

No. 664,589.

Patented Dec. 25, 1900.

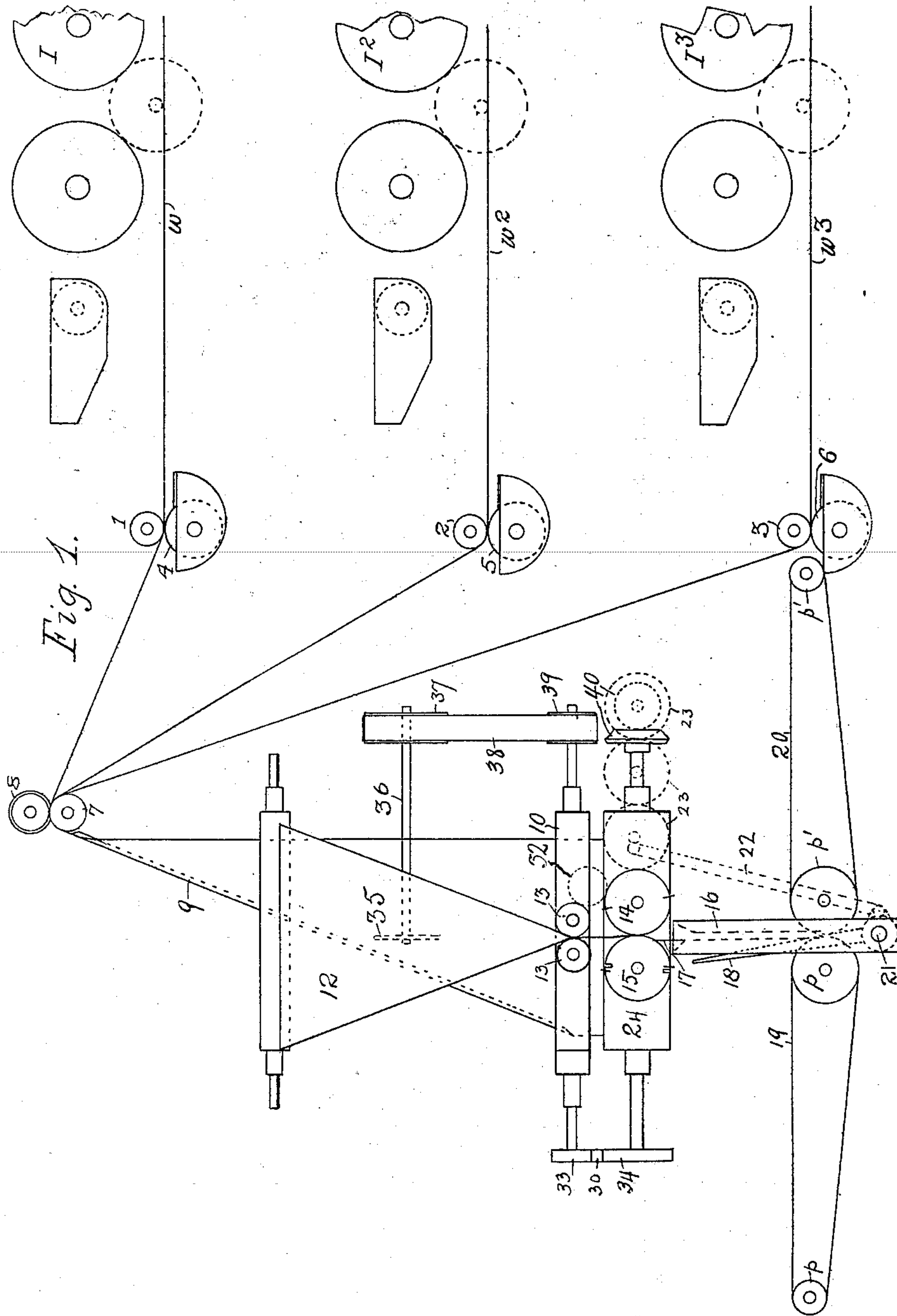
W. SCOTT.

FOLDING AND DELIVERY MECHANISM.

(Application filed Jan. 27, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

Jane Kiecox,  
Harry Baile

Inventor  
Walter Scott,  
By his Attorney  
Richard W. Parker.

No. 664,589.

Patented Dec. 25, 1900.

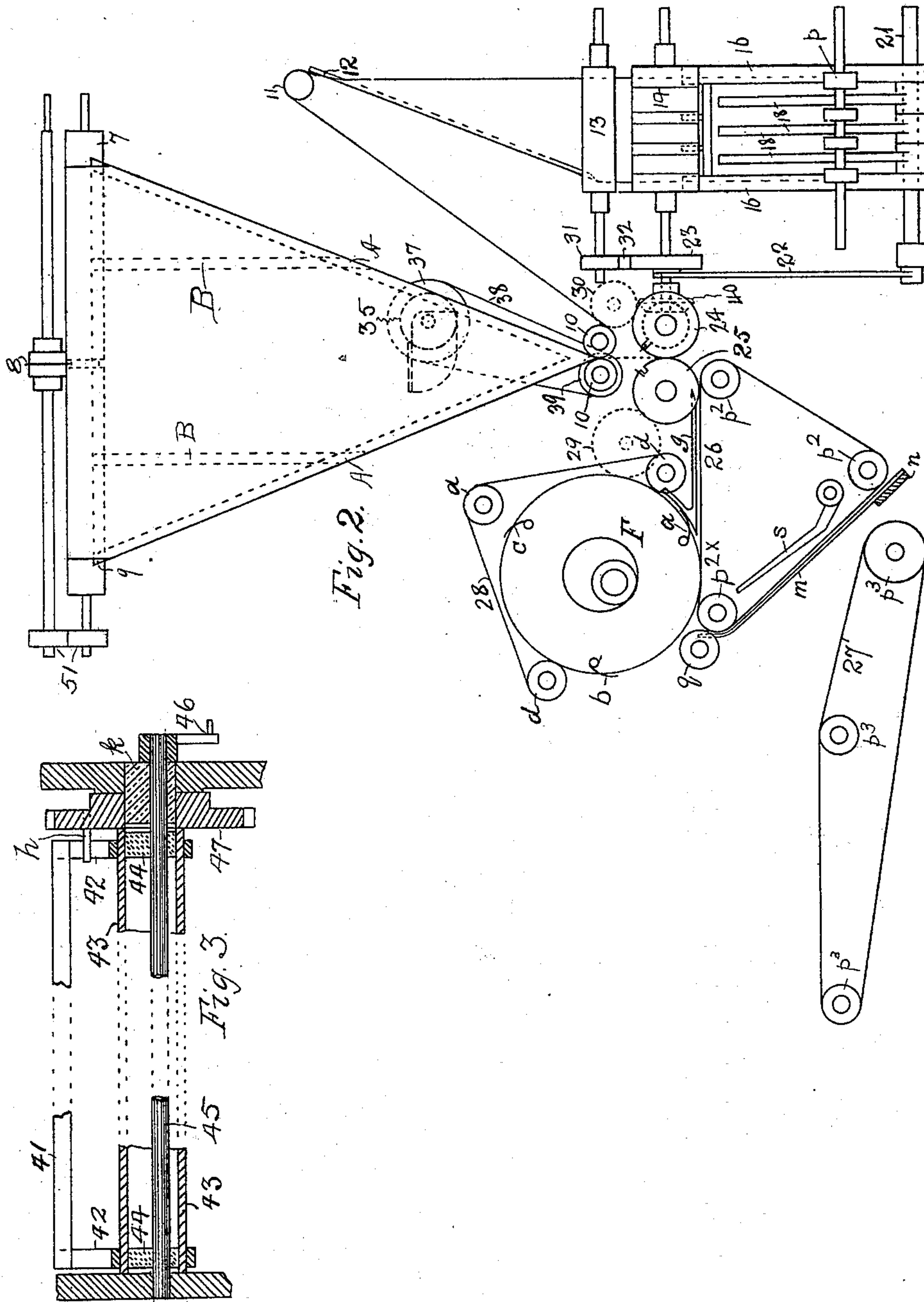
W. SCOTT.

