

(No Model.)

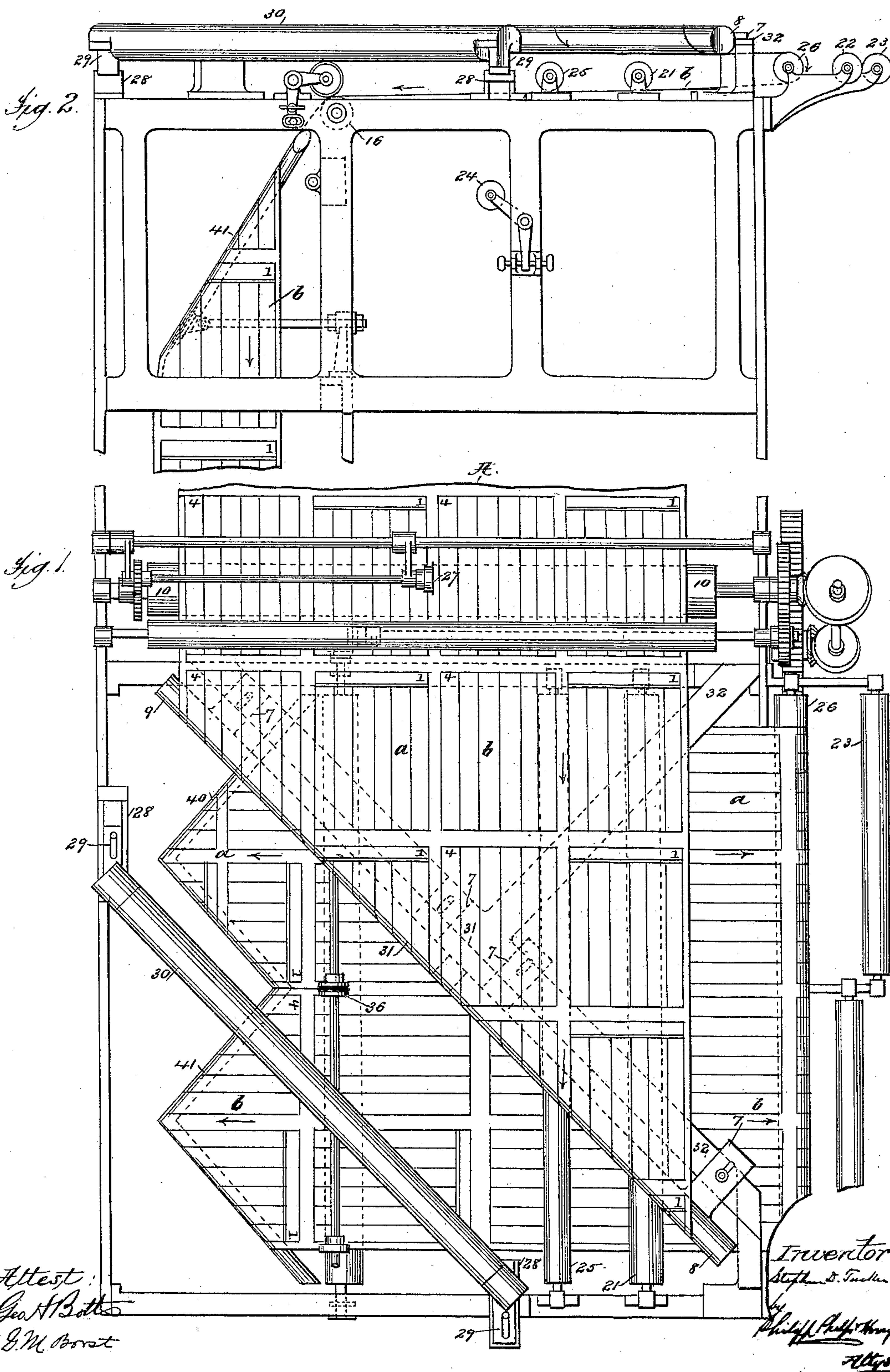
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S. D. TUCKER.

DELIVERY APPARATUS FOR WEB PRINTING MACHINES.

