(No Model.) 4 Sheets—Sheet 1.

M. WRIGHT.

PRINTING MACHINE.

No. 522,502. Patented July 3, 1894.

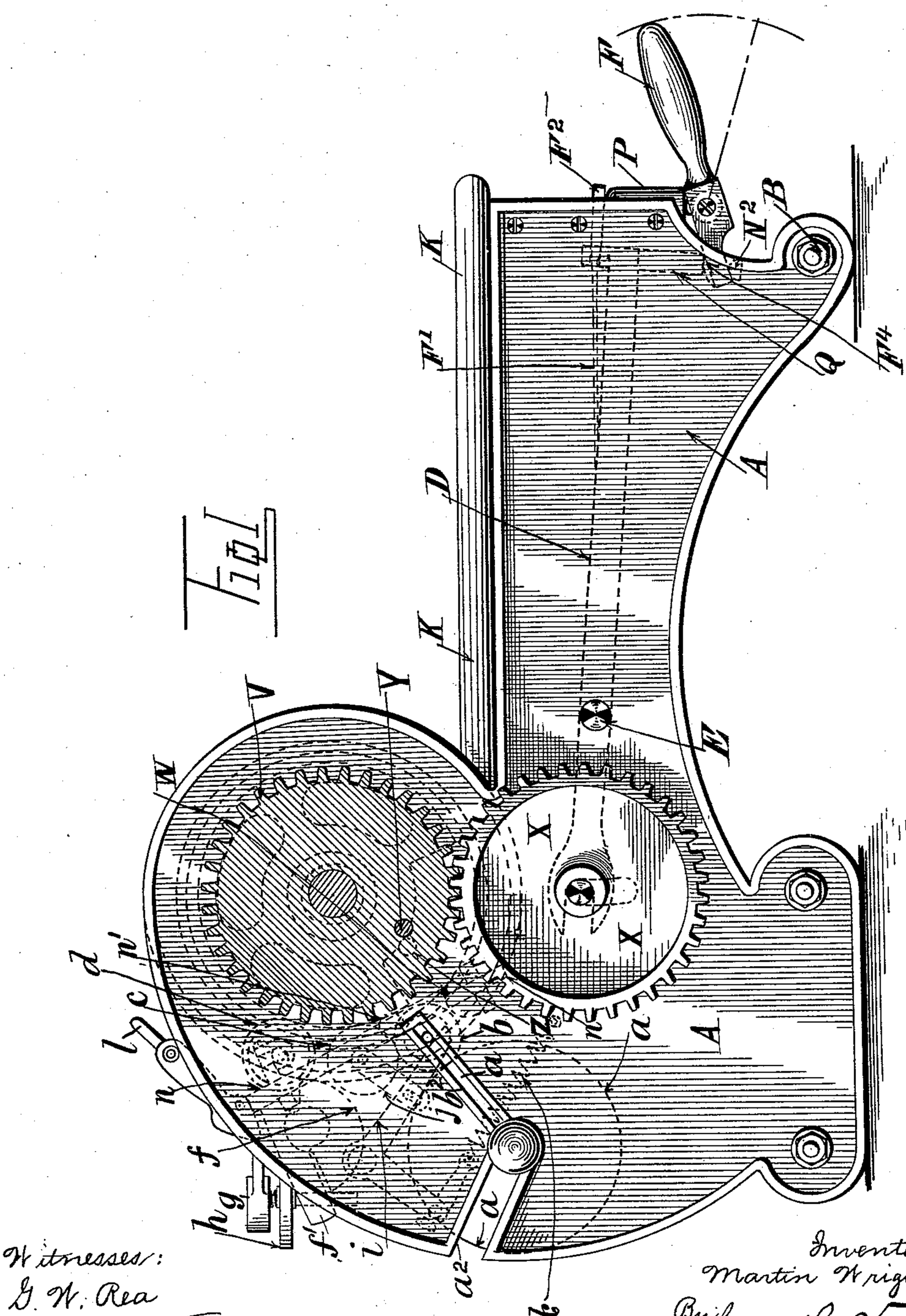

Fig. 1.

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A. H. Norris.

Inventor.
Martin Wright,
By James L. Norris.
Atty

(No Model.) 4 Sheets—Sheet 2

M. WRIGHT.

PRINTING MACHINE.

No. 522,502. Patented July 3, 1894.

