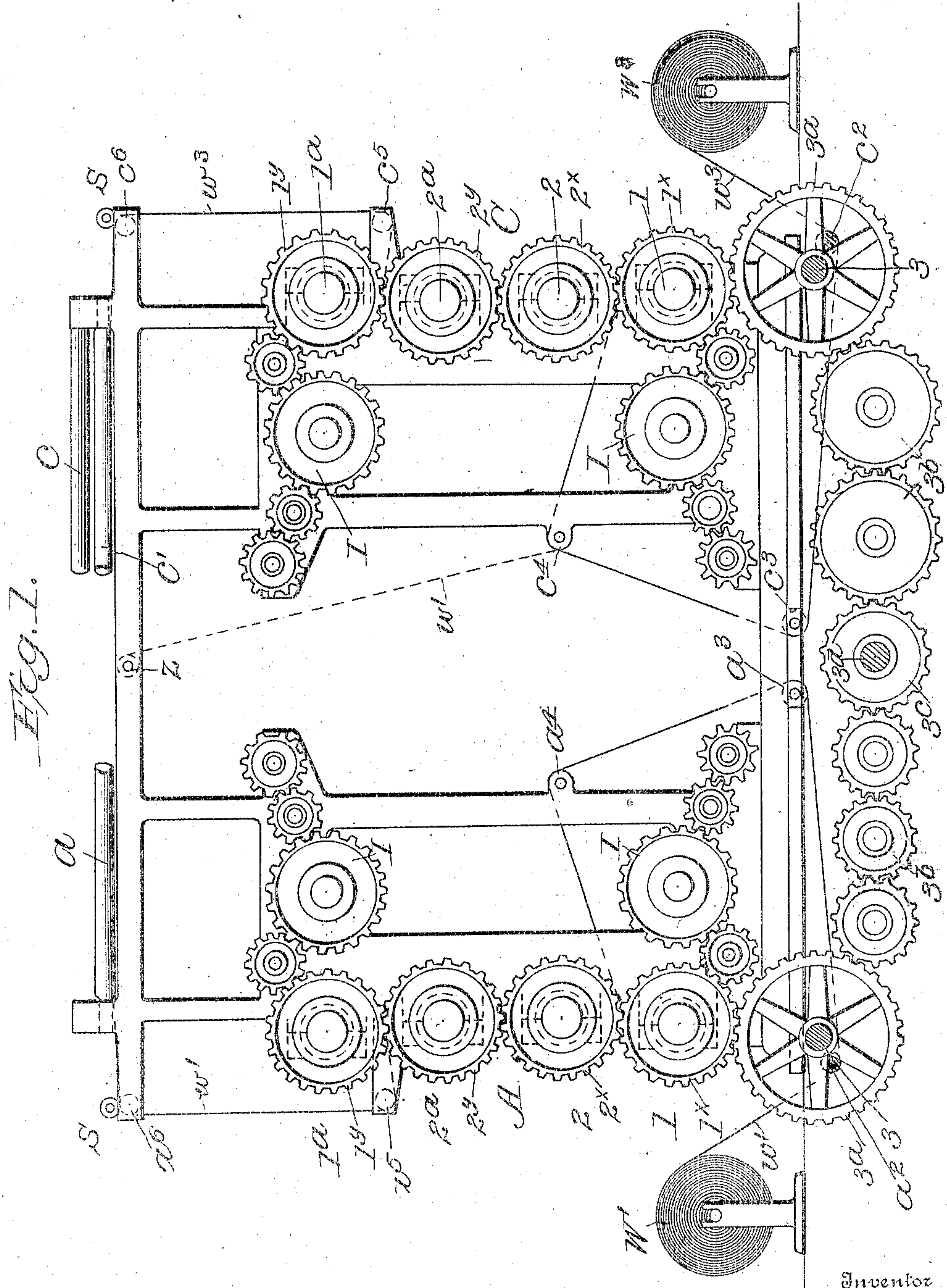


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H. F. BECHMAN.
 ROTARY PRINTING PRESS.
 APPLICATION FILED AUG. 28, 1906.

Patented July 13, 1909.

