

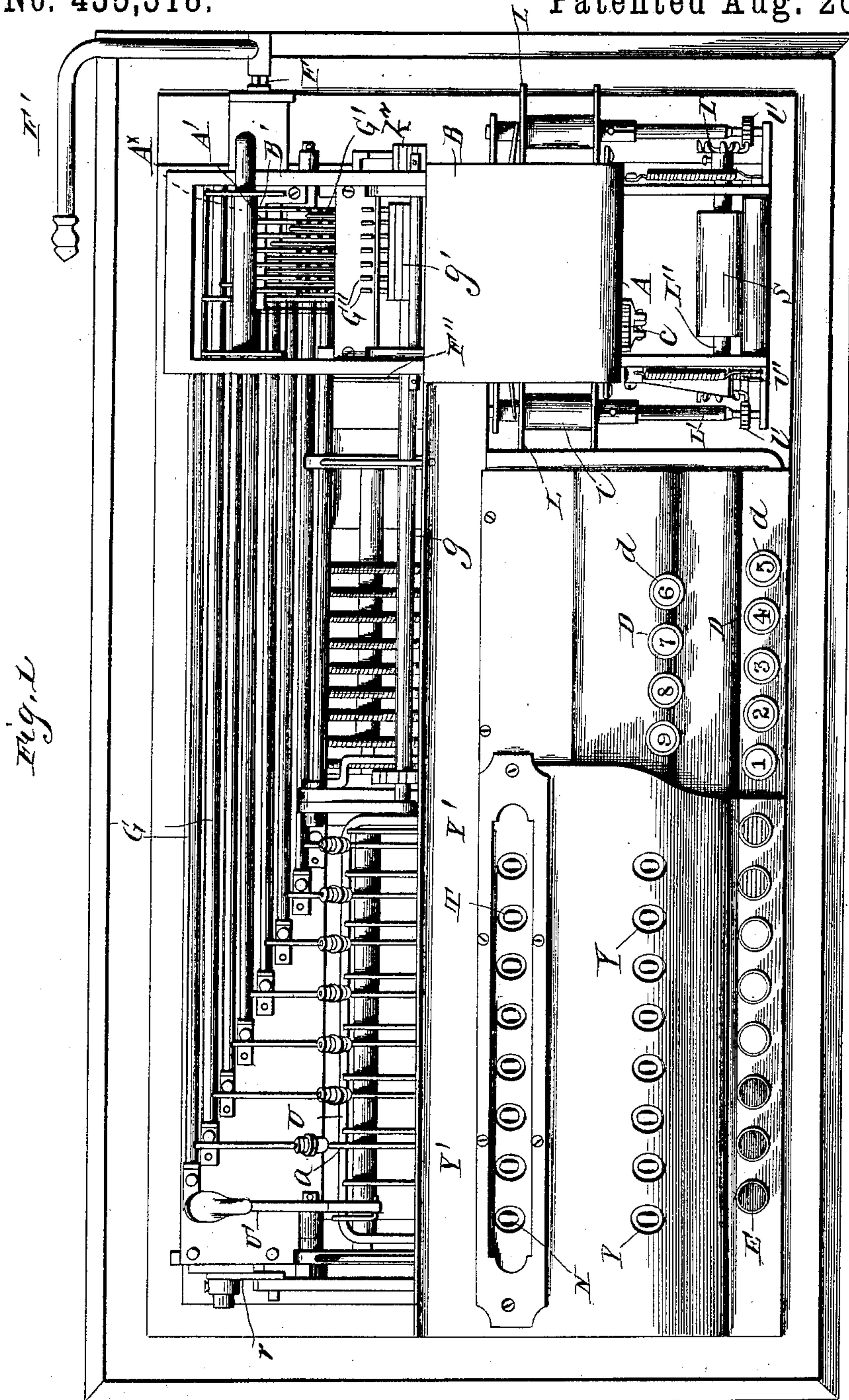
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10 Sheets—Sheet 1.

H. G. O'NEILL.
RECORDING MACHINE.

No. 435,318.

Patented Aug. 26, 1890.



WITNESSES:

