

(No Model.)

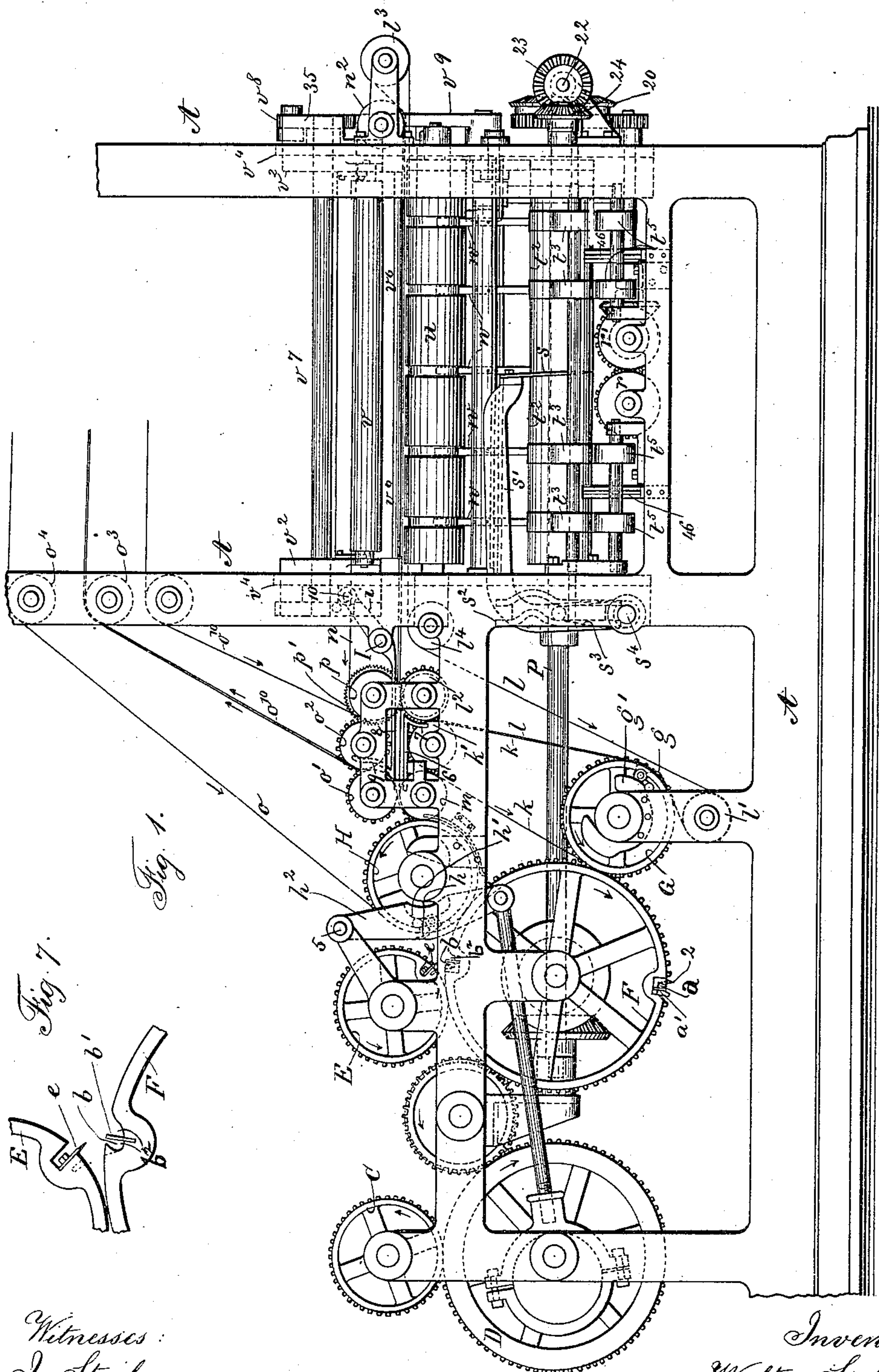
3 Sheets—Sheet 1.