3 SHEETS—SHEET 1



Inventor

Henry F. Bechman

Witnesses

C. H. Walker
James B. Mansfield

By

Alexander F. Lowell
 Attorneys

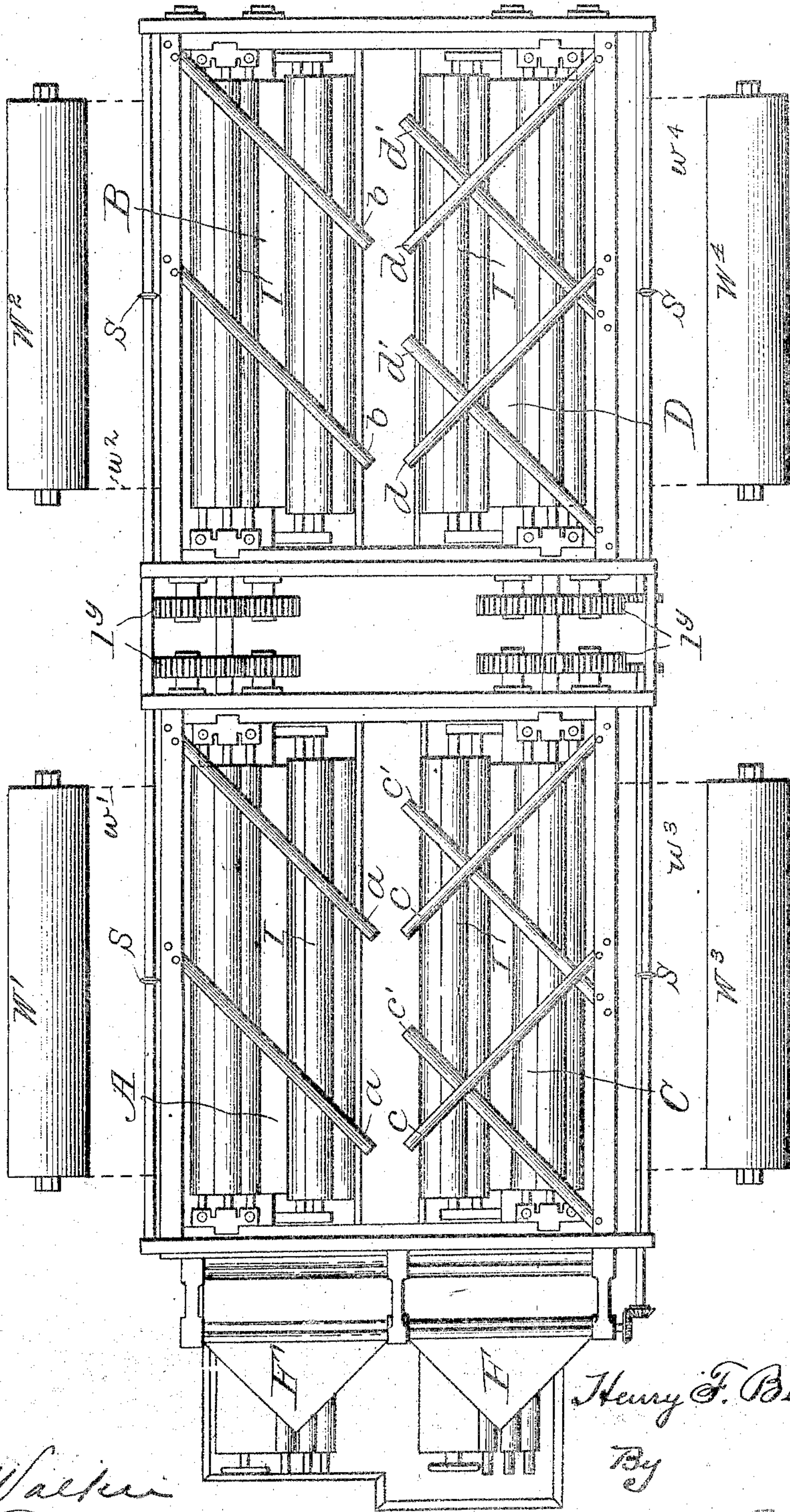
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Fig. 2.



