No. 879,510. PATENTED FEB. 18, 1908.

H. F. BECHMAN.

FOLDING MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED MAY 14, 1907.

3 SHEETS—SHEET 1.

Fig. 1.

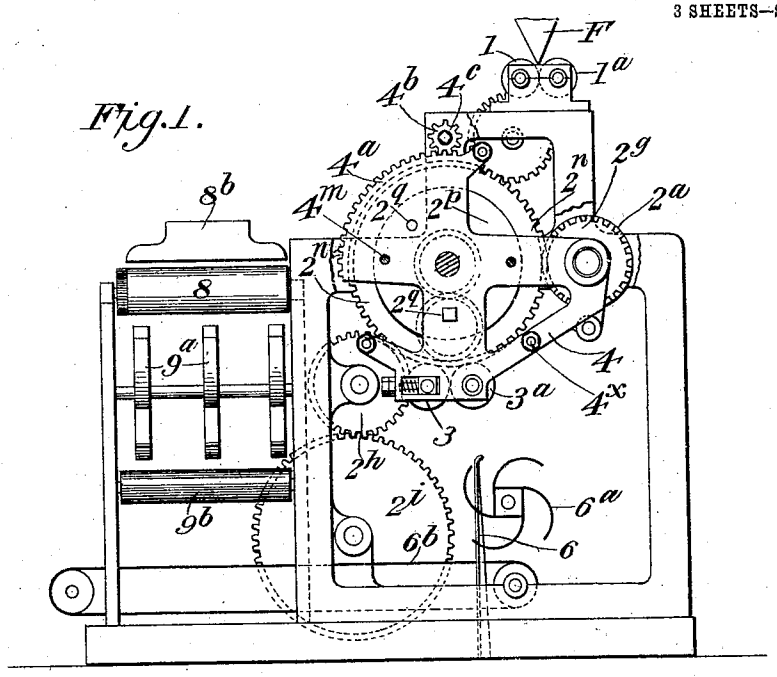
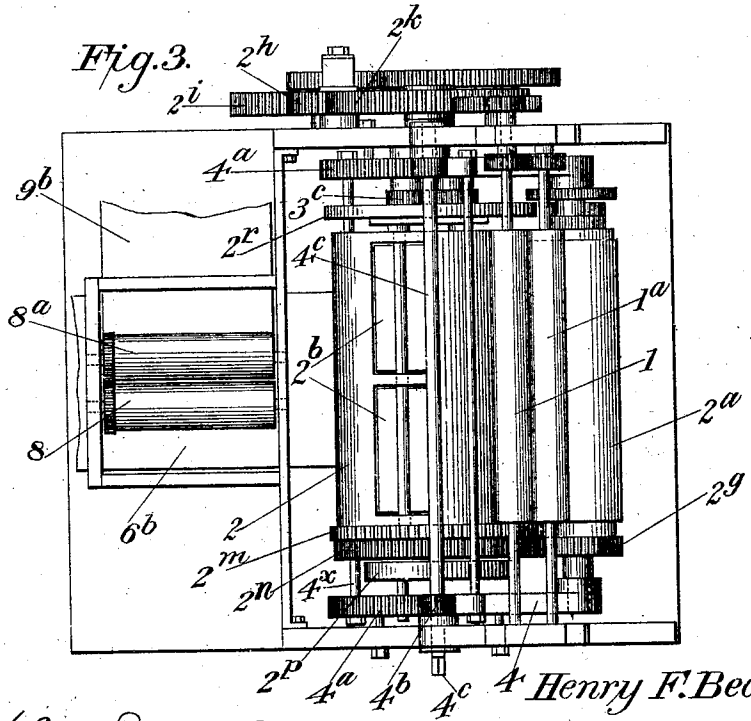


Fig. 3.



