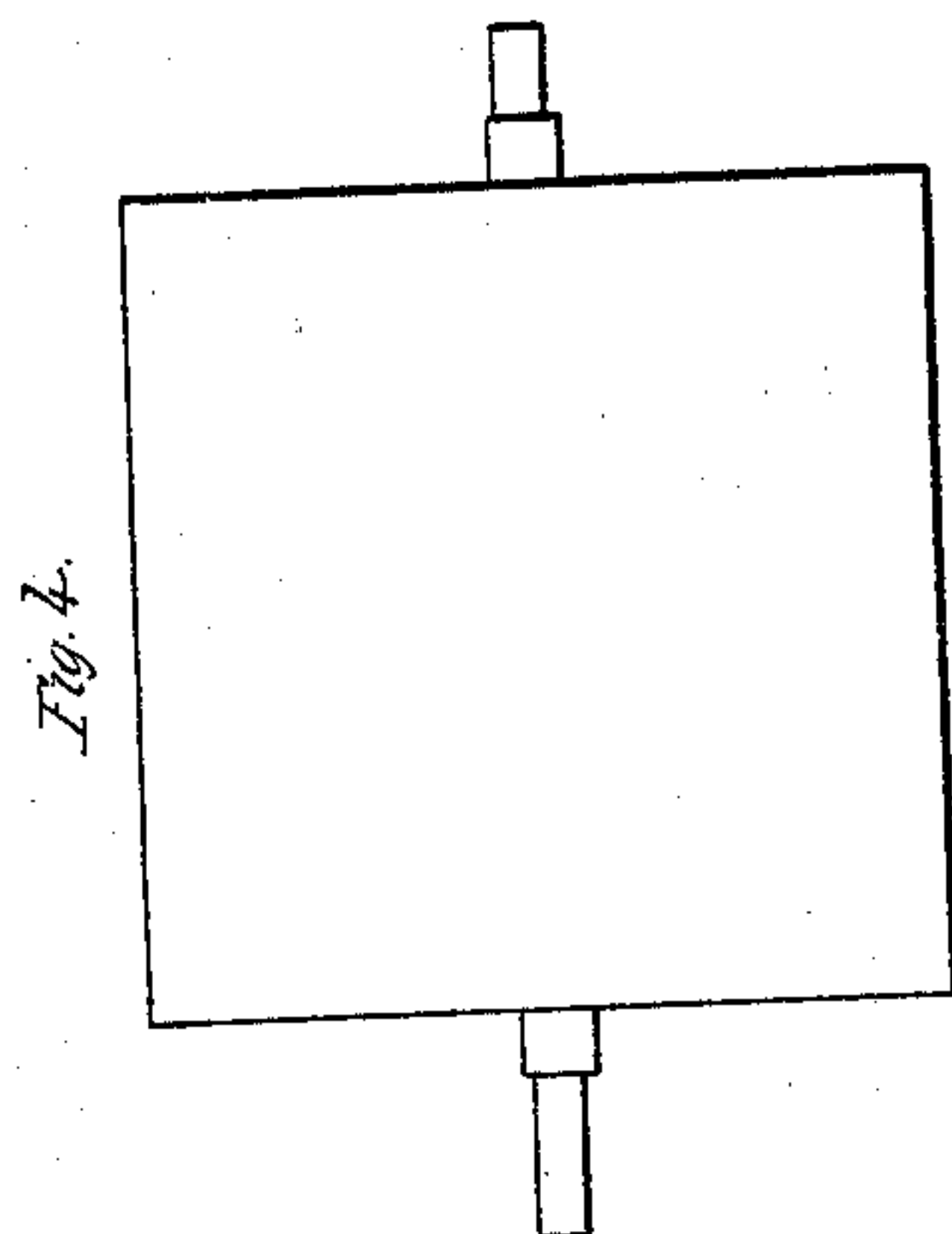
