2 Sheets--Sheet 1.

J. T. ASHLEY.

Feeding Paper to Rotary Printing Presses.

No. 144,822. Patented Nov. 25, 1873.

Fig. 1

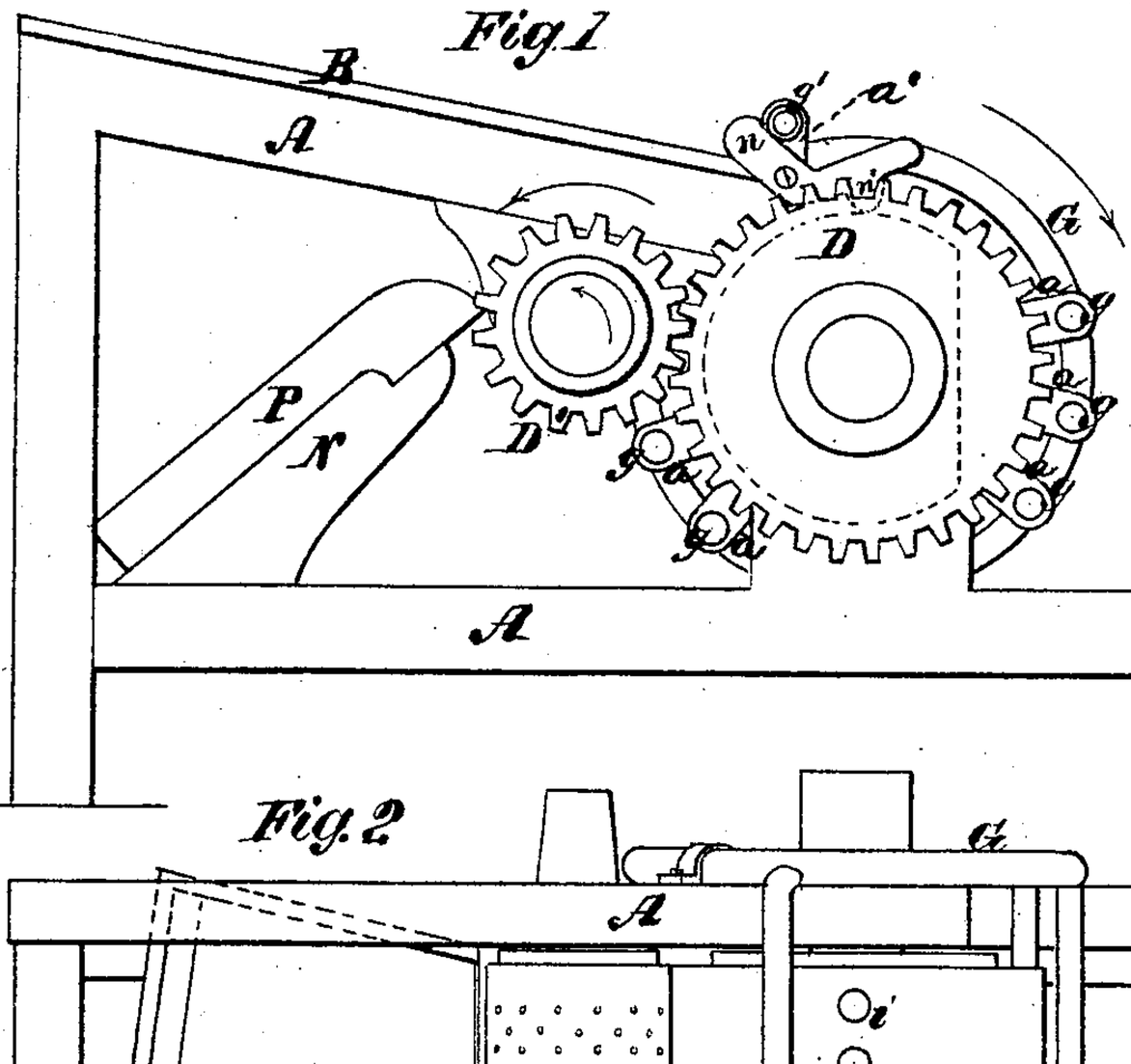