C. L. Taylor,
Phil. Massi.

INVENTOR

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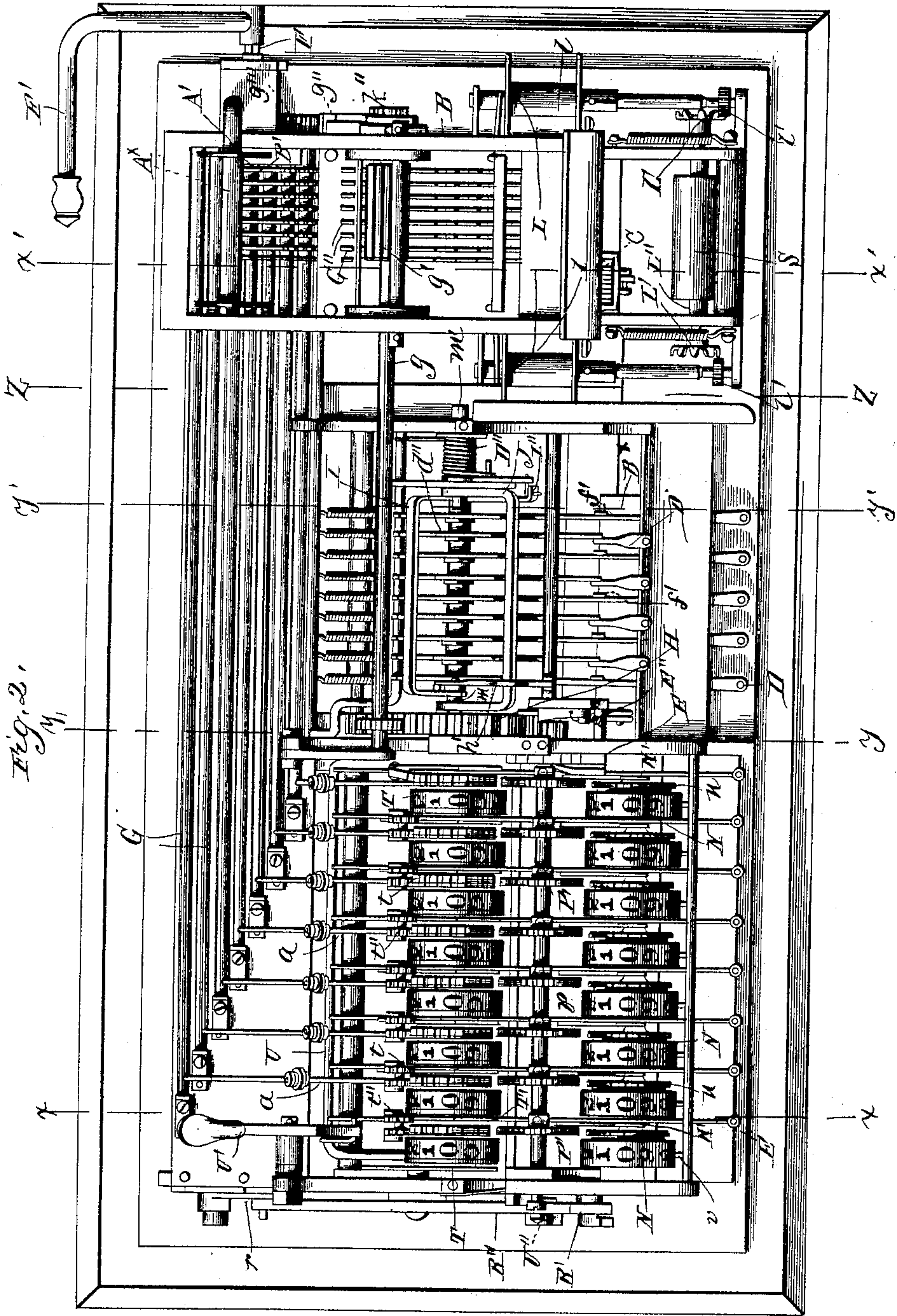
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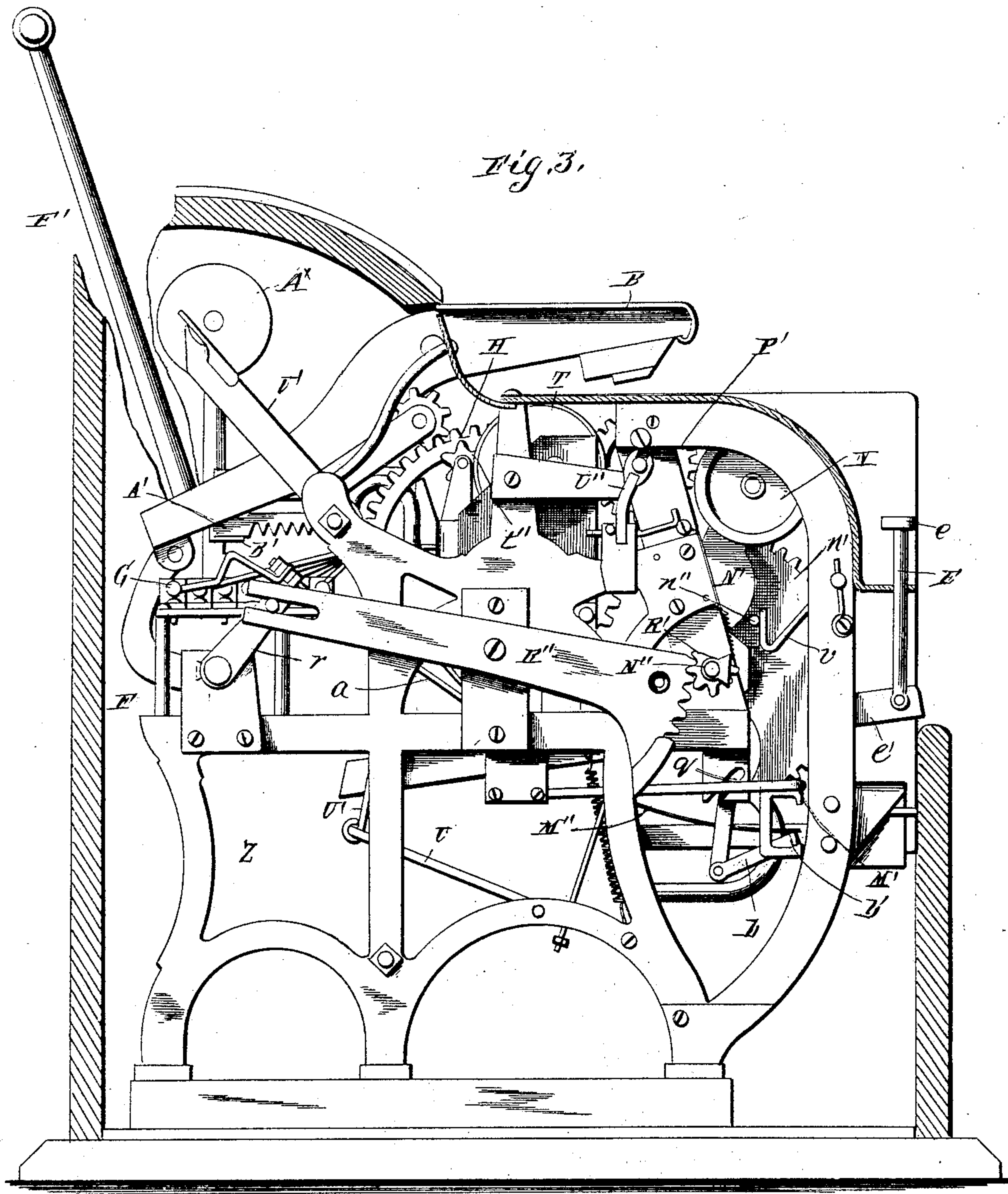
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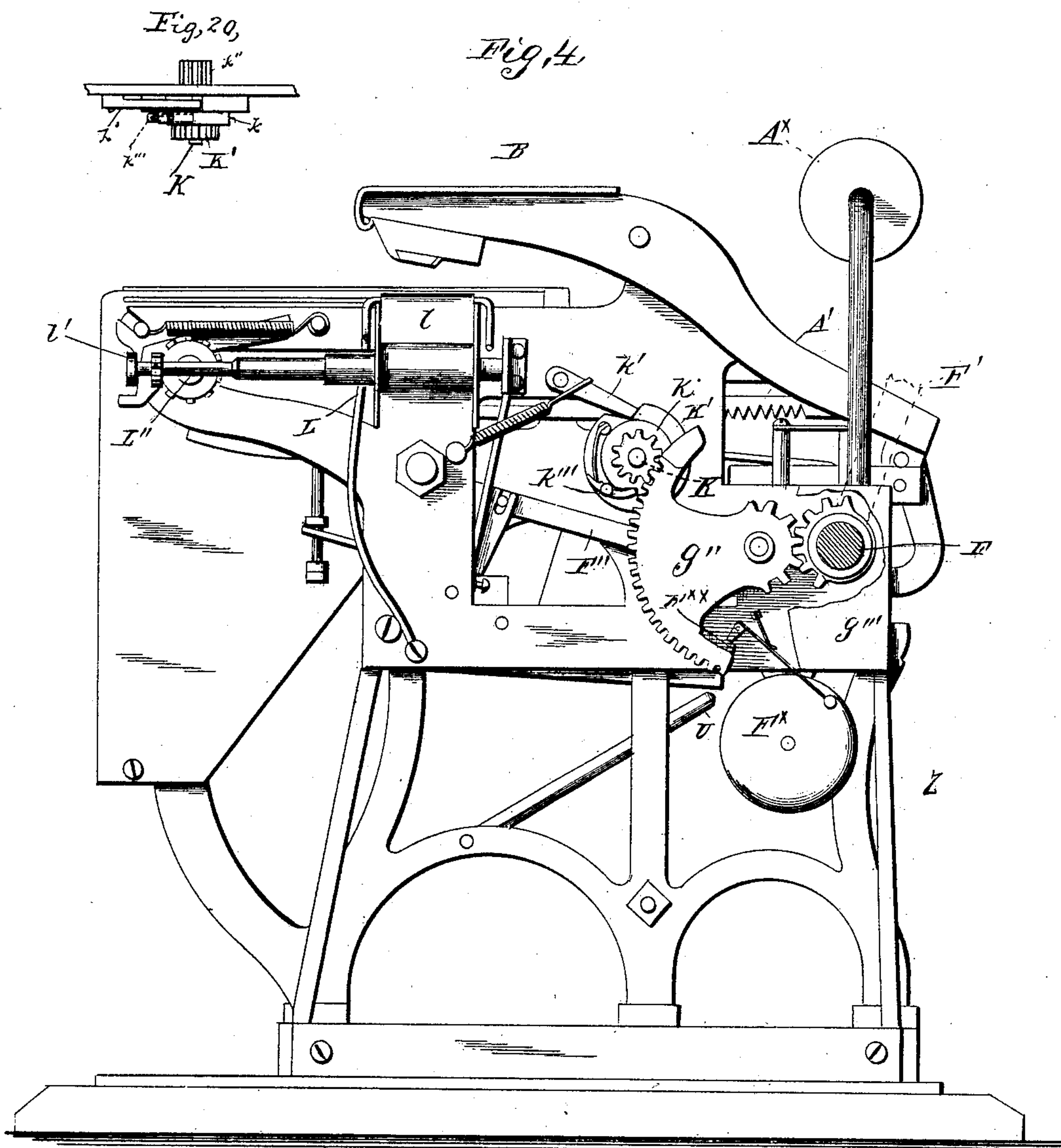