FOLDING AND DELIVERY MECHANISM.

(Application filed Jan. 27, 1898.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses  
James Kiecox.  
Henry B. Bissell

Inventor  
Walter Scott  
By his Attorney  
Richard W. Parker

No. 664,589.

Patented Dec. 25, 1900.

W. SCOTT.

FOLDING AND DELIVERY MECHANISM.

(Application filed Jan. 27, 1898.)

(No Model.)

3 Sheets—Sheet 3.

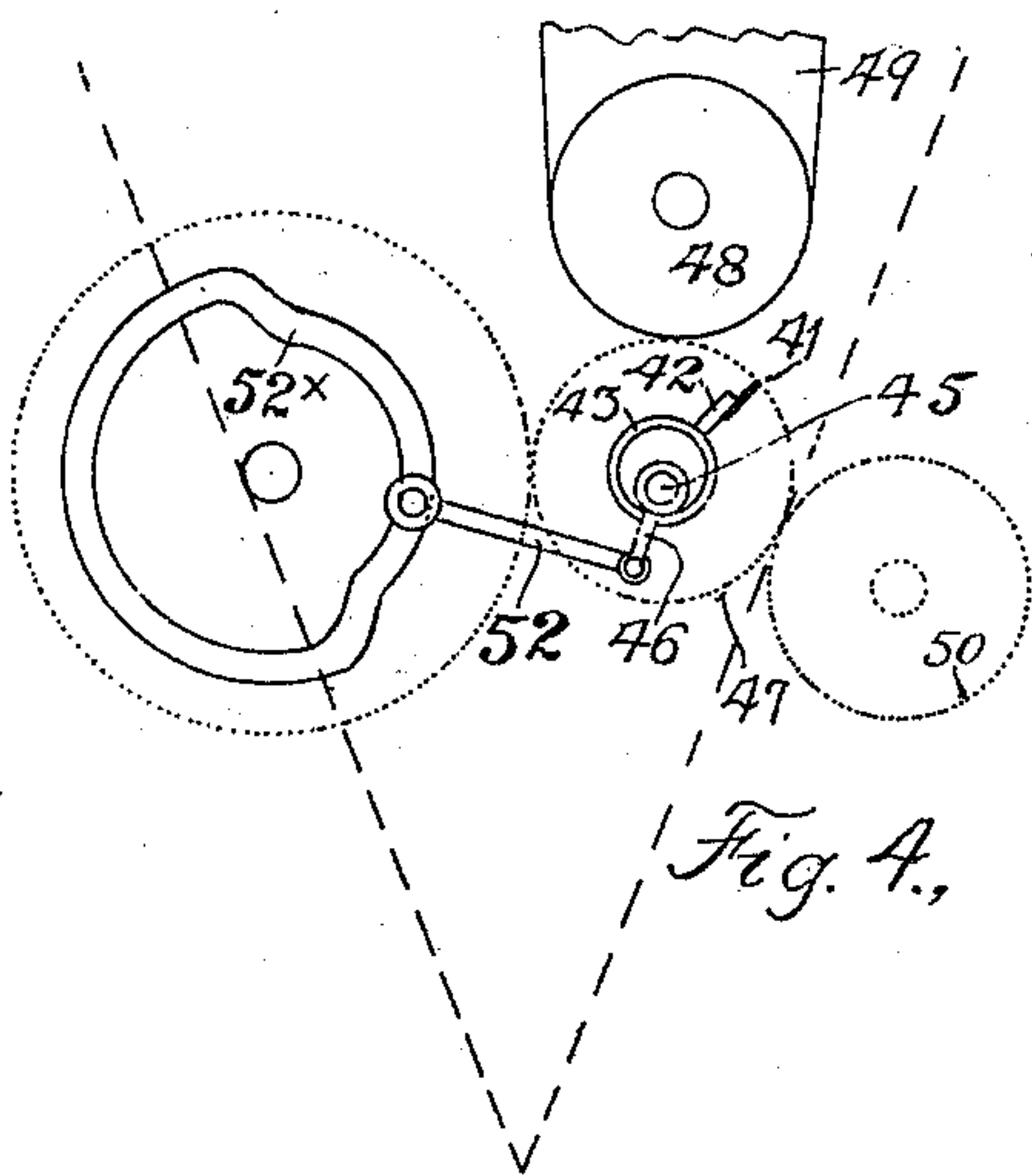


Fig. 4.

