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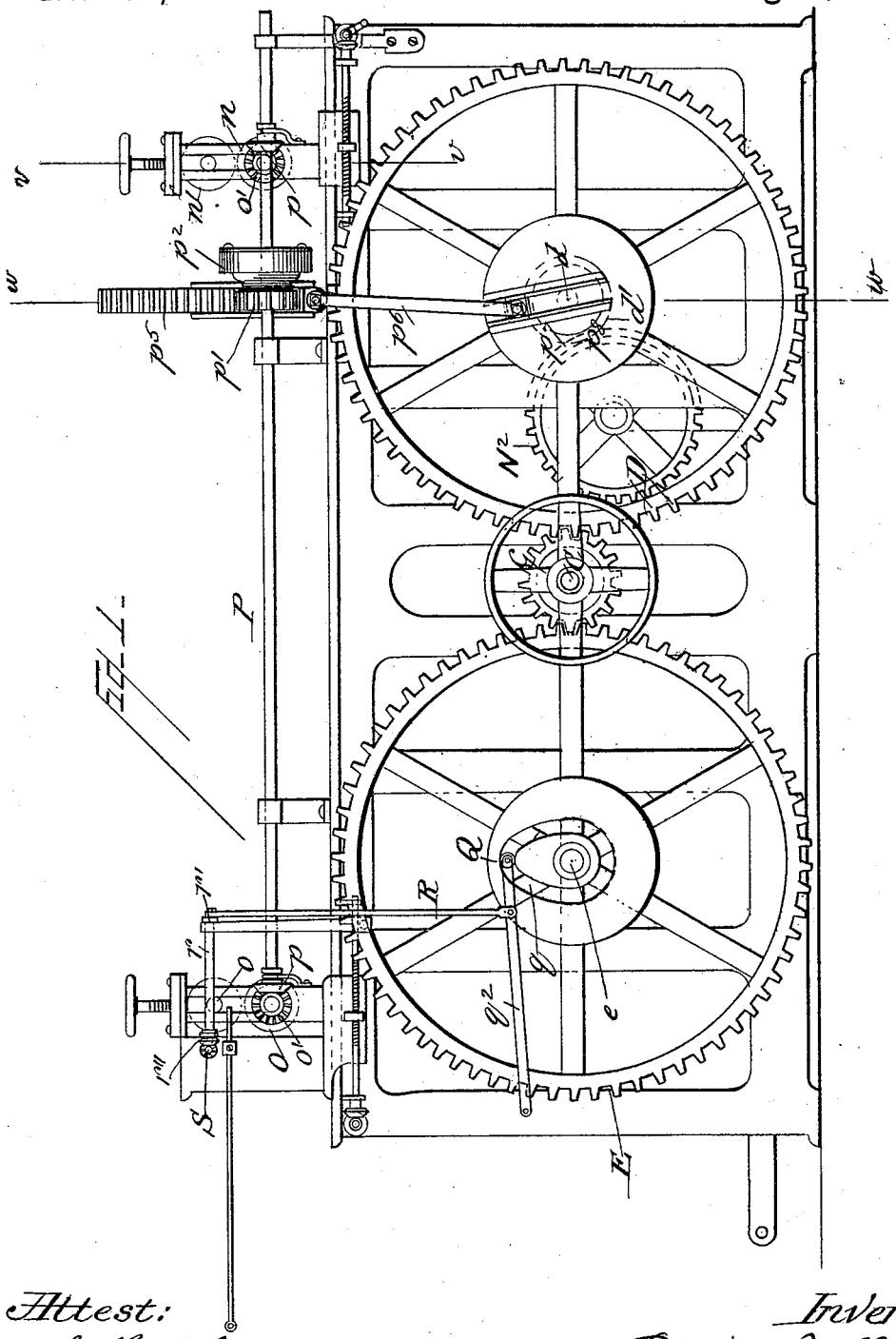

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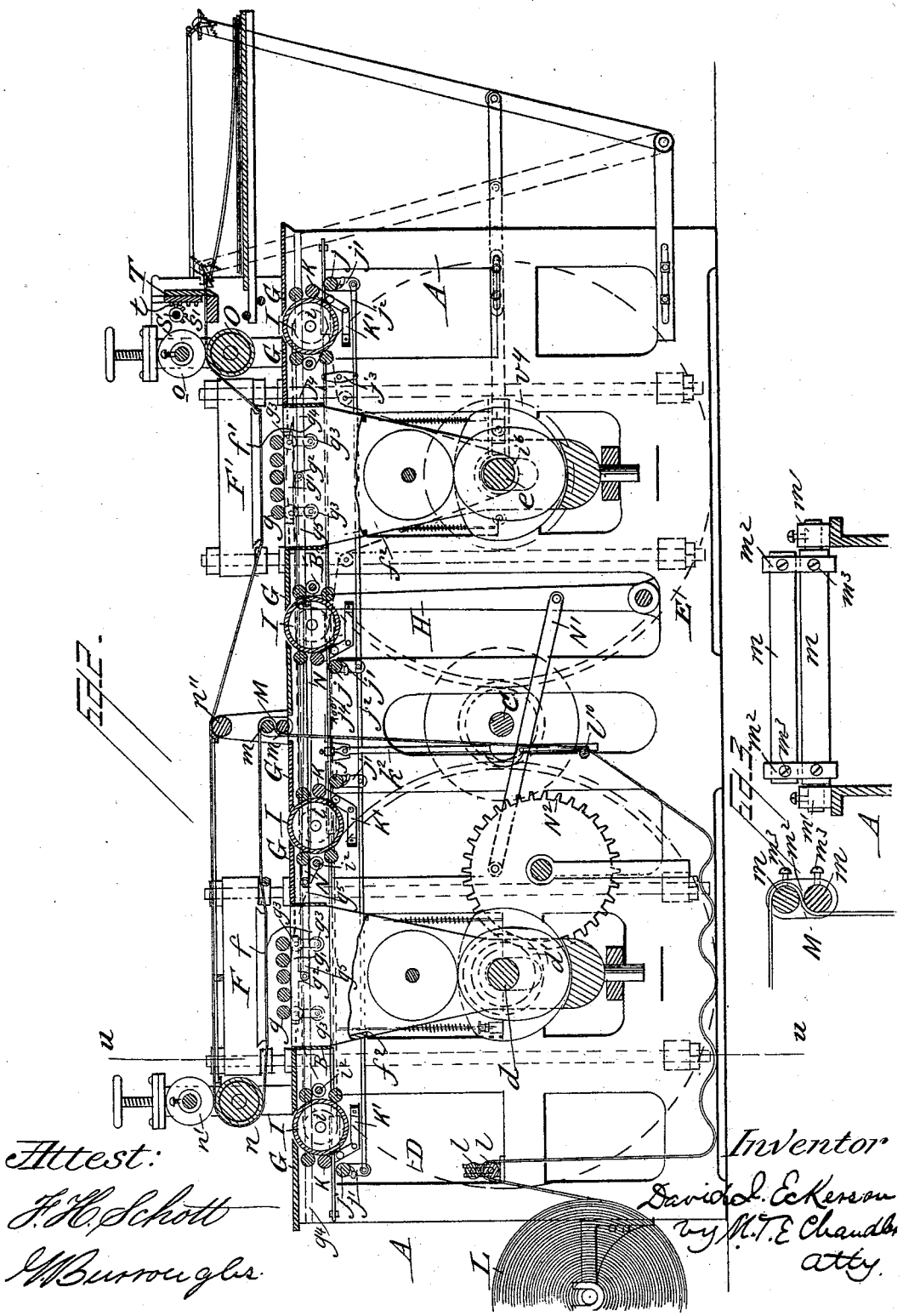