W. SCOTT.

SHEET DELIVERY APPARATUS FOR PRINTING PRESSES.

No. 316,189.

Patented Apr. 21, 1885.



Witnesses:
J. Stail
Chas. H. Smith

Inventor
Walter Scott
per Lemuel W. Russell atty

(No Model.)

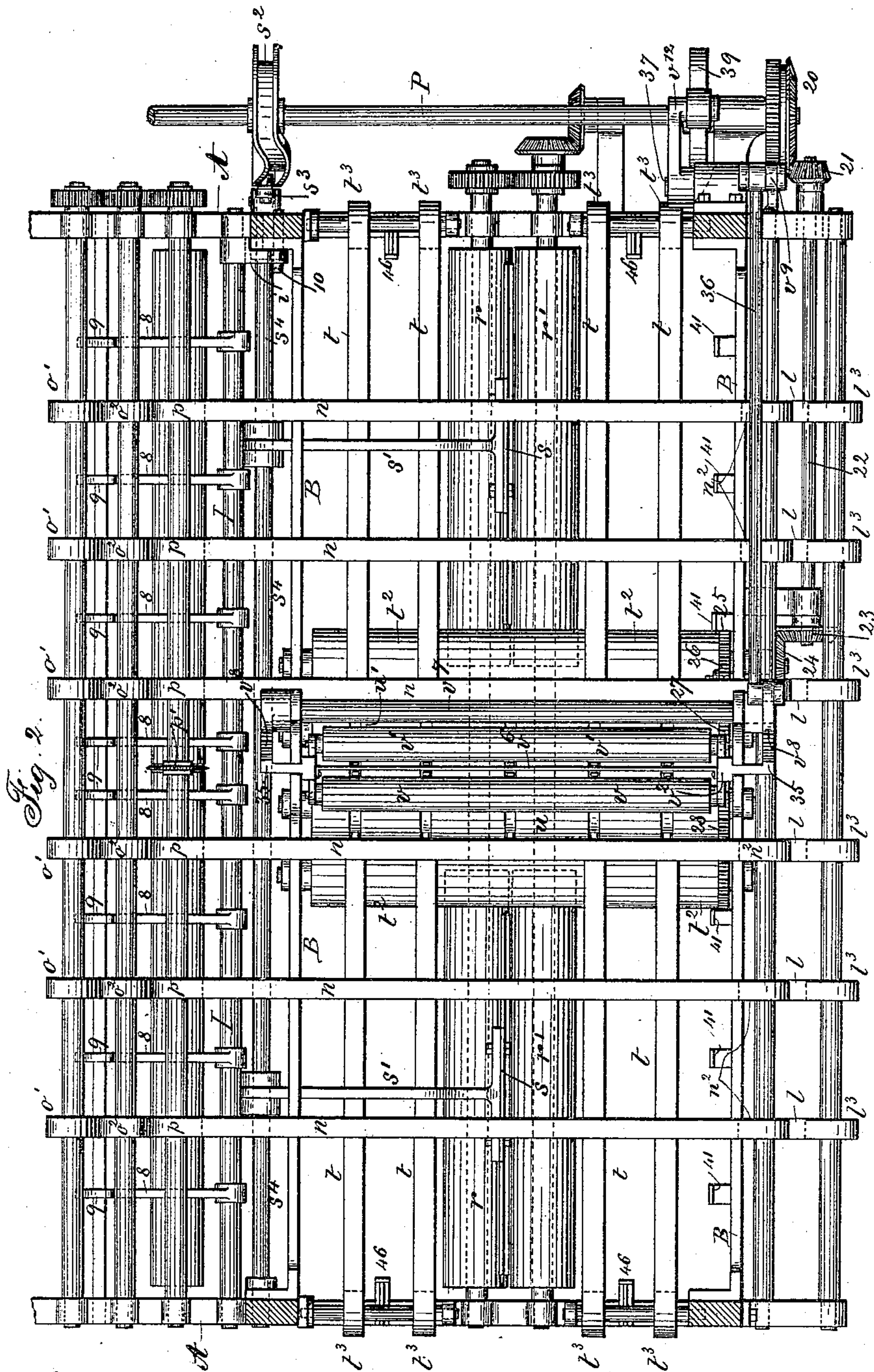
3 Sheets—Sheet 2.

