

W. SCOTT, DEC'D.
I. & D. J. SCOTT, EXECUTORS.
FOLDING AND DELIVERY MECHANISM.
APPLICATION FILED NOV. 15, 1904.

952,714.

Patented Mar. 22, 1910.
5 SHEETS—SHEET 1.

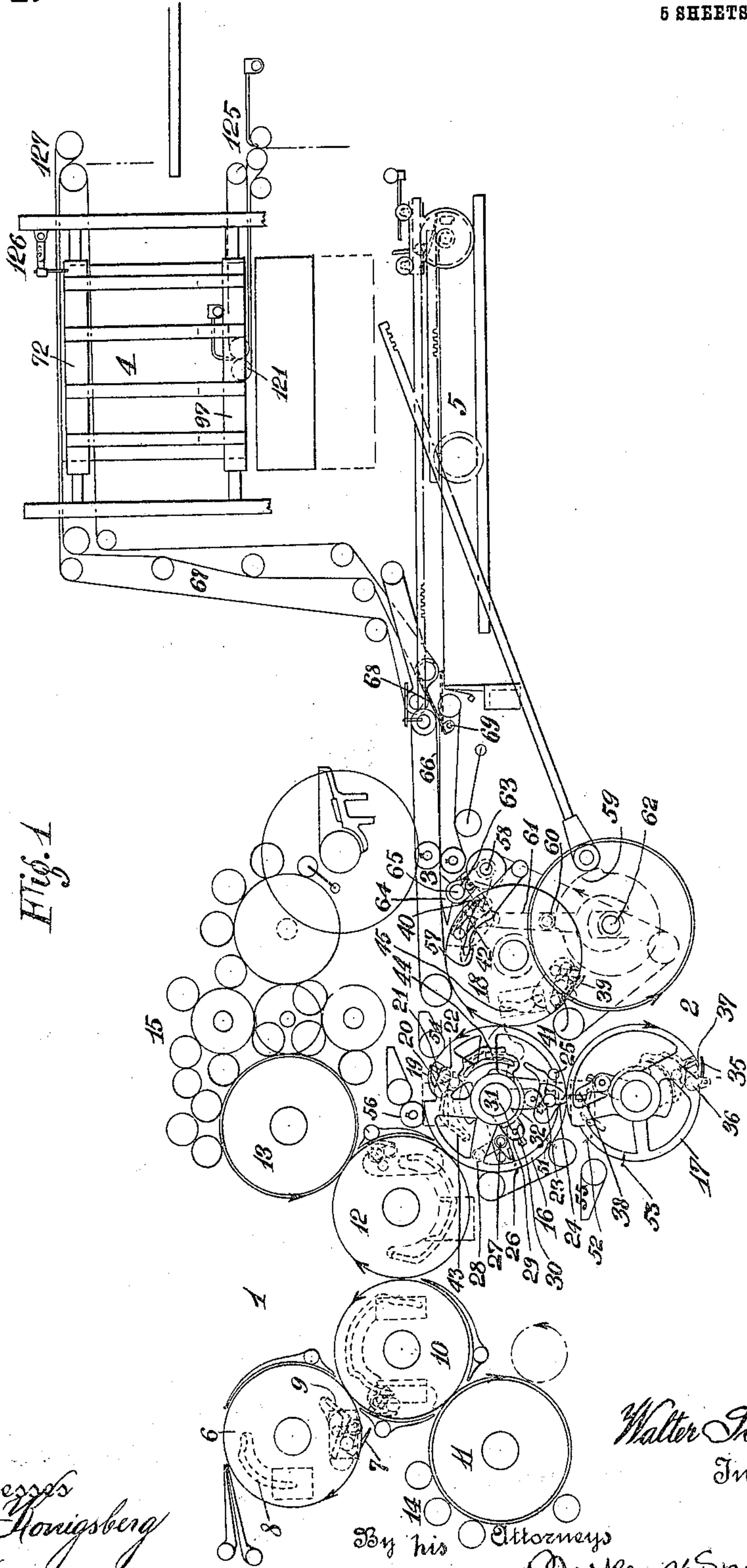


Fig. 1

Witnesses
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Anne Kessmann

Walter Scott
Inventor

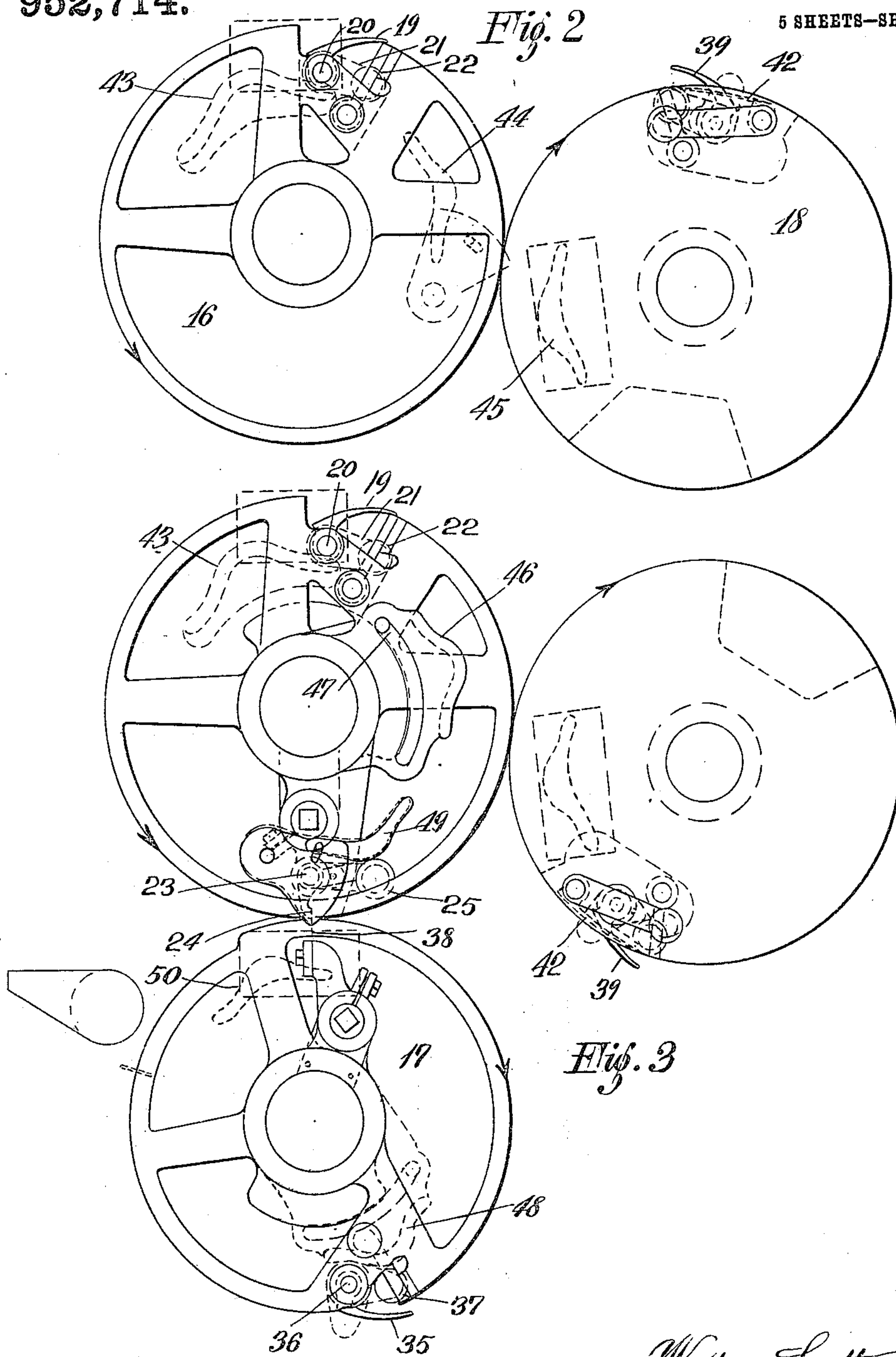
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5 SHEETS—SHEET 2.