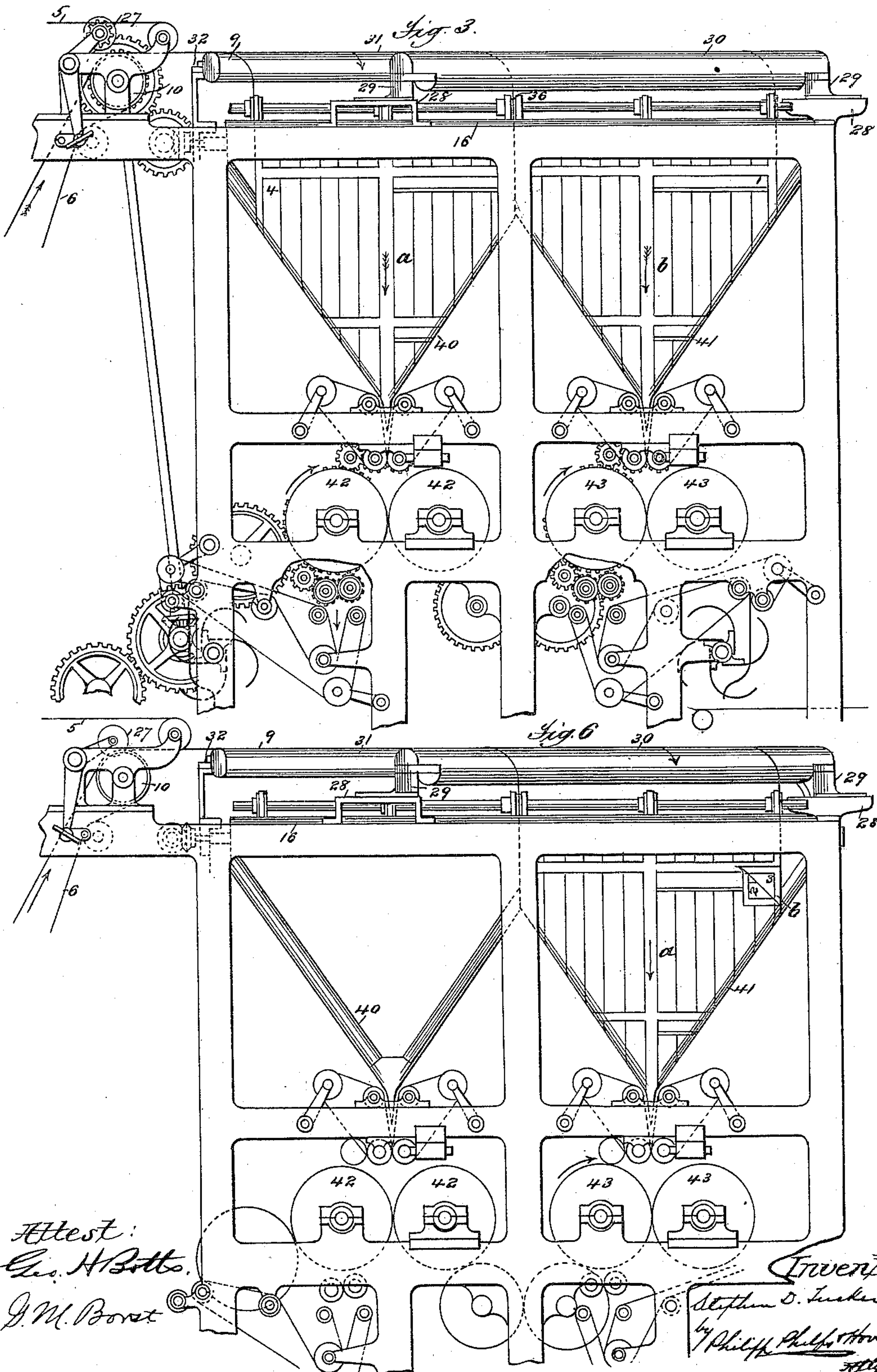
No. 408,389.

Patented Aug. 6, 1889.



6 Sheets—Sheet 2.

DELIVERY APPARATUS FOR WEB PRINTING MACHINES.
No. 408,389. Patented Aug. 6, 1889.



(No Model.)

