

Extending across the machine between the outer ends of the keys and the bed A is a light plate C, supported upon a skeleton frame C', (which I shall term a "shifting" frame,) fulcrumed just forward of the key-fulcrums on posts a' , rising from the bed and extending at its rear end just beneath the type-wheel shaft to be presently described. Just forward of the fulcrums of the shifting frame and arranged centrally with relation to the keyboard is a post A', to the upper end of which is secured by a vertical pivot a driving-rod D, the free end of which extends back to near the type-wheel shaft and is provided with a geared sector d .

The type-wheel shaft E is mounted in a hollow post A², rising from the center of the bed well toward the rear and is encircled at its lower end by a coiled spring e , tending to hold the shaft in the lowermost of the three positions it may assume. The upper end of the type-wheel shaft is provided with a shoulder, above which is loosely mounted a type wheel or sector E', carrying three series of letters on its face, arranged as is usual in this type of machines, and just below the hub of the type-wheel is loosely mounted a collar e^2 , provided at its upper end with a pinion e^3 , arranged to mesh with the toothed sector d , and at its lower end with two stop-arms e^4 , each provided on their inner faces with a series of serrations or notches e^5 , corresponding in number to the number of keys in a series. For instance, we will assume that the machine

is provided with thirty keys B, exclusive of the spacing-key, fifteen on each side of the center or spacing key B', or, in other words, fifteen keys in both the right and left hand series. With this arrangement the stop-arms e^3 and e^4 would each be provided on their inner edges with fifteen notches. This collar e' , as before stated, is loosely mounted on the shaft E and is journaled in a bearing E², carried by a bracket secured to the upper end of the post A². At the end of one of the stop-arms e^3 is a perforation to receive a long pin e^6 , extending down from the type-wheel E', thus locking the type-wheel to said stop-arm.

At points about midway between the key-fulcrums a and the type-wheel post A² two pairs of posts a^2 and a^3 are secured to the bed A, and overlying the keys of each series in rear of their fulcrums are light bars F, the rearwardly-cranked ends F' of which are pivoted, respectively, to the posts of a pair—say a^2 —near their upper ends. The upper ends of these posts a^2 also carry two forwardly-projecting pivoted arms $f f'$ and a fixed arm f^2 , provided with insulated contact-points 1234. The lower pivoted arm f is supported at its free end by the rearwardly-cranked arms F' of the rod F and moves with it against the pressure of a light spring secured to the post a^2 , while the pivoted arm f' is supported parallel to but free from contact with the arms f and f^2 by a fixed lug projecting from the post a^2 . Two light insulated conductors 20 21 lead from the positive pole of any suitable electrical battery 50 to the two contact-points 2 and 3, carried by arms f' , the contact-point 1 on the lower arm f being connected by a single insulated conductor 22 with a pair of magnets 5, arranged one above the other on the right of the shifting-rod D, and supported upon bracket-arms A³, secured to the bed A. The magnets 5 are in turn connected with the other pole of the battery by an insulated conductor 23. The contact-point 4 of the upper fixed arm f^2 is connected by an insulated conductor 24 to a pair of hammer-magnets 6, supported in rear of the paper-carriage, and pivoted in front of these hammer-magnets is a lever provided at its lower end with an armature 7, arranged abreast of the cores of the hammer-magnets, this lever being provided at its upper end with a hammer designed to force the paper against the type of the type-wheel. The hammer-magnets 6 are connected to the negative pole of the battery by a conductor 25. The devices just described relate to the control of the electric current by the right-hand series of keys only; but it will be understood that the left-hand series of keys are provided with a cranked rod G, actuating contact-carrying arms $g g' g^2$ and magnets 5^x through conductors 20^x 21^x 22^x 23^x and contact-points 1^x, 2^x, 3^x, and 4^x, constructed and arranged in all respects similar to the corresponding devices already described in detail. The driving-rod D is provided with an arma-

ture arranged opposite the cores of the respective pairs of magnets 5 and 5^x in order that said driving-rod may be moved to the right or left according as the right or left driving-magnets 5 or 5^x are energized.

