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No. 753,640. PATENTED MAR. 1, 1904.

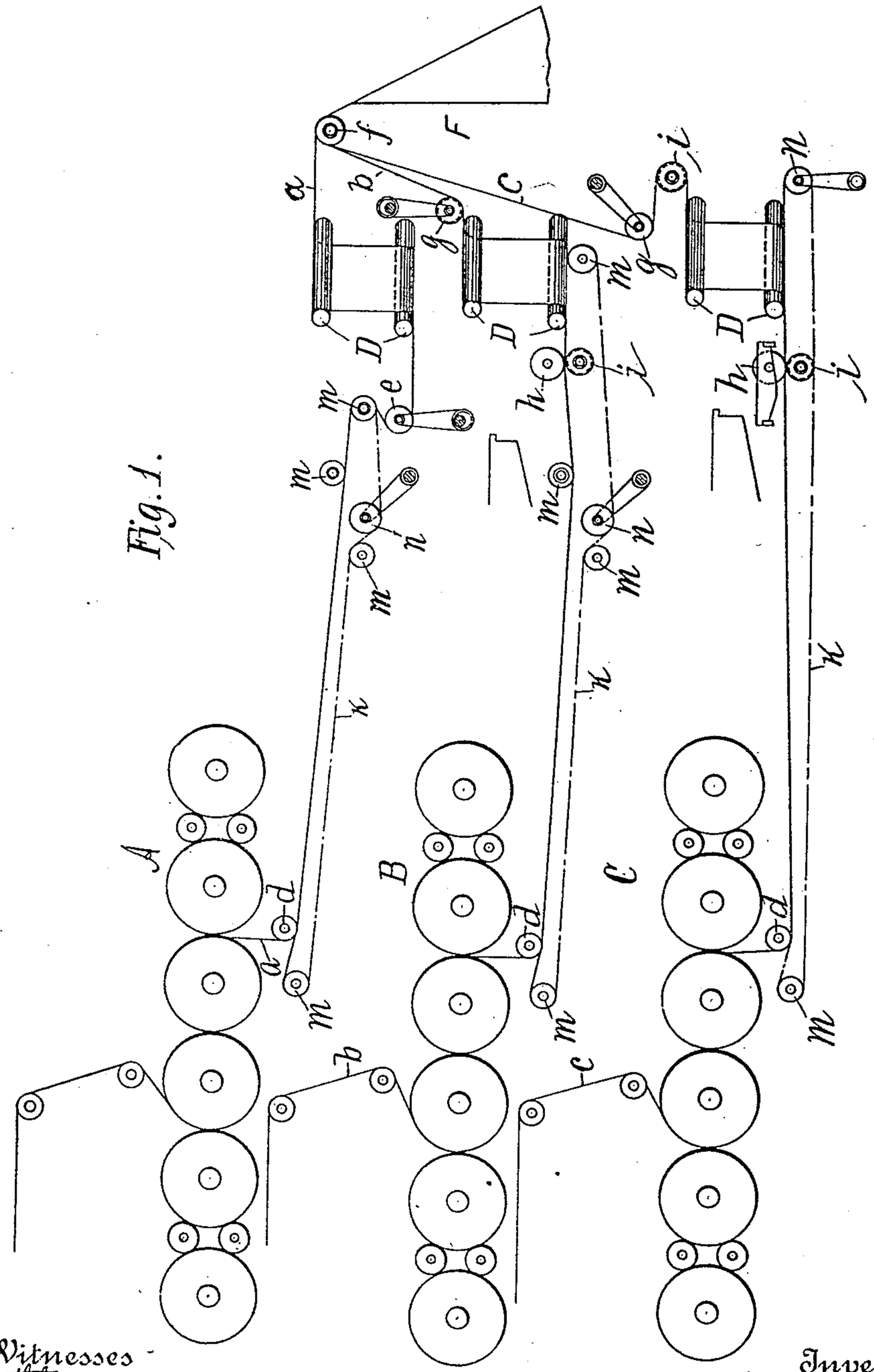
W. SCOTT.

