

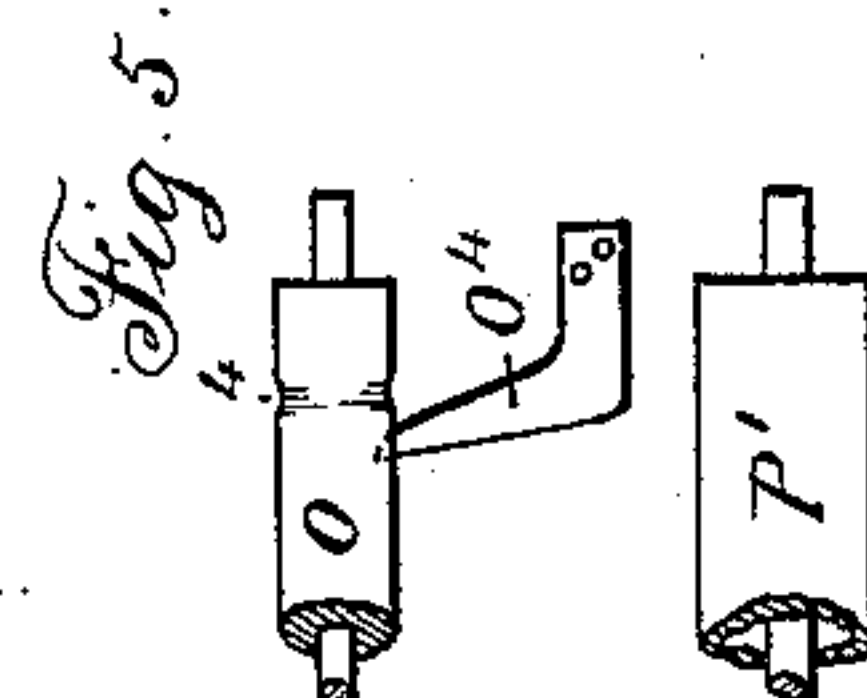
