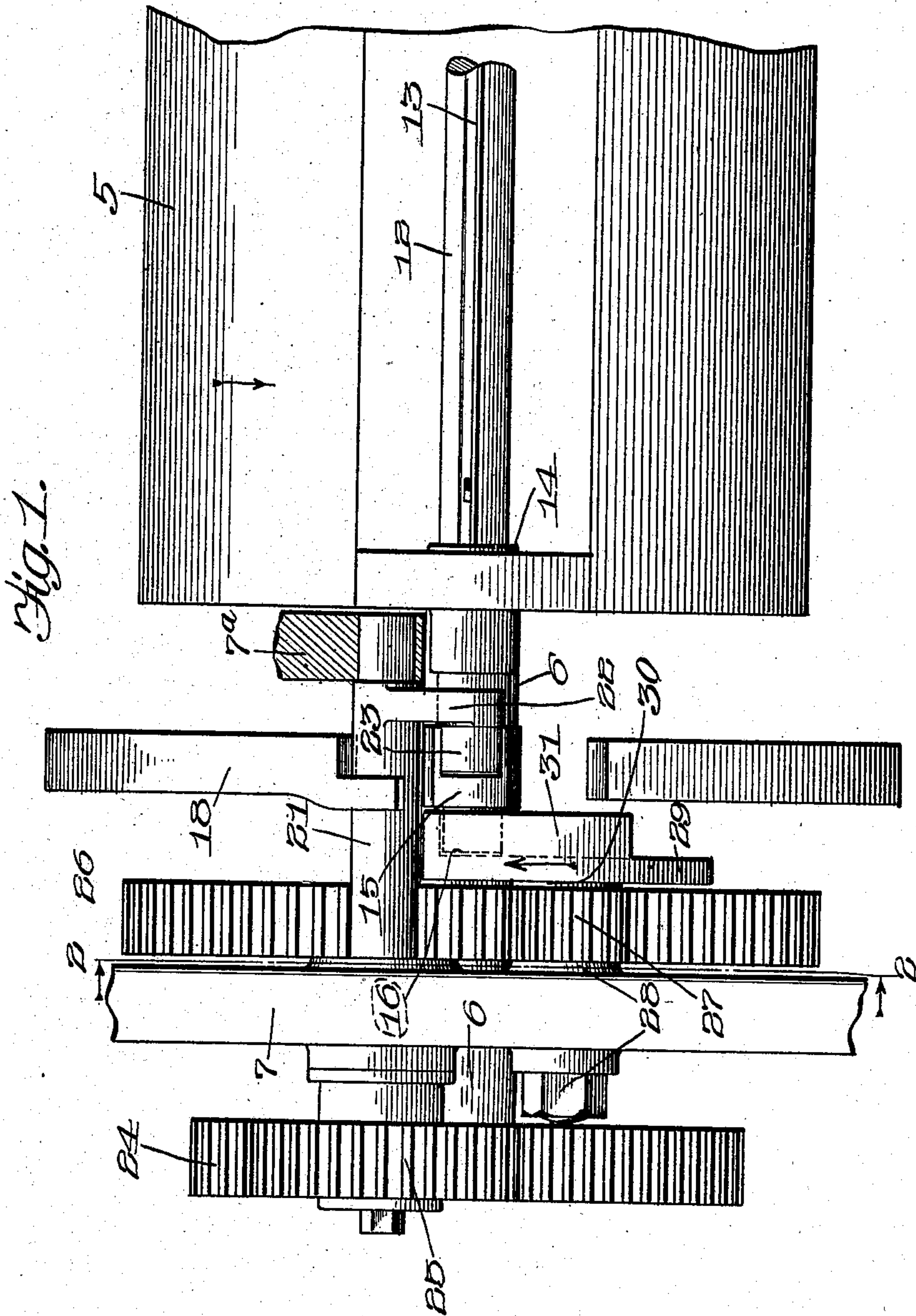


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 ROTARY FOLDING MECHANISM FOR PRINTING PRESSES.
 APPLICATION FILED MAR. 30, 1908.

899,772.