Fig. 2

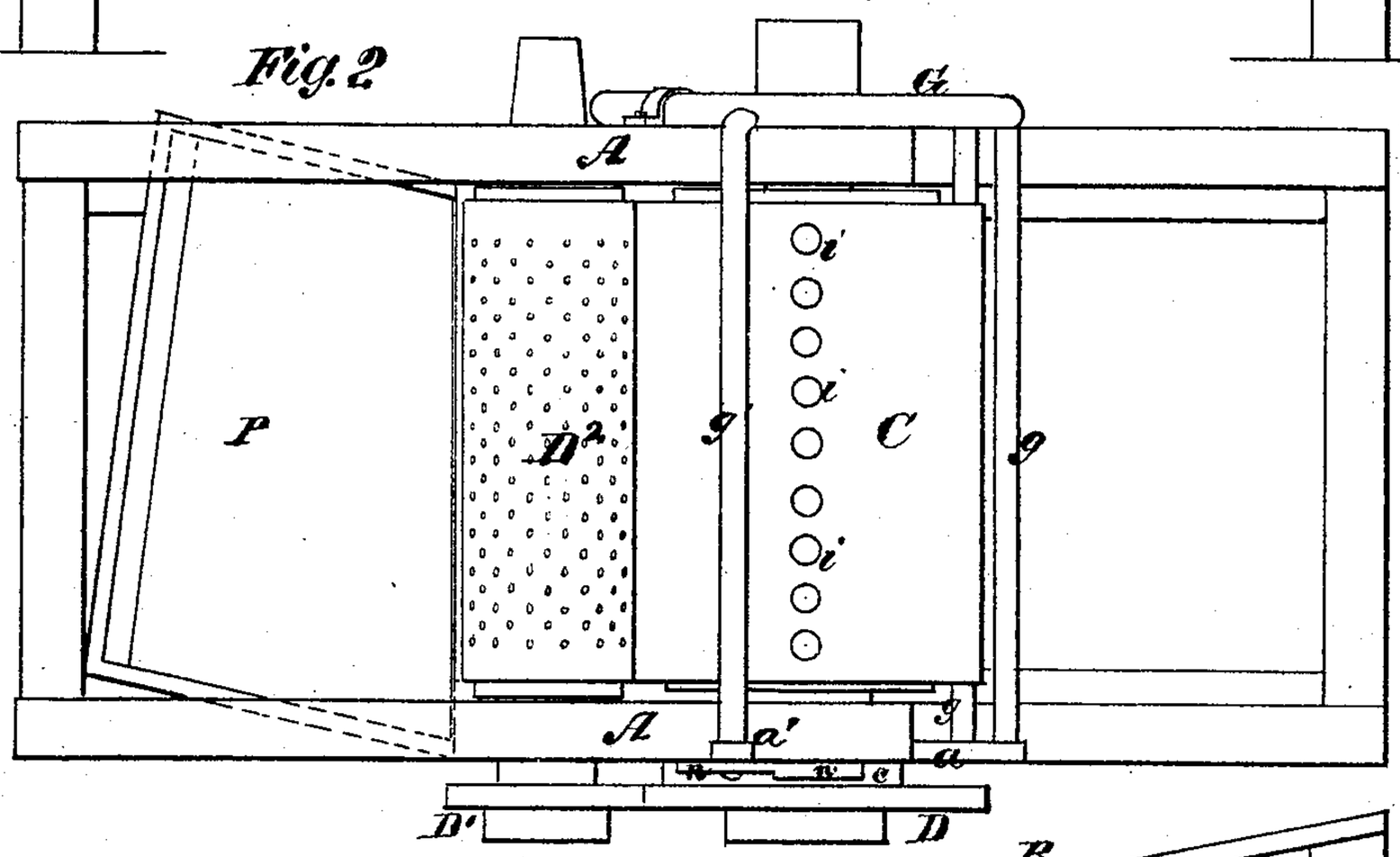
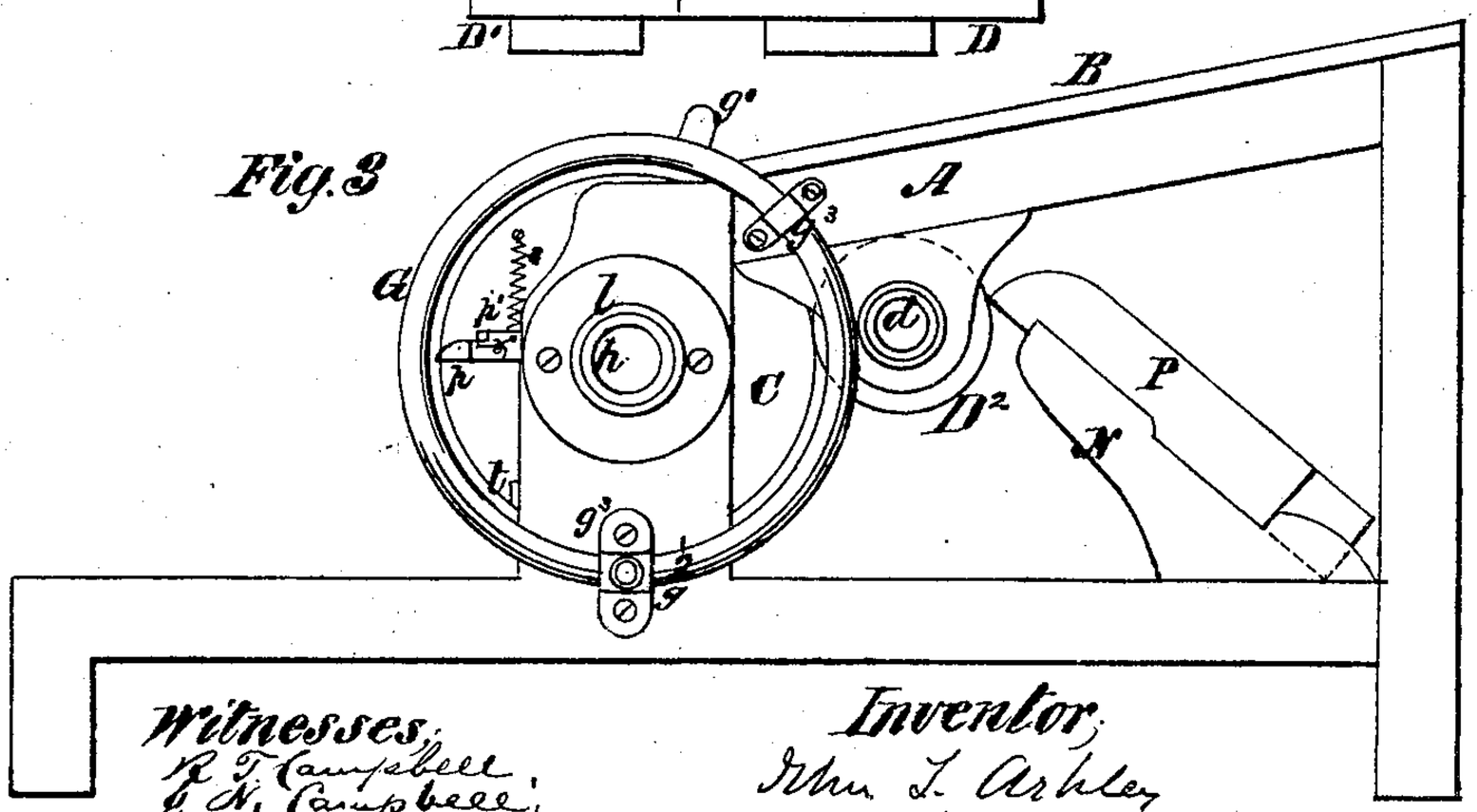


Fig. 3



Witnesses;
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J. N. Campbell;

Inventor;
John T. Ashley
by
Munn, Fenwick & Lamson

2 Sheets--Sheet 2.

J. T. ASHLEY.

Feeding Paper to Rotary Printing Presses.