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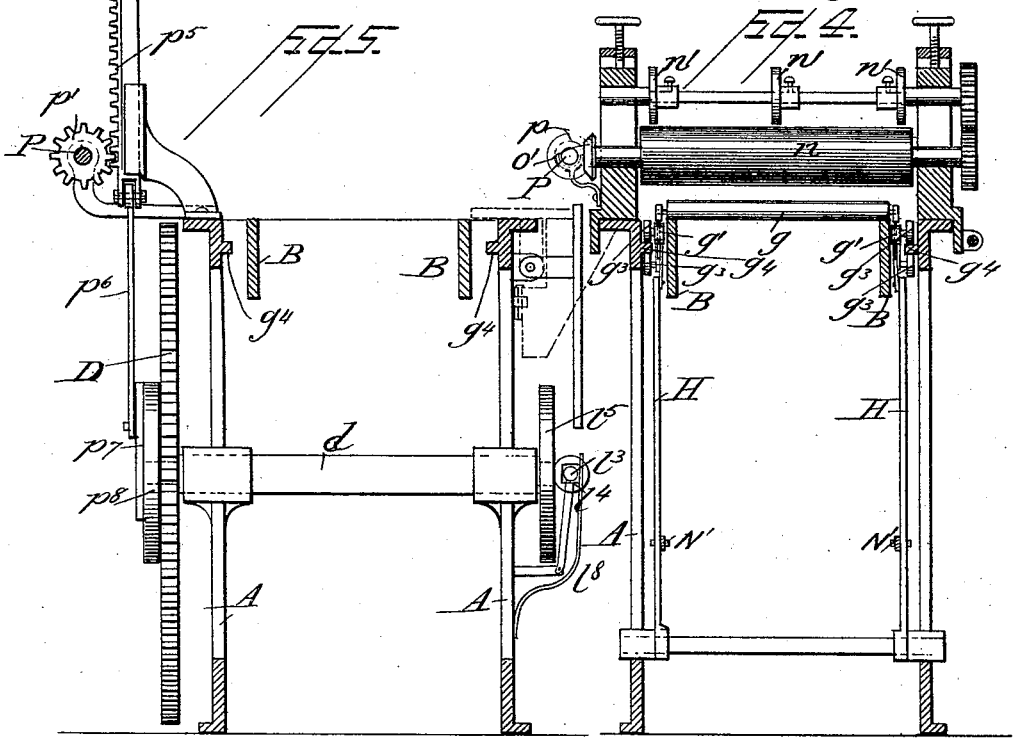

