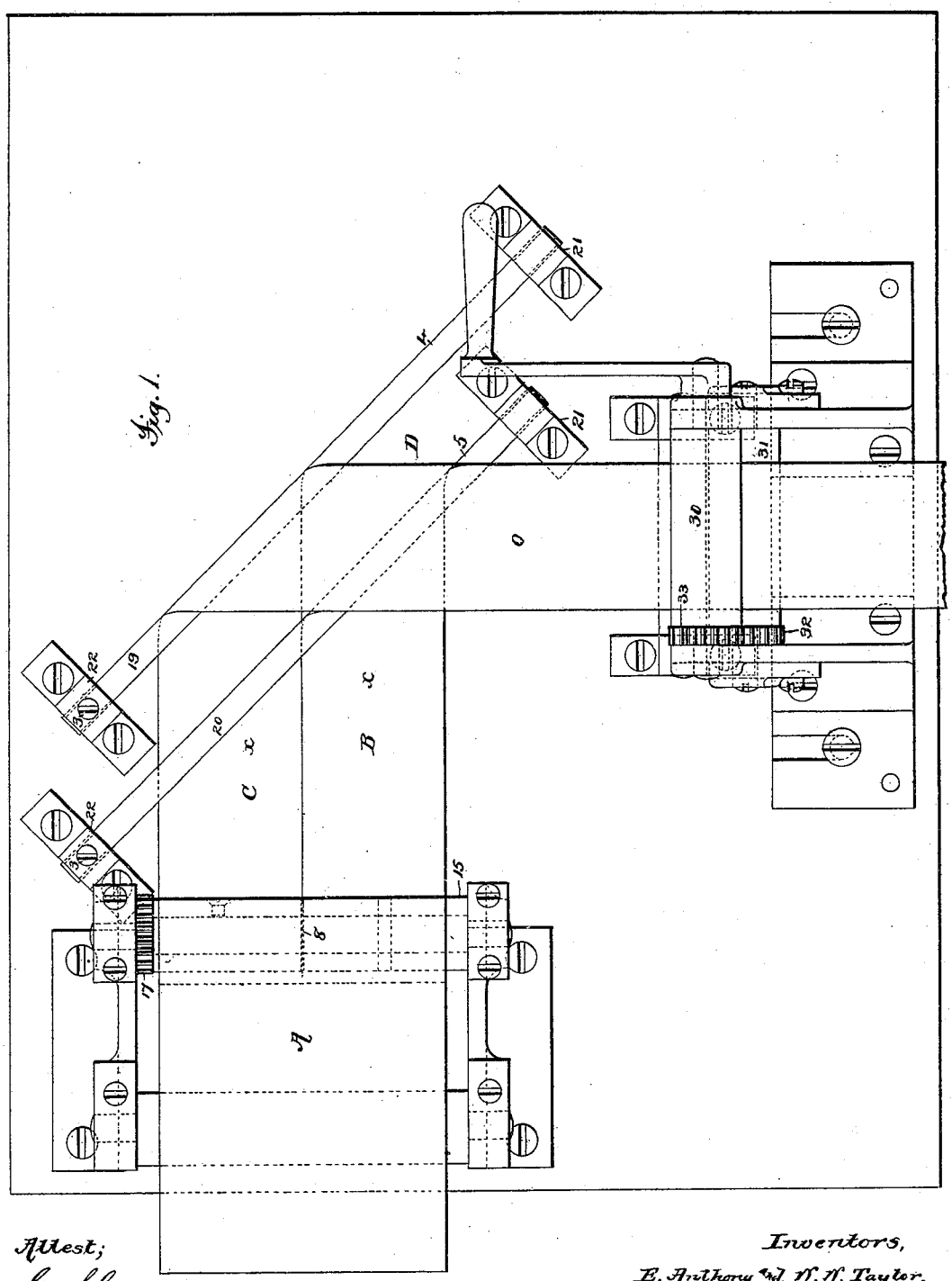
(No Model.) 3 Sheets—Sheet 1.

E. ANTHONY & W. W. TAYLOR.

PRINTING MACHINE.

No. 265,298. Patented Oct. 3, 1882.



Attest;
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Inventors,
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by Munson & Philipp
Attys.

(No Model.) 3 Sheets—Sheet 2.

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PRINTING MACHINE.