PRINTING AND FOLDING MACHINE.

APPLICATION FILED MAY 14, 1901.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



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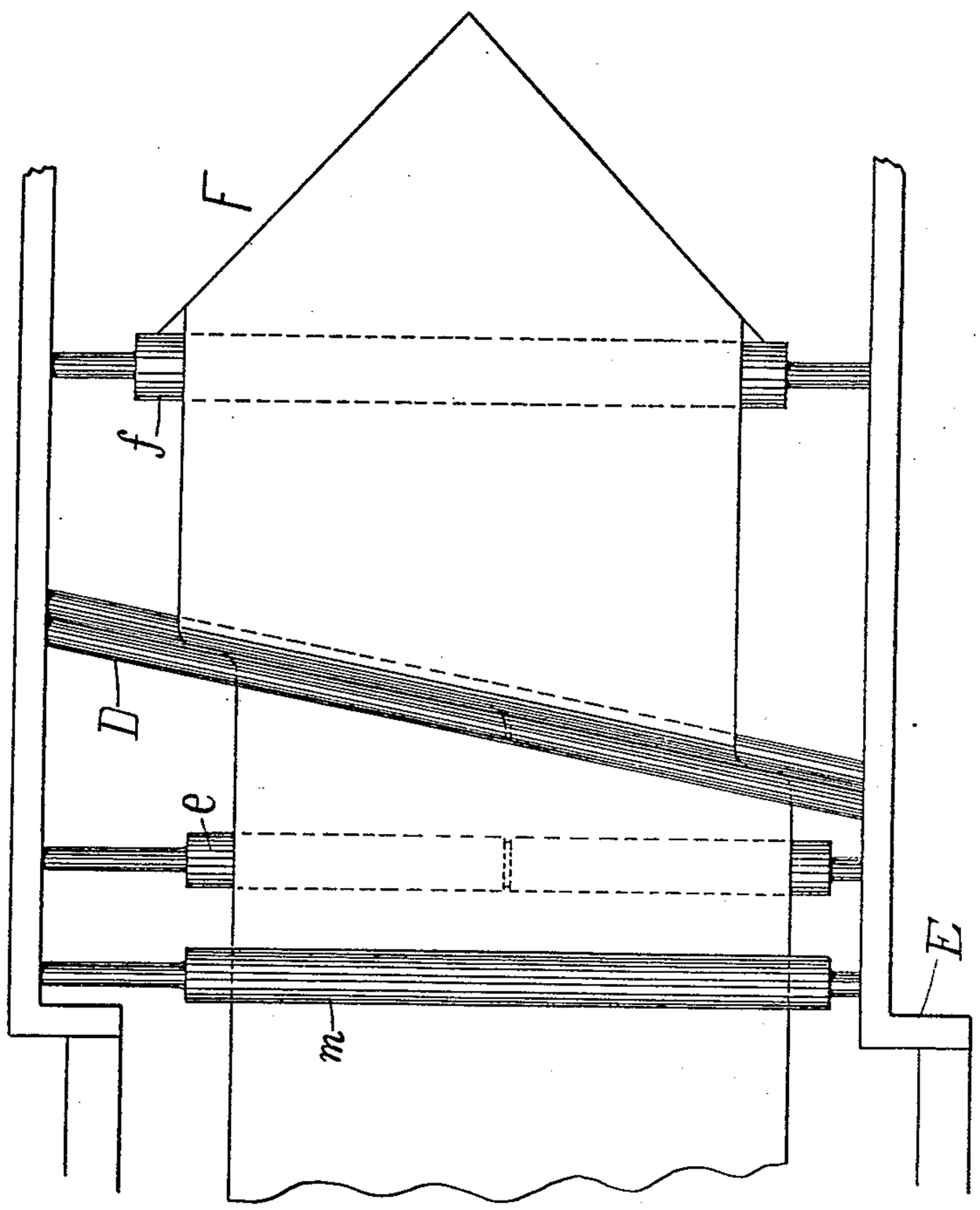
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



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270. SHEET-MATERIAL ASSOCIATING OR FOLDING.