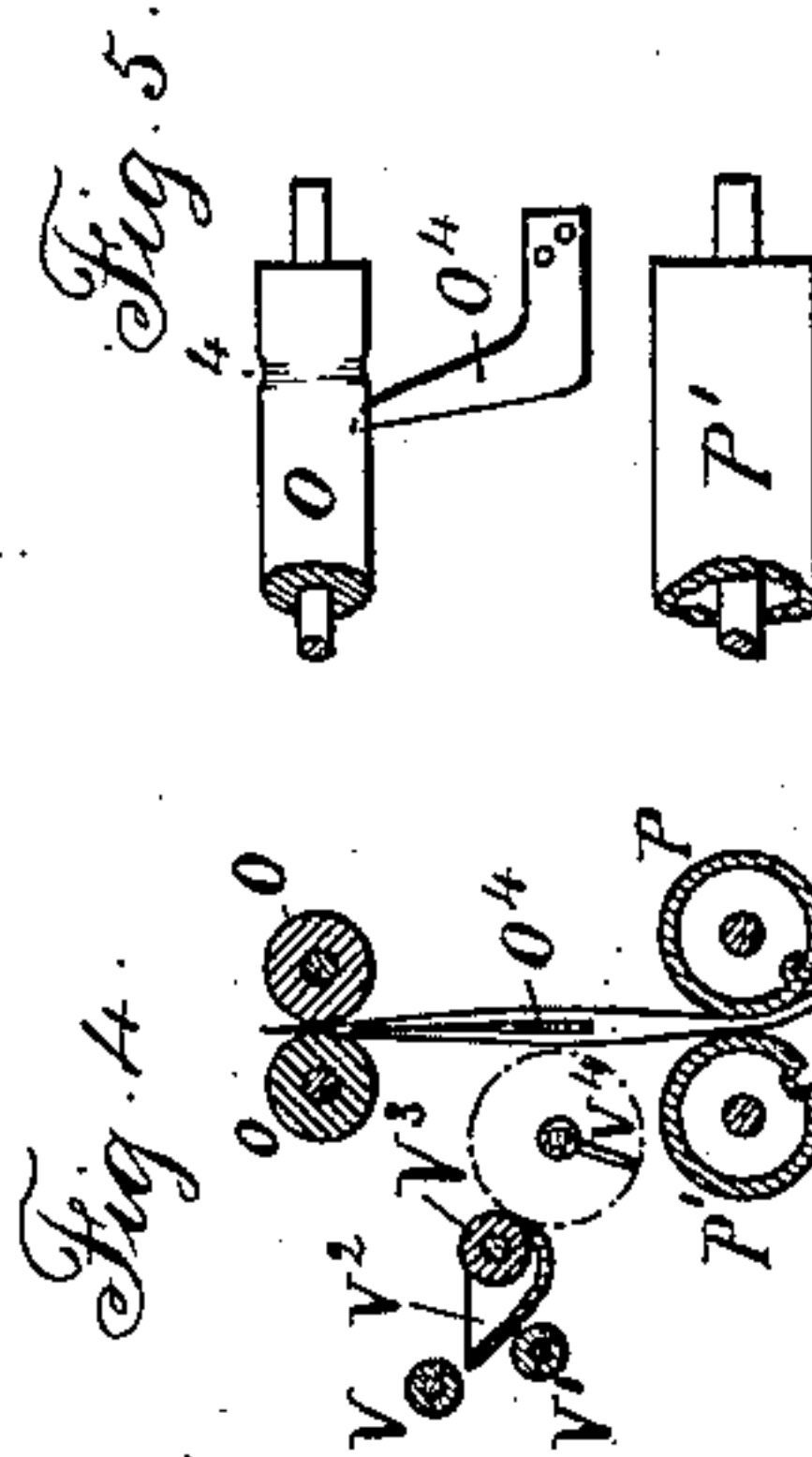
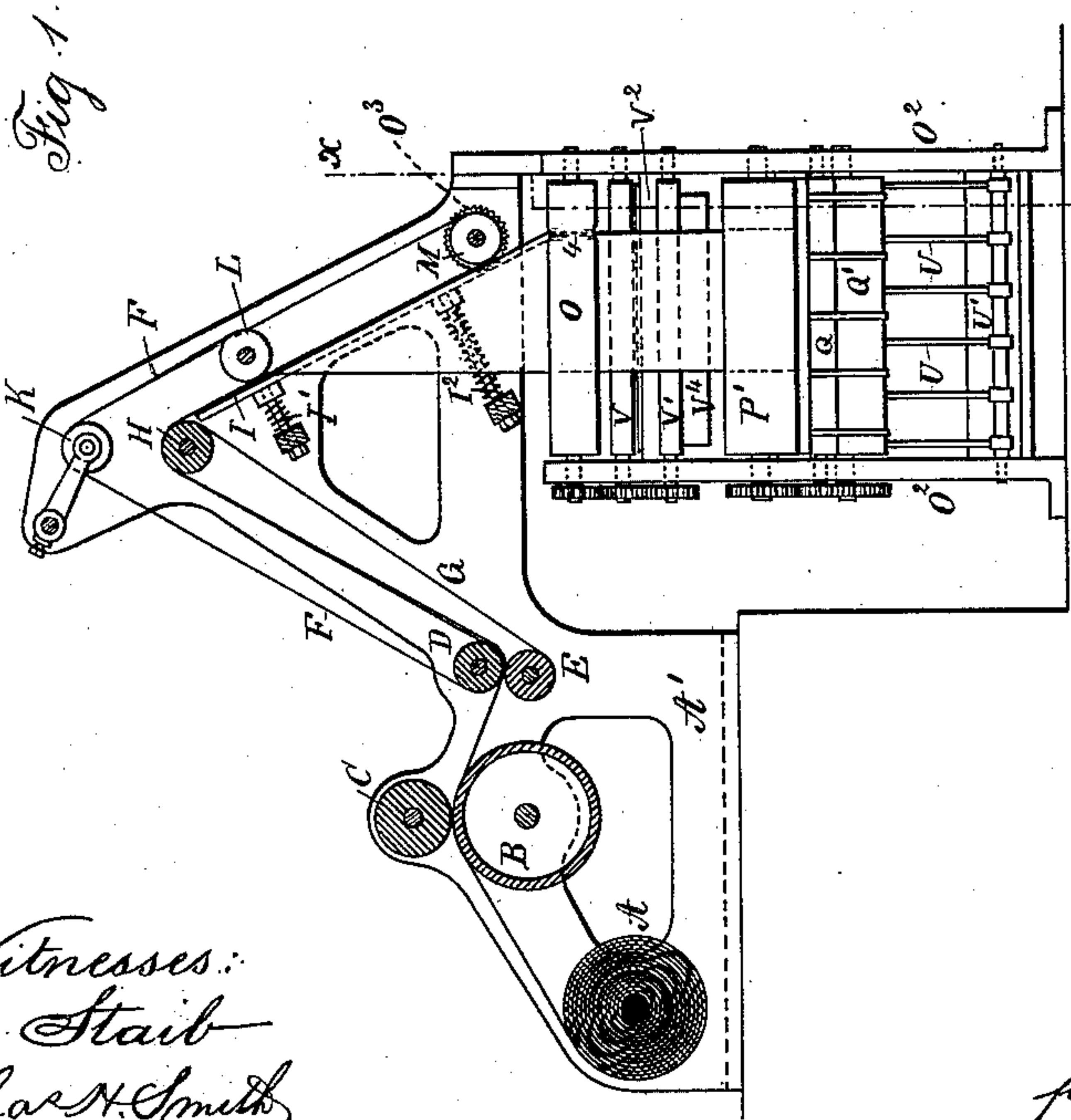
