(No Model.) 2 Sheets—Sheet 1.

J. A. DEAR.

MECHANISM FOR CUTTING AND FEEDING PAPER FOR PRINTING MACHINES.

No. 414,299. Patented Nov. 5, 1889.

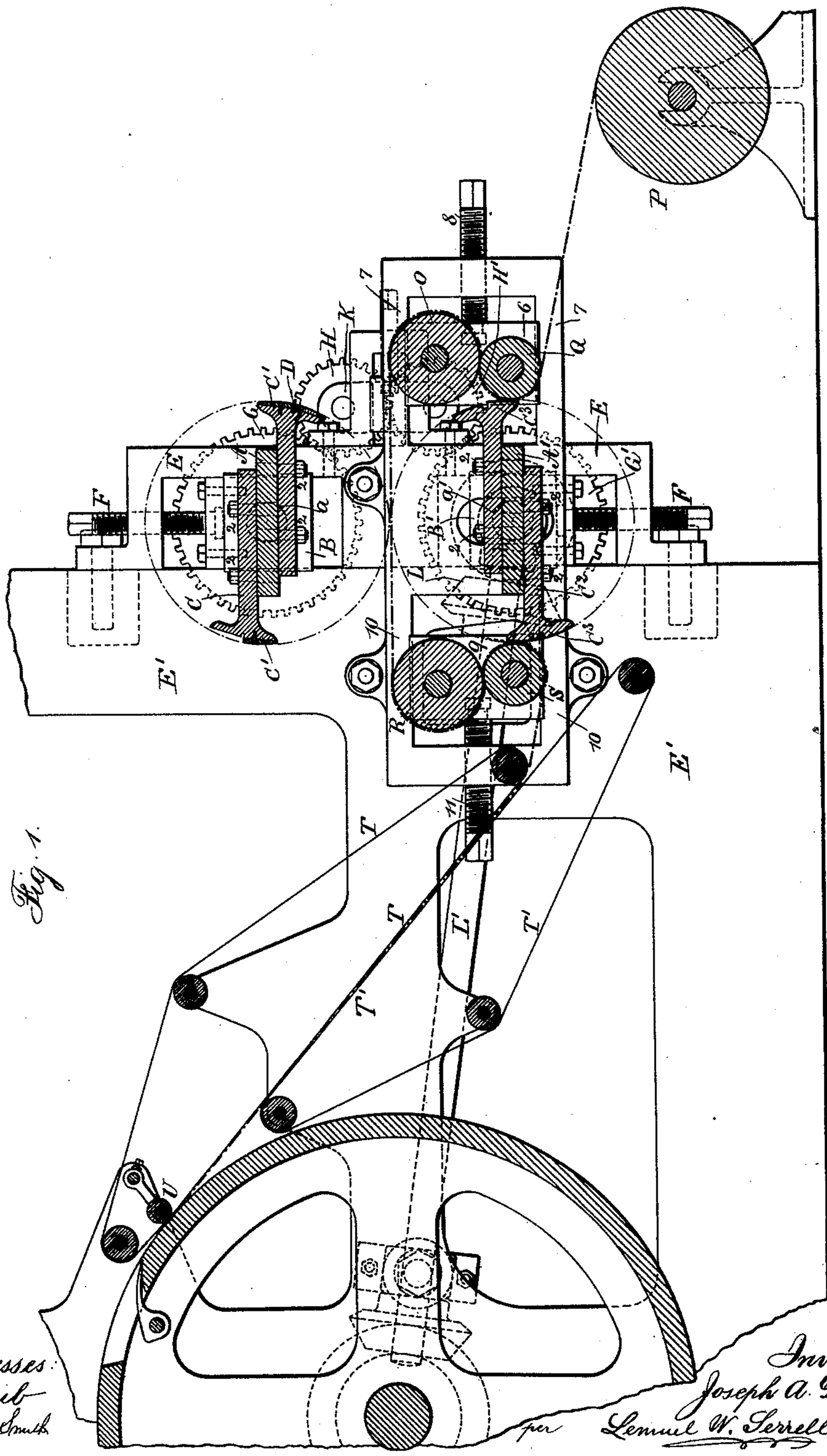


Fig. 1.

