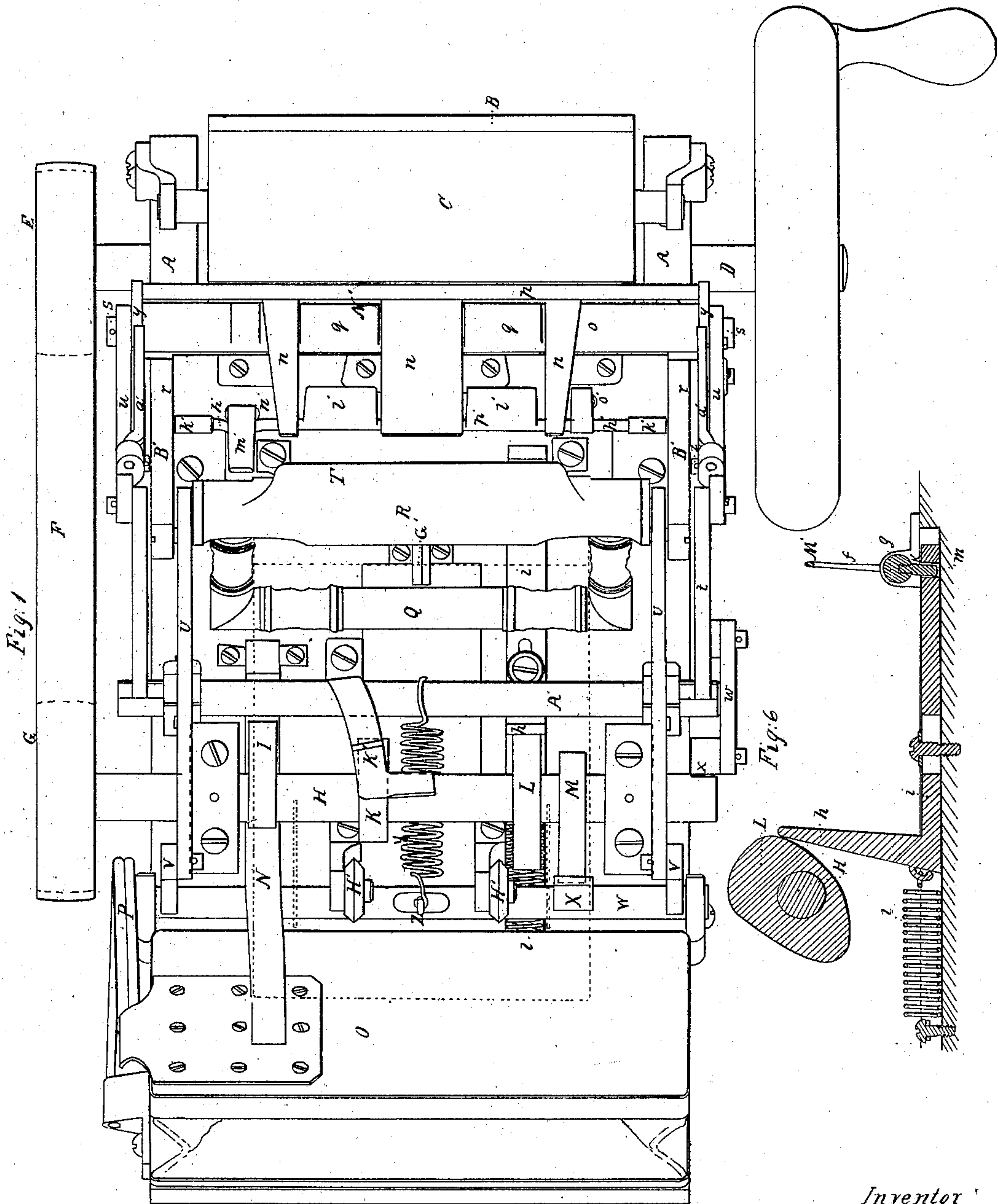


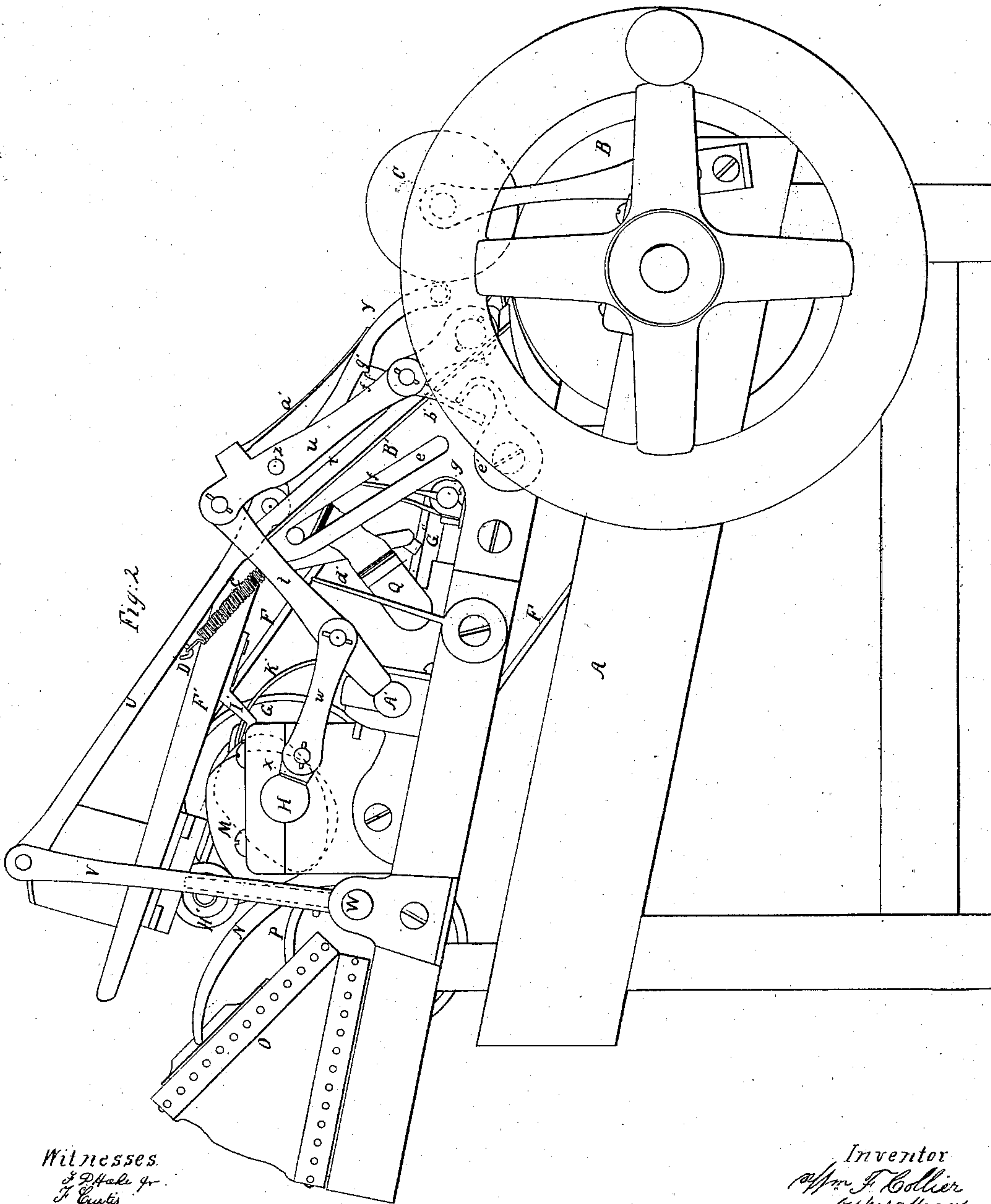
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MACHINE FOR FEEDING PAPER TO PRINTING PRESSES.
No. 11,188. Patented June 27, 1854.