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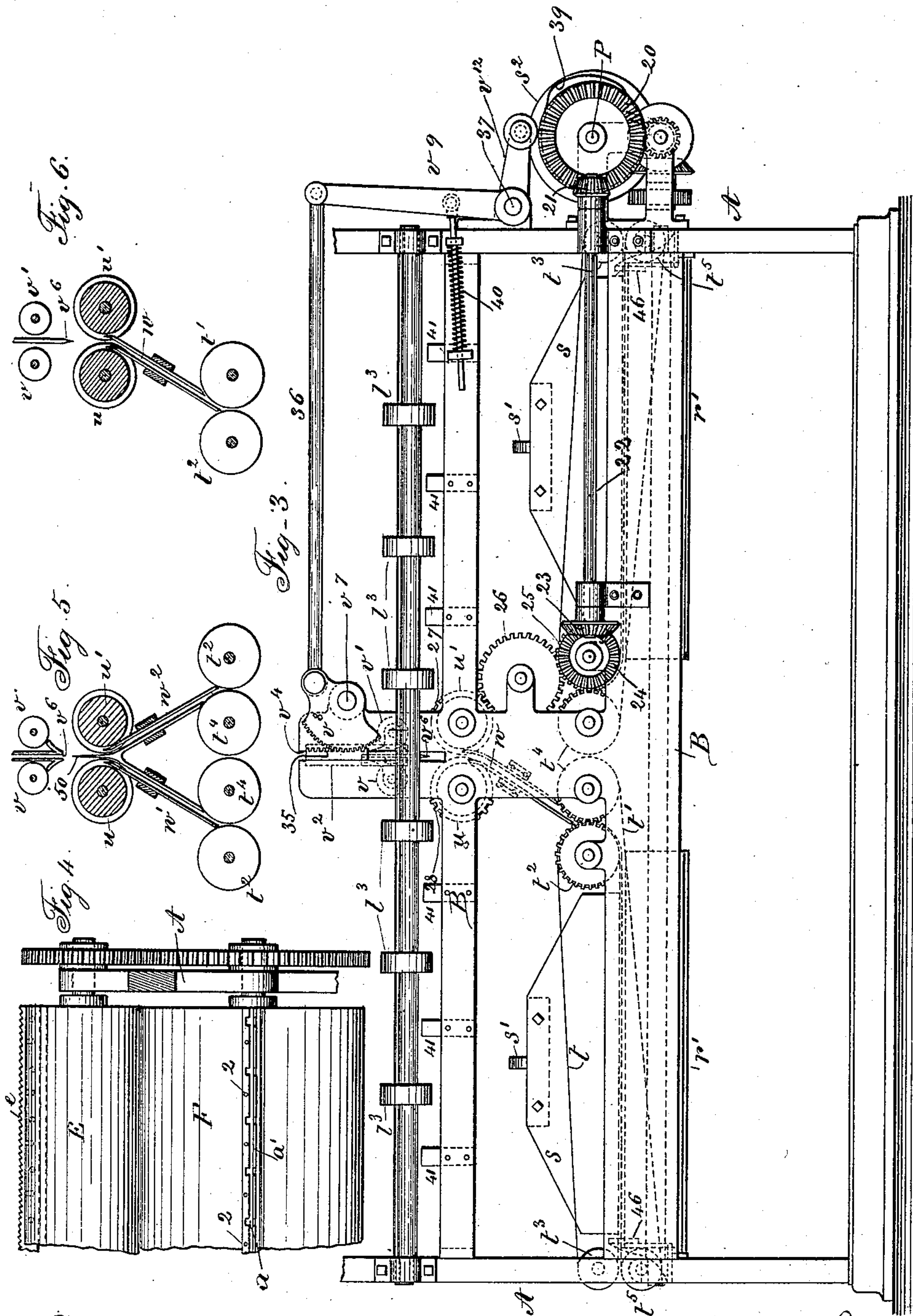
3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