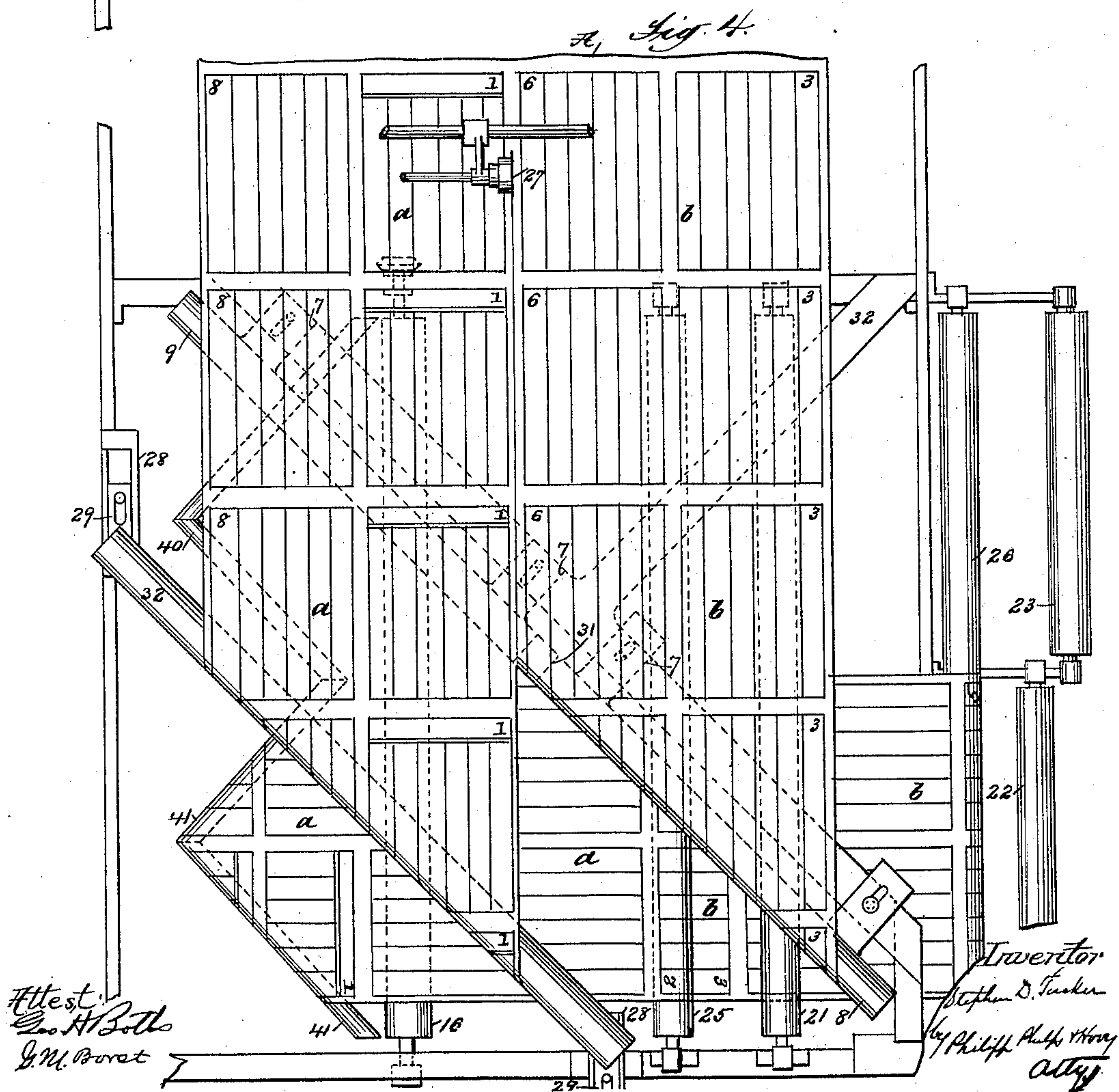
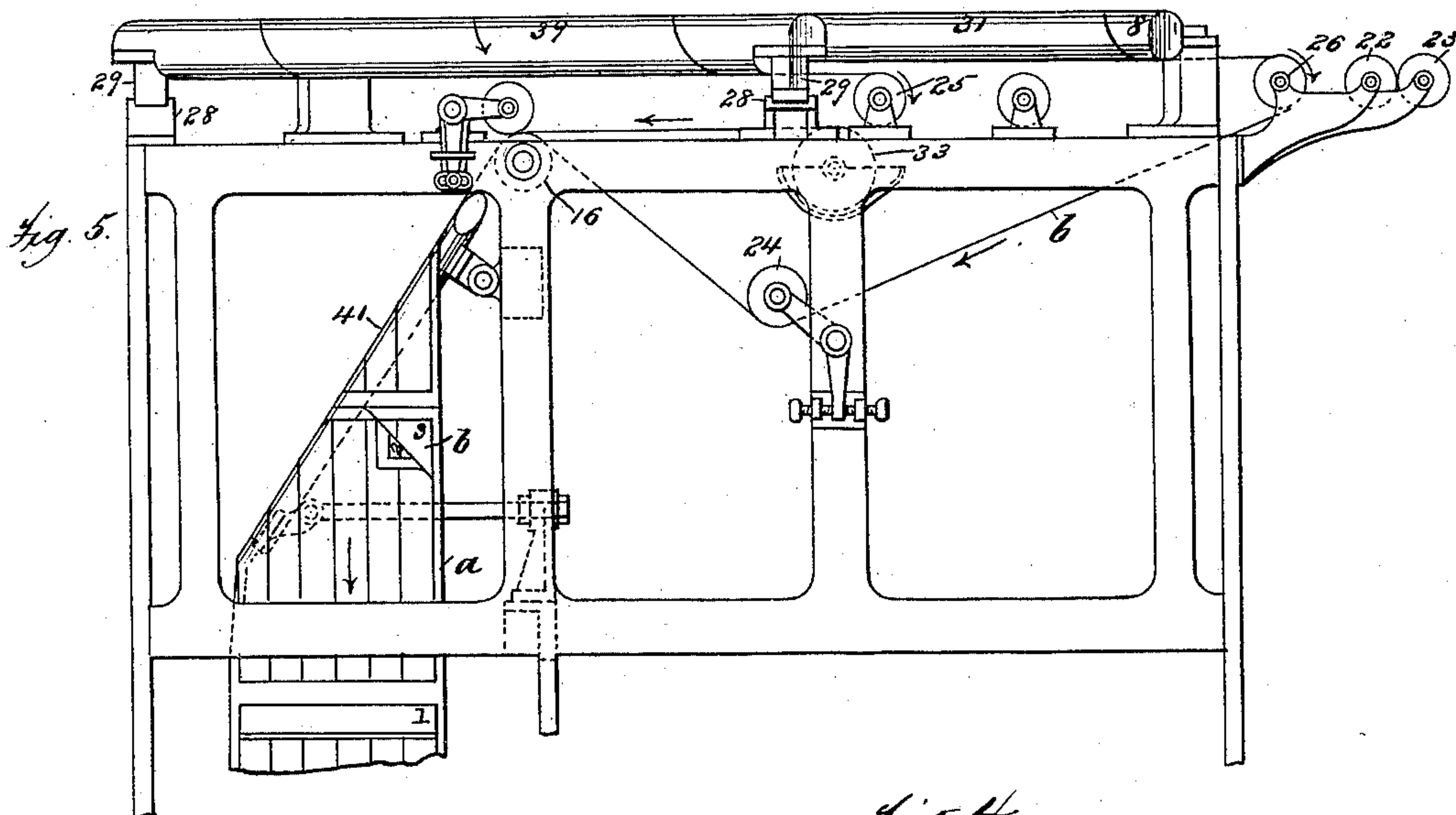
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DELIVERY APPARATUS FOR WEB PRINTING MACHINES.

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Patented Aug. 6, 1889.



Attest:
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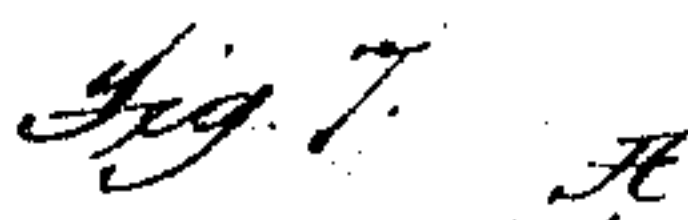
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S. D. TUCKER.

