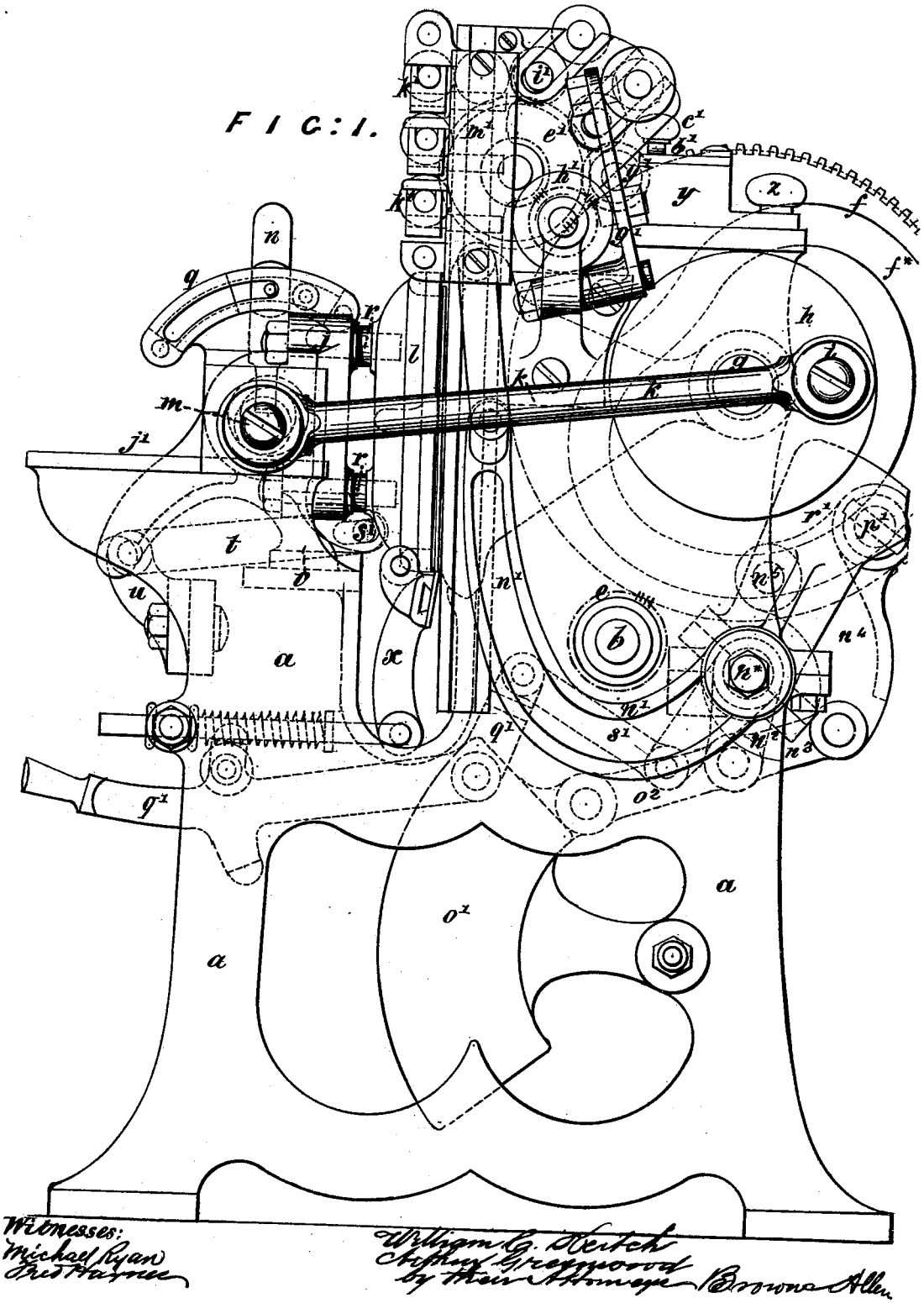
5 Sheets—Sheet 1.

W. C. KRITCH & A. GREENWOOD.

PRINTING-PRESS.

No. 188,151. Patented March 6, 1877.

FIG: 1.