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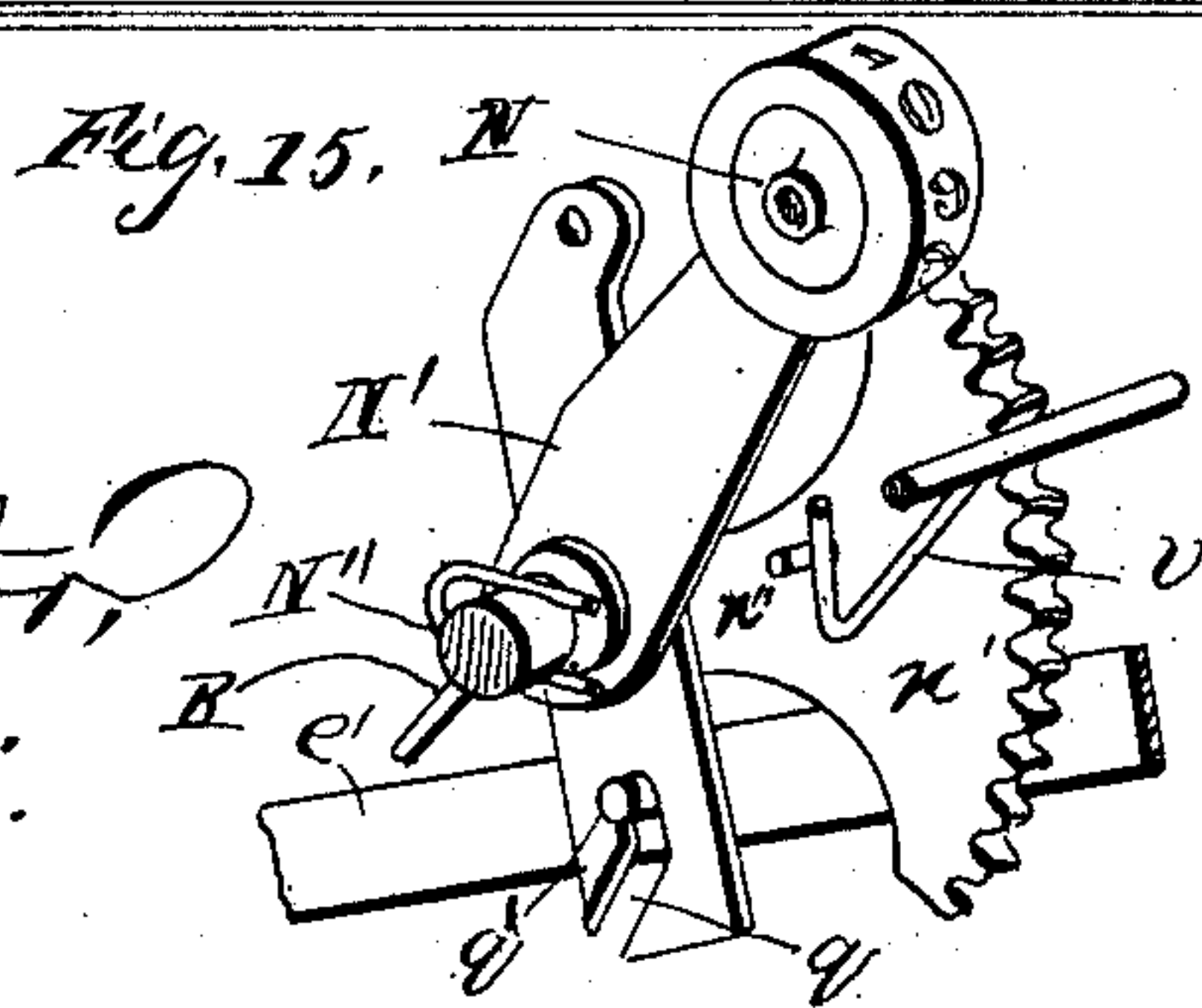
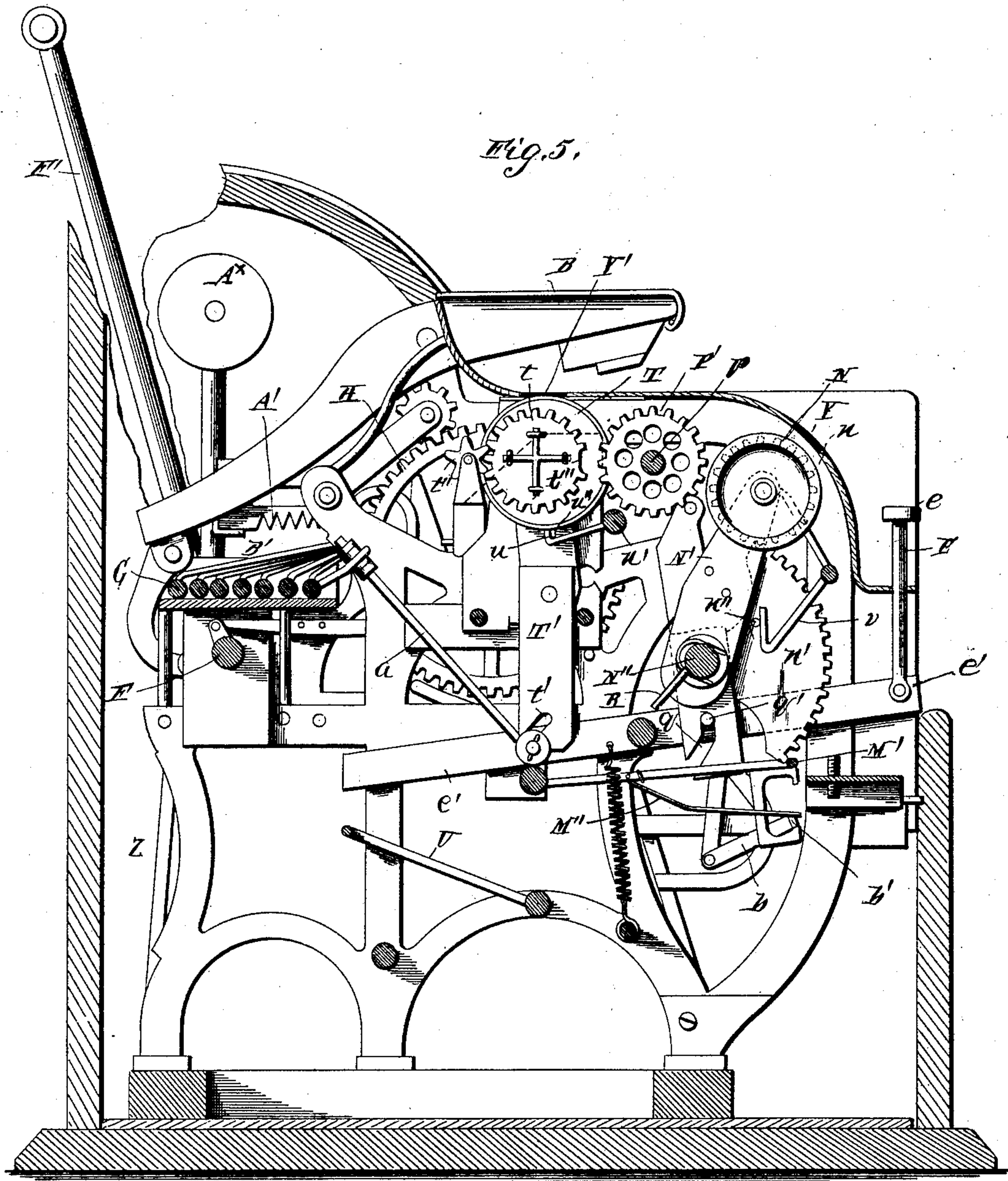
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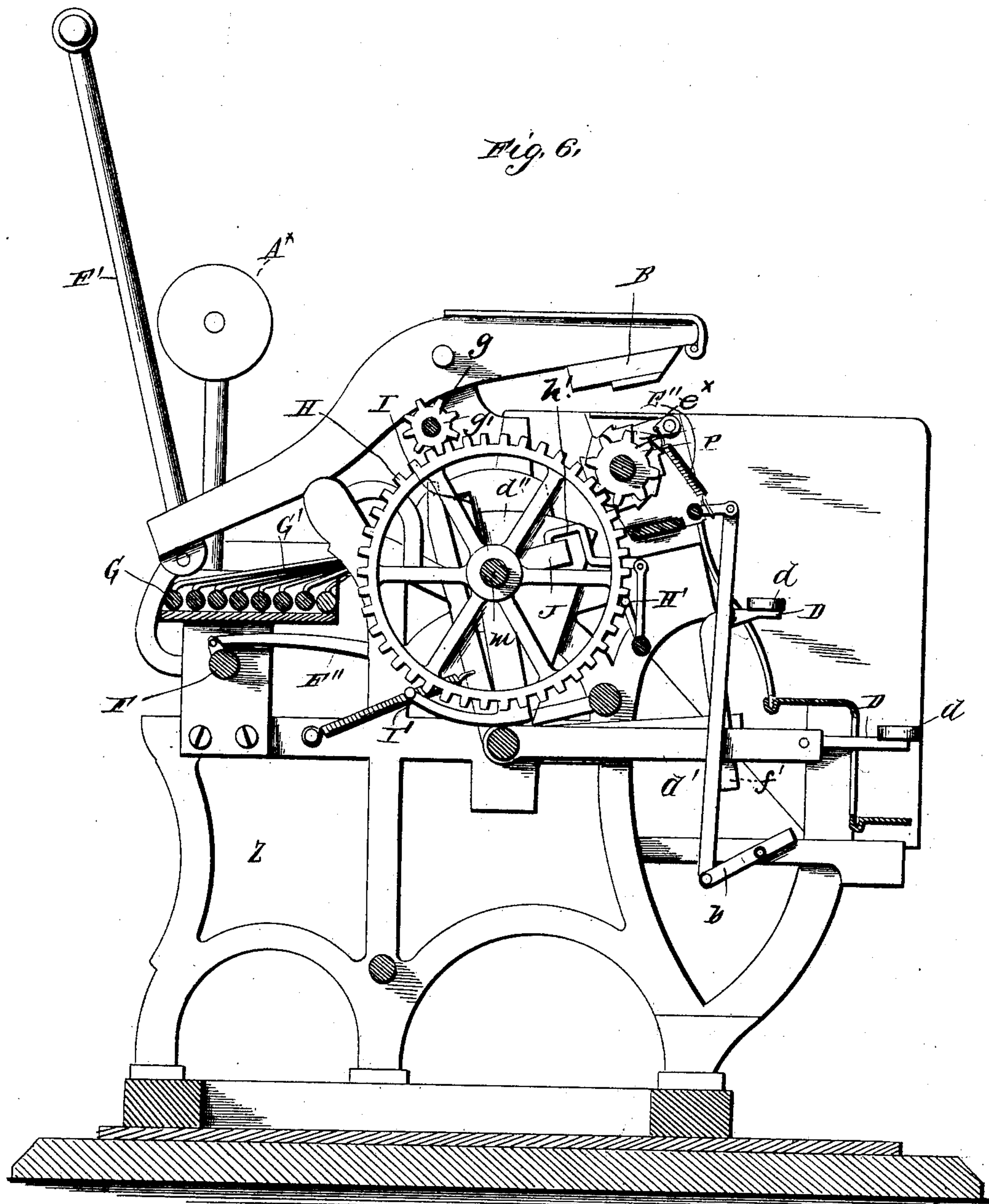
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