

No. 894,574.

PATENTED JULY 28, 1908.

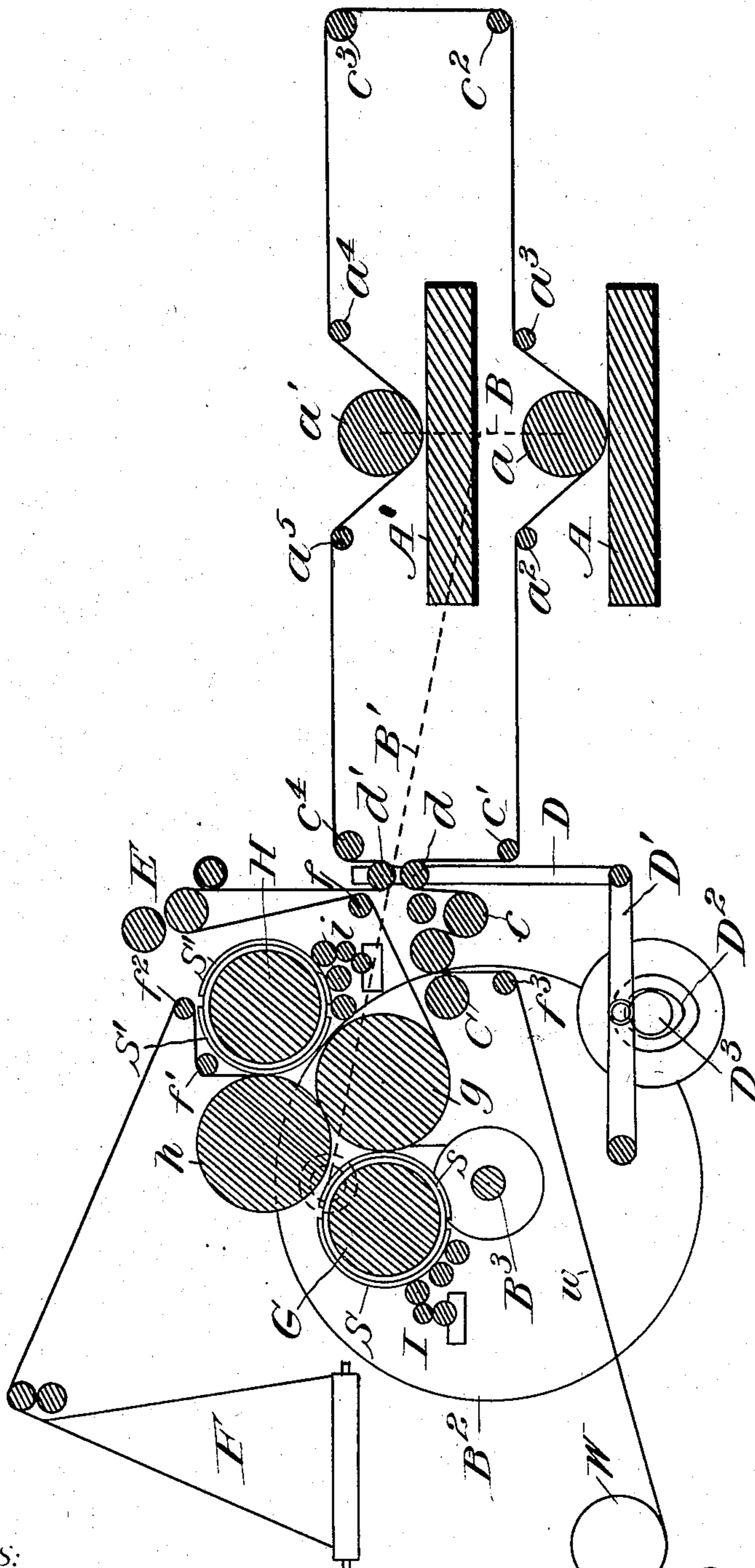
H. F. BECHMAN.

COMBINED FLAT BED AND ROTARY PRESS.

APPLICATION FILED FEB. 21, 1906.