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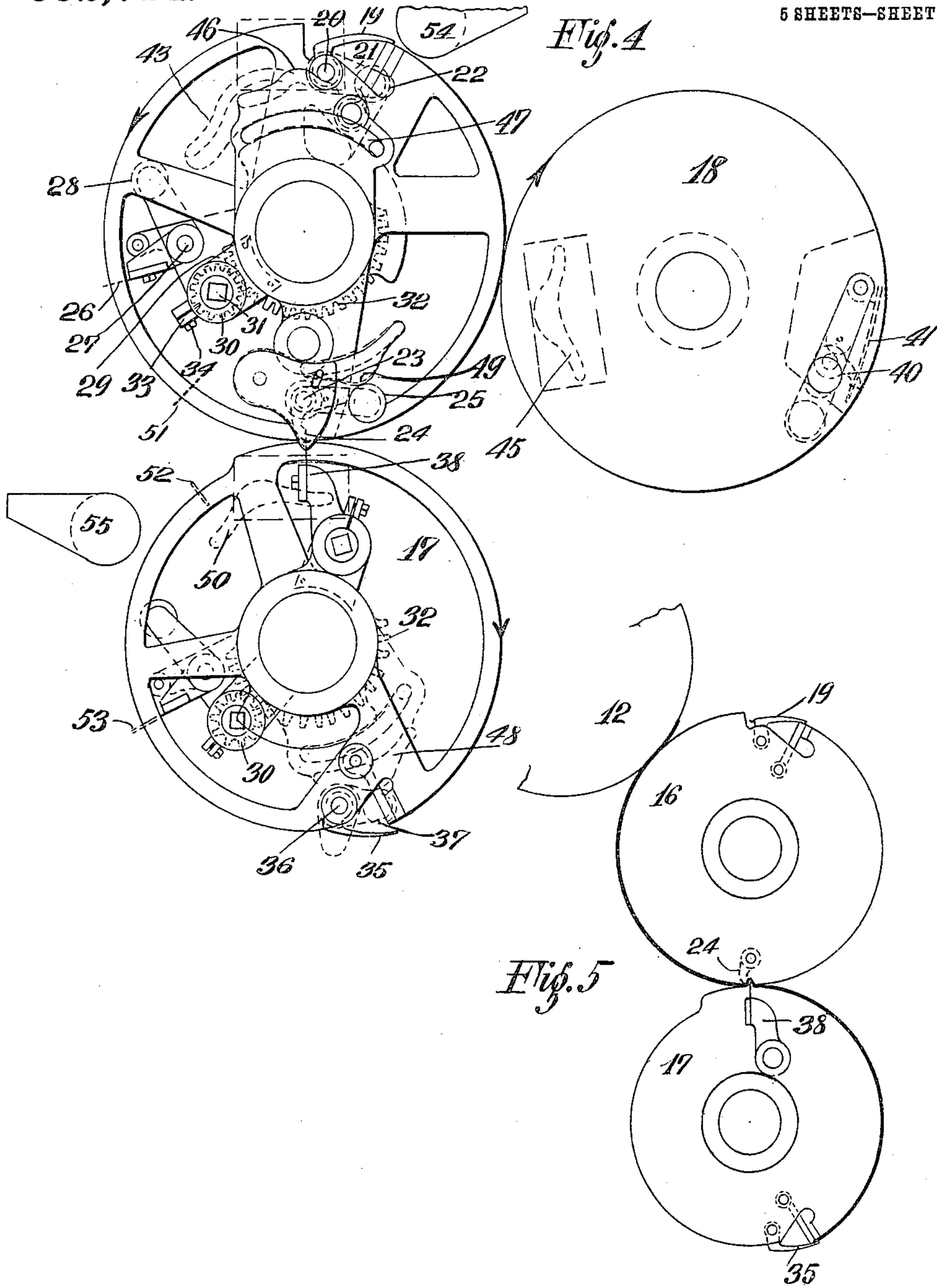
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5 SHEETS—SHEET 3.



Witnesses
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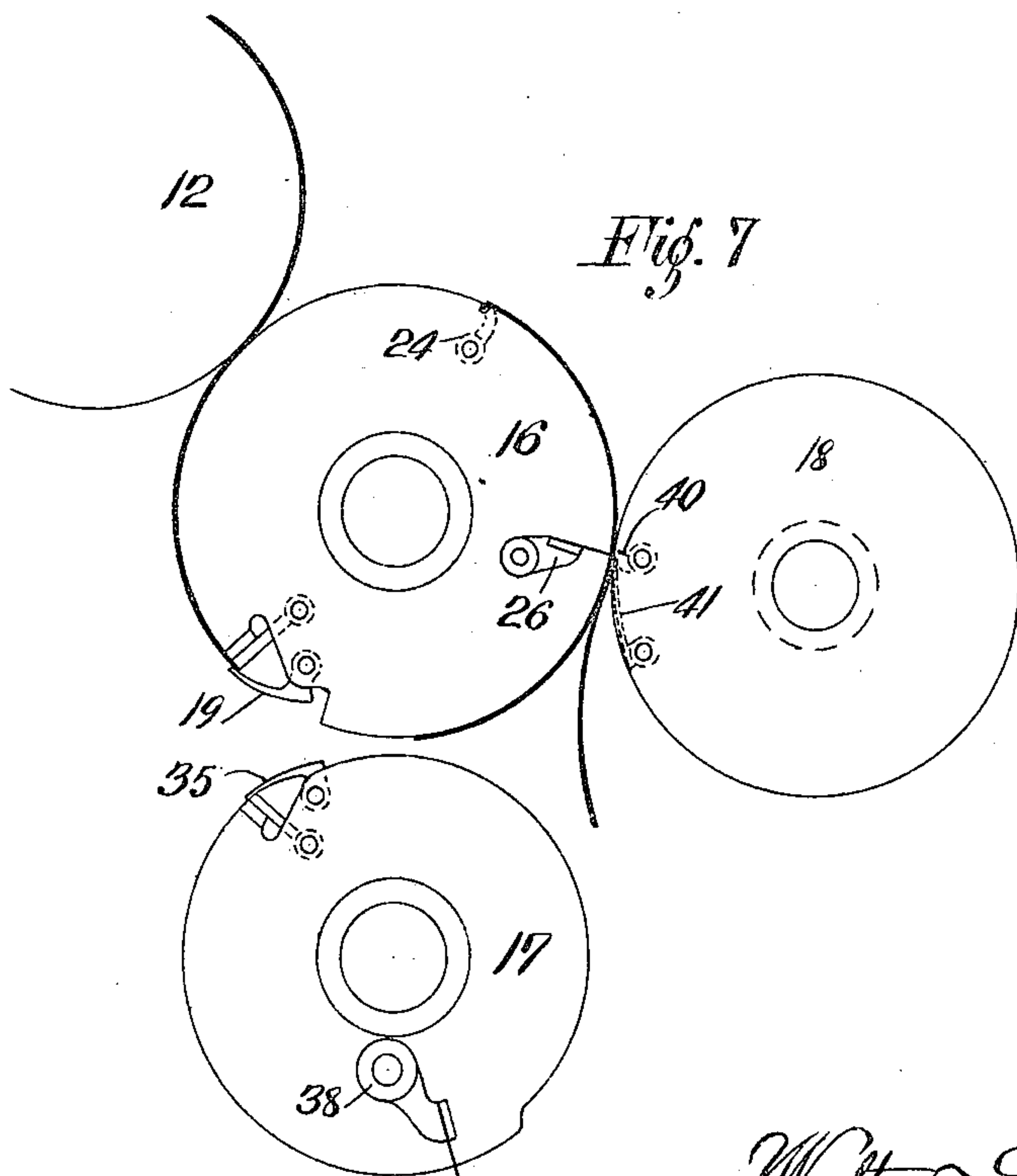
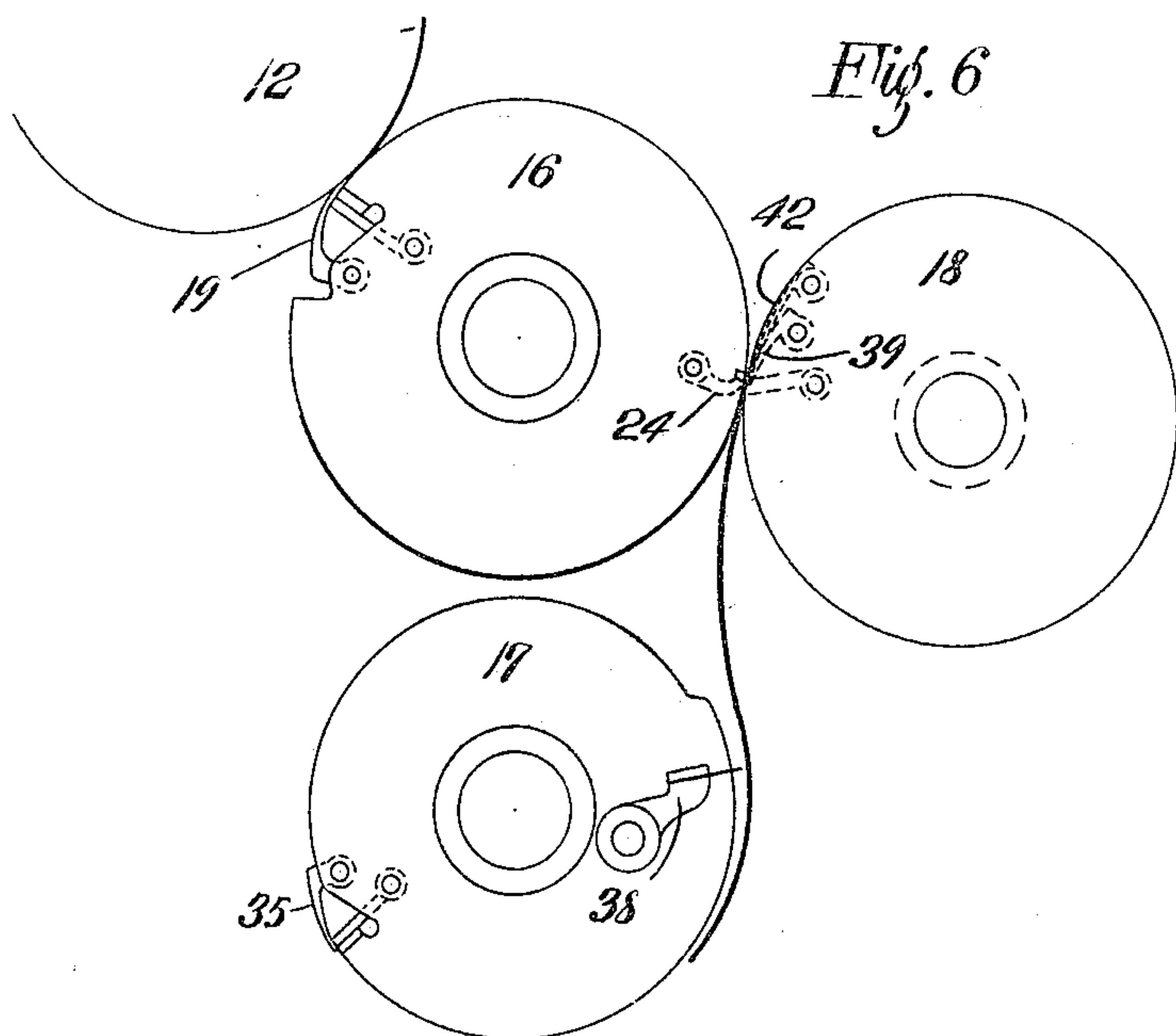
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6 SHEETS—SHEET 4.



