

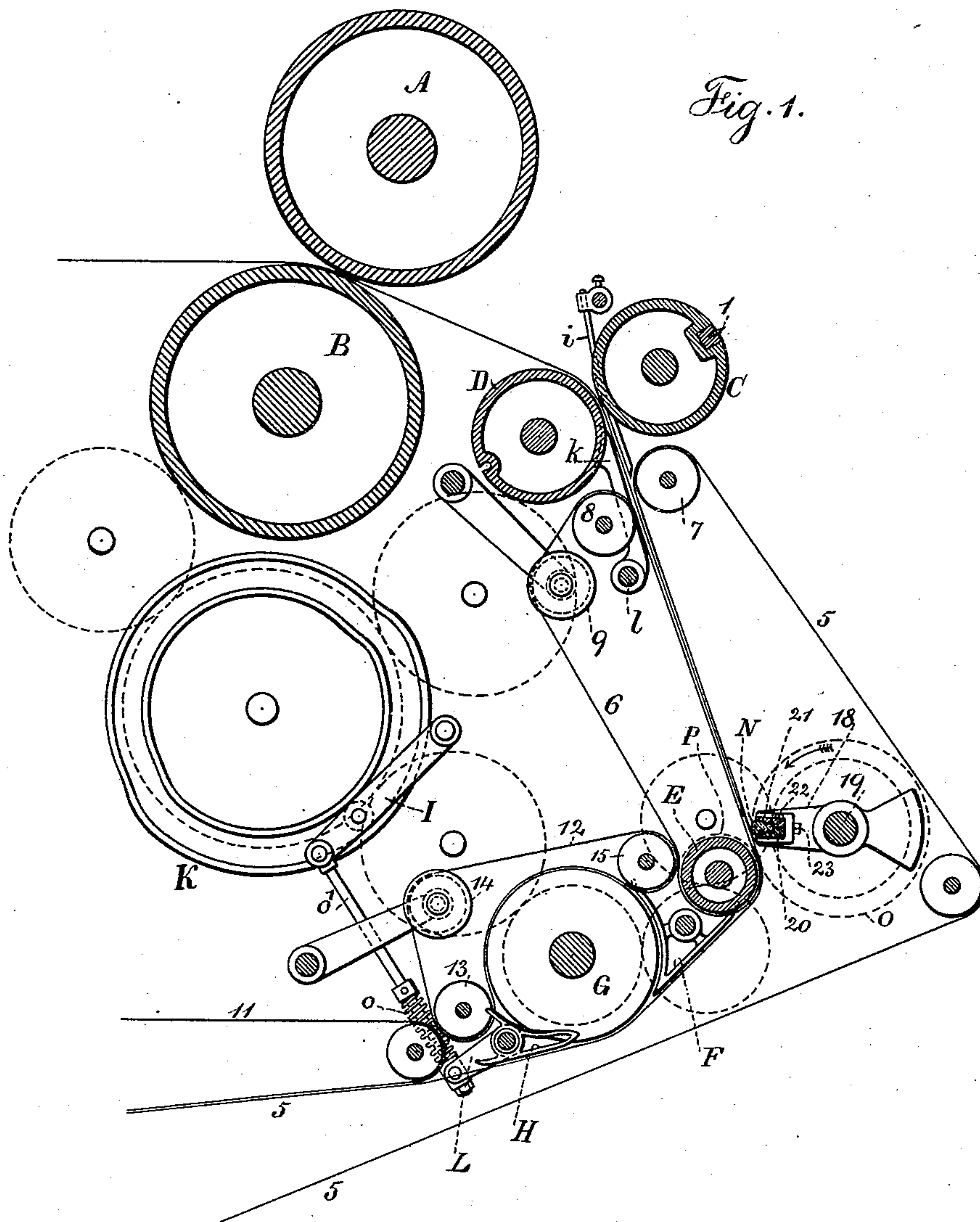
(No Model.)

3 Sheets—Sheet 1.

W. SCOTT.
SHEET DELIVERY MECHANISM.

No. 484,251.

Patented Oct. 11, 1892.