Witnesses

C. H. Walker
James Bransford

Inventor
Henry F. Bechman

By

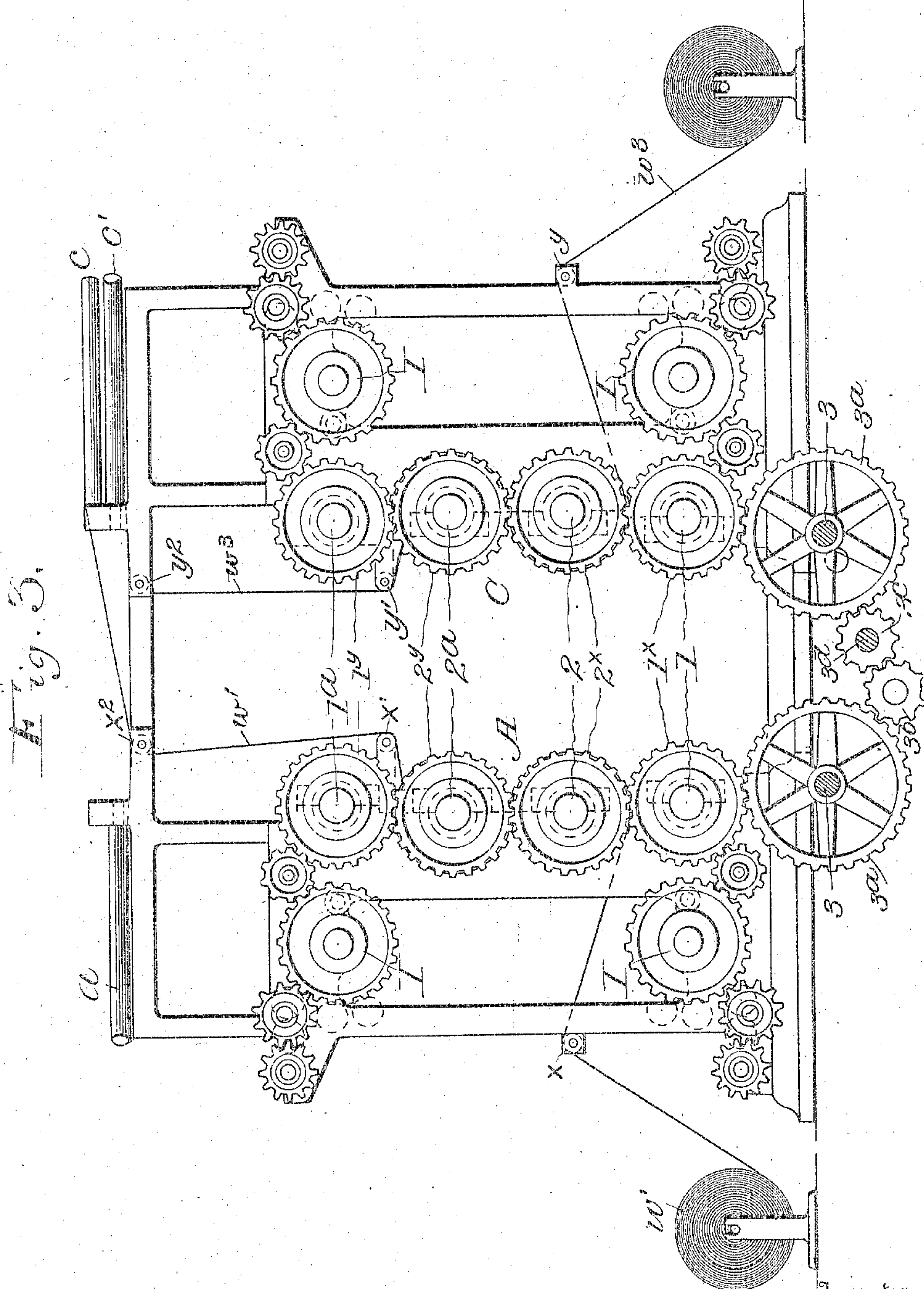
Alfred S. Foulk Attorneys

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3 SHEETS—SHEET 3.



Inventor

Henry F. Bechman

Witnesses

C. H. Walker

James H. Mansfield

By

Alexander F. Towell

Attorneys

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.

ROTARY PRINTING-PRESS.

No. 927,931.

Specification of Letters Patent.

Patented July 13, 1909.

Application filed August 23, 1906. Serial No. 332,375

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 Rotary 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 rotary presses employing stereotype-plates to print upon webs of paper, and is an improvement upon the press shown in my Patent No. 814,510 issued March 6, 1906.

The objects of the present invention are to make all the cylinders in the press easily accessible from the side of the press and from the floor so that the pressmen will not have to go into any dangerous or awkward places in the machine in order to attach the plates to, or detach them from, the cylinders; or in adjusting or examining the different parts of the machine during its operation, or in making ready.