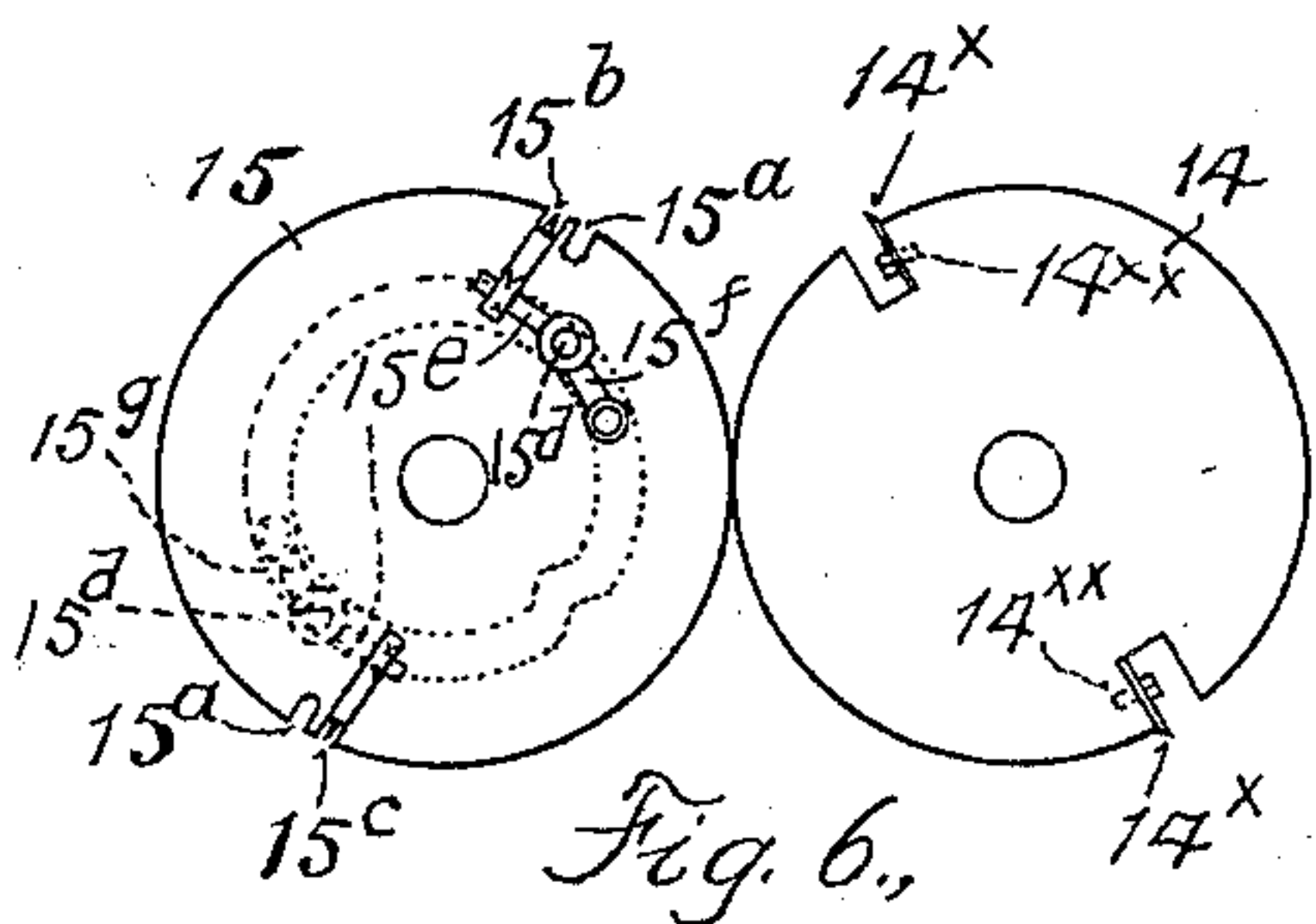


Fig. 6.

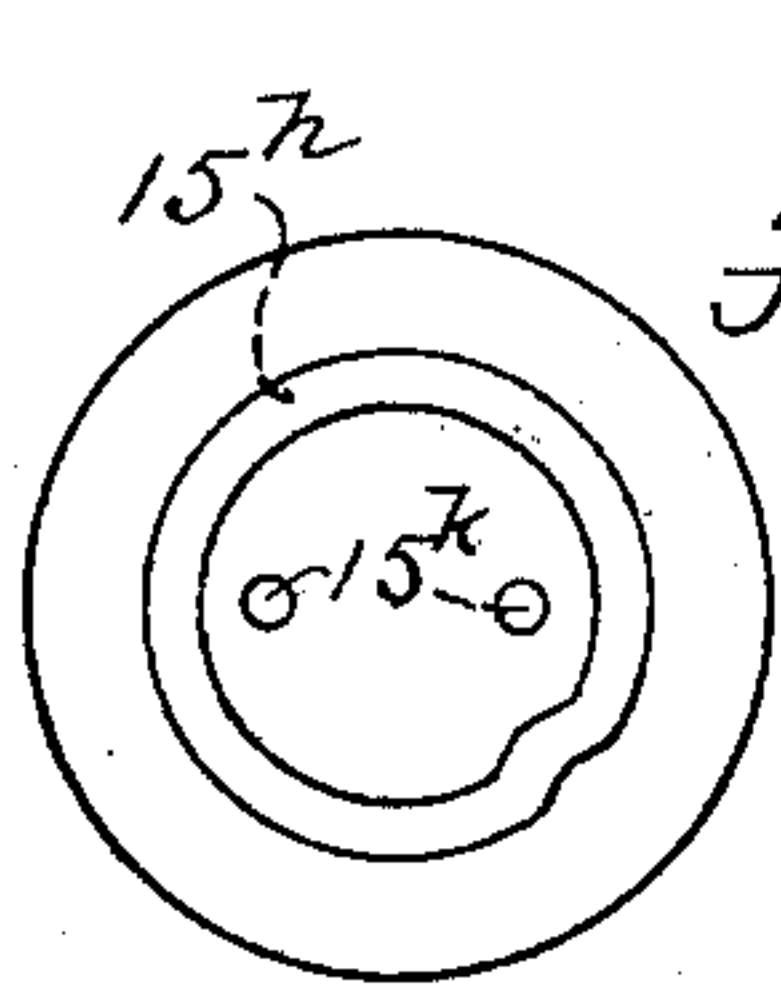


Fig. 7.