To the lower end of the post A², in which the type-wheel shaft is mounted, is secured a rearwardly-projecting lug provided on opposite sides with bearings in which are seated the inner ends of rock-shaft L, the outer ends of which are seated in bearings carried by the posts A⁴, rising from the bed. These shafts L are provided at each end with forwardly-projecting arms $l l'$ of unequal length, the ends of which are connected by a light rod l^2 . The outer or shorter arm l terminates just forward of the rear ends of the outermost keys of each series and the connecting-rods l^2 rest upon the rear ends of the keys of each series, but, owing to the greater length of the inner arms l' , cross said keys diagonally, as shown in Fig. 2. The rock-shafts L have secured to them near their inner ends vertical arms l^3 , the upper ends of which terminate just above the stop-arms e^3 and e^4 of the type-wheel collar e' . These rock-shafts, with their arms l , l' , l^3 , and rods l^2 , form, in effect, levers, which I shall term "stop-levers," their purpose being to stop or check the stop-arms e^3 and e^4 positively at such a point as will bring the desired letter of the type-wheel directly opposite the impression-hammer, and also to restore the type-wheel and its adjuncts to a normal position when the key is released. To fulfill the latter function, it will be necessary to either weight the horizontal arm or arms of the lever or connect to them a stout spring or springs l^4 , the stress of which shall be exerted to press the horizontal arm of the lever downward. The paper-carriage which is mounted just in rear of the type-wheel may correspond in general outline with that now used on the Hammond machine, and the feeding-roll, reversing devices, and escapement may also be arranged and operated like those used on the Hammond carriage. I prefer, however, to employ a feed and escapement for the carriage similar in all substantial particulars to those now in common use for the same purpose in the Remington typewriter and contemplate controlling the escapement-fingers by angled levers h , pivoted at a point in rear of the type-wheel post and having their forward ends extending just past the rear ends of the keys B and connected by a light rod h' , resting upon said rear ends of all the keys of both series.

In order to provide for the printing of a line or lines upon paper of more than usual width, I have devised a paper-carriage constructed of two sections I I', each of the length of an ordinary carriage, sliding one within or upon the other. The sections may be cylindrical, as shown, semicylindrical, or of other approved form. The outer section I is provided interiorly with oppositely-arranged grooves i , designed to receive corresponding-

ly-arranged ribs i' , secured to or forming part of the inner section I' , and the outer section I is provided with a spring-pressed latch i^2 , one end of which is designed to engage one of the notches i^3 or i^4 , formed in the opposite ends of the inner section to lock the sections together in a folded or extended position, as desired. It will be understood, of course, that intermediate notches may be formed, as indicated, to lock the sections together at points between the limits of adjustment. The notch i^3 should be quite deep to prevent the latch from slipping, but the other notches should be shallow or their ends beveled in order that the sections may be adjusted by endwise pressure on the sections in opposite directions. The inner section I' of this carriage is provided with the usual feeding-rolls and their adjuncts, and as the right-hand edge of the paper will have no support from the feed-rolls when the sections are extended I secure within the right-hand end of the inner section a light vertical partition I^2 and a similar partition I^3 within the right-hand end of the outer section to hold the exposed part of the paper P upright in front of the type-wheel to prevent false alignment. In printing upon paper of a width equal to the whole length of the extended carriage the sections are first folded together and a line printed of a length equal to the length of the folded carriage. The carriage is then restored to its first position, but without actuating the feed-roll, and the catch i^2 is withdrawn from the notch i^3 in the left-hand end of the inner section, and said inner section is then drawn out to its full extent and the latch i^2 released to engage the notch i^4 in the right-hand end of said inner section, thus locking the sections together in their extended position, when printing may be resumed as in the first instance.

