

(No Model.)

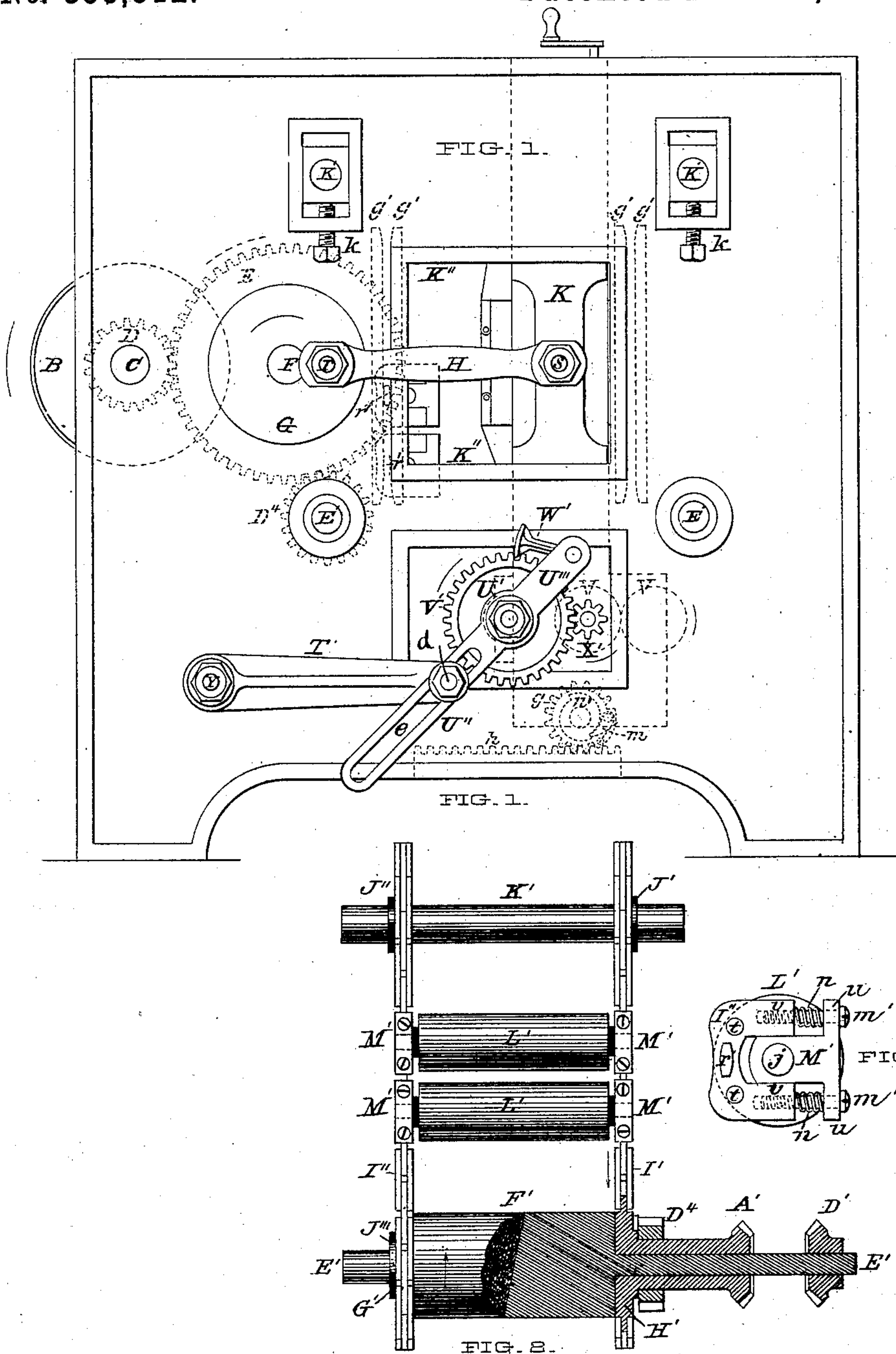
2 Sheets—Sheet 1.

W. N. KELLY.

## WEB PERFECTING PLATEN PRINTING MACHINE.

No. 353,312.

Patented Nov. 30, 1886.



WITNESSES:-

Newry, T. Cushman.  
H. & Hall

INVENTOR:

William N. Kelly,  
by Franklin Scott, Atty.

(No Model.)