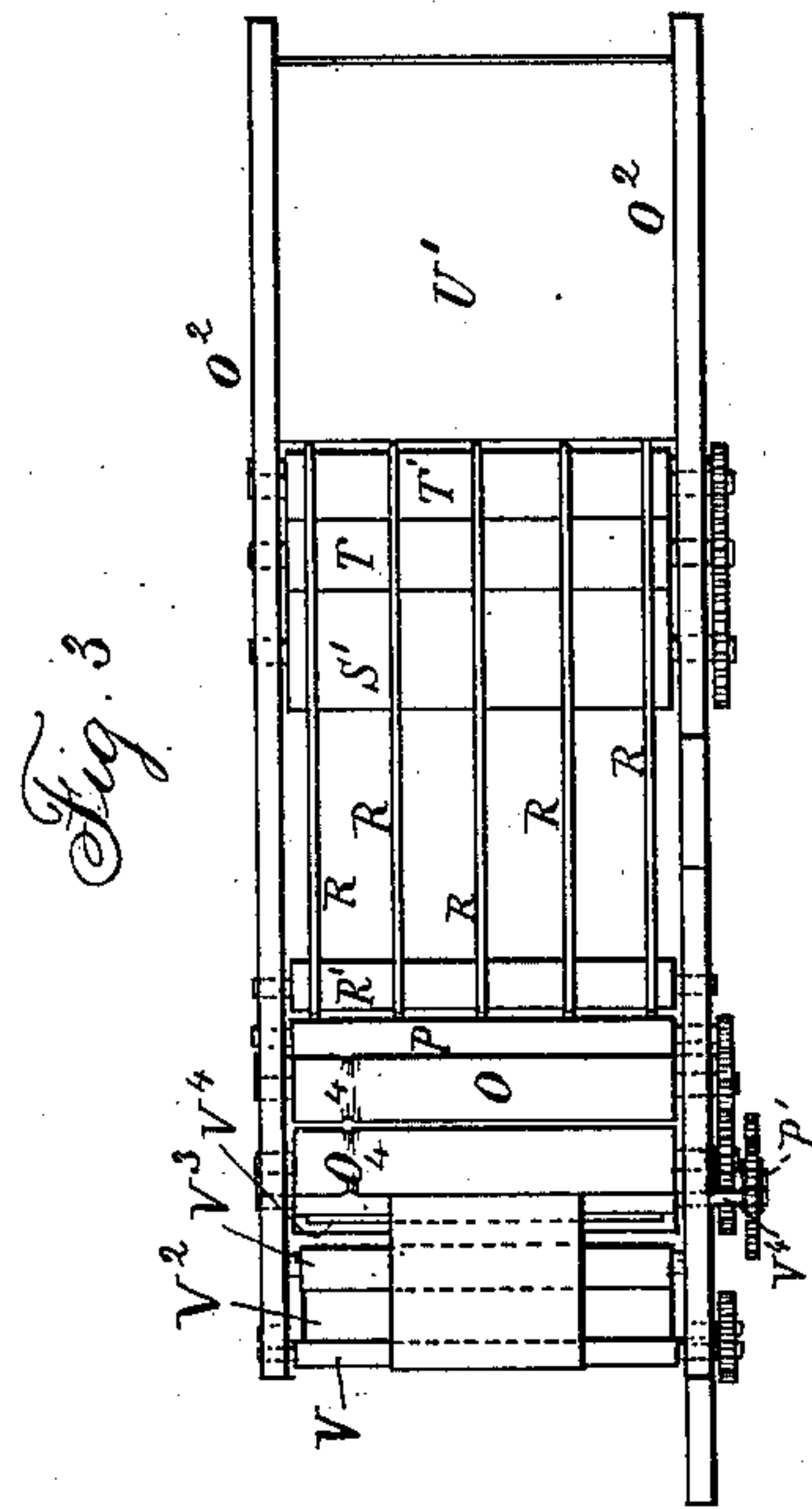
