

N^o 16311.

Patented Dec. 23. 1856.

M. S. Beach. Sheets 2 & 5.
Paper Feeding Mach.

N^o 16311.

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Fig. 4.

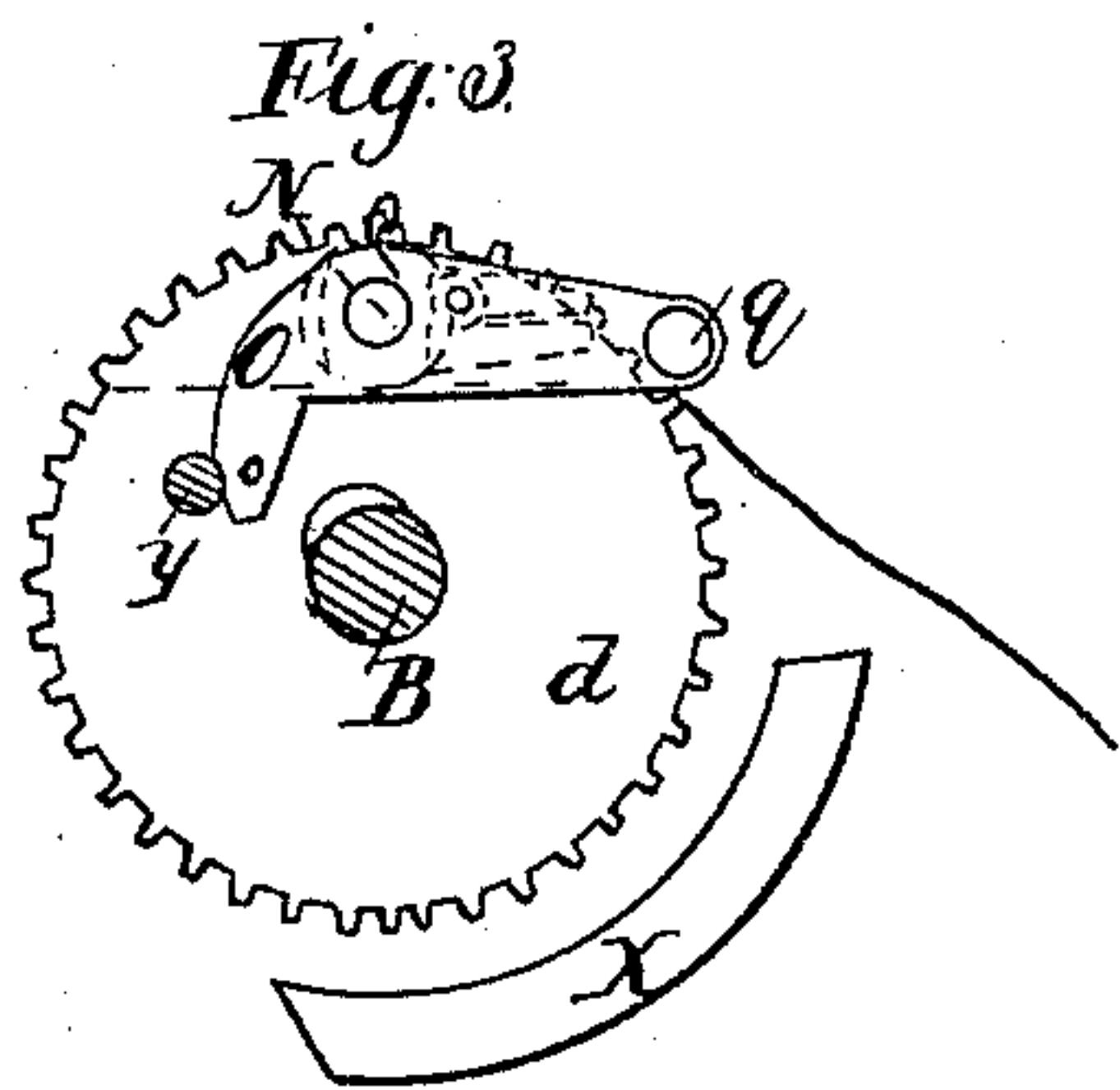