2 Sheets—Sheet 2.

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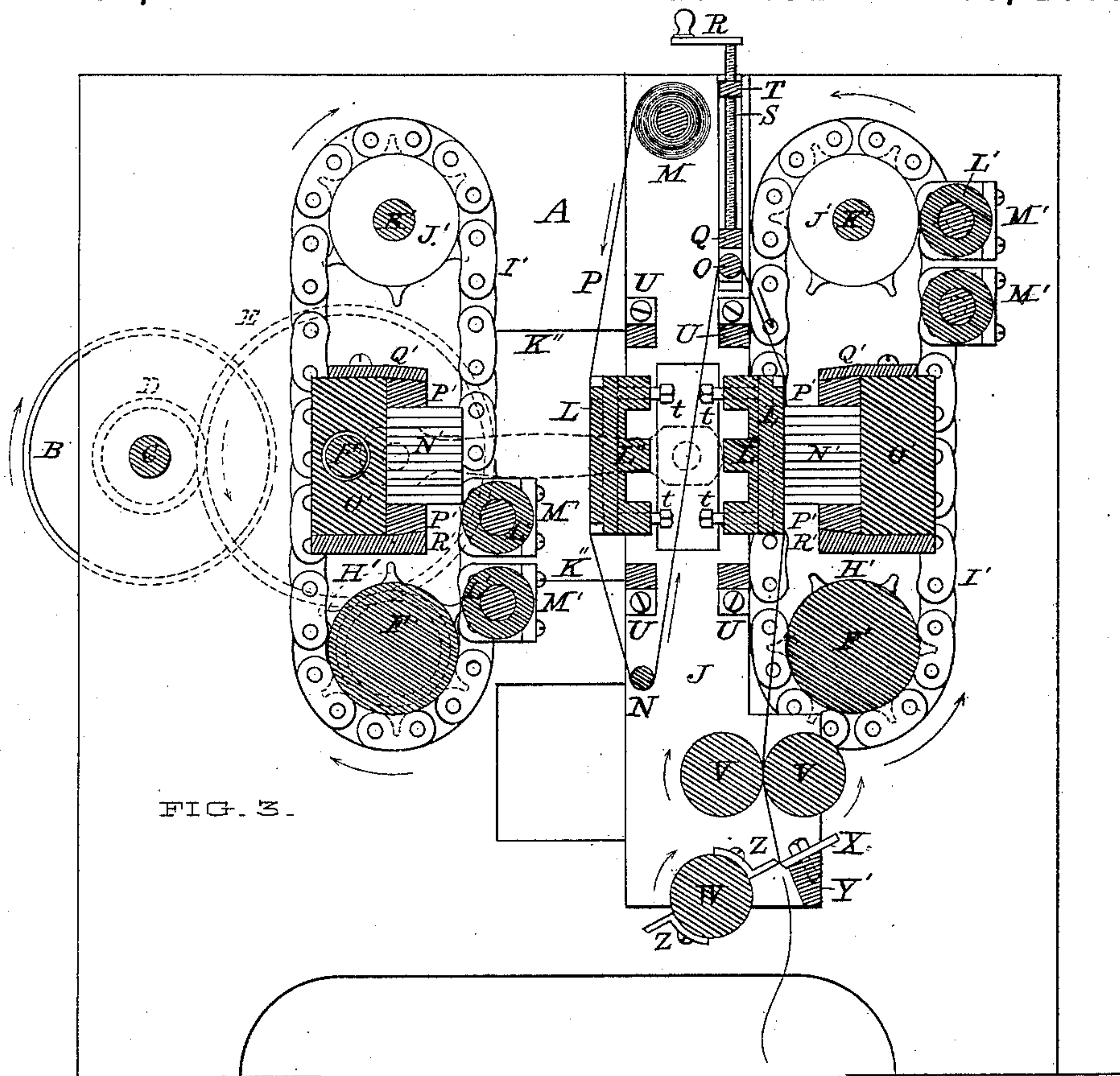


FIG. 3.