Witnesses:
J. Staib
Chas. H. Smith

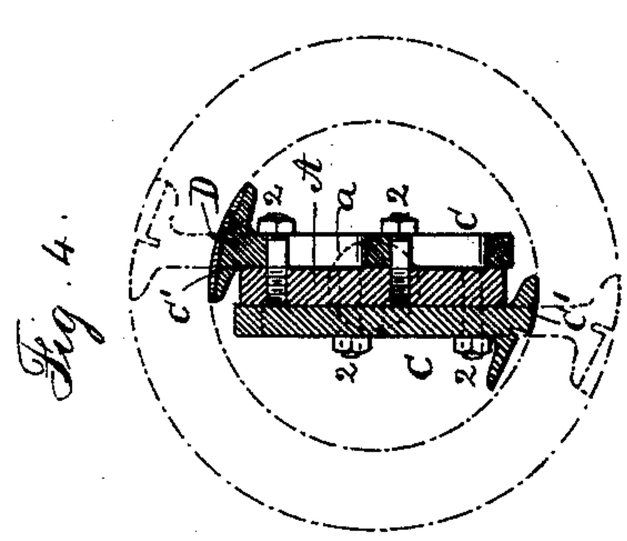
Inventor:
Joseph A. Dear
per Lemuel W. Serrell atty

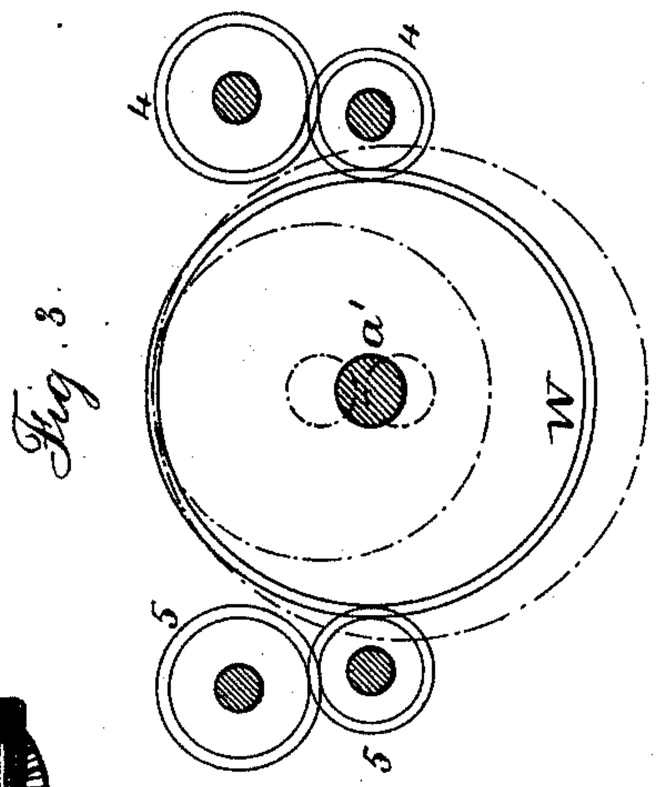
(No Model.) 2 Sheets—Sheet 2.

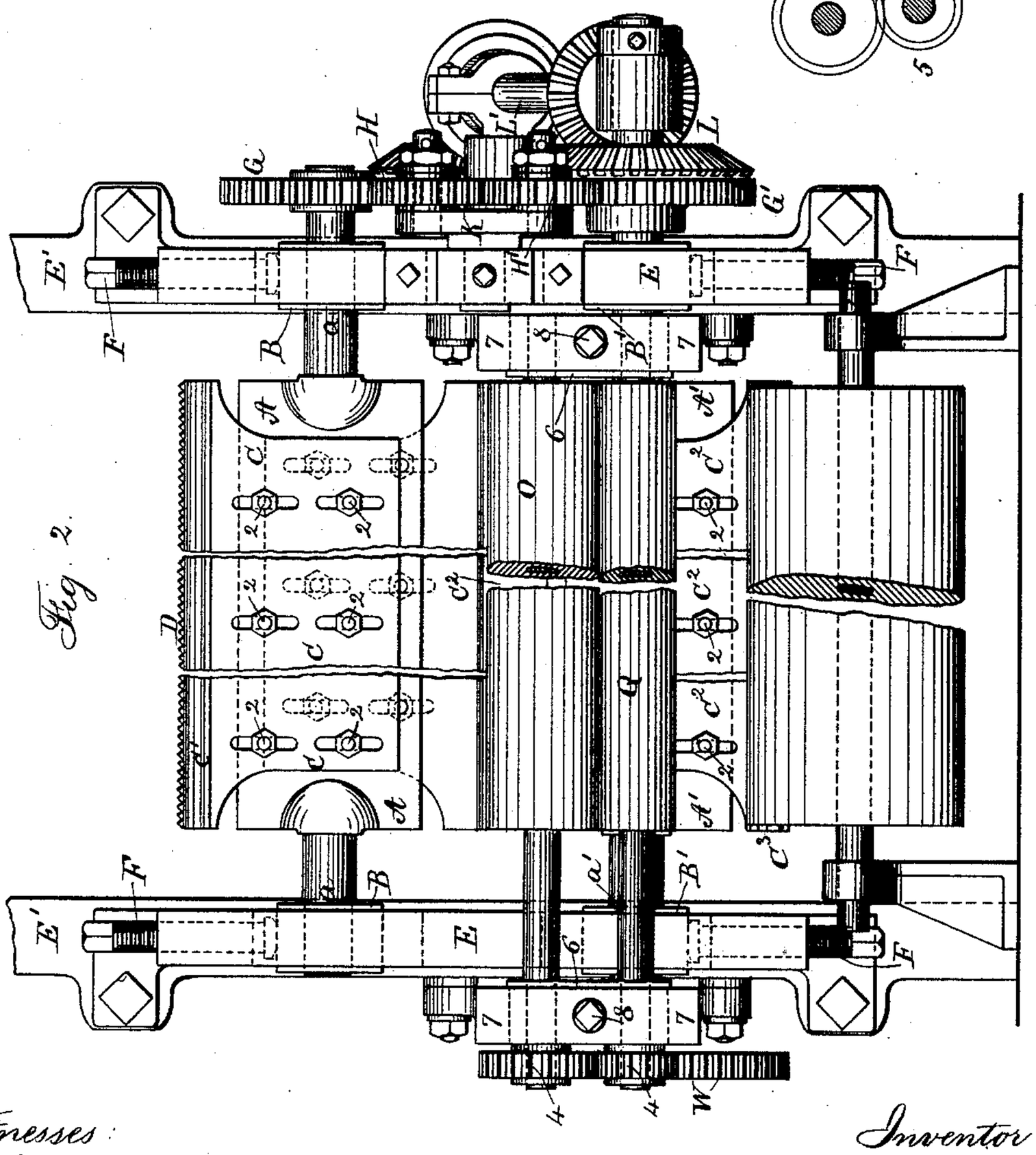
J. A. DEAR.

