

(No Model.)

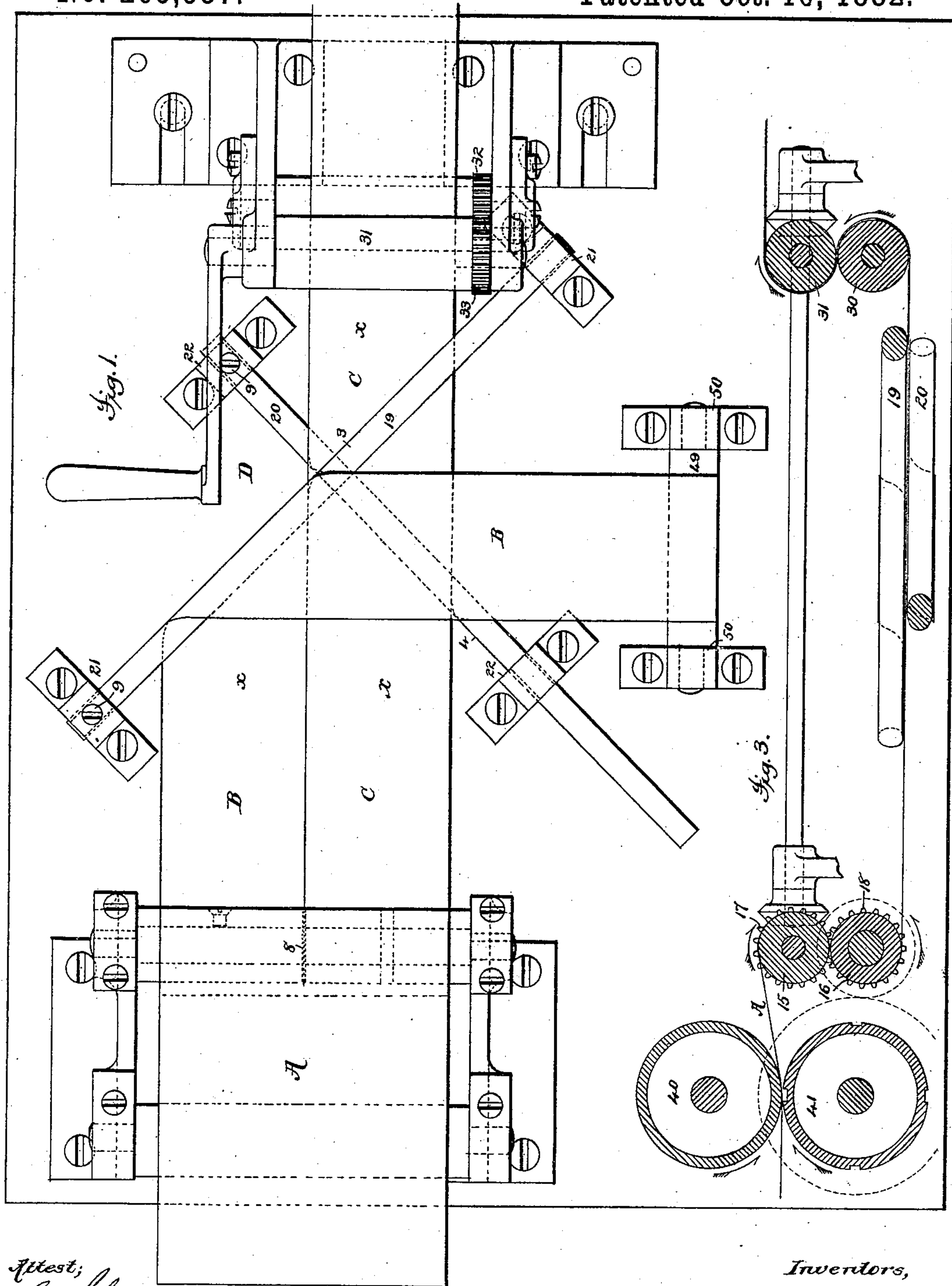
2 Sheets—Sheet 1.

E. ANTHONY & W. W. TAYLOR.

PRINTING MACHINE.

No. 265,557.

Patented Oct. 10, 1882.