In operating the machines a depression of the key B will lift the cranked rod F , and with it the lower arm f , until its contact-point 1 meets the contact point 2 on arm f' . This establishes an electric circuit from battery 50 through the wire 20 to and through the contact-points 2 and 1, thence through wire 22 to the driving-magnets 5, then back to the battery through wire 23, thus energizing magnets 5 to attract the armatures 8 of the driving-rod and moving the shifting-rod toward the right. Owing to the meshing of the pinion e^2 with the geared sector d on the driving-rod, the type-wheel collar e' will be rotated and move the stop-arm e^3 toward the left, at the same time, owing to the connection of the type-wheel E' with the type-wheel collar by means of the pin e^6 , moving said type-wheel an equal distance toward the left. During this operation the inner end of the key depressed will raise the lower arm of the stop-lever L and move the vertical arm of said lever rearward a determined distance, where the upper end of the vertical arm of the lever will arrest the stop-arm e^3 and the type-wheel. These varied actions take place almost si-

multaneously during the time that the outer end of the key has but partly completed its downward movement, and the continued movement of the key operates to raise the cranked arm F to such a height that the arm f' will be carried upward by the arm f until contact is established between the points 3 and 4, and this completes an independent circuit from the battery through wire 21, contact-points 3 and 4, wire 24 to the hammer-magnets, and thence through wire 25 back to the battery. The energizing of the hammer-magnets by this second current attracts the armature 7 and causes the hammer to strike the paper against the letter or character presented. The depression of one of the keys of the left-hand series results in the same action, as the cranked arm will first raise the arm g to make contact between the points 1^x and 2^x of the arm g and g' , thus establishing a circuit through wire 20^x , points 2^x and 1^x , and wire 22^x to the magnet 5^x , and thence back to the battery through wire 23^x , the hammer-magnets being operated from the left-hand series of keys through the wires 21^x , points 3^x and 4^x , and wire 24^x to the hammer-magnet, and thence back to the battery by wire 25.

As the upper row of characters on the type-wheel will be the lower-case type, it follows that it will not be necessary in printing the lower-case letter to raise the type-wheel, and therefore the upper-case and numeral keys b and b' , owing to their pivotal connection with the shank of the main key, will have no influence upon the shifting frame when said main key is depressed. Those keys b b' have depending from their free ends studs b^6 and b^7 , overhanging the plate C of the shifting frame C' . The stud on the end of the upper-case key b is shorter than that of the numeral-key b' , for the reason that the second row of type on the type-wheel is comprised of upper-case letters and the third row of numerals. Therefore, the depression of the upper-case key, while carrying the main key B down with it, will necessarily complete the circuits in the manner described and at the same time raise the type-wheel to its second position to bring the upper-case letters opposite the hammer, and a like manipulation of the numeral-key b' will have the same result, except that owing to its longer stud b^7 the shifting plate will be depressed a greater distance, thus raising the type-wheel higher.

As before stated, the stop-lever is designed to stop and hold the type-wheel at the point where a determined letter or character on said wheel is presented to the action of the hammer, notwithstanding the continued attraction by the driving-magnets of the armature 8 on the driving-rod D , and this stop must be made with some accuracy to obtain perfect impressions. It is with this purpose that I have provided the inner edges of the stop-arms e^3 and e^4 with notches corresponding in number to the number of keys in a series. Thus there being in the instances shown

fifteen keys on each series there must be fifteen notches in each of the stop-arms, each presenting a flat face, against which the upper end of the stop-levers will abut without danger of slipping.

Owing to the diagonal arrangement of the connecting-bar l^2 of the stop-lever, it crosses the successive keys (from the inner to the outer key) of a series at progressively-greater distances from their fulcrums. Therefore the depression of the inner key of a series will move this lever but just enough to bring the end of its vertical arm l^3 in the path of the first notch of the stop-arm, thus arresting said arm and the type-wheel which is connected with it by the pin before mentioned at a point where the first letter or character from the center of said wheel will receive the blow of the hammer. The depression of the outer key of a series will in like manner move the stop-lever the greatest possible distance to place the end of its vertical arm in the path of the last notch on the stop-arm, thus arresting the stop-arm and wheel at a point where the outermost letter or character on the face of the latter will receive the blow of the hammer.

What I claim as new, and desire to secure by Letters Patent, is—

1. In combination, in a type-writer, the keys arranged in two series, a type-wheel arranged to reciprocate on its own axis, a shifting-rod geared to the wheel connections and provided with an armature on each side, a set of magnets on each side of said rod, provided with electrical connections under control of the sets of keys, and the stop mechanism controlled by the keys to arrest and return the wheel, all substantially as described.