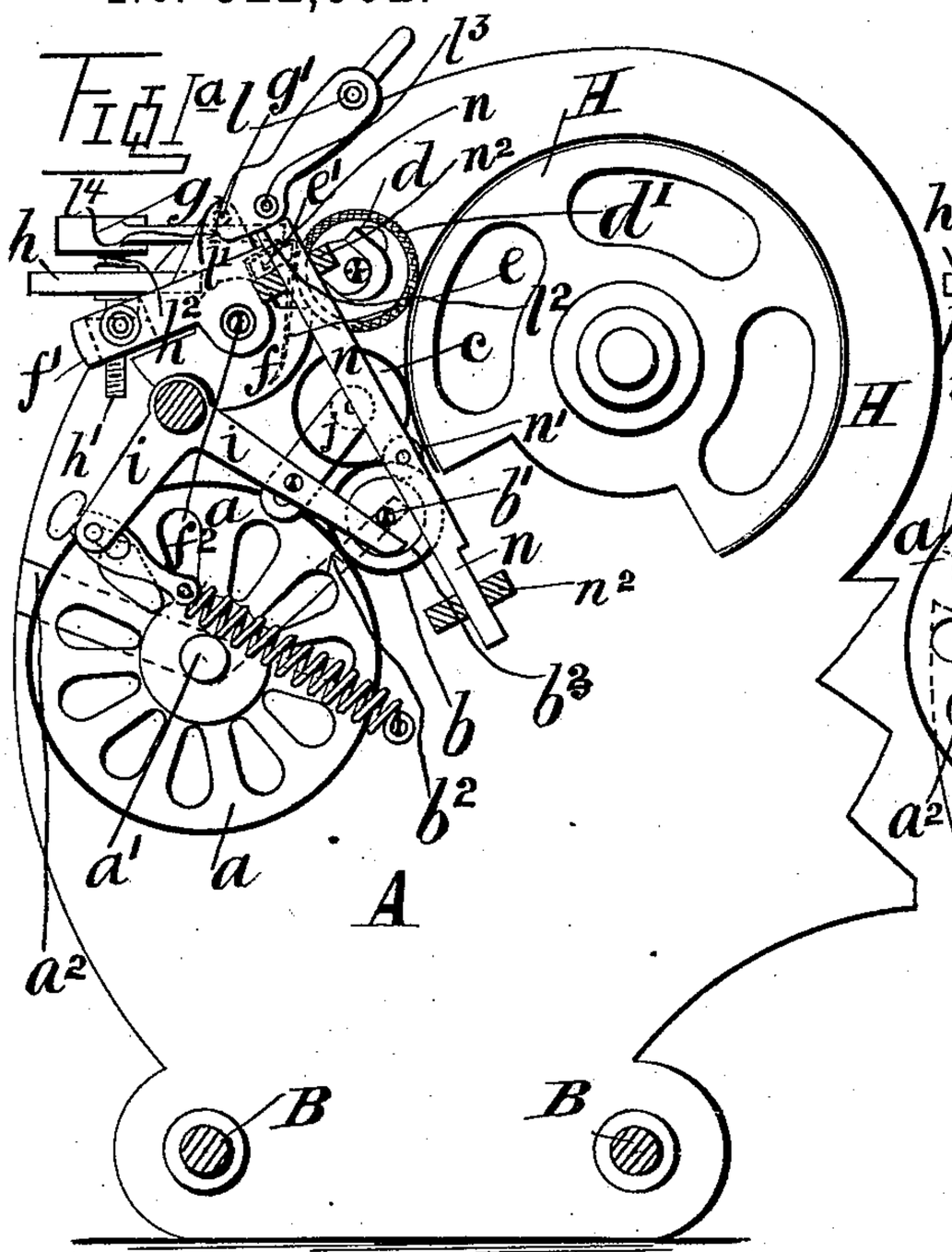


FIG II

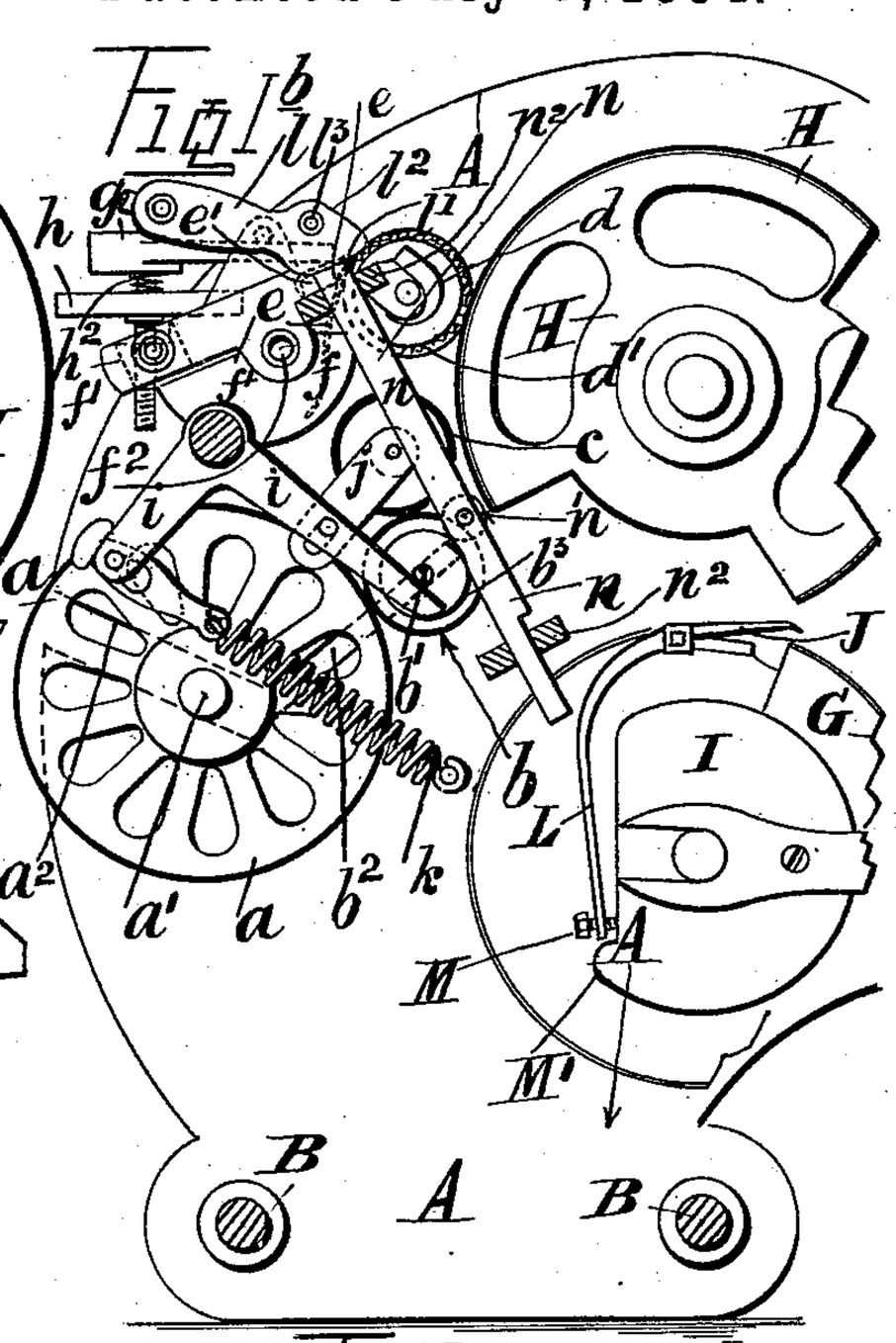


FIG II

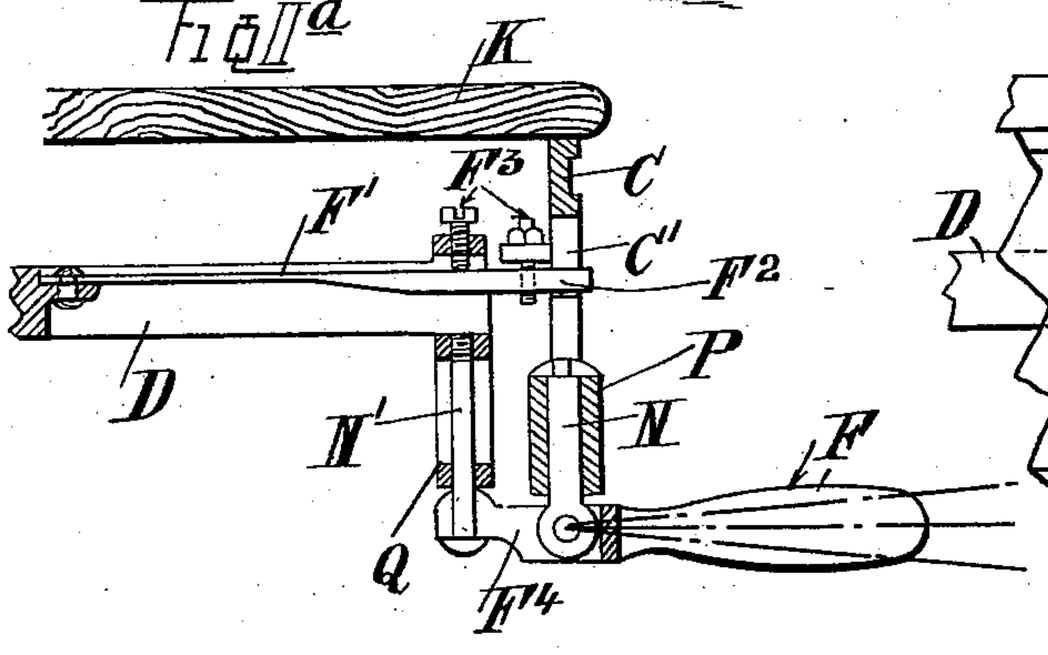