No. 144,822. Patented Nov. 25, 1873.

Fig. 4

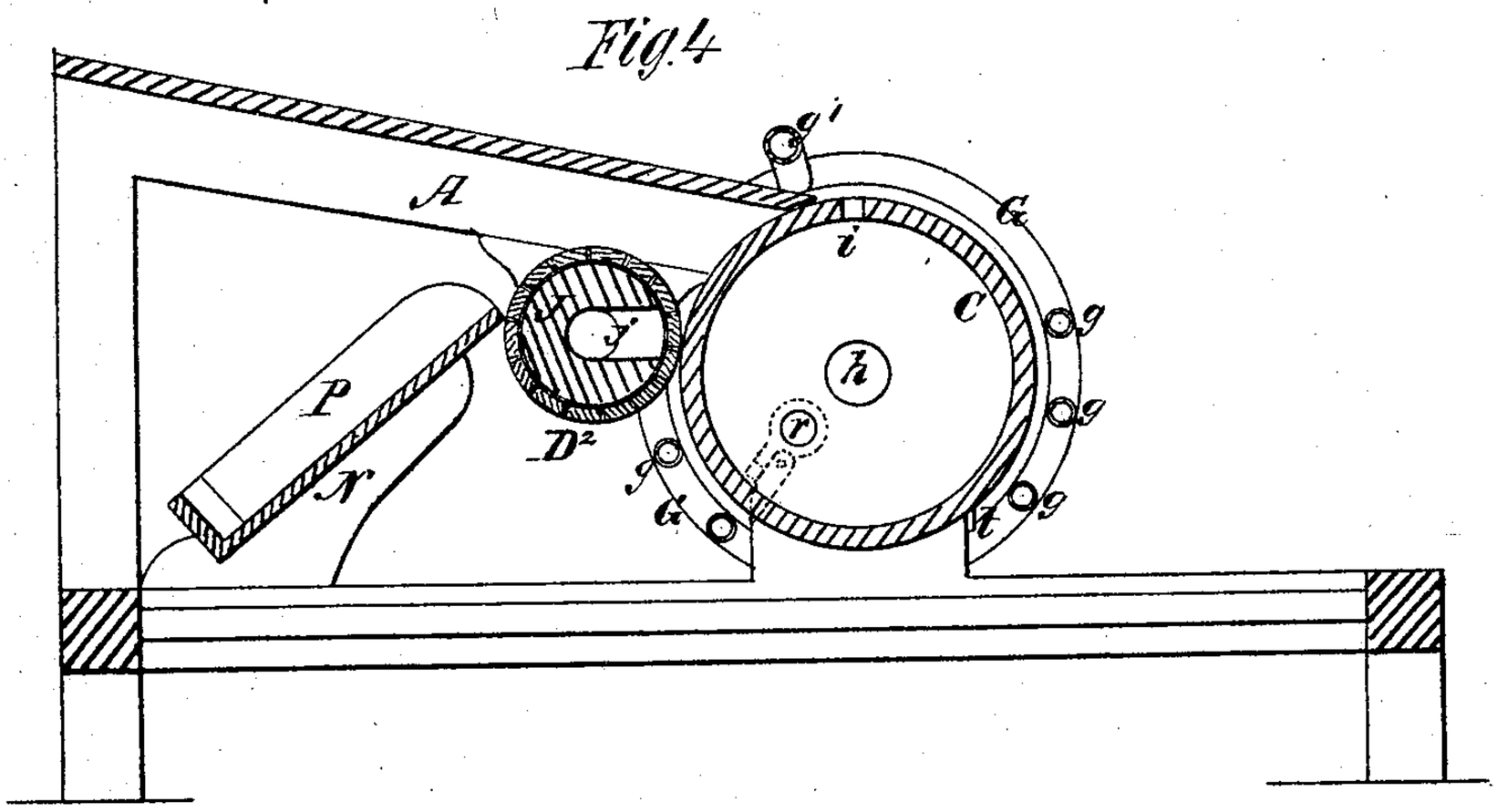