Patented Sept. 29, 1908.
 3 SHEETS—SHEET 1.



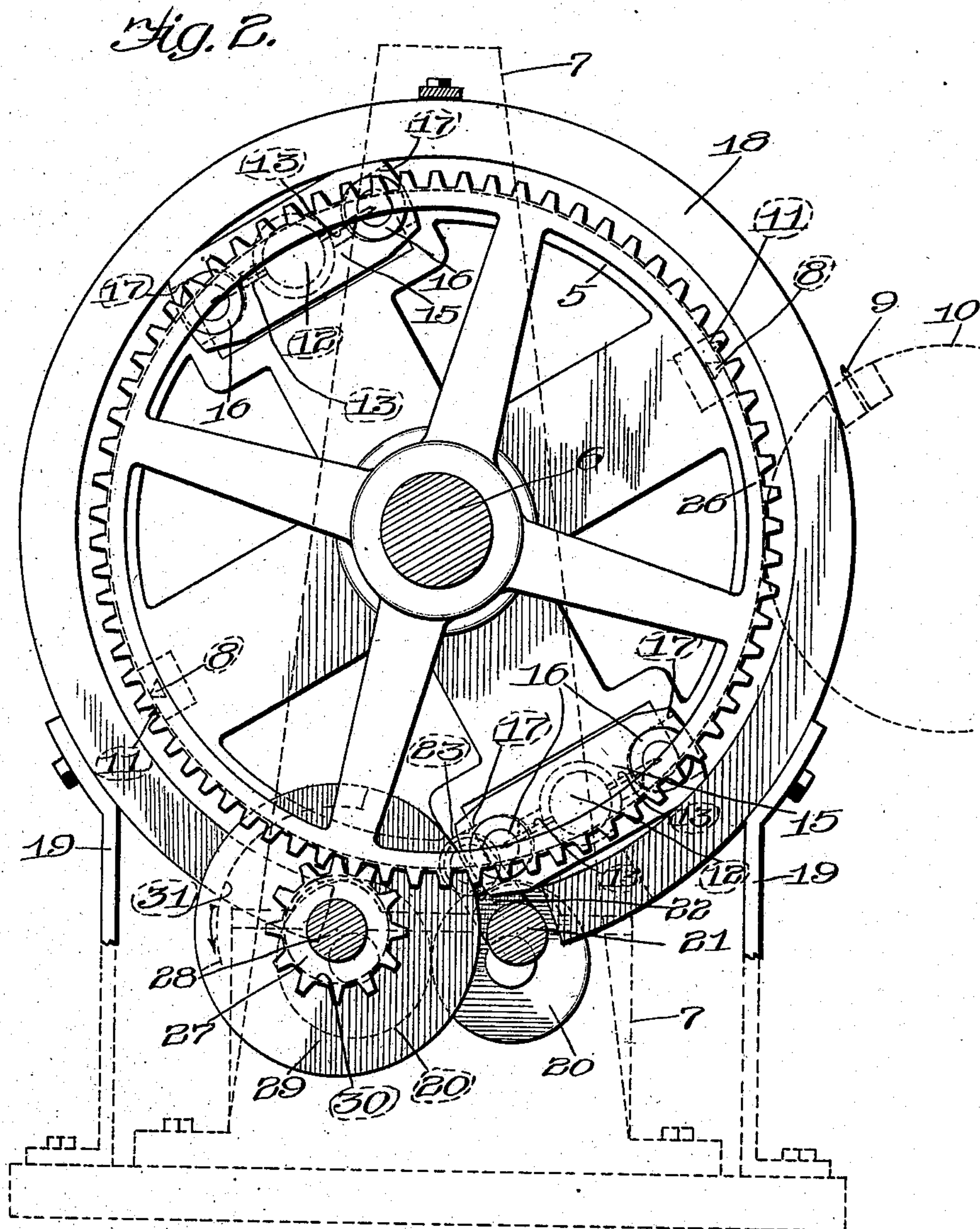
Witnesses:
Edw. D. Perry
Amos H. Nelson Jr.