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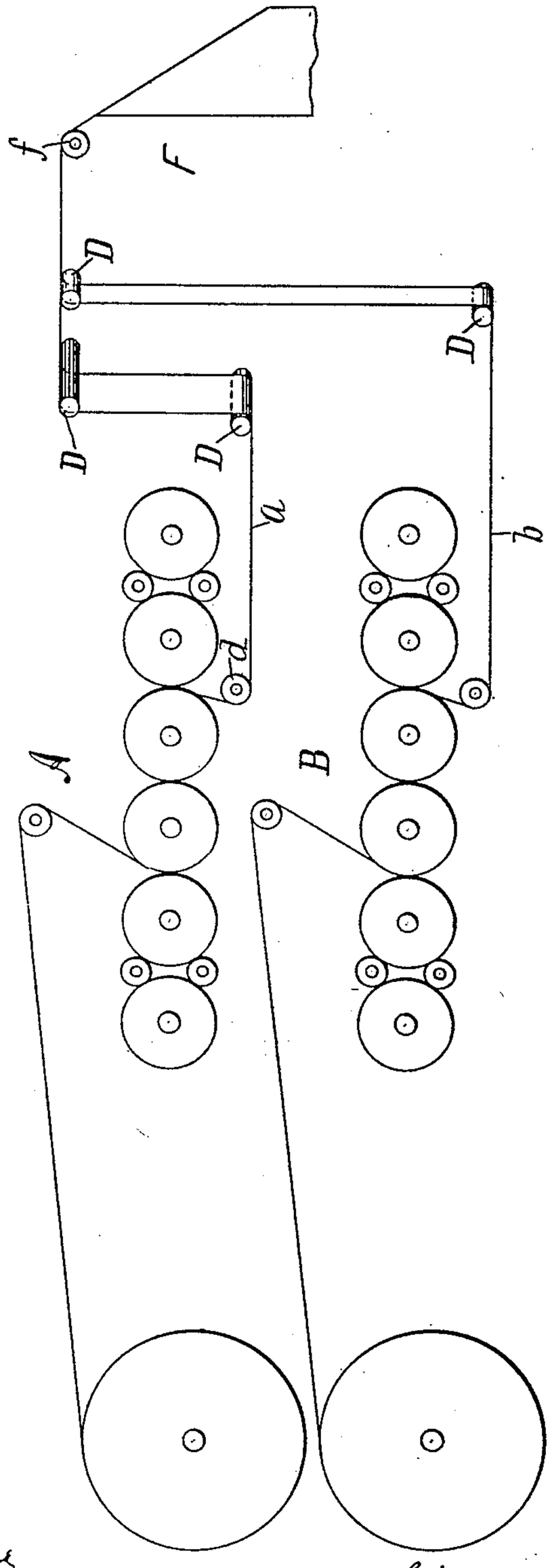
PRINTING AND FOLDING MACHINE.

APPLICATION FILED MAY 14, 1901.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3.



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No. 753,640. Patented March 1, 1904.

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

PRINTING AND FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 753,640, dated March 1, 1904.

Application filed May 14, 1901. Serial No. 60,197. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, a citizen of the United States, and a resident of Plainfield, in the county of Union and State of New Jersey, have invented a certain new and useful Improvement in Printing and Folding Machines, of which the following is a specification.

This invention relates to that class of modern printing and folding machines wherein a web is perfected in a rotary printing-press having the page-columns running around the cylinders and is then led to a suitable longitudinal folding-machine where it is cut transversely and delivered folded one or more times.

The invention is equally applicable where several webs are perfected by several presses and where there are more than one folding-machine.

It is applicable also where the webs carry four pages abreast and are run to a plurality of folding-machines which manipulate different sections thereof.