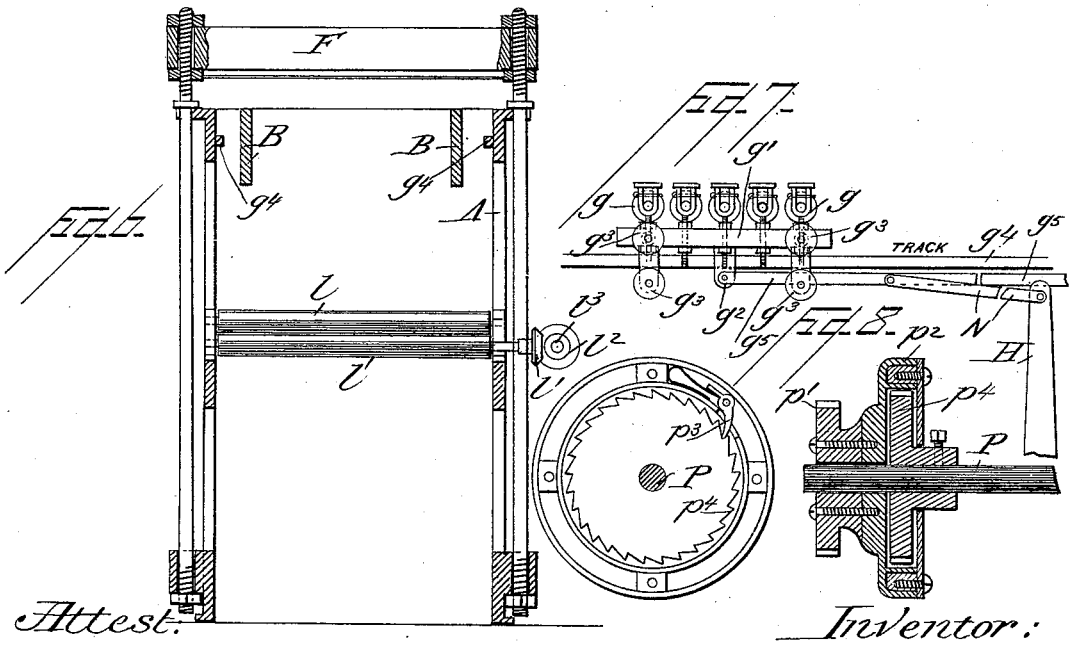

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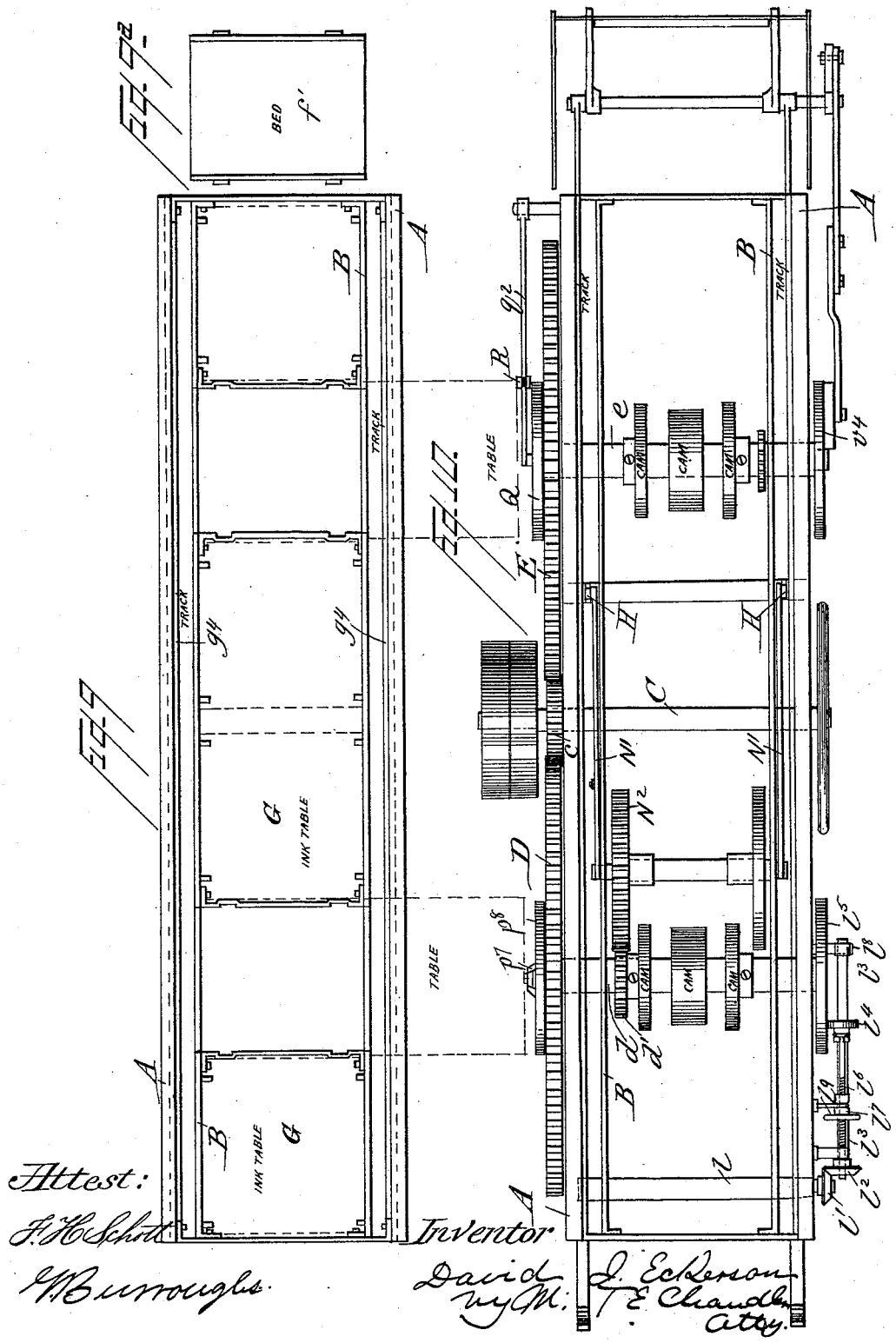

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FIG. 13.

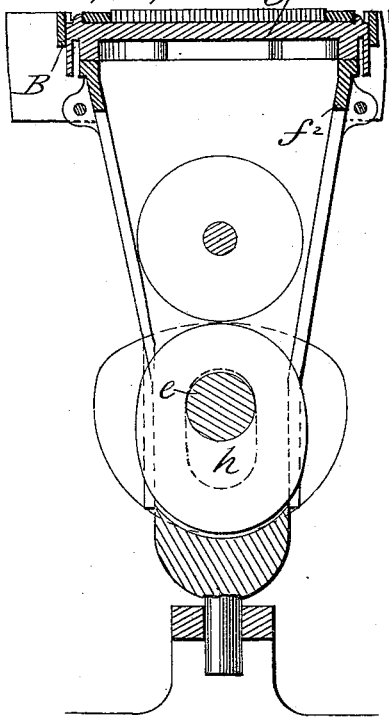


FIG. 12.

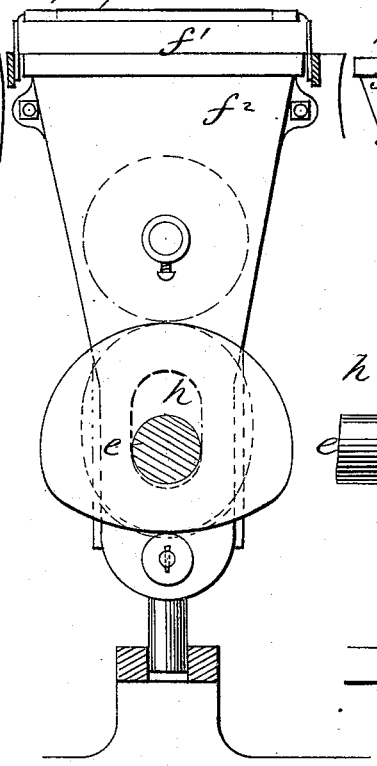


FIG. 11.