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Patented Aug. 6, 1889.



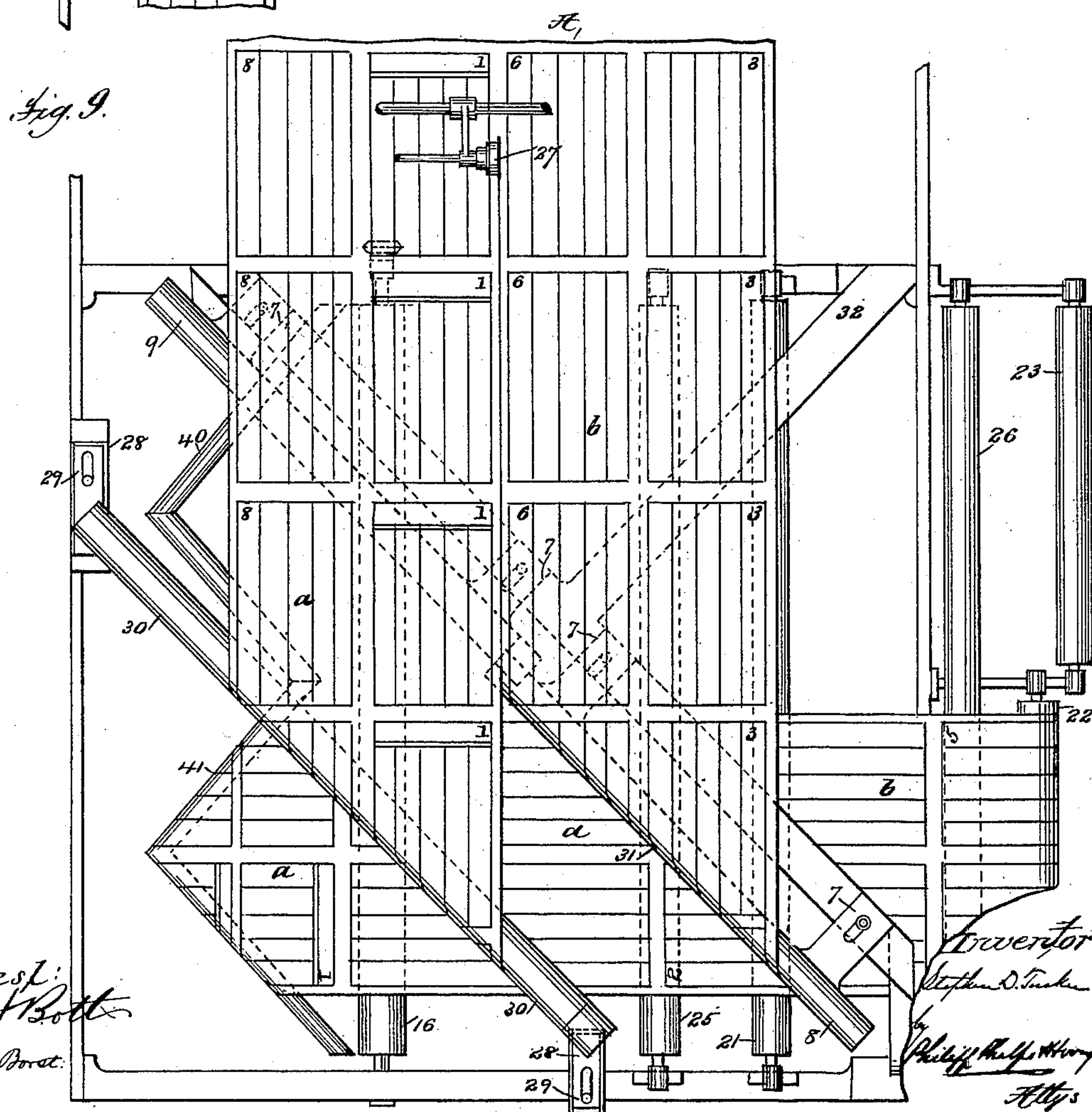
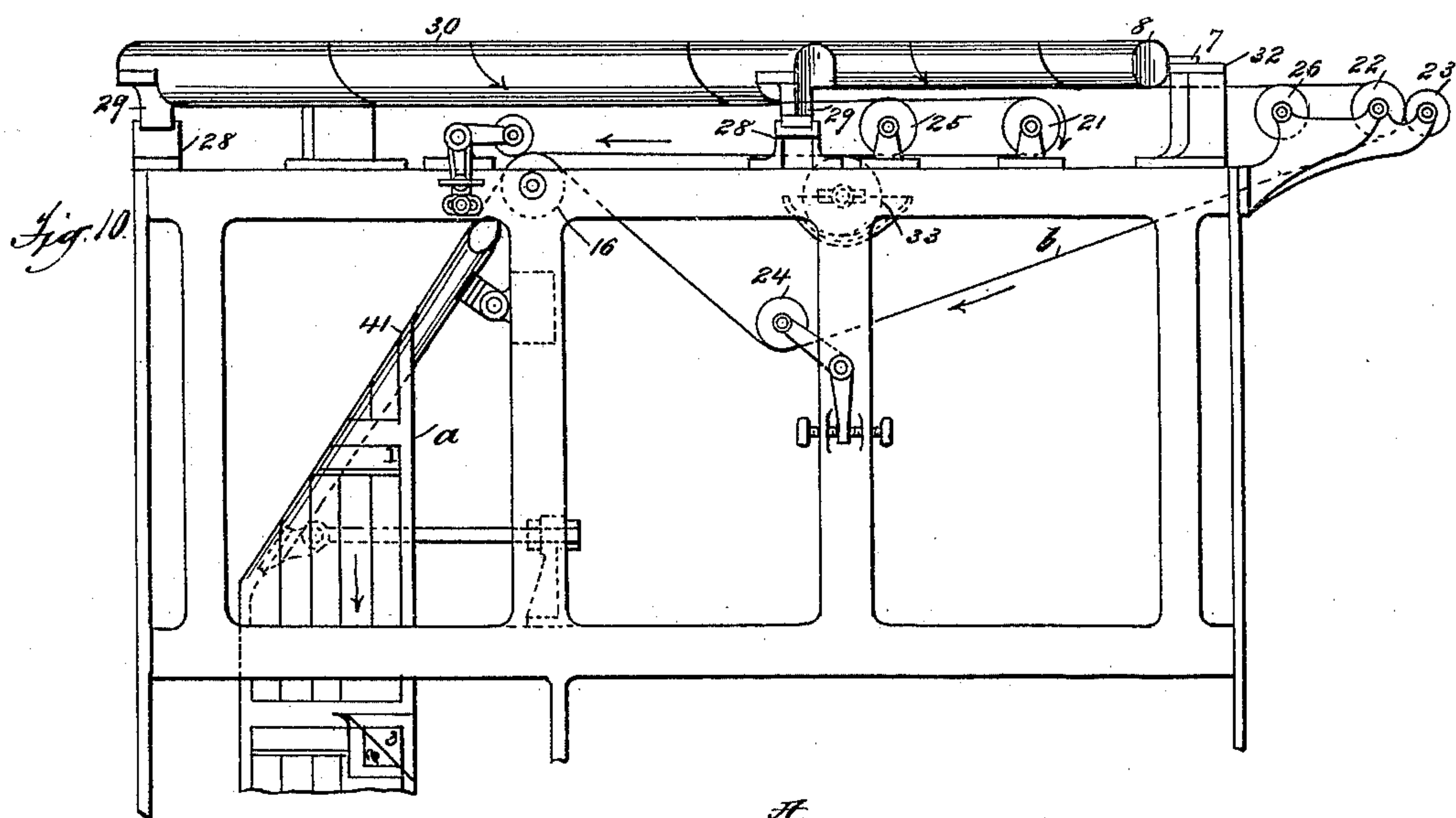
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(No Model.)