Witnesses:
J. Staib
Chas. Smith

Inventor:
Walter Scott
per Lemuel W. Serrell atty.

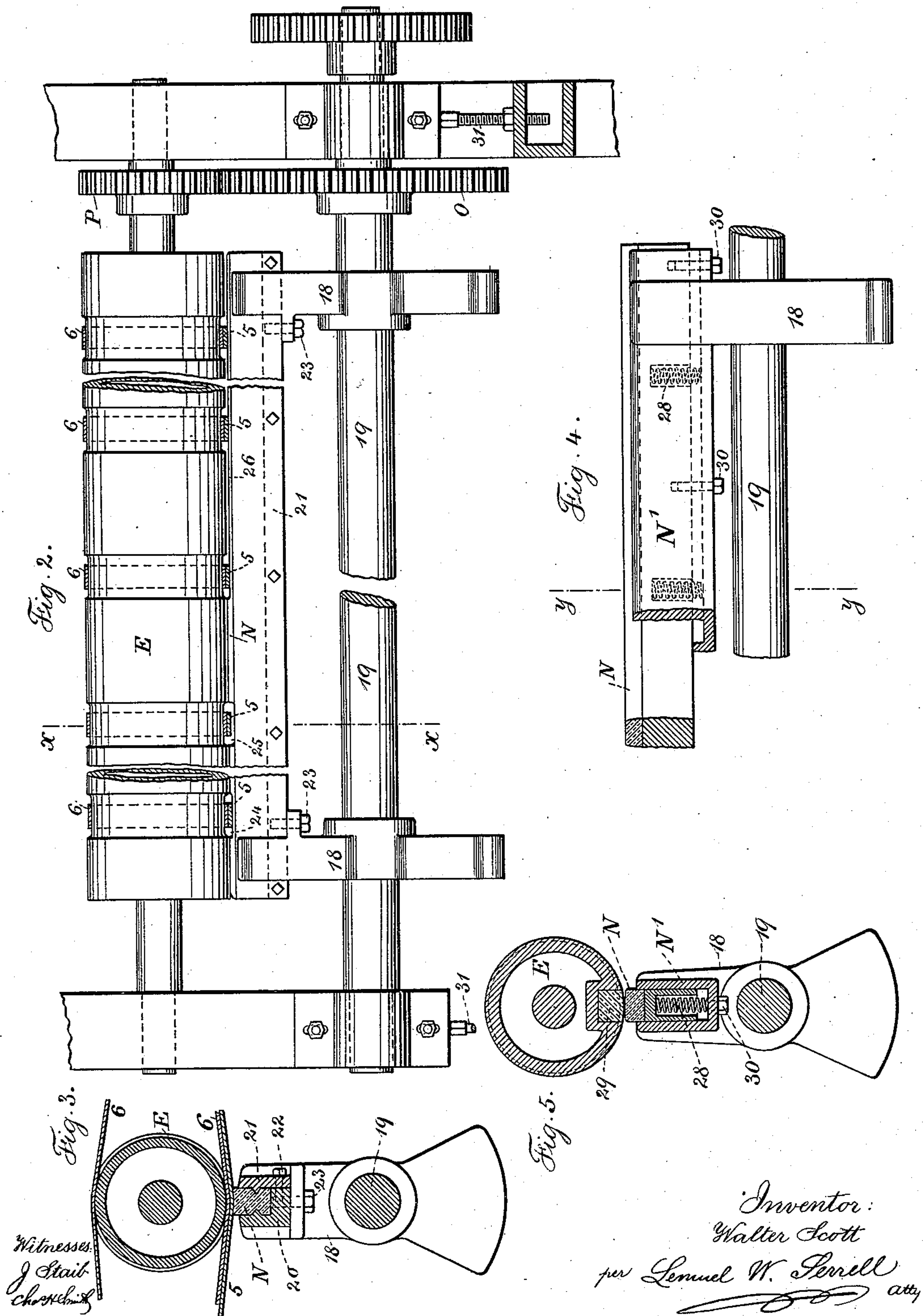
(No Model.)

3 Sheets—Sheet 2.

W. SCOTT.
SHEET DELIVERY MECHANISM.

No. 484,251.