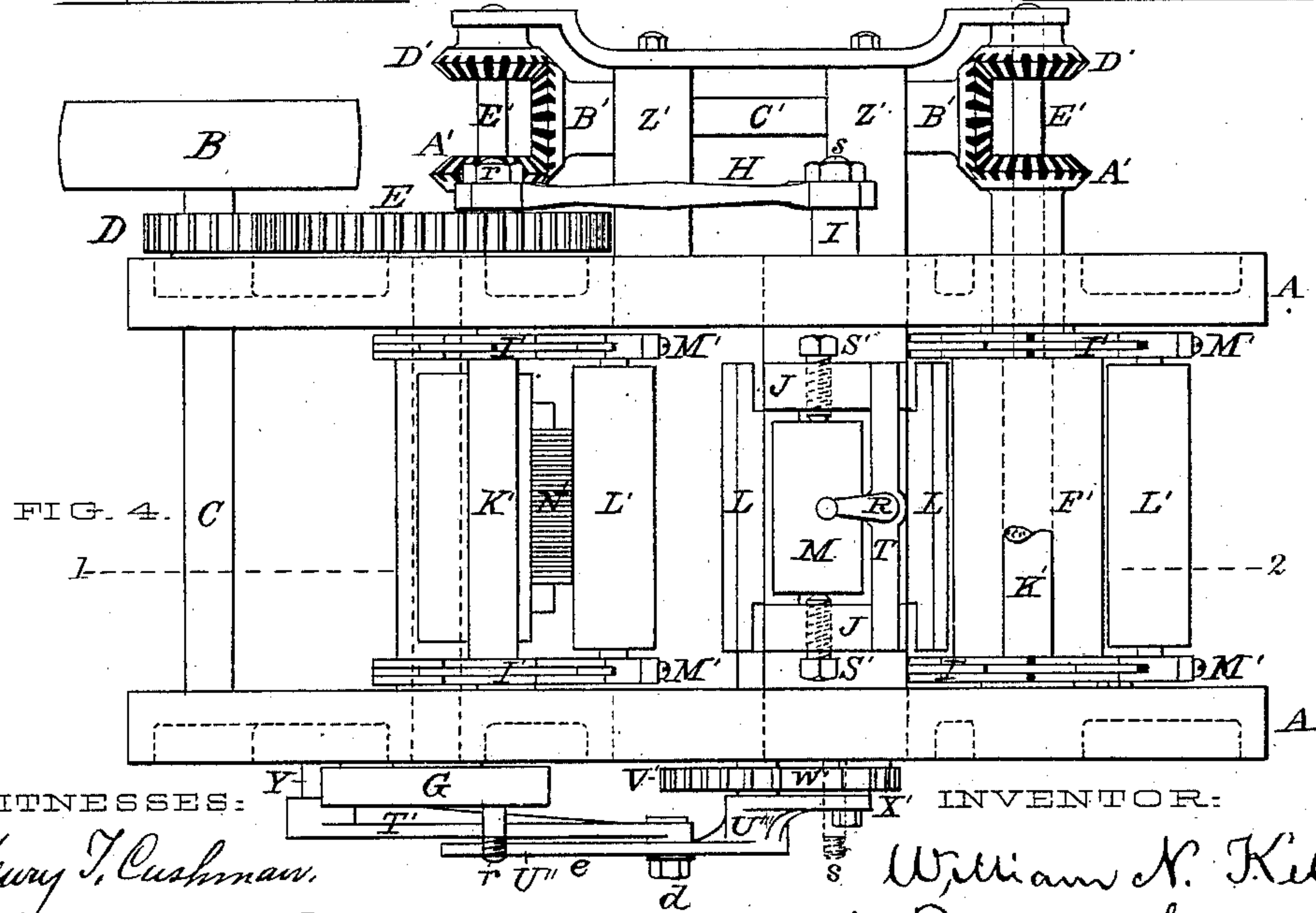


FIG. 4.

WITNESSES:  
*Henry T. Cushman.*  
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INVENTOR:  
*William N. Kelly*  
*by Franklin Scott, Atty.*



# UNITED STATES PATENT OFFICE.

WILLIAM N. KELLY, OF HOOSICK FALLS, NEW YORK.

## WEB-PERFECTING PLATEN PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 353,312, dated November 30, 1886.

Application filed January 24, 1882. Serial No. 50,870. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM N. KELLY, of Hoosick Falls, in the county of Rensselaer and State of New York, have invented certain Improvements in Web-Perfecting Platen Printing-Machines Adapted to Print from a Continuous Web, of which the following description, in connection with the accompanying two sheets of drawings, constitutes a specification.

10 The printing-press which constitutes the subject-matter of this invention belongs to that class wherein a continuous web or sheet of paper is used, which is successively printed on opposite sides, and subsequently cut off.

15 Two stationary type-beds are employed, between which a movable platen reciprocates. The type-forms are inked by rollers attached to and actuated by endless chains running over sprocket-wheels, by which they are driven.