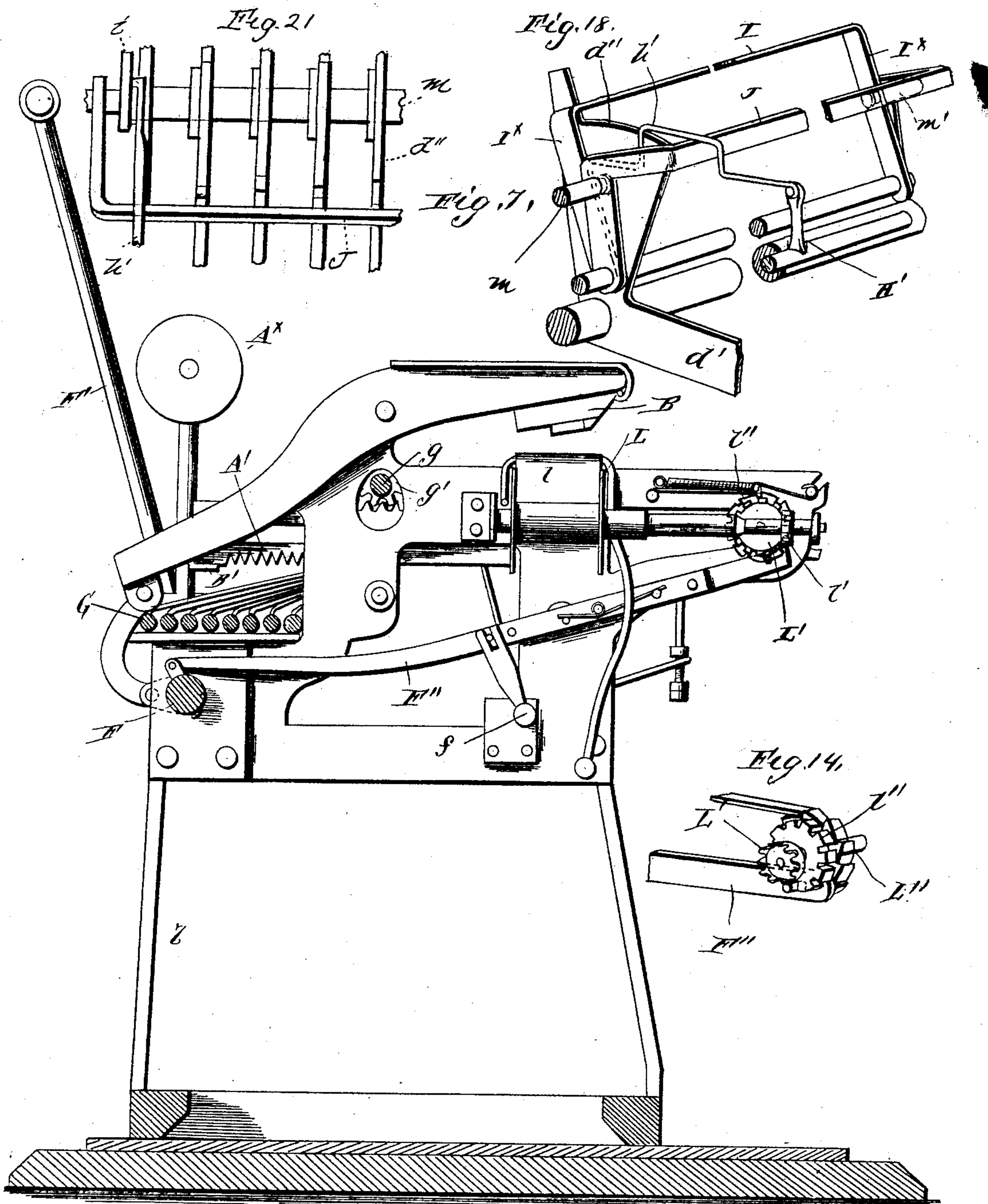
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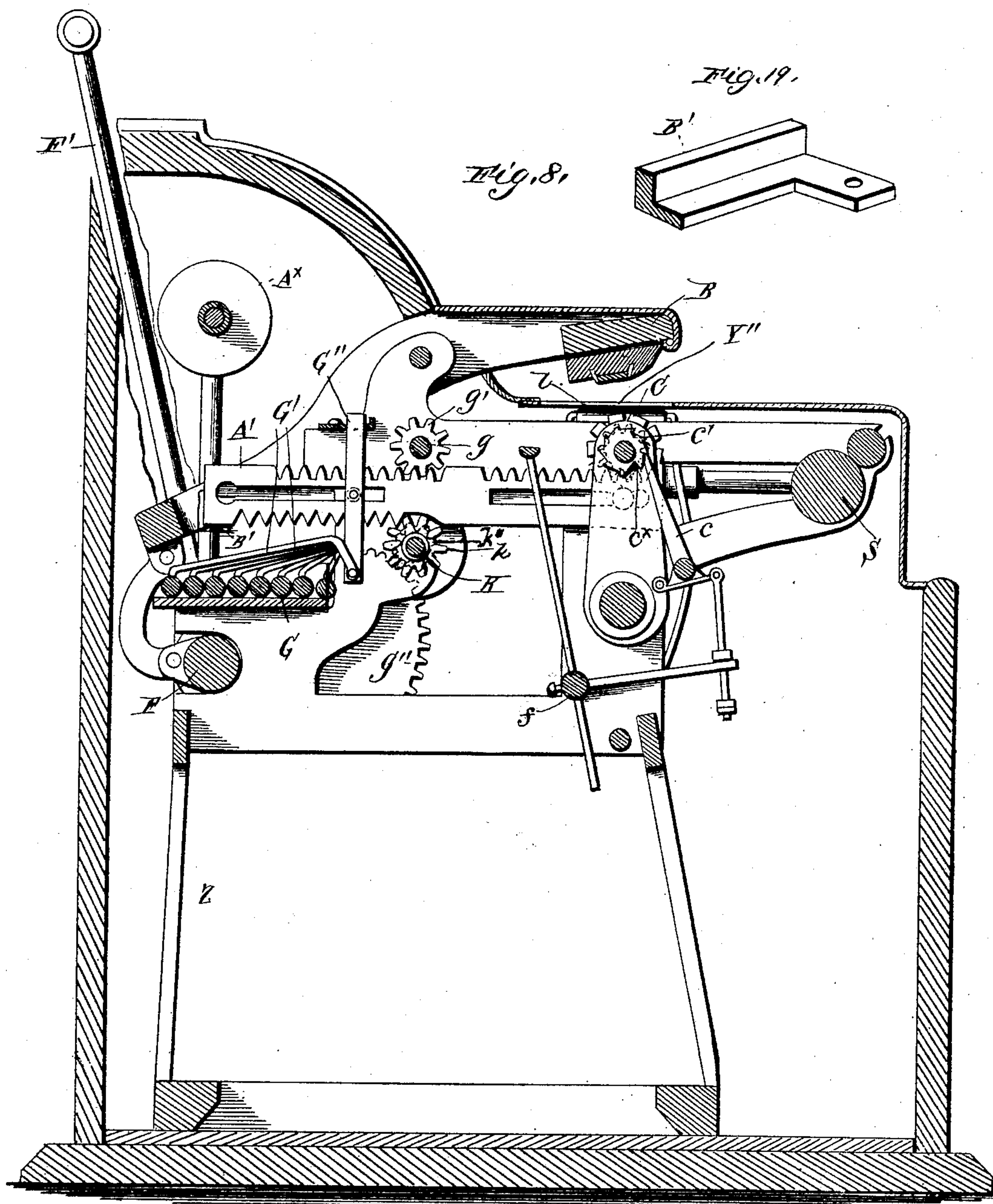
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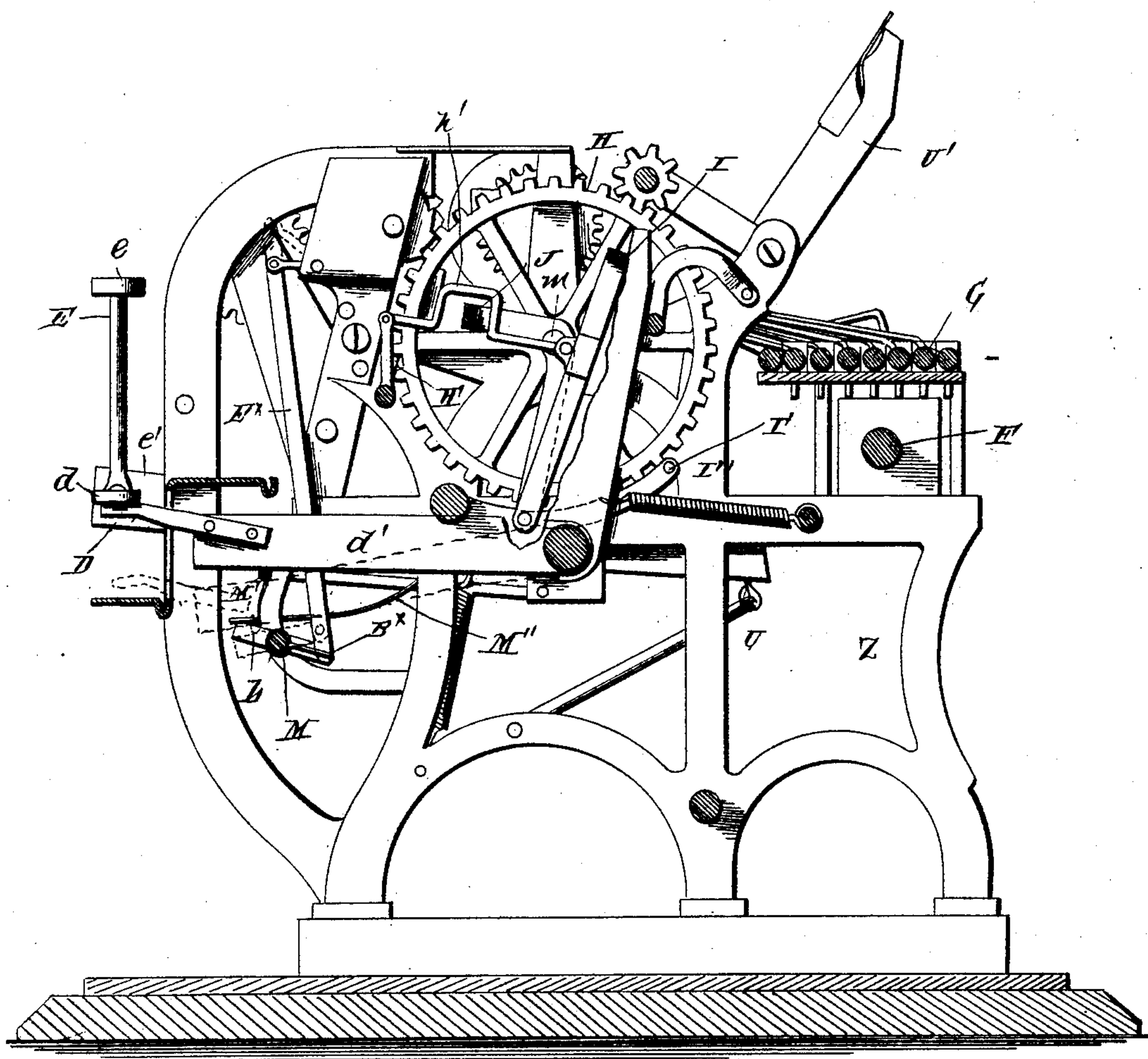
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Fig. 9.