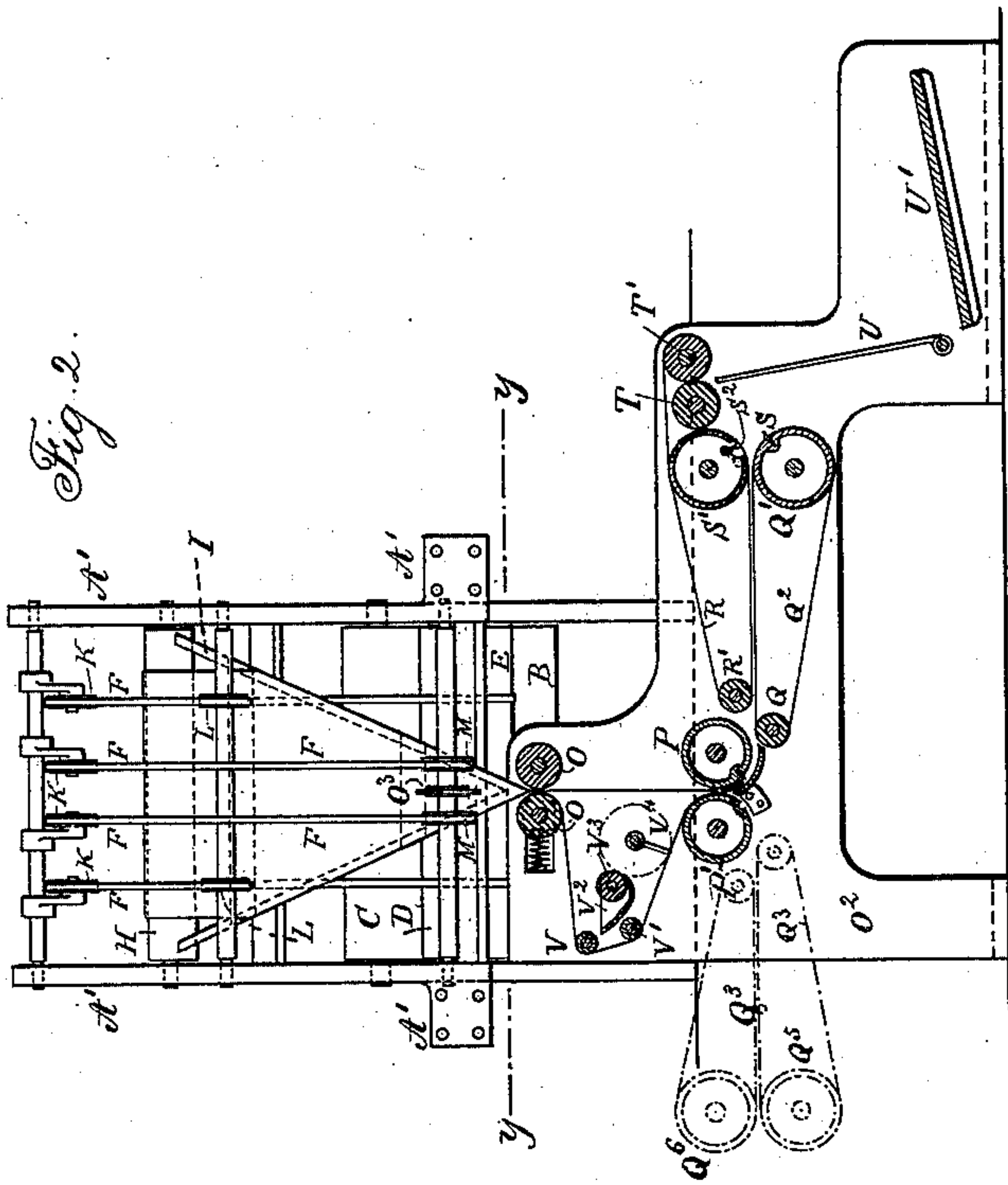
(No Model.)