FIG II a

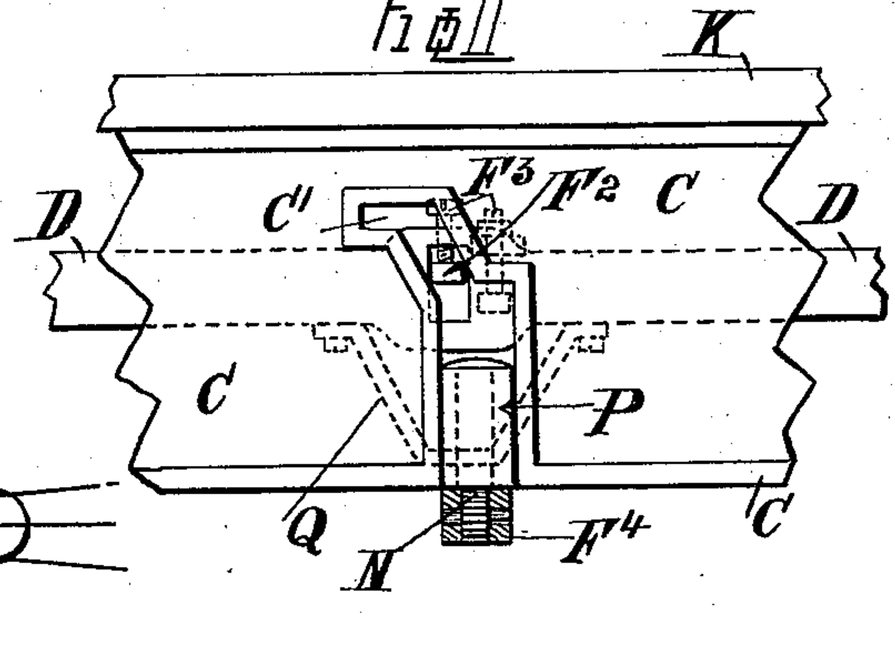
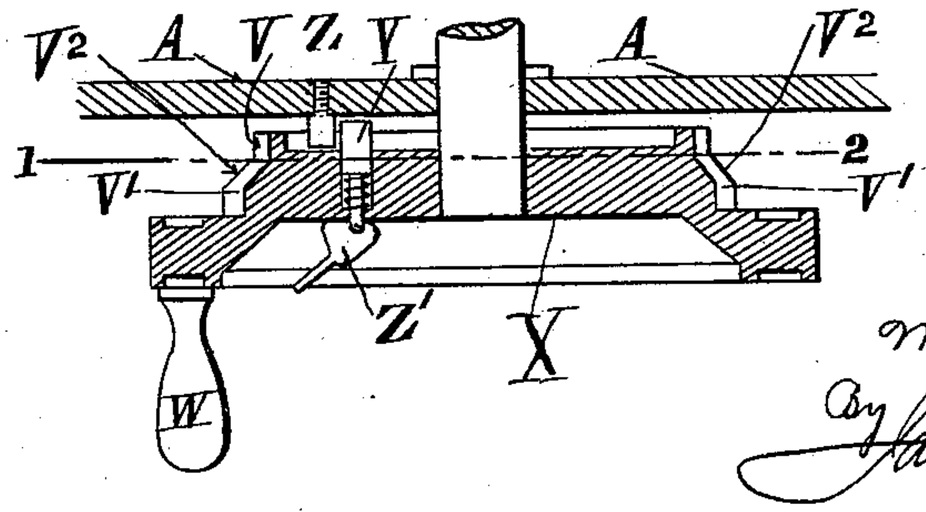


FIG III



Witnesses:
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(No Model.) 4 Sheets—Sheet 3.

M. WRIGHT.

PRINTING MACHINE.

No. 522,502. Patented July 3, 1894.

