

G. C. HOWARD & AMANDA J. DAINTY.
Plate Printing Presses.

No. 139,392.

Patented May 27, 1873.

FIG.1.

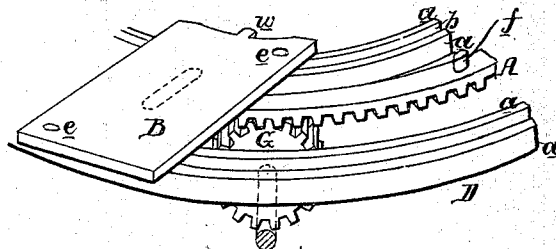


FIG.2.

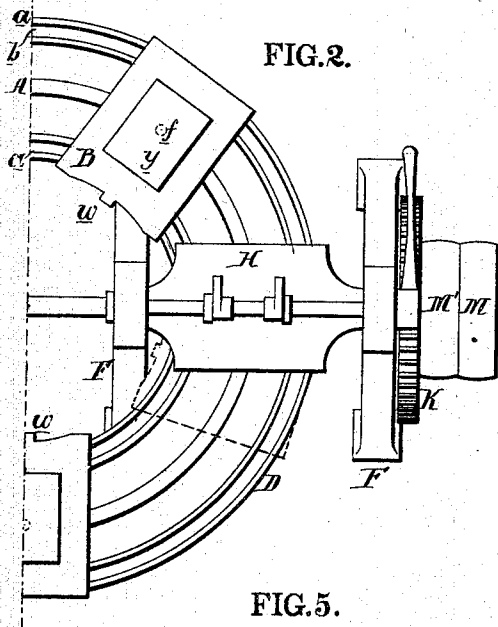


FIG.3.

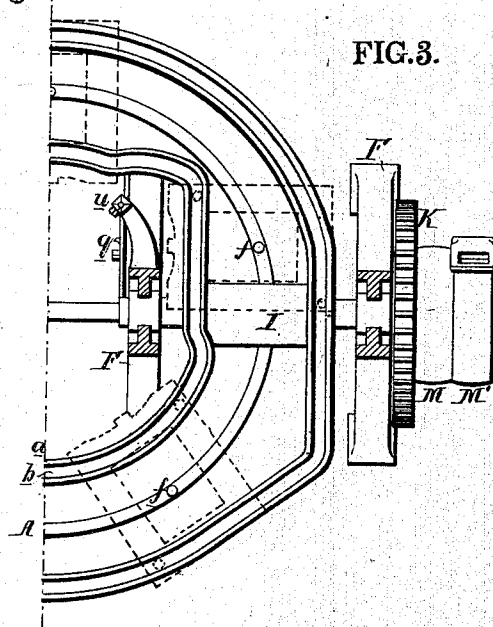


FIG.5.

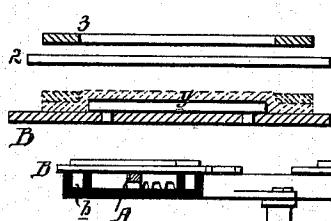
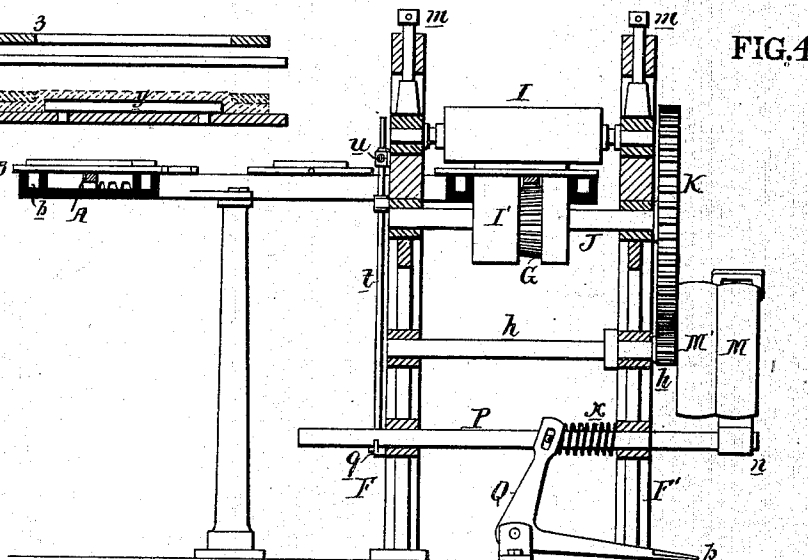


FIG.4.