W. SCOTT.

MECHANISM FOR FOLDING AND DELIVERING PRINTED SHEETS.

No. 351,470.

Patented Oct. 26, 1886.



Witnesses:
J. Stair
Chas. H. Smith

Inventor
Walter Scott
per Lemuel W. Perrell atty.

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

MECHANISM FOR FOLDING AND DELIVERING PRINTED SHEETS.

SPECIFICATION forming part of Letters Patent No. 351,470, dated October 26, 1886.

Application filed October 26, 1885. Serial No. 180,909. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Mechanisms for Folding and Delivering Printed Sheets, of which the following is a specification.

The object of this invention is to deliver printed sheets from a web of paper, and to provide a mechanism adapted to deliver to the folding apparatus a single four-page paper or to the folding and delivering of two four-paged papers conveyed away separately to different folders; or this improvement may be used with eight pages that are partially folded and cut off from the web and conveyed away to a machine that completes the folding operation, and I provide for applying paste where one sheet is attached with the next and folded at the back, so as to unite the double sheets together in pairs at the folds.

My improvement may be used with a web of paper which is the whole width of the press, or there may be two webs of paper, each of which is the half width of the press, or but one web half the width of the press may be run through, thus adapting my improvement to the various circumstances under which printing-presses may be made use of.

In the drawings, Figure 1 is a partial section transversely of the printing-cylinder and an elevation of the folding devices. Fig. 2 is a section transversely of the rollers employed in the cutting, pasting, and partial-folding portion of the mechanism at the line *x x*, Fig. 1. Fig. 3 is a plan view below the line *y y*. Fig. 4 is a section of the cutting device that may be made use of adjacent to the transverse cutting-cylinders, and Fig. 5 is a separate view of the said cutting device and the end portions of the rollers between which it is located.

A represents the roll of paper; B, the impression-cylinder, and C the form-cylinder.

D and E represent rolls or ranges of pulleys, between which the printed paper passes.

F and G represent the ranges of endless belts for conveying the paper up over the roller H.

K represents the tightening-pulleys for the belts F. These belts F pass over the roller H

and down below and around the pulleys L and M.

I is an inclined triangular folder made either as a table or with converging bars, and O O are drawing-rollers that pass the paper along from below the folder I to the other portions of the apparatus hereinafter described.

Behind the folders I are the yielding supports I' I'', formed of rods attached to the under sides of the folders I and passing through cross-bearers between the frames A' of the machine, and there are helical springs around the rods to support the folders I and to allow them to yield to any unusual strain of the paper. It is now to be understood that the paper passing up over the roller H descends upon the folders I, and from the edges of the folders the sheet is caused to be drawn into a folded or doubled condition between the rollers O O and the converging angle, and the inclination of the folders I are such that the paper will be nearly straight upon the surface of the folders I and between the edges of the folders I and the rollers O, thereby allowing the sheet to be doubled between the rollers O and to lie flat as it passes down the incline of the folders I.