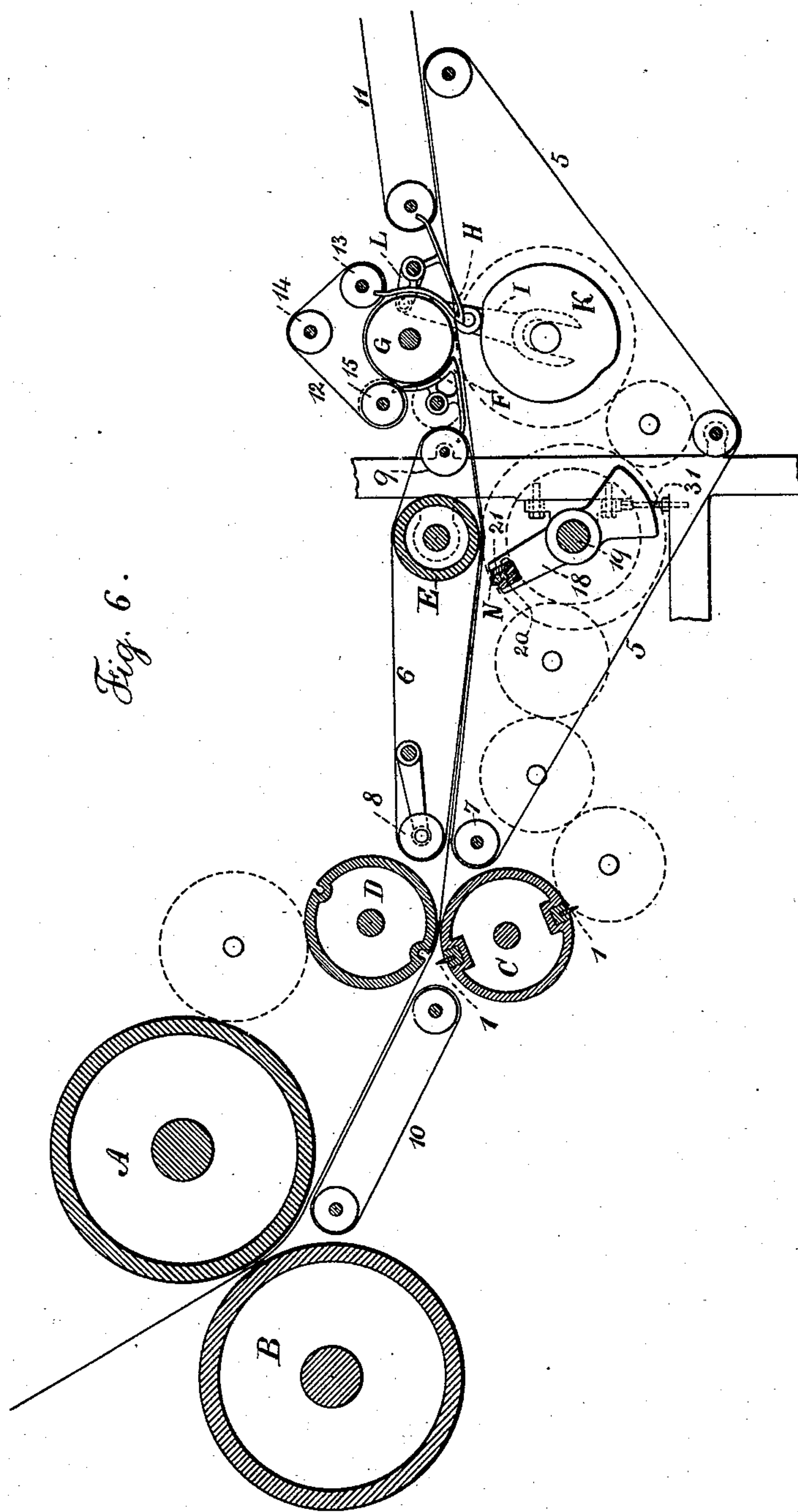
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3 Sheets—Sheet 3.

No. 484,251.

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UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

SHEET-DELIVERY MECHANISM.