3 SHEETS--SHEET 1.

2024



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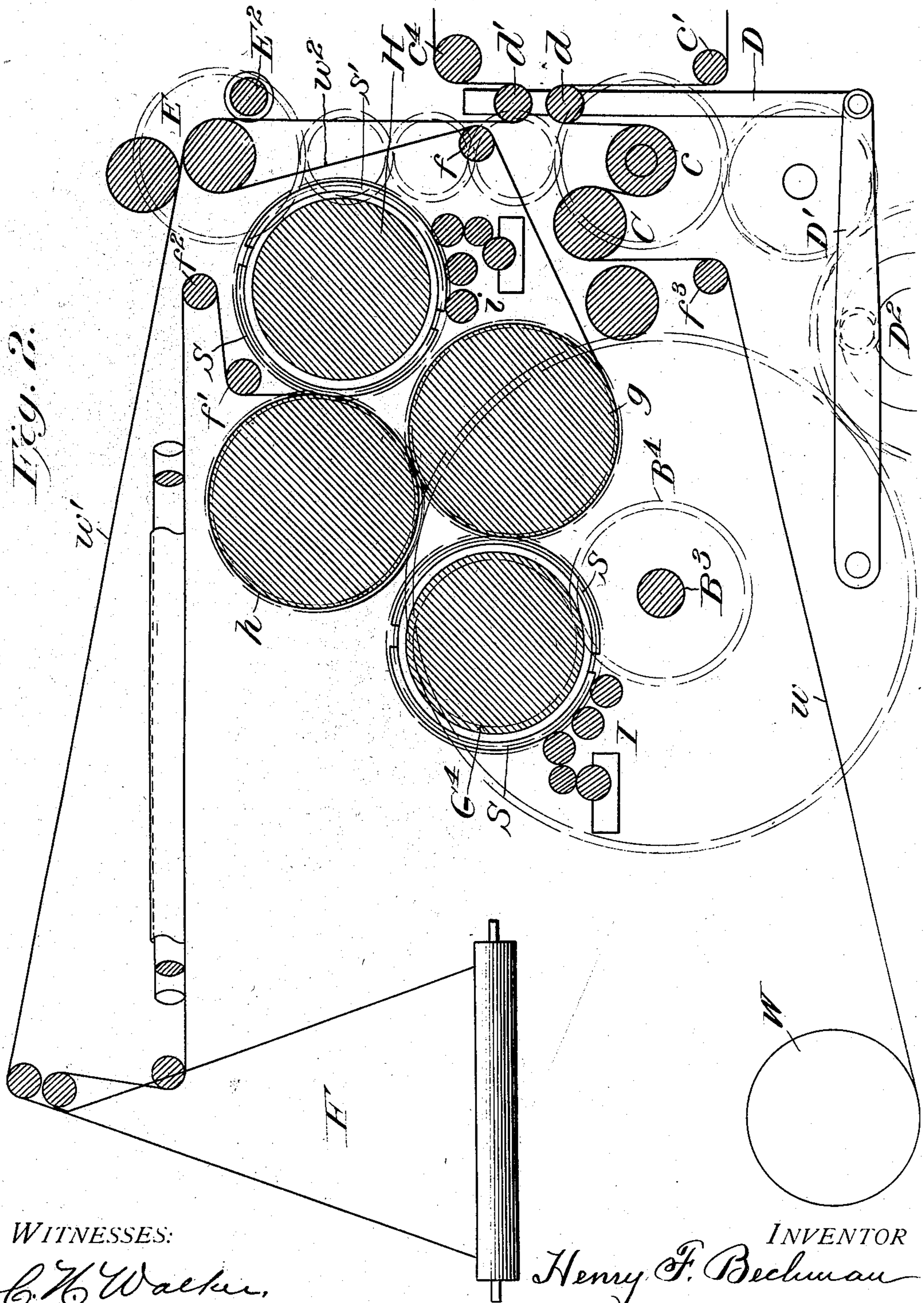
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