WITNESSES.

*Thomas McLean,
Harry Smith*

*G. C. Howard
A. J. Dainty
by their attys
Howson and Son*

UNITED STATES PATENT OFFICE.

GEORGE C. HOWARD AND AMANDA J. DAINTY, (ADMINISTRATRIX OF ESTATE OF JOHN DAINTY, DECEASED,) OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO GEORGE C. HOWARD.

IMPROVEMENT IN PLATE-PRINTING PRESSES.

Specification forming part of Letters Patent No. **139,392**, dated May 27, 1873; application filed November 23, 1872.

To all whom it may concern:

Be it known that GEORGE C. HOWARD, of Philadelphia, Pennsylvania, and JOHN DAINTY, deceased, late of Philadelphia, invented certain Improvements in Printing-Presses, of which the following is a specification:

The main object of this invention is to print from engraved plates much more rapidly than by the machinery and processes heretofore used for the purpose.

This object is attained by causing a series of plates, B, each carrying an engraved plate, to traverse an annular bed, D, as best observed in the perspective view, Fig. 1, of the accompanying drawing, and by arresting the movement of the plates at intervals for the purpose of affording time for inking the plates, applying the paper, &c., and for making the impression, when the direct pressure of a platen, H, is used for that purpose, as shown in the plan view, Fig. 2; but when rollers I I' are used for making the impression, as shown in the sectional plan, Fig. 3, and the vertical section, Fig. 4, the plates are caused to change their course from an annular path to one at right angles to the said rollers I I', owing to the peculiar construction of ways and grooves on the bed, as more fully explained hereafter. Instead of damping the paper to be printed, prior to placing it on the plate, it is adjusted to the latter in a dry condition, the damping effect being subsequently obtained by the use of a wet pad during the making of the impression, a process which greatly contributes to the attainment of the object aimed at. The annular bed D is supported partly by legs and partly by the frames F F', as shown in Fig. 4, the bed-plate having, at its inner and outer edges, flanges *a a*, on which the plates B bear, and between these flanges are grooves *b b*, for receiving pins *c c*, projecting from each plate and serving to retain the latter in its proper course and position. A is an annular rack resting on the bed D and driven by the pinion G, the gearing and stopping and starting mechanism connected with which are particularly explained hereafter. On the rack there are as many pins *f* as there are

plates B, each pin projecting into an oblong recess in the under side of the plate. When a platen, H, is used for obtaining the desired impression, the ways and grooves of the bed are annular throughout, as shown in Fig. 2, so that the plates B can traverse in an annular path throughout, their motion being arrested as each plate in succession arrives at a position beneath the platen H. Many different devices common to other printing-presses may be employed for raising and depressing the platen, hence it has not been deemed necessary to illustrate or describe mechanism for this purpose. After the impression has been imparted and the platen begins to rise, the machinery is again started and the plates again pursue their course until another is beneath the platen when their movement is again arrested, and so on.

These repeated stoppages, and the length of time required to traverse the annular bed, afford ample opportunities for attendants to remove the printed paper from the engraved plate, clean the latter, ink it for a new impression and apply new paper, and the padding alluded to hereafter.