SPECIFICATION forming part of Letters Patent No. 484,251, dated October 11, 1892.

Application filed May 1, 1891. Serial No. 391,288. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Sheet-Delivery Mechanism, of which the following is a specification.

In printing-presses it is usual to carry the sheets away between tapes or belts that pass around sets of rollers, and in many instances the paper is perforated transversely of the web to partially separate one sheet from another, and the separation is completed by a sudden pull upon the sheet at the proper place, and the pull in some instances has resulted from the advancing end of the sheet being firmly caught between the belts as they pass around one of the rolls. In practice I have found a difficulty resulting from the tape or belt intervening between the sheet and the roll, and this is especially the case with fine work upon comparatively-thin paper, because the paper does not lie smoothly upon the roll around which it passes, and in some instances the web or sheet of paper becomes buckled or creased under the action of the belts as they pass around the rolls and with the sheets between them.

One part of my present invention relates to the combination, with the range of tapes or belts, of a roll around which the tapes or belts pass, such roll being slightly grooved peripherally for each belt, in order that the surface of the belt and the surface of the roll may coincide and be of the same diameter. Hence a sheet of paper as it passes around such roll will lie smooth against the surface of the roll and will not be lifted at any place from such roll in consequence of the intervening belts, and I combine with the belts and the aforesaid roll a rotary breaker adapted to grip the paper firmly and at the proper time, so as not only to pull the sheet apart from the web on the line of the perforations, but also to give to the separated sheet a forward movement at the proper speed for reaching the grippers or other sheet-holding devices, and I provide a collecting-cylinder upon which two or more sheets may be collected and delivered as one product to the folding mechanism, or the sheets may be

passed by the collecting-cylinder directly to the folding devices without being collected.

In constructing my rotary breaker I prefer to employ a strip of rubber held in a suitable stock with the edge either straight or notched or recessed at the places where the breaker is adjacent to the belts or tapes, so that the breaking operation may be performed by the breaker acting upon the sheet independent of the belts, or upon the outer belt to press the sheet against the inner belt, and thereby cause the necessary tension and acceleration of the sheet to break the same. This edge of this breaker is either notched or plain, according to the character of the work that is being printed, and also according to whether the tapes or belts act only upon the margins or upon the printed portions of the paper. When the latter is the case, the breaker is preferably timed to operate upon the margins of the printed sheet only and not press upon the belts.

In the drawings, Figure 1 is a cross-section of the rolls and cylinders diagrammatically, and representing, also, the gearing for connecting the respective parts. Fig. 2 is an elevation representing the breaking-roll and breaking-bar and the connecting-gearing. Fig. 3 is a cross-section at the line *xx*, Fig. 2. Fig. 4 is a partial elevation of a modification in the shape of the breaking-bar. Fig. 5 is a cross-section of the same at the line *yy*, and Fig. 6 is a diagrammatic cross-section with the collecting-cylinder placed in a different position to the belts from that shown in Fig. 1.

The impression-cylinder A and type-cylinder B are of ordinary character, and the cylinders C and D are for perforating the paper transversely of the web. The perforators 1 are represented upon the cylinder C and the groove is shown as in the cylinder D. The web of paper passes from the impression and type cylinders through between the cutting-cylinders C and D. In Fig. 6 I have represented endless belts or tapes 10 for supporting the sheet as it passes to the cutting-cylinders.

The sets of endless tapes or belts 5 and 6 pass around the respective rollers 7, 8, and 9, and in Fig. 1 the sets of tapes 6 pass around

the breaker-roller E and the sheet is passed at an inclination beneath the guide-bars F to the collecting-cylinder G, and thence passes between the sets of tapes 11 and the sets of tapes 5 to the folding or other delivery device.

The switch H is moved by any suitable mechanism. I have shown a cam K and lever I with a connection to the crank-arm L upon the cross-shaft of the switch H, and there is a set of tapes 12 passing around the rollers 13 14 15 and in contact with the collecting-cylinder G. This construction of the guide-bars, switch, collecting-cylinder, belts, and rollers is well known, and it is to be understood that the switch H is moved into the position represented in Fig. 6 for directing the sheets successively to the surface of the collecting-cylinder G, and then when the switch is moved into the position shown in Fig. 1 the sheets are delivered from the collecting-cylinder as one product and pass off between the sets of belts 5 and 11.