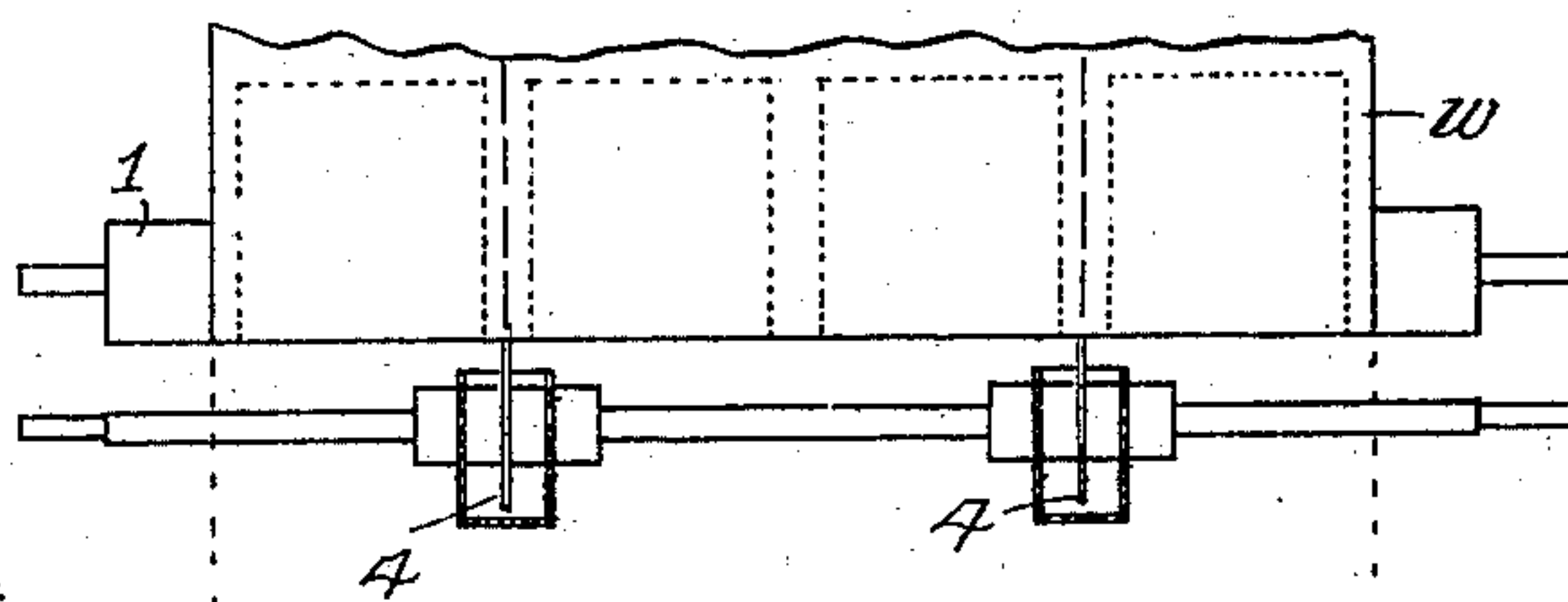
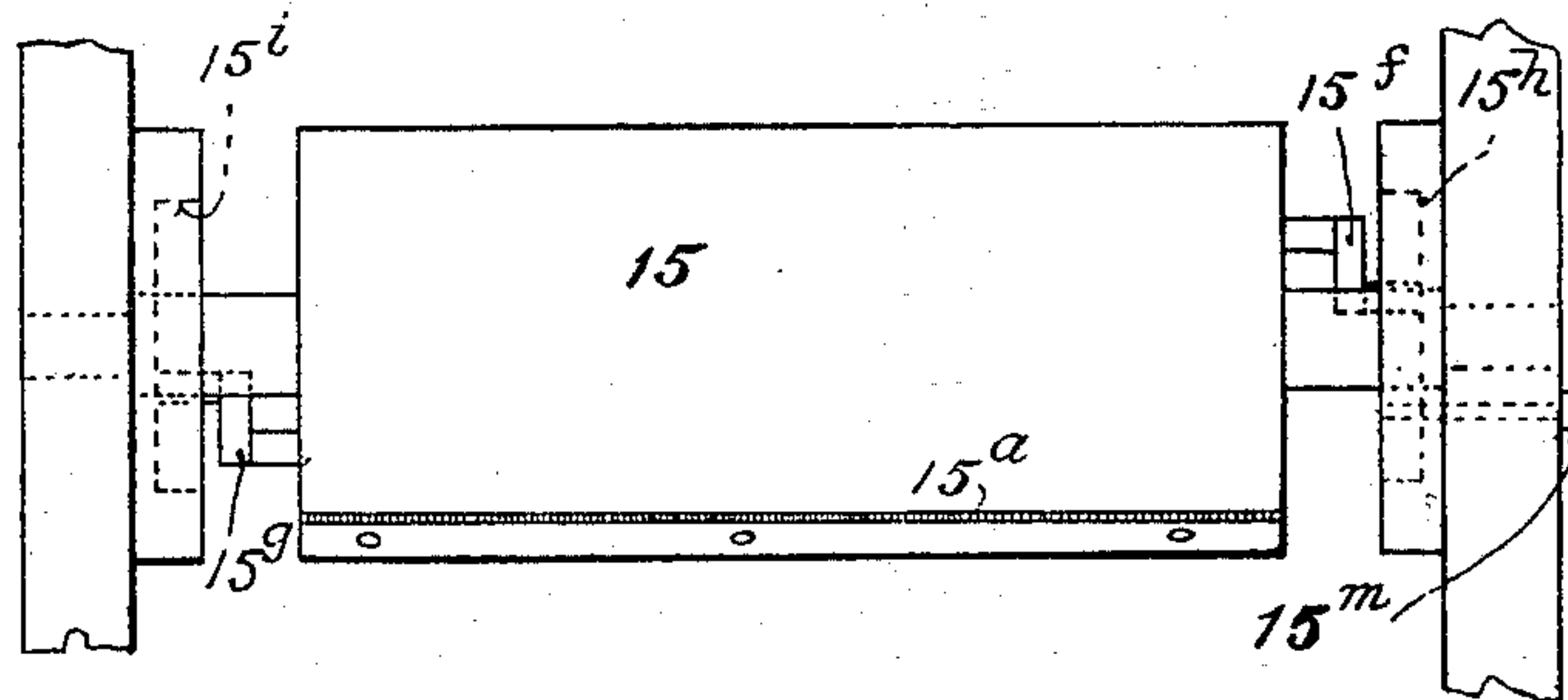
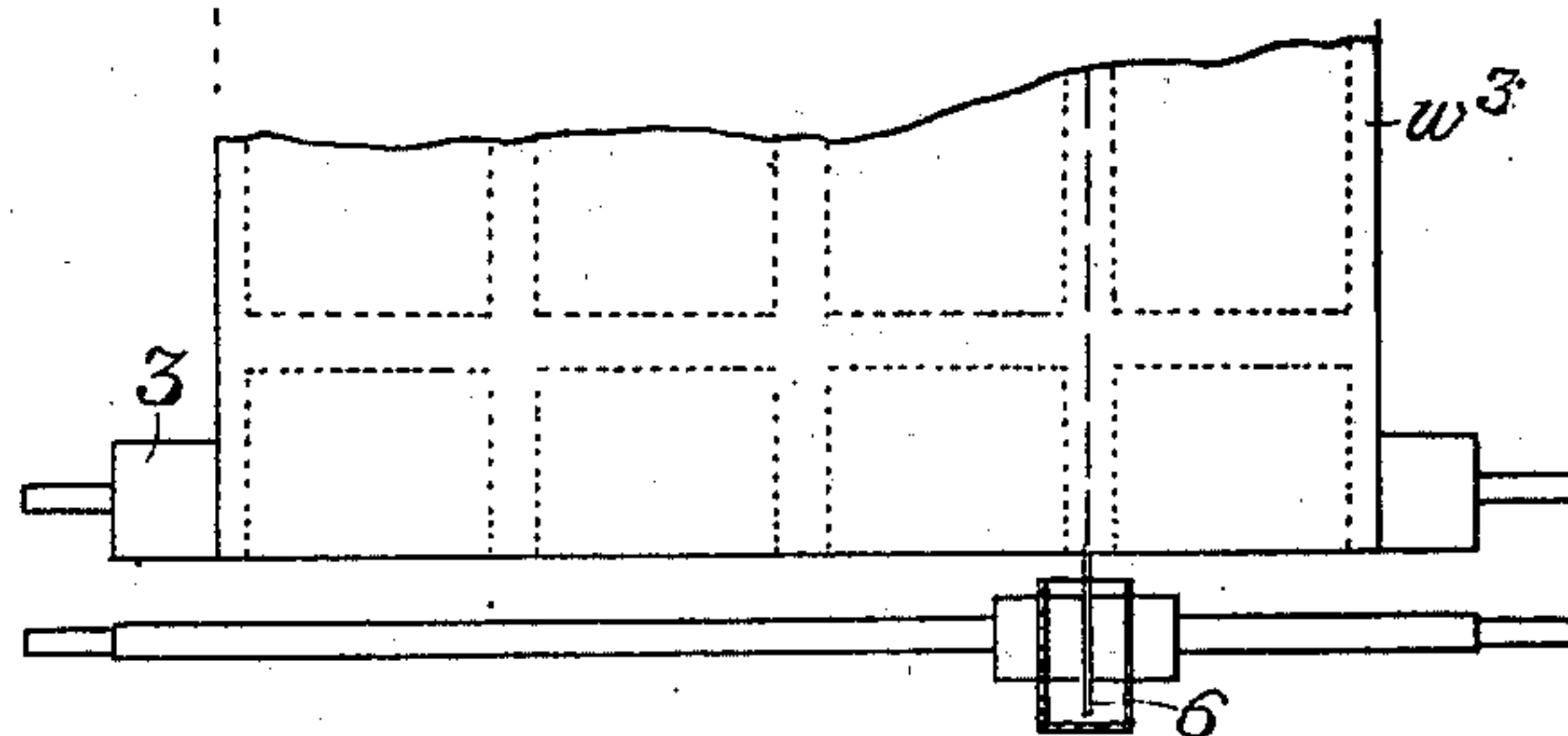
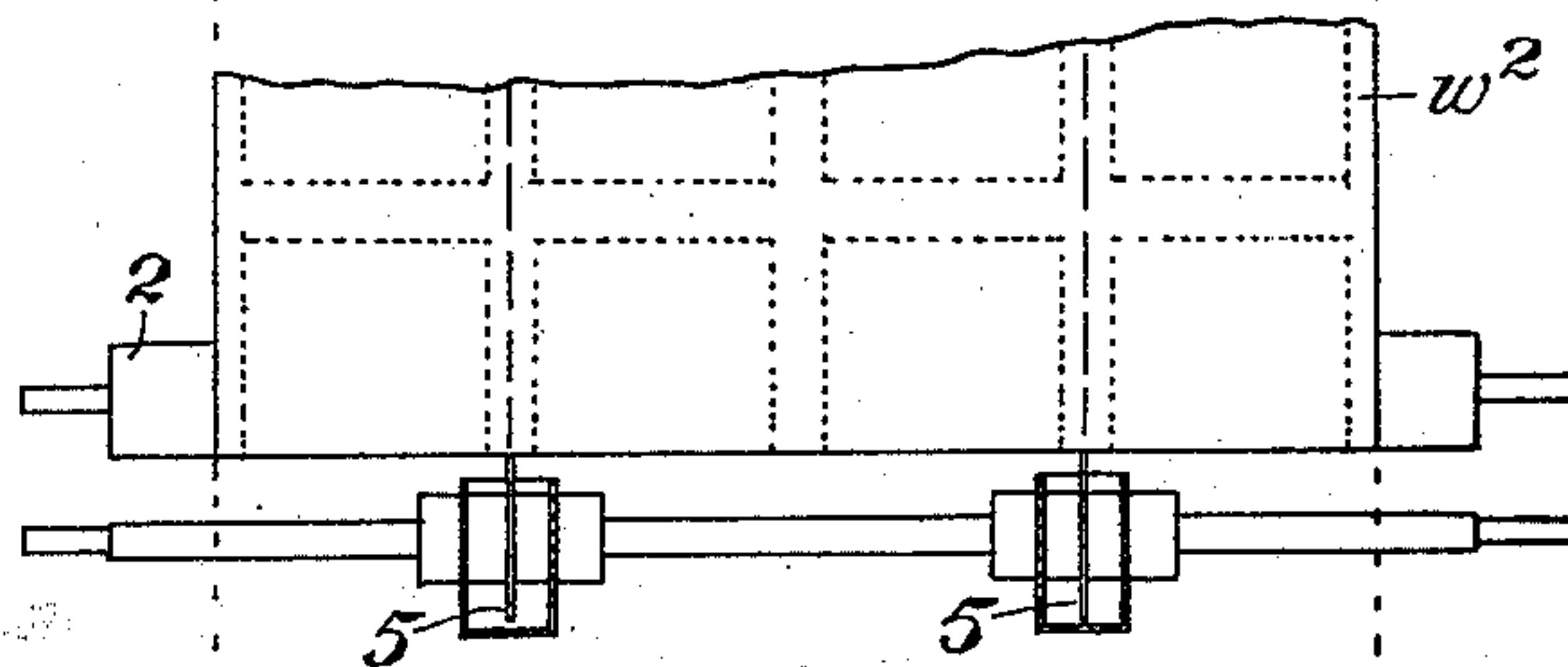