Witnesses:
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Fred Haynes

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Aubrey Greenwood
by their Attorneys Brown & Allen

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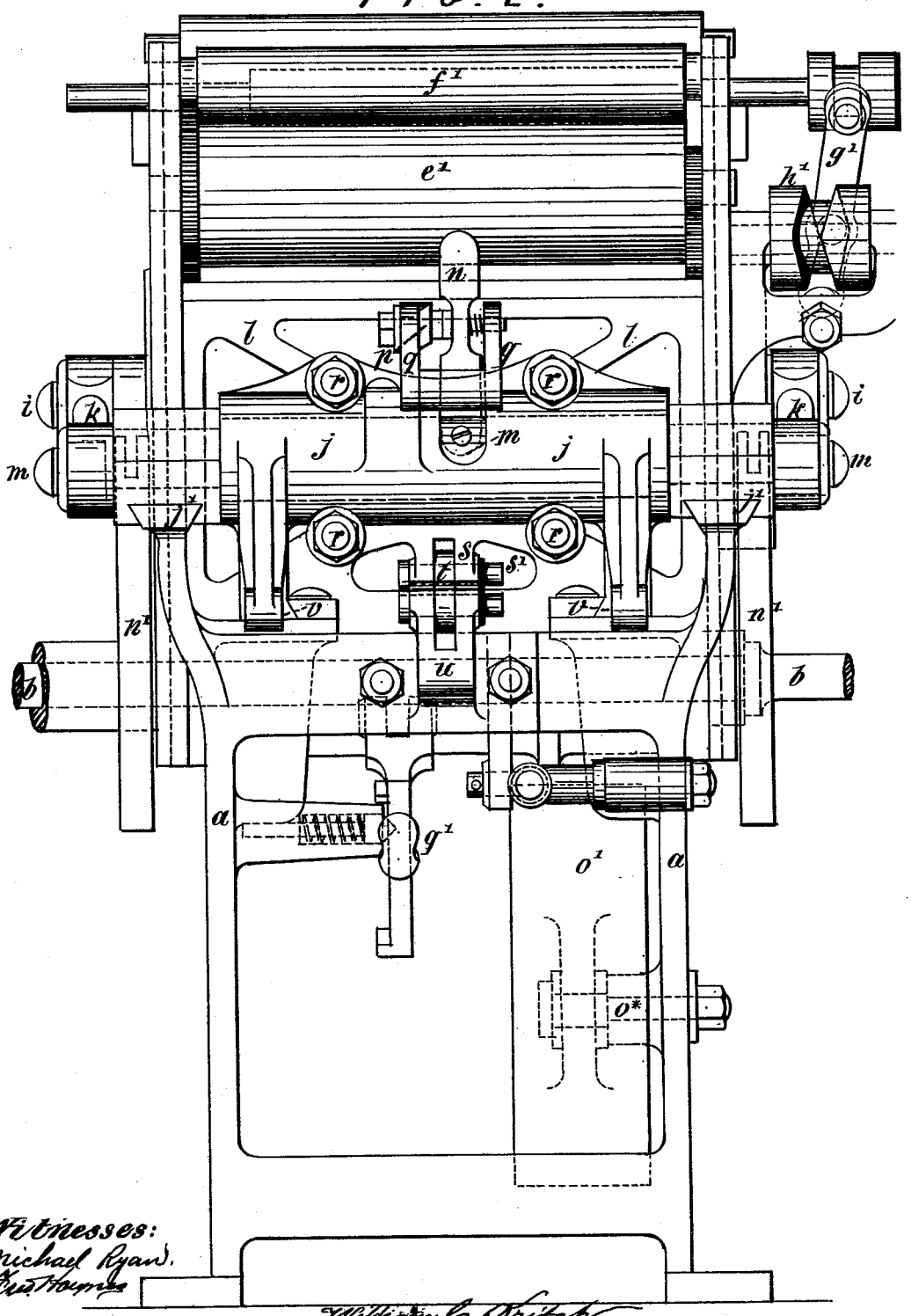
W. C. KRITCH & A. GREENWOOD.

PRINTING-PRESS.

No. 188,151. Patented March 6, 1377.

FIG. 2.