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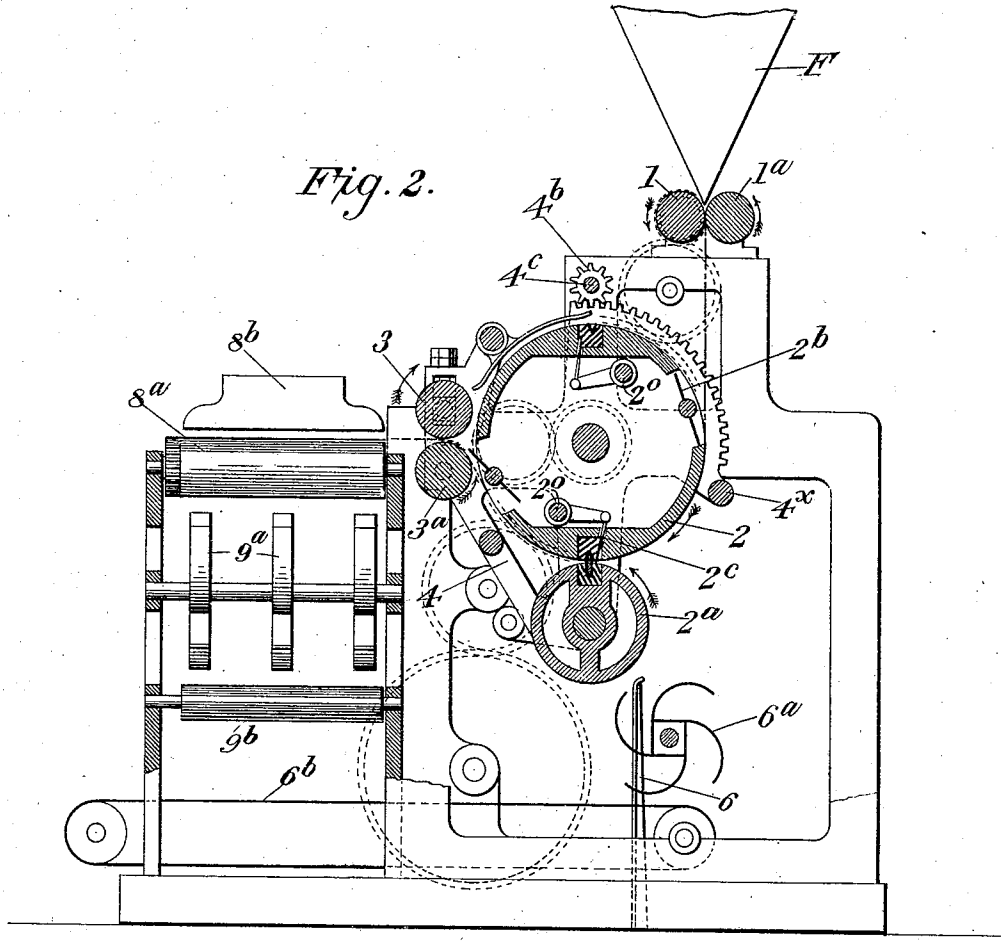
3 SHEETS—SHEET 2.

Fig. 2.



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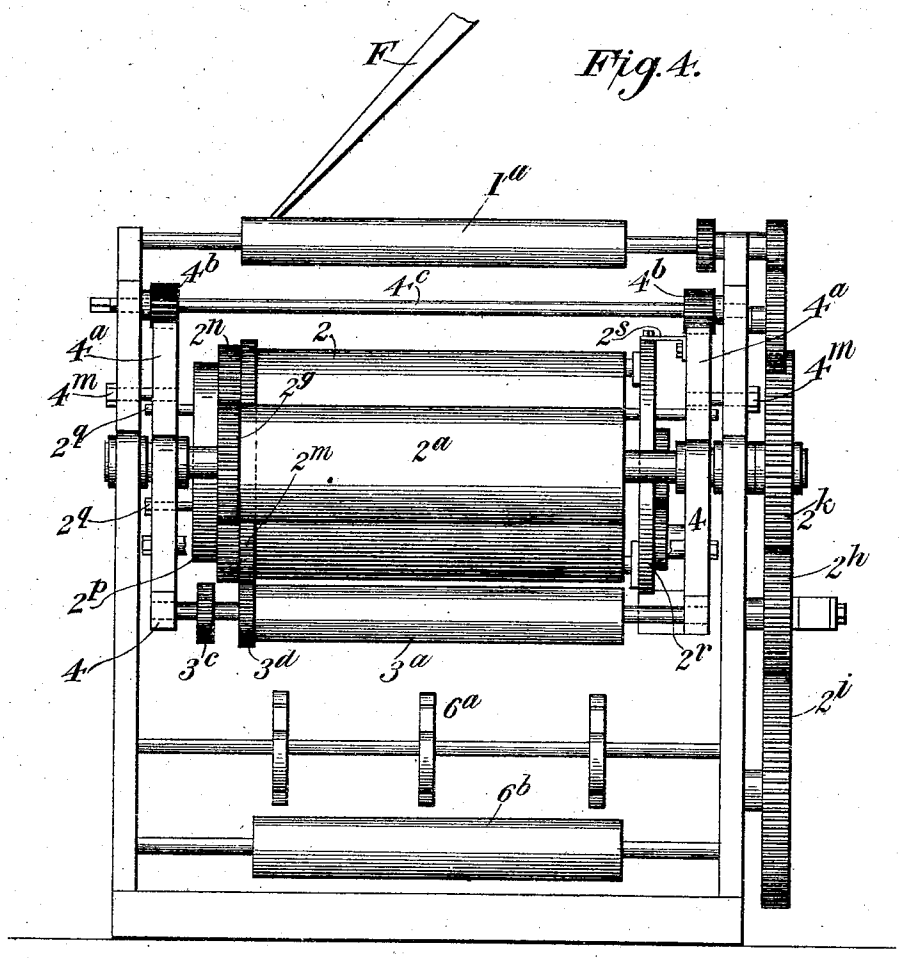
3 SHEETS—SHEET 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY F. BECHMAN, OF BATTLE CREEK, MICHIGAN, ASSIGNOR TO DUPLEX PRINTING PRESS COMPANY, OF BATTLE CREEK, MICHIGAN, A CORPORATION OF MICHIGAN.