Fig. 5.



Witnesses:  
Frank Ryall  
Aug. J. Engel.

Inventor  
Walter Scott,  
By his Attorney  
Richard W. Bartley.



# UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

## FOLDING AND DELIVERY MECHANISM.

SPECIFICATION forming part of Letters Patent No. 664,589, dated December 25, 1906.

Application filed January 27, 1898. Serial No. 668,121. (No model.)

*To all whom it may concern:*

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

There are many printing establishments devoted more especially to doing presswork for publishers of newspapers, magazines, &c., thus being called upon to do work of unlike natures and requiring many different machines to do the work or a few machines having great capacity for turning out work of different sizes, as newspapers, magazines, &c. Rotary presses being fast are preferred for this work wherever it is possible to use them.

One object of the present invention is to meet the varied requirements of printing establishments in the production of matter of various sorts and sizes, as newspapers, magazines, or the like, by a machine capacitated to print, associate, paste, fold, cut, and deliver, or such of these steps as may be required in any particular case.

Another object is to paste together webs or web-sections that are associated after being drawn over turner-bars or the internal guide or V-shaped former of a longitudinal folder.

Another object is to apply lines of paste transversely of a web or web-section after it has passed a turner-bar or the internal guide of a longitudinal folder and before it comes in contact with another web or web-section, and other objects, as will hereinafter appear.

