M. S. Beach. Sheet 1. 2 Sheets.

Printing Press.

No. 24982. Patented Aug. 9. 1859.

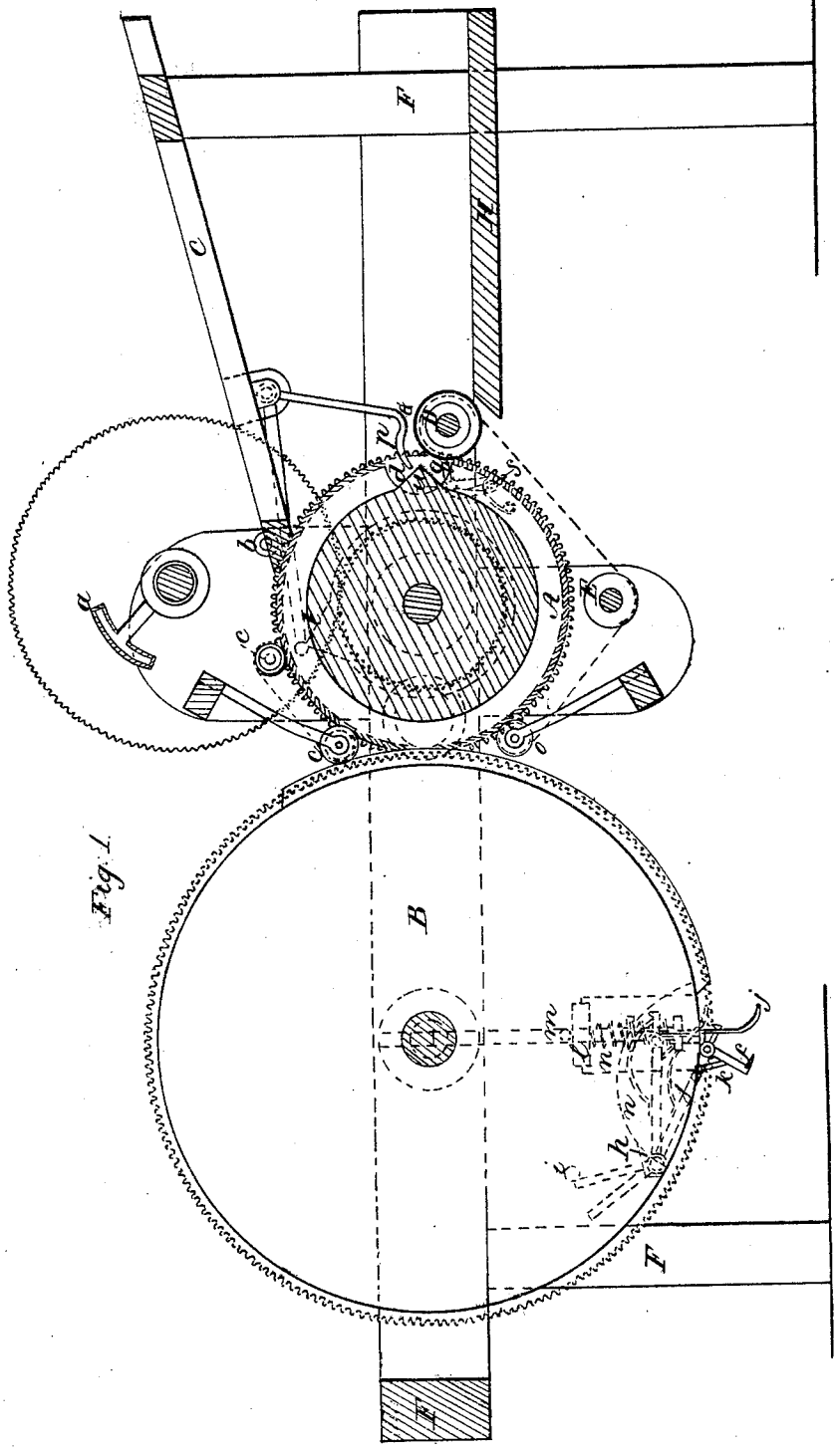


Fig. 1.