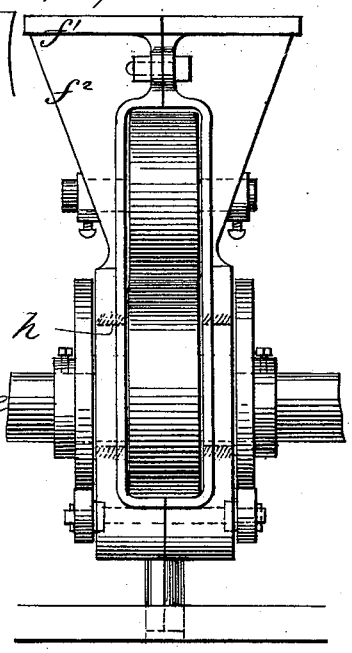


FIG. 15.

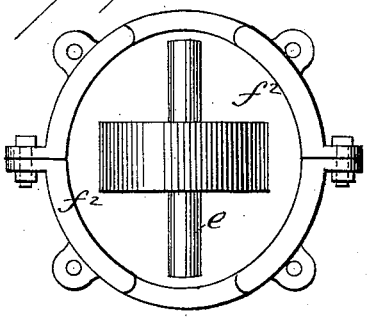
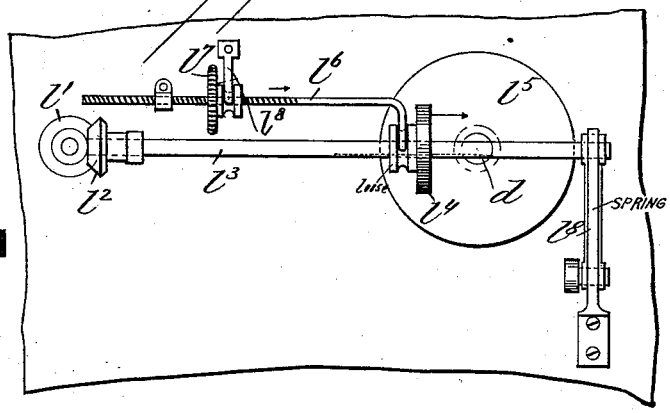


FIG. 14.



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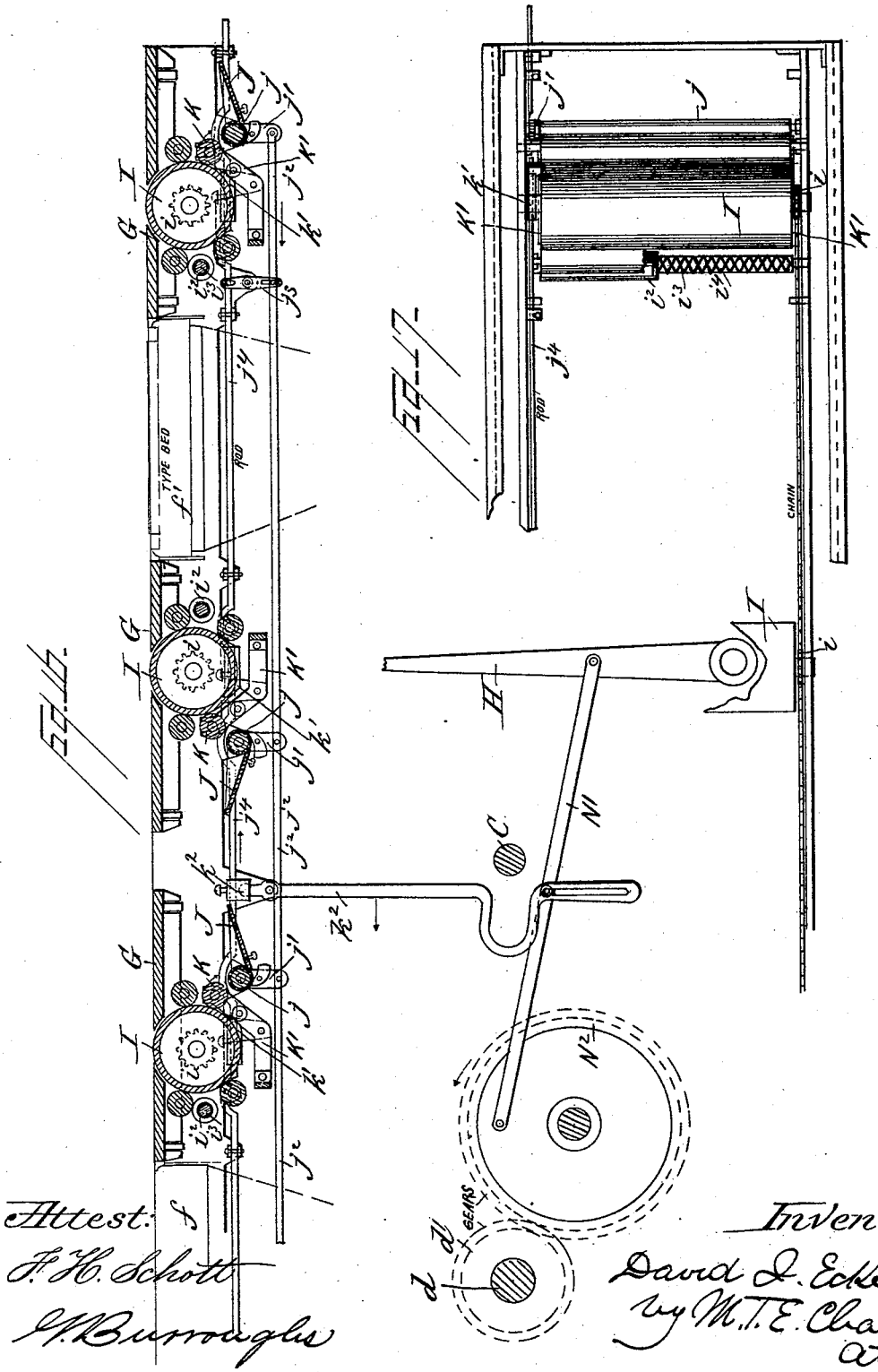

