E. G. GOSS.

FOLDING MECHANISM.

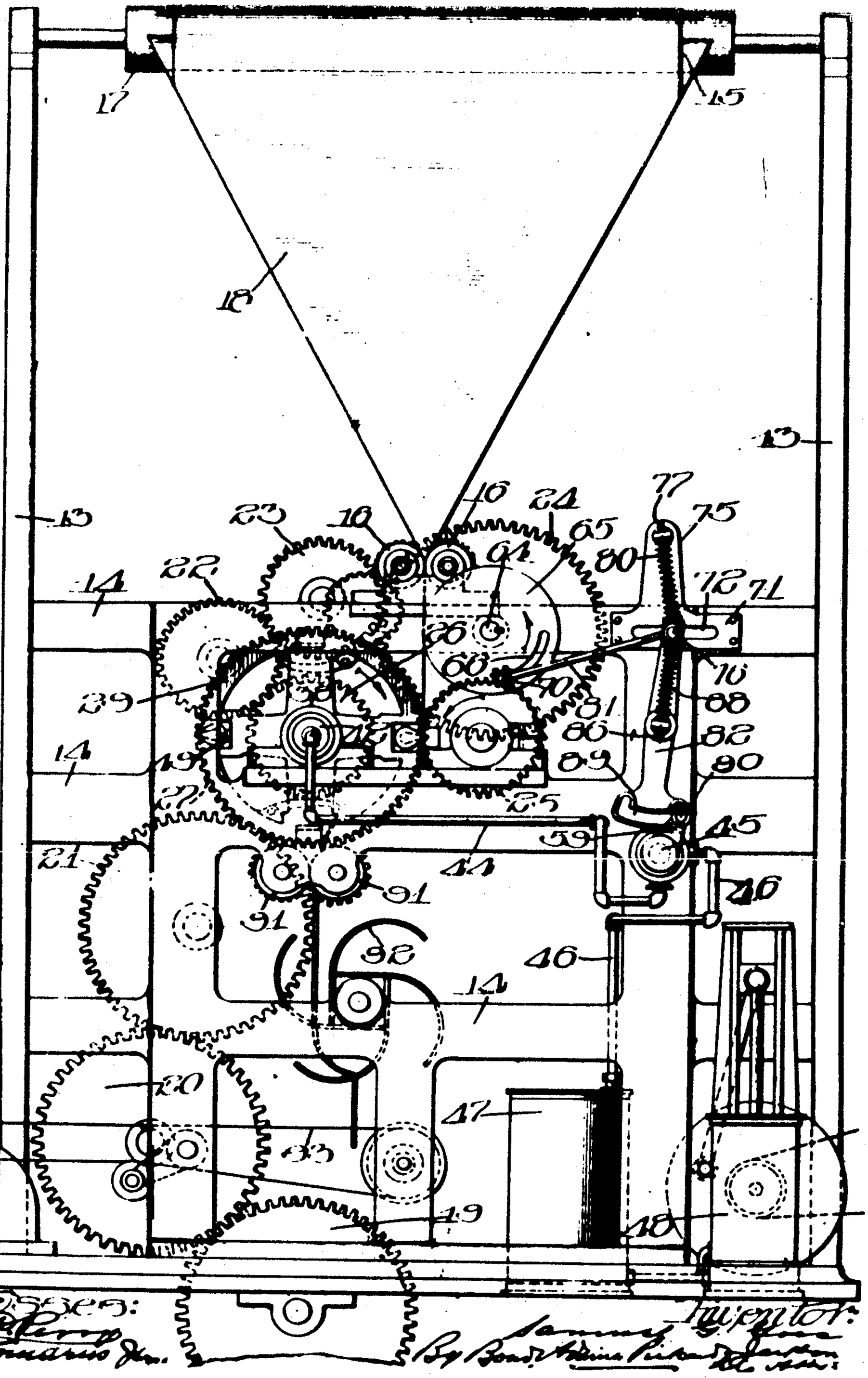
APPLICATION FILED NOV. 13, 1908.

936,710.

Patented Oct. 12, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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Inventor:

By Bond Adams Pierce & Howard Attys.

S. C. 6088.

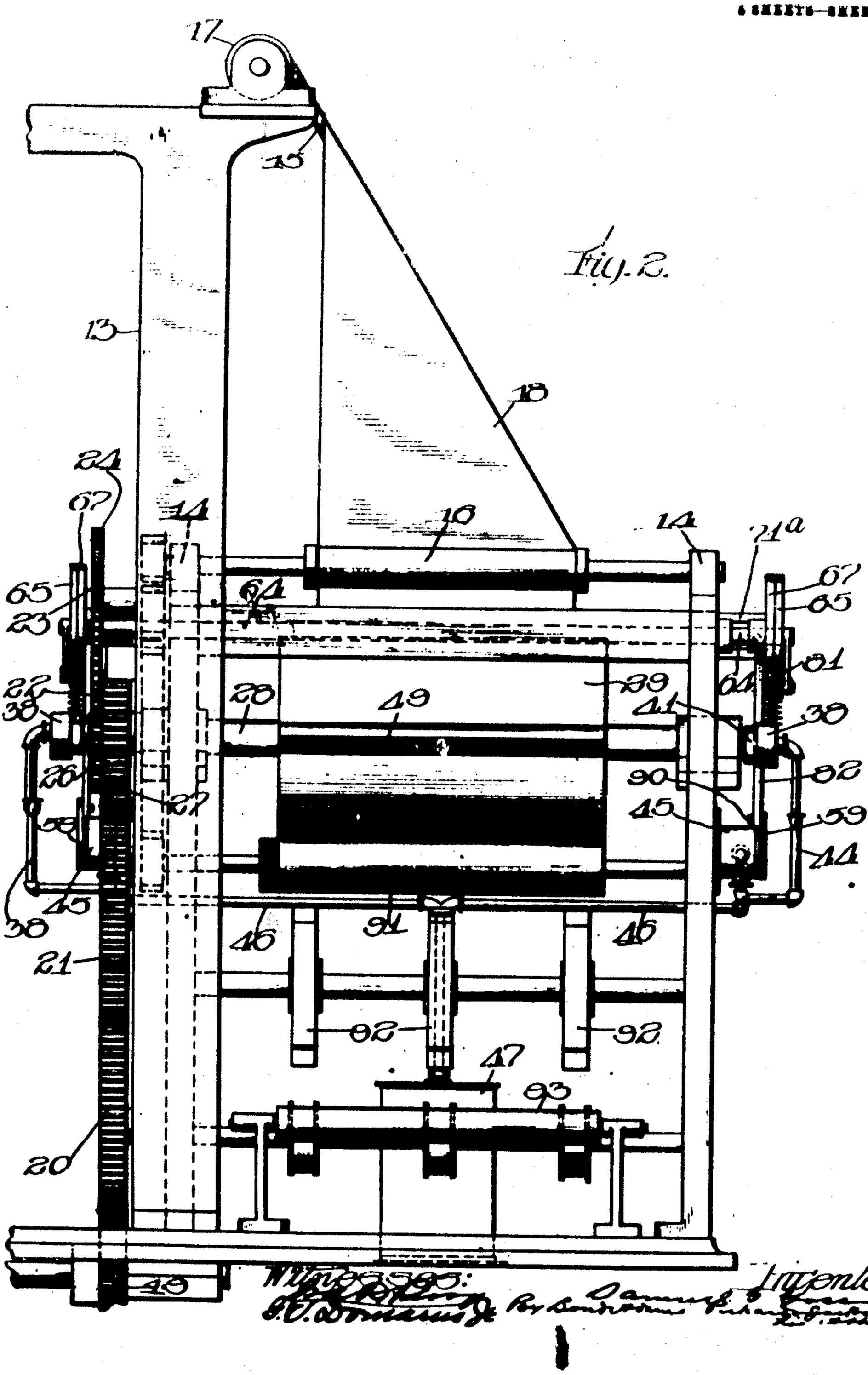
FOLDING MECHANISM.

APPLICATION FILED NOV. 18, 1903.

936,710. Patented Oct. 12, 1909.

4 SHEETS—SHEET 2.

Fig. 2.



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FOLDING MECHANISM.

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936,710. Patented Oct. 12, 1909.

6 SHEETS—SHEET 3.

Fig. 3.