Witnesses
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5 SHEETS—SHEET 6.

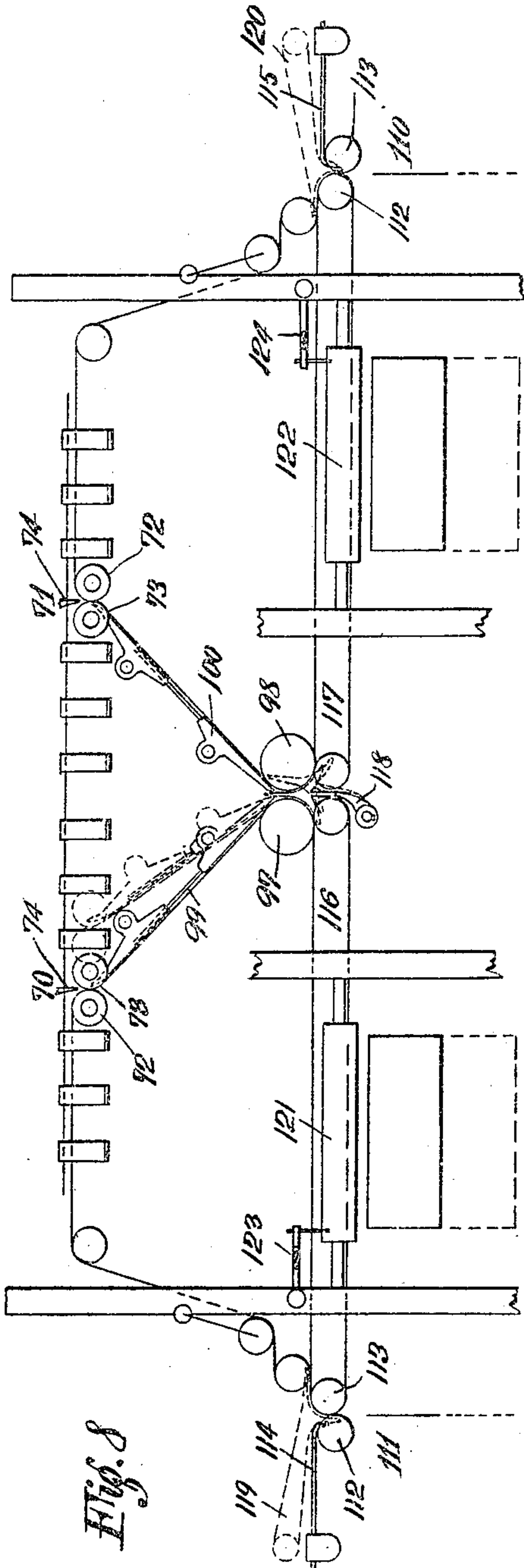


Fig. 8

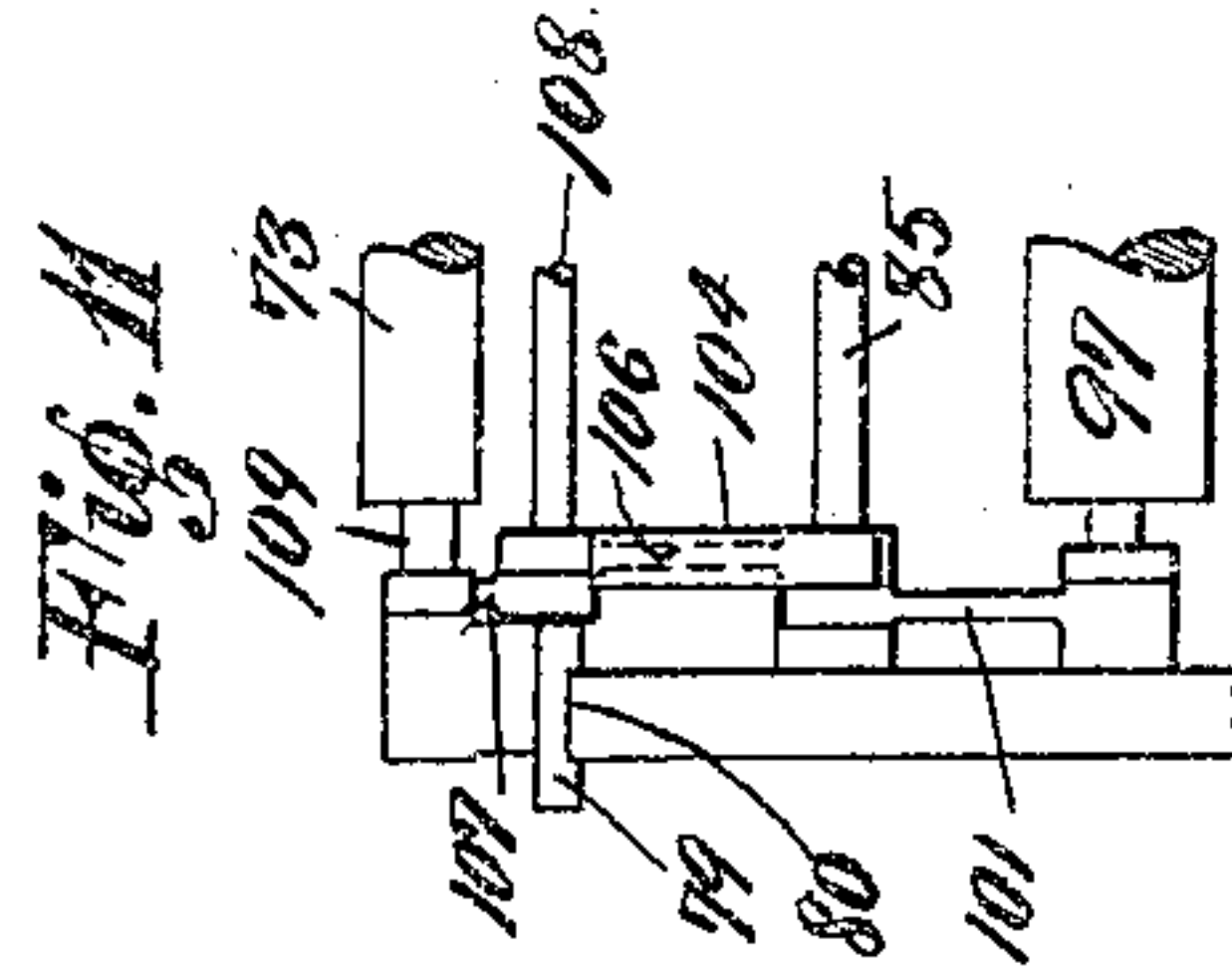


Fig. 11

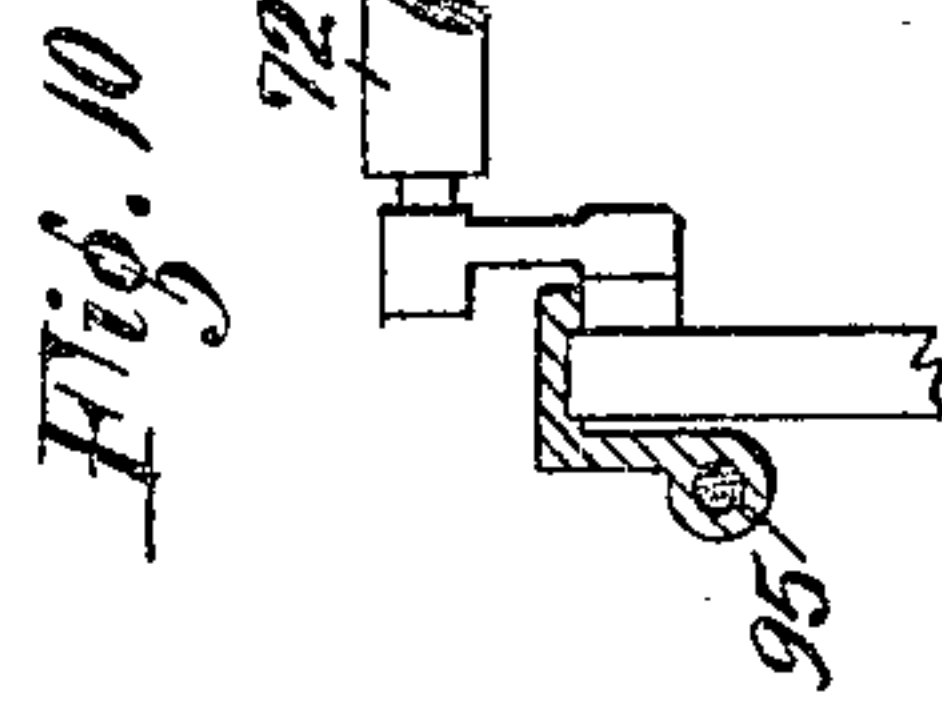


Fig. 10

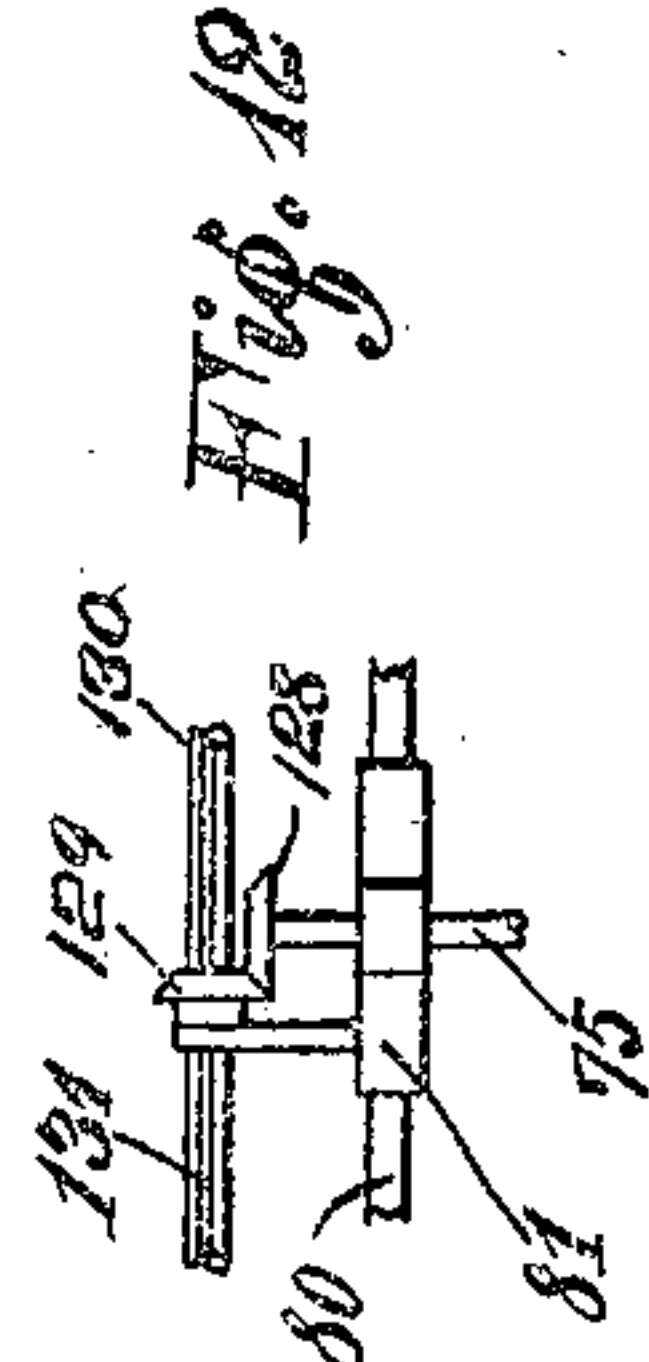


Fig. 12

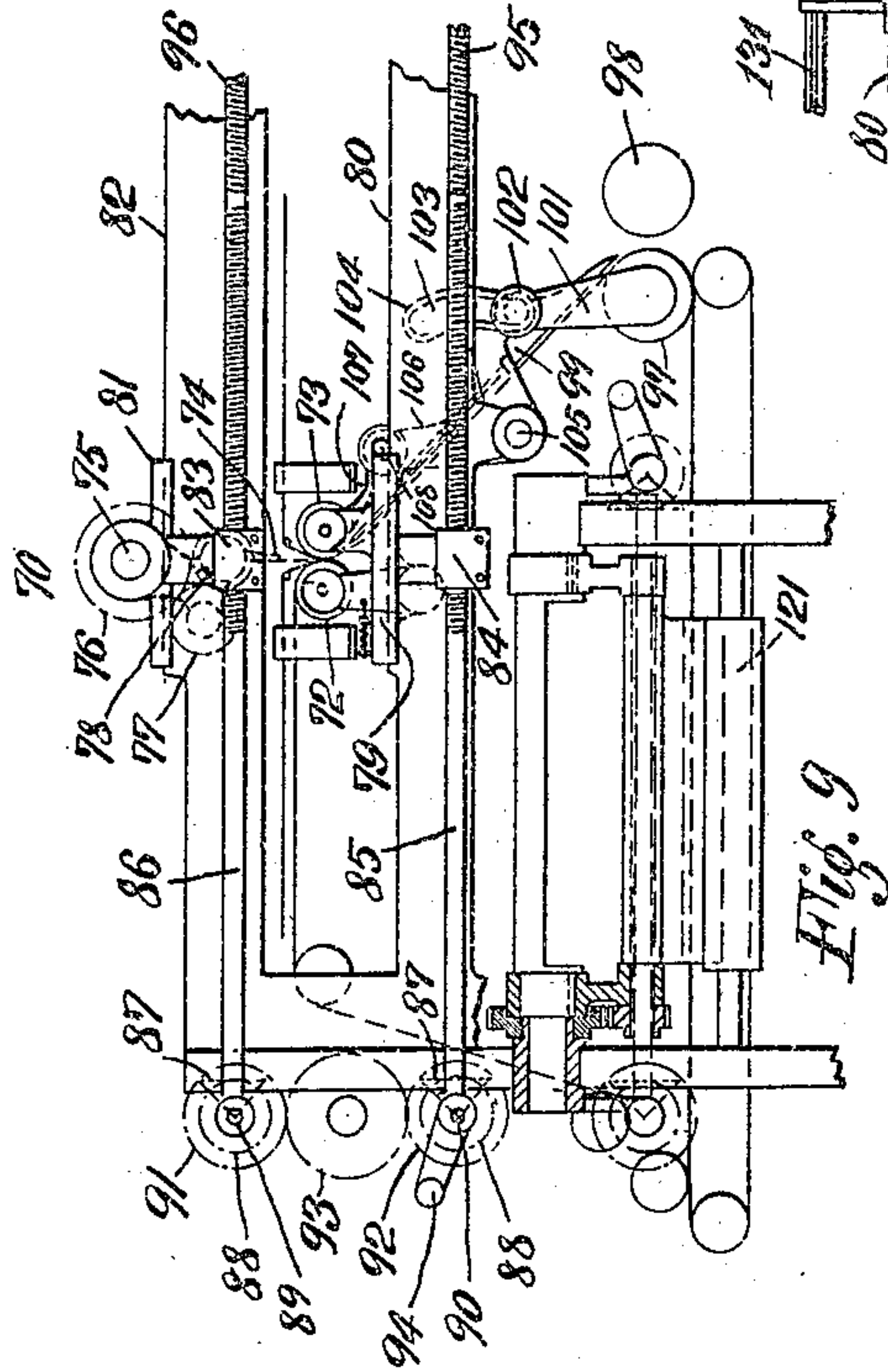


Fig. 9

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UNITED STATES PATENT OFFICE.

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FOLDING AND DELIVERY MECHANISM.

952,714.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed November 15, 1904. Serial No. 232,803.

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, Union county, New Jersey, have invented certain new and useful Improvements in Folding and Delivery Mechanism, of which the following is a specification.

My invention relates generally to folding and delivery mechanisms for sheets of paper, and has more particular reference to means for folding and delivering sheets as they are received from a printing machine.

In the art, there are certain printing machines which are adapted to print sheets of a variably predetermined size, known as all size printing machines.

The object of the present invention is to produce an organized structure or machine in which sheets of variably predetermined sizes can be properly printed, folded and delivered and otherwise acted upon at will. To this end I have devised a folding mechanism comprising novel and valuable features of construction in itself, and, further, so constructed and arranged, that it can be included in an organized structure of the character set forth so as to cooperate properly with other parts of the same structure.

A further object of the invention is to so construct the folding mechanism for folding sheets at a variably predetermined point in such a manner that it may be embraced as a cooperating part with a structure known as an all size rotary printing machine. That is, a rotary printing machine capable of printing a variably predetermined size of sheet.

A further object of the invention is to arrange delivery mechanism in connection with this folding device whereby the sheet may be delivered with any number of folds less than the maximum.