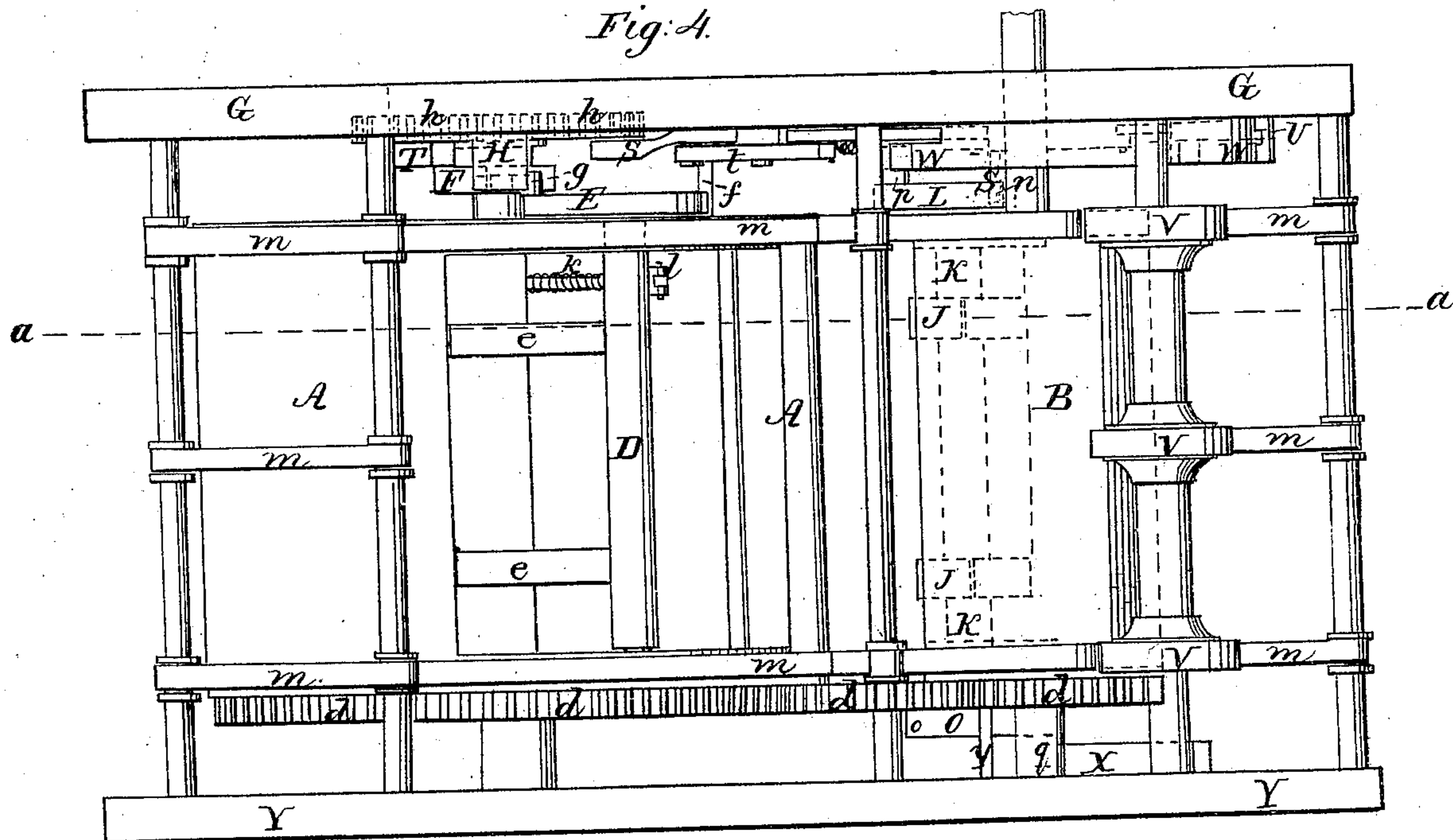
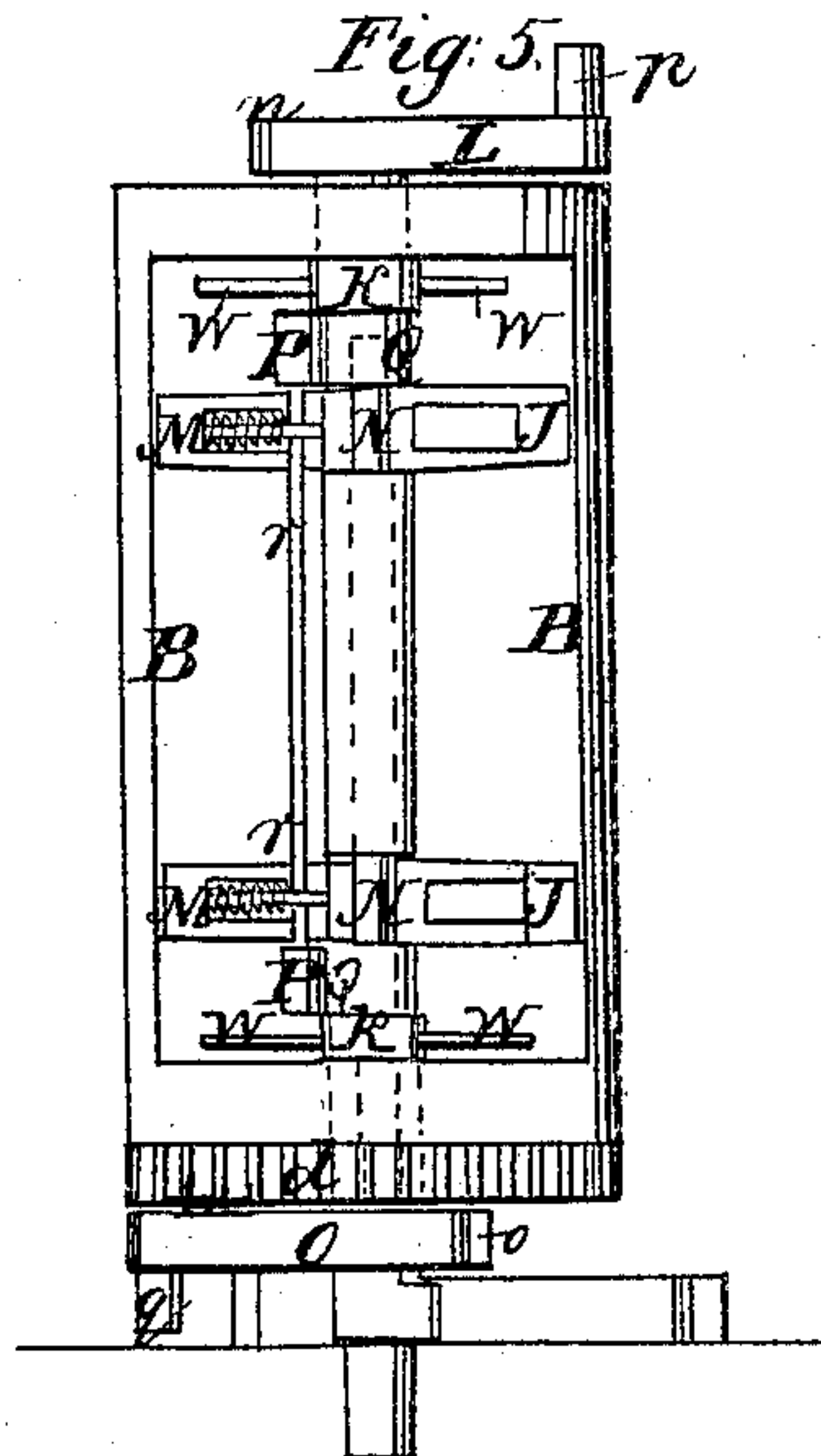