To these ends the invention includes a turner-bar or an internal guide or V-shaped former over which a web (or webs) is drawn and provided with a groove extending in the direction of motion of the web and positioned to register with a central margin of the web to which paste has been applied, combined with means for drawing the web or webs over such bar or former and for associating a second web or webs therewith after said bar or former is passed and means for applying paste to said central margin of the first-named web before it reaches said turner or bar or former.

The invention also includes a longitudinal

former or turners arranged V fashion, means for drawing and associating webs, and a paste-applying device located behind or under the former or turners to apply paste to a web after it has passed the edge of the former or the turner-bar and before it is associated with another web.

The invention also includes a longitudinal former or turners arranged V fashion, means for drawing and associating webs, and a revolving paste-applying blade making contact from time to time with a web in lines extending transversely thereof, so that when the said web is later associated with another web the two are pasted together securely on transverse lines.

The invention also includes a rotatory or oscillatory shaft and a revolving paste-blade mounted eccentrically upon said shaft and arranged to apply paste transversely of a moving web.

The invention also includes two longitudinal formers or associators arranged for action in succession upon the same web or webs, with cutting-cylinders and a delivery for each of said folders or associators.

The invention also includes other features of construction and combinations of devices hereinafter described, and all as more particularly pointed out in the appended claims.

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 printing-machine in which the invention is embodied. Fig. 2 is an end elevation of the same. Fig. 3 is a sectional view of a paste-applying device. Fig. 4 is a diagrammatic end view of the paster shown in Fig. 3 and of operating mechanism thereof. Fig. 5 is a cross-sectional view of the machine shown in Fig. 1 and taken between the folding mechanism and the printing mechanism and showing paste-applying devices and which may be adjusted or moved along the shafts or bars carrying them. Fig. 6 is a view of the cutting mechanism, showing an arrangement for rendering one or more cutters inoperative and also a means for moving the pins in and out of a cylinder. Fig. 7 contains a side view of a cylinder shown in Fig. 6 and also a like view of a cam.



In the drawings the references  $I I^2 I^3$  indicate second-impression cylinders of a three-tiered web-perfecting press. The presses shown are of a size to print newspapers having two pages of the maximum size extending across or abreast on the web, such web being known in the art as a "single-width" web. Obviously the single-width web may be in the form of a single fabric or roll, or it may be in the form of two "half-width" webs placed edge to edge, each half-width web receiving but one page of the maximum size thereacross. The perfected webs  $w w^2 w^3$  pass around guide-rolls 1 2 3 to a roll 7 at the top of the first folding-machine, where they are associated. From the roll 7 the webs pass over the V-shaped internal guide or longitudinal former 9 and between rolls 10 at the point or apex of the former and so are folded if the webs are single width. If, however, the webs are half-width or are single width and are split by the slitter 8, which coacts with a groove in the roller 7, the former 9 and rolls 10 become a means for associating the webs or longitudinal sections.

When printing two pages of the maximum size abreast on the single-width web and using three webs, the same may be attached to each other by lines of paste extending longitudinally thereof centrally, said paste being applied by revolving disks 4 5, which run in fountains and coact with webs  $w w^2$ . In this case the lines of paste pass over the point or apex of the former 9.

When printing four pages abreast on a single-width web and using all three webs, two paste-disks each are used in connection with the webs  $w w^2$ , and these are placed on their respective shafts or supports, so as to apply the paste to those central margins of webs  $w w^2$  nearest the edges of the webs, and a paste-applying disk 6 is used in connection with web  $w^3$  to apply a line of paste thereto on one or the other of the central margins of web  $w^3$  nearest one or the other edge thereof, all as indicated in Fig. 5. In order to prevent smearing of the paste applied by disk 6 (or either of disks 4 and 5 when the lower web is not used and such upper paste-disk is used) as the web passes over the former 9, the former is provided with one or more grooves B when in the form of a plate and with the curved grooves A when in the form of two round bars meeting in a miter-like point, said grooves registering with said central margins to which the pasters 4 5 6 apply paste, as above described, when printing four pages abreast on the webs. When there are four pages abreast on the webs, the slitter 8 is used to split the webs into longitudinal halves or sections, and these sections are united by the lines of paste applied by the disks 4 5 6 to form a six-ply (or less ply) product.

In each of the above cases the associated webs may be taken from the rolls 10 to and over a roll 11 and a former 12 and to and over

or between folding-rolls 13 and cutting-cylinders 14 15 and to a suitable delivery.

The dimensions of cylinders 14 15 are such that their circumferences are equal to the length or width of a page when there are two pages abreast on each single-width web and to twice such length or width when there are four pages abreast on such web, proper margins being included in each case. The male cutting-cylinder 14 is therefore provided with two knives or cutters  $14^x$ , placed at opposite sides thereof, and either or both of which are removable from or adjustable into and out of their operative positions, as by means of screw-bolts  $14^{xx}$ , that pass through slots in the blades  $14^x$  and engage with threaded holes in the side walls of the longitudinal slots in the cylinder in which the knives are placed. The female cutting-cylinder 15 is provided with two oppositely-placed longitudinal slots or grooves  $15^a$  for coaction with said blades  $14^x$  and with pins  $15^b 15^c$  behind said grooves  $15^a$  for seizing and holding the leading edges of the sheets or webs. These pins may be fixed or they may be protruded in any suitable manner, as by means of shafts  $15^d$ , arms  $15^e$ , pivotally connected with said pins, arms  $15^f 15^g$ , and cams  $15^h 15^i$ . The cams  $15^h 15^i$  are fast to the framework of the machine and one (or both) is arranged to be turned to a position in which the pins operated thereby will not be operative to seize the sheets—that is, will not be protruded when they pass the cylinder 14 and so fail to seize the heads of the sheets. The cam  $15^h$  is shown as being provided with two holes at opposite sides of its center. The framework is provided with a threaded hole, over which each of said holes  $15^k$  may be placed, according to the position of the cam, and through which a screw-bolt passes into the said threaded hole in the framework. By removing the screw-bolt  $15^m$  and turning the cam half-way around and so bringing the other hole  $15^k$  over the hole in the framework and then replacing the screw  $15^m$  the cam is secured in position such that the pins  $15^b$  are held inward of the cylinder 15 at the time they pass the cylinder 14 and the strippers 17, hereinafter described.

The products delivered by the cutting-cylinders 14 15 pass between guides 16, which are slotted vertically on their inner faces to engage with a small portion of each outer margin or edge of the copies coming down from the cylinders 14 15. In order to insure that the copies shall invariably enter the grooves of the guides 16, the copies may be stripped from the cylinder 15 by suitably-supported fingers 17, which enter circumferential grooves in said cylinder 15. The copies are pushed from between the guides 16 by vibratory fingers 18, alternate copies falling upon the traveling tapes 19 20. The fingers or arms 18 are borne by a rock-shaft 21, which is operated by means of an arm thereon, a rod 22 connecting pivotally with said arm and with a rotary part, as a gear 23, eccentrically



thereof. The tapes 19 are carried by suitably-operated rolls or pulleys  $p$  and receive alternate copies when both knives  $14^x$  are in use. The tapes 20 are borne by suitably-operated rolls or pulleys  $p'$  and receive the other alternate copies when both knives  $14^x$  are used.