Fig III a

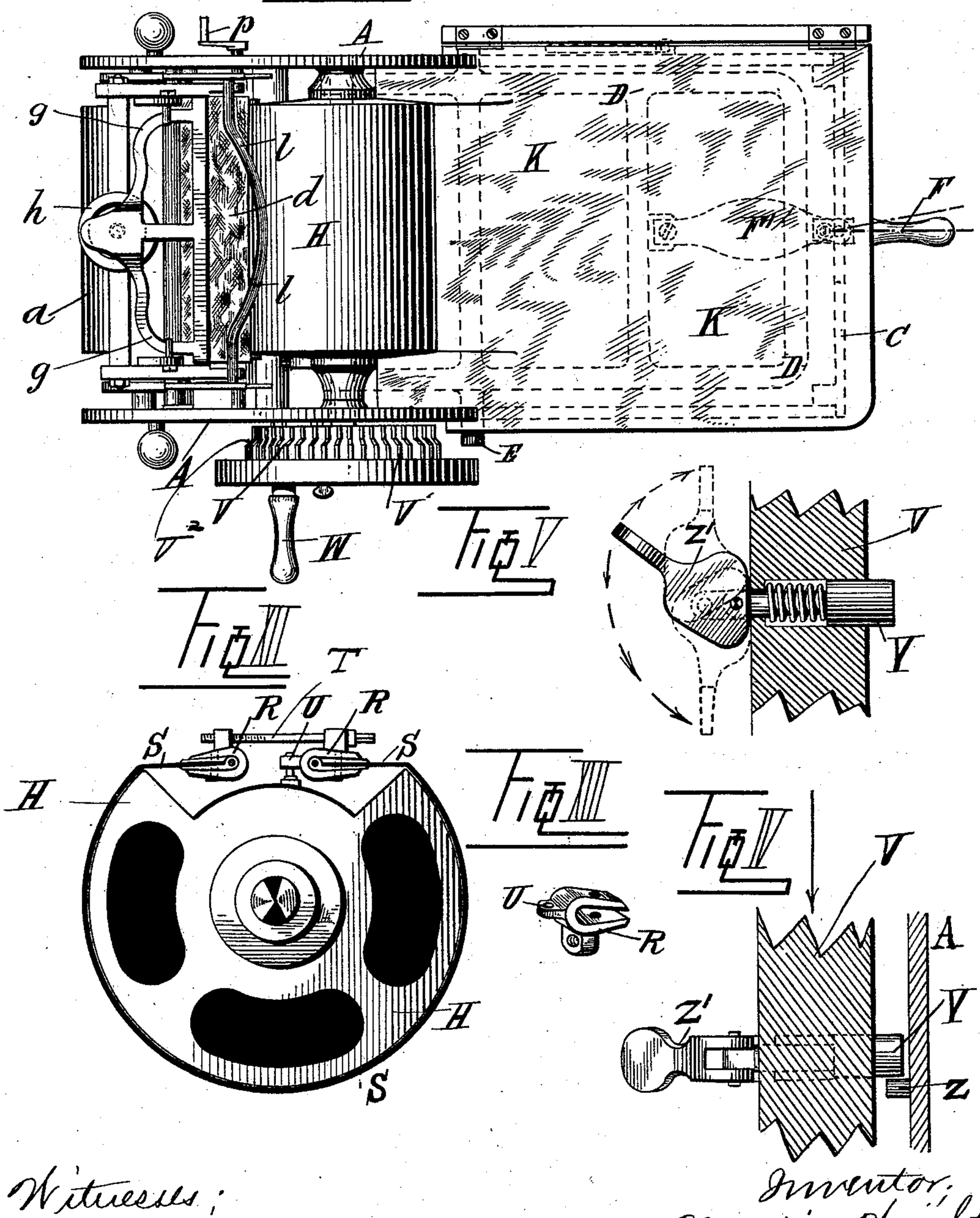

Fig V

Fig III T

Fig III

Fig V

Witnesses;
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(No Model.) 4 Sheets—Sheet 4.

M. WRIGHT.

PRINTING MACHINE.

No. 522,502. Patented July 3, 1894.