I remark that the parts represented in Fig. 6 are the same as in Fig. 1, but their relative positions are changed.

One of the principal features of my present invention relates to the breaker-bar N, which is upon arms 18, extending from the shaft 19, and this breaker-bar is adjacent to the breaker-roll E, and the surface speed of this breaker-bar and the breaker-roll should coincide, or nearly so, and be faster than the surface speed of the perforating cylinder, so that after the web of paper has passed between the cylinders C D and is perforated transversely it passes between the sets of belts 5 and 6 and is carried along by them to the breaker-roller E, and the parts are so timed that the breaker-bar N nips the advancing end of the sheet by pressing the same toward the breaker-roller E, and these parts, having a more rapid movement than the perforating-cylinders, cause the separation of the sheets at the line of perforation by the accelerated movement.

The breaker-bar N is preferably made with a surface of rubber, and this is advantageously supported by the bars 20 and 21, between which the rubber is received and held by screws 22, and the rubber breaker-bar may be adjusted toward or from the roller E by the screws 23. I have represented the gear-wheels O and P for connecting the shaft 19 to the shaft of the breaker-roller E, so that these parts travel in unison.

It will be observed, especially in Fig. 1, that the sheet passes from one inclination to another and is bent around the breaker-roll E. If the roller E is cylindrical and smooth, the tapes 6 will project from its surface, and the sheet in passing around this breaker-roll is liable to become wrinkled and not to travel with accuracy. To avoid this difficulty, the breaker-roller E is slightly grooved peripherally sufficiently for the reception of the

tapes 6, so that the surfaces of the tapes coincide with the diameter of the roller, as represented in Fig. 2. Hence the sheet will pass with smoothness and accuracy around this breaker-roller E.

In some instances the breaker-bar N will have a flat or straight edge, as represented in Fig. 4, so as to act upon the entire surface across the sheet, and thereby nip the sheet and cause its separation from the web by the accelerated movement. In that instance the belts or tapes 5 will be pressed upon the sheet with the force due to the action of the breaker-bar; but with the better quality of printing the ink sometimes may be smeared by the pressure on the tapes or belts 5. I therefore prefer to notch or recess the face or edge of the breaker-bar, as seen at 24, and such notch may be the thickness of the belt 5, so that there will be the same pressure between the belts as between the breaking-roll and breaking-bar, or such breaker-bar may be notched deeper, as at 25, to prevent any pressure of the belts 5 upon the sheet, except that which is due to the tension of the belts. In some kinds of printing, where the part of the sheet has plate-work and a part type-work, it is preferable to allow the edge of the breaker-bar N to nip the end of the sheet upon the roll only.

If desired, the straight portion 26 of the breaker-bar may act upon the tapes only to nip the sheet at the tapes.

Where the breaker-bar is fitted into the stock N', as seen in Figs. 4 and 5, it may be pressed outwardly by springs 28, the strength of which determines the nipping or grasping action of the breaker-bar in seizing the sheet, and there may be a strip of rubber 29 in the breaker-roller E, as seen in Fig. 5, for the breaker-bar N to act upon in nipping the sheet.

The screws 30, that pass through the stock N' into the bottom part of the breaker-bar N, serve to limit the movement of the breaker-bar toward the breaker-roll, and by this adjustment the relative proximity of the bar to the roll can be accurately regulated, and in addition to this the journal-boxes of the shaft are connected to the frame by bolts passing through slots, and the adjusting-screws 31 are employed to move the boxes, the shaft, and the breaking-bar for regulating the action of the latter upon the sheet. It is to be understood that this breaker-bar may be made use of with a breaker-roll that is smooth instead of being recessed for the tapes.