The rolls 7 and 10 and the former 9 constitute a first folding mechanism and the rolls 11 and 13 and the former 12 a second folding mechanism, and each of said folding mechanisms is provided with a suitable cutting and delivering mechanism. The cutting and delivering mechanism used in conjunction with the second folding mechanism has been described above and that shown or used in conjunction with the first folder will be described hereinafter.

The operation of the machine when four pages abreast on the full-width web and all three webs are in use will now be described. The slitter 8 is put in place to split the webs into longitudinal halves and the pasters 4 5 6 are placed to apply lines of paste to the central margins, as aforesaid, in order to unite the web-sections. The former 9 and rolls 10 (or one of the latter) act to associate the web-sections, and the second folding mechanism gives a longitudinal fold to the associated web-sections. Both knives of cylinder 14 and both sets of the pins on cylinder 15 may be used to sever the folded webs into separate copies or products, and these are then alternately delivered upon the tapes 19 20, as aforesaid, by the action of the pusher 18. In other cases the webs after being folded by the first folder may be taken direct to cutting-cylinders 24 25 therebelow and be divided by said cutting-cylinders into copies and be delivered thereby upon traveling tapes 26. The cylinder 24 is provided with a cutting or perforating knife, while the cylinder 25 is provided with a longitudinal groove for coaction with said knife and with a set of pins for taking the leading edge of the web or webs. The leading edge of the web or webs is stripped from the cylinder 25 by fingers  $g$ , which enter grooves therein and which overlie or are above the tapes 26. The copies are carried forward by the tapes 26 to a cylinder F, which is provided with three sets of grippers  $a b c$ , located at equal distances circumferentially thereof. The sheets may be collected by cylinder F, if desired, or they may be delivered direct to folding-rolls  $q p^{2x}$  without being collected. The cylinder F and its folding-off mechanism may be of any approved construction; but the particular construction shown in the drawings is the same in principle as that shown and described in my Letters Patent of the United States granted on the 1st day of December, 1896, and bearing No. 572,280. The sheets are run along by tapes 26 and guides  $g$  to the grippers  $a b c$  of the cylinder F and are delivered between the rolls  $q p^{2x}$ , as aforesaid, and are there folded transversely. Fixed guides  $m$ ,

carried by a fixed bar  $n$ , extend into grooves in roller  $g$  and coact with the tapes 26 to feed the copies downwardly toward traveling tapes 27 and in front of vibratory arms  $s$ , which push the folded copies out upon the tapes 27. This delivery (parts  $m$ ,  $s$ , and 26) is substantially the same as that claimed in my Letters Patent of the United States granted November 24, 1896, and bearing No. 571,982, to which reference is made for a more complete description thereof. The tapes 26 are borne by suitable pulleys or rolls  $p^2 p^{2x}$ . A set of tapes 28, running on pulleys  $d$ , may be used in conjunction with the cylinder F to retain the copies against said cylinder whenever sheets are being collected by the cylinder. The cylinders 14 15 and 24 25 are driven in any suitable way, as by a train of gears 23, connecting them together, and the beveled gears 40. The rolls 10 are driven from the cylinder 24 by means of the gears 30 33 34, and the rolls 13 are driven from the cylinder 14 by the gears 31 32. The reference 29 indicates a pinion connecting the cylinder 25 with the cylinder F.

Instead of employing a paste-applying disk 6 intermediate the printing mechanism and the first folder I may apply paste to the underneath web at a point nearer the folding or drawing rolls 10. For this purpose a paste-applying disk 35 is located under the former 9 to apply paste to the underneath web after it shall have passed the edge of the V-shaped former and prior to its arrival at the rollers 10. The disk 35 is carried by a shaft 36 and is driven from one of the rolls 10 by means of the pulleys 37 39 and the belt 38. A suitable paste-fountain is employed in connection with the disk 35. In this way the paste is fresher or not so dry as when applied by the disk 6, (or either of disks 4 5, according to the number of webs in use at any particular time.)

The forms may be placed upon the form-cylinders of the various presses with their rules or columns running circumferentially thereof, or they may be placed to have such columns running longitudinally of the said form-cylinders. The disks 4, 5, and 6 may be employed in either case whenever there are four pages abreast upon the single-width webs, or the disk 6 may be left off and the disk 35 be used in such case. In case the rules or columns run lengthwise of the form-cylinders and but two pages abreast are printed upon the single-width web or webs the disks 4 5 may be dispensed with, or they may be replaced by revolving blades which apply lines of paste transversely of the webs, as in my Letters Patent granted the 31st day of October, 1893, and bearing No. 507,758, it being understood that the paste devices are placed beneath the webs  $w w'$  and that paster 6 is omitted altogether.

In order to apply lines of paste transversely of the under web, I may employ a revolving paste-blade 41, which is arranged to apply



the lines of paste to the web after the web shall have passed the edge of a former, as 9, and before it shall have reached the folding or drawing rolls or associating device. By preference the blade 41 is timed to make at least two revolutions for each revolution of the cutting-cylinders. In case the copies are of such a width that two of their pages equal the circumference of the cylinder 14 and it is desired to apply paste transversely of the web, in which case one of the knives of the cylinder 14 and one set of pins of cylinder 15 would be rendered inoperative, it is requisite that the revolving blade 41 shall apply paste to the web at every other revolution at least of the blade. In such case I so mount the blade 41 that it may be withdrawn from its operative position every other time it passes the point where it applies paste to the web. For this purpose the blade 41 is shown as being carried by the arms 42, which are fast upon a tubular shaft 43. The shaft 43 is loosely mounted upon the disks 44, which are eccentric to the shaft 45 and are fastened to said shaft 45. The shaft 45 is provided with an arm 46, by means of which it may be rocked at suitable intervals, as by a rod 52, operated by a suitable cam 52<sup>x</sup>. The disks 44 are shown as of the same size as the fixed stud or bearing *k*, upon which the gear 47 rotates. The parts are so arranged that in one position thereof the axis of rotation of the blade 41 coincides with the axis of the gear 47, and it is while the parts are in this position that the blade 41 takes paste from the fountain-roller 48 and applies it to the web. The roller 48 runs in a fountain 49, from which it takes the paste. Upon turning the rock-shaft 45 partly around the center of rotation of the blade 41 is moved away from both the fountain-roller 48 and the web, so that it will neither take the paste from the fountain nor apply it to the web. The gear 47 is provided with one or more pins *h* for coaction with one of the arms 42 for causing the paste-blade to revolve. The gearing for driving the gear 47 is arranged to cause two or more revolutions of the gears 47 50, and so of the blade 41, to one revolution of the cylinder 14, and the mechanism for rocking or rotating the shaft 45 is arranged for moving the same and the shaft 43 in such wise that the blade 41 is withdrawn from its operative or paste-applying position after it has applied paste to the web and before it reaches the fountain-roller 48 again and is maintained in that position until after it shall have passed the web once or oftener, when it is again moved into position for coaction with the fountain-roller and the web, and so on.