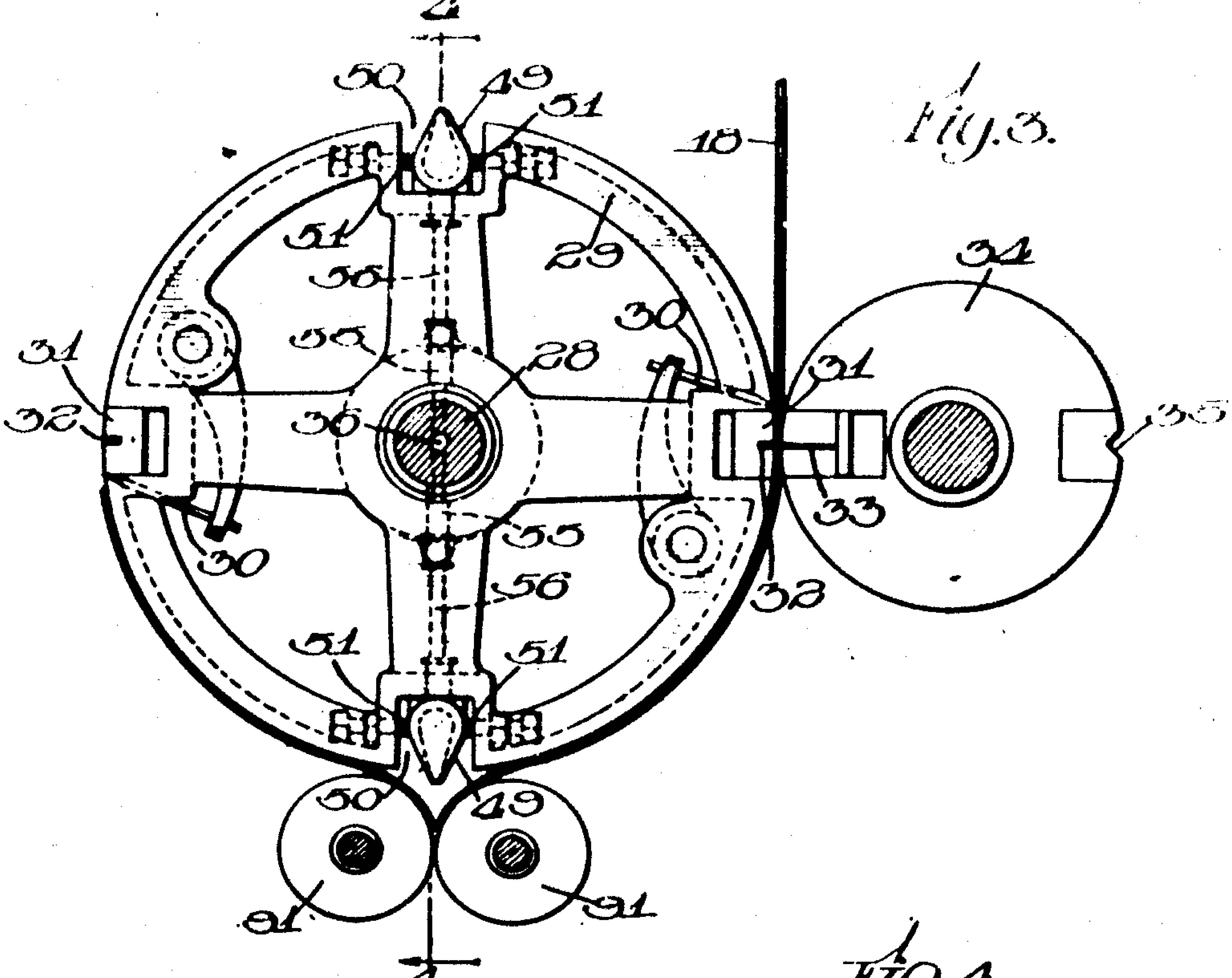
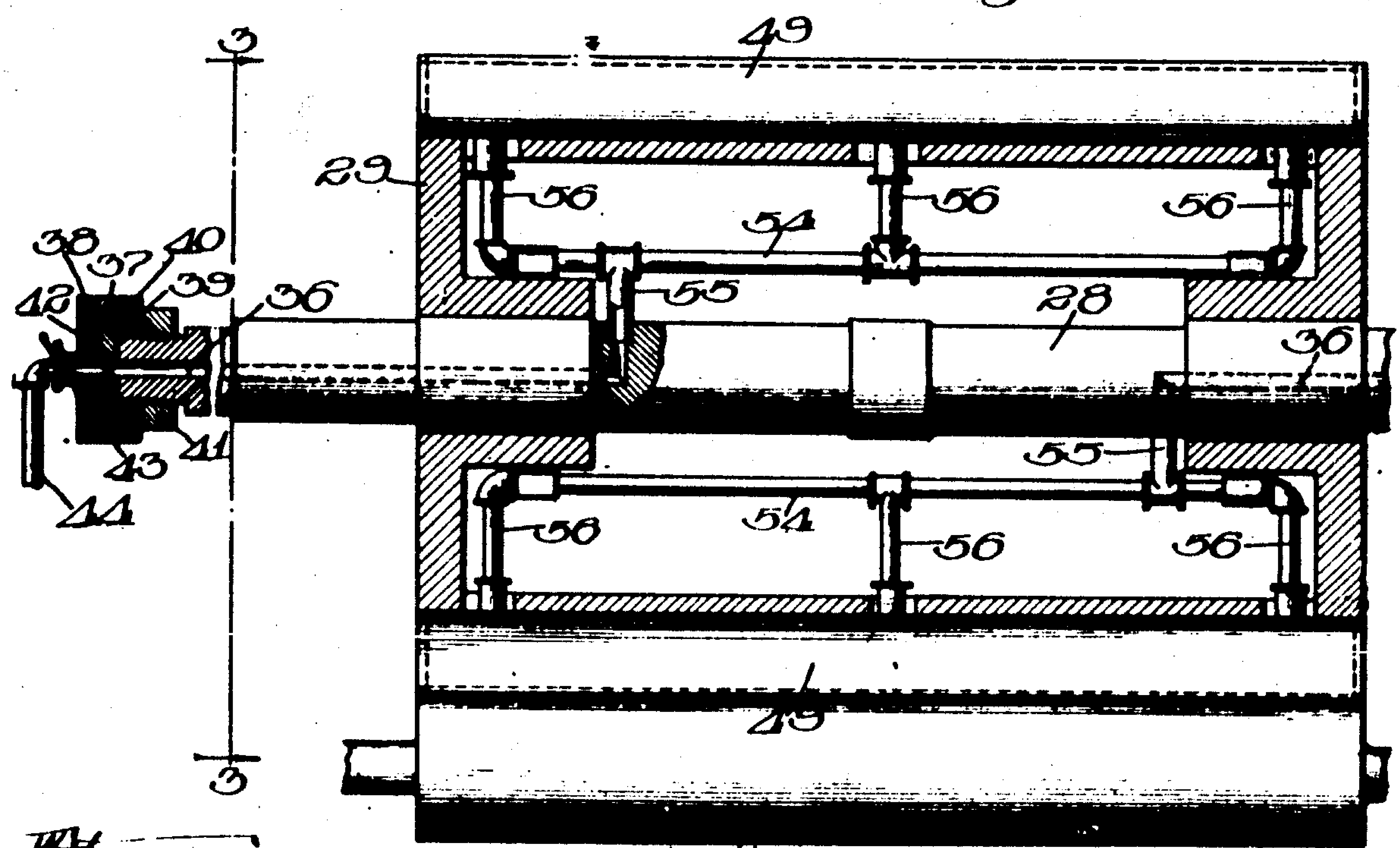


Fig. 4.



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S. G. GOSS.

FOLDING MECHANISM.

APPLICATION FILED NOV. 18, 1908.

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Patented Oct. 12, 1909.

4 SHEETS—SHEET 4.

Fig. 6.

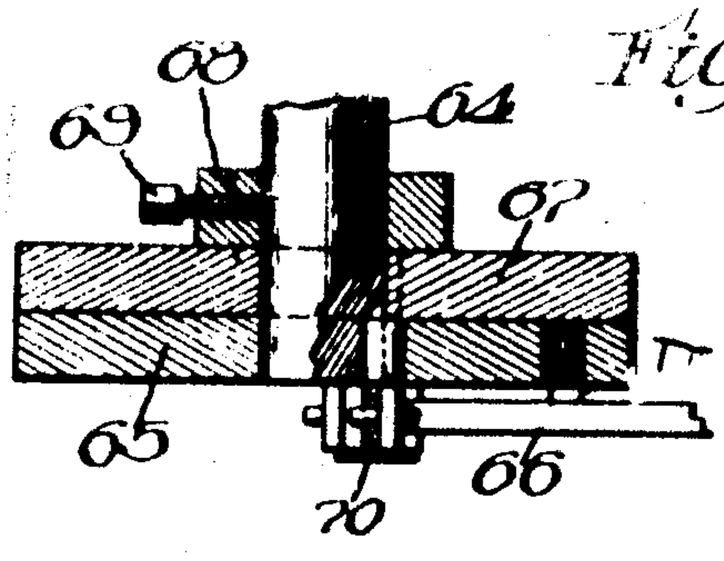


Fig. 5.