I find it advantageous to make use of wires or bars i, that pass adjacent to the cutter-cylinder C, the knife being notched and the cylinder grooved where these bars are employed. These bars prevent injury to the sheets near the line of perforation by preventing the paper sticking upon the points of the perforators, and clearers k upon the cross-shaft l may be provided, the ends of the clearers be-

ing received into grooves in the cutting-cylinder D for insuring the proper passage of the sheet to the rolls 7 and 8 and the tapes carried by them. It will be observed that the cross-shaft to which one end of the wires *i* are connected being at the opposite side of the cutters to the tapes or belts 5 and 6 and their rolls 7 and 8, such rolls 7 and 8 can be placed contiguous to the cutters, and the cross-bar forming the supports for the wires *i* is out of the way both of the sheet and of the rollers for the belts, and the ends of the wires *i* can be contiguous to the rolls 7, so as to guide the sheet in between the belts.

15 In web-presses running at a rapid rate the sheets sometimes accumulate unduly upon the collecting-cylinder G and prevent the proper movement of the switch H, and to avoid injury to the parts under these circumstances I apply a spring *o* around the bar *o'*, that extends to the lever I of the cam K, that gives motion to the switch, and this cam K draws the switch away from the collecting-cylinder G by a positive motion; but the spring *o* yields when the switch H is pressed toward the collecting-cylinder G should there be any obstruction to the movement of such switch. Hence the parts are not broken.

I claim as my invention—

30 1. The combination, with mechanism for perforating the web transversely and tapes and rollers for forwarding the web, of a breaker-bar, a shaft and arms for carrying such breaker-bar, and gearing to drive the same at the same accelerated speed as the tapes and their rolls, substantially as set forth.

2. The combination, with mechanism for printing on a web and for perforating the same transversely, of tapes and a breaking-roll around which the tapes pass, such breaking-roll being peripherally recessed the thickness of the tapes which run in such recesses, and a breaker-bar, a shaft and arms carrying the same, and mechanism for revolving the shaft and giving to the breaker-bar an accelerated surface speed corresponding to that of the tapes for separating the sheets at the transverse perforations, substantially as set forth.

3. The combination, with mechanism for perforating the web transversely, of tapes and rolls for the same, one of which forms a breaking-roll and is recessed peripherally to correspond with and receive the tapes, and a breaker-bar and a revolving shaft carrying the same, such breaker-bar being recessed slightly in its operative surface and at places

corresponding to some of the tapes, substantially as set forth.

4. The combination, with perforating-cylinders, tapes for carrying a web forward, and means for accelerating the speed of the tapes, of a shaft rotating in unison with the perforating-cylinders, a breaking-roll over which the tapes and web pass, and a breaker-bar connected to and rotating with the shaft to press the tapes and web toward the breaking-roll for accelerating the speed of the paper to separate the sheet from the web, substantially as set forth.

5. The combination, in a sheet-delivery apparatus, of tapes for carrying the web forward, a revolving shaft, arms secured to and revolving with the shaft, the breaker-bar composed of the rubber and its clamping-bars and connected to the arms, and a roll against which the breaker-bar acts, substantially as set forth.

6. The combination, with the perforating mechanism and the breaker-roller and tapes, of a breaker-bar, a shaft and stock for holding the same, springs for pressing the breaker-bar outwardly, and adjusting-screws to limit the movement, substantially as set forth.

7. The combination, in a sheet-delivery apparatus, of tapes for carrying the web forward, a revolving shaft, adjustable bearings for the same, arms secured to and revolving with the shaft, and a breaker-bar having an elastic clamping-edge, and a roll against which the breaker-bar acts, substantially as set forth.

8. The combination, in a sheet-delivery apparatus, of a perforating mechanism, tapes for carrying the web forward, a breaker-roll, a revolving shaft and breaker-bar carried by such shaft and acting to nip the margin of the sheet between the roll and bar, substantially as set forth.

9. The combination, with the collecting-cylinder and belts for supplying sheets to the same, of a switch mechanism for moving the switch toward and from the collecting-cylinder, and a yielding connection between the switch and its actuating mechanism to prevent injury to the parts in cases where there is an obstruction to the movement of the switch toward the cylinder, substantially as set forth.

Signed by me this 28th day of April, 1891.

WALTER SCOTT.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.