Witnesses
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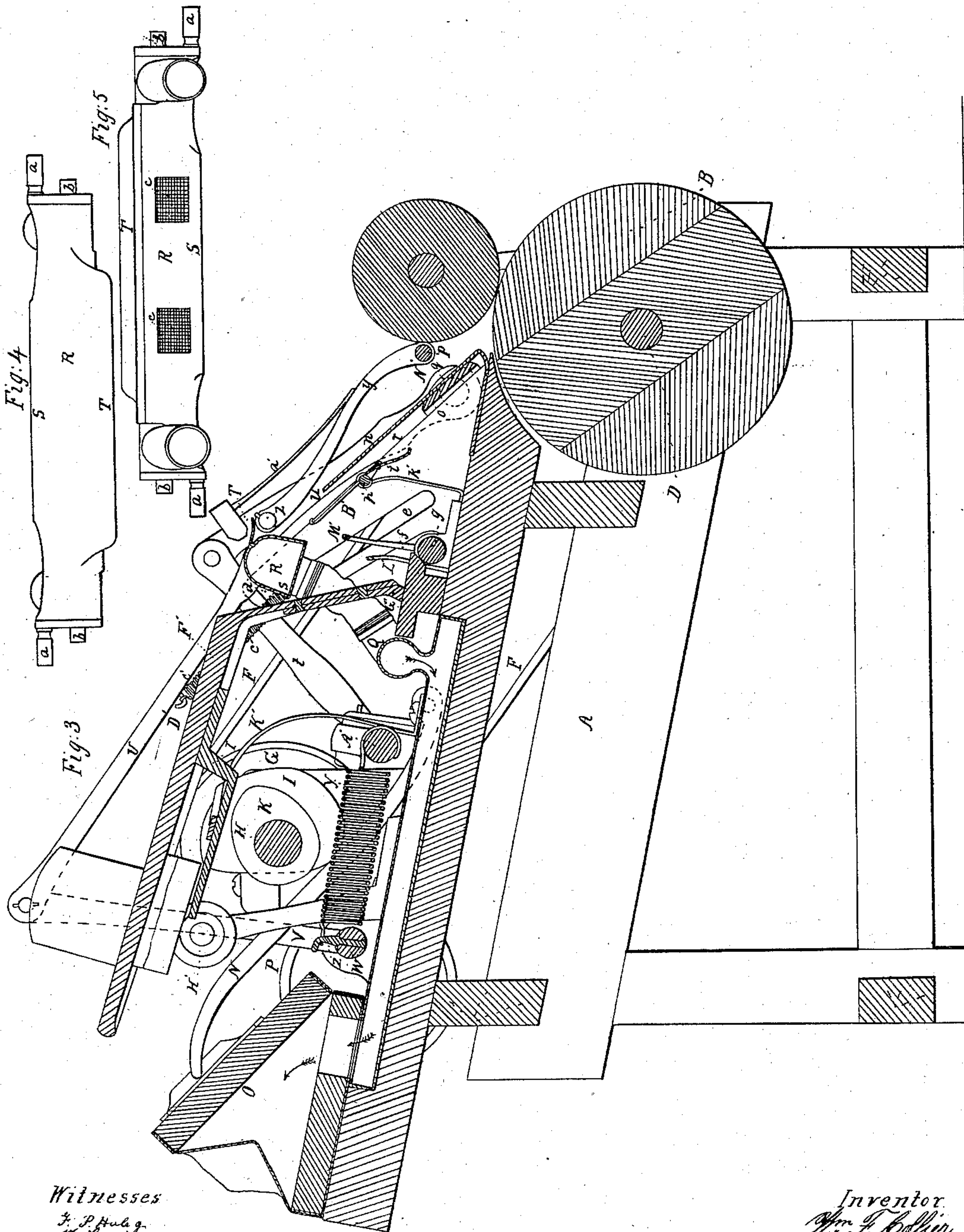


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Witnesses

J. P. Huleg.
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Inventor

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UNITED STATES PATENT OFFICE.

WILLIAM F. COLLIER, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO WM. F. COLLIER
AND JOSEPH BOYDEN.

MACHINE FOR FEEDING PAPER TO PRINTING-PRESSES.

Specification of Letters Patent No. 11,188, dated June 27, 1854.

To all whom it may concern:

Be it known that I, WILLIAM F. COLLIER, of Worcester, in the county of Worcester and State of Massachusetts, have invented a
5 new and useful or improved machine for successively removing sheets of paper from a pile or pack and transferring them to a printing-press or any other machine destined to receive them; and I do hereby declare that the same is fully described and
10 represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

Of the said drawings Figure 1 represents
15 a top view of my machine or invention. Fig. 2 is a side elevation of it. Fig. 3 is a vertical, central and longitudinal section of it.

The table or bed on which the sheets are
20 laid is exhibited in Fig. 1 by red lines, the same being in order to represent the cam shaft and mechanism situated immediately underneath said table.