Witness,  
*E. N. Graham*  
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Inventors,  
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by *Munson & Philipp*

*Atty.*

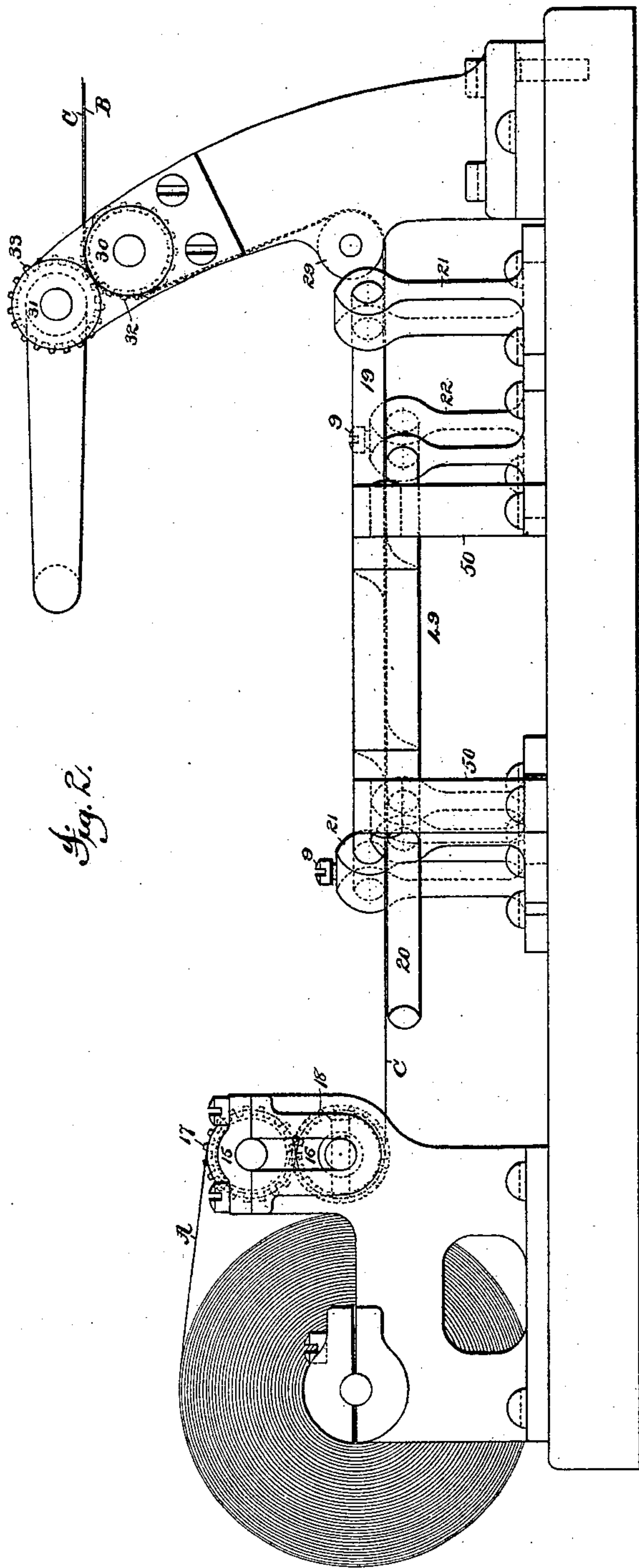
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*Fig. 2.*

Attest;  
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# UNITED STATES PATENT OFFICE.

EDWYN ANTHONY, OF HEREFORD, COUNTY OF HEREFORD, AND WILLIAM W. TAYLOR, OF RIPON, COUNTY OF YORK, ENGLAND, ASSIGNORS TO R. HOE & CO., OF NEW YORK, N. Y.

## PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 265,557, dated October 10, 1882.

Application filed July 11, 1881. (No model.) Patented in England August 31, 1875, No. 3,056.

*To all whom it may concern:*

Be it known that we, EDWYN ANTHONY, residing in Hereford, Hereford county, England, and WILLIAM WILBERFORCE TAYLOR, formerly residing in Cambridge, Cambridge county, and now residing in Ripon, county of York, England, subjects of the Queen of England, have invented certain new and useful Improvements in Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming part of the same.

Figure 1 illustrates by a plan view, Fig. 2 by a side elevation, an apparatus embodying these improvements, and Fig. 3 its arrangement with a printing-machine.