A triangular incline has before been made use of in folding paper, as a web of such paper has been drawn along over the incline. I find, however, that if the paper is compressed at the first fold near the apex of the triangle it is liable to crease in ridges. To avoid this I slightly groove or depress the surfaces of the rollers O in line with the lower end or apex of the triangular folder I, as shown at 4, in order that the rollers O may act to draw the paper along and down the inclined folder I without compressing the edge of the fold.

In order to accommodate this machine to the different circumstances to which it is used and to keep the paper flat upon the folder I, the belts F, that pass around the pulleys L, act only upon the paper where it is nearly the full width upon the folder I, and the other belts, F, that pass down and around the pulleys M, are near the middle of the sheet and keep the same flat and smooth nearly to the lower end of the folder I. The shafts of the rollers L and M preferably extend to the side frames, A', and the shafts of the rollers O are supported in frames O² at right angles to the frames A'.

Beneath the rollers O O are the cutting-cylinders P P', which separate the web of paper transversely, and at Q Q' are cylinders with tapes Q² to convey away the sheets as cut off by the cylinders P P'. These cylinders Q Q' and belts Q² may be duplicated, as shown by dotted lines, so as to pass off in both directions, the object being to divide the web of paper both longitudinally and transversely, and carry one half of the web off beneath the cylinder P and upon the belts Q² and the other half of the web of paper off beneath the cylinder P' and upon the belts Q³. The belts Q² Q³ and their respective cylinders are driven faster than the cutting-cylinders P P', in order that the sheets may be pulled apart by the respective pairs of cylinders Q' S' and Q² Q³ as soon as the advancing ends of the sheets are nipped between the pairs of rollers. In this form my improvement is adapted to the delivery of the printed sheets when two webs are run through the press in the same plane and with the edges close together. It is also adapted to a single web of paper where the same is split longitudinally, to accomplish which I make use of the following devices: Upon the shaft of the pulleys M, I place a circular cutter, O³, which occupies a position in line with the center of the web of paper, and beneath this circular cutter O³ the paper passes as it approaches the apex of the folder. This cutter is preferably made with lance points or teeth to penetrate the web of paper, but not entirely slit the same. It may, however, be a disk with a smooth cutting-edge all around it. I also provide a cutter, O⁴, in the form of a thin blade, with the edge at an inclination and the point standing upwardly near the rollers O O, as seen in Figs. 4 and 5, so that the paper, in passing down from the rollers O O to the cutting-cylinders P, is drawn along with the cutter O⁴ between the two thicknesses of paper and inside the fold, so as to act to separate the web of paper longitudinally, and it will be apparent that this cutter O⁴ will complete the separating of the paper longitudinally if a serrated cutter is employed at O³; or the cutter O⁴ may alone be made use of, and said cutter O⁴ may be similar to the cutter O³ and revolved to cut open the fold of the sheet.

The cutting-cylinders P P' are to be of ordinary character—that is to say, the cutter is preferably made with a serrated edge and passes into a groove in the cylinder P', and the cutter of the cylinder P is to be adjusted to separate the sheets transversely, entirely or partially, as may be desired, in connection with the final delivery of the sheets of paper.

I have represented a folding-blade, S, upon the cylinder Q', and a second cylinder, S', above the cylinder Q', in which cylinder S' is the clamping-gripper S², and I make use of endless belts or tapes R, passing around the cylinder S' and around the roller R', so as to act in conjunction with the tapes Q² in passing the sheet or sheets along from the cutting-cylinders P P' to the folding-blade

S. The tapes R pass under the cylinder S', up over the roller T, down beneath the roller T', and return over the cylinder S' and around the roller R', and there is a fly-frame below the rollers T' for the delivery of the sheets. This delivery mechanism is well known, and in use the sheets pass along between the tapes Q² and R, and the parts are set so that the blade S lifts up the sheet at the center line and forces a crimp or fold into the opening in the cylinder S', and the crimp or fold is nipped by the gripper S² and carried up until the paper is seized between the cylinder S' and the roller T, at which point the gripper S² is opened and a sheet is carried with the folded edge first up over the roller T and down between the rollers T and T' and in front of the fly-frame U, which lays the sheet upon the delivery-table U', as usual.