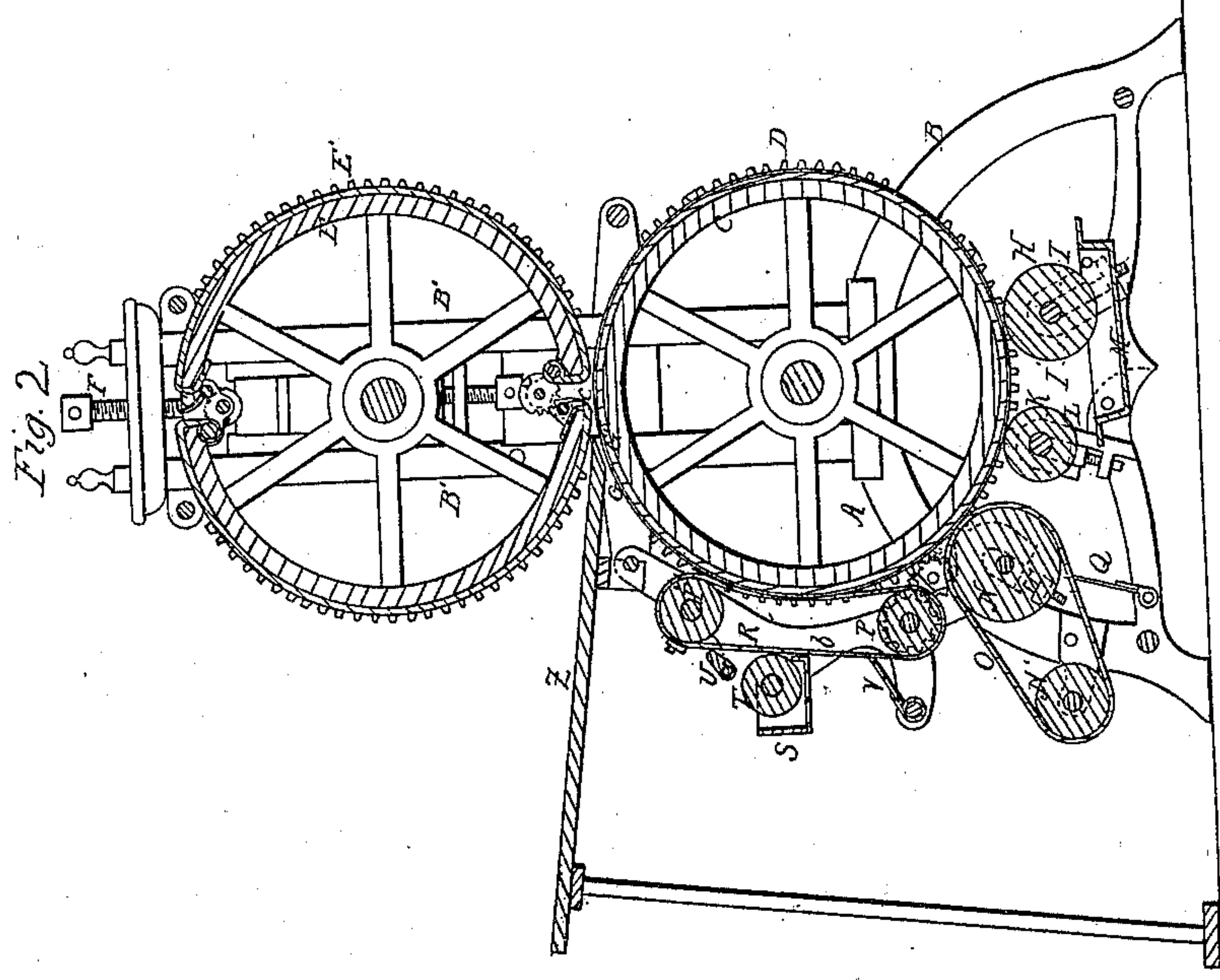