Inventor:
Joseph J. Walser
By Adam P. Lucas, Jr.
Att'y

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Edw. Perry
Wm. Nelson Jr.

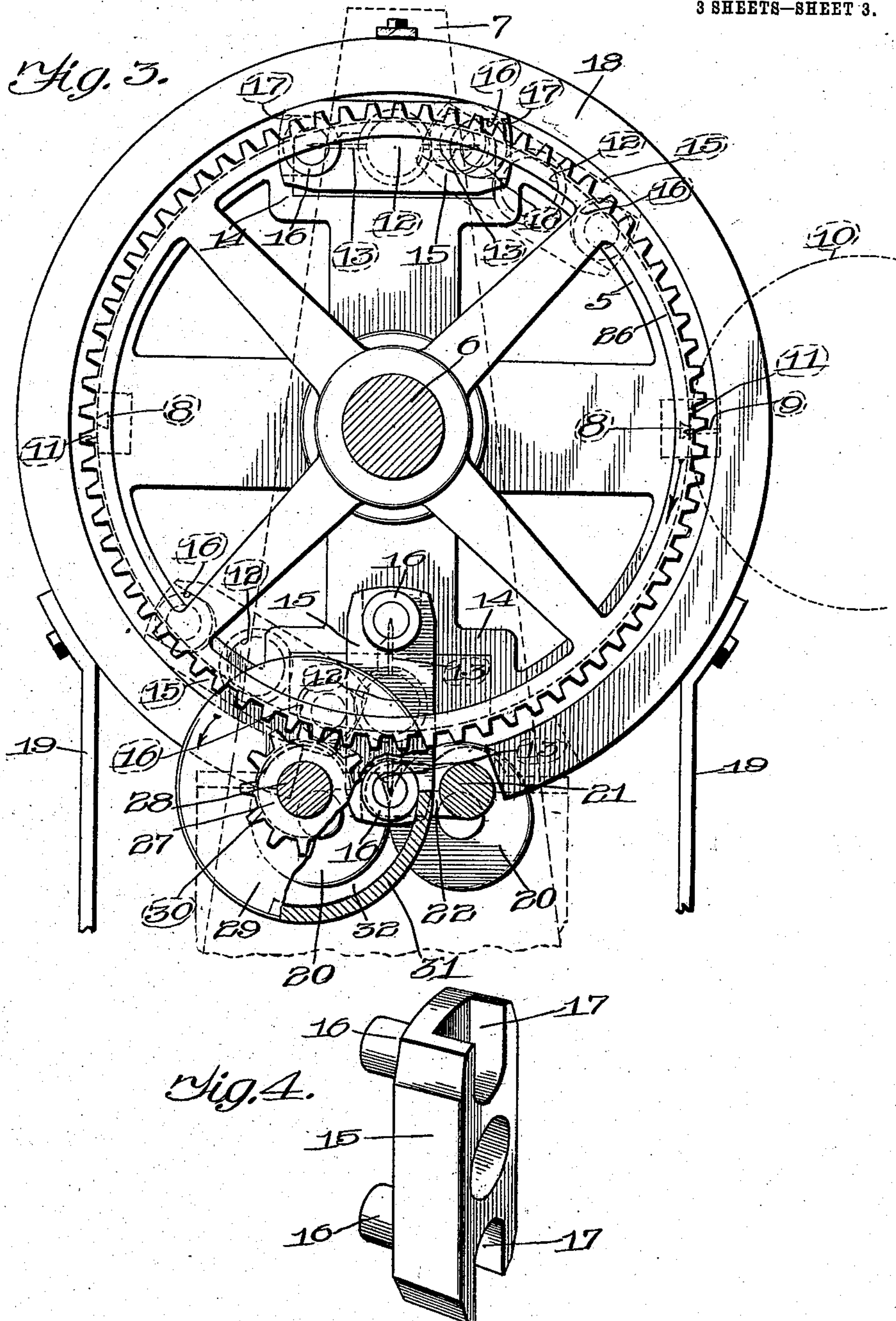
Inventor:
Joseph J. Walser
By Bond Adams, Percard & Adams
 attys

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Witnesses:
Ed. D. Perry
John H. Meloy Jr.