20 The forms and platen are disposed in a vertical position and parallel with each other, the platen reciprocating between the two forms, all of which is manifest from the illustrations accompanying this description, wherein—

25 Figure 1 is a side elevation of my press. Fig. 2 is a front elevation of the inking apparatus. Fig. 3 is a view of a vertical longitudinal section of my press, taken on line 1 2 of Fig. 4. Fig. 4 is a top plan of my invention.

30 At one side the crank-pin S is shown in dotted lines, and connecting-rod H is removed, so as to bring into view the mechanism lying underneath. Fig. 5 is a detail view of one of the links of the inking-chain, which carries

35 one of the bearings of one of the inking-rollers.

The leading novel features of this press are the following: An impression is given by the platen at each limit of its reciprocating movement, so that a single revolution of the driving-crank shaft produces two impressions, one on each side of the sheet. The feed of the paper is regulated by mechanism attached to the frame, which carries the platen and draws the paper through, depending for its movement upon the reciprocating movement of the platen-frame. A continuous web or roll of paper is supported on the platen-frame, and is carried to and fro with it as it is moved up to and away from each type-form successively

50 to receive an impression. By this method of

construction all slack in the web between the roll of paper and the type-form and all take-up devices for regulating the same are dispensed with. A single platen-frame is used; but it presents two opposite impression-faces. 55

A leading advantage secured by my improved construction consists in the fact that the several parts are so constructed and arranged that there are no suddenly-reversed movements of parts, whereby violent recoil or 60 shock is produced.

The principal mechanism of my press is mounted between two side pieces, A A, of the frame. These are united and properly secured in position by girts or stay-rods. In this instance the two bed-pieces O' O', on which the type-forms N' N' are imposed, constitute such binding connection. The side pieces, A A, are provided with horizontal slides or ways K" K", between which the sliding cross-heads K K 70 work. Such side pieces are also perforated for the reception of the necessary shafts, and for the reception of the journal-boxes for the driving and main shafts, and for the shafts of the sprocket-wheels of the inking apparatus. 75 To the outside of the frame, on one side, as in Fig. 1, is attached the swinging arm T', a part of the feeding apparatus, and on the opposite side, Fig. 4, the brackets Z' Z', on which are mounted the boxes and bearings of the shaft- 80 ing by which the inking apparatus is driven.

The driving-shaft is shown at C, and upon it are mounted the driving-pulley B and the driving-pinion D. Pinion D engages with main gear E on main shaft F, which carries at its opposite end a crank-disk, G. Wrist-pins r r 85 are attached to gear E and disk G, and connection between these and similar wrist-pins, s s, on the cross-heads K K of the platen-frame J J, is established by means of the connection- 90 rods H H. By this means reciprocatory motion is imparted to the platen-frame J J and its various appendages, the same, by means of cross-heads K K, sliding to and fro on the ways K" K". 95

The platen-frame consists of two principal uprights, J J, which are connected by the distending-ties U U U U. Upon either side of the platen-frame wings extend for the reception of the cross-heads K K. Between the distending- 100



ties U U the two breast-girts L' L' are situated. These form a back-support for the platens proper, and through them pass the set-screws *t t t t*, by means of which the platen itself is attached to the breast-girt L' and the degree of impression is regulated.

Between the uprights J J, and near their top, are located two pivot-centers or other equivalent devices, upon or by means of which the roll or web of paper M is hung. The web from this roll of paper is carried down across the platen on one side of the platen-frame under a roller, N, beneath, thence upwardly between the breast-girts L' L', over the adjustable roller O, which is mounted in a vertically-sliding frame, Q, and from said roller O down across the face of the other platen, L, to the feed-rolls V V, which are situated in the lower part of the platen-frame. The vertically-sliding frame Q, carrying roller O, is controlled as to its elevation by means of the screw S, which runs in a nut, T, cut in or attached to a cross-bar permanently fastened to the upper part of the platen-frame. The office of this vertically-adjustable roller-frame is to determine the length of the interval of web of paper between the two impressions, for it is by this means that accurate registration is secured.

The web of paper P P is drawn through by the tractile force exerted on it by means of the feed-rollers V V. The surfaces of these rollers may be roughened, if necessary, to maintain a firm hold on the paper or not, as circumstances may require; but they run in close contact. The axis of one of them protrudes through or beyond the outside of the main frame, and carries on its outer end a small spur-pinion, X'. This spur-pinion engages with and is actuated by a larger spur-gear, V', which runs on a fixed stud attached to and projecting from the side of one of the uprights J of the platen-frame.

