

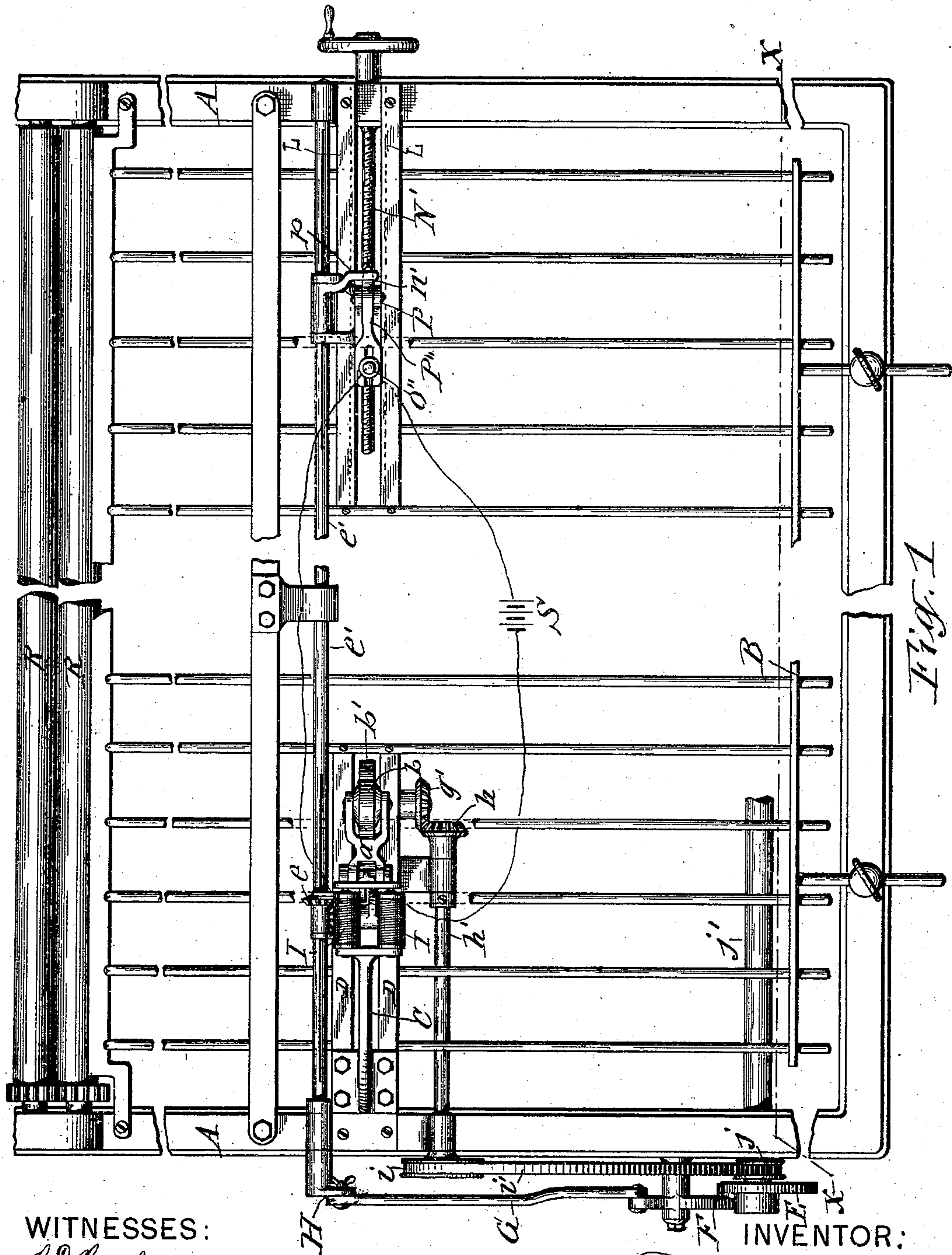
(No Model.)

4 Sheets—Sheet 1.

T. C. DEXTER.
PAPER REGISTERING MACHINE.

No. 551,923.

Patented Dec. 24, 1895.



(No Model.)