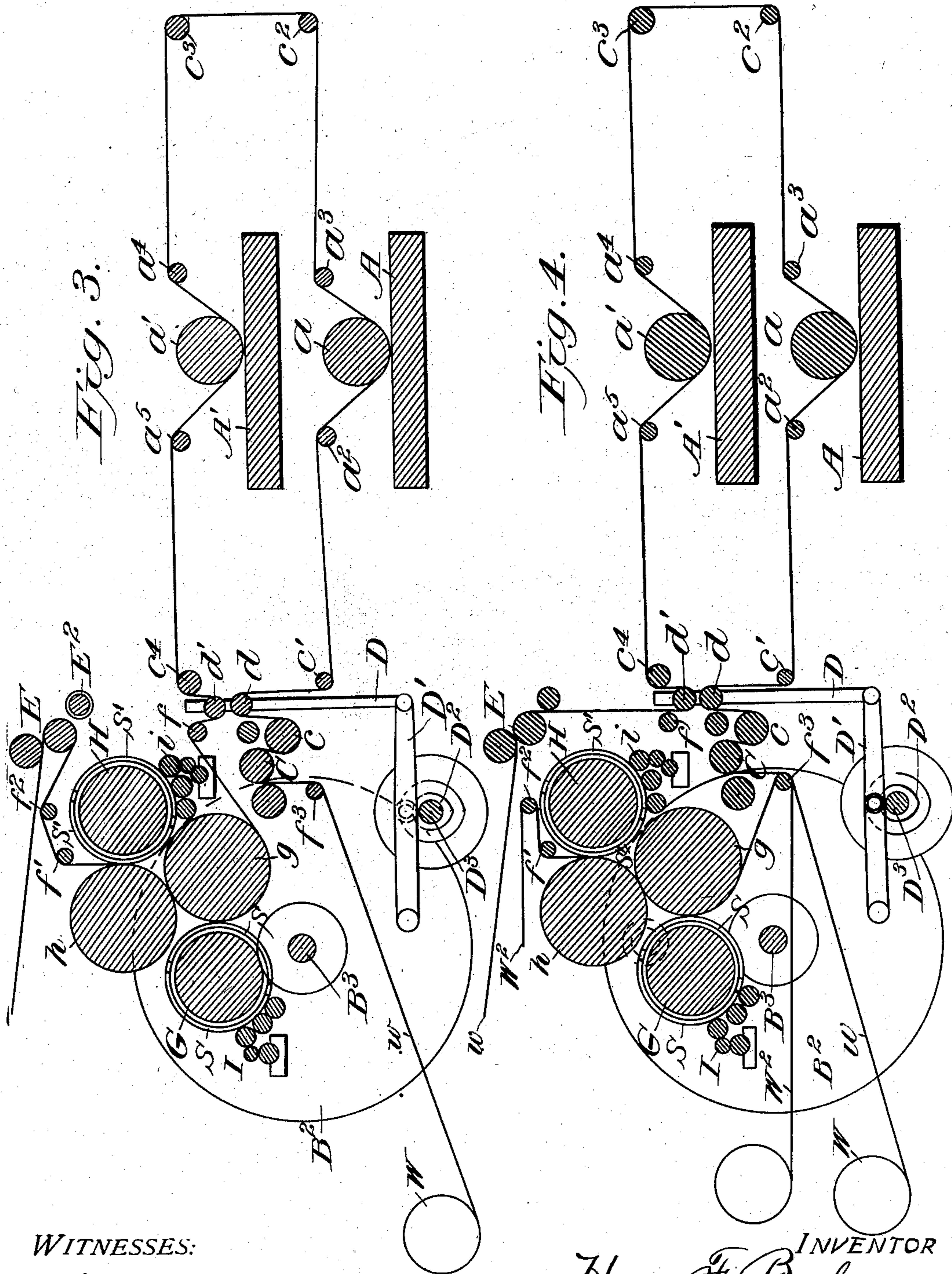
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UNITED STATES PATENT OFFICE.