Fig. 5

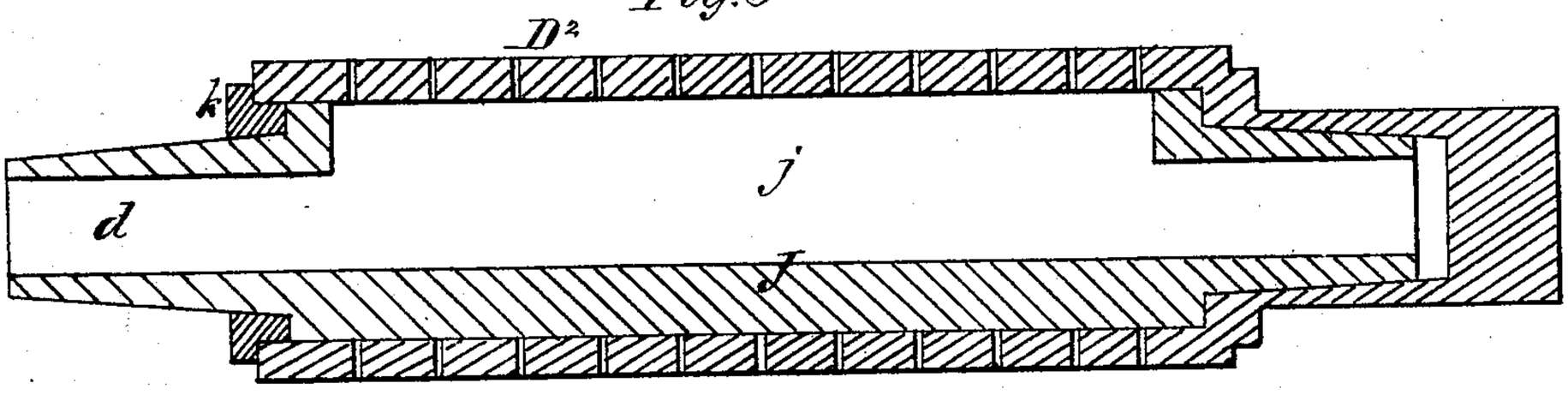
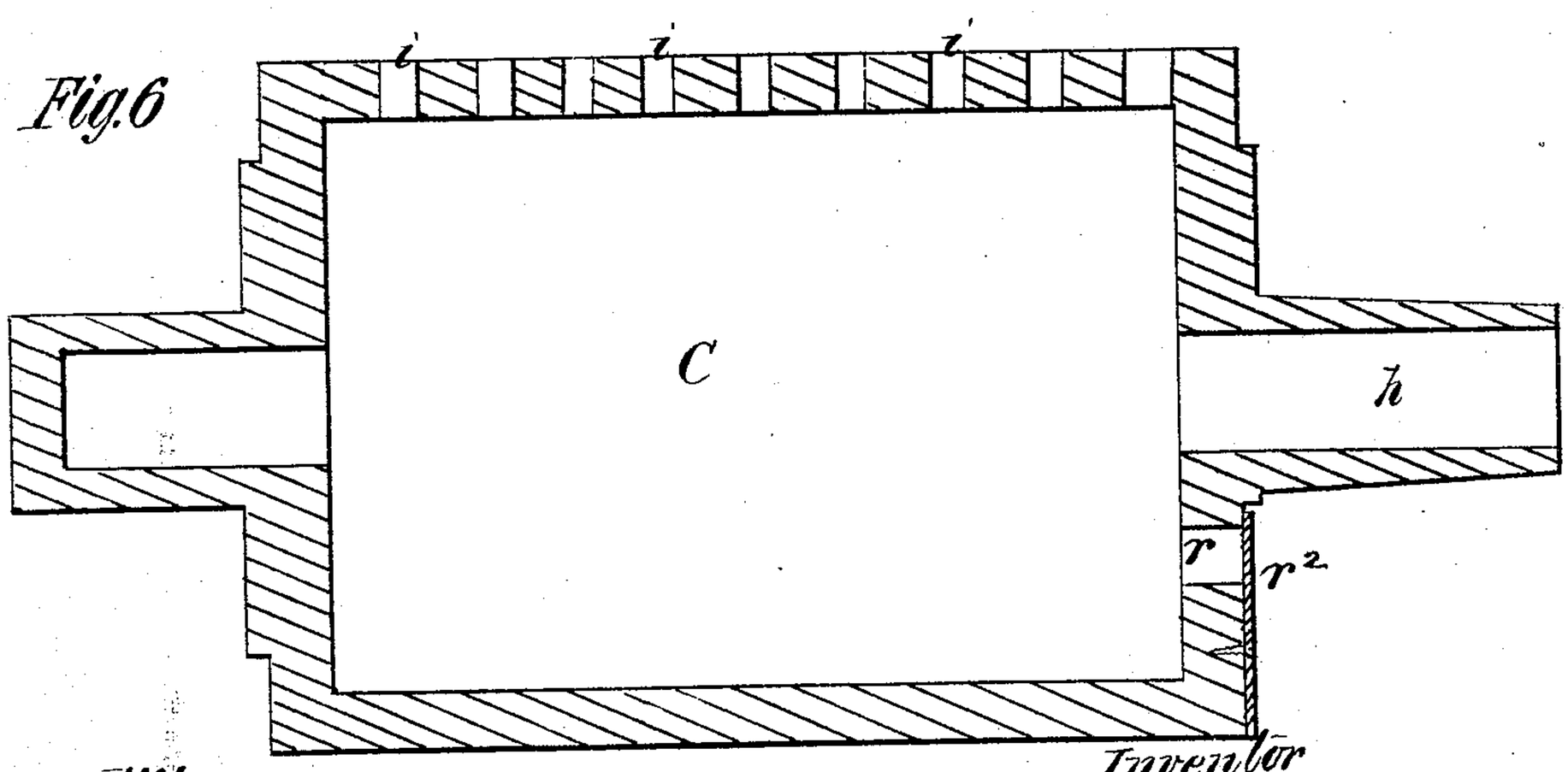