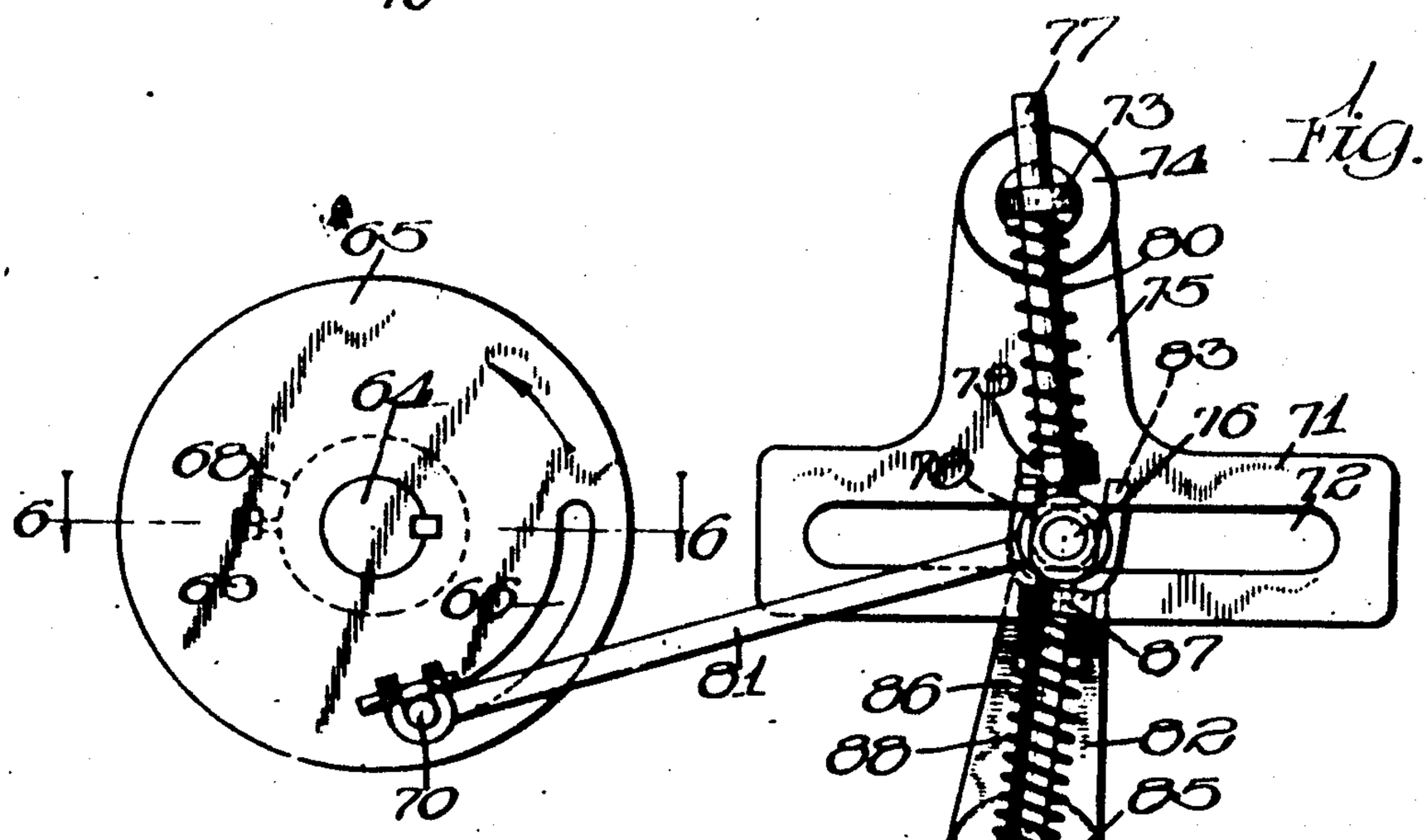
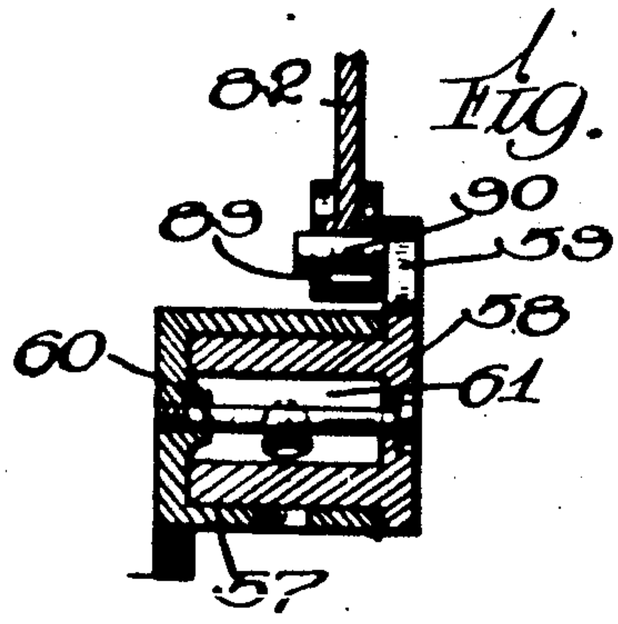


Fig. 7.



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FOLDING MECHANISM.

APPLICATION FILED NOV. 13, 1908.

936,710.

Patented Oct. 12, 1909.

4 SHEETS—SHEET 4.

Fig. 6.

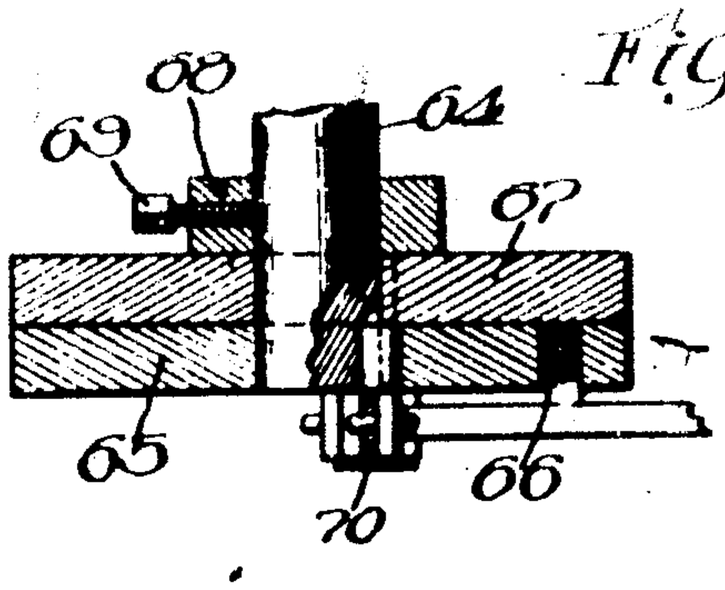


Fig. 5.