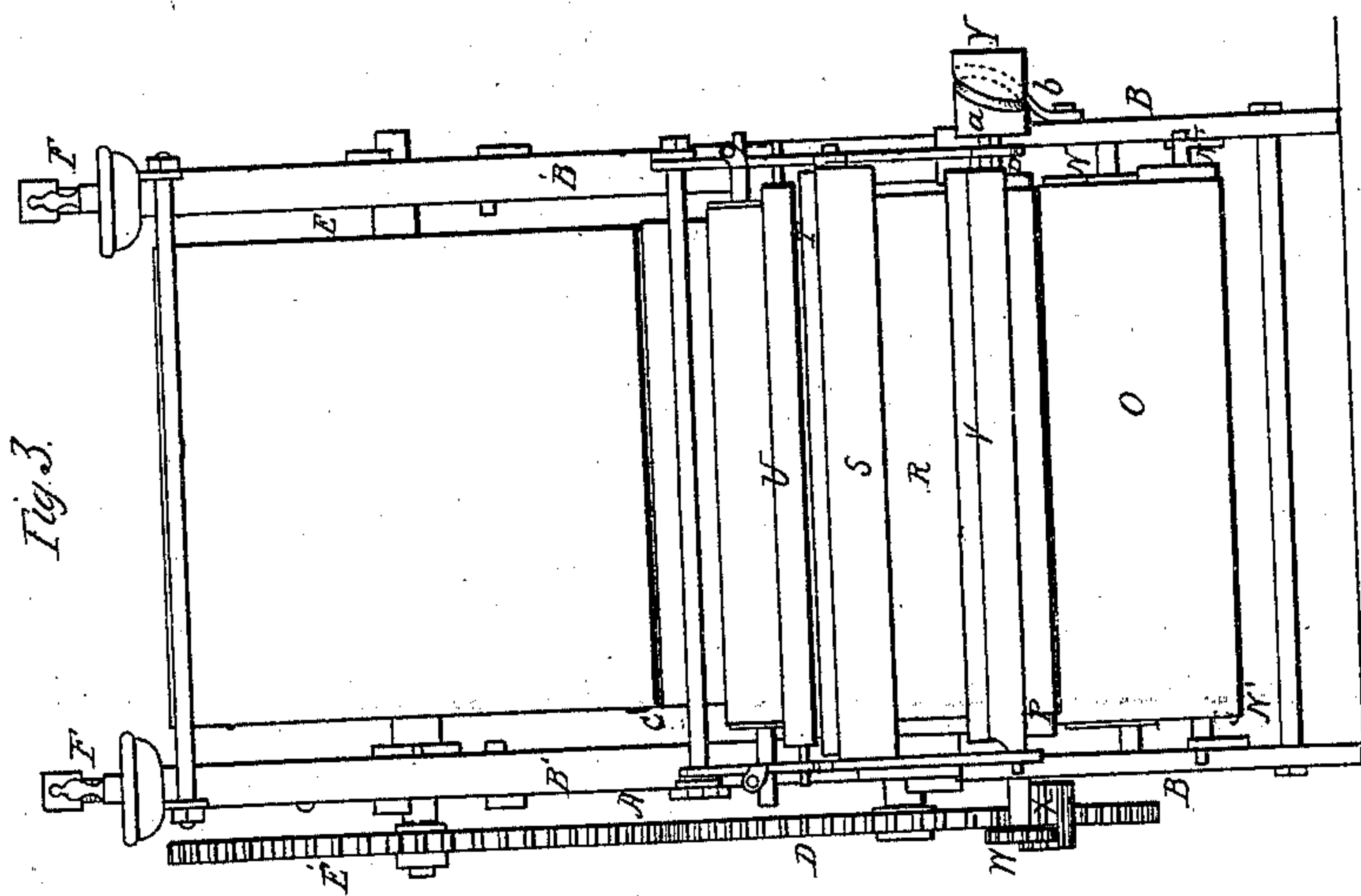