To the hub of gear V' is firmly fixed a hub, U', carrying two opposite radial projecting arms, U'' and U'''. The upper or shorter arm, U''', carries a reversible pawl or dog, W', which in action engages with the teeth on spur-gear V'. The opposite or longer arm, U'', is slotted, as at *e*. In this slot the pin *d*, connected with the outer end of arm T', works. The arm T' is pivoted on a fixed stud, Y, about which, within certain limits, it can swing. When said arm is put in adjustment, it is there confined by means of a nut on the outer end of stud Y. As the platen-frame reciprocates to and fro on the ways K K, it carries with it the gear V', and, by means of the slotted arm U'', sliding or working upon the pin *d* of arm T', a partial rotary motion is imparted to gear V', and thence to the feed-rollers V V, and these, tightly gripping the web of paper between them, draw it through to the extent of the desired breadth of a single detached sheet. The amount of feed is regulated by the adjustment of pivot *d* of arm T'. When the pivot *d* is swung down so as to increase the radial interval between itself and the hub of

gear V', the rotation of such gear will be lessened, and as a consequence the length of feed of the web of paper will be shortened correspondingly.

Immediately beneath the feed-rolls V V is located the cutting apparatus, by means of which the printed sheet is severed. It consists simply of the cylinder W, armed with one or more shearing-blades Z Z, which have a slightly helical twist, so as to secure a shearing movement, in connection with an adjustable ledger-blade, X, which is attached or bolted to its seat or bed Y'. Upon one end of the shaft of cylinder W is a loose pinion, *g*. (Shown in dotted lines in Fig. 1.) This pinion carries a pawl, *m*, which engages with the teeth of a ratchet, *n'*, which is rigidly connected with shaft of cylinder W. The pinion *g* co-operates with the rack *h*, which is attached to the inside of the main frame, so that the reciprocatory movement of the platen-frame, by means of this rack and pinion, transmits to cutting-cylinder W movement in but one direction, the pawl *m* gliding over the teeth of the ratchet *n'* when the motion of the platen-frame is reversed.

The inking apparatus consists of four shafts, K' K' and E' E', carrying sprocket-wheels J' J' and H' H', over which run the endless chains I' I', to which the inking-rollers L' L' L' L' are connected. These sprocket-wheels are driven by the system of shafting and bevel-gearing shown in Fig. 4.

The details of construction of the lower shafts, E' E', and their appendages are shown in Fig. 2, and are as follows: The two lower sprocket-shafts, E' E', revolve in stationary bearings, but the upper shafts, K' K', revolve in adjustable bearings, so that the slack in the inking-chains, if any, may be taken up by elevating the upper journal-boxes. This may be done by the adjusting-screws under the upper bearings. (Shown in Fig. 1 at K K.) Shafts E' E' also carry between the sprocket-wheels H' and J' an ink-distributing cylinder, F', which revolves with shaft E'.

The sprocket-wheels on the upper shafts, K' K', are fixed, but those on the lower shaft revolve freely. The sprocket-wheel H' has a long hollow hub or sleeve, upon the outer end of which is the bevel-gear A', and through which runs the shaft E' of the distributing-cylinder F'. The hub of sprocket-wheel H' carries the pinion D', which receives its motion from main driving-gear E, Fig. 1. Upon the outer extremity of shaft E' is attached another bevel-gear, D', and between the two and in engagement with both runs the bevel-gear B' on shaft C', as seen in Fig. 4. Motion is transmitted from the bevel-gear first driven by the pinion D' through the intermediate shaft and gears B' C' B' to the secondary inking apparatus, which is in all respects similar to the primary inking apparatus, or the one nearest the driving-gear.