Fig. VII

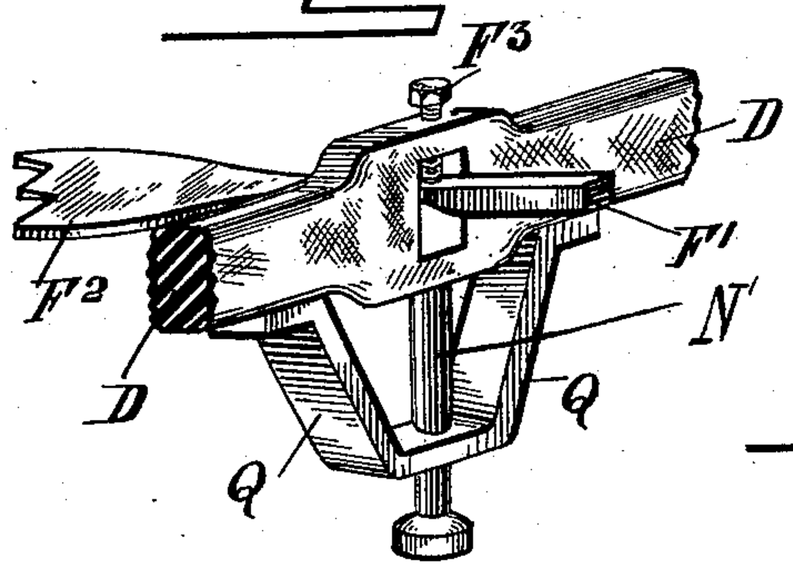


Fig. VIII

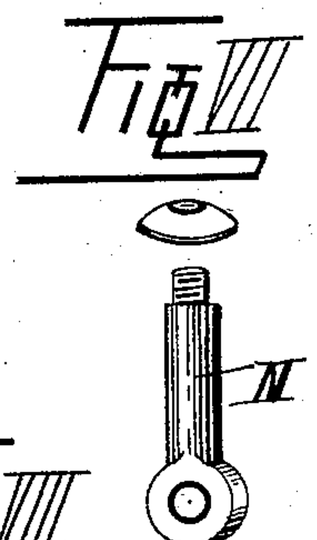


Fig. III

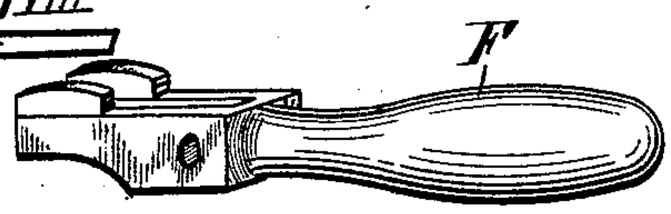


Fig. IX

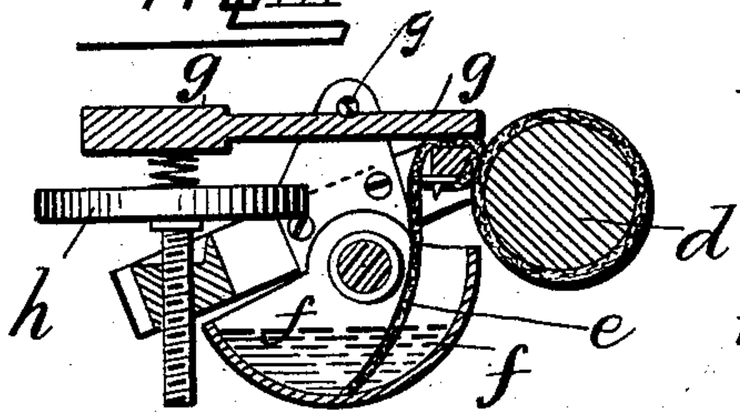


Fig. XI

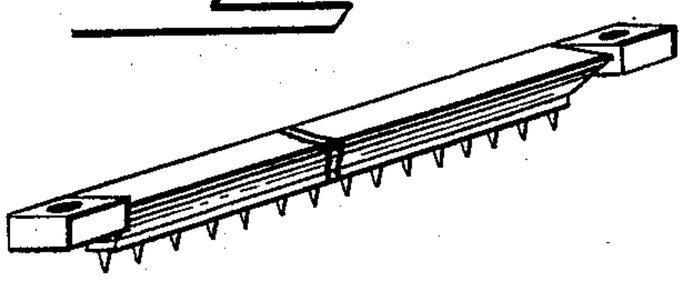
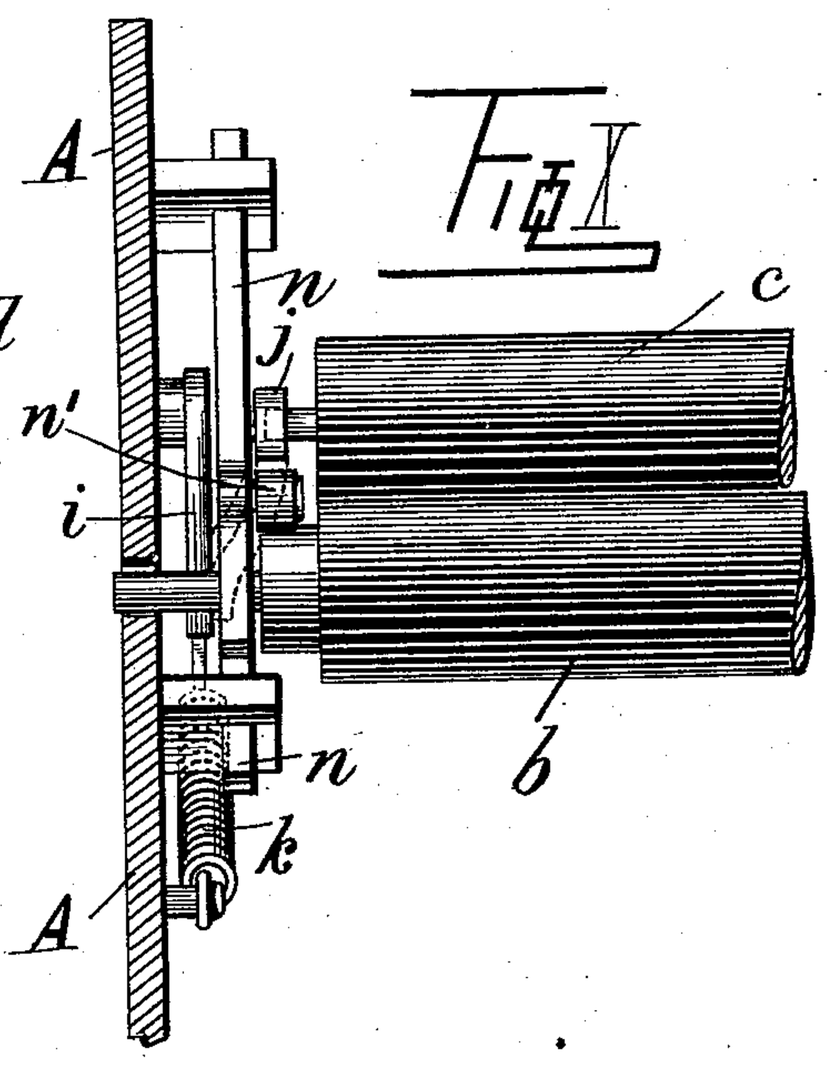


Fig. X



Witnesses;
G. H. Rea.
Robert Everett.

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Martin Wright,
By James L. Norris.
Atty.

UNITED STATES PATENT OFFICE.

MARTIN WRIGHT, OF LEICESTER, ENGLAND.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 522,502, dated July 3, 1894.

Application filed March 14, 1893. Serial No. 465,981. (No model.) Patented in England November 18, 1891, No. 20,064.

To all whom it may concern:

Be it known that I, MARTIN WRIGHT, a subject of the Queen of Great Britain, and a resident of Upper Kent Street, Leicester, England, have invented a certain new and useful Improvement in Printing-Machines, (patented in Great Britain, No. 20,064, dated November 18, 1891,) of which the following is a specification.

This invention has for its object the construction and arrangement of the workable parts of a machine in which zinc plate litho printing can be effected in an easy and expeditious manner.

The machine is specially adapted for small work and from its portability it can be used for making a number of copies either from written or printed proofs, such as those produced from an ordinary type-writer, the pressure of the pressing drum being capable of exact adjustment for obtaining impressions of the lightest lines, toning and shading such as are observable in fancy cards, tradesmen's bill heads, circulars, and the like.