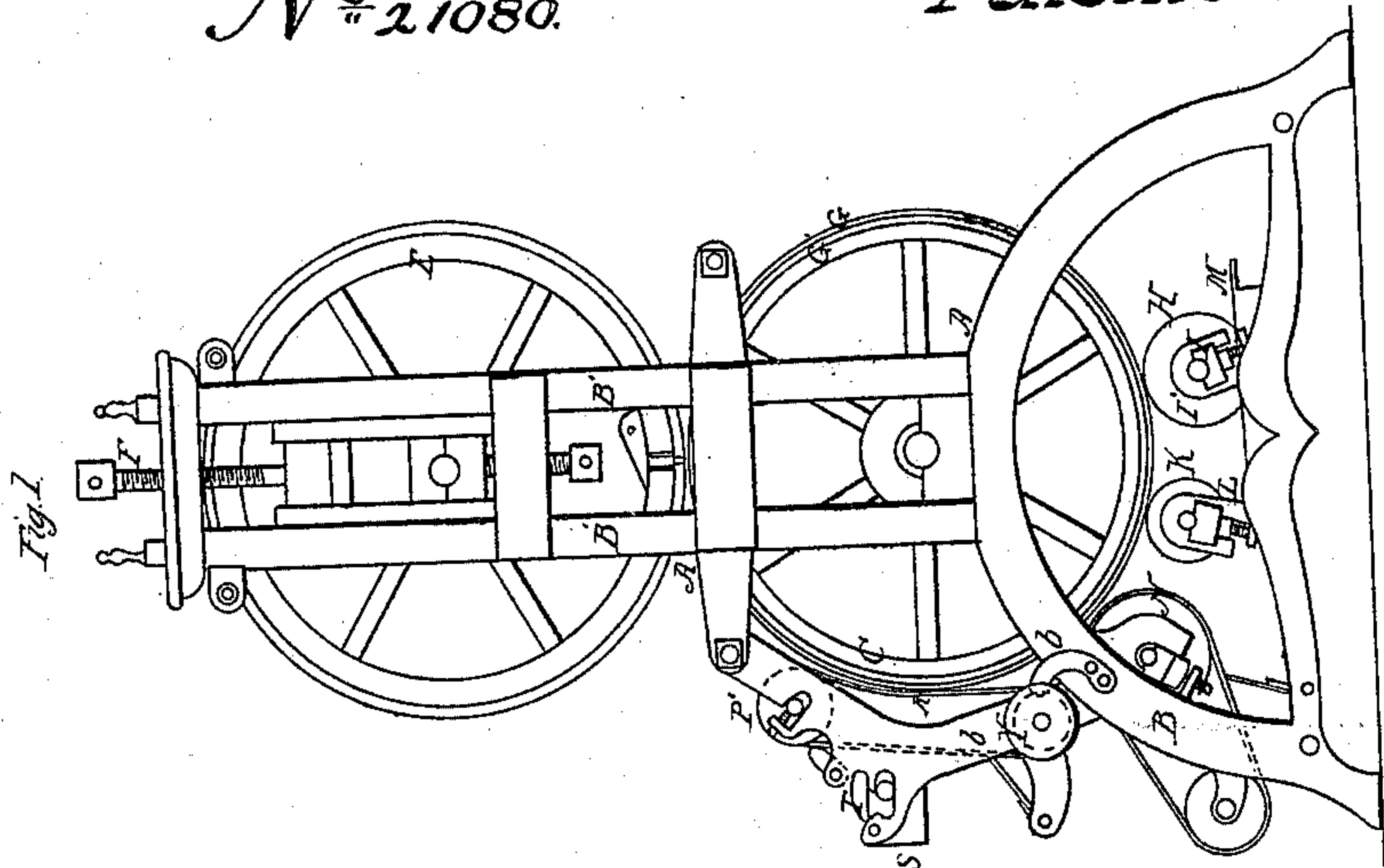