M. S. Beach. Sheet 2. 2 Sheets.

Printing Press.

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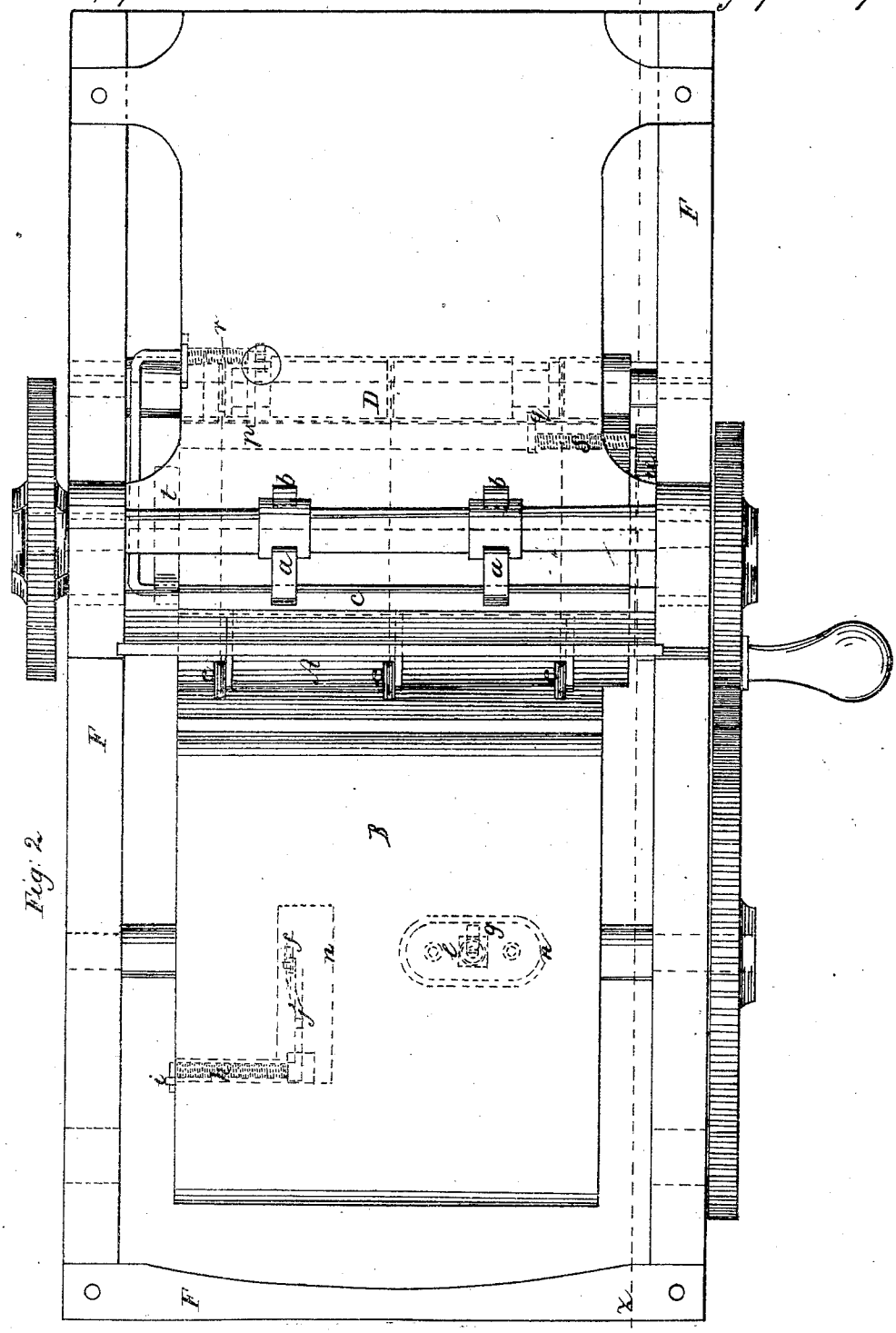


Fig. 2.