My invention will be clearly understood by the annexed drawings.

Figure 1 is a side elevation of a complete machine with the main handle wheel in section. Fig. 1^a is a side view of that part of the mechanism constituting my improvements as applied to a printing machine of the kind described in my Patent No. 477,482, dated June 21, 1892, the various parts being shown in the position they occupy when the inking roller is bearing against the drum, as when printing is being done. Fig. 1^b is a similar elevation, but with the various parts thrown back for removing the inking roller away from the drum. Fig. 2 is a part elevation of the front plate showing the angled slot up and down which the guide spring of the skeleton frame is caused to move by a slewing handle, Fig. 2^a being a side sectional view of said slewing handle, and part of the skeleton frame. Fig. 3 is a sectional plan of the operating wheel, and sufficient of the side frame to show the stop mechanism. Fig. 3^a is a plan of the complete machine on a reduced scale; Figs. 4 and 5 plan and sectional elevations, respectively, of the knuckle jointed finger action; Fig. 6, perspective view of the front of skeleton frame and parts connected; Fig. 7 bolt-nut by which the handle, Fig. 8, is secured in position to the end frame plate; Fig. 9 sectional view of the damper roller trough, and regulator. Fig. 10 is a detail view of the inking rollers showing roller riding upon reduced diameter of inking roller. Fig. 11 is a detail view of the pinned cross-bar to which the damping felt is attached; Fig. 12 detail view of alternative method of securing the zinc plate in position by means of an extra pin; Fig. 13 detail view of gripper showing holes through which and the zinc plate said pin is passed.

A A are two side frame plates braced at the required distance apart by cross-bolts B, B, and by a front plate C. Between the side plates A, A, is a balanced skeleton frame D supported somewhat loosely by pivoted projections E, E, in apertures in the side plates A, A, for side motion from the handle F. The handle F is pinned loosely to a swivel-bolt N secured in a socket P formed in the lower part of the slot in the front plate C in such a manner that it can turn with the handle F when said handle F is slewed horizontally for moving the skeleton frame. The inner end of the handle F is forked for embracing a bolt N′ which is passed through the strap Q for screwing into the front end of the skeleton frame, as more particularly shown at Fig. 2^a of the drawings. The head N^2 of the bolt N′ is rounded convex, as is also the top of the prongs forming the forked projection F^4 of the handle F, to allow of the same working freely under the vertical movement of the handle when lowering or raising the skeleton frame.

A stem F^2 forming part of a plate spring F′ projects through the angular slot C′ in the front plate C to serve as a guide and control the movement of the handle F which is thereby compelled to partake of a compound or combined vertical and horizontal movement by reason of the connection of the same to the frame D which moves laterally to move the wheel X from the narrow diameter teeth V to the wider diameter V′, the inclined teeth V^2 corresponding to the combined lateral and tilting movement of the frame upon its pivoted projections E in the side frames A, A, whereby it follows that the one wheel is never disengaged from the other. The before men-

tioned projection F^2 is shown at mid travel up or down the inclined slot C′ in Figs. 2 and 2^a. The set screws F^3 on the frame D and upon the inner face of the front plate C are adjustable to determine the pressure of the drum G against the printing roller H and to permit of a yielding action of the drum when the paper is passing through the machine, the said drum G being held in the forked ends of the frame D. At the inner side of one arm of the skeleton frame is a cam plate I for governing the motion of the gripper J which takes the paper to be printed from the feed board K by means of the stud M on the end of the gripper lever L riding up the nose M′ of the cam-plate I and keeping hold of the paper while the stud moves round the circular periphery of the cam I when the cam releases the paper by its stud falling into the cut away part of the cam plate by the action of a spring.

The damping roller *d* is composed of india-rubber, or other substance covered with a layer of felt, or other absorbent material *d′* which is wetted by contact with a flannel *e* partly immersed in water contained in the trough *f*, which is hung from the framing *f′* by a tube or rod f^2 passing through the ends of the trough *f* and the main frame sides A for holding the trough and damping roller *d* in position, the roller *d* being always in contact with the drum H.

The printing cylinder H has a recess in its periphery for the lodgment of two clips R, R, by which the zinc sheet or an ordinary gelatinous sheet S can be secured around the cylinder, said clips being drawn toward each other by the straining bar T. To centralize the sheet S on the cylinder I fix a post in the recess and by an eye U on one of the clips shown at Figs. 12 and 13 this can be readily effected.

The zinc or gelatinous paper sheet has its ends inserted and held between pairs of blades hinged together which are in a closed condition inserted into the clips from the end, the tapered shape of the blades fixing them in the tapered inner faces of the clips R.

The cylinder H is held between the sides A, A, and has on one end and outside the frame a stepped tooth or double edged gear-wheel X with a handle W by which it can be turned for the printing operation. This wheel gears into a gear-wheel fitted on the axle of the pressure drum G, whether the frame D be up or down, because as it is moved sidewise the projecting stem moving in the inclined slot C′ causes the teeth to slide down the step and engage in the larger diameter part. At each revolution of the cylinder a spring bolt Y in the wheel X is forced against a stop Z projecting from the side frame A and shown more particularly at Fig. 3 and brings the cylinder H to a state of rest, and when the cylinder has to be again rotated, a pressure on the finger piece Z′ withdraws the bolt Y from the stop Z. Should it be necessary to keep the bolt Y clear of the stop Z the finger piece Z′ is thrown upward where it is retained by the knuckle joint of the finger piece.