F. B. Nichol.
Adapting Electrotypes to Printg. Presses.
N^o 21080. Patented Aug. 3. 1858.



UNITED STATES PATENT OFFICE.

F. B. NICHOLS, OF MORRISANIA, NEW YORK.

PRINTING-PRESS.

Specification of Letters Patent No. 21,080, dated August 3, 1858.

To all whom it may concern:

Be it known that I, FREDERICK B. NICHOLS, of Morrisania, in the county of Westchester and State of New York, have invented a new and useful improvement in arranging and adapting the inking, pressing, cleaning, and polishing rollers and bands to the cylinders of printing-presses, and adapting, arranging, and combining the other parts of the press in such relation and manner as to enable perfect engravings to be produced therefrom; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification.

Figure 1, is a side elevation of a cylinder engraving press, with the electrotpe or thin engraved plate, and other parts adapted to the same. Fig. 2, is a vertical longitudinal section of ditto. Fig. 3, is a front view of the same. Fig. 4, is a front elevation of the electrotpe or thin engraved plate, wound upon and attached to the engraving or printing cylinder.

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

The nature of this invention and improvement consists in arranging and adapting the inking, pressing, cleaning and polishing rollers and bands to the cylinders of printing presses, around which electrotpe and other thin engraved plates are evenly wound and secured.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The frame A, may be made of cast iron or other suitable material, and consists of two semi-circular beams B, connected together and braced at their lower ends, and secured to a firm foundation or bed, and having uprights B', secured to the apex, or upper portions, being also braced and firmly secured together to form with the lower semi-circular beams an upright frame of the requisite size and strength to contain and support the several parts of the press. The printing cylinder C, is arranged in a horizontal position within the frame, with its journals turning in suitable boxes between the uprights B', and resting on the upper part or apex of the beams B, the ends of its shaft extending sufficiently far beyond the frame to enable a crank, band wheel, or other attachment for receiving the

motive power to be secured at one end, and a cog wheel D, at the opposite end. This cog wheel D, meshes in gear with another cog wheel E', of a corresponding size, secured on the end of a similar horizontal shaft, of the feeding and impression cylinder E, which is arranged immediately above the printing cylinder C, its woven cloth covered periphery being pressed upon the periphery of the printing cylinder by set screws F, which pass through horizontal braces which secure the uprights B', together, and operate upon the adjustable journal boxes of the shaft of the said feeding and impression cylinder E, and thus regulate its pressure upon the engraved surface on the printing cylinder C.

The electrotpe or thin plate G, on which the design or figure to be engraved from is made, is backed with a coating of alloy G', composed of lead mixed with three per cent. of antimony secured to the same by fusible alloy or other suitable material, the backing G', being of the thickness of a sixteenth of an inch, (more or less) and laid on and secured while the electrotpe or thin plate is perfectly flat or straight, the same thickness being produced over every portion by subjecting the two to a strong pressure or by any other suitable means. The plate thus prepared, and brought to the exact size necessary to entirely cover the periphery of the cylinder C, is secured at one of its narrow edges to the periphery of the said cylinder, on a line parallel with its axle, with its backed portion flat upon the said periphery, and after the secured edge is brought under the finger or impression roller E, a continuous motion is given to the cylinder C. This causes the backed plate G, to be wound upon the cylinder C, the feeding and impression cylinder E, pressing it firmly upon the same, and causing it to be bent tightly around its entire surface, and its two edges to be brought together, so as to form a concentric cylindrical covering to the periphery of the cylinder C, after its remaining edge is secured thereto by screws or other convenient and suitable means. During the process of winding and pressing the electrotpe or thin plate G, and its flexible and non-elastic alloy backing G', over the cylindrical surface, the required degree of pressure is brought upon it by the woven cloth covered periphery of the upper feed and impression cylinder E, to bend it and its backing evenly and with