MECHANISM FOR CUTTING AND FEEDING PAPER FOR PRINTING MACHINES.

No. 414,299. Patented Nov. 5, 1889.







Witnesses:
J. Stair
Chas. H. Smith

Inventor:
Joseph A. Dear
per Lemuel W. Serrell atty

UNITED STATES PATENT OFFICE.

JOSEPH A. DEAR, OF JERSEY CITY, NEW JERSEY.

MECHANISM FOR CUTTING AND FEEDING PAPER FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 414,299, dated November 5, 1889.

Application filed January 17, 1887. Renewed January 30, 1889. Serial No. 298,143. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. DEAR, of Jersey City, in the county of Hudson and State of New Jersey, have invented an Improvement in Mechanism for Cutting and Feeding Paper for Printing-Machines, &c., of which the following is a specification.

My improvements are adapted to cutting the web of paper or other material into any desired lengths, so as to adapt the sheet to the book, job, or newspaper work done on a printing-press.

My present improvement relates to revolving cutters that can be expanded or contracted, so that the distance described by the cutter as it revolves may correspond to the length of sheet, and the paper is fed in by separate rollers that act at both sides of the rotary cutters, so that said cutters have nothing to do with the movement of the paper, and the paper is carried along by belts that act to pull one sheet away from the end of the web after such web has passed the feeding-rollers, so that the risk of the web becoming entirely separated until after it has passed into the machine is entirely avoided.

By my improvement I avoid the necessity of changing the cutting-cylinders, as heretofore usual, and allow for changes being made in the size of the sheet as often as necessary to suit particular jobs of work.

In the drawings, Figure 1 is a vertical section transversely to the revolving cutters and feeding-rollers. Fig. 2 is an end view of the feeding and cutting mechanism. Fig. 3 illustrates the gearing at one side of the press by a diagram, and Fig. 4 is a separate section of one of the skeleton cutting-cylinders.

The cutting devices are expansible, and each revolving portion is composed of a stock A, in the form of a plate, having at its end journals *a*, supported in suitable journal boxes or bearings B. Upon the opposite faces of the stock A are plates C, slotted transversely for the reception of clamping-bolts 2, and upon the outer edges of these plates C are cylindrical segments C′, and the cutter D is received into a longitudinal slot in one of these cylindrical segments, and it is secured in any known or desired manner, and it is preferably serrated upon its edge, so as to perforate the paper without entirely separating the same.

In consequence of the plates C being slotted for the clamping-bolts 2, the cutter can be placed at any desired distance from the axis of rotation, so that the path described by the cutter in each revolution will be the same length as the sheet of paper that is to be separated from the web or roll P.

The stock A′, journals *a*′, bearings B′, plates C^2, and segments C^3 correspond to those before described, except that a groove is provided in one of the cylindrical segments C^3, into which the cutter D passes, and the parts can be adjusted so that the length of travel of the slot or female cutter in each revolution corresponds to the length of paper, and these devices thus far described form what may be termed "expansible skeleton" cutting-cylinders.