SHEET-DELIVERY APPARATUS FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 316,189, dated April 21, 1885.

Application filed February 5, 1884. (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 Sheet-Delivering Apparatus for Printing-Presses, of which the following is a specification.

This invention is made for separating the printed sheets from a web of paper and delivering them in such a manner that the first sheet is taken off at one place and the second sheet at another place, and the distance that the first sheet has to travel is such that when its advancing end reaches a given point the advancing end of the second sheet will have arrived at the same point, and the two sheets will be laid one upon the other, and so carried to the folding and delivery mechanism. I also provide a cutter, which separates the two sheets longitudinally, and combine with the same delivery mechanism that directs the double sheets upon each other, so as to carry four cut sheets laid on each other to the folding mechanism or to deliver such cut sheets laid one on the other, two to one folding mechanism and two to another folding mechanism. By this means newspapers especially can be cut and laid together in the proper manner previous to the folding and delivery of the same.

In the drawings, Figure 1 is a side elevation of the apparatus. Fig. 2 is a plan view of the folding apparatus and the devices for carrying the sheets into the same. Fig. 3 is an elevation of the end of the folding apparatus. Fig. 4 represents the cutting-cylinders near one end. Fig. 5 is a section of the delivering rollers and guides to deliver the sheets in opposite directions, and Fig. 6 is a section of same with guide to deliver the double sheets upon each other in one direction.

The frame-work A B is of any suitable character for receiving the cylinders and other parts hereinafter described. The cylinder C represents the type or printing cylinder, and the cylinder D the impression-cylinder.

The paper, after being printed in any desired manner upon the web, is brought to the cutting-cylinders E F. The cylinder E con-

tains the cutter *e* with a serrated edge to separate the paper in any desired manner. The cylinder F is twice the diameter of the cylinder E, and contains two slots, *a b*, into which the cutter *e* passes in separating the sheets. At these slots *a* and *b* are transverse notches, as shown in Fig. 4, that allow the grippers *g h* upon the respective cylinders G H to pass in and catch the advancing end of the respective sheets and grasp the same and convey the said sheets away. The cylinders G and H are the same diameter as the cylinder E, and the grippers on the respective cylinders G H are so placed and actuated that the advancing end of the first sheet is carried around by the pins 2 to the grippers *g* on the cylinder G, and taken off by such grippers and cylinder. The advancing end of the second sheet is taken by the grippers *h* of the cylinder H. The grippers are closed by springs, as usual. The cam *g'* will open the grippers as they come around each revolution and allow them to close at the proper time. They, however, will not grasp a sheet each time, as one sheet is carried off by the grippers *h* before reaching the grippers *g*. It is necessary, however, to open the grippers *h* only every second revolution, to effect which I employ a cam, *h'*, upon a lever, *h''*, pivoted at 5 and moved by an eccentric upon the shaft of the cylinder D, so as to be brought into the path of the wrist or crank of the grippers every second rotation of the cylinder H.