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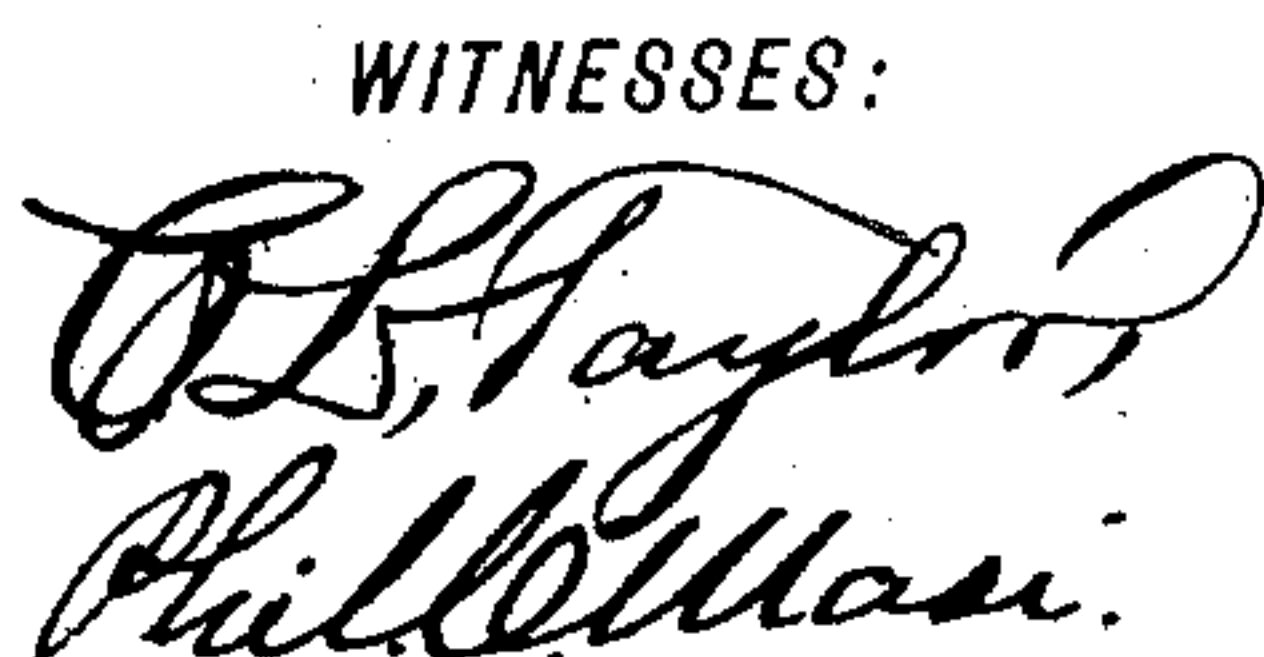
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10 Sheets—Sheet 10.