FOLDING MECHANISM FOR PRINTING-PRESSES.

No. 879,510. Specification of Letters Patent. Patented Feb. 18, 1908.

Application filed May 14, 1907. Serial No. 373,665.

To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Folding Mechanism for Printing-Presses; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in folding mechanisms for printing presses and is particularly designed to be used in connection with rotary web-printing newspaper presses. Its object is to enable the folder to deliver newspapers folded either to half-size or to quarter-size, at the will of the operator, and for this purpose the invention consists more particularly in the novel construction and arrangement of the cutting cylinder, folding cylinder and second-fold rolls, whereby the papers can be delivered by the second-fold rolls either to a receiver for papers folded to half-size or to a third set of folding devices by which the papers may be folded to quarter-size.

In the present invention the cutting cylinder and the second-fold rolls are mounted on adjustable supports which are pivoted axially of the folding cylinder, so that the cutting cylinder and second-fold rolls can be adjusted to different positions—peripherally of the folding cylinder so that the papers can be delivered either folded to half-size or to quarter-size, as desired. By this arrangement the second-fold rolls are always at the same distance from the cutting cylinder, and the severed sheets travel the same distance from the cutting cylinder to the second-fold rolls in either position thereof.

The invention will be fully understood from the following description in connection with the drawings in which certain well known parts are simply diagrammatically shown; but the illustration and description will enable anyone skilled in the art to readily construct a folder embodying the invention.

In such drawings—Figure 1 is a detail end elevation of such a folder the frame being partly broken away showing the second-fold rolls in position assumed when the folder is delivering papers folded to half-size. Fig. 2 is a vertical section through Fig. 1, showing the parts adjusted to produce papers folded to quarter-size. Fig. 3 is a plan view. Fig. 4 is a side elevation of Fig. 1.

F is a former over which the web is led from the printing mechanism between the first fold rolls 1 and 1^a located at the apex of the former by which the web is folded longitudinally upon itself before being passed to the cutting cylinder. Over rolls 1, 1^a the web is led between cutting cylinder 2^a and folding cylinder 2, the latter being provided with rotary tuckers 2^b and collecting pins 2^c, as usual in such devices. In this instance the cutting cylinder 2^a instead of being journaled upon the fixed frame has its bearings in hangers 4 which are pivoted axially of the folding cylinder 2 and can be adjusted so as to move the cutting cylinder 2^a around the periphery of the folding cylinder from the position shown in Fig. 1 to the position shown in Fig. 2. The hangers 4 may be connected by tie-rods $4^\times$, and are provided on their upper sides with segments 4^a which mesh with gears 4^b on a cross-shaft 4^c which can be operated by a wrench or crank (not shown) applied to its outer end so as to adjust the cylinder 2^a to either position desired. And when so adjusted the hangers can be fastened securely in position by bolts 4^m which are tapped through the side frames into the hangers as shown in Figs. 3 and 4, said bolts being removed when the hangers are to be adjusted.

On the hangers 4 and at 90 degrees (or any other desired angle) removed from the cylinder 2^a are journaled the second-fold rolls 3 and 3^a which are adapted to fold the severed papers to half-size. The rolls 3 and 3^a may be intergeared as shown at 3^c and may be driven by a gear 3^b on one of the rolls meshing with a gear 2^m on cylinder 2, so that the second-fold rolls will be driven in proper speed relatively to the cutting and folding cylinders.

The cylinders 2 and 2^a may have intermeshing gears as shown at 2^g, 2^m, and cylinder 2 may be driven by gears 2^h, 2^i, 2^k, as indicated in Figs. 1 and 4.