UNITED STATES PATENT OFFICE.

MOSES S. BEACH, OF BROOKLYN, N. Y.

MACHINERY TO FEED SHEETS OF PAPER TO PRINTING-PRESSES.

Specification of Letters Patent No. 24,982, dated August 9, 1859.

To all whom it may concern:

Be it known that I, MOSES S. BEACH, of the city of Brooklyn, county of Kings, and State of New York, have invented certain Improvements in Printing-Presses; and I do hereby declare that the following is a full and exact description thereof.

My invention relates to an improved mode of feeding sheets to the impression cylinders of Napier and type-revolving printing presses also to an improved mode of retaining them against the surface of such cylinders, and of detaching them therefrom.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation, reference being had to the drawings which accompany this specification.

In these drawings, Figure 1 is a side, sectional elevation, of my improvement and Fig. 2 a plan view thereof.

In these figures A, represents the impression cylinder of the printing press; B, the type drum, with the type thereon in type revolving presses, and the position of the types as they come in contact with the impression cylinder in Napier or other flat-bed cylinder printing presses.

C is the feed board on which sheets are placed before printing, and the direction from which sheets are fed to the impression cylinder from mechanical feeders; D and E the usual tape or string rollers, the tapes or strings, shown by blue lines in connection with them, serving in part to guide and keep the sheet against the impression cylinder while being operated upon.

G is the point whence the printed sheets leave the press, below which, a flyboard to receive them is represented by H on Fig. 1, but not in the other figure.

F is the frame of the machine.

Fig. 1 is a sectional view, through the red line Z Z of Fig. 2, and Fig. 2, is a plan of the machine, showing a vertical view of the invention. In these two figures, *a*, is a series of revolving scrapers, geared to make revolutions corresponding to the movements of the type, which is here shown as one revolution to two revolutions of the impression cylinder A. *b*, is a series of rollers fixed to the feed board, upon which the scrapers *a*, press as they pass, causing them to revolve. *c*, is a roller pressing upon the impression cylinder A. *d*, is the usual opening left in impression cylinders as a space for fingers and to adjust blankets.

The parts thus far described form my improvement in feeding sheets to the impression cylinder, the operation being as follows: A sheet being laid upon the feed board, at a point to be determined by the printer as the most desirable one, but covering the series of rollers *b*, the scrapers *a*, in passing over these rollers, push or drag the sheet and bring its foremost end under the roller *c*. This last point is attained just as the opening *d*, in the impression cylinder is passing under the roller *c*, thus leaving the necessary space for the sheet. When the cylinder has moved so far that the opening *d* has passed the roller *c* and the roller is again pressing upon the cylinder, the foremost end of the sheet is caught by the pressure. At the same instant the scrapers *a* have left their contact with the rollers *b*, and the sheet, released at that point, is drawn into the press to be printed, by the continued pressure of roller *c* upon the cylinder, being supported nearly to the point of contact with the type, by the tapes or strings passing over roller *c* and the pulleys *e*.

The next operation is retaining the sheet against the impression cylinder while it is being printed, and preventing its adherance to the type after the printing is accomplished. This is done in two ways, both of which are shown in Figs. 1 and 2, where *f* is one of the holders, and *g*, is the other, both of them moving with the type, a little in advance of which they are placed. *f*, is hinged upon an arm, the shaft of which at *h*, is provided with a spiral spring, throwing the arm outward from the center of the type drum, a pin being placed at *i* which, by means of a stop arm, prevents its being thrown too far outward. *f* is thrown back on its hinge, by the spring *j*, against the stop *k*, which branches from the arm. The other holder *g* consists of a hook ended spring, the proper position of which, when not in use, is thrown back like the holder *f*, but which is here shown as straight, that it may the more easily be observed. It is fastened to the end of a rod, which, passing through the slide *l*, is projected by a spiral spring until its further progress outward is prevented by a stop-pin at *m*. The holder *g*, thus has a forward and backward motion by itself, and an inward and outward move-