Other objects will appear as the specification proceeds.

To this end I employ a suitable folding means combined with means for adjusting the same to fold a sheet at a variably predetermined point, or for folding a sheet of a variably predetermined size in the center. The sheets may be folded both transversely and longitudinally one or more times. The folding means are conveniently divided into two devices which I have denominated respectively as the primary and secondary fold-

ing device. The primary folding device will preferably be constructed to fold the sheet transversely and the secondary folding device to give such additional folds to the sheet preferably both in a longitudinal and a transverse direction as may be required. Interposed between the primary and secondary folding devices is a delivery mechanism by means of which the sheets can be delivered without passing through the secondary folding device. The primary folding device is further adapted to be rendered inoperative so that the sheets can pass to the delivery mechanism in an unfolded condition. A collecting cylinder or other sheet collecting means is preferably a part of the primary folding device whereby several sheets can be delivered together either in a folded or an unfolded condition, or singly, at will.

In addition to the foregoing, I may employ a slitter conveniently located intermediate the primary and secondary folding devices, whereby the sheet can be slit into two or more sections as it passes from the said primary folding device and can be delivered flat or folded to the delivery mechanism interposed between the primary and secondary folding devices, or it may pass up to the secondary folding device where it may be folded further in any direction desired and be delivered as two or more separate sections or associated and delivered as one product either with or without further folding.

In connection with the foregoing I may employ pasting means whereby the sheet can be pasted on its transverse or longitudinal margin or margins depending upon which of these is to form the center of the book, or on both its transverse and longitudinal margins, and on either or both sides of the sheet and at a variably predetermined point to correspond to the folding of the sheets. This pasting means is likewise adapted to be rendered inoperative so that the sheets can be pasted or not, as desired.