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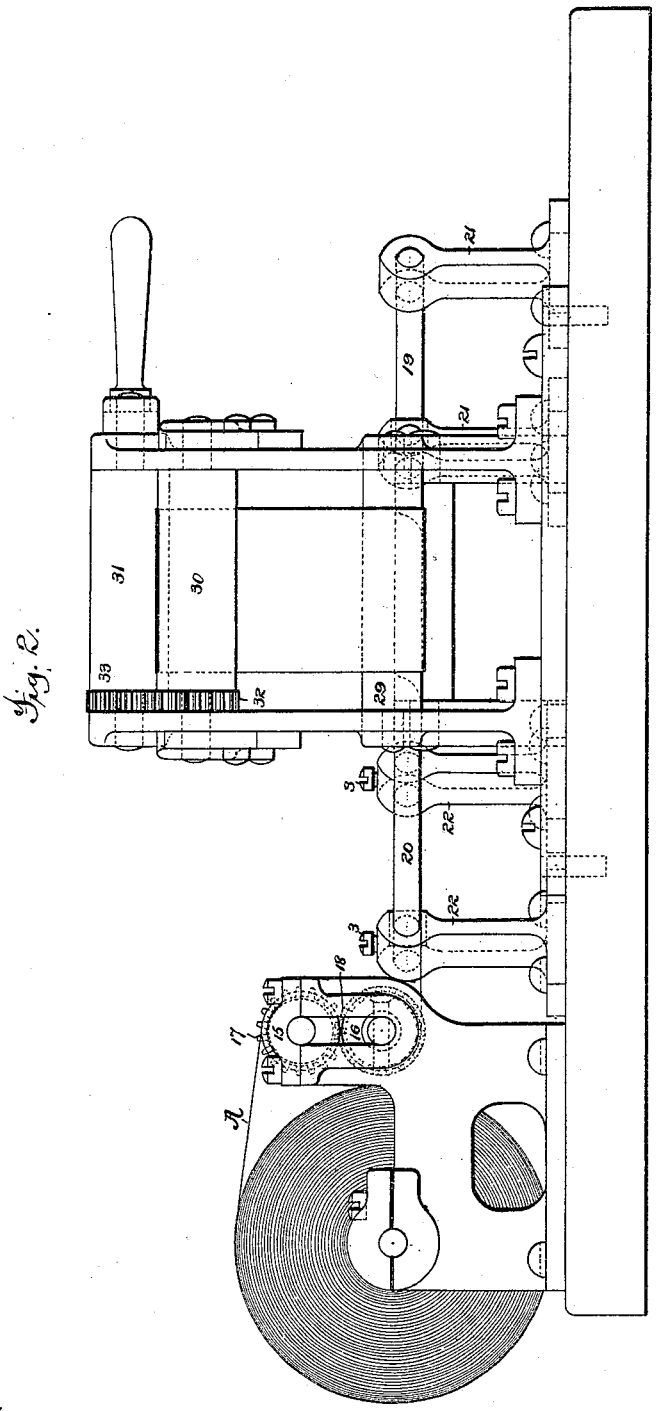

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

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PRINTING MACHINE.

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Fig. 3.