There are belts *k* around the cylinder G, passing over the roller *k'*; also belts *l* passing under the roller *l'*, over *l''*, along horizontally to the roller *n''*, up over the roller *l'''*, down and along horizontally and over the roller *l''''*, and down to the roller *l'*. There are also belts *o* around the cylinder H, over the roller *m*, under the roller *o'*, over the rollers *o'' o'''*, and back over the roller *o''''* to H. There is also a roller, *p*, with a central cutter, *p'*, acting in a central peripheral groove in the roller *l''* to slit up longitudinally the paper that is carried through between the rollers *l''* and *p*. There are also belts *n* around the roller *p*, extending to and passing around the roller *n''*. It is to be understood that these respective

belt-rollers may be full and parallel-sided rollers, or they may be pulleys, as shown, in the places where the belts are to come, and that these pulleys and belts may be closer together or farther apart or more or less numerous than shown.

There is a guide-mouth for the paper, composed of the bars 6, with curved ends 7, which are stationary in the positions shown, and the bars 8, having curved ends 9, which bars are supported by the cross-shaft I, which is provided with a holding crank-arm, *i*, and a pin, 10, which may be entered into one of the two holes shown. When entered into the lowest hole the bars 8 will be sustained horizontally and parallel with the bars 6. When the pin 10 is entered in the upper hole the bars 8 will be inclined so that their ends 9 come near to or in contact with the bars 6.

From the foregoing description it will be understood that when the parts are in the positions shown in Fig. 1 the sheet that is held by the pins 2 passes on until it arrives at the grippers *g*, and by them it is taken and carried around to the belt *l*. Here the grippers are opened, and the sheet is taken by the belts *k* and *l* up to the cylinder or roller *l'*, and at the same moment that the advancing edge of this first sheet reaches these rollers *p* and *l'* the advancing edge of the second sheet reaches the same place, and one sheet is laid on the other, and the two are carried on together between the belts *l* and *n*, and as they go forward the rotary cutter *p'* separates such two sheets longitudinally.

Upon reference to Figs. 1, 4, and 7 it will be seen that the groove at *b*² in the cylinder F is made wider than usual in female cutting-cylinders, the object being to allow the grippers *h* of the cylinder H to bend down without injuring the back end of the first sheet sufficiently to get under and grasp the advancing end of the second sheet. If this alone were made use of, the cutter itself might press the paper down into the groove without cutting it. I therefore introduce in the groove *b*² of the cylinder F the standing blade *b'*, of sheet metal, which supports the paper while being cut, the knife *e* passing in behind such blade *b'* into the narrow part *b* of the groove. This is shown more clearly in the detached and enlarged view, Fig. 7. This blade *b'* is notched the same as the blade *a'* (shown in Fig. 4) at the places where the gripper-fingers *h* pass along to run under the edge of the sheet in grasping the same.

It is to be understood that one of the grooves in the cylinder F is provided with pins 2, that hold the advancing end of one sheet, and that there are no pins at the other groove, because the advancing end of the other sheet has to be taken off by the gripper upon the cylinder H.

The second sheet in reaching the rollers *l'* and *p* has been carried by the grippers *h* around to the roller *m*, and there liberated and taken by the tapes *o* over the roller *m*, under

the roller *o'*, and projected along over the bars 6 and below the bars 8 to such rollers *l'* and *p*; but if the bars 8 are moved, as aforesaid, so that the curved ends 9 rest upon the bars 6, said curved ends 9 will deflect the advancing end of the sheet upwardly, and it will be taken off between the belts *o* and *o'* and over the roller *o'*, and horizontally to second delivery apparatus, (not shown in the drawings,) but which is similar to the devices hereinafter described with reference to the sheet as it is conveyed off between the belts *l* and *n*.

The folding-cylinders *r r'* are similar to those in any ordinary folding-machine, and the folding-blade *s* is upon an arm, *s'*, which receives motion at the proper time from the cam *s*², lever *s*³, and rock-shaft *s*⁴, upon which the arm *s'* is affixed.

t t' are belts passing around the respective pulleys *t*², *t*³, *t*⁴, and *t*⁵, and these convey the sheet along above the rollers *r r'* and beneath the creaser *s*. These parts also are similar to those used in ordinary folding-machines, and therefore do not require further description; and I remark that after the sheets have been folded by the blade *s* and cylinders *r r'* they may be folded a second time, if desired, by the usual means.