4 Sheets—Sheet 2.

T. C. DEXTER.
PAPER REGISTERING MACHINE.

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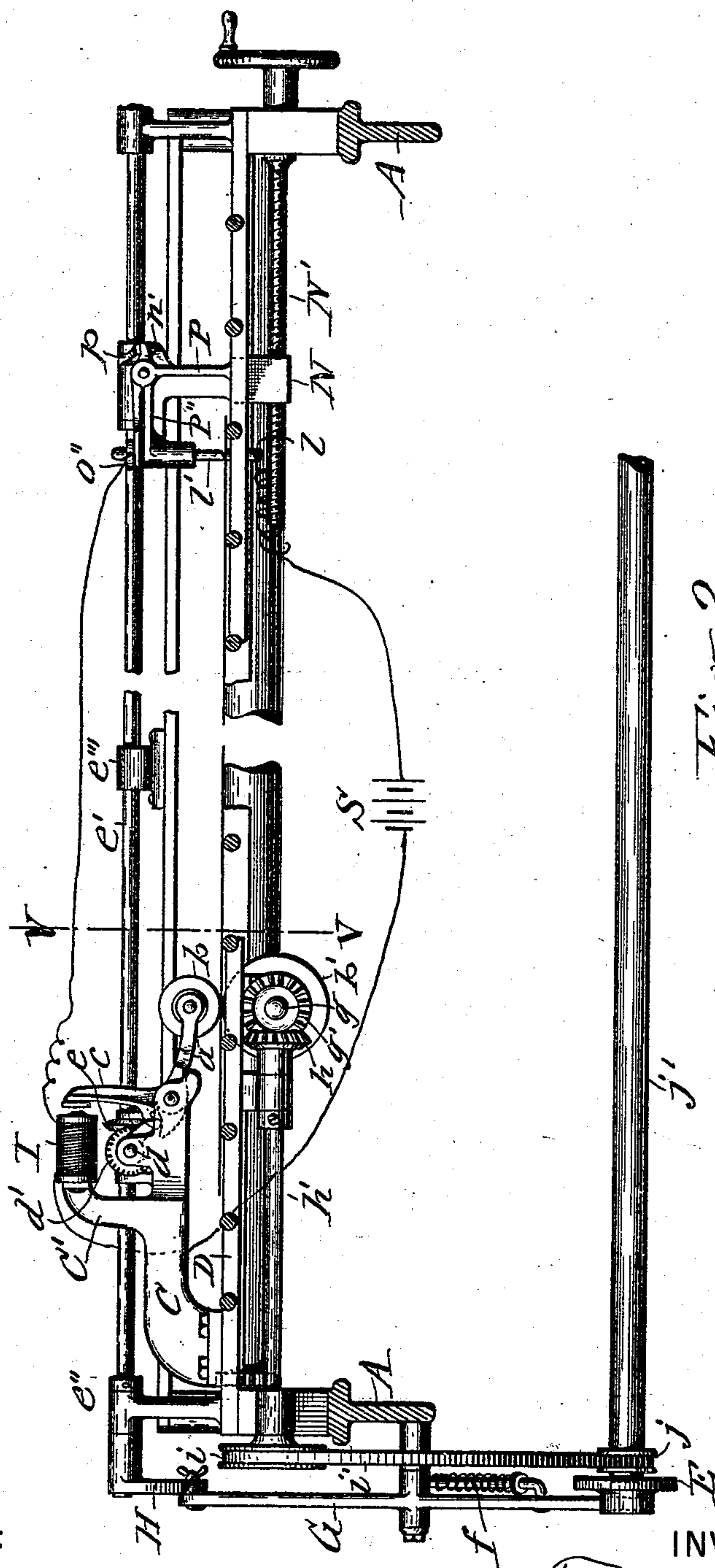