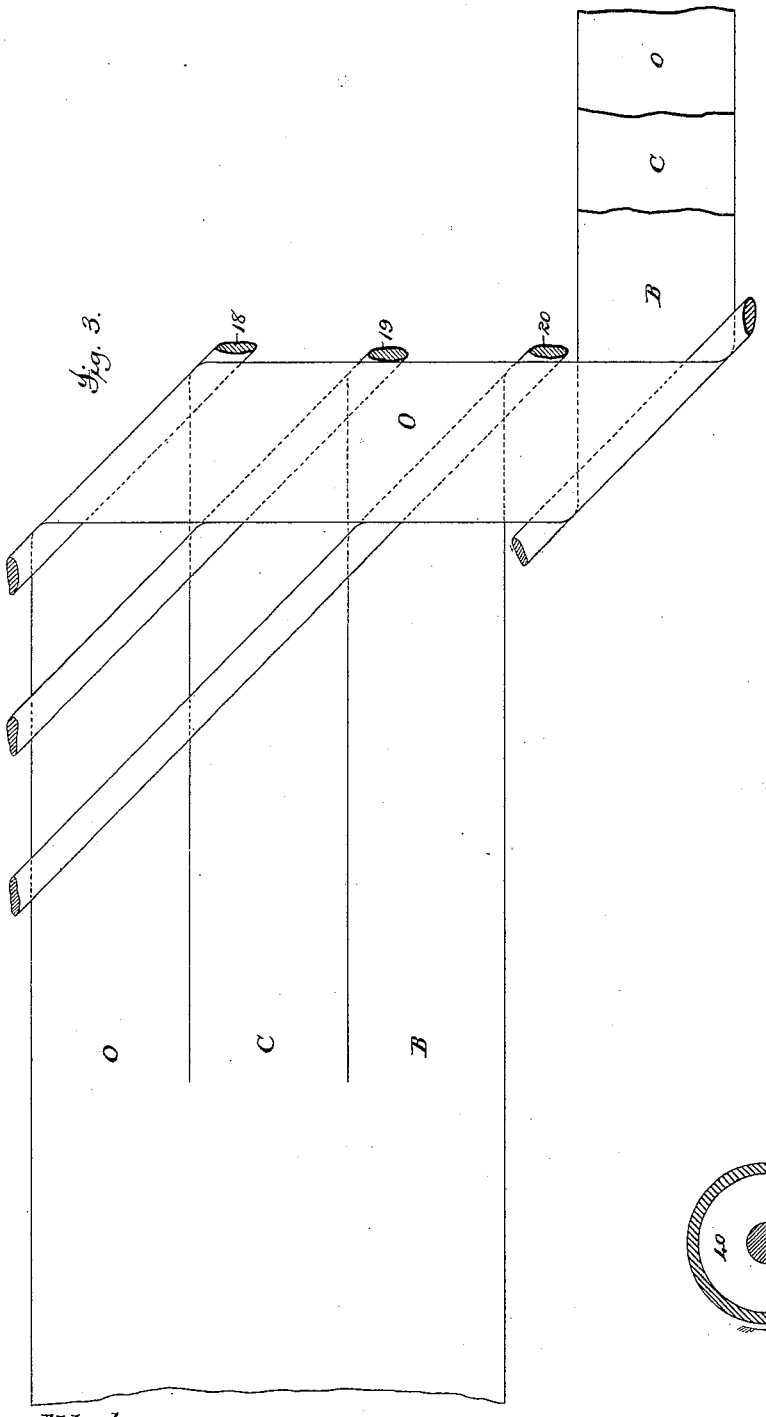
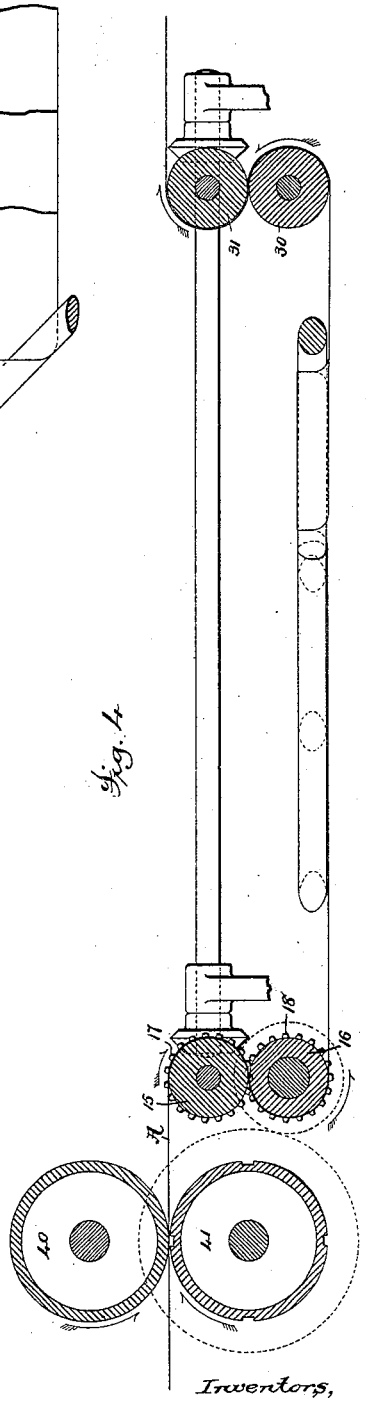


Fig. 4.



Witnesses:
Geo. H. Graham
Anthony A. Jasbera

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E. Anthony and W. W. Taylor,
by Munson & Philipp
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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. 265,298, dated October 3, 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 represents a side elevation, and Fig. 2 a plan view, of an apparatus embodying our improvements. Fig. 3 represents an extension of the system of turning, and Fig. 4 illustrates the arrangement with a printing mechanism.

The object of this invention is the association of two or more webs by bringing them into position one above the other, so that they may be simultaneously operated upon.

The improvement consists mainly in the use of two or more turners, each consisting of a turning-bar, and arranged in such an angular position relative to the path of webs traveling side by side that the webs, by being each led over a turning-bar, will be brought together over one another while all are on the run, so that the webs are associated within the space of one web. Combinations of the turners with other devices are also embraced in the invention.

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 or more webs and said webs associated together.

The apparatus illustrated in the drawings (see Figs. 1 and 2, which show the simplest embodiment of the invention) is constructed as follows:

The web-advancing rolls 15 16 are mounted to turn in a suitable frame-work, and are geared together by toothed wheels 17 18, that they may run in unison and feed uniformly, which rollers are of a length determined by the single wide web A or the two narrow webs B C, that are to be conducted side by side in the same plane. In advance of these rollers 15 16 the turners D D are placed, which turners consist of the bars 19 20, supported in standards 21 22, in which they are fixed by set-screws 3. These turners are arranged at such an angle to the direction of motion of the webs that the webs may each be bent over one of the turners, and one web thus brought directly over the other, while both are made to run in the same direction. The turning-bar 19 may be slightly larger than the turning-bar 20, and the edges 4 5 of said bars will be kept parallel. In cross-section these bars may be elliptical, circular, or otherwise shaped to present rounded surfaces around which the webs run. Though each of these turning-bars is shown as extending across the plane in which both webs travel, it is obvious that they may be considerably shortened if supported at one end only, so that the appropriate one shall only extend across the web it is to conduct. The size of these turning-bars may be greater or less than that illustrated and the angle of relation they have to the webs varied considerably, the calculations for which may be made according to the methods laid down in Patent No. 212,880.