Witnesses:
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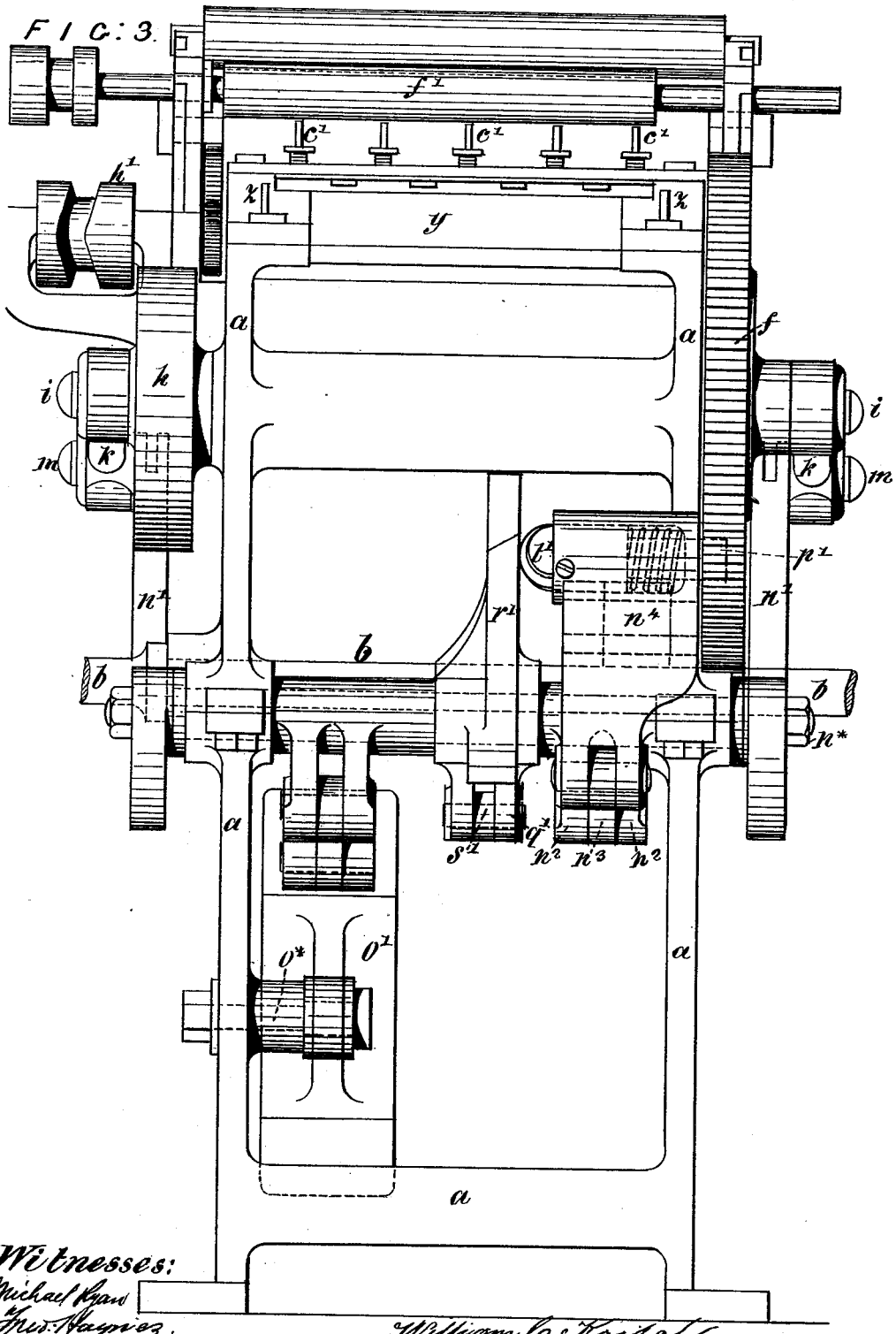
5 Sheets—Sheet 3.

W. C. KRITCH & A. GREENWOOD.

PRINTING-PRESS.

No. 188,151. Patented March 6, 1877.

FIG. 3.



Witnesses:
Michael Ryan
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5 Sheets—Sheet 4.

W. C. KRITCH & A. GREENWOOD.

PRINTING-PRESS.

No. 188,151. Patented March 6, 1877.