Fig. 2

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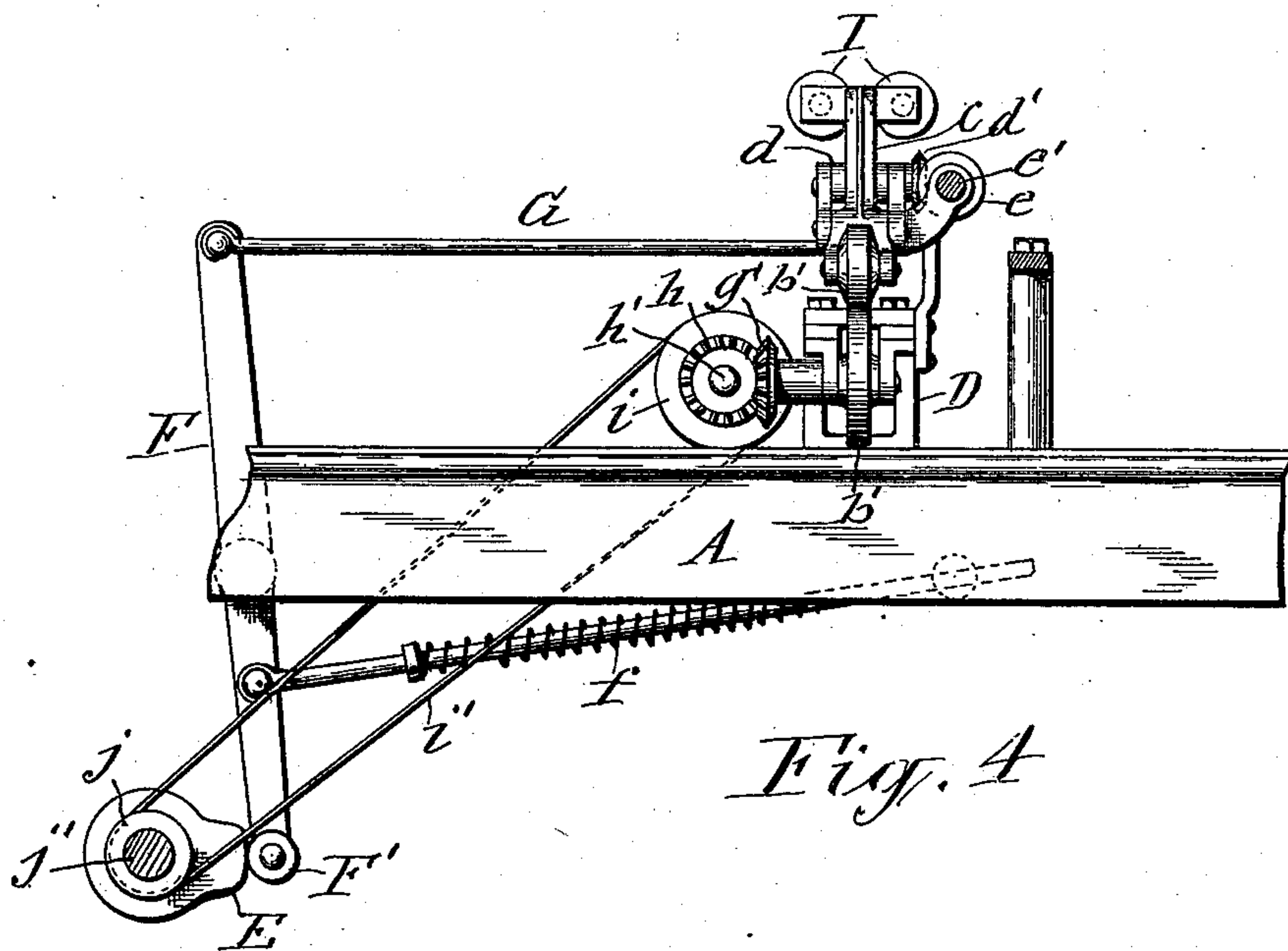