Another object is to make a press of very large capacity, so compact that it will require very little floor space as compared with other presses of like capacity, and will be very low down, so that it can be erected in a small room, and practically every part of the press can be reached by the operator while standing upon the floor.

The press as shown has four sets of perfecting mechanisms,—two sets of such mechanisms being arranged at each side of the press and extending longitudinally of the press frames and end to end, and the cylinders in each perfecting mechanism being arranged in a vertical plane so that they can all be reached by the operator from one position on the floor.

The press is provided with guides for directing the webs therethrough and with angle bars so arranged that the web printed upon any of the perfecting mechanisms can be directed to the folding mechanism, which is preferably located at one end of the press; and the webs printed upon any two of the perfecting mechanisms can all be directed to the same folder.

The plate cylinders in the press may be of any desired size and length. Assuming that they are of the ordinary size adapted to carry two sets of four plates, or eight plates

each; each perfecting mechanism can produce sixteen full pages,—and as there are four sets of such perfecting mechanisms shown in this press, the total capacity of the press would be sixty-four pages. Any less number of pages can be produced, in multiples of four, by this machine.

I will now describe the invention in connection with the accompanying drawings, and refer to the claims for summaries of the novel features of construction, and combinations of parts for which protection is desired.

In the drawings—Figure 1 is an end elevation of the complete machine. Fig. 2 is a top plan view thereof. Fig. 3 is an end elevation of a slightly modified construction.

There are four sets of perfecting mechanisms A, B, C, D, in the press shown in the drawings. The mechanisms A, B, and C, D, are arranged in longitudinal alignment; and the mechanisms A,—C, B,—D, are in parallel, side by side in the press. Each perfecting mechanism comprises two plate cylinders 1, 1^a and intermediate coacting impression cylinders 2, 2^a. The plate cylinders being located at top and bottom, and the impression cylinders intermediate the plate cylinders; all said cylinders being parallel, and all in substantially the same vertical plane, so that each of the cylinders can be reached by the operator while standing in one position upon the floor.

In the preferred form of press, shown in Fig. 1, the cylinders in the sets of perfecting mechanisms are arranged at the outermost sides of the press and can be reached by an operator standing upon the floor beside the press; the topmost cylinders 1^a being only about five feet from the floor. The cylinders are inter-geared as shown in Fig. 1 by gears 1^x, 2^x, 2^y, 1^y, so as to be driven synchronously and the gears 1^x on lower cylinders 1, are driven by gears 3^a on counter shafts 3, which may be driven by trains of gears 3^b from a gear 3^c on the main driving shafts 3^d, as illustrated in Fig. 1 of the drawings. Any other preferred mechanism for driving the cylinders in the several perfecting mechanisms in unison may be employed. The several cylinders must be kept in time in order that their products may be properly assembled at the folder F. Each perfecting cylinder 1 and 1^a is provided with suitable inking mechanism as indicated at I in the drawings, preferably constructed as shown

in my Patent No. 823,098 dated June 12, 1906, and need not be described in detail herein. It will be observed that the inking mechanisms are readily accessible without the operator having to endanger himself in adjusting them during the operation of the machine.

Above each printing mechanism A, B, C, D, is arranged a set of angle bars a , b , c , d , respectively, and above the printing mechanisms C, D, are arranged additional oppositely inclined sets of angle bars c' , and d' , respectively. The printed webs are adapted to be turned over these bars and directed to the folder F, which is shown, in Fig. 2, as located at the end of the machine adjacent the perfecting mechanism C, but may be located at any other desired point; and if desired, additional folders might be employed.

As shown in Fig. 1, the web w' is led in from a roll under guides a^2 , a^3 and over guide a^4 ; thence between cylinders 1, 2, and 2^a , 1^a (in mechanism A); out over a guide a^5 , up over a guide a^6 , and thence can be carried across the machine to the angle bars c' , whereby it is given a quarter turn and led to the folder F. The web being slitted as it passes over roll a^6 (or at any other convenient point) by means of a slitter S, so that each half of the web w' is turned over on angle bar c' and both halves are assembled together at the folder. Similarly a web w^2 may be led in over guide rollers corresponding to those for web w' , and after being printed (in mechanism B) and slit can be passed over the angle bars d' , and given a quarter turn and led directly forward to the folder F, and assembled there with the web w' . This would produce a thirty-two page paper. A third web w^3 can be led in under and over guides c^2 , c^3 , c^4 , to and through the perfecting mechanism C, and the printed web passed thence over guides c^5 , c^6 , being slitted at guide c^6 (or previously) and the halves of web w^3 are then given a quarter turn over angle bars c , and carried to the folder F, where they can be assembled together with the webs w^1 , w^2 , thus producing a twenty-four page straight run paper.