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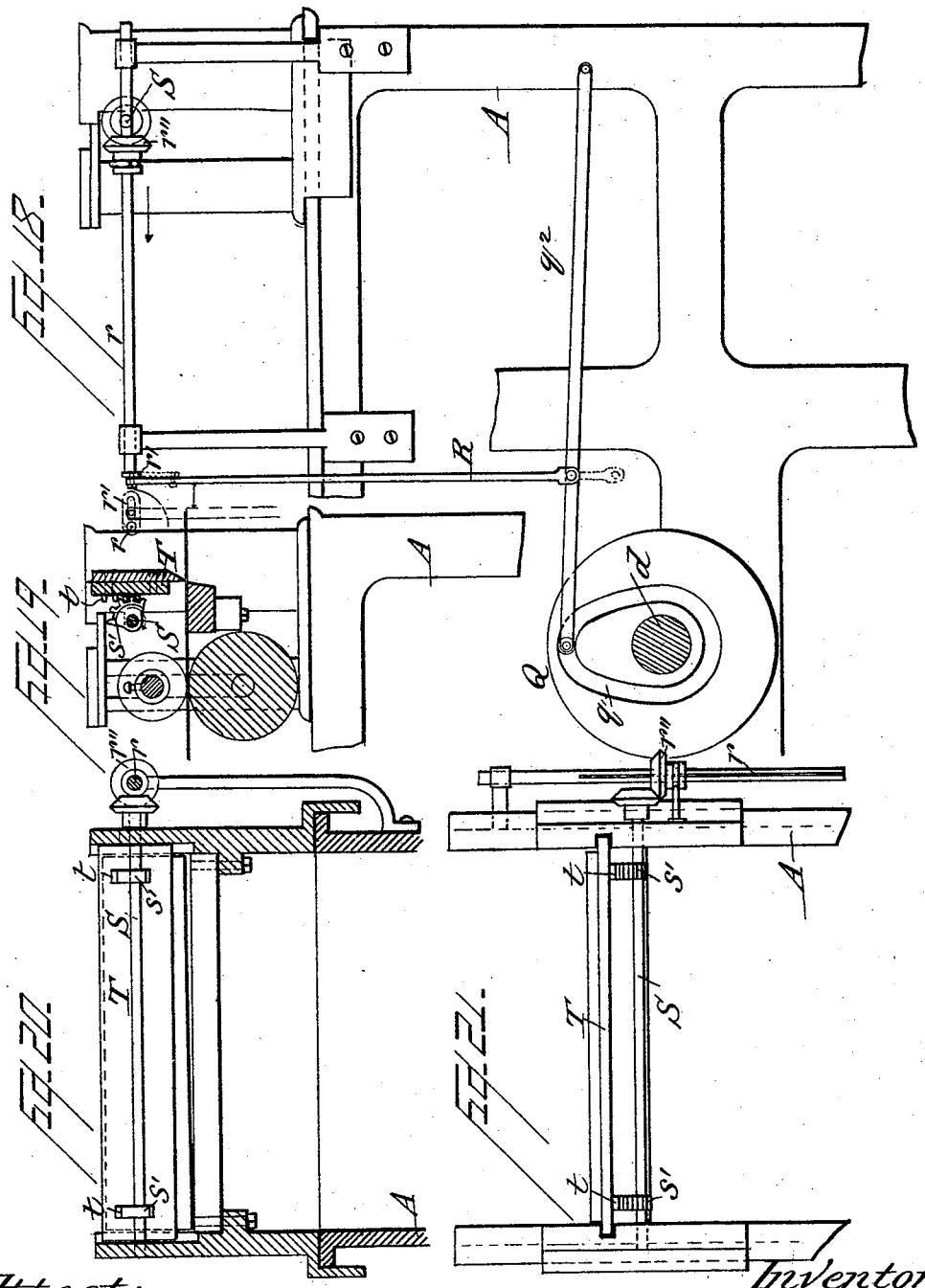

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No. 457,186. Patented Aug. 4, 1891.

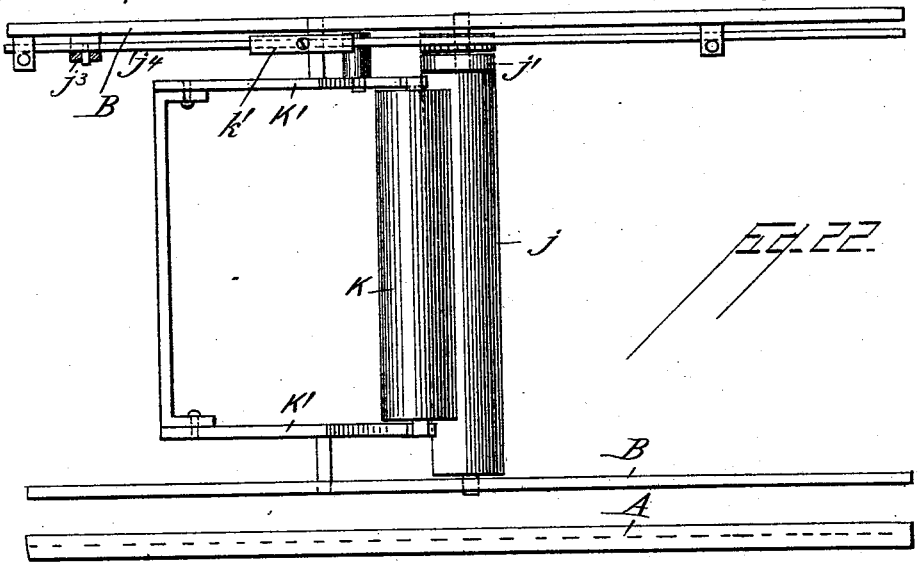

Fig. 22.

Fig. 24.

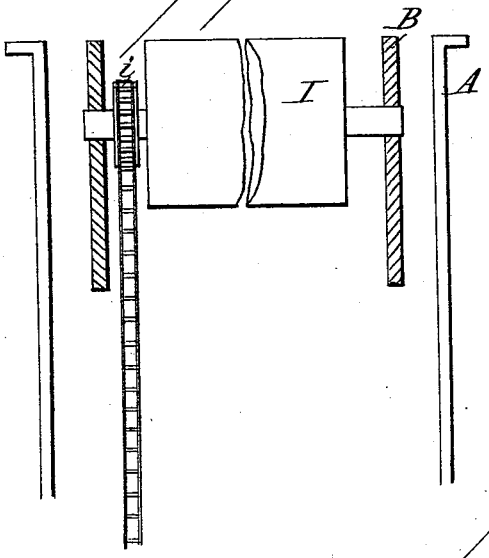

Fig. 23.