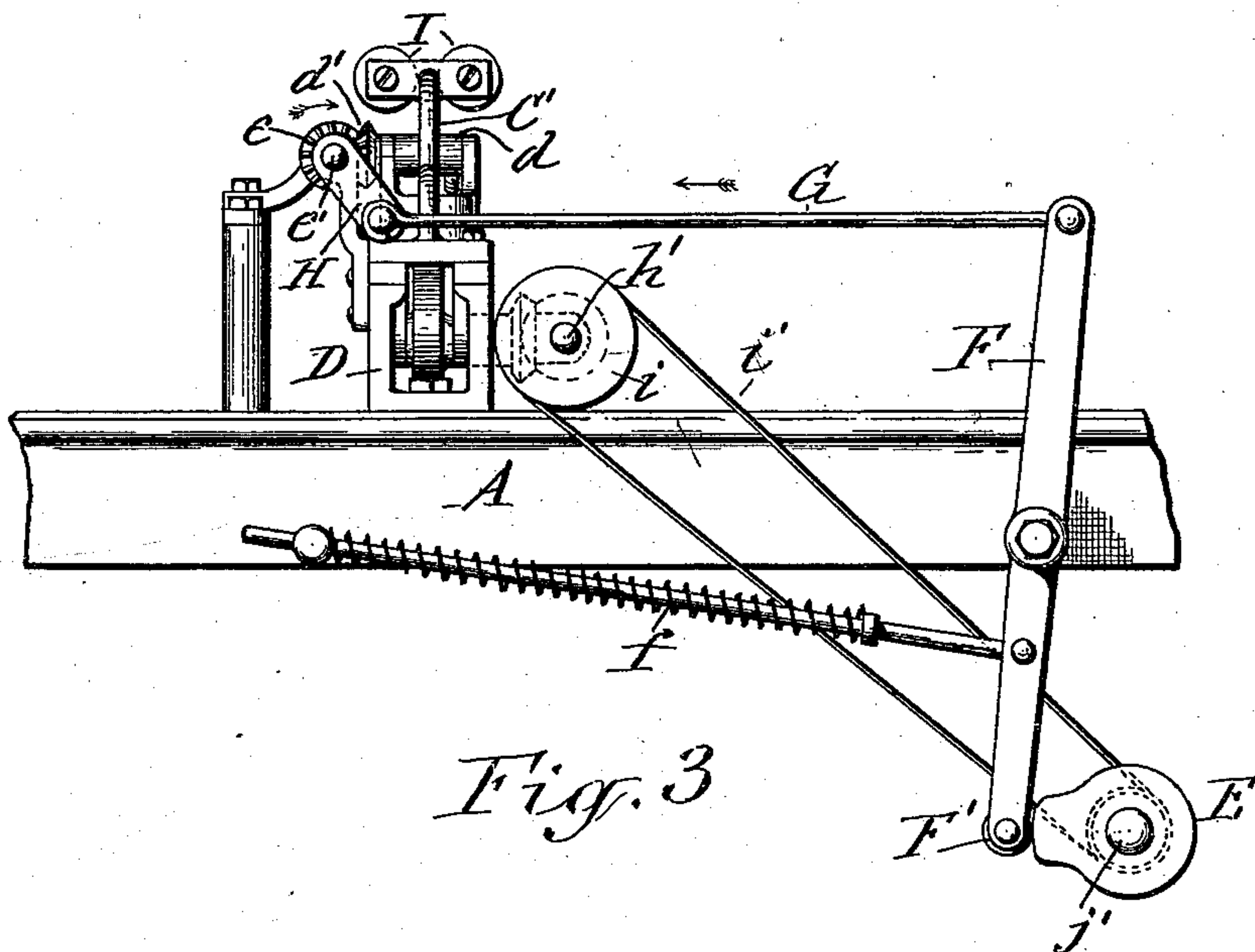
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