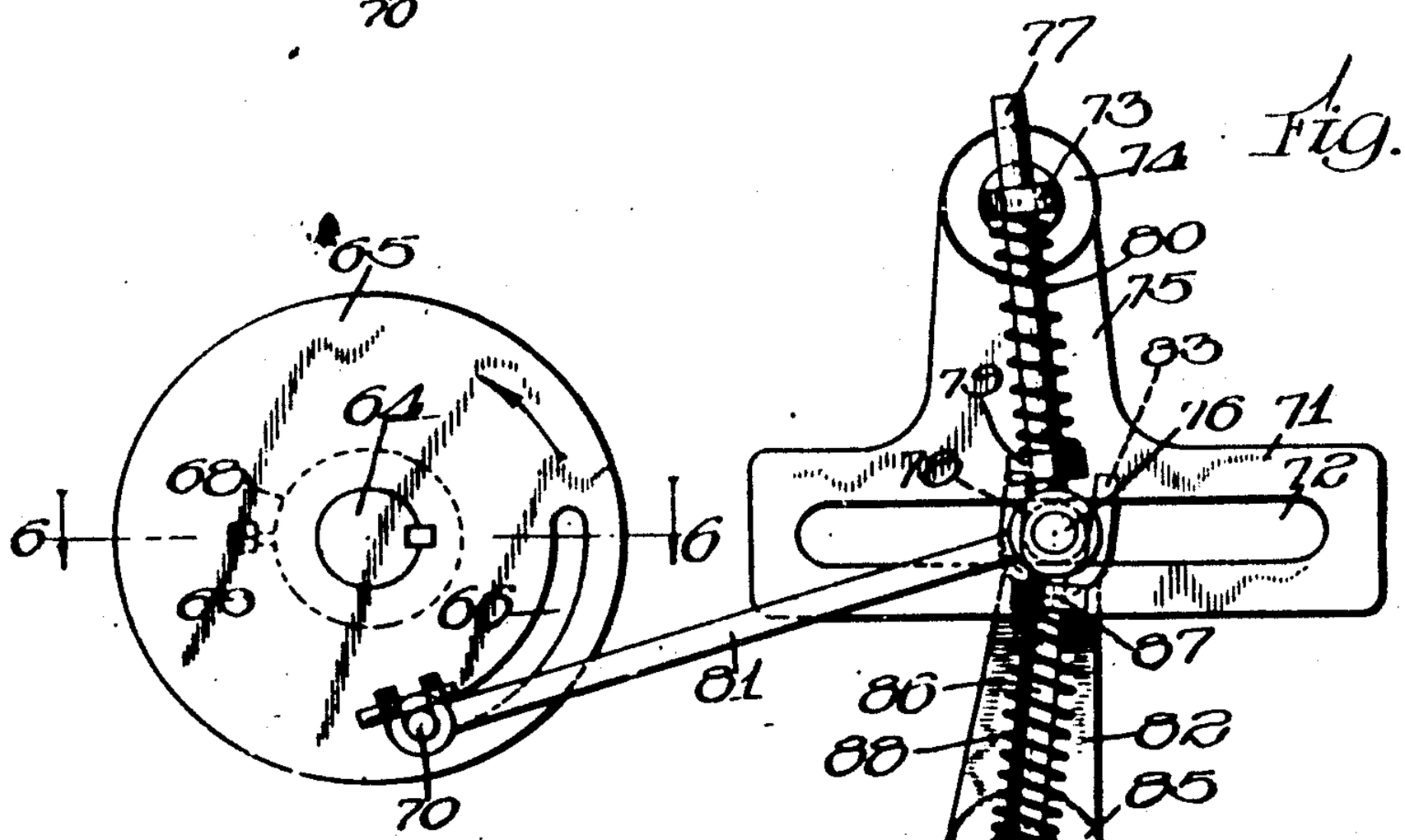
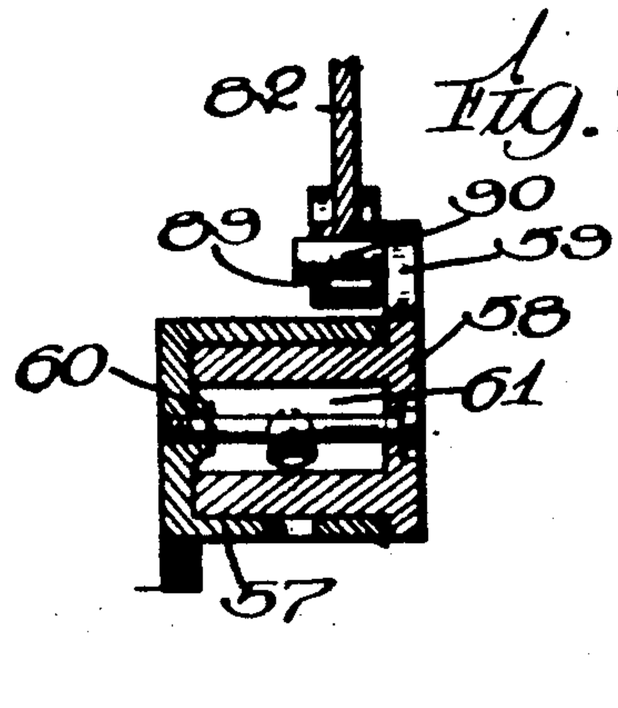
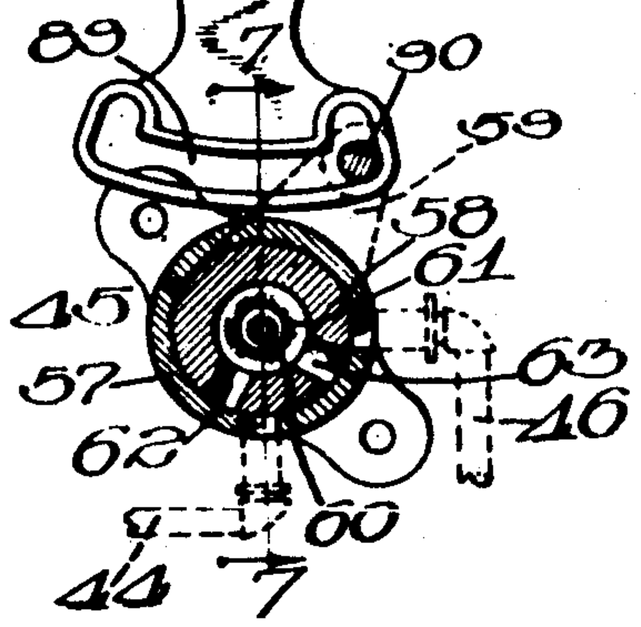


Fig. 7.





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His Attys.

S. G. GOSS.
FOLDING MECHANISM.
APPLICATION FILED NOV. 13, 1906.

936,710.

Patented Oct. 12, 1909.
6 SHEETS—SHEET 6.

Fig. 9.

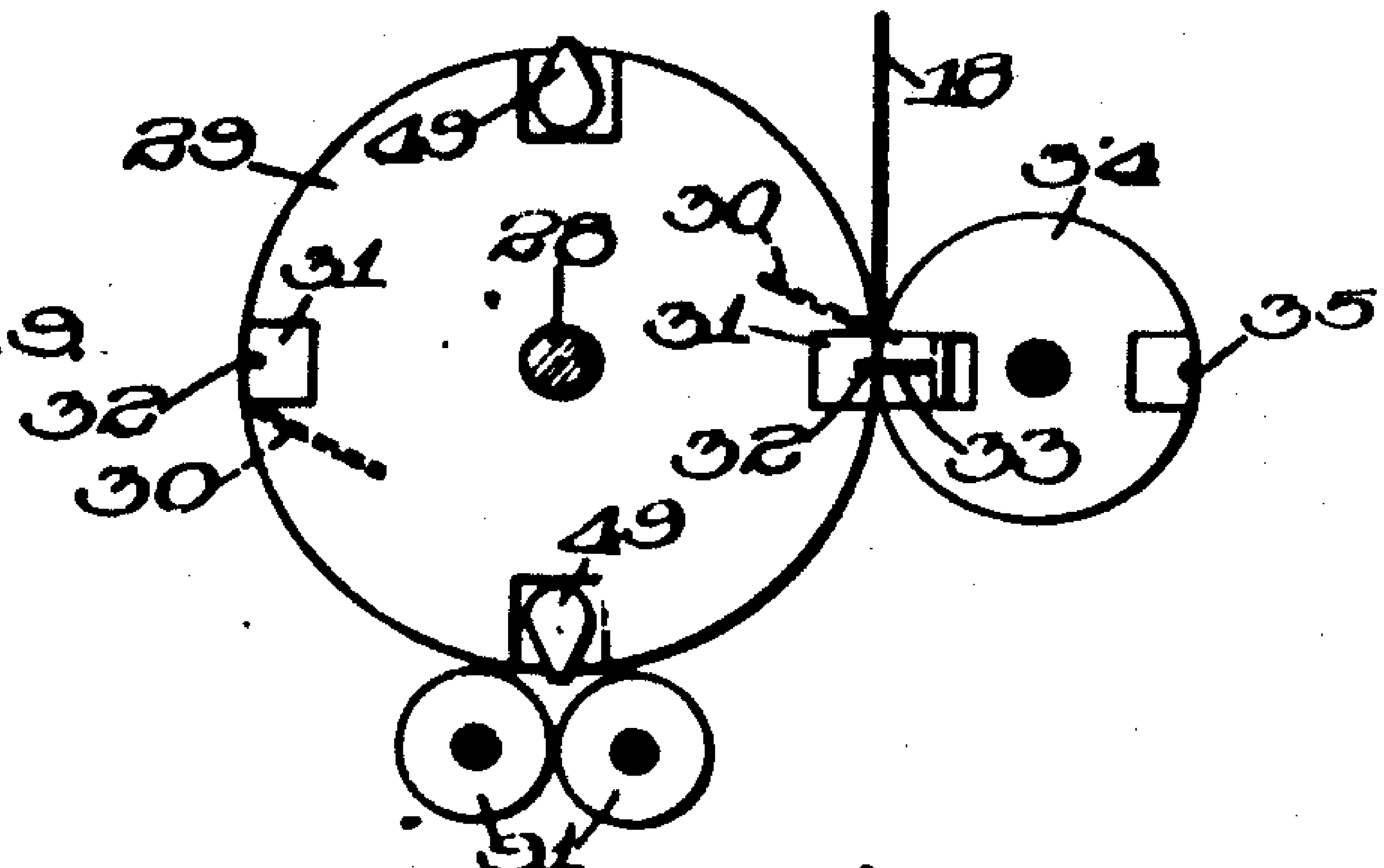


Fig. 10.