6 Sheets—Sheet 5.

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DELIVERY APPARATUS FOR WEB PRINTING MACHINES.
No. 408,389. Patented Aug. 6, 1889.



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(No Model.)

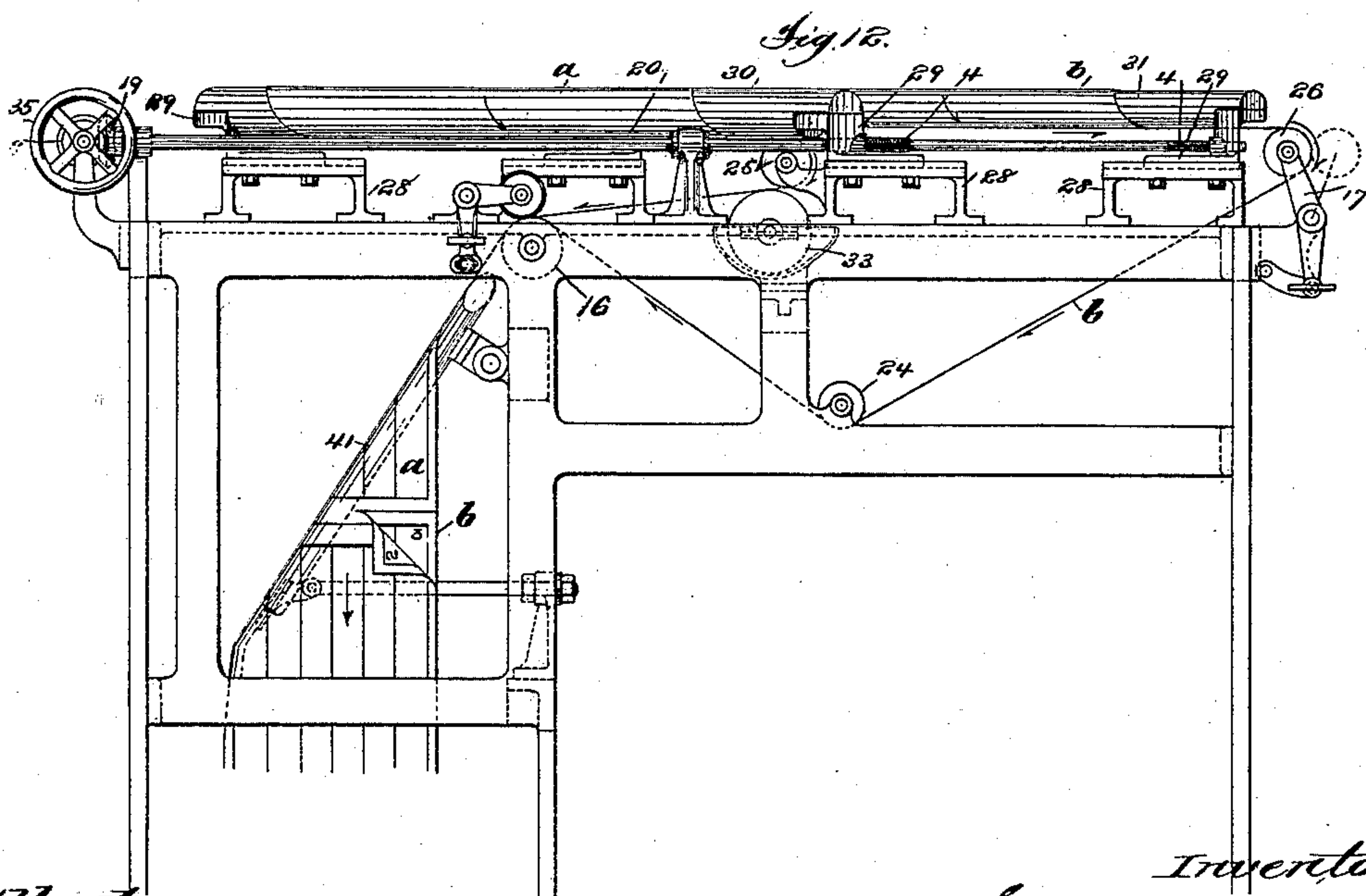
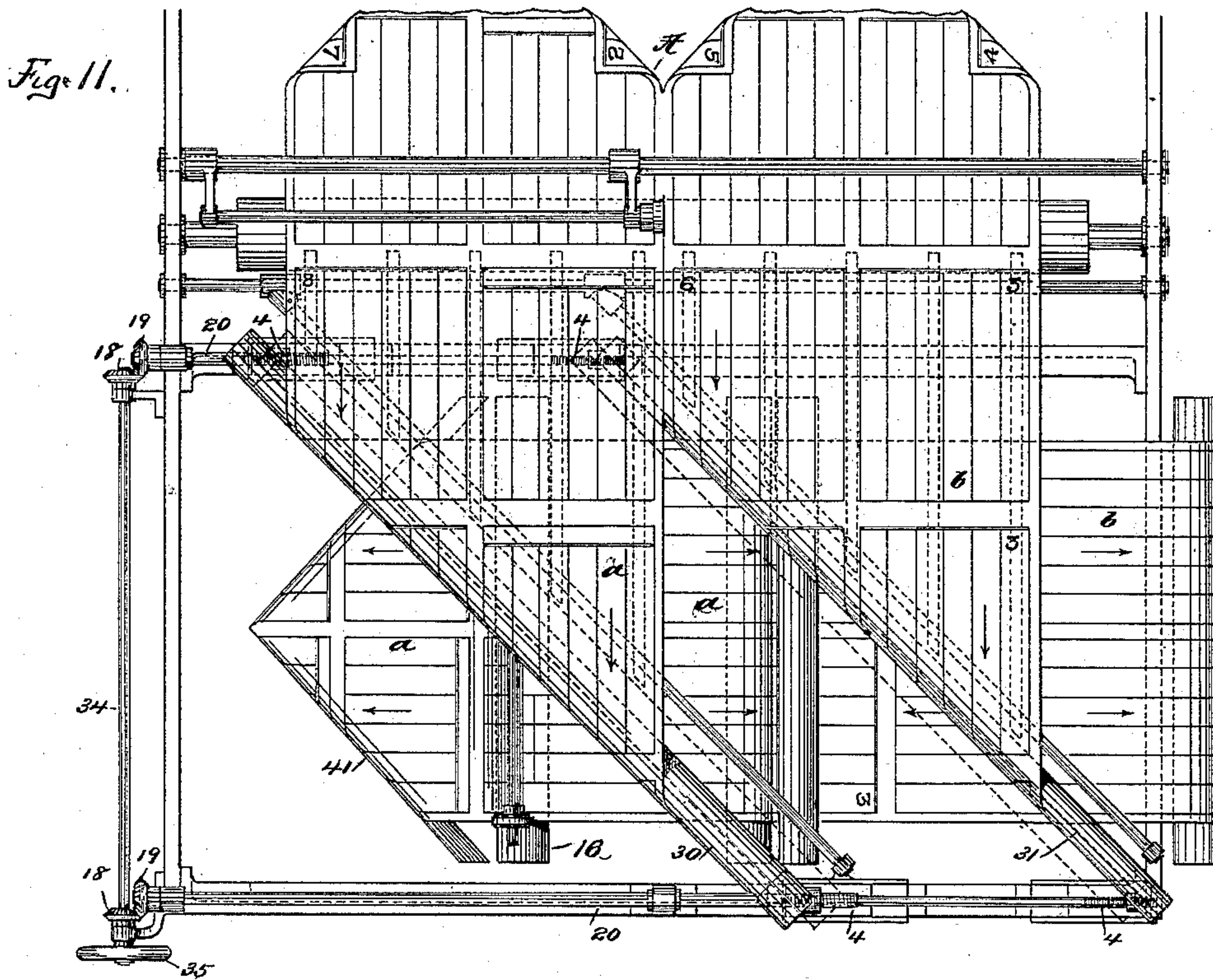
6 Sheets—Sheet 6.

S. D. TUCKER.

DELIVERY APPARATUS FOR WEB PRINTING MACHINES.

No. 408,389.

Patented Aug. 6, 1889.



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UNITED STATES PATENT OFFICE.

STEPHEN D. TUCKER, OF NEW YORK, N. Y.

DELIVERY APPARATUS FOR WEB-PRINTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 408,389, dated August 6, 1889.

Application filed October 22, 1887. Serial No. 253,098. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN D. TUCKER, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Delivery Apparatus for Web-Printing Machines, fully described and represented in the following specification, and the accompanying drawings, forming a part of the same.