2. In combination, in a type-writer, the keys arranged in two series, a type-wheel arranged to reciprocate on its axis, a shifting-rod geared to the wheel connections and provided with an armature on each side, a set of magnets on each side of said rod and an independent circuit for each shifting magnet, circuit-closers controlled by the keys, and a stop mechanism also controlled by the keys and adapted to arrest the wheel at the proper point determined by the particular key, substantially as described.

3. In combination, in a type-writer, the keys arranged in two series, a type-wheel arranged to reciprocate on its axis, a shifting-rod geared to the wheel connections and provided with an armature on each side, a set of magnets on each side of said rod, an independent circuit for each shifting magnet, circuit-closers controlled by the keys, a stop mechanism also controlled by the keys and adapted to arrest the wheel at the proper point determined by the particular key, and a hammer and hammer-magnet and circuit-closers for said hammer-magnet, controlled by the keys of both series, substantially as described.

4. In combination, in a type-writer, a type-wheel arranged to reciprocate in either direc-

tion on its axis, a rod carrying armatures and arranged to turn the wheel, if not obstructed, to the same point, a shifting magnet between each series of keys and said rod, an independent circuit for each shifting magnet, a hammer and hammer-magnet and circuits therefor, a pivoted cranked rod resting on the keys of each series, and three arms carrying two pairs of contacts, one pair of which is in the circuit of the shifting magnets and the other pair in the circuit of the hammer-magnet, and stop mechanism controlled by the key-levers, substantially as described.

5. The combination, substantially as described, of the keys arranged in two series, the type-wheel, means controlled by each series of keys for moving the type-wheel in either direction, two stop-arms moving with the type-wheel and each provided with notches corresponding in number to the number of keys in a series, and two stop-levers, each provided with a rod arranged diagonally across the rear ends of the keys of a series.

6. The combination, substantially as described, of the keys, the pivoted driving-arm carrying armatures, provided at its rear end with a rack, the type-wheel collar mounted loosely on its shaft and provided with a pinion, the type-wheel mounted loosely on its shaft, a pin for locking the type-wheel to its collar, electro-magnets, one on each side of the driving-arm, and the connections for said electro-magnets, controlled by the keys, for moving the driving-arm, and the shifting frame for raising the shaft of the type-wheel.

7. The combination, substantially as described, of the keys, the pivoted driving-rod provided at its rear end with a toothed segment, carrying armatures, and electro-magnets, one on each side of said rod, and connections for said electro-magnets, controlled by the keys, for moving the driving-rod, the type-wheel collar mounted to rotate in a fixed bearing and provided with a pinion and two stop-arms, the type-wheel shaft vertically adjustable through the hub of the type-wheel collar and provided on its upper end with a shoulder, the type-wheel loosely mounted on the shaft above said shoulder, a long pin secured to the type-wheel and passing through an opening in the collar, the driving-frame, the stop-lever, and a spring to move the stop-lever in one direction.

8. The combination, with a type-writing machine having a carriage-escapement mechanism, of a paper-carriage consisting of two sections sliding one within the other and provided one with devices to engage the escapement mechanism and the other with paper holding and feeding devices, substantially as described.

9. The combination, with a type-writing machine having a carriage-escapement mechanism, of a paper-carriage consisting of two sections sliding one within the other, devices connecting the outer section to the escapement mechanism, paper holding and feeding

devices carried by the inner section, and a latch to lock the sections together whether folded or extended, substantially as described.

10. The combination, with a type-writing
5 machine having a carriage-escapement mechanism, of a hollow paper-carriage consisting of telescopic sections, devices connecting the
outer section with the escapement mechanism, paper holding and feeding devices carried
10 by the inner section, a latch to lock the

sections together in either position of adjustment, and a partition secured within the rear ends of the inner and outer sections, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

FRANK A. HEISS.

Witnesses:

H. C. LANDON,
GEO. SPEIDEL, Jr.