The pins 2^c are mounted on rock-shafts 2^o, as usual, said shafts being controlled by a pin-cam 2^b at one end of cylinder 2, said cam being fastened to the adjacent hanger 4 by bolts 2^q, or in other suitable manner, so that the pin-cam has a fixed relation to said hangers. Otherwise the construction of the pins and pin-cams and their mode of opera-

tion is as usual, and needs no detailed explanation. The tucker-blades 2^b are also constructed as usual, and are controlled by a tucker-ring and cam 2^r at one end of the cylinder 2, said cam 2^r being fastened to the adjacent hanger 4 by brackets 2^s or in other suitable manner; so that the tucker-cam has a fixed relation to the hangers 4^a; otherwise the construction and operation of the rotary-tuckers 2^b is as usual, in such folding mechanisms and needs no detailed explanation.

Below the folding cylinder 2 is a stacker which may be constructed as usual with receiving fingers 6, a rotary fly 6^a, and endless delivery belts 6^b, and when the parts are adjusted in the position shown in Fig. 1, papers folded to one-half size will be discharged from the second-fold rolls 3 and 3^a onto the carrier 6^b.

At one side of the folding cylinder 2 is a third folding device which preferably comprises folding rolls 8, 8^a, which may be arranged at right angles to the cylinder 2, and between which papers may be tucked by a blade 8^b, indicated in the drawing and operated in the usual manner. Below the folding rolls 8, 8^a, is a stacking device which may comprise a rotary fly 9^a and endless carrier 9^b which runs at right angles to the carrier 6^b. When the cutting cylinder 2^a and the rolls 3, 3^a are swung to the position shown in Fig. 2, the papers will be discharged from the rolls 3, 3^a to this third folding device, and thereby they are folded to quarter-size and delivered onto the carrier 9^b.

In operating this folder, if it is desired to have it deliver papers folded to half-size only, the hangers are swung to bring the cutting cylinder 2^a and folding rolls 3, 3^a to the position indicated in Fig. 1, in which position the sheets of paper after being severed between the cylinders 2 and 2^a are caught by pins 2^c as usual and carried around on the cylinder 2 until their centers come opposite the rolls 3, 3^a, then the paper is tucked between the rolls 3, 3^a by the action of one of the tucking blades 2^b, and the papers are discharged onto the carrier 6^b folded to half-size and are delivered as usual. If now it is desired to fold the papers to quarter-size, the hangers 4 are adjusted to the position indicated in Fig. 2, so as to move the cutting cylinder 2^a to a position below the folding cylinder 2 and move the rolls 3, 3^a to a position intermediate the folding cylinder 2 and the third-fold rolls 8, 8^a. In this position there will be a somewhat longer lead of the web from the rolls 1, 1^a to the cutting cylinder 2^a, but there will be no longer travel of the cut sheet from cylinder 2^a to the second-fold rolls 3, 3^a and the papers will be discharged from rolls 3, 3^a to the third-fold rolls or devices 8, 8^a by which the papers will be folded to quarter-size and discharged from rolls 8, 8^a onto the carrier 9^b.

When shifting the parts from the position shown in Fig. 1 to that shown in Fig. 2, or vice versa, the gear 2^h may be slipped out of mesh, so as to allow the folding cylinder 2 to turn on its axis to the extent of the swinging movement of the cylinder 2^a and second-fold rolls, so that the collecting fingers and tucking blades will not get out of time with their respective cams which turn with the hangers; after the hangers are adjusted and fastened the slip-gear can be replaced.

By the aforesaid construction and arrangement of parts, only one set of mechanisms is required to operate the folding tucking and collecting devices, and the operator merely has to remove bolts 4^m and slip-gear 2^h when making the shift from half-size to quarter-size deliveries.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a folder, the combination of a folding cylinder, a cutting cylinder, and a folding device and means for adjusting the cutting cylinder and said device circumferentially of the folding cylinder.

2. In a folder, the combination of a folding cylinder, with a cutting cylinder and a pair of fold-rolls, and means for adjusting the cutting cylinder and said rolls to different positions circumferentially of the folding cylinder.

3. In a folder, the combination of a cylinder, hangers pivoted axially thereof, a second cylinder journaled in said hangers, folding devices also mounted in said hangers, and means for swinging the hangers to adjust the cylinder and folding devices circumferentially of the first cylinder.

4. In a folder, the combination of a folding cylinder, hangers pivoted axially of the cylinder, a cutting cylinder journaled in said hangers, folding-rolls journaled in said hangers, and means for swinging the hangers to adjust the cutting cylinder and folding-rolls circumferentially of the folding cylinder.