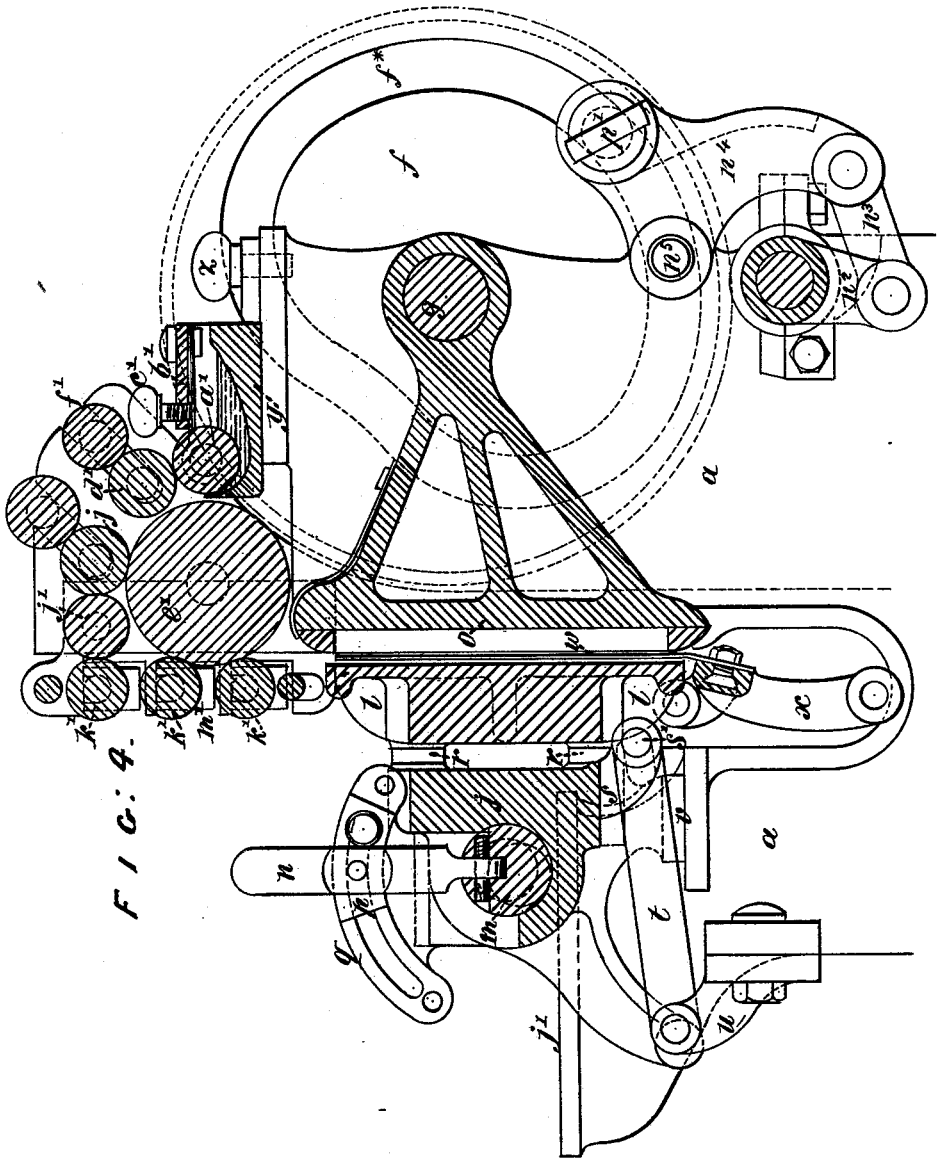

FIG. 4.

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5 Sheets—Sheet 5.

W. C. KRITCH & A. GREENWOOD.

PRINTING-PRESS.

No. 188,151. Patented March 6, 1877.

FIG. 6.