ment by means of the spiral spring described. This operation is described as follows; As the type are about to come in contact with the paper, the holders, extending out beyond the type, meet the cylinder A, while the formost end of the sheet of paper is under the pulleys *e*. They thus receive the sheet, as it were, from the pulleys, by pressing it against the cylinder A, and, continuing in that position, are themselves pressed into the recesses *n*, provided for that purpose in the type drum, B, the holder *f*, at this time appearing as shown by the red lines, and the holder *g* as shown by the blue lines in Fig. 1. When the holders first reached the paper and impression cylinder, their outer ends or heads were thrown back, while, it will be observed, that at the moment of taking the impression their shanks stand in the line of a radius of the type drum, and of an extended radius of the impression cylinder. This change is caused by the heads of the holders retaining position upon the impression cylinder A, without slipping, and is permitted by the flexibility of the spring of which the holder *g* is made, and of the spring *j*, connected with the holder *f*. As the motion of the type drum and impression cylinder continues, the two holders are again thrown out beyond the surface of the type, but now their heads or outer ends bend or incline forward instead of backward. As the holders continue to press the foremost end of the paper against the impression cylinder, they at last deliver it under the pulleys *o*, and from that point until its delivery from the machine it is supported by the tapes or strings and the roller D. As soon as the holders *f* and *g* leave contact with the cylinder, and are thus free to their own motions, they assume their original positions of leaning backward, and are then ready to renew the operation. To secure greater efficiency and entirely prevent their slipping out of position I arm the heads of the holders *f* and *g* with small points, as shown in the drawing, and these effectually secure the foremost end of the paper against the impression cylinder, while it is passing from the pulleys *e* to the pulleys *o*.

The next operation is the delivery of the sheet from the cylinder after the printing is completed. This also is accomplished in two ways both of which are shown in Figs. 1 and 2 in which *p*, and *q*, serve as deflectors, *p*, being fixed to the feed board and therefore stationary, while *q* is fixed to the impression cylinder and revolves with it. Both these deflectors are mounted upon arms reaching to shafts *r*, and *s*, which are provided with spiral springs. Their movements are effected by cam arms reaching from their respective shafts,—that of deflector *p*, resting upon the cam *t*, (shown in Fig. 1 by dotted lines,) which moved with the impression cylinder, and that of deflector *q* resting upon the cam *u* which is fixed to the frame F and is stationary. This last operation is as follows: The cam arms of the deflectors *p*, and *q*, coming in contact with the cams at the moment when the paper is to be delivered, the point of the deflector *p* is thrown into the opening *d*, in the impression cylinder and, catching under the foremost end of the sheet, sheers or guides it out over the roller D, while it is itself withdrawn by means of its spiral spring, in season to prevent its catching against the lower side of the opening. Deflector *q*, is, nearly at the same instant, and by a similar operation upon its cam arm, thrown out from the impression cylinder, and its point being under the foremost end of the sheet, pushes it out and over the roller D, thus producing the same effect as deflector *p*.

By means of my invention I am enabled to dispense with the use of fingers or grippers and the excessively quick motions by which they are operated. I also dispense with tapes passing entirely around the impression cylinder for the purpose of throwing out the sheet when printed.

Revolving arms or scrapers in feeding sheets are no novelty, but the roller which I use in connection with them are new, and my experience proves them to be indispensable in the successful use of the scrapers for any considerable length of time; the scrapers ceasing to operate perfectly, at an considerable speed, when rubbing over a stationary surface.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. Feeding sheets to the impression cylinders of printing presses, by means of revolving arms or scrapers *a*, operating in combination with rollers *b*, in the manner substantially as described.

2. Retaining the paper in connection with the impression cylinders of printing presses during the process of printing by means of holders *f*, and *g*, in the manner substantially as described.

3. Detaching the paper from impression cylinders by means of deflectors *p*, and *q*, operating substantially as described.

M. S. BEACH.

In presence of—
JAMES G. COOPER,
I. J. HALLINDER.