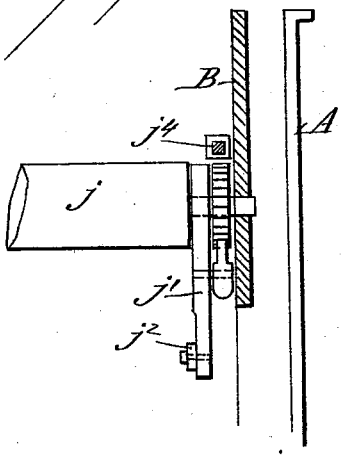

Fig. 25.

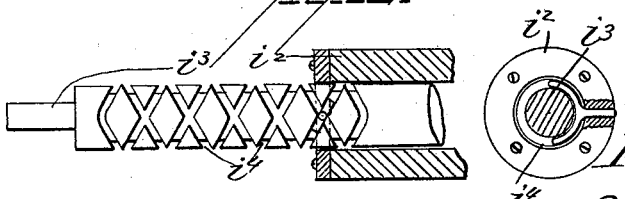

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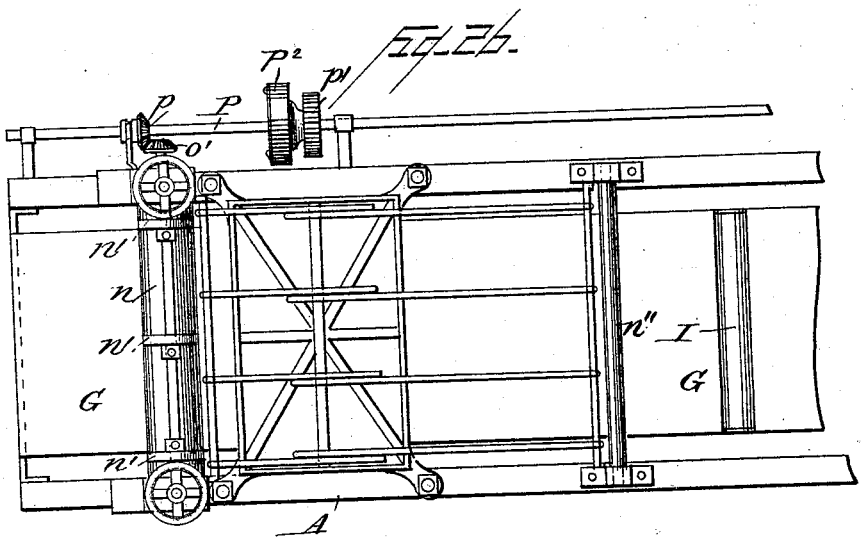
Fig. 26.



Attest:
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Atty.

UNITED STATES PATENT OFFICE.

DAVID I. ECKERSON, OF WORCESTER, NEW YORK.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 457,186, dated August 4, 1891.

Application filed July 3, 1889. Serial No. 316,407. (No model.)

To all whom it may concern:

Be it known that I, DAVID I. ECKERSON, a citizen of the United States, residing at Worcester, in the county of Otsego and State of New York, have invented certain new and useful Improvements in Printing-Presses; 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 the letters of reference marked thereon, which form a part of this specification.

My invention (for which British patent numbered 814 of 1890 has been granted) relates to printing-presses of the class adapted to print on rolls of continuous paper, and is an improvement on a press for which Letters Patent of the United States No. 387,500 were granted to me on the 7th day of August, 1888.

The invention has for its object certain improvements in the feed and inking mechanism of a perfecting platen-press, as will be hereinafter described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar reference-letters in the several views designate corresponding parts, Figure 1 represents a view of a printing-press embodying the invention as seen from the driving side. Fig. 2 represents a vertical longitudinal section thereof. Fig. 3 represents detail side and sectional views of the tension device for the paper. Fig. 4 represents a vertical transverse section of the machine on the line *v v* of Fig. 1, certain parts of the mechanism being omitted for the sake of clearness. Fig. 5 represents a similar section on the line *w w* of Fig. 1, certain parts of the mechanism being omitted. Fig. 6 represents a similar section on the line *u u* of Fig. 2, certain parts of the mechanism being omitted. Fig. 7 represents a detail side view of one of the inking-roller carriages and attachments. Fig. 8 represents detail views of the ratchet and loose pinion on the shaft that operates the intermittent feed-rollers. Figs. 9 and 9ª represent plan views of one of the type-beds and the combined outer and inner frames. Fig. 10 represents a plan view of the machine, certain parts being removed. Fig. 11 represents the type-bed standard and attached cams. Fig. 12 represents a side view thereof. Fig. 13 represents a central vertical longitudinal section of the same. Fig. 14 represents a side view of the mechanism that actuates and regulates the continuous-feed rollers. Fig. 15 represents a plan view of the type-bed standard detached. Fig. 16 represents a detail longitudinal sectional view of the ink-distributing mechanism. Fig. 17 represents a plan view of a portion of the same. Fig. 18 represents a side view of a portion of the knife-actuating mechanism. Fig. 19 represents a vertical longitudinal section thereof. Fig. 20 represents a vertical transverse section at right angles to Fig. 18. Fig. 21 represents a plan view of a portion of the mechanism shown in Fig. 18. Figs. 22, 23, 24, and 25 are detail views of portions of the ink-distributing mechanism. Fig. 26 represents a plan view of a portion of the rear or delivery end of the machine.

The present application has many points in common with an application for a patent for printing-press of the same date of filing herewith, the main difference being that the latter application is for a press that prints on one side only of the roll of paper, whereas the present application is for a press that will print on both sides of the roll while passing through the machine.

Other points of difference will be pointed out and claimed in the present application.

Referring to the drawings by letter, A designates the main frame of the press of general rectangular shape and generally similar to that in the patent referred to, the frame in this case, however, being constructed to accommodate two type-beds, the corresponding platens, and necessarily two inner frames B for the said type-beds, which frames are similarly constructed to that in said patent.