In the drawings, A, represents the main
25 framework for supporting the operative parts of the machine; B, and, C, may be supposed to exhibit the pressing rollers of an ordinary cylinder printing press. Upon one end of the shaft, D, of the lower or
30 type roller, B, there is placed a pulley, E, around which and another pulley, G, fixed on a cam shaft, H, an endless belt, F, is carried, motion being imparted, by such endless belt and pulleys, from one shaft to the other.
35 The said cam shaft, H, is provided with four cams, I, K, L, M, arranged on the shaft as seen in Fig. 1. The cam, I, operates against a lever, N, and so as to force down at such times as may be necessary the upper or
40 movable board of an exhausting bellows, O, said board being elevated by means of a spring, P. These bellows by means of a pipe, Q, made flexible whenever necessary are made to communicate with what I term
45 a sheet lifter, R. This sheet lifter is a hollow box provided with two journals, a, b, at each end of it as seen in top view in Fig. 1. The bottom part of this box is made flat, and has one or more openings, c, c, as seen
50 in Fig. 5, (which is an underside view of the box,) such openings being provided with wire gauze inserted in them. The rear side, d, of the box makes with the bottom a straight edge or bar as seen at, S, the purpose of which will be hereinafter explained. There is also applied to the top of said box

and so as to project from it as seen in the drawings a plate or wing, T, the office of which will be hereinafter properly explained.

Each of the journals, b, b, of the sheet
60 lifter, R, is made to extend through and so as to freely rotate in one end of one of two connecting rods, U, U, which are respectively jointed at their other ends to two arms V, V, made to extend upward from a rocker shaft, W, disposed between the bellows, and the
65 cam shaft, H, as seen in the drawings. From this rocker shaft, W, an arm, X, extends upward and rests against the periphery of the cam, M, so that during the revolution of the cam shaft, the said cam will be made to move the arm, X, backward and
70 of course produce a partial rotation of the rocker shaft in one direction, it being moved in the reverse direction by means of a helical spring, Y, one end of which is fastened to a short arm, Z, projecting upward from the rocker shaft W, while the other end of the
75 said spring is connected to another rocker shaft, A', arranged as seen in the drawings. 80

Each of the other two journals, viz, a, a, of the sheet lifter is made to pass into one of two inclined slots, e, e, see Figs. 2 and 3, such slots being respectively formed in stationary metallic plates or standards B', B'.
85 To each of these journals, a, a, there is also attached one end of one of two helical springs, C', C', the other end of the said spring being fastened to a hook or staple D', extended from one of the connecting
90 rods, V, V, as seen in the drawings. The object of these springs is to draw and hold the journals, a, a, up against the upper ends of their slots, e, e, for a short period of time while the connecting rods are drawn backward and the straight ends, S, is in contact with the pile of paper. Such a movement
95 of the connecting rods, while the edge, S, is in contact with the pile causes a partial rotation of the sheet lifter, during which time the exhausting board of the bellows is raised so as to exhaust the air from the sheet lifter and cause it to draw toward it or hold
100 against it by the pressure of the atmosphere the sheet of paper against which it rests, and to lift from the pile that part of the sheet of paper which extends below the lifter. 105

When a pack of paper is placed upon the bent table, F, it is so laid thereon that while
110 it shall repose on the top surface of the table, it shall extend down the inclined parts,

(which rest on the rails, G,) and come directly between such inclined parts and the straight bar or edge, S, of the air exhausting apparatus. The straight bar or edge, S, combined with the exhausting box is thus made to press against the pack of paper while the exhausting apparatus is in the act of lifting from the pack, the sheet or that part of the sheet which extends below said straight edge, the remainder of the sheet being held firmly in position by the pressure of the straight edge S, against the pack. By the employment of the straight edge in this way we cause the exhausting box to roll the edge against the pack, on the angular table, F'. This angular bed or table consists of a carriage supported in an inclined position upon a slide rail, G', and upon two rollers, H', H', the weight of the carriage and its inclined position being sufficient to cause the carriage to move up toward the sheet lifter when not prevented by means to be described.