The journal boxes or bearings B B′ of the expansible skeleton cutting-cylinders are received into supports or slides E upon the frame E′, and these bearings are adjusted nearer to or farther from each other by the screws F, that pass through the ends of the slides and act upon the journal-boxes to move them either up or down and to hold them in the positions to which they may be moved.

The journals or shafts *a a*′ are to be geared together, so as to revolve at the same speed. I prefer to employ the gear-wheels G G′ on the respective shafts *a a*′, and the intermediate gears H H′ upon gudgeons in an adjustable frame K, by means of which the intermediate gears can be brought properly into contact with the gears G G′ when the expansible skeleton cutting-cylinders are contracted and the shafts brought nearer together, or when they are expanded and the shafts moved farther apart.

I have shown bevel or miter gears L and a shaft L′ to connect the impression-cylinder with the expansible skeleton cutting-cylinders; but the driving-power for such cylinders may be derived from any suitable moving part of the press.

O and Q form a pair of forwarding-rollers, to draw the paper from the roll P and pass it between the expansible cutting-cylinders,

and R and S form a similar pair of rollers to draw the paper from between the cutting-cylinders and forward the same to the ranges of belts T T′. These belts and the rollers around which they pass are of any desired character or arrangement, and at U is a roller pressing the paper into contact with the surface of the impression-cylinder, so that as soon as the end of the sheet reaches the impression-cylinder its speed is accelerated and the sheet is separated from the web where the punctures or incisions have been made.

The speed of movement of the paper might be regulated by variable frictional gearing, but in order to secure a positive movement I prefer to use the pairs of rollers O and Q and R and S, caused to revolve by the pairs of gears 4 4 and 5 5, and the journals of the rollers O Q are in a box 6. Within the stationary slides 7 and 8 are adjusting-screws, and the journals of the rollers R S are in boxes 9. Within the slides 10 and 11 are adjusting-screws for the same, so that by these devices the pairs of rollers may be moved nearer to or farther from each other, and kept as near to the path of the female expansible cutting-cylinder as necessary, and the surface-speed of these pairs of rollers must be the same, or nearly so, as the speed of travel of the cutting-blade, and to render this entire motion positive I make use of a gear-wheel W upon the shaft a', which gear-wheel is changeable, so that with each change in the diameter of the skeleton cutting-cylinders a different wheel W will be applied to the shaft a', the pitch-line of said gear-wheel corresponding in size to the path described by the exterior of the cylindrical segments C^3, and this gear-wheel W engages the teeth of the gears 4 and 5 on the respective shafts of the rollers Q and S, so as to insure the proper direction of rotation of the respective parts.

Two cutters may be used on one expansible skeleton cylinder and the two grooves in the other of such cylinders when it is desired to cut the paper into short sheets.

I claim as my invention—

1. The expansible skeleton cutting-cylinder formed of a stock A, with journals a at the ends, plates C, slotted transversely, clamping-bolts 2, passing through the slots and holding the plates in position, cylindrical segments at the outer edges of the plates, and a cutter inserted into one of the cylindrical segments, in combination with rollers for supplying the paper and drawing the same along in the path of the cutter, substantially as set forth.

2. The combination of two rotating expansible skeleton cutting-cylinders, a cutter connected with one of said cylinders, supporting frames or slides, and adjustable bearings for supporting the cutting-cylinders and for adjusting them to conform to the diameter of the skeleton cutting-cylinders, substantially as set forth.

3. The combination of the skeleton expansible cutting-cylinders with the boxes and mechanism for adjusting the same, and with pairs of feed-rollers acting to bring the paper to the cutting-cylinders and to draw away the punctured paper, substantially as specified.

4. The combination, with the expansible skeleton cutting-cylinders and their adjustable journal-boxes, of a pair of feeding-rollers to bring the paper to the cutting-cylinders, a pair of rollers for drawing the paper away from the cutting-cylinders, gears to connect the respective pairs of rollers, and a changeable gear-wheel for connecting the feeding-rollers with the shaft of the female skeleton cutting-cylinder, substantially as specified.

5. The combination, with the printing mechanism in a press and the ranges of belts or tapes to convey the sheets to the same, of male and female expansible skeleton cutting-cylinders and pairs of movable rollers for drawing the paper along between the cutting-cylinders and for delivering such paper to the forwarding-belts, substantially as set forth.

6. The expansible skeleton cutting-cylinders geared together, in combination with rollers for supplying the web of material to be cut, and changeable gearing to render the movement of the material approximately the same as the speed of the cutter, substantially as set forth.

Signed by me this 5th day of January, A. D. 1887.

JOSEPH A. DEAR.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.