5. In a folder, the combination of a folding cylinder, tucking blades and collecting pins therein; movable supports beside said folding cylinder; a cutting cylinder journaled in said supports, folding devices also mounted on said supports, and a pin-cam and a tucker-cam mounted on said supports, and means for adjusting the supports so as to move the parts thereon circumferentially of the folding cylinder, substantially as described.

6. In a folder, the combination of a folding cylinder, and tucking blades and collecting pins therein; hangers pivoted axially of said folding cylinder; a cutting cylinder and folding rolls journaled in said hangers, a pin-cam and a tucker-cam mounted on said hangers, and means for adjusting the hangers so as to move the parts thereon circumferentially of the folding cylinder, substantially as described.

7. In a folding mechanism, the combination of a folding cylinder; hangers pivoted axially of said cylinder at opposite ends thereof, collecting pins and tuckers in said cylinder; a tucker-cam mounted on one hanger; a pin-cam mounted on the other hanger; means for simultaneously swinging said hangers, and means for locking them in adjusted positions.

8. In a folding mechanism, the combination of a folding cylinder; hangers pivoted at opposite ends thereof, collecting pins and rotary tuckers in said cylinder; a tucker-cam and a pin-cam mounted on said hangers; and means for simultaneously adjusting said hangers; a cutting cylinder journaled in said hangers and co-acting with the folding cylinder, and a pair of folding rolls also journaled in said hangers and gearing for driving the rolls and cylinders in unison, substantially as described.

9. In a folder, the combination of a folding cylinder, a cutting cylinder, and a folding device and means for adjusting the cutting cylinder and said device circumferentially of the folding cylinder; with a folding device at one side of said folding cylinder adapted to receive papers from the first folding device when the latter is adjusted adjacent thereto, substantially as described.

10. In a folder, the combination of a folding cylinder, with a cutting cylinder and a pair of fold rolls, and means for adjusting the cutting cylinder and said rolls to different positions circumferentially of the folding cylinder; with folding devices at one side of said folding cylinder adapted to receive papers from the said folding rolls when the latter are adjusted, adjacent thereto, substantially as described.

11. In a folder, the combination of a folding cylinder, hangers pivoted axially of the cylinder, a cutting cylinder journaled in said hangers, folding-rolls also journaled in said hangers, and means for swinging the hangers to adjust the cutting cylinder and folding-rolls circumferentially of the folding cylinder; with a folding device located adjacent the folding cylinder and adapted to receive papers from the aforesaid folding rolls when the latter are adjusted to a position adjacent thereto, substantially as described.

12. In a folder, the combination of a folding cylinder, and tucking blades and collecting pins therein; hangers pivoted axially of said folding cylinder; a cutting cylinder and folding rolls journaled in said hangers, a pin-cam and a tucker-cam mounted on said hangers, and means for adjusting the hangers so as to move the parts thereon circumferentially of the folding cylinder; with a set of third-fold devices located at one side of the cylinder and adapted to receive papers from the said folding rolls when the latter are adjusted to one position, and fold the papers to quarter-size, substantially as described.

13. In a folding mechanism, the combination of first-fold rolls, a folding cylinder adjacent thereto, a set of third-fold rolls adjacent the folding cylinder; hangers beside said folding cylinder, a cutting cylinder and a pair of second-fold rolls journaled in said hangers, gearing for driving the rolls, collecting pins in the folding-cylinder, a pin-cam on the hangers, tuckers in said folding cylinder, and a tucker-cam on the hangers; with means for adjusting said hangers so that said second-fold rolls will in one position deliver papers folded to half-size to a suitable receiver, and when in another position will deliver the papers to the third-fold rolls.

14. In a folding mechanism, the combination of a former, a pair of first-fold rolls at its apex, a folding cylinder adjacent thereto, a set of third-fold rolls adjacent the folding cylinder; hangers pivoted axially of said folding cylinder, a cutting cylinder journaled in said hangers; a pair of second-fold rolls also journaled in said hangers, gearing for driving the rolls, collecting pins in the folding cylinder, a pin-cam on one of the hangers, tuckers in said folding cylinder, and a tucker-cam on one of the hangers; means for adjusting said hangers in one position so that said second-fold rolls will deliver papers folded to half-size to a suitable receiver, and in another position will deliver the papers to the third-fold rolls to be folded to quarter-size.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

HENRY F. BECHMAN.

Witnesses:
CHAS. G. MECHEM,
F. W. DUNNING.