There is combined with the sliding or movable table such means or mechanism, which is not only for the purpose of permitting it to fall or move forward toward the sheet lifter, while the upper sheet of the pile is raised above the lifter as will be hereinafter described, but also to hold the table firmly in position while the sheet lifter is being moved away from the pile in order to enable the sheet of paper to be raised upward over the lifter and into the transferer. This last mentioned mechanism consists in part of a bent bar, I', fixed to the underside of the table and extended therefrom as seen in Fig. 3. On this bent bar one end of a spring brake, K', is made to bear and so that when it presses on the bar it may do so with sufficient force to overcome the tendency of the table to move forward. This spring brake is raised off the bar by means of the cam, K, which is formed so as to elevate it at a proper time. It will readily be seen that as the upward movement of the straight edge, S, of the sheet lifter terminates always at a given position; the table on which the pack of paper is laid must be allowed to move forward a short space equal to the distance of the thickness of a sheet of paper after each sheet is raised from the pack. This is effected by the gravitating power of the table and the mechanism just described. When the front part of a sheet of paper is raised from the pack by the action of the sheet lifter and the air exhausting apparatus its front or lower edge is thrust or carried against a horizontal rod, bar, or stand, L', arranged directly under the lifter as seen in Fig. 3, the object of such bar being to shake or produce such a concussion of the sheet, that should, by accident two sheets be lifted up together their adhesion may be so disturbed that the lower

one may separate from the upper and fall back upon the pack. This bar may be made stationary as seen in the drawings, or it may have a vibrating or other movement if necessary to enable it to perform its office.

The next part of the mechanism to be described is what I term the sheet elevator, M', its object being to pass under the sheet of paper after it has been raised from the pack by the sheet lifter, the paper resting on it while the sheet lifter is being moved downward. This sheet elevator consists of a straight bar supported upon arms, f, f, that extend upward from a rocker shaft, g, arranged as seen in Fig. 3. In Fig. 6, I have exhibited a vertical section of the sheet elevator, M', the slide, spring, and cam by which it is operated. The said cam is before represented by the letter, L. It operates against an arm, or stud, h, that projects upward from a slide bar, i, which is so applied to the framework of the machine as to be capable only of an endwise or longitudinal movement either forward or backward and it is moved forward by the cam L, and backward by a spring, l, arranged as seen in the drawings. There is a short arm or stud, k, extended from the rocker shaft, g, and into a slot or hole, m, made throughout the front end of the slide, i. Consequently when the slide, i, is put in motion, it will communicate rotary motion to the rocker shaft which will move the sheet elevator, M'.

After the sheet has been deposited by the sheet lifter upon the top of the sheet elevator, such sheet lifter is made to descend below the level of the top of the sheet elevator and to remain stationary for a short time while the sheet elevator is moved forward toward it and so as to cause the sheet to be deposited upon the top of the sheet lifter R, which is next moved upward to its highest position preparatory to operating upon and lifting the next sheet of paper. Now while the sheet lifter is in such a position and is being rotated so as to lift the second sheet from the pile (which it does by the action of the air exhausting apparatus as hereinbefore described) the projecting wing, lip or plate, T, hereinbefore mentioned as applied to the lifter is moved with the lifter and so as to elevate the sheet entirely above the inclined rests or planes, n, n, n, arranged in rear of the press rollers B, and C, as seen in the drawings. Now during the next forward movement of the wing or plate, T, it deposits the sheet of paper upon the top surfaces of the inclined rests, n, n, n, ready for it to be seized by what I term the transferer. This transferer consists of jaws which grasp the sheet of paper and move it forward and between the press rollers. These jaws are composed of two rods or bars, o, p, one of which, viz,

5 o is arranged directly underneath the inclined rests n, n, n , and is provided with projecting parts as seen at, g, g , that extend up between the rests and above their upper surface. The bar, o , slides freely upon inclined rails or surfaces, r, r , and it is provided with journals, s, s , that are respectively connected with two arms, t, t , by means of connecting rods or bars, u, u , the connections or joints being such as to produce a movement of the bar, o , upward and downward on its rails, when a rocker shaft, A' , is rotated. The arms, t, t , project upward from the rocker shaft, A' , and such rocker shaft has a reciprocating rotary movement imparted to it by means of a connecting rod or link, w , and a crank, x , the said crank being fixed upon one end of the cam shaft H . During every entire revolution of the cam shaft H , there will be produced a reciprocating rectilinear or backward and forward movement of the transferer N' , on its rails r, r . The upper jaw rod, p , of the transferer is affixed to two arms, y, y , that are respectively jointed to the two rods u, u , or turn vertically on pins, z, z , inserted in them as seen in the drawings. There is a spring, a' , applied to each arm, y, y , and to its rod, u , and so as to press upon the arm, y , and close the jaw bar, p , down upon the bar, o , whenever necessary. To one of the rods, u , a lever or trigger catch, b' , is applied and made catch the tail or lower arm of the lever catch, b' , that extends between two stationary studs, d', e' , as seen in Fig. 2. There is a small notch, f' , made in the upper end of the catch, b' , and the arm, y , directly over said trigger catch, is provided with a small projection, g' , to rest in said notch.