The purpose of this invention is the bringing together of two webs by transferring one laterally onto the other while both are running onward, so that the two associated webs may be simultaneously manipulated.

The invention consists principally in the use of a turner composed of two turning-bars which cross each other at right angles, each also crossing at an angle the plane widthwise, in which a web runs, and a returning-roller, which operates as a means for returning one web after it has passed one bar to direct it properly to the second bar, which devices operate in connection with two webs running side by side in the same plane, and to turn over one web, transfer it laterally, so as to direct it over its companion web, and thus associate the two webs, so that they may be further manipulated as a single web. Combinations of other devices with such a turner are embraced in the improvements, as will more fully hereinafter appear.

It may be premised that these improvements are more especially adapted for use in connection with a printing-machine where a wide web is printed upon both its sides and requires to be folded, its primary fold being longitudinal or parallel with its direction of travel; but, as will be apparent, the improvements may be applied to any machine from which is delivered a wide fabric that requires to be divided longitudinally into two webs and said webs associated together.

The apparatus illustrated in the drawings, which show a simple embodiment of the invention, is constructed as follows:

A pair of rollers, 15 16, geared together to run in unison by wheels 17 18, are mounted to turn in a suitable frame-work. The rollers are of a length suited to the width of the web A, or to that of two webs, B C, running side by side through them. At a suitable point in front of these rollers a turner, D, is fixed. This turner consists, as shown, of two bars, 19 20, that are mounted in standards 21 22, in which they are fixed by set-screws 9, which bars are disposed so that their turning surfaces shall suit the plane in which the upper surface of the webs run, and so that their edges 3 4 shall be at complement angles to each other. Each turning-bar must cross the plane in which the web that is to pass over it runs at an angle diverging from the axis of the roller 15 or 16, and this angle may be greatly varied. One at forty-five degrees is preferable, since it causes the turning-bars 19 20 to stand at right angles to each other and enables the returning-roller 49 to lie parallel with the run of the webs from the rollers 15 16 to the turning-bars. In cross-section these bars may be elliptical or circular, or otherwise shaped to present rounded surfaces. The bars 19 20 should have only sufficient space between them vertically to allow the web to pass easily. Thus the under surface of the bar 19 must be flush with the upper surface of the web and the under surface of the bar 20 flush with the under surface of the web. The size and angle of relation of the turning-bars may be varied to a considerable degree, the calculations for which may be made according to the methods laid down in Patent No. 212,880.

The returning-roller 49 is in this case placed at a suitable distance on one side of the apparatus, to enable it to receive the web without interference with the turning-bars, said roller 49 being mounted at a right angle to the rollers 15 16 in suitable standards, 50.

A guiding-roller, 29, and a set of delivery-rollers, 30 31, are mounted to turn in suitable bearings at the delivery end of the machine, the rollers 30 31 being geared together to run



in unison by toothed wheels 32 33, and provided with a means for driving them so that they operate to draw the webs through the machine.

5 It is manifest that the rollers 15 16 may, when made of proper size, operate as the impression-cylinders of a printing-machine, suitable type-cylinders supplied with inking and other appropriate mechanisms being arranged  
10 to coact with them, as in the well-known Walter, Hoe, and other web-printing machines, so that it is to be understood that the rollers 15 16 represent herein web-conducting rollers or cylinders, from which the web, whether printed or not, passes to the turner, as is described  
15 and illustrated in a companion application.

The rollers 30 31, by being placed at the proper height, may receive the webs direct, and thus enable the roller 29 to be dispensed with,  
20 and from these rollers the associated webs B C may be cut into sheets and led to a fly; or they may be led to a folding or other sheet-delivery apparatus that is provided with or has combined with it a transverse cutting mechanism.  
25