It is often important to be able to deliver the two printed sheets one upon the other after the web has been cut longitudinally, and also to apply a line of paste to the center of one sheet to unite the two sheets together at the line of the center fold. This is especially advantageous in newspaper-printing. To accomplish this object I make use of the guide-rollers V V' and paste-trough V². This paste-trough V², paste-roller V³, and pasting-blade V⁴ are constructed, arranged, and actuated in such a manner that the pasting-blade V⁴ at its edge moves at a speed corresponding to the speed of the paper, and in its movement it touches against the paste-roller V³, so that the edge of the pasting-blade is constantly supplied with the proper amount of paste. When the pasting apparatus is made use of, one strip of the printed web, after the web is separated by the knife O³, is passed off laterally around the rollers V V' and back between the cutting-cylinders P P', and the parts are placed in such a manner that the first sheet of the part of the web that is deflected coincides with the second sheet of the part of the web that is not deflected, so that the sheets are in their proper position for being cut by the cutting-cylinders P P', and the line of paste from the pasting-blade V⁴ is applied to the center line of the sheet midway between one transverse cut and the next; hence the paste is at the place where the folding-blade S operates upon the sheets as they pass through between the cylinders Q' and S', as before described.

It is preferable to make use of springs to press one roller O toward the other roller, in order that the sheets may be properly grasped and drawn through the machine by said rollers O O; and I remark that it will be apparent that my improvements are not limited to use with any particular kind of folding or delivery apparatus, and that the columns or pages upon the printing-cylinder C are to be arranged with reference to the folding and delivery devices; and, further, that when the split web is to be run off in two directions the pasting apparatus is not required.

The gearing for driving the respective parts may be of any desired character. I have shown gear-wheels on the ends of the respective shafts for moving the parts.

5 I claim as my invention—

1. The combination, with the form and impression cylinders, the rollers and the delivery-tapes, of a triangular roller, I, placed at an inclination with the apex downwardly, a yielding support for the same, the rollers O O, between which the paper is passed, and the cutting-cylinders P P', for separating the sheet transversely, substantially as specified.

2. The combination, with the printing and impression cylinders and the delivery-rolls, of the inclined folder I, yielding supports for the same, and the pulleys L, around which the tapes pass for acting upon the web of paper, near the edges of the same, and the pulleys M, around which the tapes pass for acting upon the web of paper near the apex of the folder, substantially as set forth.

3. The combination, with the inclined triangular folder I, of the rollers O O, adjacent to the apex of the folder I, one or both of said rollers O having a peripheral depression in line with the apex of the folder, for the purposes and substantially as specified.

4. The combination, with the triangular

inclined folder and the rollers O O, of a paste-receptacle, V², revolving pasting-blade V⁴, guide-rollers V V', and transverse cutting-cylinders P P', substantially as set forth.

5. The combination, with the triangular inclined folder I and the rollers O O, of the cutting-cylinders P P', for separating the sheet transversely, the belts Q² and R, rollers Q and R', cylinders Q' and S', delivery-rollers T T', and fly-frame U, substantially as specified.

6. The combination, with the triangular inclined folder, of the rollers O O, for conveying along the doubled web of paper, the cutting-cylinders P P', for separating the sheets transversely, and a cutter for separating the web of paper longitudinally, substantially as set forth.

7. The combination, with the rollers O O and cutting-cylinders P P', of the tapes or belts Q² Q³, passing off in opposite directions, and the pairs of rollers for such belts, substantially as set forth.

Signed by me this 22d day of October, A.D. 1885.

WALTER SCOTT.

Witnesses:

GEO. T. PINCKNEY,

WALLACE L. SERRELL.