A web w^4 can be led in over guides corresponding to the guides c^2 , c^3 , c^4 , c^5 , c^6 , through the perfecting mechanism D, and after being slit can be turned over angle bars d , and carried forward to the folder F; and assembled there with the other webs, thus producing a thirty-two page paper, assuming that each perfecting mechanism is printing but eight pages, and not printing its full capacity. Any one or more of the perfecting mechanisms A, B, C, D, can be cut out of action.

The web w^2 , could if desired, be turned over angle bars b , thence to and over angle

bars a , thence to and over angle bars c' , and thence to the former F; and the web w' could be carried from roller a^6 to and over roller c^6 then back to and over angle bars c , thence to the folder; in fact with the arrangement of angle bars and rollers shown in the drawings, the webs can be directed to the folder in a variety of ways, and it is possible to print one full width web on one section, and a narrow width web on another section and assemble all at the folder. And I am able to produce any desired number of pages in multiples of two, up to thirty-two pages.

In the construction shown in Fig. 3, the inking mechanisms are arranged at the outer side of the press and the perfecting mechanisms are thus brought closer together, and the operator has access thereto by going in, or down the central alley-way of the press. In this arrangement a less number of web guides is required and the web can be led from roller w' up over a guide x , then between the perfecting cylinders, then over guides x' , x^2 , to the angle bars c , which in this case are supported from their inner ends instead of from their outer ends, as in Fig. 1. Similarly web w^3 could be led in over guide y , then through perfecting mechanism C, then under and over guides y' , y^2 , to angle bars c' , and thence to the folder. The arrangement shown in Fig. 3 is a substantially obvious modification of the construction shown in Fig. 1, and further detailed explanation thereof is unnecessary.

The press could be used for multi-color work by providing the auxiliary guide rollers z , as indicated in Fig. 1, so that the web w' for example, after being perfected in one color by mechanism A, can be directed from roller a^6 to and over guide z , thence down to and under guide c^4 , and then passed through the perfecting mechanism C, where it can receive multi-color impressions and then pass on to the folder F, like web w^3 . The press can also be threaded in other ways so as to produce multi-color work on one or more webs,—and I do not restrict the invention to one-color printing. The plate and impression cylinders might obviously be transposed if desired.

If each perfecting mechanism was threaded with a full width web, and each mechanism printed sixteen pages at each operation of the press, it is obvious that sixty-four page papers could be produced at each operation of the press, by folding and assembling the webs. It might be found difficult or impracticable to fold more than a thirty-two page paper in one folder, and therefore if desired the press could be provided with an additional folder and collecting mechanism, or folder as indicated at F¹, so that when printing a sixty-four page paper, two webs can be assembled and folded at each folder.

F and F¹, and then the folded papers assembled; moreover by providing the press with a plurality of folders as at F, F¹, it can produce simultaneously two equal or different sized papers, up to its full capacity.

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

1. In a rotary printing press the combination of two adjacent series of web perfecting mechanisms each series comprising a plurality of perfecting mechanisms arranged end to end, each perfecting mechanism comprising plate and impression cylinders arranged in substantially the same vertical plane, the two series of perfecting mechanisms being parallel and all the cylinders extending longitudinally of the press; a folder at the end of the press, a set of angle-bars above each perfecting mechanism for directing the web printed therein to the folder, and oppositely disposed angle bars above the first angle bars for also directing a web printed in an adjacent perfecting mechanism to said folder.

2. In a rotary web perfecting printing

press the combination of two adjacent series of web printing mechanisms, each series comprising a plurality of perfecting mechanisms arranged closely adjacent and end to end; each perfecting mechanism comprising plate and impression cylinders arranged in substantially the same vertical plane, the two series of perfecting mechanisms being parallel and the several cylinders being arranged at the outer sides of the press, and all extending longitudinally of the press; with a folding mechanism at one end of the press; angle bars above each perfecting mechanism for directing the web printed thereon to the folder, a second set of angle bars above the first set for directing webs printed on adjacent perfecting mechanism to the folder, and means for operating all of said perfecting mechanisms synchronously.

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

HENRY F. BECHMAN.

Witnesses:

F. W. DUNNING,
CHAS. A. GRAMES.