The means for folding the sheet transversely or the transverse folding mechanism will preferably be carried by cylinders, and adjustable circumferentially thereon. In the particular construction here followed these cylinders carry supporting means which are adjustable circumferentially one with relation to the other and with relation to suitable sheet taking devices as a gripper or other means. These supporting devices carry suit-

able folding or pasting members, as the case may be, or both, depending upon how it is desired to act upon the sheet.

The secondary folding device will preferably be utilized to fold the sheet longitudinally and to give such other folds as may be desired either longitudinally or transversely, and will preferably be constructed in the form of two rolls and a creaser superposed intermediate the same, adjustable in unison transversely of the direction of the moving sheet. If the sheet is slit there may be two or more sets of rolls and creasers or folding members adjustable in unison so as to fold the two or more slit sections at variably predetermined points in either or both directions. These two folded sections can then be delivered singly with or without additional folds or as one product with or without additional folds. When two or more of such sets of rollers and creasers are employed, the arrangement is such that either can be rendered inoperative at will, and when a single one of these sets is thus employed out of a number of available sets, the set to be used is capable of adjustment to the center of the path of the sheet or to any other point.

Suitable delivery mechanisms are arranged at various points so that the sheet can be delivered at almost any point in the secondary folding device after passing through any of the folding members, or, in other words, the sheet can be delivered when any desired number of folds have been made or can be delivered with any less number of folds than the maximum.