The former 9 if in the form of a plate is provided with grooves B, which extend in the direction of the motion of a web drawn across the former, as in folding, and placed to come opposite those central margins to which the disk 6 may apply paste, thus avoiding the smearing of paste upon the web. The grooves

B are continued around the edge of the former, as at A, for the like purpose.

51 represents gears for gearing the slit 8 with the roll 7.

I remark that different-sized or unlike products may be simultaneously produced by the mechanism shown and described. For instance, the plate-cylinders may have plates on one end with their columns running circumferentially thereof, while on their other ends the cylinders may have the plates with their columns running lengthwise thereof, thus allowing of the printing of different periodicals or matter at one and the same time by one and the same machine. One longitudinal half of the web or webs would then go to the cylinders 24 25 and the corresponding delivery and the other longitudinal half of the web or webs would go to the cylinders 14 15 and the corresponding delivery and cutting mechanism.

Pin-holes in the tops of pages of newspapers are objectionably noticeable, though they are not so if in the bottom margins thereof. The described arrangement of the first folder, the cylinders 24 25, tapes 26, cylinder F, rolls *q p*<sup>2x</sup>, guides *m*, and tapes 27, with the placing of the forms on the plate-cylinders with their heads following—that is, with their columns running circumferentially of the cylinders and with the bottoms thereof arranged to pass any given point first and the heads to pass last—insures that the pin-holes shall be in the bottom margins of the pages and that the copies shall be delivered upon the tapes 27 with their titles uppermost. In other words, the sheets are presented to the grippers *a b c* of the cylinder F tail first, just the reverse of what happens in the case of Patent 572,280 aforesaid.

The revolving blade 41 should be located as closely as possible to the V-point of the turner or former in connection with which it is used. To allow of this, the arms supporting the blade are made short, and the blade is revolved two or more times to each application of paste thereby to the web and is also moved “in and out,” so to say, in order to miss the web during certain revolutions.

Many changes and substitutions may be made without departing from the spirit of this invention, which is not limited to the precise form thereof hereinbefore described.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a folding mechanism, the combination of a longitudinal V-shaped former provided with a groove extending in the direction of travel of the web, and means for applying paste to said web along a longitudinal line thereof before the web reaches said former, with means for drawing the web over said former, laying the fold and pressing the parts of the web together, whereby said paste is caused to unite the web-sections, substantially as described.

2. In a folding mechanism, the combination



of a longitudinal or V-shaped former, means for drawing a web thereover and associating the web-sections, and a paste-applying device located inside the web under the former and applying paste to the web after it leaves the edge of the former and before it reaches the drawing means, whereby said drawing means also cause the web-sections to be pasted together, substantially as described.

3. In a folding mechanism, the combination of a longitudinal V-shaped former, drawing means coacting therewith, and a revolving blade for applying paste to the inner side of a web after it leaves the edge of said former and before it reaches said drawing means, substantially as described.

4. In a folding mechanism, the combination of a longitudinal V-shaped former, drawing means coacting therewith, a journaled shaft located between said former and said drawing means, a paste-applying blade mounted eccentrically of said shaft, and mechanism for revolving said blade independently of the motion of said shaft, substantially as described.

5. In a folding mechanism, the combination of a longitudinal V-shaped former, drawing means for coaction therewith, a revolving blade located to apply paste to the inner side of the web after it leaves the edge of said former and before it reaches said drawing means, mechanism for revolving said blade, and mechanism for moving the blade into and out of position for coaction with said web, substantially as described.

6. In a printing and folding machine, the combination of web-printing mechanism, a longitudinal folder to which the web is led without being turned over, cutting-cylinders adjacent the apex of said folder, a collecting or carrying cylinder at the left of said cutting-cylinders, impaling-pins on said carrying-cylinder, folding-rolls below said carrying-cylinder and between which the sheets are folded off, guides for the edges of the copies fed downwardly by said folding-rolls, a set of tapes for carrying the sheets from the cutting-cylinders to the carrying-cylinder and also coacting with said guides, a receiver, and a pusher, substantially as described.

7. In a folding mechanism, the combination of two longitudinal folders arranged to act in succession on the same web to fold it twice longitudinally and to associate sections thereof or half-width webs at the first folder and to fold the same or part thereof at the second folder, with two independent cutting and delivery mechanisms adapted one to coact with the first folder and the other to coact with the second folder, and means whereby the web

may be led from the first folder to the second folder without being cut by the cutting mechanism for the first folder, substantially as described.

8. In a folding mechanism, the combination of a longitudinal former 9, guide or folding rolls 10 at its apex, cutting-cylinders 24 25, and delivery mechanism for delivering products at one place, with roll 11, former 12, the web going to former 12 being led thereto without being cut by cylinders 24 25, rolls 13 at the apex of former 12, cutting-cylinders 14 15, and delivery mechanism coacting therewith to deliver products at a second place, whereby various products may be delivered some at one place and some at another simultaneously or otherwise, substantially as described.

9. In a folding mechanism, the combination of a longitudinal folder to which the web is taken without being turned over, cutting-cylinders below said folder, a sheet-carrying cylinder at the left of said cutting-cylinders, guides for the sheets extending tangentially of said cutting and carrying cylinders at the under sides thereof, a pair of folding-rolls between which the carrying-cylinder delivers the sheets, and a delivery, substantially as described.

10. In a folding mechanism, the combination of a longitudinal folder to which the web is taken without being turned over, cutting-cylinders below said folder, a sheet-carrying cylinder at the left of said cutting-cylinders, guides for the sheets extending tangentially of said cutting and carrying cylinders at the under side thereof, a pair of folding-rolls between which the carrying-cylinder delivers the sheets, guides for the edges of the copies as they are run down by said rolls, a set of tapes coacting with said guides, a pusher, and a receiver, substantially as described.

11. In a folding mechanism, the combination of two longitudinal folders or V-shaped turners and associators adapted to act in succession on the same web, a paste-applier located to apply paste to the inner side of the web after it has left the edge of the first former or turner and before it reaches the rolls or associator, and two independent cutting and delivery mechanisms one for each folder and delivering products at different places, substantially as described.

Signed by me at New York city, New York, this 12th day of January, 1898.

WALTER SCOTT.

Witnesses:

RICHARD W. BARKLEY,  
CHAS. A. BRODEK.