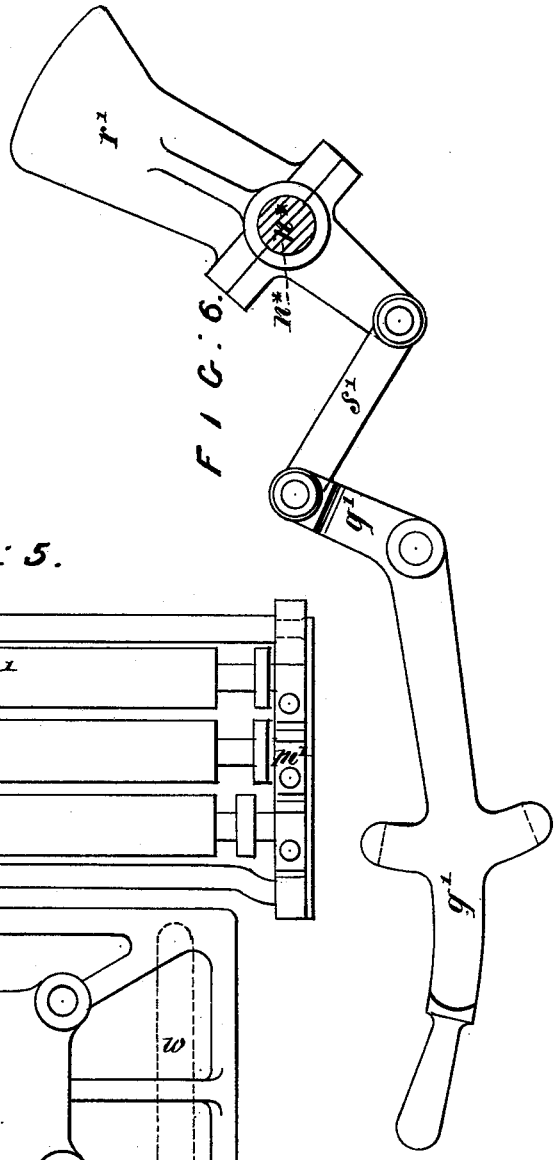
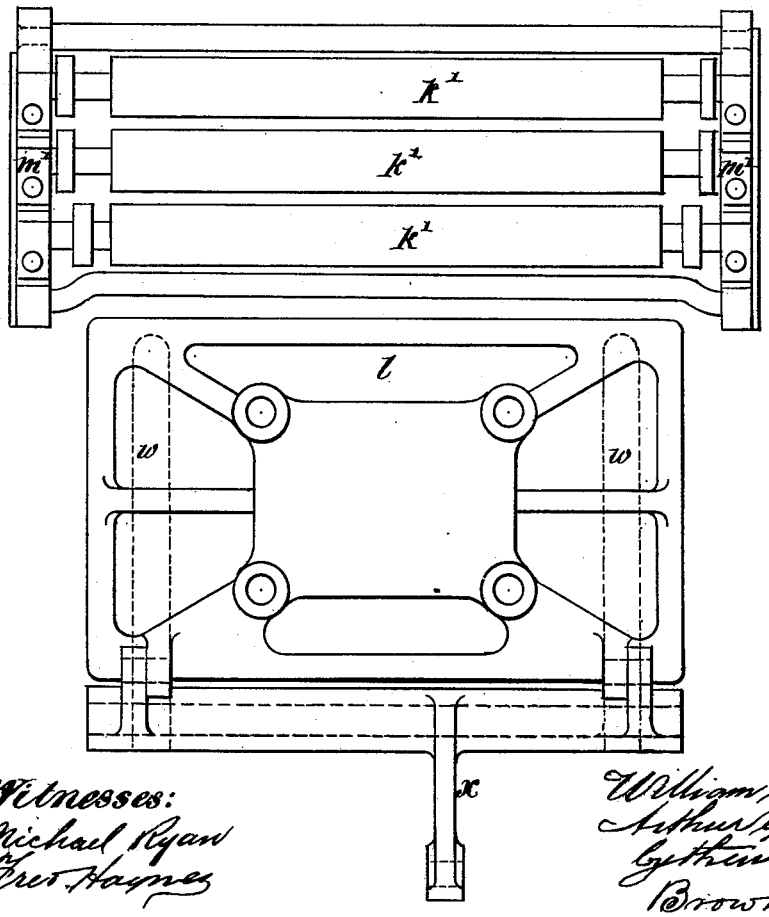


FIG. 5.



Witnesses:
Michael Ryan
Fred. Haynes

William C. Kritch
Arthur Greenwood
by their Attorneys
Brown & Allen

UNITED STATES PATENT OFFICE.

WILLIAM C. KRITCH AND ARTHUR GREENWOOD, OF LEEDS, ENGLAND.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **188,151**, dated March 6, 1877; application filed December 30, 1875.

To all whom it may concern:

Be it known that we, WILLIAM CASPAR KRITCH and ARTHUR GREENWOOD, both of Leeds, in the county of York, England, have invented certain Improvements in Printing-Presses, of which the following is a specification:

This invention of improvements in printing machinery relates to various improvements in the construction of platen printing-machines, whereby positive mechanical motions, as far as practicable, are imparted to the various working parts of the machine, instead of employing springs, as heretofore, for effecting some of the motions. By this means we are enabled to construct a more effective and substantial machine than those heretofore employed.