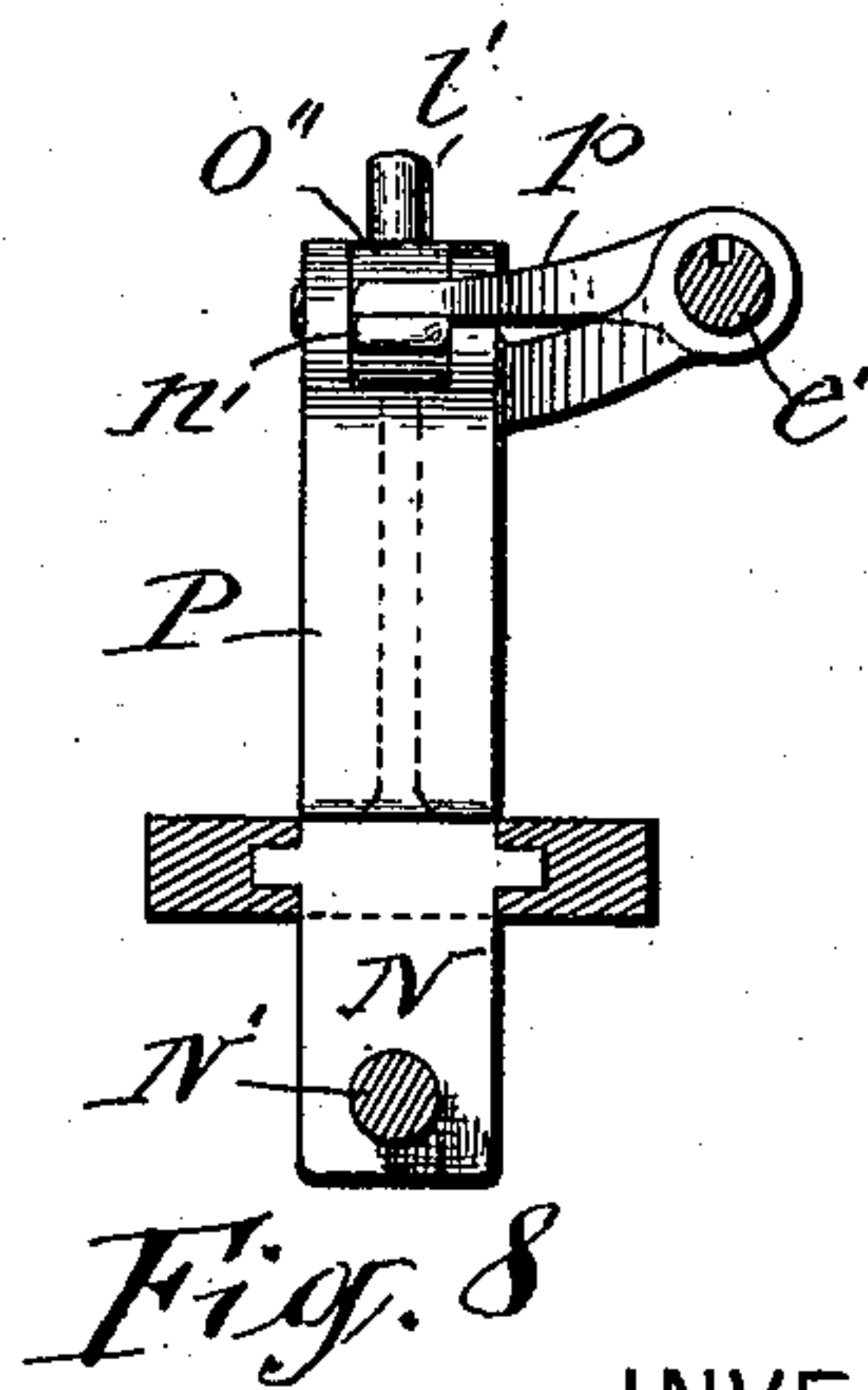
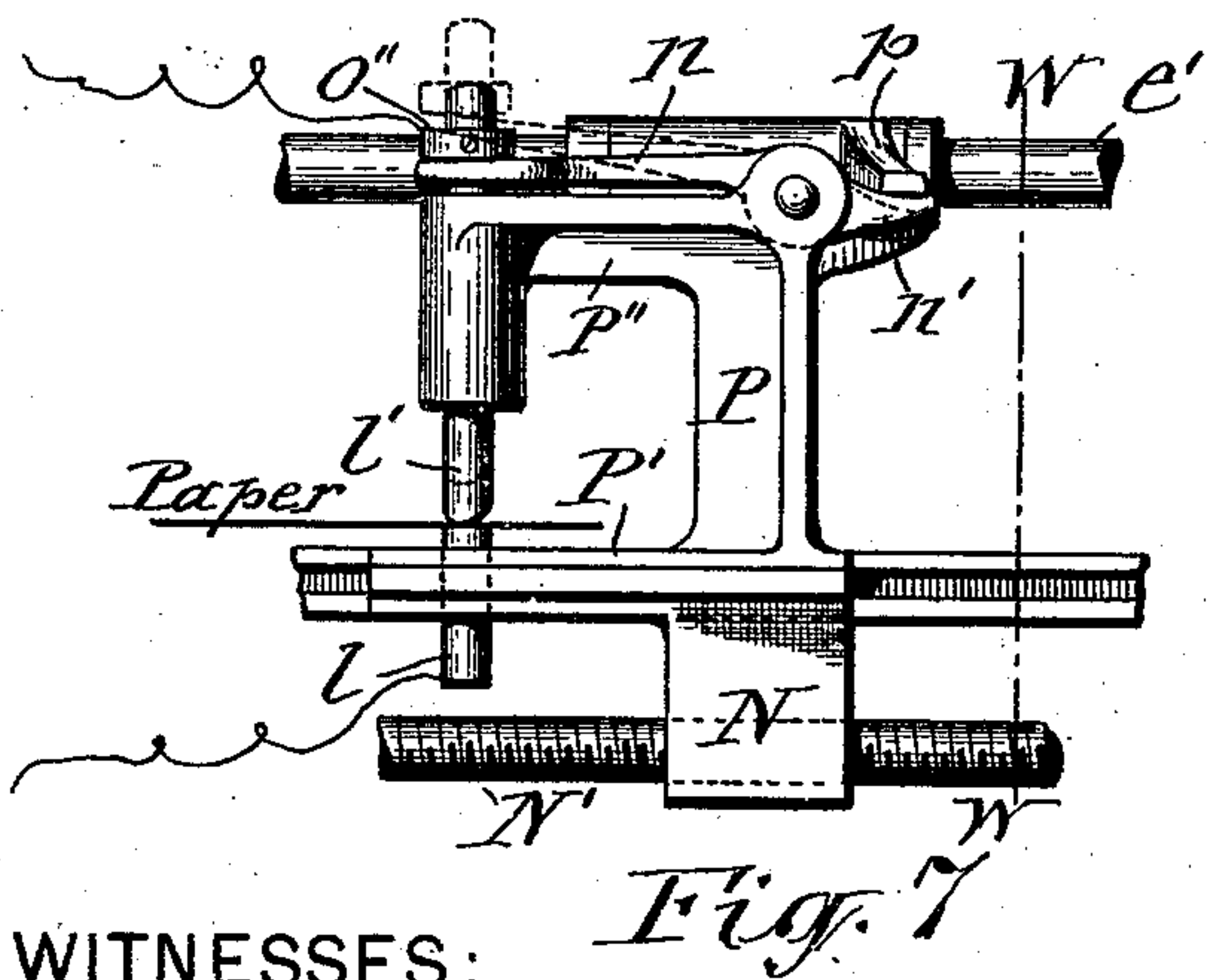