When rollers I I' are used for making the impression, as shown in Figs. 3 and 4, the ways and grooves of the bed are not annular throughout, as in the former case, but both the ribs *a a* and grooves *b b* take a straight course at right angles to the rolls for a short distance at and near the rolls, this straight portion of the ways and grooves merging with curves shown in the drawing, Fig. 3, into the annular portion so that the plates B, as they traverse the bed in the direction of the arrow will, owing to the control which the grooves have on their pins, suddenly depart from their annular course and pursue one at right angles to the rolls as they pass beneath the same, but will again resume their annular course after they are clear of the rolls. The roller I' is secured to a shaft, J, which turns in bearings in the opposite frames F F', and which carries a cog-wheel, *k*, driven by a pinion, *h'*, on a shaft, *h*, which also turns in the opposite frames F F' and carries fast and loose pulleys

M M' for receiving and driving belt. The bed D is cut away for admitting the roll I', the top of which is level with or very slightly above the upper surface of the ribs or ways *a a* of the bed, and into a groove in the roller projects the annular rack A, so that its teeth may gear into those of the pinion G formed in the said groove, as shown in Fig. 4. The upper roller turns in bearings arranged to slide in the frames and acted on by set-screws *m m*, by which more or less pressure may be imparted to the upper roller as in ordinary copper-plate printing-presses. A bar, P, is arranged to slide in the opposite frames F F', and carries at its outer end a belt-shifting arm, *n*, and this bar can be moved outward so that the belt will be shifted to the fast pulley M by depressing a treadle, *p*, forming one arm of the bell-crank lever Q, the other arm of which is connected to the bar. When the bar is moved outward, as in Fig. 4, it is retained by a lever, *q*, hung to the side of the frame F, one arm of the lever fitting into a notch in the under side of the bar, and the other arm being connected to the lower end of a guided rod, *t*, the upper end of which is furnished with a stud, *u*, inclined on the under side so that, as a pin, *w*, on each plate B passes beneath the stud, the latter, and with it the rod *t*, will be elevated, and the lever and the bar P, being consequently released, will be forced rearward by a spring, *x*, and the belt will thereby be moved from the fast pulley M to the loose pulley M', and thus the movement of the plates B will be arrested. It will be seen, therefore, that while the starting of the machine is under the control of the operator, the stopping is determined by each plate in succession.

When a platen is used for making the impression, as in Fig. 2, the stoppage of each plate in succession will take place when it is beneath the said platen, but when rollers are used for making the impression, as in Fig. 4, the stoppage takes place immediately after one plate is clear of the rolls and before another has reached them, so that the attendant has time to see to the proper adjustment of paper and pad on the plate before starting the machine, while another attendant is at hand to remove the padding and paper from the plate, which has passed from between the rollers.

An important feature of this invention is that which dispenses with the usual preparatory damping of the paper to be printed. When paper is damp it is difficult to register the sheets properly on the plate, as they

vary in size to a considerable extent and are more or less distorted. The engraved plate *y* is confined to the plate B by simple pins, as shown in Fig. 5, so that it can be removed at pleasure.

After the inking of the engraved plate, we place perfectly dry paper on the same, and on the paper we place a damp pad, 2, of felt or other equivalent absorbent material, the pad being large enough to overhang the edges of the engraved plate. A quadrangular frame, 3, of thin metal is then placed over the pad so as to depress its edges to the face of the plate B, and so confine it to the engraved plate that it cannot be displaced by the action of the upper roller.

While under pressure the moisture of the pad is necessarily transmitted to the paper, and this so efficiently that quite as good an impression is made as though the paper had been subjected to the usual preliminary damping.

This improved press, although especially intended for printing from engraved plates, is applicable as well, it will be evident, to typographic and lithographic printing.

What is claimed is—

1. A printing-press in which a number of plates are caused to traverse a continuous path and beneath a platen, or its equivalent, substantially as described.

2. The combination with the above of the belt-shifter, lever *q*, rod *t* and its stud *u*, or equivalent mechanism, whereby the traversing-plates are rendered the means of arresting their own motion.

3. The combination of a stationary bed, D, having annular, or partly annular and partly straight, ways and grooves, with a revolving rack A, and plates B, adapted to the grooves and to the rack, as herein set forth.

4. The process of printing from an engraved plate by the application thereto of a sheet of dry paper, and above the latter a sheet of absorbent material from which moisture is transmitted to the paper on the application of pressure, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEO. C. HOWARD.
AMANDA J. DAINTY,
Administratrix.

Witnesses:

CHAS. H. LUNGREN,
ANNA E. DAINTY.