such equal force between the ends of the cylinder C, as to prevent it bulging or springing up at the edges, in the manner represented by dotted lines in Fig. 4, as it would have a tendency to do were it not for this equal pressure over its entire surface. This tendency of plates to slightly turn up at the edges, and assume a slight concavity from points midway between these edges, is owing to the lack of the same compensating and bracing body of metal at the edges as is contained in the portion between them, and hence it follows that when they are backed by the body of the alloy as in this case, and pressed upon and rolled around the cylinder C, with an equal and strong pressure from edge to edge, by the cylinder E, which rolls with it, a firm and equal bend and positive or fixed set is given them, which makes them conform to, and remain over the even surface of the cylinder C.

Below the cylinder C, and slightly in the rear of a vertical line through its center, is arranged a horizontal inking roller H, formed of hard and non-absorbent wood or other suitable material, whose journals turn in adjustable sliding boxes I, placed in slots, formed in lugs or projections I', fixed to the lower brace of the semi-circular beams B, and provided with set or adjustable screws passing through a portion of said lugs, and acting against the lower part of the boxes so as to enable the inking roller H, to be pressed against the electrotpe or plate G on which the design is engraved, with the required force to thoroughly ink its surface. In front of this inking roller and parallel with the same is placed another roller K, made of metal highly polished on its surface and of less diameter than the roller H, and adjusted to press with any degree of force against the surface of the electrotpe or thin plate, by set screws, operating on sliding boxes, in which its journals turn, and arranged in projecting lugs L, formed and operated in precisely the same manner as the corresponding parts of the printing roller. Below these rollers is arranged an ink trough M, suspended on pivots near one of its edges, and having pins projecting from its ends near its opposite edge, which rest on lugs, projecting from the frame, in such a manner as to allow this latter edge to be raised or lowered to give greater or less dip to the inking roller. In front of this roller and above the same is arranged another roller N, covered with felt cloth or other soft material, and provided with sliding boxes in which its journals turn, and adjusted to the surface of the printing cylinder by set screws in the same manner as the rollers H, K. An endless leather band O, extends around this roller N, which extends around another roller N', whose shaft turns in fixed boxes below and in front of the same, a horizontal

and inclined scraper Q, being suspended on pivots below the endless band O, whose upper edge is made to press against the same by a spring or other yielding power, for clearing the said band of the excess of ink taken from the printing cylinder. Above this endless leather band is arranged another horizontal roller P, whose journals turn in suitable boxes secured in curved projecting bars b, of the frame and around the lower part of which extends an endless band R, also extending around a corresponding roller P', above the horizontal plane on which the shaft of the printing cylinder C, is arranged, in such a manner as to cause the surface of one side of said endless band R, to press against the surface of the electrotpe or thin plate G, of the printing cylinder C, the degree of pressure or tension with which it presses against the same, being governed, by adjusting or set screws, operating on the sliding boxes, in which the journals of its upper roller turn.

On the opposite side of the endless band R, or in front of the same, is suspended a horizontal trough S, containing whiting or other cleaning or polishing material, in which is placed a roller T, whose lower surface moves over and in contact with the whiting in the trough S, and whose side portion presses against, or comes in contact with the front portion of the endless band R, so as to constantly supply the same with whiting from the box,—a pivoted india rubber bar or buffer U, being suspended above the roller T, and next the endless band R, so as to press against the same, which bar prevents an excess of whiting adhering to and being carried up by the surface of the said endless band of leather R, an inclined scraper V, being also suspended on pivots below and in front of the endless band R, with its upper vibrating edge resting against the same, for clearing it of any excess of whiting or dirt, which may accumulate thereon.