This invention relates to a delivery apparatus for a printing-machine which is especially designed to meet the wants of those publishers who desire to issue newspapers the size or volume of which varies with different issues. For this purpose it frequently happens that it is desirable to change the size of the sheet, and such change can be most conveniently effected by increasing or decreasing the number of columns in the page and using a web of correspondingly greater or less width.

The present invention relates, particularly, to an arrangement of web-turners for use in connection with a folding mechanism, which enables webs of different widths to be presented to said folding mechanism in proper position to receive the fold.

As a full understanding of the invention can be best given by an illustration and a detailed description of the manner in which it is embodied in a delivery apparatus, such description will be given, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a delivery apparatus for a double-width web-printing machine containing an arrangement of web-turners embodying the present invention. Fig. 2 is a side and Fig. 3 a front elevation of the same. These figures illustrate the operation of the apparatus in delivering from a web a product consisting of two independent full-sized sheets. Figs. 4, 5, and 6 are views similar to Figs. 1, 2, and 3, illustrating the manner of using the apparatus in delivering from a web a product consisting of two full-size sheets associated and folded together. Figs. 7 and 8 are views similar to Figs. 1 and 2, illustrating the manner of using the apparatus in delivering from a web a product consisting of two single independent sheets of smaller dimensions. Figs. 9 and 10 are similar views illus-

trating the manner of using the apparatus in delivering a product consisting of two of these smaller sheets associated and folded together. Figs. 11 and 12 are similar views illustrating a modified arrangement of the web-turners applicable to those delivery apparatuses in which only one folder is employed and delivers associated sheets exclusively.

Referring now particularly to Figs. 1, 2, and 3, it is to be understood that the delivery mechanism as herein shown consists, essentially, of a web-turning or turning and associating mechanism composed of turning-bars 30 31, a longitudinal folding mechanism consisting of two folders 40 41, arranged side by side, two transverse cutting or cutting and folding mechanisms composed of the cylinders 42 43 and their auxiliaries, and suitable sheet laying or piling mechanism consisting in the case shown of S-shaped flies 44, of substantially the form shown in United States Letters Patent No. 269,021.

The turning-bars 30 31, forming the web-turning or turning and associating mechanism, are arranged obliquely across the path of the web in the usual manner. The bar 31 extends entirely across the web, and is so arranged that when the web is led around this bar it will be turned at right angles to its previous course and pass forward under a slitting-cutter, which slits it longitudinally into two narrow webs, which run side by side, one to each of the longitudinal folders 40 41. The bar 30 is of less length, and is arranged parallel to and in advance of the bar 31, and at such a distance therefrom that when one-half of the web is led around each bar the two halves will be turned at right angles to their previous course and pass forward one above the other, so as to be associated and pass together over the folder 41. The bar 30 is supported at its ends in supports 29, which are made adjustable upon bearings 28, formed upon or secured to the frame-work of the machine. The arrangement of the supports 29 and bearings 28 is such that the bar 30 can be adjusted to and from the bar 31, and yet preserve its parallel relation with the latter. The bar 31 is made in two parts 8 9, the meeting ends of which are halved together, so that when the two parts of the bar are brought

into line, as in Fig. 1, they form a continuous turner. The two parts 8 9 are provided with projecting arms 7, by which they are secured to a supporting-bar 32, which extends obliquely across the machine. The arms 7 are slotted, so as to permit the parts 8 9 to be adjusted to and from the bar 30 and yet preserve their parallel relation thereto. The purpose of this adjustment of the bar 30 and the parts 8 9 of the bar 31 will be made clear when the operation of the apparatus is explained. The longitudinal folders 40 41 and auxiliaries are, as herein illustrated, of substantially the construction shown and described in the United States Letters Patent No. 331,280, and need not therefore be described in detail. These folders may, however, be of any other appropriate form.

The cutting or cutting and folding mechanisms represented by the cylinders 42 43 may be of any suitable construction. Such mechanisms being well known need not be herein described in detail.

The remaining features in the construction of the delivery apparatus will be described in connection with an explanation of the manner of using the apparatus.

In such explanation it will be first assumed that it is desired to deliver the printed product from the longitudinal folders in the form of folio or four-page papers, the sheets being of maximum size. In such case the web A will be of full width, and having been perfected by any suitable form of web-printing mechanism will be conducted over the usual roll 10, and thence forward above the turning-bar 31. In passing to the folders 40 41 the web will be split longitudinally by a slit 36, located above the roll 16, or in any other convenient position and operating in the usual manner. By this means the web will be split into two narrow webs *a b*, one of which will pass over each of the folders. To aid in conducting the web to the bar 31 suitable tapes, as 5 6, may be provided. In the case assumed the two parts 8 9 forming the bar 31 will be adjusted into line, as shown in Fig. 1, and the web will be conducted downward around the two parts of the bar, so as to turn at right angles to its previous course, and will be led thence outward around a roll 26 and inward over the roller 16 to the two longitudinal folders 40 41, as shown in Figs. 1 and 3. The two webs will be longitudinally folded along their centers by the folders in the usual manner, and after being folded will pass to the cutting-cylinders 42 43 to be severed into sheets, which sheets may then pass directly to the piling mechanisms, or be first folded and then pass to the piling mechanisms. The product delivered in this case will consist of single independent sheets of maximum size. Assuming, now, that it is desired to produce a product consisting of two sheets of the maximum size associated and folded longitudinally, the operation will be the same, except that the slit 36 will be