A guiding-roller, 29, and a set of delivery-rollers, 30 31, are mounted to turn in bearings at the delivery end of the machine, their position being at right angles to the rollers 15 16, 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.

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 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 repre-

sent herein web-conducting rollers or cylinders from which the web, whether printed or not, passes to the turners.

The rollers 30 31 may, if placed at the proper height, receive the webs direct, and thus enable the roller 29 to be dispensed with, and from these rollers the associated webs B C may, after being cut into sheets, be 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. These rollers 30 31, being placed at right angles to the rollers 15 16, may in some cases take up too much room. To avoid this it is obvious that a single additional turner over which both webs may be bent, as in Fig. 3, will cause said webs to travel in a line parallel with that the webs have in passing from the rollers 15 16 to the turning-bars 19 20, and that the plane and direction of travel may be any that may be desired or required by the use of turners, as is explained in said Patent No. 212,880.

A device consisting of the cutting-disk 8 is 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 on its 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 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 the two webs B C; or said webs are led between such rollers. The web B is bent over the turning-bar 20 and the web C is bent over the turning-bar 19, the two webs thus being changed in their direction of travel to one at a right angle to that which they have in moving from the rollers 15 16 to the turning-bars, and the web C being, in consequence of the relation of the turning-bars, shifted or transferred laterally a distance equal to its width, and carried directly over the web B, both webs continue to run onward and in the same direction. The associated webs are then entered between the rollers 30 31, which, properly driven, draw them through the apparatus. Each web is thus turned over, so that the surfaces *x x*, which were uppermost before the webs reached and passed the turning-bars, are thereafter undermost, while the surfaces *o* are brought uppermost. The webs B C are thus associated so that they may be operated upon simultaneously by a cutting, folding, flying, or other delivery mechanism, as has been explained.

The turning-bars may be three or even more in number, according as it is desired to associate three or more webs together. This is shown by the addition of the turning-bar 18 and of the web O in Fig. 3, the effect and operation of which will be readily understood from the foregoing description, as will the fact that this system of turners may be extended indefinitely to accomplish the association of any desired number of webs.

It is apparent from the foregoing description that two or more webs may be extended side by side to receive any manipulation upon their extended surfaces, and one or more then be transferred laterally, so that all are associated together within the vertical space of one web while said webs are running onward at a high rate of speed, equal to that of any mechanism operating upon or producing said webs.

It is not essential that the rollers 15 16 should form any part of the printing-machine, as is shown by Fig. 4, where said rollers are independent of the printing-machine which is illustrated by the last impression and type 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 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 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 beyond it, by varying the positions of the turning-bars with relation to each other.

What is claimed is—

1. The combination, with mechanism for advancing a plurality of webs, of a plurality of turners arranged obliquely across the path of the webs, and having their turning-edges in such co-relation that, each of the several webs being led over a turner, the whole will be associated in the space of one web, all substantially as described.

2. The combination, with mechanism for advancing a plurality of webs, and a plurality of turners arranged obliquely across the path of the webs, and having their turning-edges in such co-relation that, each of the several webs being led over a turner, the whole will be associated in the space of one web, of a single turner for changing the direction of travel of the associated webs, all substantially as described.

3. The combination, with a slitting mechanism and a mechanism for advancing a plurality of webs, of a plurality of web-turners arranged obliquely across the path of the webs, and having their turning-edges in such co-relation that, each of the several webs being led over a turner, the whole will be associated in the space of one web, all substantially as described.

4. The combination, with a printing mechanism and a mechanism for advancing a plurality of webs, of a plurality of turners arranged obliquely across the path of the webs, and hav-

ing their turning-edges in such co-relation that, each of the several webs being led over a turner, the whole will be associated in the space of one web, all substantially as described.

5. The combination, with a printing mechanism, a slitting mechanism, and a mechanism for advancing a plurality of webs, of a plurality of turners arranged obliquely across the path of the webs, and having their turning-edges in such co-relation that, each of the several webs being led over a turner, the whole will be associated in the space of one web, all substantially as described.

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 William Wilberforce Taylor:

HENRY H. SLATER,
Clerk, Sharow Cottage, Ripon.
C. W. KENT,
Grammar School, Ripon.

Witnesses to the signature of Edwyn Anthony:

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