In the present application the transverse driving-shaft C is journaled in bearings situated centrally in the sides of the main frame and has mounted upon it a suitable driving-pulley, Fig. 1, and on one side of the main frame a pinion *c*, that meshes on opposite sides with the large gear-wheels D and E, mounted, respectively, on the transverse shafts *d* and *e*.

F F′ are two similar platens secured by vertical adjusting screw-rods to the main frame and having, preferably, detachable impression-plates, and $f f'$ are the corresponding type-beds moving in the inner frames B and bolted to the depending standards $f^2 f^2$, each having an upper reversed conical portion, a lower cylindrical portion, and a depending guide-stem, which moves in a guide-opening in a cross-bar of the main frame. The said standards are preferably made in two longitudinal equal sections bolted together, Fig. 11, for the more easy insertion of the parts that stand therein, and the axes of the standards are aligned vertically with the shafts d and e, respectively, which shafts pass through longitudinal slots in the corresponding standards. Each standard is provided with a longitudinal slot at right angles to that through which the corresponding shaft passes, and upon said shaft and within said slot is mounted a cam-disk that bears upward on an anti-friction roller mounted within the standard and raises the said standard and attached type-bed. On the said shaft, on each side of the standard, is mounted a cam-disk that bears downward on an anti-friction roller journaled upon the standards and depresses the latter.

The described construction is fully shown in Figs. 11, 12, and 13. Each type-bed has at its corners depending rods which pass through perforations in lugs on the main frame, and around said rods between the lugs and type-bed are coiled springs strong enough to support the corresponding type-bed and standard and lessen the labor of the attached cams.

The operative mechanism of the inking-rollers is constructed as folllows: G G are inking-tables on each side of each type-bed, and g g are inking-rollers mounted in a suitable manner in bearings on the carriage g', each of which is provided with a central depending lug g^2, perforated near its end. The said carriages are provided with the wheels g^3 g^3, arranged in pairs, the members of which turn, respectively, upon the upper and lower surfaces of the flangeways g^4 on the main frame. g^5 g^5 are horizontal longitudinal rods having their ends pivoted to the perforated ends of the depending lugs g^2 of the two inking-carriages on each side, so that said carriages will move together. H H are opposite vibrating levers journaled at their lower ends on a transverse bar of the main frame and with their upper end attached by pivoted link-rods N N to the corresponding horizontal rods g^5. N′ is a pitman that connects one of the levers H to a gear-wheel N^2, that meshes with a gear-wheel d' on the shaft d within the main frame. The said wheel d' by its rotation causes the pitman N′ to vibrate the levers H, and consequently reciprocate the type-carriage over the flangeways described.

The ink-distributing mechanism is constructed as follows: There are four inking-tables G, one on each side of each type-bed, and below each table is journaled in the main frame a transverse inking-cylinder I and other smaller inking-cylinders, which impinge thereon and are rotated thereby. Each cylinder I has on its shaft at one side a sprocket-wheel i, and its circumference protrudes through a transverse slot in the corresponding table. i^2 is a distributing-cylinder about half as long as the corresponding cylinder I and mounted on a shaft i^3, with its surface touching one of the smaller inking-cylinders, but not the cylinder I. The shaft i^3 is provided with the oppositely-inclined communicating thread-grooves i^4, Fig. 17, by means of which and a swiveled pin or block on the cylinder i^2 (see Fig. 25, end view) the latter is caused to reciprocate on the shaft i^3 when it is rotated. The cylinders I are rotated by a chain which passes over the sprocket-wheels i, mounted at suitable points on the main frame, and a sprocket-wheel i^6, mounted on the shaft e, so that they receive motion from the latter. (See Fig. 2 in dotted lines.) Below each cylinder I is an ink well or receptacle J, having an inclined floor and a metal plate secured to said floor, with its free lower edge adjustable up and down by means of screws passing through said floor. In contact with said edge is a cylinder j, having a ratchet-wheel on its shaft, which ratchet-wheel is engaged by a pawl that is pivoted on an arm j', that swings from the main frame. The ends of all the arms j'—four in number—are connected by a horizontal rod j^2, to which the lower end of the swinging lever j^3 is also loosely attached. The said lever is pivoted about centrally upon the main frame, and its upper end is attached loosely to a horizontal rod j^4, that is supported in bearings on the main frame. K is a cylinder between the transfer-cylinders I and j, mounted on the upper arms of a swinging frame K′, upon which is mounted an anti-friction roller, the frame being pivoted at its angle on the main frame. Upon the rod j^4 are mounted the adjustable sleeves k', which make contact with the said anti-friction roller and swing the respective frames K′ so that the cylinder K will alternately make contact with the corresponding cylinder j and I and will carry ink from the former to the latter. The rod j^4 is reciprocated by a lever k^2, which is connected to it at the upper end by a sleeve and pivotal joint, Fig. 16, and is pivoted to the main frame below said upper end, and has a longitudinal slot in its lower end to receive a pin on the pitman N′, so that said pitman will swing the lever and reciprocate the said rod. The rod j^2, by means of the reciprocating rod j^4, the lever j^3, and arms j', cause the pawls and ratchet-wheels to rotate the cylinders j, which thereupon feed from the ink-wells.

The mechanism for feeding the paper is as follows: L is the paper roll wrapped on a shaft mounted in bearings secured to the main frame. The strip of paper or web feeds from the roll between the continuous-feed

rollers *l l*, which are constructed as follows: The rollers *l l* are journaled in bearings secured to the main frame above the roll L, and upon the shaft of one of said rollers is a bevel-gear *l'*, which meshes with a bevel-gear l^2 on a shaft l^3, that is supported in bearings secured to the main frame and has splined upon it a friction-roller l^4, having a circumferential groove in its hub or base. The said friction-roller bears against the friction-wheel l^5 on the shaft *d* and is rotated thereby, the spring l^8, which is secured to the main frame, bearing against the shaft l^3 and keeping the friction-roller and friction-wheel in contact.