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UNITED STATES PATENT OFFICE.

HENRY G. O'NEILL, OF LOUISVILLE, KENTUCKY, ASSIGNOR OF THREE-
FOURTHS TO THE STANDARD RECORDER COMPANY, OF NEW YORK.

RECORDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,318, dated August 26, 1890.

Application filed May 11, 1889. Serial No. 310,457. (No model.)

To all whom it may concern:

Be it known that I, HENRY G. O'NEILL, a citizen of the United States, and a resident of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Recording-Machines; and I do 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a top plan view. Fig. 2 is a similar view with the plates removed. Fig. 3 is an end view. Fig. 4 is a similar view, partly in-section, looking from the opposite side. Fig. 5 is a vertical sectional view on the line X X, Fig. 2. Fig. 6 is a similar view on the line Y Y, Fig. 2. Fig. 7 is a similar view on the line Z Z, Fig. 2. Fig. 8 is a section on the line X' X', Fig. 2. Fig. 9 is a section on the line Y' Y', Fig. 2, the lever *d'* also being shown in dotted lines in its depressed position. Figs. 10, 11, 12, 13, 14, 15, 16, 17, and 18 are detail views. Fig. 19 is a detail, partly sectional, and perspective view, showing more clearly the stops for limiting the forward movement of the racks actuated by the rock-shafts of the notation-keys; and Fig. 20 is a similar detail view of a portion of the rack-returning mechanism. Fig. 21 is an enlarged detail broken plan view, more clearly disclosing the arcuate stop projections of the stop-bail mechanism.

The object of the invention is to provide for financial transactions—receipts or discounts—a recording-instrument wherein the type-wheels, arranged in notation series, are operated independently by digit-keys, and gear-turning mechanism, normally disengaged from the gear in connection with said type-wheels, but set in operative connection there- with by a series of notation shifting-keys, governing the engagement of the type-wheel gear and guarding the action of the digit-keys and their gear-turning mechanism.

The invention further consists in providing, in connection with the recording type-

wheels arranged in notation series, the type-wheel gear and the operating mechanism normally disengaged therefrom, but set in engagement therewith by means of notation shifting-keys, the consecutively-numbering wheels, and turning-pawls operated at each movement of the printing-platen.

The invention further consists in providing a stop device, in connection with the mechanism of the printing-platen, limiting the actions of each digit-key so that when the type-wheels are set to record a transaction the mechanism is prevented from further effective working until the platen is operated to print off the transaction, reset the type-wheels, and make the record.

The invention also consists in providing an indicator attachment for the recorder, wherein the indicator-wheels are operated in like manner to the type-wheels, and are similarly reset when the printing-platen is operated; and the invention further consists in other novel devices and combinations, as hereinafter set forth.

In the accompanying drawings, the letters A A designate the recording type-wheels; B, the platen or press; C C, the numbering-wheels in line with the recording type-wheels; D D, the digit-keys, including their finger-pieces *d* and levers *d'*, and E E the notation-keys, also including their finger-pieces *e* and levers *e'*.

Z indicates the frame-work.

F is the operating-shaft of the printing-platen, having a lever F' and connection F'' to operate the pawl-moving shaft *f*, which actuates the pawls *c c* of the numbering-wheels C C.

G G are rock-shafts thereof which in practice correspond in number to the type-wheels and notation-keys, though in the present instance being shown one less in number than said keys, and said rock-shafts are respectively connected to the notation-key levers, as indicated at *a*, and are operated thereby when the notation-keys are pressed. These rock-shafts are provided with arms G' and rack-carriers G'', which support the racks A', and when said rock-shafts are turned raise or set said racks in gear with the pinion-gear *g'* of

the pinion-shaft g , which is operated by the main gear-wheel H when the digit-keys D are pressed. The type-wheels are normally engaged with the setting-racks and the mechanism operated by the notation-keys, and are disengaged from the gear-turning mechanism operated by the digit-keys. When, however, one of the notation-keys is pressed, the corresponding rack is set or shifted to engage the pinion g' of the gear-turning mechanism. As each digit-key operates to turn the main wheel H through an arc corresponding to the digit of said key, the pinion g' is correspondingly rotated and the rack in engagement therewith reciprocated, turning the type-wheel to bring the proper figure thereon to the front or printing position.

In connection with the shaft of the platen B is the rack-returning mechanism, which may consist of the segmental gear g''' on said shaft meshing with a corresponding gear on a segmental rack g'' , suitably supported in position, a returning-pinion K' on a shaft K gearing with the teeth of said rack, a ratchet-head k on said returning-pinion engaged by a pawl k''' , and the reversing-pinion k'' arranged on the ratchet-head k , engaged by a pawl k' . When the shaft F is turned to depress the platen toward the type-wheels to effect the printing, the segment-gear g'' moves backward, turning the reversing-pinion k'' freely away from its pawl. When, however, the movement of the platen-operating shaft is reversed, the segment-gear g'' is moved forward, and the reversing-pinion k'' engaging the rack A' and becoming locked by its ratchet and pawl to the ratchet-head of the returning-pinion K , the latter is rotated and moves the rack or racks A' back to normal position. The racks A' are of sufficient length to rotate their respective type-wheels once around, and when they have received their full movement a stop B' prevents further motion in the forward direction. Before the type-wheels can be again operated the platen must be worked and the racks returned to normal position. A bell or alarm F^x is usually employed in connection with the platen-moving mechanism to indicate when the platen has been moved back from the type-wheels, and when the racks have been returned to their first position through the striking of the hammer of said bell by a projection F^{xx} on the inner side of the segmental gear g'' .

The numbering-wheels $C C$ are provided, respectively, with ratchets $c' c'$, each having a deep tenth-notch c^x to allow for the engagement therewith of the pawls c . The pawls $c c$ are rigidly connected and held in their operative position by the coiled spring c^2 , as seen in Fig. 11.