Fig. 6



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UNITED STATES PATENT OFFICE.

JOHN T. ASHLEY, OF BROOKLYN, E. D., NEW YORK.

IMPROVEMENT IN FEEDING PAPER TO ROTARY PRINTING-PRESSES.

Specification forming part of Letters Patent No. **144,822**, dated November 25, 1873; application filed May 23, 1873.

CASE A.

To all whom it may concern:

Be it known that I, JOHN T. ASHLEY, of Brooklyn, E. D., in the county of Kings and State of New York, have invented certain Improvements in Feeding Paper to Rotary Printing-Presses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1, Plate 1, is an elevation of one side of a press-frame with my improvements applied to it. Fig. 2, Plate 1, is a top view of the same. Fig. 3, Plate 1, is an elevation of the opposite side of the machine to that shown by Fig. 1. Fig. 4, Plate 2, is a section taken vertically and longitudinally through the machine. Fig. 5, Plate 2, is a section taken diametrically through the perforated suction-roller which takes the sheets from the press-cylinder. Fig. 6, Plate 2, is a diametrical section through the press-cylinder.

Similar letters of reference indicate corresponding parts in the several figures.

The object of my invention is to improve printing-presses by the employment of such means as will enable me to dispense with grippers and tapes, and the many objections attending the same.

The following description of my invention will enable others skilled in the art to understand it.