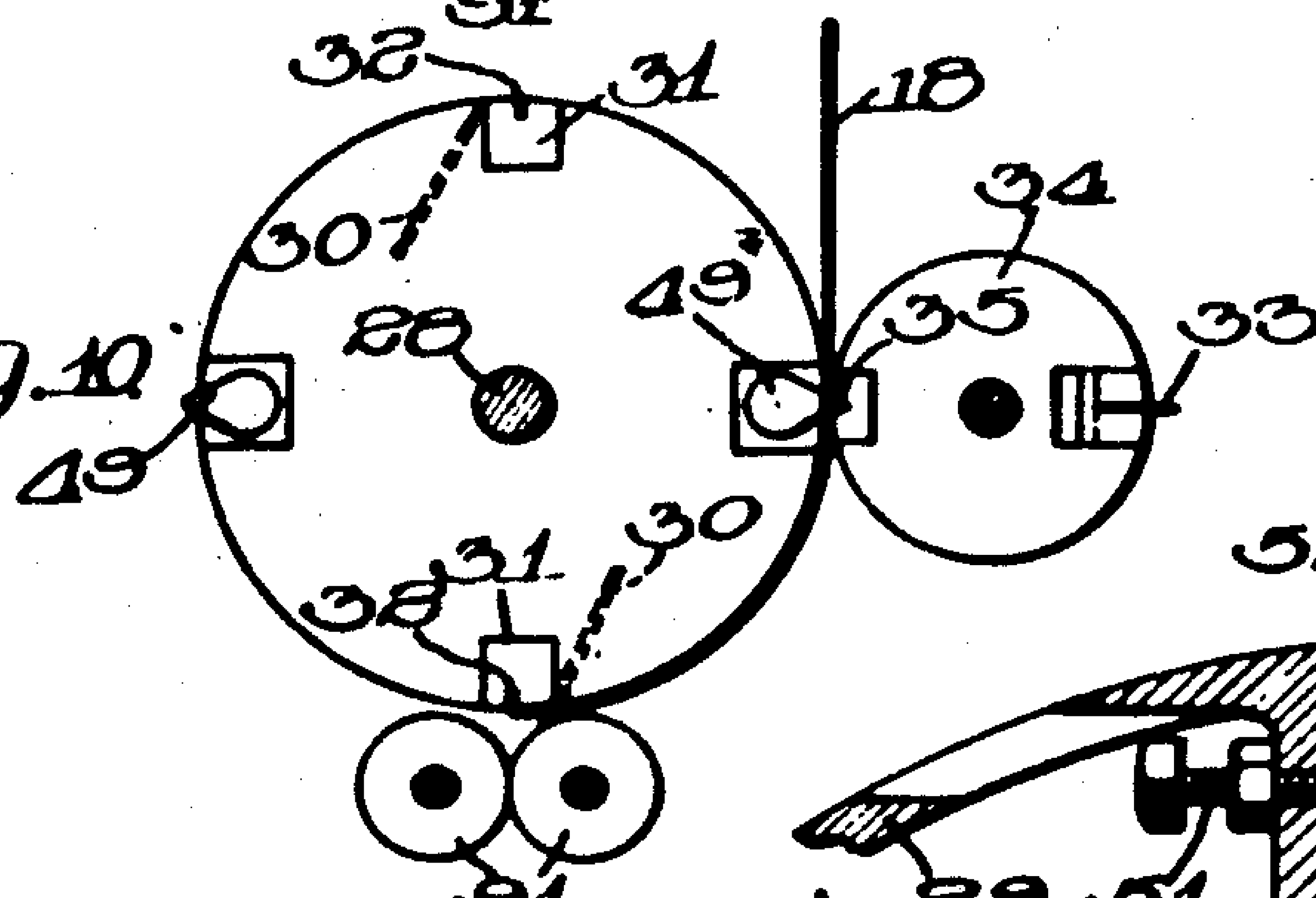


Fig. 8.

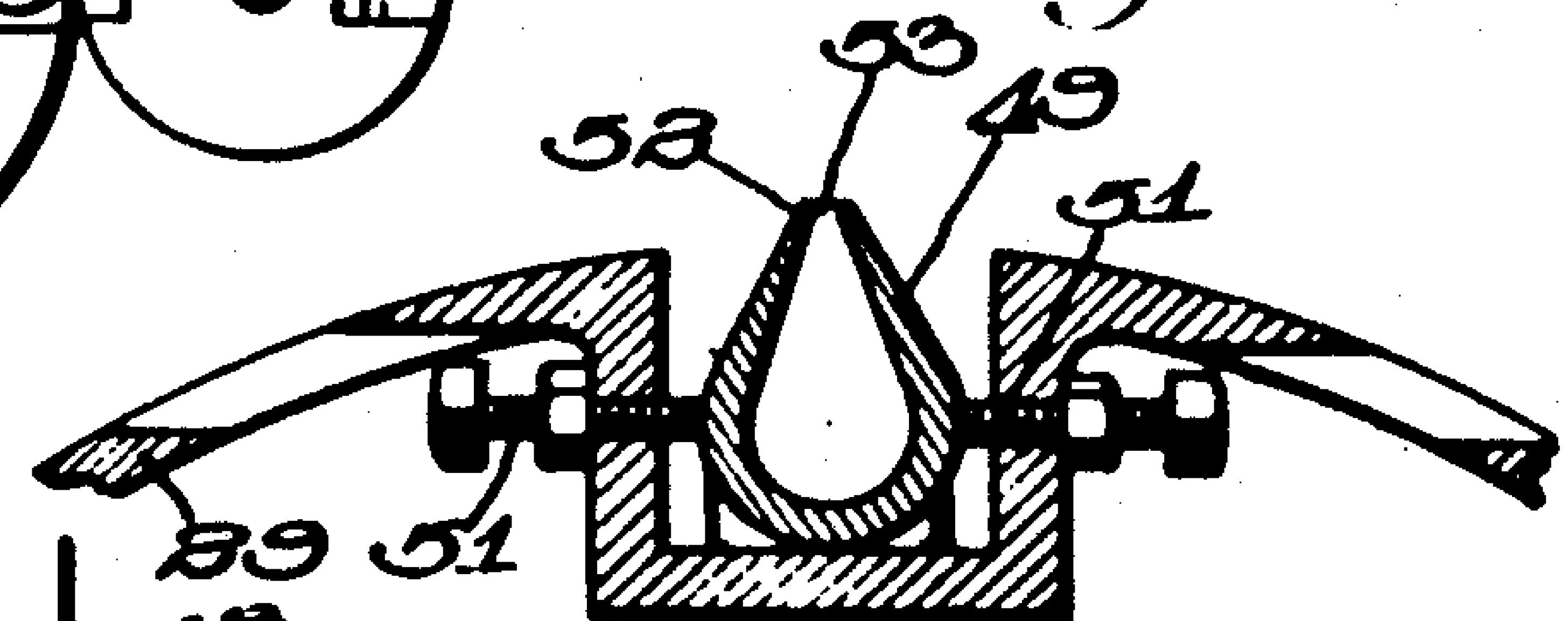


Fig. 11.

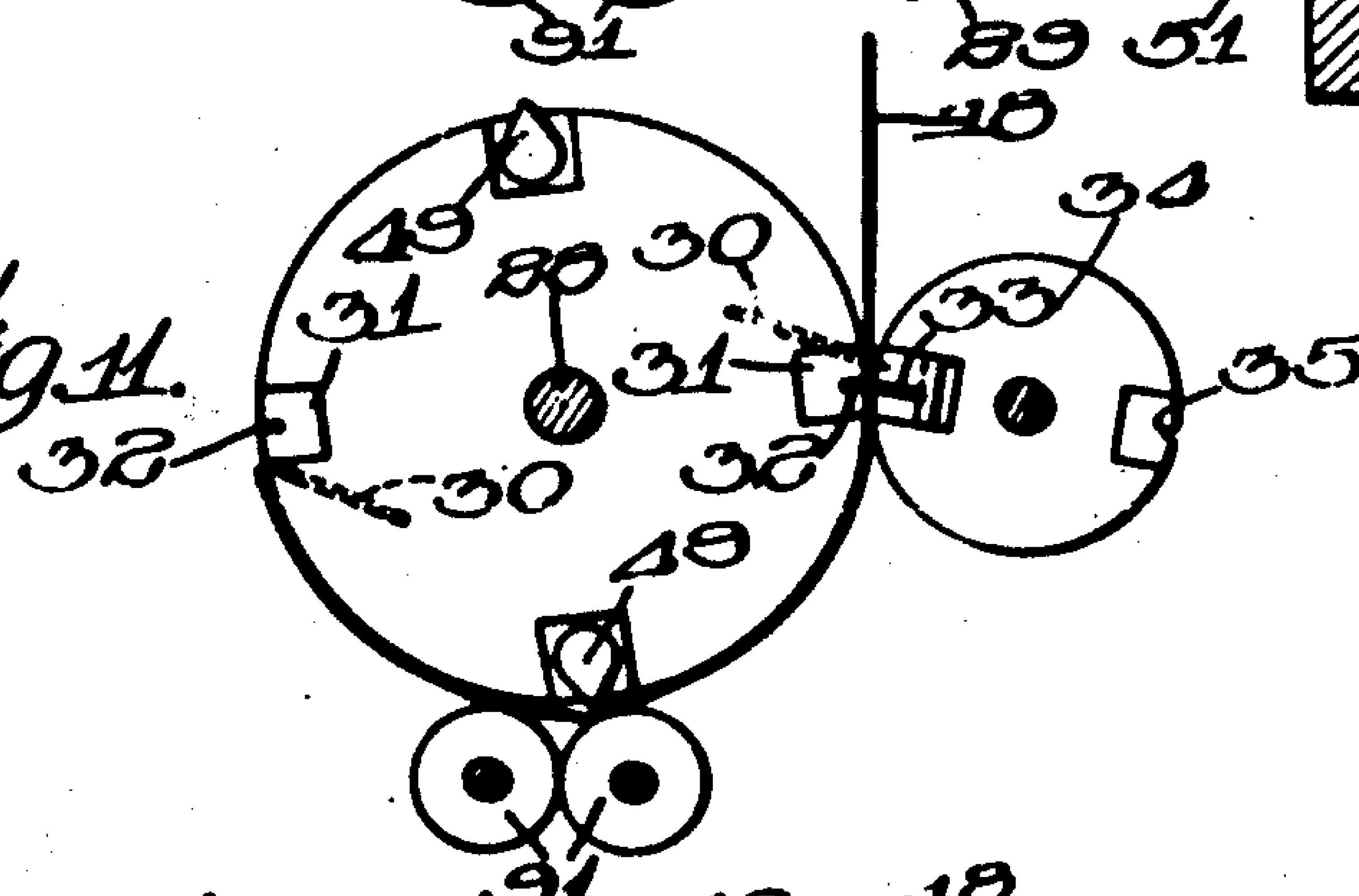
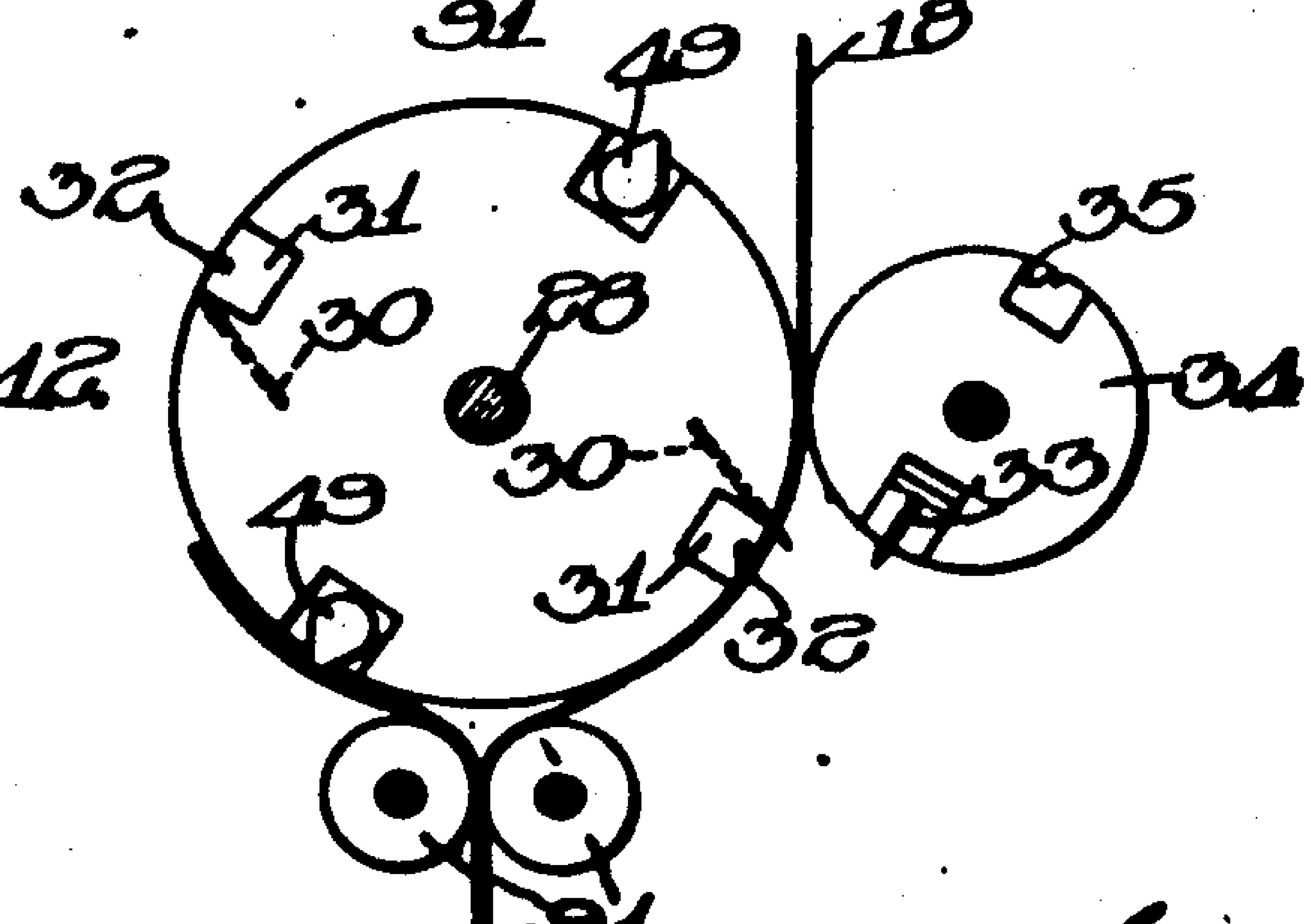