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

COMBINED FLAT-BED AND ROTARY PRESS.

No. 894,574.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed February 21, 1905. Serial No. 246,738.

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 a Combined Flat-Bed and Rotary Press; 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 printing machinery, and its object is to provide a combined bed-and-cylinder-press with a rotary-cylinder-press in such manner that they may be used conjunctively to produce large size papers or smaller multi-colored papers.

In particular the invention is an improved rotary press attachment to the well-known duplex flat-bed-web-perfecting-printing-press, the rotary press being arranged within the frames of the flat-bed press and driven from the power shaft of such press and in such time with the other mechanisms of the flat-bed press that a web for a newspaper of eight pages or less can be first printed on the ordinary duplex press and immediately thereafter printed in colors upon the rotary press before its delivery. Again eight pages or less can be printed on one web by the duplex press and simultaneously eight pages or less printed on another web by the rotary press, and the products of the two presses assembled in the usual folder of the duplex press. Again the rotary press may be used to print eight pages or less from stereotype plates while the type forms are being made up for the flat-bed press.

Other practical utilities of the combined presses will be hereinafter explained, and I will now describe the invention as illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatical sectional elevation of a duplex combined flat-bed and cylinder-web-perfecting-press and a rotary cylinder-perfecting-press operating on the same web. Fig. 2 is an enlarged diagrammatical view of the rotary cylinder-press and web-looping and guiding-devices. Fig. 3 is a similar view showing how one web may be perfected in black and part of the same web printed in color on the machine. Fig. 4 is another diagram illustrating how two webs may be printed and assembled in such a press.

A, A', designate type-beds, with which

co-act reciprocating cylinders a, a' , which are journaled in a common cross-head B, reciprocated by means of pitmen B' from crank-wheels B² on a shaft B³, as in the ordinary duplex press. The web w is led in from the roll W through continuously feeding rolls C, and then under guide roller c , which may be one of the feed-rolls up over looping-roller d , down under guide c' , forward over guide a^2 between cylinder a and bed A, up over another guide a^3 , back to guide c^2 , up over guide c^3 , back over guide a^4 , then between bed A' and cylinder a' , up over guide a^5 to guide c^4 , down under looping-roller d' , and then it may be carried direct to the feeding-out rolls E, and pass on to the folder F. All the aforesaid parts are constructed and operated as in the well-known duplex press, the guides c, c', c^2, c^3 and c^4 being stationary guides, while the guides a^2, a^3, a^4 and a^5 travel with the cylinders. The feed rolls C and the delivery rolls E are driven at uniform speed and feed the web w constantly toward and from the printing mechanism. The rollers d, d' , however, are mounted upon reciprocating bars D attached to levers D', which are oscillated by means of cams D², attached to a cross-shaft D³ and geared to the crank-wheels B², as indicated in the drawings. The aforesaid parts are all constructed and operated as in the ordinary duplex press, and substantially as shown and described in the patents to Cox, No. 478,503, of July 5, 1892, and No. 501,456, of July 11, 1893.

Located in the frame of the press between the folding mechanism and the feeding and delivery rolls C and E, is a rotary press or attachment, comprising two plate-cylinders G and H and their co-acting impression-cylinders g, h . These cylinders are arranged transversely of the press and may be driven by any suitable gearing from the shaft B³ on which the crank-wheels B² are keyed. As shown a gear B⁴ on said shaft meshes with a gear G⁴ on cylinder G. The cylinders G, H, g, h , are intergeared as usual so as to have a peripheral movement exactly corresponding with that of the rolls C and E.

Sets of inking mechanism, indicated at I and i , are provided for the plate-cylinders G and H respectively, but as the particular means for inking these cylinders is well known, I have simply conventionally illustrated the same in the drawings.

In the duplex press in order to shorten the

travel of the cylinders a, a , operating on the type-beds A, A' , the type-forms are arranged in one line, side by side upon said beds and transversely of the press, and a sufficiently wide web is used to enable the desired size of paper to be produced. Therefore, in order to enable registering impressions to be made from the plates on cylinders G and H , upon the same web that is printed by the bed and cylinder mechanism, it is necessary to employ duplicate forms or plates on said cylinders G and H .

As it is impractical to make plates to entirely surround the surface of the cylinders G and H , the cylinders are made of such diameter that two duplicate sets of forms or plates may be attached to each cylinder at diametrical y opposite sides thereof, as indicated in the drawings; the plates S, S , on the cylinder G are duplicates, and the alternate impressions produced thereby will register with successive impressions produced by the bed-and-cylinder mechanism. The same is true of the forms S', S' , on the plate-cylinder H .