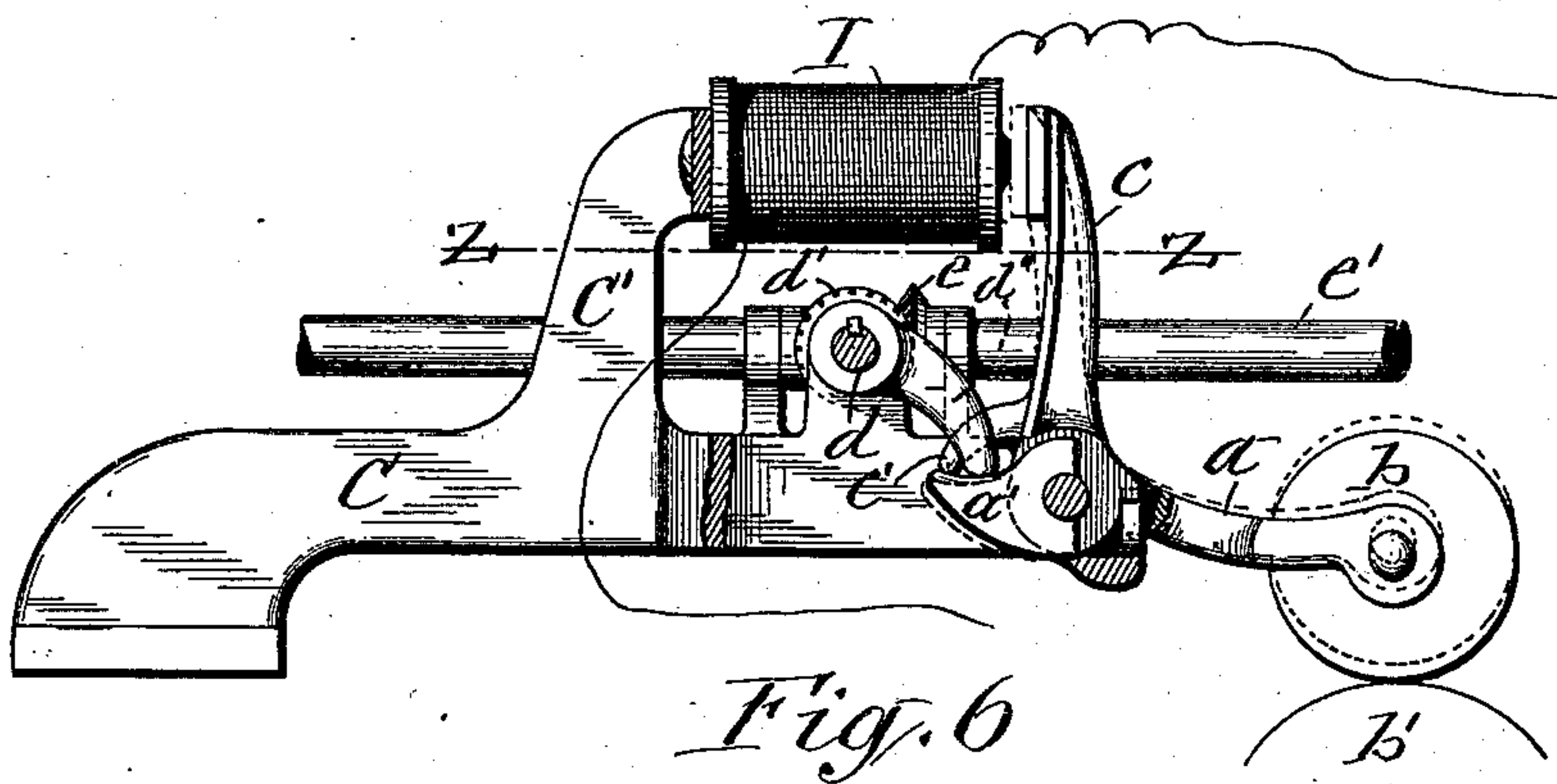
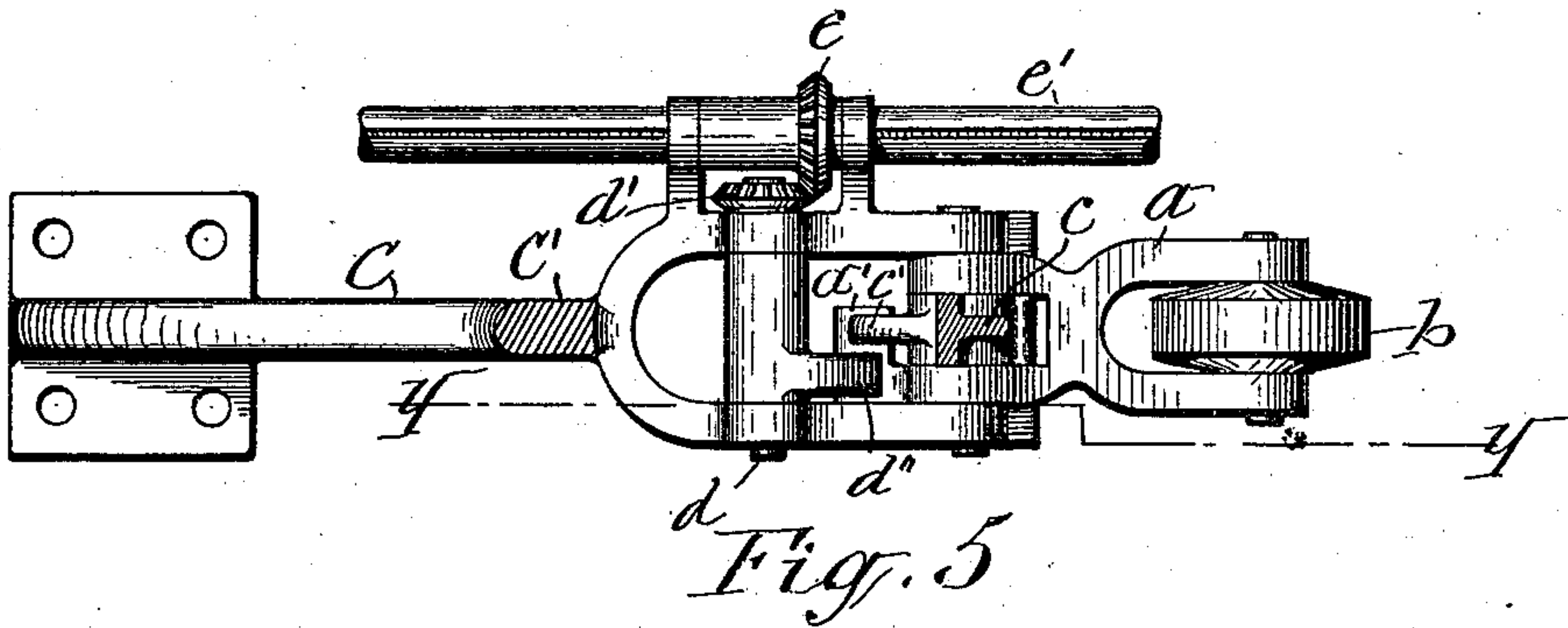
(No Model.)