The flannel *e* is wrapped around the cross-bar *e′*, the end being pressed over the pin points e^2 for securely fastening it to the same, and the wheel *d* as it revolves in contact with the slanting face of the flannel *e* absorbs a degree of moisture for transference to the zinc or gelatinous covering on the drum H, the amount of moisture so transferred being determined and regulated by the plate *g* which bears upon the flannel *e* more or less as the wheel *h* and the screw spindle *h′* to which it is attached puts the buffer spring h^2 more or less in tension to lift the hinder end of the plate *g*, the points *g′*, *g′*, fixed upon the ends of the frame *f′* serving as a resistance or fulcrum to impart a downward motion to the forward end of the plate *g* upon the flannel, and intercept the capillary flow of the liquid to the roller surface *d′*.

The ink supply roller is mounted upon an axle *a′* which has its bearing in inclined slots a^2, a^2, formed in the frame A. The distributing roller *b* is also mounted upon an axle *b′*, and is inserted in the inclined slots b^2 of the frame side A, said slots being a continuation of the larger slot a^2 at the opposite angle. The roller *b′* transfers ink from the supply roller *a* to the roller *c*, which in turn inks the zinc or gelatinous surface on the drum H for printing purposes. The roller *c* is mounted or pivoted between or to the projecting arms *j*, *j*, which are adjustable upon the bell-crank levers *i*, *i*. The bell-crank levers are pivoted to the frame sides A and a spring *k* attached to one of the arms of the said lever pulls same to force the roller *c* into contact with the zinc or gelatinous surface upon the drum H.

The roller *b* is formed with an extension of reduced diameter b^3, upon which a smaller roller *n′* bears, said roller being pivoted to the sliding bar *n* held between the guides n^2, n^2, projecting from the frame sides A, so that when the rod *n* is pushed down by throwing the handle bar *l* over from the position it occupies in Fig. 1^a to that shown in Fig. 1^b, the wheel *n′* rides upon the reduced end b^3 of the roller *b*, and pushes it back, causing the axles *b′* of same to move down the inclined slots b^2 in the frame sides, and bear against the long arm of the bell-crank lever *i* to move it down sufficiently to bring the roller *c* clear away from the zinc or gelatinous surface on the drum H, as shown very clearly in Fig. 1^b. The roller *b* as it is moved down the slot b^2 also bears against the inking roller *a* to move it up the slot a^2.

The throw-over lever *l* is formed with ends of somewhat triangular shape having two flat surfaces *l′*, l^2, and is pivoted out of the center to the frame sides, that is to say, the pivotal point l^3 is nearer to the flat side l^2 than *l′*, consequently when said flat side l^2 is bearing upon the bar *n*, the bar is at its highest point,

and is held in that position by reason of the tension on the spring *k* pulling upon the bell-crank lever *i*, and lifting the roller *b* by its axle *b'*, which roller by the reduced periphery b^3 on same lifts the bar *n* by contact under the roller *n'*. If on the contrary the flat side *l'* is bearing upon the bar *n*, the bar *n* will be pushed down to move the roller *c* away from the drum H by reversing the order of the movements already described. In moving over the lever *l*, the nose l^4 acts as a cam, to gradually exert a pressure upon the bar *n*.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with a trough *f*, the roller *d* having a covering of absorbent material, and the damping cloth *e* having one end secured to a bar *e'* in contact with the roller *d* and its other end immersed in the trough *f*, of the pivotally supported pressure-plate *g* having one end bearing against the damping cloth, a screw-wheel *h* adapted to exert pressure on the other end of said plate, and a buffer spring between said wheel and plate, substantially as shown and described.

2. The combination of a skeleton frame D, strap Q, and pin N' with a handle F having forked projections F^4 for embracing said pin or bolt N', and pivoting the said handle F to a swivel-pin N socketed in the frame end C in combination with a spring projection F^2, inclined slot C' for imparting a combined vertical and horizontal movement to the handle F when same is operated for sliding the frame D on its pivoted projections E in the side frames A, A, for the purpose and in the manner substantially as described and shown.

3. The combination of bell-crank levers *i*, *i*, distributing rollers *b*, *c*, and small roller *n'* pivoted to sliding bars *n*, and a triangular shaped lever or handle *l* pivoted to the side frames, and capable of movement upon its pivot for throwing the inking rollers into or away from the printing drum as described and substantially in the manner shown.

In witness whereof I have hereto signed my name, in the presence of two subscribing witnesses, this 28th day of October, 1892.

MARTIN WRIGHT.

Witnesses:

ARCHIBALD M. HARWAR,
28 *Upper Tichborne Street, Leicester, Solicitor's Clerk.*

FRED FELLOWES WIGGINS,
56 *Walnut Street, Leicester, Solicitor's Clerk.*