The position of the friction-roller nearer to or farther from the center of the friction-wheels causes the feed of the rollers *l* to be faster or slower, and the said position is adjusted by the following means: l^6 is a horizontal screw-rod supported in bearings on the main frame, with its end bent down and bifurcated to rest in the groove in the hub of the friction-roller, and l^7 is a nut on the threaded part of said rod, which nut is prevented from traveling on the rod by a detent l^8, secured to the main frame, with its free end entering a circumferential groove in the hub of said nut, so that the rod is compelled to travel through the nut when the latter is turned, and thus adjust the position of the the friction-roller. (See Fig. 14.) After the strip of paper or web has passed the continuous feed rollers it descends in a loop and passes to the inner side of the shaft *d* and the corresponding platen F and type-bed *f*, and thence ascends over a suitable directing-roller l^{10} to a tension device M, composed of the two tension-rollers *m m*, the lower one of which is journaled in bearings *m'*, Fig. 3, secured to standards rising from the main frame. The tension-rollers are connected by end straps m^2 m^2, in which both have bearings, in which they may be bound by the set-screw m^3 m^3 to retard or prevent their rotation, if necessary or desirable. From the tension device the strip of paper or web passes between the front platen F and type-bed *f* to the lower roller *n* of the front intermittent feed-rollers *n n'*, respectively, passing around the said lower roller and thence between the latter and the upper roller or rollers *n'*, which are preferably arranged in sets, their common shaft resting in adjustable bearings in standards rising from the main frame, while the lower rollers are single and have fixed bearings in said standards. From the front rollers *n n'* the strip of paper passes over the directing-roller *n''*, journaled in standards rising from the main frame, Fig. 2, and thence downward between the platen F' and type-bed *f'*, its unprinted side being then downward and facing the type-bed *f'*. The paper strip beyond the platen F' passes between the rear intermittent rollers O *o*, similarly arranged and of similar construction to the front intermittent rollers. From the said rollers the paper strip passes to the severing end delivering mechanism, hereinafter described. The lower intermittent rollers have on one end of their shafts bevel gear-wheels *o'*, for a purpose hereinafter described, and on their other ends gear-wheels that mesh with similar wheels on the shaft that carries the upper intermittent rollers and cause the latter to rotate.

The mechanism that actuates the intermittent rollers is constructed as follows: P is a longitudinal shaft journaled in standards rising from the main frame and provided with bevel gear-wheels *p*, that intermesh with the similar wheels O' on the shafts of the lower intermittent rollers. Upon the shaft P is a loose pinion *p'*, having secured to it a cylindrical shell p^2, provided with a pivoted pawl p^3, Fig. 8, arranged to engage a ratchet-wheel p^4, secured by a set-screw upon the shaft P, Fig. 8, so that the rotation of the pinion *p'* will turn the shaft in one direction only, and while the pinion is turning in the opposite direction the shaft P and intermittent rollers are at rest. The pinion *p'* meshes with a straight rack p^5 of Fig. 1, that reciprocates between guides secured to the side of the main frame, and has pivoted to its lower end a pitman p^6, the lower end of which has secured upon it a swiveled block that rests and is adjustable in a groove in a radial guide-strip p^7, secured to a disk p^8 on the end of the shaft *d*, so that the rotation of said shaft will by means of said pitman reciprocate the rack p^5, and will consequently move the pinion *p'* alternately in opposite directions, and will thereby actuate the shaft P and intermittent gearing, as described.

The knife or severing mechanism is constructed as follows: Q, Fig. 1, is a cam-wheel on the shaft *e*, provided in one side with an eccentric cam-groove *q*, and q^2 is a lever pivoted at outer end, Fig. 1, on the main frame and having a pin or anti-friction roller on its inner end to enter said groove and vibrate the lever q^2 as the cam rotates. At a proper point on said lever is pivoted the lower end of a link or rod R, the upper end of which is pivoted to the outstanding arm of a crank *r'* of a horizontal shaft *r*, journaled in bearings on the standards of a frame rising from the main frame near the rear end thereof. The shaft *r* has on its opposite end a bevel gear-wheel *r''*, that meshes with a similar bevel gear-wheel on the adjacent end of a transverse horizontal shaft S, journaled in bearings on the standard of the frame rising from the main frame and carrying on its opposite end a segmental gear *s'*, (see Figs. 18, 19, 20, and 21,) that meshes with a straight vertical rack *t*, secured to a knife-blade T, which reciprocates between vertical guide-strips secured to said standards and severs lengths from the strip of paper when it descends thereon. Thus the cam and link or rod R actuates the knife by the described intervening mechanism to sever equal lengths

from the paper strips at equal intervals of time and during the periods of rest of the intermittent rollers.

Having described my invention, I claim—

1. In a printing-press, the combination, with the two platens and corresponding vertically-reciprocating type-beds, of the continuous-feed rollers l l, the directing feed-roller l^{10}, receiving the strip of web from said rollers l, the tension device M, receiving the web from the directing-roller l^{10}, from which tension device the web passes between the front platen and type-bed and around the lower roller of the front set of intermittent feed-rollers n n', which draw the web from the tension device between the front platen and type-bed, the directing-roller n'' between the front and rear platens and type-beds, and the rear set of intermittent rollers O o, drawing the web from the directing-roller n'' between the rear platen and type-bed, substantially as specified.

2. In a printing-press, the combination, with the inking-rollers, the carriages bearing said rollers, and the rods g^5, connecting the carriages on each side of the main frame, of the vibrating levers H, the link-rods N, connecting said levers to the rods g^5, the gear-wheel N^2, rotated by a gear-wheel on the shaft d, and the pitman N', connecting said gear-wheel and the lever H on the same side of the main frame, substantially as specified.

3. In a printing-press, the combination of the ink-wells, the rollers j, intermittently rotated therein, the swinging frames, the transfer-rolls journaled in the said frames, the arms j', the pawl-and-ratchet connection between the said arms and the rollers j, the rod j^2, extending longitudinally of the machine and connecting the arms j', the rod j^4, parallel with the rod j^2, the lever j^3, connecting the rods j^2 and j^4, the sleeves adjustably secured on the rod j^4, adapted to move the frames K', and the means for reciprocating the rod j^4, consisting of the gear-wheel N^2, the lever H, the pitman N, connecting the said lever and wheel, and the lever connecting the pitman and the rod j^4, substantially as described.

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

DAVID I. ECKERSON.

Witnesses:
CHAS. A. JUDD,
THOMAS A. EVERS.