In the accompanying drawings, A represents the frame of a printing-press, in which a horizontal reciprocating form-bed is to be employed, working beneath a rotating cylinder, C. B represents an inclined feed-board, from which the sheets to be printed are transferred by a "feeder-boy" to the surface of the cylinder C in the usual well-known manner. The journals of the cylinder C have their bearings in elevated standards of the frame A, and one of these journals is tubular, as at *h*, and turns in a stationary tubular journal-box, *l*, on which is suitably applied a pipe or hose which communicates with an exhausting-engine. If desirable, journals may be tubular. The cylinder C is hollow, and has a row of perforations, *i i*, through it, which are arranged in a straight line, extending across it from end to end, as shown in Figs. 2 and 6. There is also a perforation, *r*, made through one end of the cylinder C, which, at certain times, is closed by a valve, r^2. This valve r^2 is arranged on the outside of the cylinder; and its pivoted stem p' (see Fig. 3) has a toe, *p*, pivoted to it, which is held in place by a spring, *s*. At the proper time during the revolution of the cylinder C for opening the valve r^2, the outer extremity of the toe *p* strikes a stop, *t*, on the frame A, which allows air to enter the cylinder C through the passage *r*. The spring *s* causes the valve r^2 to close the passage *r* after the toe *p* leaves the stop *t*. Partially surrounding the cylinder C is a number of pipes, $g\ g^1$, which are parallel to the longitudinal axis of this cylinder, and which are connected, at their open ends, to a tubular ring, G. The closed ends of the tubes *g* are supported by radial arms *a*, and that end of the pipe g^1 which is on the same side of the machine as the closed ends of the pipes *g* is supported by a standard, a'. One end of the pipe g^1 communicates with the tubular ring G, and the opposite end is closed, at certain times, by one end of a valve, *n*, which is pivoted to the standard a', the opposite end of which valve is loaded, and rests, by its toe n', upon a cam or segment, *c*, which is on a spur-wheel, D, at one end of the cylinder C. The tubular ring G is secured to the frame A by straps g^3, or other means, and on this tubular ring is a coupling, g^2, to which a pipe or hose is to be attached, which leads from a suitable blast-engine, by means of which air is forced through perforations which are made through the pipes $g\ g^1$, and directed toward the cylinder C.

I have represented the pipes *g* as being arranged parallel to the axis of the cylinder C, so as to induce a blast of air toward its axis; but, if desirable, segments of pipes, which are concentric to the axis of the cylinder, may be adopted; or nozzles may be used instead of the short perforations. I prefer to make the perforations through pipes $g\ g^1$, so that the jets of expelled air will be directed a little outward or obliquely toward each end of the cylinder C, for the purpose of spreading the sheets smoothly against the surface of this cylinder and preventing the sheets buckling or waving.

D^2 represents a taking-off cylinder, which is arranged so as to nearly touch the cylinder C, and which may be of any required diameter. This cylinder is thickly perforated, and it is rotated in an opposite direction to the cylinder C by means of spur-wheels D D^1. Inside of this perforated cylinder D^2 is applied a round bar, J, having a slot, *j*, made longitudinally into it, which slot is directly opposite the cylinder C, and at a point where it is desired to take the sheets when printed from this cylinder C, as shown in Fig. 4. At one end of the slotted bar J is a tubular coupling, *d*, and a ring-packing, *k*. The coupling or tubular extension *d* is for the purpose of receiving a pipe or hose, which leads from an exhausting-engine. P represents a tray for receiving sheets of paper as they are discharged from the perforated cylinder D^2. This tray is supported upon brackets N on frame A, and inclined in two directions—that is to say, it inclines downward from cylinder D^2 at a proper angle—and is also inclined laterally, or toward one side of the press-frame A, as shown in Figs. 1, 2, 3, and 4. In all other respects the press is or may be furnished in the usual well-known manner.