In the accompanying drawings I have embodied my invention in a concrete form though it is obvious that I do not wish to be understood as confining myself in any way whatsoever to the particular device shown.

In the said drawings: Figure 1 is a general view of a structure embodying my invention showing a side elevation and with the framework removed. Fig. 2 is a detail view of part of the primary folding device showing the parts used when the sheets are to be delivered flat, or when the folding members are inoperative. Fig. 3 is another view of parts of the primary folding device showing the arrangement when one transverse fold is desired. Fig. 4 is a view similar to Fig. 3 showing the arrangement of the parts when two transverse folds are to be made. Fig. 5 is a diagrammatic view showing how the first fold is made, for either a one or two fold operation. Fig. 6 is a diagrammatic view showing the position of the parts when a sheet folded but once is being transferred to the collecting or transfer cylinder. Fig. 7 is a diagrammatic view showing how a second fold may be given to the sheet in a transverse direction. Fig. 8 is an end view in a diagrammatic form of a part of the secondary folding device. Fig.

9 is a view looking in the same direction showing the framework and the construction for adjusting the two rolls and creaser constituting one set of folding members in unison and means for adjusting two sets of folding members in unison. Fig. 10 is a part section and part side view showing the sliding carriage mounting the adjustable folding rolls and the screw and nut which slide the carriage on the frame. Fig. 11 is a view showing the carriage supporting the stationary folding rolls and means for telescoping the guide. Fig. 12 is a detail view showing how power is applied to the creaser when adjusted to any desired point.

Similar characters of reference indicate corresponding parts in the different views.

1 indicates the printing mechanism of the printing machine, 2 the primary folding device, 3 the slitter, 4 the secondary folding device, and 5 the delivery mechanism interposed between the primary and secondary folding devices. The style of printing machine shown is adapted to print sheets of varying size or of a varying width and length, and is, in the present instance, in the form of a rotary machine adapted to print sheets of variably predetermined sizes.

6 indicates a cylinder having the grippers 7 adapted to be operated by the cams 8 and 9 for receiving sheets from a feed board or from an automatic cutting device capable of delivering sheets of a variably predetermined size cut from a web, as shown in Patent #506,798.

10 indicates the first impression cylinder and 11 the first plate cylinder constituting the first printing couple, while 12 is the second impression cylinder and 13 the second plate cylinder constituting the second printing couple. Adjacent to each of the plate cylinders is suitable inking mechanism as 14 and 15.

It is evident that any number of printing couples may be used. Adjacent to the second impression cylinder or other cylinder is the primary folding device composed of a plurality of cylinders having coöperating folding members adjustable to fold the sheets at a variably predetermined point or a sheet of a variably predetermined size in the center and adapted to be rendered inoperative at will. In the present instance, I provide a folding couple consisting of the cylinders 16 and 17 and adjacent to the cylinder 16 is a collecting or transfer cylinder 18 which may coöperate with the cylinder 16 to give an additional fold to the sheet. It will be understood that by multiplying the cylinders an increased number of folds can be given. The cylinder 16 which may be made in sections or rings or in any other suitable manner, is provided with grippers 19 mounted on the gripper rod 20, on the outer end of which is the crank 21 and fric-

tion roll 22 adapted to be opened by suitable cams and closed by springs in the usual manner. On this cylinder is also adjustably mounted a nipper rod 23 carrying the folding nippers 24 and provided with an arm at one end carrying the friction roll 25. The cylinder further carries an adjustably mounted creaser 26 mounted on the rod 27 carrying at one end an arm provided with the friction roll 28. Both the nippers and creaser are mounted on the cylinder by means of supporting devices identical in their constructions or substantially so, and one of these supporting devices will therefore only be described. The creaser rod 27 is mounted on arms 29 adapted to rotate loosely around the axis of the cylinder, being mounted loosely on the shaft or other portion of the cylinder 16, and provided with a gear 30 at each end, only one of which is seen, mounted on the spindle 31, carried by the arms 29. Attached to the shaft of the cylinder 16 is a fixed segment 32 with which the said gears are adapted to engage when rotated by means of a wrench or otherwise. Split bushings 33 span the spindles 31, the ends of which are bolted together at 34. When these bolts are loosened, the position of the supporting device can be circumferentially adjusted by causing the gears to travel over the segment. When the supporting device has been properly adjusted, the bolts 34 are tightened thereby maintaining the said supporting device in the position to which it has been adjusted. The cylinder 17 is provided with grippers as 35 mounted on the shaft 36 and adapted to be opened by a suitable cam engaging with the friction roll 37 and further carries the creaser 38 supported on a supporting device similar to the one used on the cylinder 16, whereby the said creaser blade is circumferentially adjustable. The collecting cylinder 18 is provided with grippers 39 similar in all respects to the grippers on the other cylinders and with a folding nipper 40 adjustably mounted in the same way as the folding members on the other cylinders.

In connection with the grippers and folding nippers on the cylinder 18 are provided throw off fingers 41 and 42. By this arrangement it will be understood that the distance between the grippers and folding members carried on each cylinder can be varied by moving the folding member toward or away from the gripper whose position is preferably fixed. In connection with these cylinders I provide suitable cams for opening the grippers, creasers, folding nippers and throw off fingers. It will be understood that these cams will vary in number and position according to whether it is desired to fold the sheet once, twice, or more times, or not at all. Thus, for instance, when it is desired to deliver the sheet flat

without folding it in any way, the folding members are removed from the cylinders 16 and 17, as well as the gripper on the cylinder 17, or otherwise rendered inoperative. The folding nippers on the cylinder 18 are likewise removed or otherwise rendered inoperative. In this instance there will be a cam 43 in a fixed position on the framework adjacent to the cylinder 16 for opening the gripper 19 so as to receive a sheet from the cylinder 12. A second cam 44 will of course have to be provided in this instance adjacent to the point of contact between the cylinders 16 and 18 whereby the grippers can be opened so as to transfer the sheet to the gripper 39 on the cylinder 18 which, in turn, is opened to receive the sheet by means of the cam 45.

In case it is desired to give one transverse fold to the sheet, the folding nippers 24 on the cylinder 16 and the creaser blade 38 on the cylinder 17 as well as the gripper 35 on the cylinder 17 are attached in proper position or otherwise rendered operative and adjusted circumferentially to cooperate at the proper point desired to fold the sheet. In this instance there is provided a cam 46 adjacent to the cylinder 16 adjustable circumferentially by means of the bolt and slot connections 47 and a similar cam 48 likewise adjustable adjacent to the cylinder 17 as well as cams 49 and 50 adjacent to the point of transfer between the cylinders 16 and 17. In this instance, the gripper 19 will receive the sheet being opened by means of the cam 43 and will carry the sheet around the cylinder 16 down to the point of transfer between the cylinders 16 and 17. The cam 49 will then open the gripper 19, and the gripper 35 on the cylinder 17 will receive the leading edge of the sheet, being opened by the cam 50 and will carry the sheet over the cylinder 17 until it reaches the cam 48 when it will release the sheet. At this point, the folding members of the two cylinders will be in the position shown in Fig. 3 and the creaser 38 will fold the sheet into the bite of the nipper folders 24, the latter being opened by means of the cam 49, and will then carry the sheet up around the cylinder 16 until the point of contact with the cylinder 18 is reached when the cam 46 will open the nipper folder and release the sheet while the gripper 39 on the cylinder 18 will receive the folded sheet, being opened for that purpose by means of the cam 45.

If it is desired to give a second transverse fold to the sheet, the cam 46 on the cylinder 16 is adjusted to the position shown in Fig. 4, while the gripper 39 on the cylinder 18 is rendered inoperative and the nipper folders 40 on the cylinder 18 operative. In this case, the nipper folders 24 will carry the sheet after it has received the first fold

along the cylinder 16 until the creaser blade 26 on the said cylinder 16 which has been rendered operative meets the nipper folders 40 on the cylinder 18 when the nipper folders 24 will release the sheet and the nipper folders 40 receive it by reason of the creaser 26 folding the sheet into the same.