The first improvement relates to a novel arrangement of ink fountain or duct, whereby a greater quantity of ink may be contained in the fountain, and, by the constant working of the fountain-cylinder, a more perfect supply and distribution of ink is obtained. The fountain is so arranged and constructed that the supply of ink can be instantly regulated or entirely cut off when required, and this is effected by means of regulating-screws for working the sliding journals which carry the fountain-cylinder. The entire ink-fountain is mounted upon a slide, and can be drawn out of gear by releasing the locking-screws which retain it in its position. The principal cylinders for receiving the ink from the fountain are supplied by means of intermediate rollers, which run in contact with the fountain-roller, and thus carry the ink forward. These rollers are driven by friction, and to secure the perfect distribution of ink one of the distributing-rollers is mounted in sliding boxes immediately above the intermediate roller. An endway sliding motion is imparted to this distributing-roller by means of a cam and lever, so that the ink may be more properly distributed over the surface of the other rollers.

The inking-rollers are constructed in the usual manner adopted in this class of platen-machine, and are mounted in a carriage or frame, to which a vertical motion across the chase is imparted by means of a bell-crank lever provided with a bowl or pin, for working in a cam-groove on the face of the main driving-wheel of the machine. This pin can be disconnected by means of a lever, placed in a convenient position at the front of the machine, from the cam-groove of the main driving-wheel.

The second part of this invention relates to an improved mode of mounting and working the platen, and to the arrangement of some of the parts for adjusting the pressure on the printing-surface. The bridge to which the platen is connected moves on two horizontal slides at right angles to the type-bed of the machine. A backward and forward motion is imparted to this bridge by means of cranks placed at either end of the main shaft, and connected by means of links. The bridge is connected, by means of a slotted link, to the frame of the machine, so that, as the bridge is forced by the crank away from the type-bed, the platen will be tipped into a convenient and almost horizontal position for the operator to feed the paper onto it, and remove the printed sheet therefrom. As the cranks draw the bridge toward the type-bed the slotted link will force the platen to assume a vertical position, exactly parallel to the type-bed. This position is assumed at a short distance from the type-bed, so that, during the latter part of the forward motion, the platen will advance in a perfectly straight or parallel line toward the type. To secure this parallel motion flat surfaces at the under side of the bridge come in contact with and slide upon similar flat surfaces on the frame of the machine. Beveled edges are attached to the frame, and embrace the projecting flat surfaces attached to the bridge, and thus secure the steady advance of the platen toward the type. Passing through the center of the bridge is a shaft, each end of which is made eccentric, and upon these eccentric ends the connecting-rods from the cranks are mounted. This shaft has attached to it a spring-lever, which passes through an opening near the middle of the bridge, so that if the operator should desire to throw the impression-surface out of work instantly, he can do so without stopping the machine by simply moving the spring-lever on its center of motion. This will partially rotate the eccentric shaft, and draw

the platen a certain distance away from the type.

In the accompanying drawing we have shown various views of a printing-machine constructed according to our improvements.

Figure 1 is a side, and Fig. 2 is a front, elevation of the machine. Fig. 3 is a back view, showing the mechanism for throwing the inking-rollers in and out of gear. Fig. 4 is a vertical section of some of the working parts, showing the type-bed, the platen and its appendages, and the inking apparatus. Fig. 5 is a back view of the platen and an elevation of inking-carriage. Fig. 6 shows the lever and links for throwing the inking-rollers in and out of action, detached.

a is the frame-work of the machine; *b*, the main driving-shaft, at one end of which is keyed a fly-wheel, and at the other end a pair of driving-pulleys. On the driving-shaft *b* is keyed a pinion, *e*, which gears into a large toothed wheel, *f*, which is keyed upon the shaft *g*. Upon the outer face of the wheel *f*, and upon the outer face of a disk, *h*, which is keyed on the opposite end of the shaft *g*, are fixed suitable eccentric pins *i*, to which are jointed the rods *k k*, whereby a backward and forward movement is given to the bridge *j*, upon which the platen *l* is mounted. This bridge *j* slides upon suitable V surfaces *j'* on the frame-work *a* of the machine. Passing through the bridge *j* is a shaft, *m*, and the ends of this shaft are turned eccentric to the center portion, and are embraced by the ends of the draw-bars *k*. This shaft *m* may be partially rotated by means of a lever, *n*, passing through a suitable opening in the bridge *j*. By moving this lever *n* on its fulcrum, and thereby causing the shaft *m* to turn, the distance between the face of the platen *l* and the face or bed of the main casting *a*, upon which the form *o* (containing the type) rests, is increased. The object of this motion is to enable the operator to throw off suddenly the impression-surface while the machine is at work, and this is effected by simply turning the eccentric shaft *m*, and consequently withdrawing the platen a short distance from the form.