One of the features of my present invention relates to the peculiar mechanism that intervenes between the belts *l* and *n* and the folder, whereby the sheets are directed to the folders.

There are two cylinders, *u u'*, below the belts *l* and *n*. These receive a constant rotation from the shaft P through the bevel-gears 20 21, shaft 22, bevel-gears 23 24, and gears 25 26 27 28, or by any other suitable gearing. Above these cylinders *u u'* there are the two rollers *v v'* in frames *v*², that are guided at their ends in vertical slides *v*⁴, and between them is a blade or director, *v*⁶, which is fixed in the frame, and may be a single blade, as seen in Fig. 6, or a two-part director, as seen in Fig. 5.

Upon the frame *v*² there are rack-teeth 35, and upon the rock-shaft *v*⁷ there are segmental gears *v*⁸, the teeth of which gear with the rack 35, and to one of the gears *v*⁸ a rod, 36, is connected to a lever, *v*⁹, upon the rock-shaft 37, and upon the shaft P there is a cam, 39, that gives motion to the frame *v*² through the arm *v*¹², rock-shaft 37, lever *v*⁹, rod 36, segments *v*⁸, rock-shaft *v*⁷, and racks 35, to raise and lower such frame, rollers, and blade, and the cam is shaped so as to give the motions at the proper time, and such cam may be grooved; or there may be a spring, 40, to press the lever *v*⁹ to the cam 39.

The sheets of paper, divided up longitudinally by the cutter *p'*, pass along upon and between the belts *l* and *n*, and the advancing edges are arrested against the fence 41. The sheets are either single or double, as before described. The longitudinal separation comes directly beneath the blade *v*⁶, and the sheets are below the rollers *v v'* and above the roll-

ers $u u'$; and these latter rollers $u u'$ are revolving constantly; hence when the frame v^2 , rollers $v v'$, and blade v^6 are carried down by the sectors v^8 the blade v^6 passes down and bends the adjacent edges of the sheets downwardly between the rollers $u u'$, and the moment the rollers $v v'$ press the sheets upon the rollers $u u'$ the rotation of the latter causes the sheets to be carried down between the two rollers $u u'$.

The fences 41 aid in rendering the folding accurate. However, they may be dispensed with if the creasers and drop-rollers are accurately timed to act upon the sheets.

If a single guide-mouth, w , formed of sheet metal or bars, is made use of, as shown in Figs. 3 and 6, then one sheet is laid against the other, and the two or four sheets are laid one upon the other as they pass down between $u u'$ and $t^2 t^4$ and off between the belts $t t'$ and beneath the folding creaser or blade s . Their movement is stopped by a fence at 46, and the creaser s is brought down to carry the sheets down between the rollers $r r'$ to give to them the additional fold.

If the two-part mouth $w' w^2$, composed of sheet metal or bars, as shown in Fig. 5, is made use of, the two-part blade or director v^6 (shown also in Fig. 5) is adapted to pass down at each side of the central divider, 50, and carry the edges of the sheets downwardly, and cause them to be conveyed through the mouths w' and w^2 to the respective sets of belts which carry the sheets out in opposite directions to the respective folding-machines.

If the sheets are to be pasted together at the line of the fold, a wheel may be employed to apply such paste at the proper place, as in folding-machines.

By this construction and arrangement of sheet-delivering apparatus the sheets may be conveyed away separately to folding-machines, or one sheet may be laid upon the other previous to arriving at the folding-machine, and also the sheets, whether single or double, can be conveyed away to the folders either separately, or one sheet or one pair of sheets laid upon the other sheet or pair of sheets, and conveyed away together to the folder or folders. This gives to my delivery apparatus a capacity to adapt the machine to newspaper-work, or to the printing of books or other matters where the sheets are separately folded and delivered.