A device consisting of the cutting-disk 8, mounted on roller 16 and cutting upon the surface of the roller 15 or into a slot with which it is provided, operates to slit the web A in its  
30 central line, and thus divides it to form the two webs B C. This cutting device may of course be independent of the rollers 15 16 and operate upon the web before or after it passes between such rollers; or the two webs B C may  
35 be separate webs and fed to the apparatus side by side, as shown. The web A is passed through the rollers 15 16 and divided by the cutter 8 into two webs, B C, or said webs are led between such rollers. The web B is bent  
40 over the turning-bar 19, led out over the web C at a right angle to the travel of the latter, and, passing over the returning-roller, is bent up over the turner 20, and thence passes onward under the web C, the two webs being led  
45 under roller 29 and entering between the delivery-rollers 30 31. The web C thus passes directly through the apparatus in a right line, but the web B is turned over in being carried over the bars 19 20 and shifted laterally a distance equal to its width, and thus, starting  
50 with its *x*-surface uppermost, passes the turners with its *o*-surface uppermost, the surfaces of the two webs thus being laid upon each other, their *x*-sides being outermost. The web  
55 B is thus turned over three times and finishes underneath the web C. The two webs associated in this manner may be operated upon simultaneously by a cutting, folding, flying, or other delivery mechanism, as has been explained. This operation is tantamount to imparting one longitudinal fold to a single wide  
60 web, as A, as in doubling it upon itself. Such folding as accomplished by the turner D makes a product of two sheets cut apart on what is

commonly a folded edge, and greatly facilitates 65 the use of a product that is to be book-like in its structure.

From the above description it is apparent that the webs may travel with like surface speed, one be turned over and transferred laterally, and the two associated together within 70 the vertical space of one web at high speed and on the run, which speed will be equal to that of any mechanism operating upon or producing the webs.

75 It is not essential that the rollers 15 16 should form any part of the printing-machine, as is shown by Fig. 3, where said rollers are independent of the printing-machine, which is illustrated by the last impression and type- 80 cylinders 40 41 of a web-perfecting press from which the web A is shown as passing to said rollers 15 16. In such arrangement, if the rollers 15 16 are used, they should be geared to the cylinders 40 41, as is indicated by dotted 85 lines, so as to run in unison therewith; but, as before stated, the rollers 15 16 may compose in part the printing mechanism, which would be illustrated in this figure if the rollers 15 16 were omitted and the web passed direct to 90 the turners from the cylinders 40 41. Said cylinders are therefore to be understood as the equivalent of the rollers 15 16.

The web may be slit at one side of its center line, and one web may be transferred but partially over the other, or partially or even wholly 95 beyond it, by varying the position of the turning-bars with relation to each other.

What I claim is—

1. The combination, with mechanism for advancing two webs of paper, of the turning-bars, 100 as 19 20, arranged obliquely across the path of travel of the webs and at an angle to each other, and the returning-roll, as 49, arranged to guide the web from one turning-bar to the other, whereby one of the two webs is transferred laterally while both are running onward, and the two are associated one over the other, all substantially as described. 105

2. The combination, with slitting mechanism 110 and mechanism for advancing two webs of paper, of the turning-bars, as 19 20, arranged obliquely across the path of travel of the webs and at an angle to each other, and the returning-roll, as 49, arranged to guide the web from one turning-bar to the other, whereby a wide web is split and one of its parts is transferred laterally while both are on the run, and the two are associated one over the other, all substantially as described. 115 120

3. The combination, with a printing mechanism and a mechanism for advancing two webs of paper, of the turning-bars, as 19 20, arranged obliquely across the path of travel of the webs and at an angle to each other, and the returning-roll, as 49, arranged to guide the web from one turning-bar to the other, whereby two 125 webs are printed and one is transferred later-

ally while both are on the run, and the two are associated together one over the other, all substantially as described.

4. The combination, with printing and slitting mechanisms and mechanism for advancing two webs of paper, of the turning-bars, as 19 20, arranged obliquely across the path of travel of the webs and at an angle to each other, and the returning-roll, as 49, arranged to guide the web from one turning-bar to the other, whereby a web is printed, split, and one of its parts transferred laterally while both are on the run, and the two are associated one over the other, all substantially as described.

15 In testimony whereof we have hereunto set

our hands, each in the presence of two subscribing witnesses:

EDWYN ANTHONY.  
W. W. TAYLOR.

Witnesses to the signature of Edwyn Anthony: 20

T. H. PALMER,  
H. T. MUNSON.

Witnesses to the signature of William Wilberforce Taylor: 25

HENRY H. SLATER,  
*Clerk, Sharon Cottage, Ripon.*  
C. W. RENT,  
*Grammar School, Ripon.*