Fig. 5.



UNITED STATES PATENT OFFICE.

MOSES S. BEACH, OF BROOKLYN, NEW YORK.

MACHINE FOR FEEDING PAPER TO PRINTING-PRESSES.

Specification of Letters Patent No. 16,311, dated December 23, 1856.

To all whom it may concern:

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

My invention consists in providing an extra or second cylinder, which is furnished with fingers for seizing the sheet, and in placing said extra or second cylinder behind or at any other convenient point in proximity to the impression cylinder, the arrangement being such that the sheet will be drawn around the circumference of the second or extra cylinder and delivered to the impression cylinder to receive a second impression.

My invention further consists in the peculiar construction of the fingers for seizing the sheet.

In a previous application for a patent made by me the impression cylinder is provided with a set of fingers which seize the sheet after or during the printing of its first side and cause it to be again carried around the impression cylinder to receive a second impression, the sheet being thus printed upon both sides before leaving the press; but it is necessary that the impression cylinder should be of a circumference adapted expressly to the size of the sheet to be printed.

My present improvement permits the use of paper of different sizes, simply by changing the distance at which the extra or second cylinder, or its equivalent, is placed from the impression cylinder.

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 annexed drawings, forming a part of this specification, in which—

Figure 1, represents a vertical section of the two cylinders and their appliances, through the blue line *a, a*, in Fig. 4. Fig. 2, is the same vertical section of the extra or second cylinder with the working parts attached. Fig. 3, is the right or rear end of the same extra or second cylinder with its gearing wheel attached—the finger motion projecting through said wheel as shown. Fig. 4, is a vertical or plan view of both cylinders and their appliances. Fig. 5, is a

vertical view of the extra or second cylinder, showing the construction of the improved fingers.

In these several figures, A is the impression cylinder of the printing press, and its point of contact with the form of types, if it be a type-revolving press, is represented by the red lines *b*, and if it be a Napier or other flat-bed printing press, by the red lines *c*. B is a second or extra cylinder placed behind and geared to run with the impression cylinder A, by the cog wheels *d*.

C is the feed board of the impression cylinder, the blue lines upon it indicating sheets of paper ready for use. A reel of paper with an apparatus for cutting off sheets as needed may, however, be substituted for the feed board and pile of sheets, if desired.

D is the finger shaft of the impression cylinder, and *e* are the fingers connected with it. E is a crank also connected with the finger shaft D, one end of which, *f*, forms a tripping point, while on the opposite end is placed a button or spindle *g*.

F is a double cam placed upon and extending nearly across the diameter of cog wheel *h*. This cog wheel is sunk into the side frame G, and receives its motion from cog wheel *i*, which is connected with the main shaft of the impression cylinder A.

H is a stationary slot attached to side frame G.

A shelf or support *j*, for the spiral spring *k*, is fixed on the inside of the impression cylinder A. This spring acting upon the crank *l*, serves to keep the fingers open or closed when those positions have been given them, as indicated by the black and red lines in Fig. 1.

The operation of the impression cylinder with its fingers as shown in Fig. 1, is as follows:—A sheet having been taken from the pile and laid at the proper point, the revolution of the cylinder brings the button *g*, of the finger shaft crank E in contact with the cam F (shown in first position Fig. 4), by which it is thrown up into the stationary slot H, and the continued motion of the cylinder impels it upward in the slot until the finger crank shaft D, has passed the mouth of the slot, after which it descends. This motion of the button *g*, being accompanied by a corresponding motion of the fingers *e*, the ends of them catch upon the sheet of paper in the manner indicated in

the second position shown by red lines in Fig. 1. The cylinder A, having made about one-half of one revolution while the fingers *e* are pressed upon the paper by the spring *k*, (thus drawing the paper from the pile and around the cylinder) the tripping point *f*, catches against the tripping pin I, which is fixed to the frame G, and being pressed against it by the continued revolution of the cylinder the fingers *e* are forced open and finally thrown back allowing the paper to be carried off between the endless tapes *m*, between which it is now held, to the second or extra cylinder B.