Fig. 12.



Witnesses:

Inventor:
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By Bond, Adams, Pickard & Jackson
his Attys

UNITED STATES PATENT OFFICE.

SAMUEL G. GOSS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FOLDING MECHANISM.

936,710. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed November 13, 1908. Serial No. 462,489.

To all whom it may concern:

Be it known that I, SAMUEL G. GOSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Folding Mechanism, of which the following is a description, reference being had to the accompanying drawings.

My invention relates to new and improved folding mechanism for printing presses, and its object is to provide new and improved mechanism by means of which the folding blade is done away with and the paper is folded by a blast of air suitably directed between the folding rollers to thrust the paper into the bite of the rollers. Generally speaking, I accomplish this object by means of mechanism, which, broadly stated, consists of a pair of folding rollers or equivalent mechanism, forwarding means preferably in the form of a rotary carrier, which forwards the sheet of paper to be folded into proper operative relation with the folding rollers, and an air discharge pipe and suitable automatically-operated valves which discharge a blast of air against the sheet of paper opposite the folding rollers so as to thrust the sheet to be folded into the bite of the folding rollers.

My invention also relates to the providing of a new and improved automatically-operated valve designed to suitably control the blast of air in the above-named mechanism and to so operate that when the press is stopped,—no matter at what point of its revolution,—the valve will be closed so that air will not escape.

My invention further contemplates other improvements in pneumatically-operated folding mechanism hereinafter specifically described.

In the drawings:—Figure 1 is a front elevation of the folder. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged detail, being an end view of the rotary carrier carrying the air-blast apparatus, being a vertical section on line 3—3 of Fig. 4. Fig. 4 is an enlarged detail, being a vertical section on line 4—4 of Fig. 3. Fig. 5 is an enlarged detail, being a front elevation of my improved valve and operating mechanism, showing the valve in vertical section. Fig. 6 is an enlarged detail, being a section on line 6—6 of Fig. 5. Fig. 7 is an enlarged detail, being a section on line 7—7 of Fig. 5. Fig. 8 is a still more enlarged detail, being a section through part of the rotary carrier, showing the mounting of the discharge tubes. Figs. 9, 10, 11 and 12 are diagrammatic views, showing the operation of the folding mechanism at different stages of its work.

Referring to the several figures of the drawings,—18 indicates side-frames and 14 the end frames of the folder.

15 indicates the ordinary V-shaped former or internal guide by means of which, cooperating with the external turners 16 at the point of the former, and forwarding roller 17 at the top of the former, the paper is folded longitudinally. As this longitudinal folder may be of any well-known form and construction and operates in the well-known manner, I have not shown the means for driving the external turners or forwarding rollers 16 and the forwarding roller 17, in order not to encumber the drawings with unnecessary figures, as it will of course be understood that they are driven in any well-known and approved manner.

18 indicates the web of paper passing over the former and being folded between the external turners 16.

19 indicates the driving gear of the press, and 20, 21, 22, 23, 24, 25, 26 and 27 indicate gears by means of which the several parts hereinafter described are driven. The gears 26 and 27 are mounted upon a shaft 28, upon which is mounted a rotary carrier 29. The rotary carrier 29 is provided with the usual pins 30 which impale the lead end of the web and carry it around with the rotary carrier. As these pins operate in the well-known manner and form no part of my present invention, it is not necessary to describe them here. The rotary carrier is also provided with blocks 31 provided with the usual cutting grooves 32 which coöperate with the knife 33 on a cutting cylinder 34 to sever the paper transversely in the well-known manner. The cutting cylinder 34 is preferably one-half the size of the rotary carrier 29 and is provided with only one cutting knife, which coöperates alternately with the two grooves 32 and is provided upon its surface diametrically opposite the knife 33 with a longitudinal groove 35 which coöperates with devices hereinafter described to form a transverse

crease across the paper to mark the line of the transverse fold and to assist in the folding hereinafter described.

The shaft 28 of the rotary carrier 29 is journaled of course in suitable journals in the frame, and is centrally bored from each end to form a central tubular opening 36 which extends inward axially of the shaft to a suitable distance within the rotary carrier. These tubes extend inward from each end of the shaft, and, at a suitable point within the rotary carrier, they bend outward so as to open upon the exterior of the shaft 28, said openings being respectively diametrically opposite each other. Referring to Fig. 4 where these parts are best shown, the outer ends of the shaft 28 are provided with disks 37, each of which is secured rigidly to the end of the shaft. Fig. 4, for convenience of illustration, shows only one end of the shaft with the parts now to be described, but it will be understood that similar parts are placed upon the other end of the shaft 28 also.

38 indicates a cylindrical cup provided with a flange 39 upon its inner end and which is rotatably mounted one upon each end of the shaft 28 with the flange 39 bearing closely against the shaft inside of the disk 37.

40 indicates a packing which is interposed between the flange 39 and the disk 37 so as to afford an air-tight packing around the shaft.

The cup 38 is held in position by means of the nut 41 which is screw-threaded upon the end of the shaft inside of the flange 39 and operates to hold the cup 38 against the interposed packing and the disk 37 so as to prevent the escape of air entering the shaft as hereinafter described.

42 indicates a cap which is screw-threaded into the outer end of the cup 38 and is preferably provided with a conical-shaped extension 43 which enters a correspondingly-conically-shaped depression in the disk 37.