I remark that, where the press is not of a width to require the use of the cutter p' to separate the sheets longitudinally, the cylinders and grippers may be employed exactly as described to bring the second sheet directly upon the first sheet, so as to carry them in this condition to the folding-machine. If the cutter p' is removed, the single sheet, or the two sheets when laid one on the other, will pass along below the drop-rollers $v v'$, and the blade or director v^6 will act with the rollers v

v' to carry the single or double sheet down between the rollers $u u'$ and fold the same, and the guides w convey the sheet to the other folding appliances, as before.

When the tapes $o o^{10}$ are not used, the tapes n should be carried back and pass around the roller o' . In this case the guide-bars 8 will not be required, and the roller p may be dispensed with.

I claim as my invention—

1. The combination, in a rotary printing-press, of the cutting cylinders E and F, the cylinders G and H, the grippers $g h$, the belts $l k$, and rollers $o' m p l' k' l^2 l^4 l^3$, whereby the second sheet is laid upon the first sheet and the two sheets are delivered through the rollers l^2 and p , substantially as set forth.

2. The combination, in a sheet-delivery apparatus, of the cutting-cylinders E and F, the latter being twice the diameter of the former, and provided with sheet-holding devices, such as the pins 2, adjacent to the slot a , the grippers and cylinders G H, and the belts and rollers for conveying the sheets and laying one upon the other, substantially as set forth.

3. The combination, with the cylinder E and cutter e , of the the cylinder F, of twice the diameter of the cylinder E, and provided with two openings into which the cutter passes in cutting the sheets, and the sheet-holding pins 2, and the supporting-blade b' , notched for the grippers, substantially as set forth.

4. The combination, with the cutting-cylinders E and F, of the grippers $g h$ and their cylinders G and H, the belts or tapes, the rollers $o' m p l^2$, the guide-bars 6 8, one of which is movable to deflect or to guide one of the sheets, substantially as set forth.

5. The combination, with the cutting-cylinders, of the grippers and their cylinders and belts for conveying away the sheets, and the rollers p and l^2 , and the cutter p' for separating the sheets longitudinally, substantially as specified.

6. The combination, with the rollers u and u' and blade v^6 , in a sheet-folding mechanism, of the rollers $v v'$, the guides w , the rack 35, the sectors v^8 , and mechanism, substantially as specified, for giving motion to the same, substantially as set forth.

7. The combination, with the cutter p' , of the rollers $u u'$, drop-rollers $v v'$, and director v^6 , substantially as and for the purposes set forth.

8. The combination, with a rotary printing-press for printing upon a web of paper, of cutters for separating the paper transversely and longitudinally, rollers and belts for presenting and laying the second sheet upon the first, and for laying the two pairs of cut sheets face to face and conveying the same to a folding-machine, substantially as specified.

9. The combination, with the rollers $u u'$, of the drop-rollers $v v'$, director v^6 , guides and conveying-rollers $t^2 t^4$ and belts, folding-blade s , and rollers $r r'$, substantially as set forth.

10. The combination, with the cutter p' , of the rollers $u u'$, drop-rollers $v v'$, director v^6 , and the guides, substantially as set forth.
11. The combination, with the rotary printing-cylinder, of the cutting-cylinders E F, cutter p' , rollers $u u'$, drop-rollers $v v'$, director v^6 , and guides, substantially as set forth.
12. The combination, with a rotary printing-press, of the cutting-cylinders E F, the cutter p' , the rollers $m o'$ and belts, the rollers $u u'$, drop-rollers $v v'$, director v^6 , and guides for directing the sheets, substantially as specified.

Signed by me this 2d day of February, A. D. 1884.

WALTER SCOTT.

Witnesses:

WILLIAM G. MOTT,
HAROLD SERRELL.