The second or extra cylinder B is provided with twin fingers, twin finger-shafts and twin cranks. The twin fingers J are connected with the outer twin shaft K, and that with the twin crank L, while the twin fingers M are connected with the inner twin shaft N, and that with the twin crank O. Each of these finger shaft cranks is provided with tripping points *n* and *o*, and crank buttons or spindles *p* and *q*. The twin fingers M, are also provided with cam rollers P, acted upon by spiral springs bearing upon the shaft *r*, which connects them. These rollers by their action upon the cams Q, which are cut into finger shaft K, serve to maintain the twin fingers opened wide apart or close-hugged together, whichever of these positions is given them. The fingers thus revolve unobstructed with the cylinder B, while opened wide apart. They move in this way, while the sheet which comes from the impression cylinder as above described is passing under the cylinder B and out loose behind it but, when the last or tail end of the sheet presents itself in thus passing, the tripping point *n* by coming in contact with its tripping pin *s* throws over crank L and with it the twin fingers J. The paper is thus caught and held between the two pairs of twin fingers as seen in Fig. 2. The tripping pin *s* by which this motion is effected, is placed upon a rocking plate R, centered at *x*, and is brought into position for use by the lever S, connected at one end with the rocking plate R, and acted upon at the other end by the cam T on cog wheel *h*. *t* is a counter lever with spiral spring which serves to bring back the lever S and rock plate R when the cam T has ceased to act. This last motion brings the tripping pin *s* close to the shaft of the cylinder B and out of the reach of the tripping point *n*. Connected by a link with the rock plate R is a side plate U in which is cut a double slot *u*, *v*, to receive and guide the button *p*. The slide plate U is guided in its motion back and forth by the shields or guide pieces W, which also serve as guides to the button *p* before it enters and after it leaves the double slot *u*, *v*. A similar shield X is provided on the other side frame

Y for crank button *q*, and for tripping point *o* a tipping pin *y* is provided and fixed upon the side frame Y.

When the tail end of the sheet has been caught by the twin fingers as already described, the button *p*, enters the slot *u* which, by the motion of the rock plate R, is now brought forward. Having entered this slot and been impelled to its extremity while the twin finger shafts K and N are passing the slide plate U the continued motion of the cylinder B causes the button to return by the opposite branch of the slot *v*, to the position indicated by the dotted lines in Fig. 2. The wire springs *w* by pressing slightly upon the under side of the finger shaft K, prevent the crank button *p* from falling into and catching in the slot *u*, by the weight of the two pairs of twin fingers, instead of returning, as it should do, through the slot *v*. By the motion here described it will be seen that the tail end of the sheet held fast by the twin fingers J and M is brought back and carried between the tapes on the upper side of the cylinder B. The tripping point *o* connected with crank O and twin fingers M now comes in contact with its tripping pin *y*, as shown in Fig. 3, and the fingers M are thus thrown open leaving the sheet at liberty to follow the tapes. The twin fingers now occupy the position represented in Fig. 5, and so revolve with cylinder B until the tail end of a new sheet is presented for their action. At this point the rollers V by pressing upon the paper as it passes over the cylinder B, prevent it from slipping and insures its return under the feed board to the cylinder A, where it is seized by the fingers *e* in the same way and by the same operation as that first described for seizing the head or first end of the sheet. The tail end of the sheet now passes first around the impression cylinder, the head end following it. The second side of the paper is thus presented to the types and the sheet thus printed on both sides leaves both cylinders and passes off to the flying machine or to the fly boards. If a flying machine is used, however, it is necessary temporarily to separate the tapes which convey the sheet to it, by cam or wedge motion or by any convenient contrivance so as to allow the sheet to be returned for the second impression without obstruction.

This invention may be used in a modified form by placing the second cylinder, provided with single instead of twin fingers, (or some other contrivance to effect the same purpose,) at the end of the fly-board in such a way as that the back or tail end of the sheet will be thrown by the fly machine in a position to be secured and drawn off the board by the fingers on the second cylinder and so returned to the impression cylinder to receive the second impression after which

it would pass off from the machine entirely.

If an opportunity is desirable to permit the whole or partial drying of the ink between the first and second impression, the
5 sheet may be diverted from the course described in this as well as in my former application, and conveyed around cylinders either heated or cold or through air by tapes, and afterward returned to the impression
10 cylinder.

What I claim as my invention, and desire to secure by Letters Patent, is.

1. Turning the sheet and delivering it to the impression cylinder for a second impression by means of an extra or second cylinder, or its equivalent, substantially as described. 15

2. I also claim the arrangement and construction of the twin fingers J, M, operating substantially as described.

M. S. BEACH.

Witnesses:

JAMES G. COOPER,
J. HOLLENDEN.