44 indicates pipes which enter the caps 42 at each end of the shaft 28 in register with the tubular openings 36 and which are connected to valves 45, mounted on the framework one at the front and one at the rear of the folder, and operating to intermittently admit compressed air to the tubes 36. The detailed operation and construction of these valves will be hereinafter described.

46 indicates pipes which lead from the valves 45 to a suitable source of compressed air, as reservoir 47, and pump 48.

Referring again to Figs. 3, 4 and 8, 49 indicates discharge pipes, which, in the form in which my invention is embodied in the drawings, are two in number and are located diametrically opposite each other in suitable recesses 50 in the rotary carrier 29, and are midway between the two cutting grooves 32. These discharge pipes are held in position by set screws 51 by means of which their position may be slightly adjusted in the rotary carrier. As is best shown in Figs. 3 and 8, the discharge pipes 49 are so shaped as to narrow to a thin discharge edge 52 which projects slightly beyond the surface of the rotary carrier 29 and are provided with a thin discharge slot 53 which preferably extends substantially the length of each discharge pipe 49. 54 indicates pipes which are suitably supported inside of the rotary carrier and are connected by short stub pipes 55 with the tubular openings 36, and, by means of other pipes 56, are connected with the discharge pipes 49.

It will be obvious from the description so far that whenever the valve 45 is opened, compressed air passes through the pipes 44 into the tubular openings 36, from thence into the tubes 54, 55 and 56, into the discharge pipes 49, from whence the air issues through the slots 53 in a thin stream substantially the width of the rotary carrier.

Figs. 5, 6 and 7 show the detailed construction of the valves 45. Referring to those figures, 57 indicates a cylindrical valve casing which is mounted upon the end framework 14, one at the front and one at the rear of the folder frame. The pipes 44 and 46 enter the cylindrical casing through suitable openings therein, as is best shown in Fig. 5. 58 indicates a cylindrical valve member which is mounted to swing in the cylinder casing 57 and is provided at its outer end with an operating arm 59. As is best shown in Fig. 7, the cylindrical valve member 58 is mounted in the cylindrical casing 57 by means of a bolt 60 so as to oscillate air-tight in the casing, and is provided with a central opening 61 into which two tubular openings 62 and 63 enter, passing into said central openings from the exterior of the cylindrical valve member 58. The openings 62 and 63 are so placed as to simultaneously register with the openings in the casing 57 through which the pipes 44 and 46 enter when the valve member is oscillated.

It will be obvious from the above description that when the oscillating valve member 58 is swung, as the openings 62 63 register with the entrances of the pipes 44 and 46, compressed air will enter through the pipe 46 and the opening 63 and be discharged through the opening 62 and pipe 44 into the rotary carrier and through the device above described into one or the other of the discharge tubes and be discharged from thence through the slot 53.

The valve is operated by the following mechanism. 64 (see Figs. 1 and 2) indicates a shaft which is journaled in the frame and is driven by the gear 24, which is secured thereto. Upon each end of the shaft 64 is keyed a disk 65. Referring now to

Figs. 5 to 7, inclusive, where these parts are best illustrated, the disk 65 is provided with a curved slot 66 concentric with the center of the disk and subtending an angle of about ninety degrees. 67 indicates disks which are loosely journaled on the shaft 64 against the inner surface of the disk 65 and are held in position by a collar 68 and set-screw 69. 70 indicates a pin which is rigidly secured to the disk 67 and passes outward through the slot 66. 71 indicates plates which are mounted upon the framework, one at the rear and one at the front of the folder, upon suitable blocks 71ª so that they may stand out from the framework. The plates 71 are provided with a longitudinal slot 72. 73 indicates a lug which is pivotally mounted so as to oscillate in a suitable ear 74 on the bracket 75 which is formed integral with the plate 71. 76 indicates a stud which is circular in section and which is slidingly mounted in the slot 72. 77 indicates a rod which is slidingly mounted in the lug 73 and which, at its other end, is provided with a ring-head 78 which pivotally embraces the stud 76. 79 indicates a bearing which is mounted upon the rod 77 near its lower end. 80 indicates a spiral spring which bears at one end against the stud 76 and at the other end on the bearing 79. 81 indicates a link one end of which is pivotally connected to the pin 70 and the other by means of a ring similar to the ring 78 to the stud 76. 82 indicates a lever which is pivoted to the framework below the plate 71 and whose upper end is provided with a fork 83 which embraces the inner end of the stud 76. 84 indicates a lug which is pivotally supported in a suitable head 85 at the pivotal point of the lever 82. 86 indicates a rod which is slidingly mounted in the pivoted lug 84 and is pivoted at its inner end with a ring similar to the ring 78 and embracing the stud 76 on the outside of the plate 71. 87 indicates a bearing head which is secured to the rod 86 near its upper end. 88 indicates a spiral spring which bears at one end on the pivoted lug 84 and at the other end upon the bearing head 87. The springs 80 and 88 tend to move the rods inward toward each other when free to do so. The lower arm of the lever 82 is provided at its lower end with a curved slot 89 whose curve is concentric with the pivotal point of the lever 82, and which engages a pin 90 on the operating arm 59.

It will be obvious that as the fixed disk 65 rotates in the direction indicated by the arrows on Figs. 1 and 5, as soon as the rear end of the slot 66 engages the pin 70 on the disk 67 the pin will be moved so as to move the stud 76 in one direction or the other through the slot 72, thus rocking the lever 82. Assuming for the purposes of description that the stud 76 is at the left-hand end of the slot 72, the parts are so adjusted that the slot 66 will be a little more than ninety degrees farther to the left of the position shown in Fig. 5 with its rear end engaging the pin 70, and the operating lever 59 will be in the position shown in Fig. 5, and the lower arm of the lever 82 will be of course swung to the right so that the pin 90 will be at the left-hand end of the slot 89. As the disk 65 rotates with the rear end of the slot 66 in engagement with the pin 70, the stud 76 will be moved to the right in the slot 72, swinging the lower arm of the lever 82 toward the left, the pin 90 moving freely in the slot so as to not operate the lever 59. As soon, however, as the slot has moved into such position that the rods 77 and 86, which form, as it will be seen, a sort of toggle-joint lever, have passed their centers,—that is to say when the parts are in the position shown in Fig. 5,—the lower end of the lever 82 as shown in said figure, will be swung far enough to the left for the pin to be engaged at the right hand end of the slot 89, in other words, in the position shown in Fig. 5. At this instant, the two rods being past centers, the springs will instantly operate to throw the stud 76 rapidly to the right nearly to the right-hand end of the slot 72, bringing the pin 70, moving of course much more rapidly than the rotation of the disk 65, to the lead end of the slot or nearly so,—that is to say, so that the link 81 will come in line with the slot 72. This will operate of course to swing the lever 82 rapidly, moving its lower end almost instantly to the left in Fig. 5, and carrying the pin 90 with it and therefore carrying the operating arm 59. This will cause a quick oscillation of the oscillating valve member 58, carrying the openings 62—63 first into simultaneous registry with and then beyond the openings of the pipes 44 and 46 into the casing 57. As the openings 62—63 come simultaneously into registry with the pipe openings 44—46, air under pressure will be admitted to the apparatus, as above described, and the valve will be almost instantly closed again. The disk 65 continuing to rotate, the parts will remain stationary until the rear end of the slot 66 again engages the pin 70, when the pin 70 will be again carried around with the disk 65, moving the stud 76 to the left in the slot 72 and swinging the lower end of the lever 82 to the right, the pin 90 moving in the slot. As soon as the slot 66 is moved into such a position that the rods 77 and 86 again pass centers in the other direction, their rapid movement will again be effected by the springs, and the pin 90, which, at this moment is in engagement with the other end of the slot 89, will be rocked in the other direction, causing the same simultaneous registry of the openings 62—63 with the pipes 44 and 46 and their almost instant closing

again. By these means it will be seen that the valve 38 is rapidly oscillated, once to the left and once to the right with each rotation of the disk 65. It will thus be seen that inasmuch as it is the spring-operated action of the toggle-levers that works the valve, as this valve is normally in a closed position and the operation of the toggle levers at the same movement opens and closes the valve, it will not be possible for the valve to be open so as to permit the escape of air by a stoppage of the press, no matter at what point the press stops. The valves are so timed as to operate alternately,—that is to say, one valve opens up the passage into one of the discharge pipes and the other valve opens the passage into the other, and, operating alternately, first one discharge pipe and then the other operates in the folding of the paper.

91 indicates a pair of folding rollers which are mounted below the rotary carrier 29 in the usual manner, and, driven in any well-known manner, operate in the usual way to fold a sheet of paper thrust into their bite.

The operation of the devices is as follows, and is best illustrated in the diagrammatic Figs. 9 to 12. The lead end of the web, longitudinally folded, is impaled upon the impaling pins in the carrier, as is shown in Fig. 9, and is carried around the carrier in the ordinary manner. When the carrier has been moved one-quarter of a revolution, as shown in Fig. 10, the notch 35 in the cutting cylinder 34 is brought into position to register with the relatively sharp edge of one of the discharge pipes 49, which forces the paper into the notch 35 and marks the line of the transverse fold, to be subsequently made. As the parts reach the position shown in Fig. 11 and the line of the fold is brought opposite the folding rollers 91, the cutting knife severs the paper transversely and at this moment one of the valves 45 which connects with the discharge tube about to operate to fold the sheet is opened and a blast of air issues from the slot in the discharge tube against the paper, which, at the same time freed from the pins engaging its lead end, is by the said blast of air, operating against the crease across it, forced into the bite of the folding rollers and the paper is folded transversely. The next sheet of course is folded in the same manner by the operation of the discharge pipe upon the opposite side of the carrier. The folded sheets are then discharged and delivered by any suitable delivery mechanism, as by the rotary fly 92 and slow moving tapes 93, which, being of the well-known form and description, are only conventionally illustrated.