Inventor:
Joseph J. Walser.
 By *Benjamin Adams Pickard* Attorney

UNITED STATES PATENT OFFICE.

JOSEPH J. WALSER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ROTARY FOLDING MECHANISM FOR PRINTING-PRESSES.

No. 899,772.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed March 30, 1908. Serial No. 424,177.

To all whom it may concern:

Be it known that I, JOSEPH J. WALSER, 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 Rotary Folding Mechanism for Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in rotary folding mechanism for printing presses and particularly to improvements in the mechanism shown and described in Letters Patent of the United States, No. 870,964, to Hans P. Husby, granted November 12, 1907, in which the folding blade in a rotary carrier is operated from normal position into operative position and out of operative position into normal position by two moving guides which, while traveling in the same direction with the folding blade, successively act upon it to move it into and out of operative position; and its object is to provide new and improved mechanism by which the folding blade may be operated without any blow or violent contact of parts, thereby increasing the speed at which the blade may be operated.

In the accompanying drawings:—Figure 1 is a bottom view with the rotary carrier broken away, and with the folding rollers removed. Fig. 2 is an end view, being a section on line 2—2 of Fig. 1. Fig. 3 is an end view, being a section on line 2—2 of Fig. 1, but showing the tumbling-lever and operating mechanism in different positions. Fig. 4 is a detail, being an isometric view of the tumbling-lever.

Referring to the drawings:—5 indicates a rotary carrier which is mounted upon shaft 6 which is journaled in any suitable framework, as 7. The rotary carrier 5 is of the usual type and description and operates in the usual manner. It is preferably also a cutting cylinder, and to that end is provided with a cutting groove 8 which coöperates with a knife 9 on the cutting cylinder 10 in the usual manner and with impaling pins 11 which may be of any well-known form, description and method of operation and are therefore only conventionally illustrated.

12 indicates folding blade shafts which carry folding blades 13 and which shafts are journaled in suitable supports, as 14, in the rotary carrier 5.

15 indicates a tumbling-lever which is mounted upon one end of each shaft 12. As is best shown in Fig. 4, this tumbling-lever 15 is provided upon its outer surface with two studs 16, preferably in the form of rollers, and located one at each end of the tumbling-lever. Upon its other or rear side the tumbling-lever 15 is provided with two recesses 17 which extend inwardly from each end towards the center of the tumbling-lever and are of somewhat less depth than the thickness of the tumbling-lever. The recesses 17 are adapted to engage an operating stud on the rotary disk hereinafter described.

18 indicates a circular guide which is supported upon suitable supports, as 19, exterior to the rotary carrier 5. The inner surface of the guide 18 forms a bearing for the tumbling-lever 15, whereby, when the tumbling-lever is not operated to fold the paper, the folding blade may be held in normal inoperative position, which, in the form of my invention shown in the drawings, is with the tumbling-lever and folding blade at right angles to the diameter of the rotary carrier which passes through the center of the folding blade shafts 12. The guide 18 is broken away at the bottom to leave an open space above the folding rollers for the operation of the tumbling-lever.

20 indicates folding rollers mounted in the usual manner in any suitable framework and operating in the usual manner to fold the paper transversely when the same is thrust into the bite of the folding rollers in the manner hereinafter described. As these folding rollers may be mounted in any well-known and approved manner and are of the usual structure and operation, I have not shown the method of mounting in the framework in order not to obscure the drawings with unnecessary parts.

21 indicates a shaft which is journaled near its outer end in any suitable portion of the framework, as 7, and at its inner end in any suitable bracket or similar portion of the framework, as 7^a.

22 indicates a crank-arm on the inner end of the shaft 21.

23 indicates a stud, preferably in the form of a roller, which is mounted upon the end of the crank-arm 22 so as to be in register with and engage the recesses 17 on the tumbling-lever 15 in the manner hereinafter described.

24 indicates a gear which is keyed or otherwise secured upon the outer end of the rotary carrier shaft 6.