The invention may be used also in the case where the form-columns run along the cylinders and the folding takes place primarily along lines parallel with the columns of the printed pages. The sheets may be severed from the webs in any known way and at any known time, according to the nature of the folding-machine used, as before, after, or during the folding operation.

The main object of this invention is to adapt the whole machine to peculiar situations, as where the floor-space is of such a configuration that the center of the printing mechanism and the center of the folding mechanism cannot be set in one line, as where a wall, pillar, or another machine forms an obstruction.

Another object is to smooth out each web, where more than one is used, before it is associated with another web.

In its general features this invention consists in web-perfecting printing mechanism through which the web-path lies in one plane—that is, all the webs move in one general plane, so to say—combined with folding mechanism into which the paper passes by a path in a plane parallel to and at one side of its original plane of travel—that is, said printing and folding mechanisms are arranged with the folding mechanism offset laterally with respect to the printing mechanism and means interposed between said printing and folding mechanisms for offsetting each web from the first to the second of said pathways before the webs are associated or brought into register with each other. The invention also includes other combinations of devices.

The preferred form of the invention is illustrated in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatic side elevation of a machine in which the invention is embodied. Fig. 2 is a partial plan of the same, and Fig. 3 is a diagrammatic side elevation of a modified arrangement.

In the drawings I have omitted the framework generally; also, all driving mechanisms, as these may be of any known or suitable character, and generally all those adjuncts or parts known in the art and which any competent designer of printing-machines can supply, such as a delivery mechanism and the operative parts of a folding mechanism, the purpose of said omissions being to secure clearness of illustration.

In illustrating my present invention I have elected to show three web-perfecting printing-presses A B C, arranged one above another in a common frame, (frame not shown fully,) together with a single longitudinal folding-machine F and a pair of angle-bars D for each web for offsetting the same from the printing to the folding mechanism. The sides of the framework for the printing-presses and that for the folder are not in line with each other, but are joined by offsets E.

The web *a* passes around guide-rolls *d* and a register-roll *e* to the upper pair of angle-bars D, by which it is moved laterally for the distance by which the longitudinal central vertical planes of the printing and the folding mechanism are separated, after which the web *a* passes to the roller *f* at the top of the folder F.

The web *b* is led from the press B about guide-rolls *d* to its pair of angle-bars D and thence about a register-roll *g* to the said roller *f*. A paste-disk *h* may be used to apply a

line of paste along the web *b*, and the lower bar D of the pair for the web *b* has a suitable groove for permitting the paste to pass without touching, and so, also, of the roll *g*. Paste may be supplied to the disk *h* in any suitable way. In like manner the web *c* is led from the press C about rollers *d* to the corresponding pair of angle-bars D and around them to a guide-roller *i* and an adjustable register-roll *g* to the roller *f* aforesaid. A line of paste may be laid along the web *c* by means of a paste-disk *h*, the lower of the corresponding pair of bars D and the roll *h* being suitably grooved to permit the paste to pass them without touching.

The webs *a b c* are associated and pasted together when paste is used at the roller *f* and pass to the folding mechanism and are folded together, after which they may be cut into sheets and these be folded and delivered in any known manner or by any known mechanism. (Not shown.)

The webs *a b c* may be supported by running tapes *k* between the roller *d* and the bars D, said tapes running on rollers *d* and on pulleys *m*, take-up rollers or pulleys *n* being used to keep the tapes taut, as usual in this class of machines, and I remark that the tapes *k* and the roller *f* may be driven at a slightly-higher surface speed than the surface speed of the cylinders of the presses in order to keep the webs taut and to move them about the bars D at the same rate of speed as that with which they leave their respective presses.

It is noted that each web before it is associated with any other web is offset by being drawn around parallel bars placed one above another at different levels and set at an angle to the course of the web other than an angle of forty-five degrees and that each web is smoothed out by being drawn over such bars before any association occurs, whereby wrinkles or folds and tearing of the web is avoided in the folded products delivered by the machine.