It will be understood that by adjusting the folding members and cams to various positions that a sheet can be folded at variously predetermined points one or more times, and a sheet of a variably predetermined length can be folded in the center. It will further be understood that by arranging the cylinders otherwise, the sheet may be folded between the cylinders 16 and 18 thus dispensing with the cylinder 17. The arrangement of the cylinders and folding members will depend upon which side of the sheet it is desired to fold outward. If only one side of the sheet is printed that side would be folded outward, and if both were printed, the side which is printed last would be folded outward. It will of course also be understood that the folding members could be transposed, the creaser being mounted on the cylinder 16 and nipping folders on the cylinder 17. See Patents #220,873 of October 21, 1879 and #221,704, November 18, 1879.

In case it is desired to paste the sheet transversely, I provide paste blades 51, 52 and 53 whereby the sheet can be pasted in a transverse direction on one or both sides in the margins of the same which will form the center of the book and subsequently folded. The paste blades can be mounted on supporting members circumferentially adjustable, in the same manner as the folding members, so as to apply transverse lines of paste at variably predetermined points or in the center of a sheet of a variably predetermined size. The paste blades receive a supply of paste from the fountains 54 and 55 or from any other suitable source of supply.

In case it is desired to apply longitudinal lines of paste either continuous or intermittent to the sheet, I may place a pasting device as 56 at any suitable point either in the primary or secondary folding device. This would be in the form, in this instance, of a rotary paste blade, adjustable longitudinally of the axis of the cylinder so as to apply the paste line or lines at variably predetermined points, or in the longitudinal center of the sheet of a variably predetermined width.

The cylinder 18 can be made in the form of a collecting cylinder, if desired, and can, to that end, be provided with a rocking cam 57 pivoted at 58 and can be adapted, by means of the cam 59 and roll 60 on the connecting rod 61, to be in the path of the friction rolls carried by the folding nippers 40

or gripper 39 say once to every four revolutions, whereby four sheets either folded or unfolded or partly folded would be collected before being delivered. If the sheets either folded or unfolded are to be delivered every time or singly, the cam 59 would be loosened on the shaft 62 or otherwise rendered inoperative, thereby making the cam 57 stationary, thus opening the gripper or nipping folders once to every revolution. The cam 57 is connected to the arm 63 of the guide 64 mounted on the pivot 65, whereby the said guide would be in proper position so as to enable the throw off fingers on the cylinder 18 to place the leading edge of the sheet on the said guide at the proper periods.

Leading from the cylinder 18 is a sheet path 66 to the delivery mechanism 5 which latter, in this instance, is in the form of a flat drop delivery such as is shown and described in my Patent #689,919, but of course any other style of delivery could be used. From this sheet path 66 is a sheet path 67 leading to the secondary folding device, and at the point of junction between the sheet paths 66 and 67 there is located a deflecting guide 68 by means of which the sheet may be directed into the delivery mechanism 5 or into the sheet path 67 as may be desired. This guide 68 is circumferentially adjustably mounted on the rod 69.

The secondary folding device is comprised of one or more folding members or sets of folding members each set consisting of two rollers and a superposed creaser blade. Each set of folding members will preferably be adjustable transversely of the path of the sheet so that a fold may be imparted at any point longitudinally of the path of the direction of the sheet, whereby a fold can be imparted at a variably predetermined point or a sheet of a variably predetermined size can be folded in the center either longitudinally or transversely.

The secondary folding device is adapted to impart such additional folds to the sheet after it comes from the primary folding device as may be desired in either direction, or it may fold a sheet coming in an unfolded condition from the primary folding device. Preferably, the parts are arranged so that a longitudinal fold will be imparted first to the sheet as it comes from the primary folding device, and if the sheet is slit, means will be provided in the form of a sufficient number of sets of folding members to fold each section of the sheet separately and at variably predetermined points or each section of a variably predetermined width in the center or at any other point. In the present instance, I provide one or more sets of folding members as 70 and 71 for folding the sheet longitudinally. Each set of fold-

ing members is composed of two rollers 72 and 73 and a superposed creaser blade 74 either of a reciprocating or rotary nature but in this case driven from the shaft 75 by means of the gears 76, 77 and 78. The two rollers 72 and 73 are mounted on the carriage 79 sliding on the track 80 of the framework, while the creaser blade and the means for driving the same are mounted on the carriage 81 sliding on the track 82 of the framework. Each of these carriages is provided with an internally threaded sleeve 83 and 84 which engages the screw cut rods 85 and 86 provided with bevel gears 87 at their outer ends, meshing with the bevel gears 88 mounted on the shafts 89 and 90 which carry the spur gears 91 and 92 and which are connected by the intermediate gear 93. A handle 94 is attached to the shaft 90 whereby the rods 85 and 86 will be caused to rotate thereby moving the rolls and creaser blade in unison in either direction, thereby adjusting the set of folding members to any position in relation to the sheet so that a fold may be given at any point. If two sets are used, the screw rods 85 and 86 will be extended and screw cut in the other direction as at 95 and 96, whereby both sets will be adjusted in unison toward and away from each other.

Located below the set or sets of folding members 70 and 71 are the transfer rolls 97 and 98. Interposed between the two sets of folding members 70 and 71 and the transfer rolls are telescoping guides 99 and 100 adapted to be moved in unison with the sets of folding members and to automatically lengthen or shorten according to the position they occupy. One end of these guides is supported by means of arms 101 mounted on the shaft of the roller 97 and carrying a friction roll 102 adapted to play in the slot 103 of the curved member 104. This member 104 is pivoted at 105 and is connected by means of the arm 106 to the arm 107 pivoted on the rod 108 and on the shaft 109 of the roll 73. These devices being all alike, it is only necessary to describe one of these.

When two sets of folding members are embodied in the machine such as 70 and 71, and it is desired to fold a sheet of a variably predetermined size in the center or at any other point, one of the said sets as 71 is disconnected from the screw cut rods 85 and 86 by reason of the threaded sleeves 83 and 84 being made in the form of split sleeves as indicated in the drawings, and the set is moved out of the way of the sheet or otherwise rendered inoperative, while the set of folding members 70 is adjusted to the center of the path of the sheet or to any other point desired.

Any number of sets of folding members may of course be embodied in this secondary folding device and properly connected to

each other by tapes or other suitable sheet conveying means and each set should of course be made adjustable in the same way as the sets marked 70 and 71 and the said sets should be arranged to give any number of folds in the desired direction. In the present structure, I have arranged two sets of longitudinal folding members as 110 and 111 consisting of the rolls 112 and 113 and creaser blades 114 and 115 whereby an additional longitudinal fold may be imparted to the sheet. These sets are connected to the transfer rollers 97 and 98 by means of the tapes 116 and 117 and intermediate and below the transfer rollers 97 and 98 I place an adjustable switch 118 whereby the sheet may be run out through either of the sets 110 or 111, or if the sheet is slit into two or more sections, each section may be run out separately or both may be run out together to one side by simply adjusting the guide 118 as indicated in the drawings. In case both sections are run out in one direction, it will be associated by means of the rollers 97 and 98 and can then be folded either by means of the sets of folding members 110 or 111 or by interposing guides as 119 and 120 the sheet or sections may be delivered singly or together without further folding.

Instead of imparting an additional longitudinal fold, I may employ transverse folding sets as 121 and 122, and adjust the stops 123 and 124 so that the sheet will be stopped and run at right angles to its former course into the sets 121 and 122 either singly or as one product and receive a transverse fold and be delivered without further folding, or instead of this I may connect the sets 121 and 122 with the sets 125, only one of which is seen, and impart an additional transverse fold to the sheet either singly or to both sections singly or as one product. Instead of passing the sheets through the sets of folding members of the secondary folding device I may lift the stop 126 out of its lowermost position and render the said sets 70 and 71 inoperative, and deliver the sheet without further folding to the rollers 127. It will of course be understood that each of these sets can be made adjustable as the set 70 and 71 but as the construction would be the same, it is unnecessary to repeat the description, or, as shown, the stop 126 is adjustable to stop the sheets at various points so as to fold the same at variably predetermined points. The shaft 75 is provided with a bevel gear 128 meshing with the bevel gear 129 mounted on the shaft 130 which is provided with a long sleeve or spline 131. The bevel gear 129 is connected to the carriage 81, whereby the creasing blade 74 can be driven no matter to what point the set of folding members is adjusted. The creaser blade of the set 71 will be operated in the same way and preferably from the same shaft.