$L L$ are the printing-ribbon rollers, carrying the ribbon l . The rollers are mounted on shafts turning in bearings of the frame, and provided with pinions l' , alternately engaging the driving crown-wheels $L' L'$ of the

shifting-shaft L'' , which is provided with a ratchet l'' , operated by a pawl connected to the arm F'' , which extends from the platen-operating shaft F . The shaft L'' is adjustable endwise, so that either of its crown-wheels can be brought into engagement. By this means the ribbon may be moved in one direction until it is nearly unwound from one roller, and then the motion may be reversed in order to unwind it from the other roller back upon the first. The shaft L'' carries the paper-feeding roller S .

The gear-turning mechanism operated by the digit-keys comprises in the construction illustrated the compound bail-lever devices $I J$ and the pawls and stops in connection therewith, whereby when a notation-key is pressed any one of the digit-keys can be operated to rotate the main gear-wheel H through an arc corresponding in length to the number of units of the digit whose key is pressed by means of the varying arcuate upper edge of the stop projection of the respective key-lever, fully hereinafter referred to.

In the instrument illustrated the carrying devices are arranged in accordance with the decimal system; but this may be varied to suit other systems of coinage.

Each digit-key lever d' is provided with a stop projection d'' of proper height and segmental area to engage the stop-bail J when the stop projection is carried down by the operation of the digit-key lever the required extent, moving the upper part of the bail-lever I forward, and at the same time throwing the lower part of the arm of the said lever next the main wheel H backward, and moving its pawl I' to engage and rotate the main wheel.

The bearing-stud m forms a prolongation of the axis of the main wheel H , and opposite thereto on the frame is the bearing-stud m' , and upon these bearing-studs are pivoted the arms of the stop-bail J . To the lower ends of these arms are pivoted the lower ends of the arms I^x of the bail-lever I , said arms I^x resting a little in rear of the studs $m m'$ when the bail-lever is in retracted position, being held back against the extension D' of the digit-key levers by the spring D'' .

H' is a stop-pawl, which is by means of a connection h' joined to the bail-lever I , so that when said lever commences its movement said stop-pawl is released from the teeth of the main wheel. As said bail-lever continues to move forward pressed by the digit-key lever, its arms engage the studs $m m'$, which become fulcrums therefor, and cause said bail-lever to cant forward and to move the stop-bail J downward to engage the stop projection d'' of the key-lever and moving the actuating-pawl I' to turn the main wheel. Before, however, the main wheel can be turned by the devices described it must be released from the action of the locking-pawl E' of the notation-shifting mechanism, said pawl engaging the ratchet e'' of the pinion P , which

engages the main wheel. The locking-pawl E' is connected by a bar E^x to a lever-arm b of a rock-shaft M , which also carries a pressure-plate B^x , which extends under the feet f' of the digit-keys, and said locking-pawl E' is normally held out of engagement with the ratchet of the pinion P by a spring, as at E'' , while a supplemental pawl e^x engages a ratchet e^{xx} on the side of the ratchet e'' to prevent a reactionary movement of said ratchet. The outer end of the lever-arm b engages a bearing, as at b' , of a bail-lever M' , which extends lengthwise under the notation key-levers in position to be pressed downward thereby when the notation-keys are actuated. This bail-lever M' is normally held upward by a spring M'' , which connects with the pawl e^x and lever-arm b , and by engagement with the lever-arm b holds the locking-pawl E' in engagement with the ratchet e'' of the pinion P . When any one of the notation-keys is depressed, the bail-lever M' is also depressed, and releases the lever-arm b , allowing the spring E'' to instantly act and release the pinion P . It is therefore apparent that the action of the digit-keys and gear-turning mechanism is guarded by and dependent on the operation of the notation-keys, since by the depression of any one of which it will have been noticed from the foregoing that the pinion P is free to be turned by the wheel H simultaneously with the actuation of the digit-gear-turning mechanism, which latter operation is effected by the bail-lever devices I, J , as above pointed out. These notation-keys are arranged in notation series, the first key on the right designating the units place or type-wheel; the next in the decimal system the tens or type-wheel; the next the hundreds place or type-wheel, and so on throughout the series, which may be easily carried to seven or eight places. Usually the pressure-heads or finger-pieces of the notation-keys are colored to correspond with the ruling of a ledger or account-book, the first two heads being white, the next three red, and the others blue. The object of thus designating the keys is to enable the operator to act with certainty and rapidity in pressing the proper notation-key for the figure to be recorded.

As the type-wheels are somewhat hidden under the ribbon and by the paper upon which the record is made, it is usual to provide, in connection with this recorder, indicating device to show what has been set up by the type-wheels, and to this end the shaft p of the pinion P is extended and provided with a series of pinions P' , corresponding in number to the type-wheels.

N, N represent the indicator-wheels, which are provided with lateral pinions n , and are pivoted to the upper ends of levers N' , which are pivoted on the shaft N'' , and are also provided with the resetting segment-gears n' , engaging the pinions n and having the lateral studs n'' normally engaging the front stops

v . The levers N' are provided with cam edges or inclines q at their lower ends to engage lateral studs q' of the notation-levers e' when the latter are depressed, this action causing the levers N' to vibrate backward slightly or sufficiently to bring the pinions of the indicator-wheels in engagement with the pinions P' of the shaft p . Thence when any notation-key is operated its lever N' is also moved to bring its indicator-wheel to engagement position, in order that when the gear-turning mechanism is put in action by any digit-key it will not only rotate the type-wheel corresponding to the notation-key, but will also rotate the indicator-wheel, bringing the proper figure thereof to the sight-slot Y of the case.

The shaft N'' is provided with the resetting-arms R , which normally extend rearward, and to said shaft N'' at its end is secured the segment-gear R' , engaging the segment-lever R'' , which is pivoted to the frame, and slotted in its rear arm to engage a stud of a crank-arm r of the rock-shaft F of the printing-platen. When the notation-key is depressed, bringing the indicator-wheel to engagement position, and a digit-key is operated to rotate the type-wheel, the indicator-wheel is also rotated and the resetting-segment is turned back toward one of the resetting-arms R . Similar actions of corresponding parts occur on operating the notation-keys and digit-keys to set the type-wheels and indicator-wheels for all the figures of a transaction, and after this has been done it is in order to print off the transaction upon the paper under the platen and upon the printing-ribbon. Upon moving the platen-lever to depress the platen toward the type-wheels, the rock-shaft F is operated, actuating the segment-lever R'' and turning the shaft N'' forward with its resetting-arms, which engage the lateral pins of the segments n' and rotate said segments forward to normal position, this action bringing the indicator-wheels also back to their first position, so that they show zero at the sight-slot of the case. Upon moving the platen-lever to the rear and rotating its rock-shaft F back, the segment-lever R'' is again actuated, rotating the shaft N'' and its resetting-arms R back to their normal position. After each transaction is printed the type-wheels and indicator-wheels are set back to zero.

In operation, the figures of the required number or amount it is desired to record being given, the corresponding notation and digit-keys are operated in their order, the actuated rock-shaft G bringing into requisition the required racks A' , through which the said notation-keys are put into co-operative relation with the platen B . Simultaneously with the actuation of said digit-keys the bar B^x is depressed therefor, pulling upon the lever-arm b , which will disengage the pawl E' from the ratchet e'' , thus unlocking the shaft p , which through its pinion P is thus rendered capable of rotation by the wheel H , the pawl

H' also at the same time being disengaged from the wheel H, and the stop projection or projections d'' of the digit-key levers caused to pass at their upper arcuate edges under the stop-bail J during their initial movement. In the meantime the upper end of the bail-lever I is canted forward or downward by the fulcruming of said lever upon studs $m m'$, thus throwing its lower end outward or rearward, consequently causing its pawl I' to engage and turn the wheel H, this being permitted until the upper extremity of the segment of the stop-projection d'' has engaged the bail-stop, when the movement of said bail-lever and wheel will be arrested, thus controlling the arc or extent of the movement of the wheel, which by its engagement, as aforesaid, with the pinion P of the shaft p provides for the required rotation of the latter for the engagement of its pinions P with the pinions n of the indicator-wheels N. The platen B now being depressed, the pinion g' on the shaft g will be turned, thus actuating the wheel H, as also the numbering-wheel C, through the shafts $F f$, connecting F'' and pawls $c c$, and the impression or record of said recording-wheels will be made on the surface of ribbon l , which, when the platen returns to its elevated position, will be fed through its feeding mechanism, so as to present a fresh portion for a subsequent impression or record; also, simultaneously with the elevation of the platen F the racks A' will be returned through the gear mechanism $g'' g'''$, &c., to their original position for a subsequent forward movement as the platen shall be again depressed.