This lever *n* is held in position by a catch, *p*, mounted on a segment, *q*, attached to the bridge *j*. This catch *p* is adjustable, so as to regulate the amount of pressure or impression required. The platen *l* is attached to the bridge *j* by means of four screws, *r*, which enable the platen to be adjusted with accuracy parallel with the form. On the lower side of the bridge *j* is a lug or bracket, *s*, (shown by dots in Fig. 1,) and which is connected by means of a pin, *s'*, to the link *t*. The other end of this link *t* is attached by a pin to another lug or bracket, *u*, fixed to the frame-work of the machine. The action of this link *t*, connected as it is to the bridge by one end, and to the frame-work by the other, is to tilt the platen *l* on its backward motion, and bring it to an almost horizontal position, so as to enable the operator to place the paper on, and to remove the printed sheet from, the platen *l* of the machine.

On the forward motion of the bridge *j* and platen *l*, this link *t* throws the platen into a vertical position, which is assumed just before the platen comes in contact with the form, so that the platen is perfectly vertical before the impression is made. To secure this perfectly parallel advance, suitable projections or feet are provided on frame or plate, at *v*, Figs. 1 and 2, for the bridge to move forward upon when it comes in contact therewith, a lip on the lower side passing under suitable projections on the frame-work of the machine. Gripers *w*, which act as a frisket to hold the paper, are mounted on the lower edge of the platen *l*, in the usual manner. The object of these gripers is to withdraw the paper from the type after the impression has been made. They receive the requisite motion from the link *x* and spring *x**.

Upon suitable flat surfaces, at the upper part of the back of frame-work *a*, is mounted the ink-fountain *y*. (See Fig. 4.) This ink-fountain is held in position by two thumb-screws, *z*, so that by loosening these thumb-screws the ink-fountain may be readily slid back out of gear with the machine. In this ink-fountain is a fountain-cylinder, *a'*, mounted in bearings, and having a constant rotating motion given to it by suitable gearing driven from the wheel *f*, as shown in the side elevation, Fig. 1.

The amount of ink taken up by the fountain-cylinder is regulated by a scraper, *b'*, Fig. 4, which may be adjusted to bear heavily or lightly upon it by means of the thumb-screws *c'*. This fountain-cylinder *a'* runs in contact with an intermediate roller, *d'*, which is driven by friction of contact from the principal inking-cylinder *e'*. This cylinder *e'* is driven by gearing from the wheel *f*, and is supplied with ink by the intermediate roller *d'*.

To secure perfect distribution of ink upon the cylinders a distributing-cylinder, *f'*, is mounted immediately over the roller *d'*, and is driven by friction of contact with it. This distributing-cylinder *f'* receives an endwise reciprocating motion by means of a lever, *g'*, Fig. 1, and motion is imparted to this lever by means of a grooved cam and runner, *h'*, driven by gearing from the wheel *f*. The end of the lever *g'* works between collars at the end of the distributing-cylinder *f'*, as shown at Fig. 2, and thus imparts to it the reciprocating motion given by the cam *h'*. The ink now passes from the principal ink-cylinder *e'* onto the roller *j*, Fig. 4, and from that to the roller *j'*. Both these rollers are driven by friction of contact, and operate in conjunction with the principal inking-roller, to carry the ink onto the inking-rollers *k'*, which are mounted in sliding bushes in the frame *m'*, and are kept in contact with the ink-cylinder *e'* by means of springs. The sliding frame *m'* receives a vertical or up-and-down motion