4 Sheets—Sheet 4.

T. C. DEXTER.
PAPER REGISTERING MACHINE.

No. 551,923.

Patented Dec. 24, 1895.



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UNITED STATES PATENT OFFICE.

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PAPER-REGISTERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 551,923, dated December 24, 1895.

Application filed August 13, 1894. Serial No. 520,152. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, of Pearl River, in the county of Rockland, in the State of New York, have invented new and useful Improvements in Paper-Registering Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to devices employed for automatically registering sheets of paper fed to paper-folding machines or other machines requiring a proper adjustment of the alignment of the sheets in relation to the folding-rollers or other mechanisms designed to operate on said sheets.

The object of my present invention is to effect said registering by simple and efficient mechanism combined with electrically-operated appliances and without depending on the stiffness of the sheet for controlling the electric circuit, thus rendering my present invention capable of accurately registering very thin and light paper, and also sheets which may be fed to the machine in a wavy condition; and to that end my present invention consists in a novel organization of the paper-registering machine hereinafter described, and set forth in the claims.

In the annexed drawings, Figure 1 is a plan view of a paper-registering machine embodying my invention. Fig. 2 is a vertical transverse section on line X X in Fig. 1. Fig. 3 is a side elevation of my invention. Fig. 4 is a transverse section on line V V in Fig. 2. Fig. 5 is a horizontal longitudinal section on line Z Z in Fig. 6. Fig. 6 is a vertical longitudinal section on line Y Y in Fig. 5. Fig. 7 is an enlarged elevation of the circuit making and breaking devices, and Fig. 8 is a vertical section on line W W in Fig. 7.

Similar letters of reference indicate corresponding parts.

A represents the main frame of a paper-folding machine.

R R designate the rollers which receive the paper between them and fold said sheet, and B is the end gage which arrests the longitudinal movement of the paper fed to the folding-machine in the usual and well-known manner. In striking said end gage the sheet of paper becomes straightened, so as to lie

with its advance edge parallel with the folding-rollers, and then requires only to be shifted laterally to register with the subsequent successive lines of foldings. For this purpose I have devised the following improved electrically-controlled automatic registering-machine, the paper-shifting mechanism of which is in this case represented of the form similar to that illustrated in my prior application for Patent, Serial No. 476,580, filed June 5, 1893. I do not, however, limit my present invention to its connection with such specific paper-shifting mechanism, inasmuch as my said invention is adapted to be used in connection with any paper-shifting mechanism the operation of which is controlled electromagnetically.

The chief feature of novelty of my present invention resides in the devices for applying frictional bearings on one marginal portion of the sheet while said sheet is being drawn from said bearings by the paper-shifting mechanism engaging the opposite margin of the sheet, the sheet being thereby subjected to sufficient tension to stretch it into a uniform plane, and thus allowing the registering to be accurately accomplished with very thin and light paper as well as thicker paper.

The invention also consists in a novel manner of utilizing the said devices for making and breaking the electric circuit and thereby controlling the action of the paper-shifting mechanism; and the invention furthermore consists in certain novel features of the details of the registering-machine, all of which I will now describe.

The paper-shifting mechanism, as shown, consists of the arm C, which is mounted on a rigid horizontal supporting-bar D extending at right angles from the side of the frame A. To the free end of this is pivoted axially at right angles to the folding-rollers R R the supplemental arm a, which in turn has pivoted to its free end the roller b. The pivoted end of the arm a is bifurcated and formed with an outwardly-projecting heel a', as more clearly shown in Figs. 5 and 6 of the drawings. On the pivot-pin of said arm in the bifurcation thereof is loosely mounted the armature-lever c, which is provided with a lug c', by which it normally bears on the heel

a'. From the arm C rises a post C', to which are attached the electromagnets I I, which when energized to attract the aforesaid armature, causes the lug *c'* to depress the heel *a'* and consequently lift the free end of the supplemental arm with the roller *b* pivoted thereto for the purpose hereinafter explained.

Across the arm C and journaled therein is a shaft *d*, to one end of which is fastened a miter-pinion *d'*, meshing with a similar pinion *e* mounted on a rock-shaft *e'*. The shaft *d* has projecting from it a lug *d''*, which bears on the heel *a'* of the supplemental arm *a* for the purpose of further lifting said arm to freely admit the paper under the roller *b*. Said rock-shaft extends completely across the machine for the purpose hereinafter explained. It is supported at its ends in bearings *e''* mounted on the frame A, and is supported at its center by a bearing *e'''* attached to a cross-bar secured at opposite ends to posts mounted on top of the frame A. Said rock-shaft receives its motion from a rotary cam E, deriving motion from the driving-gears of the folding-machine by suitable gearings, which obviously vary in form and disposition with the various forms of the folding-machine, and therefore need not be shown in this case. The motion of the rock-shaft is transmitted by means of the lever F, pivoted intermediate its length to the frame A and provided at one end with a roller F', which is held in contact with the cam E by the spring-actuated rod *f*. The opposite end of said lever is connected by a pitman G to a crank H attached to the end of the rock-shaft *e'*. Directly under the roller *b* is another roller *b'* in the same vertical plane and mounted on a shaft *g* journaled in bearings fixed to the under side of the supporting-bars D. This roller receives positive rotary motion by means of a miter-pinion *g'*, attached to the shaft *g*, and meshing with a corresponding pinion *h*, attached to the shaft *h'*, which has also secured to it a pulley *i* connected by an endless belt *i'* to a pulley *j* attached to the shaft *j'* of the cam E hereinbefore referred to.