The combined presses may be used to print eight or less pages in colors on a single web, and when so used the press is threaded as shown in Fig. 1. In this case, after the web has been printed and perfected on the beds A, A' , and passed to the delivery E , it is led back to a guide f then to and between impression cylinder g and plate-cylinder G ; then between impression cylinder h and cylinder H ; then over guides f' and f'' , and thence to the folder F , as indicated in the drawings. In this manner any number of pages up to eight may be printed and perfected in colors, and, obviously, in the same manner, eight pages could be perfected in black, and any desired number of such pages additionally printed in color. When less than the entire number of pages are to be printed in color, however, the entire web may be perfected on the beds, and then it may be divided at the rolls E by a slit E^2 , as shown in Fig. 2, and one-half w' of the web may be led from the rolls E directly to the folder F and the other half web w'' may be led around the guide f , between the cylinders G, g and H, h to guide f' , and thence over guide f'' to the former F , being there assembled with the other part w' of the web.

As indicated in Fig. 3 the web, instead of passing from roller d' directly to the rolls E , may be passed over guide f , through the rotary press to and over rollers f', f'' , then back to the delivery rolls E , and thence to the folder. In this way the web is acted upon by both the bed-and-cylinder-press and the rotary-cylinder-press in its passage between the feed rolls and the delivery rolls.

As indicated in Fig. 4 a web W may be printed and perfected on the bed-and-cylinder press, and carried direct from the rolls E

to the folder F , and another web W^2 may be led under a guide f^3 , then between the cylinders G, g, H, h , and over guides f', f'' to the folder. In this way two independent webs are simultaneously printed one on the bed and cylinder press and one on the rotary press, and are assembled at the folder.

In order to use the cylinder press stereotype plates are necessary, but where newspapers of large size are to be printed, the advertising and general matter can be made up in plate form and attached to the cylinders, while the telegraphic latest news items can be placed in the type-forms for the bed-and-cylinder press.

In the arrangement shown in Fig. 4, where two webs are printed, the press can produce papers of from six to sixteen pages varying by twos. Suitable mechanisms may be provided whereby the cylinder press and the bed-and-cylinder press can be disconnected if desired as by making gear B^4 slidable on shaft B^3 so that one may be operated without necessarily having to operate the other, and its capability for producing different varieties of work correspondingly increased.

While I have illustrated and described the invention as applied to a "duplex press" having two flat beds and reciprocating cylinders arranged in parallel planes, I do not consider my invention restricted to such arrangement of beds, nor to the particular number of beds shown, as it would be equally useful in connection with flat bed presses of less or more capacity than that indicated in the drawings. And further, I do not consider my invention restricted to the employment of a flat bed press in which the forms are necessarily arranged side by side in a single line, which necessitates the employment of duplicate sets of plates on the rotary-cylinders, as if the stroke of the reciprocating cylinders be sufficiently increased, as is well known, two or more rows of forms can be placed on the beds A and A' , so that the opposite forms on the plate cylinders G and H would not have to be duplicates, and would respectively register with the first and second rows of impressions produced from the first and second rows of forms on the beds.

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

1. In a printing press, the combination of a stationary bed and a reciprocating cylinder, a rotary plate-cylinder and co-acting impression cylinder, means for continuously feeding the web to and delivering it from the bed-and-cylinder, means for converting the continuous movement of the web into an intermittent movement thereof through the bed-and-cylinder printing mechanism, means for directing the web to and through the rotary printing mechanism, and means for operating the rotary printing mechanism in

unison with the bed and cylinder mechanism, substantially as described.

2. In a printing press, the combination of a plurality of printing mechanisms each comprising a stationary bed and a reciprocating cylinder, a plurality of rotary printing mechanisms, each comprising a plate-cylinder and co-acting impression cylinder; means for continuously feeding the web to and delivering
10 it from the bed and cylinder printing mechanisms; means for converting the continuous movement of the web into an intermittent movement thereof through the bed and cyl-

inder printing mechanisms; means for directing a web to and through the rotary printing mechanisms, and means for operating the rotary mechanisms in unison with the bed and cylinder mechanisms, substantially as described. 15

In testimony that I claim the foregoing as
my own, I affix my signature in presence of
two witnesses. 20

HENRY F. BECHMAN.

In presence of—

GUY H. FENN,

CHARLES A. GRAMES.