thrown out of operation, for which purpose the slit 36 is made removable from its shaft, and a slit 27, located above the roll 10, will be put into operation, so that the web will be split to form the webs *a b* before it arrives at the turning-bars, and the web *a*, instead of being led around the part 9 of the bar 31, will be led forward and around the bar 30, as shown in Figs. 4 and 5. The web *b*, after passing around the part 8 of the bar 31, will be led around a roll 25. From the rolls 25 26 the two webs will be led inward, so as to be associated and pass together over the longitudinal folder 41, where they will both be folded and afterward severed into sheets and delivered in the manner already described. The web *b* will in this case, after leaving the roll 26, pass beneath a register-roll 24, which is made adjustable so as to effect the proper register between the printed pages of the two webs. If it is desired to unite the two sheets forming the product, a paster 33 may be provided, which will operate to apply a line of paste to one of the webs on the line of the longitudinal fold, so that when the two webs are associated in passing over the folder 41 they will be united along this line. Assuming, now, that it is desired to deliver a product consisting of single sheets, but of less than the maximum size, one or more columns will be omitted from the side of the page, and the web A, after being perfected in the manner already described, will be slit centrally by the slit 27, and will pass forward above the turning-bar 31. The two webs *a b* being, however, in this case narrower than in the first case, it becomes necessary, in order to cause them to be folded centrally by the folders 40 41, that they should be separated from each other a distance in proportion to the reduction in the width of the web A, as otherwise the folds made by the folders 40 41 would not be in the centers of the webs. To effect this necessary separation of the webs, the parts 8 9 of the bar 31 are adjusted to the position shown in Fig. 7—that is to say, the part 8 is adjusted forward, so as to bring the center of the web *b*, when it has passed around the bar 8, in line with the point of the folder 41, while the part 9 is adjusted rearward, so as to bring the center of the web *a* in a similar manner in line with the point of the folder 40. By this means the webs, after being turned around their respective parts of the bar 31, so as to pass forward at right angles to their previous course, as in the case first described, are separated a certain distance from each other. To compensate for this change in the position of the turning-bar and preserve the proper register of the printed pages upon the webs with the cutting-cylinders, the web *a*, instead of being led around the roll 26, is led around a roll 23, by which its travel is increased to correspond with the changed position of the part 9 of the bar 31, while the web *b* is led around a similar roll 22, located so as to change the travel

of that web to conform to the changed position of the part 8 of the bar 31.

The operation of the folders 40 41 and the subsequent mechanism is the same as already described.

Assuming, now, that it is desired to produce a product consisting of two of these smaller sheets associated and folded, the web *b* will be led around the part 8 of the bar 31, which remains in the same position as last described, while the web *a* will be led around the bar 30, but this bar, to conform to the change in the width of the web *a*, will be adjusted inward from the position shown in Fig. 4 to the position shown in Fig. 9, thus bringing the web *a* in line with the web *b* and the folder 41. The two webs *a b* will thus be associated and folded the same as described in producing the similar product with sheets of the maximum size. In this case, however, the web *a*, instead of being led around the roll 25 will be led around a roll 21, suitably located to correspond to the changed position of the bar 30.

In some cases it is required that the product of the web A shall be associated sheets exclusively, and then it is only necessary to provide the delivery apparatus with one folder, and in such case the part 9 of the turning-bar 31 may be omitted. Figs. 11 and 12 illustrate an organization of this character.

To produce a product consisting of two associated sheets of maximum size with the machine thus organized the web A will be of full width, and after being split by the slit 27 the narrow webs *a b* will be led around the bars 30 31, as in Fig. 11, and to the single folder 41, the same as before. To produce a product consisting of two sheets of reduced size a narrower web will be used and the bars 30 31 will be adjusted toward each other, as indicated by dotted lines, so that the narrower webs being led around the bars will be properly presented to the folder. A single-sheet product may, however, be produced with the machine thus organized by using a half-width web. If such product is to consist of a sheet of the maximum size, the bar over which it turns will be adjusted to the position shown by full lines in Fig. 11, while if the product is to consist of a sheet of less size the bar will be adjusted to the position shown by dotted lines, or to some intermediate position. To facilitate the ad-

justment of the bars 30 31 they may in this case be mounted upon supports 29, which are provided with nuts which engage with right and left hand screws 4, formed upon rods 20, which are provided with bevel-gears 19, which engage with similar gears 18 upon a shaft 34, having a hand-wheel 35. By operating the hand-wheel 35 the bars 30 31 can readily be adjusted to and from each other with perfect accuracy and to any desired extent. In this case the roll 26 is mounted in swinging arms 17, by which it can be adjusted to different positions to correct any irregularity in the register of the webs caused by any change in the position of the turning-bars.

The gearing for driving the various parts and the connecting mechanisms are for the most part shown in the drawings; but it is not necessary to describe these parts in detail, because they are of the ordinary form and will be readily understood by any one familiar with this class of machines.

What I claim is—

1. The combination, with a longitudinal folder, of a pair of turning-bars made adjustable to and from each other, whereby webs of different widths may be turned and properly presented to said longitudinal folder, substantially as described.

2. The combination, with a plurality of folders, of a turning-bar 31, made in sections, which are adjustable with relation to each other, whereby webs of different widths may be turned and properly presented to said folders, substantially as described.

3. The combination, with a pair of folders, of a pair of turning-bars which are adjustable to and from each other, one of said bars being made in sections, which are adjustable with relation to each other, substantially as described.

4. The combination, with a pair of turning-bars 30 31, of the rods 20, having the right and left hand screws for adjusting said bars to and from each other, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

STEPHEN D. TUCKER.

Witnesses:

CHAS. W. CARPENTER,
RICHARD KELLY.