Motion being communicated to the cylinders from any convenient prime motor, and they being rotated in the directions indicated by the arrows on Fig. 1, and the blast and suction-engines being put in motion, air will be exhausted from the cylinders C and D^2, and forcibly ejected from the pipes *g* g^2. When the perforations *i i* through cylinder C are brought around to the position shown in Fig. 4, a sheet of paper is moved from the table B, and the front edge of such sheet is adjusted properly over these perforations, and securely held by the external pressure of the atmosphere acting on those points of the paper which cover the perforations. The sheet is thus held until it is carried around, printed, and brought opposite the slotted portion *j* of the bar J, which is inside of the thickly-perforated cylinder D^2. Just at this moment, and while both cylinders continue to revolve, the valve r^2 will be opened and air will be allowed to rush into the cylinder C in such quantities as to counteract the pressure of air on the paper, and allow the edge of the sheet to be transferred to the cylinder D^2 by the exhaustion taking place through that portion of it opposite the slot *j*. The sheet will then be attracted to the cylinder D^2, moved over it, and, finally, discharged into the tray P, in which the sheet will be moved downward, and to one side, against the bottom and side ledges of this tray. I thus leave the sheets in the pile with two of their edges even.

It will be observed that I use separated perforations *i*, instead of one continuous slot across the cylinder. I do this for the purpose of preventing the front edges of the sheets from being drawn into the cylinder, which would render the press in operation, and the movement of the sheets, uncertain. The bridges or partitions between the holes *i* allow only portions of the paper to be acted on by atmospheric pressure induced by exhaustion, and these bridges effectually prevent the paper from being drawn or forced into the cylinder.

This feature of separated holes arranged in a row across the hollow cylinder I consider very important, as it enables me to dispense with gripers, and, consequently, all their attendant mechanical contrivances; and, where two or more such cylinders are used as I contemplate using them in perfecting presses, the labor and inconvenience of adjusting gripers are obviated. I also increase the capacity of the press by gaining surface for sheets of paper on the cylinder, as the perforations *i* occupy much less space than gripers hitherto used.

During the operation above described, air is ejected from the pipes *g* against the sheet, which keeps every part of it snugly and smoothly in close contact with the cylinder C, thereby rendering unnecessary the use of tapes, which are objectionable in printing-presses for many reasons. The effect of the outward currents of air on the sheets, which is due to the oblique directions given to the perforations or nozzles in pipes *g*, is that sheets are smoothed out laterally, as well as blown closely against the face of the cylinder C. If desirable, blast or suction pipes may be arranged in such relation to the thickly-perforated cylinder D^2 that they will cause the edges of the sheets to be blown down as they are moved over said cylinder and into the tray P, and thus prevent any surrounding air from displacing the sheets by causing their edges to turn upward at the commencement of their discharge from the said cylinder D^2. Such auxiliary pipes may be found useful in printing on large sheets of very thin paper. I do not, however, confine myself to their use.

During the operation of feeding each sheet to the front guides of the press, the blast from pipe *g'* is suspended by the opening of its valve *n*, after which this valve *n* will be shut, and the blast from said pipe *g'* caused to smooth the sheet on the front edge of the feed-board. The blast from pipe *n* will continue to act on the sheet for keeping it smooth upon the upper part of cylinder C, and will cease again at a proper time to allow the adjustment of another sheet against the front guides.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. One or more pipes, *g*, applied to induce blasts of air onto the sheets as they are moved around on the surface of the cylinder C, substantially as described.

2. The hollow rotating impression-cylinder C for taking the sheets one at a time from the feed-board B, in the manner described, in combination with a taking-off cylinder, which removes the printed sheets from the impression-cylinder and delivers them into a tray, substantially as described.

3. The stationary slotted exhaustion-bar J

and the perforated rotary cylinder D^2, combined with the impression-cylinder C, substantially as described.

4. The blast-pipe g', arranged above the front edge of the feed-table B, and perforated so as to direct blasts of air upon the top sheets while they are being drawn off by the impression-cylinder C, substantially as described.

5. The valve-opening r through the head of the hollow impression-cylinder provided with a valve, r^2, and valve-trip, in combination with a tubular journal, h, and fixed tubular journal-box l for receiving a hose, substantially as described.

6. The double inclined tray P, having all sides fixed and arranged to take the sheets directly from the rotating cylinder D^2, and by the gravity of the sheets alone adjust two of their edges even, in combination with the perforated discharging-cylinder D^2, substantially as described.

Witnesses: JOHN T. ASHLEY.

J. N. CAMPBELL,

JAMES MARTIN, Jr.