The operation of the machine is believed to be sufficiently understood from the foregoing description, and it is therefore not considered necessary to repeat the same.

5 What I claim is:

10 1. In a printing machine, the combination with means for printing a variably predetermined size of sheets, a primary folding device adapted to fold the sheets one or more times, a secondary folding device, a delivery mechanism interposed between the two folding devices, and a delivery mechanism located adjacent to the secondary folding device for delivering the sheets from the said secondary folding device without folding the same.

20 2. In a printing machine, the combination with means for printing sheets of a variably predetermined size, of a primary folding device adapted to fold the sheets one or more times, a secondary folding device, a delivery mechanism interposed between the primary and secondary folding devices, means for collecting the sheets interposed between the primary folding device and delivery mechanism aforesaid, and a delivery mechanism from the secondary folding device.

30 3. In a printing machine, the combination with means for printing sheets of a variably predetermined size, of a primary folding device, a secondary folding device, a delivery mechanism interposed between the two folding devices, means for collecting the sheets interposed between the primary folding device and the delivery mechanism aforesaid, and delivery mechanism located at various points in the secondary folding device whereby the sheets can be delivered after any desired number of folds have been made.

40 4. In a printing machine, the combination with means for printing a variably predetermined size of sheets, of a primary folding device adapted to fold the sheets one or more times, a secondary folding device, a delivery mechanism interposed between the two folding devices, means for collecting the sheets interposed between the primary folding device and the delivery mechanism aforesaid, and delivery mechanism located adjacent to the secondary folding device for delivering the sheets from the said secondary folding device without folding the same.

50 5. In a printing machine, the combination with means for printing sheets of a variably predetermined size, of a primary folding device adapted to fold the sheets one or more times, and adapted to be rendered inoperative, a secondary folding device, a delivery mechanism interposed between the primary and secondary folding devices, means for collecting the sheets interposed between the primary folding device and delivery mechanism aforesaid, and a delivery mechanism from the secondary folding device.

60 6. In a printing machine, the combination

with means for printing a variably predetermined size of sheets, of a primary folding device adapted to fold the sheets one or more times, adapted to be rendered inoperative, a secondary folding device, a delivery mechanism interposed between the two folding devices, means for collecting the sheets interposed between the primary folding device and the delivery mechanism aforesaid, and delivery mechanism located adjacent to the secondary folding device for delivering the sheets from the said secondary folding device without folding the same.

70 7. The combination with a primary folding device adapted to be rendered inoperative, of a secondary folding device, a delivery mechanism interposed between the two folding devices, and delivery mechanism located adjacent to the secondary folding device for delivering the sheet from the said secondary folding device without folding the same.

80 8. The combination with a primary folding device, of a secondary folding device, a delivery mechanism interposed between the two folding devices, means for collecting the sheets interposed between the primary folding device and the delivery mechanism aforesaid, and delivery mechanism located adjacent to the secondary folding device for delivering the sheets from the said secondary folding device without folding the same.

90 9. The combination of two adjustable rolls and a creaser blade superposed intermediate the same, of two fixed rolls, a guide connecting the adjustable and the fixed rolls, means for adjusting the adjustable roll and creaser blade, and means whereby the guide automatically lengthens or shortens to correspond with the distance between the fixed and the adjustable rolls.

100 10. The combination of two adjustable rolls and a creaser blade superposed intermediate the same, of two fixed rolls, a telescoping guide connecting the adjustable and fixed rolls to compensate for the variation in distance between the adjustable and fixed rolls.

110 11. The combination with two cylinders, of sheet taking means carried by the same, circumferentially adjustable cooperating folding members on the said cylinders, and one or more circumferentially adjustable pasting members carried on one or both of the said cylinders.

120 12. The combination with three cylinders, each having a sheet taking means and a circumferentially adjustable sheet folding member on each of said cylinders adapted to cooperate with the circumferentially adjustable folding member on one of the other cylinders whereby sheets may be delivered with two transverse folds.

125 13. In a machine of the character set forth, the combination with a group of cylinders

constituting a primary folding device, of
circumferentially adjustable folding mem-
bers carried by said cylinders adapted to
coöperate with each other to fold a sheet
5 at variably predetermined points one or
more times at will, and adapted to be ren-
dered inoperative, means carried by one of
said folding cylinders for collecting the
folded or unfolded sheets, also adapted to
10 be rendered inoperative, a secondary folding
device, a slit interposed between the pri-
mary and secondary folding devices, and ad-
justable folding members in the secondary
folding devices for giving additional folds
15 to the sheets in either or both directions
adapted to be rendered inoperative, whereby
the slit product may be delivered as one
product or as two separate sections.

14. In a machine of the character set forth,
20 the combination with a group of cylinders
constituting a primary folding device, of
circumferentially adjustable folding mem-
bers carried by said cylinders adapted to co-
operate with each other to fold a sheet at
25 variably predetermined points one or more
times at will and adapted to be rendered in-
operative, a secondary folding device, and
adjustable folding members in the secondary
folding device for giving additional folds
30 to the sheet in either or both directions
adapted to be rendered inoperative.

15. The combination with a primary fold-
ing device having means for folding a sheet
of a variably predetermined size at any point
35 in one direction, and means for folding the
sheet at another point in the same direction,
of a secondary folding device adapted to
fold the sheet in one or both directions.

16. The combination with two folding
40 rolls, a slidable carriage mounting the same,
a creaser blade, and means to rotate the
same, a slidable carriage mounting the said
creaser blade, internally threaded bushings
on said carriages, screw cut rods passing
45 through the same, and gearing connecting
the screw cut rods whereby the two carriages
can be adjusted in unison.

17. The combination with three cylinders,
each having a sheet taking means, and a cir-

cumferentially adjustable sheet folding 50
member adapted to be rendered inoperative,
the said sheet folding members being adapt-
ed to coöperate, whereby the sheets may be
delivered in a flat or folded condition, and
means for collecting several of the folded or 55
unfolded sheets.

18. The combination with a cylinder
carrying sheet taking means, circumferen-
tially adjustable sheet folding grippers, and
a circumferentially adjustable sheet folding 60
creaser, a folding cylinder carrying sheet
taking means, a circumferentially adjustable
sheet folding creaser, and a sheet collecting
and delivering cylinder carrying sheet tak-
ing means, and circumferentially adjustable 65
sheet folding nippers.

19. In a machine of the character set forth,
the combination with a cylinder, of a sup-
porting device of the character indicated
comprising means loosely supported on the 70
axis of the cylinder, gear wheels carried by
said means, a segment fast on said cylinder,
and means for maintaining the gears in the
positions to which they have been adjusted
with relation to said gear. 75

20. The combination of a cylinder, a sec-
ond cylinder, grippers and folding members
on the two cylinders whereby the sheet is
folded into the bite of the folding member
on the first cylinder, a third cylinder adapt- 80
ed to receive the sheet from the first cylin-
der, and means for holding the sheet be-
tween the first and third cylinders adapted
to be rendered inoperative.

21. The combination of a cylinder, grip- 85
pers, folding nippers and creaser blades car-
ried by said cylinder, a second cylinder co-
operating with the first cylinder, grippers
and creaser blades carried by the second cyl-
inder, a third cylinder coöperating with the 90
first cylinder, and grippers and folding nip-
pers on the third cylinder.

Signed at New York this 5th day of No-
vember 1904.

WALTER SCOTT.

Witnesses:

J. FRED. BEEKER,
JOHN H. HAZLETON.