The paper gripping and releasing actions of the described paper-shifting mechanism are controlled by the electric circuit making and breaking devices consisting essentially of two contacts or terminals receiving between them the margin of the paper directly opposite the aforesaid paper-shifting mechanism and caused to bear on the paper during the lateral withdrawal thereof from between the contacts. The interposition of the paper breaks the circuit and the aforesaid withdrawal of the paper from between the contacts closes the circuit and the energies of the magnets I I are thus controlled. It is obvious that the detail construction of said circuit maker and breaker is susceptible of numerous modifications, and therefore I do not limit myself specifically in that respect. My preferred construction, however, is as follows: On rigid horizontal ways secured to the frame A at

the side directly opposite the paper-shifting mechanism and extending toward the same are parallel ways L, on which rides a post P, which is provided at its base with a nut N disposed axially parallel with the ways and receiving through it the screw-rod N', journaled in the side of the frame A, and provided with a wrench or handle wheel by which to turn it so as to move the post toward or from the paper-shifting mechanism according to the size of the sheet to be registered. From the foot of the post extends a short distance toward the paper-shifting mechanism a plate P', to which is secured the electrical contact or terminal *l*, which is sustained immediately under the path of the paper. From the top of the post extends an arm P'', which is over the plate P', and sliding vertically in it is a pin *l'*, which constitutes the other terminal of the electric circuit maker and breaker. Said pin is supported and moved vertically by a lever *n*, pivoted to the post and engaging by its free end the under side of a collar *o''*, attached to the upper end of the pin, as more clearly shown in Fig. 7 of the drawings. The opposite end of said lever has projecting from it a lug *n'*, upon which bears a lug *p*, attached to the hereinbefore-described rock-shaft *e'*, whereby the lever *n* is caused to intermittently lift the pin or terminal *l'* to admit between it and the subjacent terminal *l* the sheet fed to the folding-machine.

The operation of registering the sheets is as follows: During the movement of the sheet to the end gage B, the rock-shaft *e'* lifts the upper roller *b* and pin *l'* to permit the sheet to freely pass under said parts. The movement of the rock-shaft is so timed as to allow said roller and pin to drop onto the sheet after its forward movement has been arrested by contact with the end gage B. The lower roller *b'* being in constant rotation and faced with rubber on its periphery, and the upper roller being an idler or revoluble independently and pressing the sheet down onto the lower roller causes the frictional hold thereof to draw the sheet laterally. The two contacts or terminals being in the meantime insulated from each other by the interposition of the paper breaks the electric circuit, the battery of which is represented at S. As soon as the paper is withdrawn from between said terminals the upper terminal *l'* drops into contact with the lower terminal *l* and thereby closes the circuit which immediately energizes the magnets I and thus cause the armature to be attracted. This lifts the upper roller *b* sufficiently to release the sheet from the frictional hold of the lower roller *b'*, and allow the sheet to enter between the folding-rollers, into which it is tucked by the usual folding-blade. (Not necessary to be here shown.) After the sheet has been thus released the rock-shaft *e'* again lifts the pin or terminal *l'* and further lifts the roller *b* to allow the succeeding sheet to freely pass beneath them, and subsequently operate on the same in the manner aforesaid.

What I claim as my invention is—

1. A paper-registering machine comprising an end-gage arresting the longitudinal movement of the sheet, lateral paper-shifting mechanism engaging one of the side margins of the arrested sheet, electro-magnets throwing said mechanism out of its operative position, and a circuit controller receiving between its terminals the opposite marginal portion of the sheet arrested by the end-gage and thereby breaking the circuit, and by the lateral withdrawal of the sheet from said terminals closing the circuit and thereby energizing the aforesaid magnets.
2. In combination with the end gage, laterally moving paper-shifting mechanism engaging one of the marginal portions of the sheet, electro-magnets throwing said mechanism out of operative position, a circuit maker and breaker having one of its contacts immediately under the opposite marginal portion of the sheet, and the other contact movable to and from the top of the sheet, and mechanism lifting the latter contact intermittently to admit the sheet between the contacts as set forth.
3. A paper-registering machine comprising a laterally moving paper-shifting mechanism having one of its paper-engaging members movable to and from one of the marginal portions of the paper, sheet-gripping devices normally engaging the opposite marginal portion of the paper, a rock-shaft extending across the machine, a lug on said shaft throwing one of the paper-engaging members of the sheet-gripping devices from the paper to release the same and mechanism transmitting motion from the rock-shaft to the paper-shift-

ing mechanism to throw the latter out of operative position as set forth.

4. In combination with the paper-shifting mechanism having a vertically movable member engaging one of the marginal portions of the sheet and electro-magnets throwing said mechanism out of engagement, a stationary electric terminal under the path of the opposite margin of the sheet, a vertically movable electric terminal over the stationary terminal in circuit with the aforesaid magnets, a rock-shaft extending across the machine, and mechanisms actuated by said rock-shaft and simultaneously lifting both the movable member of the paper-shifting mechanism and the movable terminal to admit the sheet under said parts as set forth.

5. In combination with the frame —A— and electrically controlled paper-shifting mechanism engaging one of the margins of the paper, horizontal ways supported on the frame opposite the aforesaid shifting-mechanism and extending toward the same, a post mounted movably longitudinally on said ways and provided with a nut axially parallel with the ways, an adjusting screw journaled in the frame and working in said nut, and two electric terminals carried on the post and adapted to receive between them and bear on and release the paper, and mechanism lifting the upper terminal intermittently from the path of the paper as set forth.

In testimony whereof I have hereunto signed my name this 25th day of May, 1894.

TALBOT C. DEXTER. [L. S.]

Witnesses:

JOHN J. LAASS,
C. L. BENDIXON.