It will be seen by inspection that the sprocket-



wheels on the lower set of shafts, E' E' and the ink-distributing cylinders F' F' have opposite motions as a result of the manner in which they are geared. Such construction effects a more perfect distribution of the ink upon the cylinder-faces, and consequently upon the inking-rollers as they pass over them, by reason of the relatively-increased differential movement so produced. Two or more links, M' M' of each sprocket-chain are so constructed as to constitute bearings for the journals at the end of the ink-rollers. The details of these roller-journal links are shown in Fig. 5. The part I'' constitutes the link proper, and has projecting from it a lateral lug, r', which in use runs between the two guides g' g', which are raised or cast on the inside of the side pieces, A A, of the frame. Their position and relation are fully shown in dotted lines in Fig. 1. The office of this combination is to hold the rollers up to the face of the form as they pass over it. Link I'' has two cheeks, v v, between which the journal-box M' is received. The box is adjusted and confined in position by means of two screws, m' m', which pass loosely through wings u u of the same and are screwed into cheeks v v of the link. A coil-spring, n, is interposed between the cheek v and wing u of the box to keep the box adjusted in one direction, adjustment in the opposite direction being secured by means of screws m' m'. By removing the screws m' m' of any roller-box the roller may readily be removed for purposes of cleaning or exchange. Any of the well-known ink-distributing devices may be interposed in the path of the ink-rollers; but I preferably construct a disk-distributor in the back side of bed-piece O', which lies in the path of movement of the ink-rollers.

Operation: A roll of paper, either dry or properly dampened, is fixed in position between the pivots S' S'. The free end thereof is then carried down across the face of one platen under roller N, thence up over roll O, and down across the opposite platen-face, and from that point down between the feed-rolls V V, between which the end of the web of paper is grasped. Upon starting the press from the position indicated in the drawings, by rotating driving-shaft C in either direction the platen-frame will commence its return movement toward the type-form on the left. Before it will reach the form on the left the ink-rollers will have inked the form, and have passed out of the way of the platen. As such movement commences the slotted arm U'' impinges against pin d, and further movement of the platen-frame causes said lever or arm to rotate gear V' on its axis by means of pawl W' acting upon the teeth of gear V'. Gear V', acting upon pinion X', causes the same to rotate the feed-rolls V V, so as to draw the web of paper along through the press until the platen-frame has reached the limit of its travel. At this moment the impression against

the left form of type is made. Pending these movements, the extremity of the web, which has passed through between the feed-rolls V V, has descended between the cutting-cylinder W and ledger-blade X, and hangs in position to be severed. At the commencement of the movement to the right of the platen-frame, pinion g, revolving on rack h, brings pawl m up against one of the teeth or projections of ratchet n', thereby effecting the forward revolution of cutting-cylinder W. The cutting-cylinder is armed with two shear-blades, so that about a three-quarter revolution of the cutting-cylinder will bring both blades into action, thereby effecting two sections of the web; but whether one or two sections are desired depends on the number of blades used or the length of rack h, over which the pinion g runs.

The inking-rollers may easily be changed by removing the cap-screws m' m', Fig. 5, from the cap M' of the chain-link carrying the journal-box and removing the caps M' M'.

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

1. A printing-press constructed with two stationary parallel type-beds arranged face to face, and two platens to operate in connection therewith, supported on a reciprocating platen-frame, in combination with provisions, substantially as shown, for imparting to said platen-frame a reciprocating movement between said type-beds, substantially in the manner described, and for the purposes set forth.

2. A web-perfecting press having a platen-frame adapted to reciprocate between two parallel stationary type-beds, which are disposed face to face in substantially the manner described, and said platen-frame having mounted upon it the continuous web or roll of paper, and the feed-rolls, whereby the paper is fed from the roll to the face of the platen, substantially as shown, and for the purpose set forth.

3. A web-perfecting printing-press wherein the roll of paper, the platens, feed-rolls, and severing apparatus are all mounted on a frame which is interposed between two parallel stationary type-beds, with faces opposed to each other, and which frame has a reciprocatory movement between such type-beds, substantially as described and set forth.

4. The mechanism shown for cutting off the sheet, consisting of stationary rack on main frame, loose pinion-carrying pawl on axis of cutting-cylinder, the cutting-cylinder armed with severing-blades, and ratchet for co-operation with said pawl, and a stationary ledger-blade, said several parts being mounted, combined, and arranged to operate substantially in the manner specified.

5. The two platens disposed back to back, having an interval or passage-way between them for the passage of the continuous web of paper, in combination with appropriate devices, substantially as described, for carry-



ing or conducting said web over one platen,  
thence between the two platens, and finally  
over the other platen, all as a means of re-  
versing the sheet of paper so as to consecu-  
5 tively present its opposite sides to the type-  
forms to be printed, substantially as described  
and set forth.

In testimony whereof I have hereto set my  
hand, at Hoosick Falls, New York, this 29th  
day of July, A. D. 1881.

WM. N. KELLY.

In presence of—

FRANKLIN SCOTT.

NELSON B. FORD.