over the face of the form o through the arms n^1 n^1, one on each side of the machine, motion being communicated to these parts by a scroll cam-groove, f^*, cut in the inner face of the wheel f, as shown at Fig. 1, by means of friction-rollers attached to said arms and working in said grooves. On the shaft n^*, on which the bent levers n^1, Fig. 1, are mounted, is keyed an arm, n^2, which is connected by a link, n^3, to a bell-crank lever, n^4, which has its center of motion in a bearing, n^5, fixed to the framing of the machine. This bell-crank lever n^4 carries a pin, p', which works in the cam-groove f^* of the wheel f, which therefore rocks the bell-crank lever n^4, and, through it and its link n^3, actuates the rock-shaft, to which the bent arms n^1 are attached, and works the vertical frame m' up and down. The inking-rollers k' are thus moved by the action of the machine across the face of the form after each impression, and will transfer the ink to it from the inking-cylinder e'. A weight, o^1, which has its center of motion at $o^\times$, is connected by a link, o^2, to another arm on the shaft n^*, and therefore acts with the arms n^1 to counterbalance the frame m'.

To enable the operator to stop the up-and-down motion of the inking-rollers k' while the machine is at work, an arrangement is provided to withdraw the pin p' of the bell-crank n^4 from the cam-groove of the wheel f. The pin p' is capable of a lateral motion in a suitable bearing in one end of the bell-crank lever n^4, so that it may be drawn out of the cam-groove in the wheel f. This pin p' is surrounded by a coiled spring, the tendency of which is to withdraw the pin from the cam-groove. If this action of the spring on the pin p^1 were not controlled when the machine is at work the inking-carriage would remain standing with the inking-rollers at the top of the stroke—that is, in contact with the inking-cylinder e'. When the inking-rollers k' are required to move across the type and supply the form with ink, a lever, q', (shown detached in Fig. 6,) placed conveniently in front of the machine, is forced down. This lever is connected to another lever, r', by the link s'. The further extremity of the lever r' is provided with an inclined edge, which, when brought against a runner, t', at the end of the pin p', forces the latter into the cam-groove in the wheel f; and so long as this lever r' is allowed to remain in this position the inking-rollers k' will continue to work across the type after every impression; but when the lever q' is raised the lever r' will be moved out of the way of the end of the pin p', which thus becomes free, and the pin will be forced by the spring out of the cam-groove. The wheel f will then rotate without acting on the inking apparatus. The lever r' is arranged in such a position that this can only take place when the inking-rollers k' are at the top of the stroke.

Having now described our invention and explained the manner of carrying the same into effect, we claim—

1. The combination, with the principal inking-cylinder e', of a constantly-rotating ink-supply roller, a', mounted in a fountain, y, which latter is capable of being slid back on, or entirely removed from, its seat, on which it may be secured in any position by means of clamping-screws z, such adjustable fountain y and constantly-rotating ink-supply roller being provided with an adjustable scraper, b', and regulating-screw c', so that by such scraper bearing either heavily or lightly on the ink-supply roller, the supply of ink to the distributing and inking rollers may be regulated as may be desired, as herein set forth.

2. The combination of the curved levers n^1, mounted on the rock-shaft n^*, with the bell-crank lever n^4, linked to an arm, n^2, on the rock-shaft n^*, and provided with a spring-pin, p', the end of which works in the cam-groove f^* of the large driving-wheel f, for the purpose of moving the inking-rollers k' at the required intervals across the face of the type, substantially in the manner herein set forth.

3. The combination, with the spring-pin p', (which is capable of lateral motion,) of the lever r', link s', and hand-lever q', whereby the lever r' may be withdrawn (when desired) from the end of the spring p', which will then be forced back out of the groove f^* by its spring, and the above parts being combined with the mechanism for moving the inking-roller k' across the face of the type, and which inking mechanism will then be thrown out of action when required, substantially as and for the purpose herein set forth.

4. The platen-bridge mounted upon a shaft journaled eccentrically in blocks which move upon horizontal guides, said shaft being provided with a lever projecting through an aperture in the platen-bridge, and provided with a clamping device for adjusting and holding the platen in the desired position, in combination with the feet v and brackets s and u, constructed and arranged substantially as described, whereby the platen is thrown back to receive the paper as it recedes from the type, and is presented squarely to the face of the type as it approaches the same, as set forth.

Dated the 27th day of November, 1875.

WM. C. KRITCH.
ARTHUR GREENWOOD.

Witnesses:
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WILLIAM J. GREEN,
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