In Fig. 1 the distances separating the members of each pair of bars D are equal in all cases, and the bars D are all parallel with each other and are set at the same angle to the courses of the webs *a b c* thereto from the printing-presses.

In the modified form illustrated in Fig. 3 the travel of the lower web *b* from one to the other member of the corresponding pair of bars D is greater than the travel of the upper web *a* from the lower to the upper member of its corresponding pair of bars D, and the angle of the pair of bars D, corresponding with the web *b*, with the said web is more nearly a right angle than is the case with the angle made with web *a* by the corresponding pair of bars D. In every case, however, the members of each pair of bars D are parallel to each other. The rule for finding the angle between the bars D for any web and the course of that web may be expressed as follows: The tangent of such angle (acute) is equal to the perpendicular distance between the pair of bars (these being vertically one over the other) divided by the lateral displacement or offset of one edge of the web.

It is understood, of course, that one or more of the printing-presses may be silenced or stopped while the remainder is in use; also, the presses capable of printing four pages of the maximum size abreast on a web and a plurality of folders arranged side by side or in other ways may be used and that in such a case one or more of the folding mechanisms may be silenced or rendered inoperative while the remainder may be in use, whereby many varied products may be secured, all without departing from the spirit of this invention or the scope of my claims. It will be understood also that the register-rolls *e* and *g* may be adjustable, as usual, for the purpose of causing proper register of the printed matter as the webs are associated; also, that register-rolls for the webs may be used in the case illustrated in Fig. 3, or the register may be secured by turning the form or plate cylinders forward or back while the cutting mechanism remains stationary, and so also of the folding mechanism.

What is claimed as new is—

1. The combination with web-perfecting mechanism through which the web passes with its central longitudinal line always in one vertical plane, of mechanism for folding the paper along a longitudinal line, the path of the paper into said folding mechanism and during such longitudinal folding being in a vertical plane at one side of and substantially parallel to the first-named vertical plane, and means interposed between said printing and folding mechanisms for moving the paper laterally from the first to the second of said paths, the whole being so arranged as that no part of the paper can pass into said folding mechanism without such lateral transfer, substantially as described.

2. The combination with web-perfecting printing mechanism through which the web-path lies in one plane, of folding mechanism into which the paper always passes by a path substantially parallel to said web-path, and parallel angle-bars for each web, said bars being arranged in pairs the members of which are at different levels and set at an angle to the said web-path dependent upon the distance between said members and the amount of the offset of the web passing therearound in moving from one to the other of said paths.

3. The combination with a plurality of web-perfecting presses arranged one above another and through which the webs pass each with its longitudinal central line always in one vertical plane, of a folding mechanism whose central vertical plane is at one side of and substantially parallel with said central

line or vertical plane, and means for moving the paper laterally from one to the other of said planes, the combination and arrangement being such that no part of the paper passes from the presses to the folding mechanism without being transferred laterally, substantially as described.

4. The combination with a plurality of web-perfecting printing-presses arranged one above another and adapted to deliver each a web, of folding mechanism into which the paper always passes by a path substantially parallel to the web-path through said presses, and a pair of parallel angle-bars for each web, the members of each pair being placed at different levels and set at an angle to the said web-path dependent upon the distance between said members and the amount of the offset of the web passing therearound in moving from its first to its path into said folding mechanism.

5. The combination of a plurality of web-perfecting presses arranged one above another and adapted to deliver each a web, a folding mechanism into which the paper always passes by a path at one side of and substantially parallel to the web-path through said presses, and two parallel angle-bars for each web, the bars of each set being on different levels at the same distance apart and placed at the same angle.

6. The combination with a plurality of web-perfecting presses arranged one above another, and adapted to deliver each a web, of a folding mechanism into which the paper always passes by a path substantially parallel to the web-path through said presses, and two parallel angle-bars for each web set at different levels, the bars of each set being the same distance apart and placed at the same angle.