On one end of the shaft of the lower roller P, is secured a cog wheel W, which meshes in gear with a drum pinion X, turning on a stud or pin, projecting from the semi-circular beam B, of the frame, which pinion X in turn meshes in gear with the cog wheel D, on the end of the printing cylinder shaft C, and in this manner receives and transfers motion to the endless band R. On the opposite end of the shaft of said roller P, is secured a drum wheel Y, on the periphery of which is formed a zig-zag groove a, in which the end of a projecting lug or arm b, secured to one of the semi-circular beams B, enters, so as to give a reciprocating movement to the lower roller P, in its revolution and to cause the endless band R, to have a corresponding zig-zag movement, over the lines of the design engraved on the surface of the elec-

trotype or thin plate G, on the printing cylinder C, as the two move past each other, somewhat corresponding with the irregular movement at present given to the hands when moved over the surface of the ordinary straight copper plates for polishing the same, thereby preventing the polishing endless band R, from moving parallel to the lines of the design on the electrotrotype or thin plate on the printing cylinder, and absorbing or taking up the ink contained in the same.

The inclined board Z, over which the paper upon which the design on the printing cylinder, is to be engraved or printed, is secured to the frame in any suitable manner, with its lower edge terminating at the proper relation to the surfaces of the two cylinders C, E, as to enable them to be readily carried between the two. The fingers c, for grasping the edges of the sheets of paper on which the impression is to be produced, are attached to the finger and impression cylinder E, and operated in the usual or most approved manner.

The operation is as follows:—Motion being given to the moving parts of the press, through any convenient power, the lower edges of the sheets of paper on which the design engraved on the electrotrotype or thin plate G, on the printing cylinder, is to be produced, are successively moved over the inclined feeding board Z, to the lower edge of the same, so as to enable them to be successively grasped by the fingers c, inserted in spaces at equal distances apart, in the periphery of the feeding and impression cylinder E, and firmly embraced between the same and the woven cloth periphery next the edge of said spaces, so as to cause them to be drawn or to pass between the peripheries of the printing cylinder C, and the finger and impression cylinder E, and to be pressed upon the surface of the electrotrotype or thin plate G, on which the design or figure to be printed or engraved is made, by the woven cloth covered cylinder, with the required degree of force to take a proper impression upon each sheet of paper that passes between the two cylinders after which, but not before the entire impression is obtained, they are in the same successive manner detached from the finger and impression cylinder E, by the fingers c, relaxing their grasp through corresponding

means to those which caused them to grasp the said sheets. The printing cylinder electrotrotype or thin plate G, is inked during its revolutions by the inking roller H, and the ink received from the same is pressed into the lines of the design or figure on the electrotrotype or thin plate on said printing cylinder, by the inking and polished rollers, H, K, and the ink on the smooth or blank portion of the said plate or electrotrotype, together with any excess of the same contained in the lines of the design is removed or absorbed by the polished roller K and endless leather band O, and the blank surface is subsequently polished by the endless leather band R, at each revolution as before stated, to properly prepare the electrotrotype or plate G, to give the impression on the sheets of paper as before mentioned.

What I claim as new and desire to secure by Letters Patent, is—

1. The employment of the polished metallic roller K, arranged immediately in front of the inking roller H, and made adjustable by set screws, so as to enable its smooth periphery to be pressed against the periphery of the printing cylinder, on a line parallel with the axis of both, and with such force as to prevent any ink on the engraved surface of the printing cylinder from passing between the two, and thereby removing the excess of ink from the smooth portions of the electrotrotype or thin plate, and causing the same to descend over the rising side of the said polished roller K, into the ink trough M, as described.

2. I claim arranging the rollers P, P', and endless band R, over the same in front of, and in such relation to the periphery of the printing cylinder C, as to cause the descending portion of the endless band R, to extend from the same, tangential to a circle smaller than it in diameter, and to bear upon a portion of the periphery, with an equal degree of tension over every part which it touches, and giving to the said part of the endless band, a zig-zag movement, by means of the zig-zag grooved drum Y, and lug or arm b, in the manner and for the purpose herein set forth.

F. B. NICHOLS.

Witnesses:

PHILIP BOILEAU JONES, Jr.,
S. F. COHEN.