25 indicates a gear which is keyed or otherwise secured to the outer end of the shaft 21 and meshes with the gear 24. The gears 24—25 are to each other, respectively, as two to one, whereby the gear 25 will be rotated twice for each rotation of the gear 24 and of the rotary carrier.

26 indicates a gear which is keyed or otherwise secured to the rotary carrier shaft 6 and is located between the gear 24 and the circular guide 18 near the outer surface of the tumbling-lever.

27 indicates a gear which is mounted upon a stud 28 on the framework 7 and meshes with the gear 26. The gears 26—27 are to each other as six to one, whereby the gear 27 is given six rotations for each rotation of the gear 26 and of the rotary carrier 5.

29 indicates a disk which is formed integral with or secured upon the inner surface of the gear 27, and is provided with a hub 30 circular in section and shown in dotted lines in Figs. 2 and 3.

31 indicates a circular flange extending from the inner surface of the disk 29 and perpendicular thereto and having its interior surface concentric with the exterior surface of the hub 30, forming between them a curved recess or groove 32 of a width adapted to receive one of the studs 16 and permit it to travel therethrough freely but without lost motion.

The several rotating parts are driven so as to rotate in the direction indicated by arrows in the several figures,—that is to say, the shaft 21 and the gear 28 rotate in the same direction with each other and in the opposite direction to that of the rotary carrier 5. The axial lines of the shaft 21 and of the gear 27 and disk 29 are a short distance above the axial lines of the folding rollers 20, and are placed one upon each side of the vertical longitudinal plane of the machine.

The operation of the above-described mechanism is as follows:—As the rotary carrier rotates, the folding blade shafts and of course with them the folding blades and tumbling-levers are carried around with the cylinder, and the tumbling-lever bearing upon the circular guide 18, as above described, the folding blade is held in normal inoperative position until its lead end reaches the opening in the bottom of the circular guide above the folding rollers. At this moment, the shaft 21 rotating in the direction indicated by the arrows and carrying the stud 23 in the same direction as the travel of the lead end of the tumbling-lever, the recess 17 engages the stud 23, the parts being in the position shown in Fig. 2. As the rotation continues, the engagement of

the recess in the lead end of the tumbling-lever 15 with the stud 23 will cause the tumbling-lever to be moved into folding position, as is shown in solid lines in Fig. 3, and, as this moving of the tumbling-lever is effected by the cooperation of the stud with the lead end of the tumbling-lever while both parts are traveling in the same direction, the lead end of the tumbling-lever will be engaged in normal position and moved into folding position without any blow or violent contact of parts, and the paper, delivered to the cylinder in any well-known and usual manner, severed by the knives transversely, will be tucked by the folding blades between the folding rollers 20. At this moment,—that is to say, when the parts are in the position shown in solid lines in Fig. 3,—the stud 23 will leave its engagement with the leading end of the tumbling lever, and, the rotation of the parts being properly timed, at this same moment the lead end of the flange 31 will reach the position shown in Fig. 3 and the stud 16 upon the outer surface of the tumbling-lever 15, which has so far been at the lead end of the tumbling-lever, will enter the curved groove 32 between the inner surface of the flange 31 and the outer surface of the hub 30. As the rotation thereupon continues, the engagement of the roller 16 in the groove 32 will cause the tumbling-lever to be rocked out of folding position into normal position. By this operation, the tumbling-lever will be reversed, so that what was at the beginning of its operation the lead end becomes its rear end, and, by the time it is thus rocked into normal position and delivered to the guide 18, the stud heretofore engaged by the groove will be freed from the groove. As this engagement of the stud and the groove and the rocking of the tumbling-lever from folding position into normal position are accomplished while the engaged stud on the tumbling lever and the engaging groove are both traveling in the same direction, the movement of the tumbling-lever and therefore of the folding blade from folding position into normal position will be accomplished without any blow or violent contact of parts. Because the folding blade is operated as above described by rotary moving members traveling during their operation on the folding blade in the same direction therewith and therefore without violent contact of parts, the speed at which the folding mechanism may be operated is greatly increased.