7. The combination with a plurality of web-perfecting presses arranged one above another and adapted each to deliver a web, of a folding mechanism into which the paper always passes by a path at one side of and substantially parallel to the web-path through said presses, means for moving each web laterally from one to the other of said pathways, the points at which each web leaves one and enters the other of said pathways being on different levels, and adjustable rollers for securing register before the webs come into contact with each other.

8. The combination with a plurality of web-perfecting presses arranged one above another and adapted each to deliver a web, of a folding mechanism into which the paper passes by a path at one side of and substantially parallel with the web-path through said presses, angle-bars for moving each web laterally from one to the other of said paths, the angle-bars for each web being on different levels and means for leading the webs from the printing-presses to said angle-bars.

9. The combination with a web-perfecting printing-press, a longitudinal folding-machine placed substantially parallel with said press but in a different vertical plane, and two parallel turning bars located at different levels and placed between said printing and folding mechanisms at such an angle thereto that the web in its course from one to the other of said bars will be shifted laterally from the plane of the printing-press to the plane of the folding-machine.

10. The combination with a plurality of web-perfecting printing-presses arranged one above another and adapted to deliver each a web, the web-path through said presses lying in one plane, a folding mechanism into which the paper passes by a path substantially parallel with said web-path, and two parallel angle-bars for each web, the distance between the members of one pair being greater than the distance between the members of the other pair of bars, the bars having the greater distance between them being placed at a more acute angle to the printing-cylinders than are the bars having the shorter distance between them, whereby the webs will be delivered associated to the folding mechanism.

11. In a printing and folding machine, the combination of means for offsetting a traveling web from one to another vertical plane consisting of a pair of parallel horizontal bars or guides placed at different levels, with a perfecting-press through which the web passes in the first-named vertical plane, and a folding mechanism through which said web passes while in the second-named plane, substantially as described.

12. In a printing and folding machine, the combination of means for diverting a web from a path in one vertical plane to a path in another vertical plane substantially parallel to the first, the points where the web leaves one and enters the other path being on different levels, with printing mechanism delivering the web into the first-named path, and a folding mechanism into which the web passes while moving in the second path, substantially as described.

13. In a printing and folding machine, the combination of means for diverting webs moving in one vertical plane into another vertical plane substantially parallel with the first, the points where the webs leave the first plane and enter the second plane being on different levels, with a plurality of web-perfecting presses delivering said webs into said plane first named, and a longitudinal folder arranged with its axis in said second-named plane, substantially as described.

14. In a printing and folding machine, the combination of means for perfecting a plurality of webs, said means being arranged one above another and the webs all moving one way, a longitudinal folding mechanism arranged with its axis substantially parallel to and offset laterally with respect to the verti-

cal plane in which the printing means are arranged, and parallel angle-bars arranged at different levels for shifting said webs laterally from the first to the other of said planes, substantially as described.

15. In a printing and folding machine, the combination of a plurality of web-perfecting presses arranged one above another with their webs all moving the same way, a longitudinal folding mechanism arranged with its axis substantially parallel to and offset laterally with respect to the vertical plane of said presses, and pairs of parallel angle-bars, one pair for each web, the members of each pair being arranged at different levels for shifting said webs laterally from the first to the second of said planes, substantially as described.

16. In a printing and folding machine, the combination of means for offsetting a web from one plane to another plane parallel thereto consisting of a pair of horizontal parallel guides lying at different levels and forming an angle with the course of the web thereto and therefrom, with a web-perfecting press, and a longitudinal folder whose axis is at one side of and parallel to the central margin or margins of said web as the web leaves said press.

17. In a printing and folding machine, means for offsetting a web from one to another vertical plane, said planes being substantially parallel with each other, consisting of a pair of parallel horizontal bars placed at different levels and forming an angle with the course of the web thereto and therefrom, in combination with a web-perfecting press, and a longitudinal folder whose axis is at one side of and parallel to the central margin or margins of said web as said web leaves said press.

Signed at New York city, in the county of New York and State of New York, this 9th day of May, A. D. 1901.

WALTER SCOTT.

Witnesses:
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RITA BRADT.