40 While the jaws of the transferer are being moved backward underneath the inclined rests or planes, n, n, n , the projection, g' , may be supposed to rest in the notch, f' , and the jaws to be opened apart from one another, they being kept open by the lever catch, b' . When the jaws of the transferer are carried backward from the rests n, n, n , the sheet of paper deposited on these rests will be introduced between these jaws and the lever catch b' , will be carried into contact with the stud or post, d' , and so as to release the upper jaw, p , and enable it to be forced down toward the lower jaw and to cause them to grasp the paper with a firm hold. Next, the transferer will be moved forward toward the press rollers until the lever catch, b' , is made to come in contact with the stud, e' , and to lift the upper jaw p , from off the lower jaw and thereby enable the rollers on seizing the sheet of paper to draw it from between the jaws of the transferer.

65 The next part of the machine to be described is what I term the sheet receder; it

is shown at p' ; it is employed in combination with the inclined rests, n, n, n , and in connection with the mechanism for seizing the sheet and transferring it to the press rollers. The object of this receder is to move each sheet backward to a certain position, should it by accident have been thrown too far forward during the process of lifting it from the pack and depositing it between the jaws of the transferer. Said sheet receder consists of a horizontal shaft, h' , whose journals are supported in stationary bearings, k', k' , having projecting plates, l', l' , extended from it and between the inclined rests, n, n, n , as seen in the drawings. This shaft is so connected with the lower jaw, o , of the transferer, N' , by means of the link m' , and an arm, n' , projecting from said shaft that during the backward movement of the transferer, the shaft, h' , shall be rotated so as to throw the plates l', l' , up against the front edge of the sheet of paper and force the sheet back into a correct position between the jaws of the transferer. The shaft h' , has a spring o' , so applied to it as to produce a reverse rotary motion of the shaft such as will turn the fingers or plates, l', l' , forward below the rests n, n, n , during the first part of the forward movement of the transferer.

I claim—

1. Combining with the table F' , (on which the paper is laid) and the sheet lifter, R , the bar or stand, L' , against which the sheet of paper is driven while being lifted from the back. The object of such bar being to shake the sheet or produce such a concussion thereon, that should two sheets adhere together and be lifted they may be shaken apart, so that while the upper one is further raised upward the lower one may be set free so as to drop back upon the pack.

2. I also claim the combining with the lifter, R , the sheet elevator, M' , by which the sheet of paper is elevated or kept elevated and deposited on the top of said lifter, substantially as specified.

3. I also claim the combining with the rotary lifter, R , the projecting wing, lip, or plate, T , by which the sheet of paper is raised and presented to or upon the inclined planes or rests, n, n, n , of the transferer as specified.

4. I also claim the transferer, N' , in combination with the exhaust lifter, R , and the inclined rails, n, n, n , the same being employed to receive and transfer a sheet of paper from its place of deposit on the rails to the press rollers as specified.

5. I also claim the mode of opening, holding open, and closing the jaws of the transferer, viz, by means of the trigger catch lever, b' , the two stops d', e' , and the springs applied to the upper jaw.

6. I also claim the moveable sheet re-

ceder, p' , in combination with the inclined
rests, n, n, n , and mechanism substantially as
hereinbefore described for elevating a sheet
from the pack and transferring it to the
5 press rollers, substantially as specified.
7. I also claim the combining with the
sliding or movable table on which the pile
or pack of paper is deposited, mechanism
for permitting it not only to fall or move
10 toward the sheet lifter, while the upper sheet
of the pile is raised above the lifter, but to

hold the table firmly in position while the
sheet lifter is being moved away from it or
the pile of paper on it as hereinbefore
stated.

15

In testimony whereof, I have hereunto
set my signature, this twenty-sixth day of
April, A. D. 1854.

WM. F. COLLIER.

Witnesses:

HENRY CHAPIN,
HOMER B. SPRAGUE.