The indicator-wheels N are actuated through the gearing $n n' P'$, and shifted into gear with the shaft P by the lever T' and N', engaged by the stud q' on the notation-key levers e' , to disclose the duplicate of the record made by the wheels on the ribbon l .

An adding attachment to this recording-machine is indicated in rear of the pinions P', T T designating the adding-wheels, and $t t$ their pinions, having shifting-connection with said wheels and actuated by levers T', having inclined slots t' , engaging studs of the notation-key levers. When a notation-key is operated, the lever T' is inclined sufficiently to effect the engagement of its pinion t with a pinion P' of the shaft p , in order that the rotation of said shaft by the gear-turning devices in connection with the digit-keys may be effected. Back of the wheels T and pinions t are the carrying-pinions t'' , which are actuated each by a marginal notch or slot t''' of a wheel t when the digit 9 of said wheel has passed its indicative position and turned sufficiently to move the pinion t of the next wheel one step. By means of this adding attachment the transactions recorded by the type-wheels are summed up, and the result is shown by the wheels T at the sight-slot Y' of the case.

In order to reset the wheels of the adding

attachment to zero, the bail device U is provided, which, when operated by the lever-arm U', serves to actuate all the notation-key levers simultaneously. This action operates the angle-lever U'' to raise the stop-fingers u of the shaft u' to engage the stops u'' of the wheels T, and at the same time moves the slide-shaft p longitudinally, bringing its pinions in engagement with the slot t''' of the pinions t . Upon movement of one of the digit-keys the entire series of wheels T will be turned until stopped by the fingers u , and each of said wheels will be stopped with zero at the sight-slot of the case.

The mechanism is designed to be inclosed in a secure incasement having an opening at Y'' where the printing-platen works to facilitate the insertion of checks, the entry of a recording-strip, &c. The sight-slots at Y and Y' are glazed, and the door is provided with a safe-lock, the key to which should be in the possession of the party for whose information and security the machine is operated.

By means of these machines financial papers may be numbered and stamped with their values, and a regular record may be kept, showing each transaction by its consecutive number and value.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. In a recording-machine, the combination, with type-wheels arranged in notation series, corresponding notation-keys, and type-wheel-turning mechanism in connection therewith, of the digit-keys and gear-turning mechanism adapted to actuate the type-wheel-turning mechanism when set in engagement therewith by said notation-keys, substantially as specified.

2. In a recording-machine, the combination, with a series of type-wheels, gear-turning mechanism, and a series of digit-keys independently engaging said gear-turning mechanism adapted to move any type-wheel of the series, of a series of notation-keys and shifting-levers and their adjunctive mechanism adapted to set any type-wheel of the series into engagement with said gear-turning mechanism, substantially as specified.

3. In a recording-machine, the combination, with a series of digit-keys, a series of type-wheels, and gear-turning mechanism adapted to be actuated by all of and independently engaged by each of said digit-keys, of a set of notation shifting-keys and connected mechanism governing the operation of the gear-turning mechanism upon the type-wheels, substantially as specified.

4. In a recording-machine, the combination, with digit-keys and gear-turning mechanism, the recording type-wheels arranged in notation series and the operating mechanism engaging said type-wheels and the gear-turning mechanism, of the notation setting-keys, the printing-platen, the consecutively-numbering wheels, and type-wheel-turning mechanism

operating in connection with said printing-platen to actuate said consecutively-numbering wheels, substantially as specified.

5 In a recording-machine, the combination, with the type-wheels arranged in notation series and their notation setting keys and mechanism, the series of digit-keys, and gear-turning mechanism common to each digit-key of the series, of a series of indicator-wheels and
10 shifting-levers corresponding thereto and engaging the levers of the notation setting-keys, the pinions of said indicator-wheels, and a pinion-shaft in connection with the gear-turning mechanism of the digit-keys, substantially
15 as specified.

6. In a recording-machine, the combination, with the platen-operating mechanism comprising a rack connected to the notation shifting-keys and their gear mechanism and the
20 digit-keys and gear-turning mechanism geared to said rack, of type-wheels and gear-returning mechanism therefor, resetting segmental gears, and the notation key-levers, substantially as set forth.

25 7. In a recording-machine, the combination, with the platen-operating mechanism comprising a rack connected to the notation shifting-keys and their gear-shifting mechanism, the type-wheel-turning mechanism, the digit-
30 keys, and the gear-turning mechanism geared to said rack, of the type-wheels and indicator-wheels and their respective returning-gear mechanism and the platen-operating mechanism.

35 8. In a recording-machine, the combination, with the type-wheels having pinions and the sliding racks engaging said pinions, the notation shifting-keys and their type-wheel-turning mechanism connected to said racks, the
40 digit-keys, and gear-turning mechanism normally disengaged from the racks, the vibratory printing-platen, its operating mechanism, and returning-gear in connection therewith, adapted to engage said racks and reset the
45 digit-wheels, the digit-keys, and gear-turning mechanism, substantially as specified.

9. In a recording-machine, the combination, with the notation-keys and mechanism connecting them with sliding racks, of the type-
50 wheels and their gearing, the digit-keys and gear-turning mechanism, and gear-returning mechanism for said racks and type-wheels, substantially as specified.

10. In a recording-machine, the combination,
55 tion, with the notation-keys and the type-

wheels, their gearing, and sliding racks, and mechanism connecting said racks with said notation-keys and the platen-moving mechanism, of the digit-keys and gear-turning mechanism and the gear-returning mechanism in connection with said platen-moving mechanism, and means of connection between
60 said numbering-wheels and said gear-turning mechanism, substantially as specified.

11. In a recording-machine, the combination, with a platen-moving shaft and the type-wheels, of the sliding racks, the resetting-pin-
65 ion, the segment-gearing, the ratchet and pawl of said resetting-pinion, and the reversing-pinion on said resetting-pinion provided with
70 a ratchet and pawl, substantially as specified.

12. In a recording-machine, geared type-wheels, and operating-racks in engagement therewith, in combination with resetting devices and numbering-wheels, and platen-
75 moving mechanism actuating said resetting devices and numbering-wheels, substantially as specified.

13. In a recording-machine, the combination, with the platen and its moving shaft, of
80 the type-wheels, the notation-keys and their levers, and indicator-wheels, their resetting segmental gears, gear-returning mechanism, and the sliding racks for said type-wheels,
85 substantially as specified.

14. In a recording-machine, the combination, with the type-wheels, their notation-keys, and connected mechanism, of the digit-keys, the levers thereof, and their stop projections, the bail-stop, and bail-lever, the actuating-
90 pawl, and holding-pawl, the main wheel, and the fulcrum-pins in the axial line of said main wheel, substantially as specified.

15. A printing-recorder having its geared type-wheels in engagement with shiftable
95 rack-operating mechanism in connection with notation-keys, a single set of digit-keys, and gear-turning mechanism normally disconnected from the rack-operating mechanism of
100 said type-wheels, a platen-operated gear-returning mechanism for said type-wheels, and a limiting-stop B' for their movements, substantially as specified.

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

HENRY G. O'NEILL.

Witnesses:

CHARLES E. ROBINSON,
HENRI GERARD.