What I claim as my invention and desire to secure by Letters Patent is:—

1. The combination with folding rolls, a moving carrier adapted to engage a sheet of paper and forward it into folding position with reference to said folding rolls, and a compressed air supply, of a discharge pipe mounted on said carrier and adapted to discharge a sheet of air between said folding rolls, connections between said discharge pipe and said compressed air supply, and automatically-operating valve mechanism adapted to open the connections to said discharge pipe when said sheet is in position to be folded and then to automatically close said connections.

2. In combination, folding rolls, a rotary carrier adapted to engage a sheet of paper and carry it into folding position opposite said folding rolls, a source of compressed air supply, a discharge pipe carried by said carrier and adapted to discharge a blast of air between said folding rolls, connections between said discharge pipe and said compressed air supply, and automatically-operating valve mechanism adapted to momentarily open said connections as said sheet is brought into folding position and then close the same.

3. In a pneumatic folding mechanism, the combination with folding rolls, a rotary carrier adapted to engage a sheet of paper and carry it into folding position opposite said folding rolls, mechanism adapted to crease the paper on the line to be folded while on its way to folding position, and a source of compressed air supply, of a discharge pipe carried in said rotary carrier and adapted to discharge a blast of air between said folding rolls, connections between said source of compressed air supply and said discharge pipe, and automatically-operating valve mechanism adapted to momentarily open said connections as said sheet is brought into folding position and then close the same.

4. In a pneumatic folding mechanism, the combination with folding rolls, a rotary carrier adapted to engage a sheet of paper and carry it into folding position opposite said folding rolls, mechanism adapted to crease the paper on the line to be folded while on its way to folding position, and a source of compressed air supply, of a discharge tube mounted on said carrier and having a narrow opening of substantially the length of the width of the sheet of paper and adapted to discharge a blast of air between said folding rolls, connections between said source of compressed air supply and said discharge pipe, and automatically-operating valve mechanism adapted to momentarily open said connections as said sheet is brought into folding position and then close the same.

5. In a pneumatic folding mechanism, the combination with folding rolls, a rotary

carrier adapted to engage a sheet of paper and forward the same into folding position opposite said folding rolls, a rotary member having a creasing groove and adapted to coöperate with said rotary carrier, and a source of compressed air supply, of a discharge tube on said rotary carrier adapted to coöperate with said creasing groove on said rotary member to crease the paper along its fold line, and adapted to discharge a blast of air between said folding rolls, connections between said discharge tube and said source of compressed air, and automatically-operating valve mechanism adapted to momentarily open said connections as said sheet is brought into folding position and then close the same.

6. In a pneumatic folding mechanism, the combination with folding rolls, a rotary carrier adapted to engage a sheet of paper and carry it into folding position opposite said folding rolls, a cutting member on said rotary carrier, a cutting cylinder adapted to coöperate with said rotary carrier to sever the paper transversely and having a longitudinal creasing groove, and a source of compressed air supply, of a discharge tube on said rotary carrier adapted to coöperate with said creasing groove on said cutting member to crease the paper along its fold line, and adapted to discharge a blast of air between said folding rolls, connections between said discharge tube and said source of compressed air, and automatically-operating valve mechanism adapted to momentarily open said connections as said sheet is brought into folding position and then close the same.

7. In a pneumatic folding mechanism, comprising folding rolls, a carrier adapted to engage a sheet of paper and forward the same into folding position opposite said folding rolls, a discharge pipe adapted to discharge a blast of air between said folding rolls, a source of compressed air supply, and connections between said source of compressed air supply and said discharge tube, the combination with a valve located in said connections, of spring-actuated mechanism adapted to quickly open and immediately close said valve when the sheet of paper is in folding position, and means for moving said spring-actuated mechanism into operative position.

8. In a pneumatic folding mechanism, comprising folding rolls, a carrier adapted to engage a sheet of paper and forward the same into folding position opposite said folding rolls, a discharge pipe adapted to discharge a blast of air between said folding rolls, a source of compressed air supply, and connections between said source of compressed air supply and said discharge pipe, the combination with a valve located in said connections, of toggle-joint lever mechanism connected with said valve, means for moving said toggle-joint lever mechanism so that the same will pass centers, and springs on said toggle-joint lever mechanism and adapted as soon as the same passes centers to rapidly swing said toggle-joint lever mechanism and momentarily open and quickly close said valve.

9. In a pneumatic folding mechanism, comprising folding rolls, a carrier adapted to engage a sheet of paper and forward the same into folding position opposite said folding rolls, a discharge tube adapted to discharge a blast of air between said folding rolls, a source of compressed air supply, and connections between said source of compressed air supply and said discharge tube, the combination with a valve located in said connections, of a lever adapted to reciprocate said valve, a toggle-joint lever connected with said valve-operating lever, means for moving said toggle-joint lever, and springs on said toggle-joint lever adapted as soon as the same passes centers to further rapidly move said toggle-joint lever and said valve-operating lever to momentarily open and quickly close said valve.

10. In a pneumatic folding mechanism, comprising folding rolls, a carrier adapted to engage a sheet of paper and forward the same into folding position opposite said folding rolls, a discharge tube adapted to discharge a blast of air between said folding rolls, a source of compressed air supply, and connections between said source of compressed air supply and said discharge tube, the combination with a reciprocatory valve in said connections, of a frame, a slide-block mounted in said frame, a swinging lever connected with said valve and with said slide-block, a toggle-joint lever adapted to pass centers in both directions and connected to said slide-block, means for reciprocating said slide-block, and springs on said toggle-joint lever adapted when said toggle-joint lever passes centers in either direction to quickly impart a further movement to said block to momentarily open and then close said valve.

11. In a pneumatic folding mechanism, comprising folding rolls, a carrier adapted to engage a sheet of paper and forward the same into folding position opposite said folding rolls, a discharge tube adapted to discharge a blast of air between said folding rolls, a source of compressed air supply, and connections between said source of compressed air supply and said discharge tube, the combination with a valve casing having entrance and discharge passages connected with said compressed air connections, an oscillating valve member having entrance and discharge passages adapted to simultaneously register with the entrance and discharge passages in said casing, and a valve stem on said valve member, of a frame, a block slidingly mount-

ed in said frame, a swinging lever having a slot connection at one end with said valve stem and a connection at the other end with said sliding block, means for reciprocating said sliding block, toggle-joint levers pivotally connected at their inner ends to said sliding-block, and springs on said toggle-joint levers adapted as soon as they pass centers to give a rapid further movement to said sliding block and to operate said swinging lever to move the two-way passages in said valve member into and out of registry with the entrance and discharge openings of said valve casing.

12. In a pneumatic folding mechanism, comprising folding rolls, a carrier adapted to engage a sheet of paper and forward the same into folding position opposite said folding rolls, a discharge tube adapted to discharge a blast of air between said folding rolls, a source of compressed air supply, and connections between said source of compressed air supply and said discharge tube, the combination with a valve casing having entrance and discharge passages connected with said compressed air connections, an oscillating valve member having entrance and discharge passages adapted to simultaneously register with the entrance and discharge passages in said casing, and a valve stem on said valve member, of a frame, a block slidingly mounted in said frame, a swinging lever having a slot connection at one end with said valve stem and a connection at the other end with said sliding block, a shaft, means for rotating the same, a disk secured to said shaft and having a curved slot, a member loosely mounted on said shaft and having secured thereto a pin projecting through said slot, a link pivotally connecting said pin with said sliding block, toggle-joint levers pivotally connected at their inner ends to said sliding block, and springs on said toggle-joint levers adapted as soon as they pass centers to give a rapid further movement to said sliding block and to operate said lever to move the two-way passages in said valve member into and out of registry with the entrance and discharge openings of said valve casing.

13. In a pneumatic folding mechanism, comprising folding rolls, a carrier adapted to engage a sheet of paper and forward the same into folding position opposite said folding rolls, a discharge tube adapted to discharge a blast of air between said folding rolls, a source of compressed air supply, and connections between said source of compressed air supply and said discharge tube, the combination with a valve in said connections, of a frame provided with a slot, a slide-block mounted in said slot, means for reciprocating said slide-block in said slot, a swinging lever connected at one end with said valve and at the other end with said slide-block, a swinging rod pivotally connected at one end with said slide block, and a spring on said swinging rod adapted as soon as said swinging rod passes in either direction beyond a line perpendicular to said slot to quickly swing said rod and give said slide block a rapid additional motion and cause said lever to momentarily open and close said valve.

SAMUEL G. GOSS.

Witnesses:
JOHN L. JACKSON.
WILLIAM H. DE BUSK.