It will, of course, be understood that my improved folding mechanism as above described is adapted to fold a web of paper transversely, and particularly adapted for attachment to web-perfecting presses. As the web is delivered to the folding cylinder and carried around thereby in any well-

known manner, and as the method of delivery of the web to the rotary carrier is well understood, I have not illustrated the web or the mechanism for delivering it in the drawings in order not to obscure the drawings by the illustration of unnecessary parts.

I have described my mechanism as being operated with the parts rotating in the directions indicated by arrows. It will of course be understood that the parts may be rotated in the opposite direction, the position of the cutting cylinder being of course suitably changed, and the operation of my devices will be the same in effect, the only difference being that in this case the tumbling-lever will be moved from normal position into folding position by the engagement of the stud 16 on the lead end of the tumbling-lever with the groove 32 on the disk 29 and will be moved out of folding position into normal position by the engagement of the stud 23 with the corresponding recess 17.

That which I claim as my invention, and desire to secure by Letters Patent is,—

1. The combination with a rotary carrier, and a folding blade carried thereby, of a tumbling-lever on said folding blade provided upon one side thereof with a recess at each end and upon the other side thereof with a stud at each end, and moving means adapted to engage the recessed end of said tumbling-lever and one of the studs thereon and move the same from normal position into folding position and from folding position into normal position.

2. The combination with a rotary carrier, and a folding blade carried thereby, of a tumbling-lever on said folding blade provided with a recess at each end on one side thereof and a stud near each end on the other side thereof, and rotary members adapted to engage the recessed end of said tumbling-lever and one of said studs, respectively, and move the same out of normal position into folding position and out of folding position into normal position.

3. The combination with a rotary carrier, a folding blade shaft journaled therein, and a folding blade on said shaft, of a tumbling-lever on said shaft provided with a recess at each end upon one side thereof and a stud near each end upon the other side thereof, and a pair of moving members adapted the one to engage the recess upon the lead end of the tumbling-lever and the other to engage the stud on the lead end of said tumbling-lever and successively move said folding blade from normal position into folding position and from folding position into normal position.

4. The combination with a rotary carrier and a folding blade carried thereby, of a tumbling-lever at one end of said folding blade and having engaging studs upon one

side one at each end and recesses upon the other side one at each end, a rotating member provided with a stud adapted to engage the recess on the end of said tumbling-lever, a rotating member provided with a curved groove adapted to engage the stud upon the end of said tumbling-lever upon its other side, and means for rotating said rotary members whereby said rotating members will successively engage said tumbling-lever, and, while traveling in the same direction therewith, will successively receive said folding blade in normal position and move it into folding position and move said folding blade out of folding position into normal position.

5. The combination with a rotary carrier, and a folding blade carried thereby, of a tumbling-lever at one end of said folding blade having engaging studs upon one side one at each end and recesses upon the other side one at each end, a shaft, a crank on the inner end of said shaft provided with a stud adapted to engage the recessed end of said tumbling-lever, a disk provided with a groove adapted to engage the stud upon the lead end of said tumbling-lever, and means for rotating said crank and said disk whereby the stud on said crank and the groove on said disk may successively engage said tumbling-lever while moving in the same direction, and, while moving in the same direction therewith, successively move said folding blade from normal position into folding position and from folding position into normal position.

6. The combination with a rotary carrier, a folding blade shaft, and a folding blade thereon, of a tumbling-lever at one end of said folding blade shaft having engaging studs upon one side one at each end and recesses upon the other side one at each end, a shaft, a crank on the inner end of said shaft provided with a stud adapted to engage the recessed end of said tumbling-lever, a disk provided with a curved groove adapted to engage the stud upon the lead end of said tumbling-lever, means for rotating said crank and said disk in the same direction with each other and in a direction opposite to that of the rotary carrier, whereby the stud on said crank and the groove on said disk may successively engage said tumbling-lever while moving in the same direction, and, while moving in the same direction therewith, successively move said folding blade from normal position into folding position and from folding position into normal position, and a guide adapted to bear on said tumbling-lever and retain said blade in normal position while not being operated.

JOSEPH J. WALSER.

Witnesses:

W. T. GOSS,

LILLIAN M. CAGNEY.