

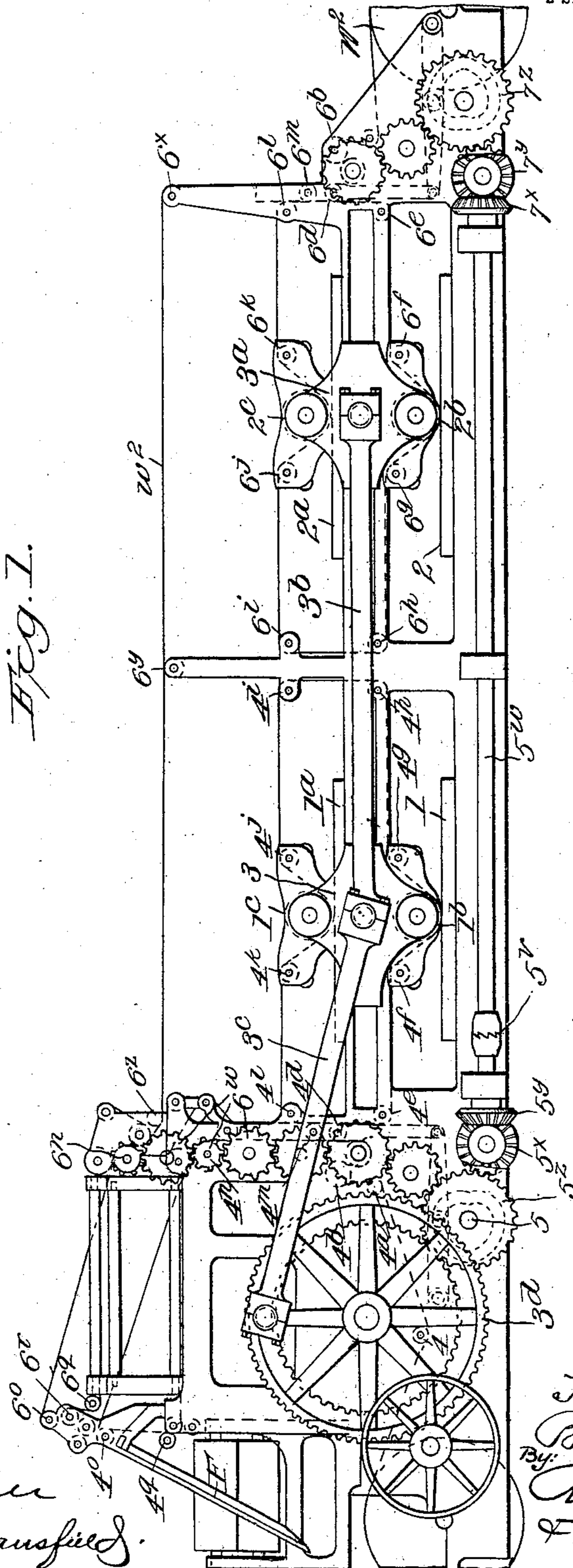
No. 856,126.

PATENTED JUNE 4, 1907.

H. F. BECHMAN.
PRINTING PRESS.

APPLICATION FILED AUG. 27, 1906.

2 SHEETS—SHEET 1.



Witnesses
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2 SHEETS—SHEET 2.

Fig. 2.

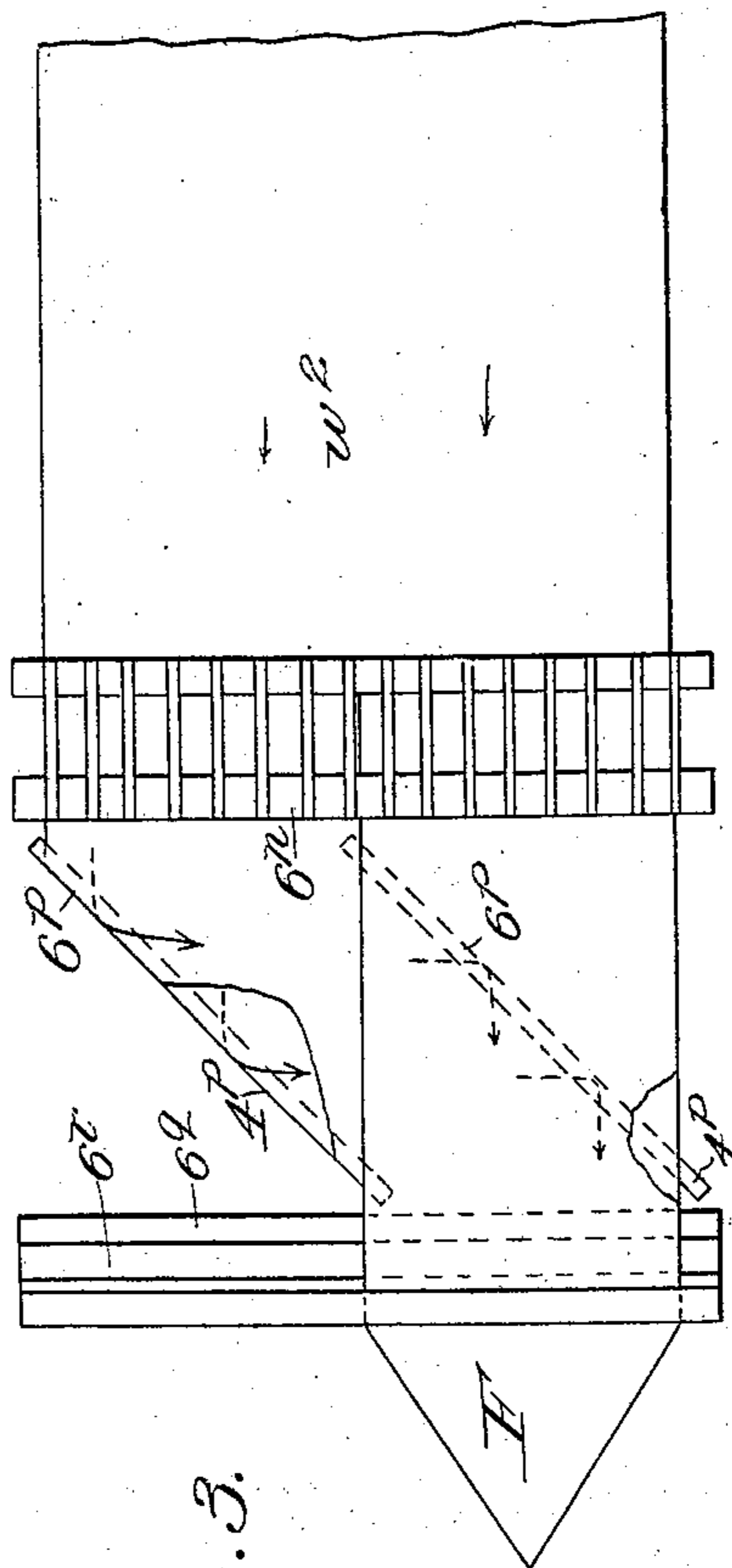
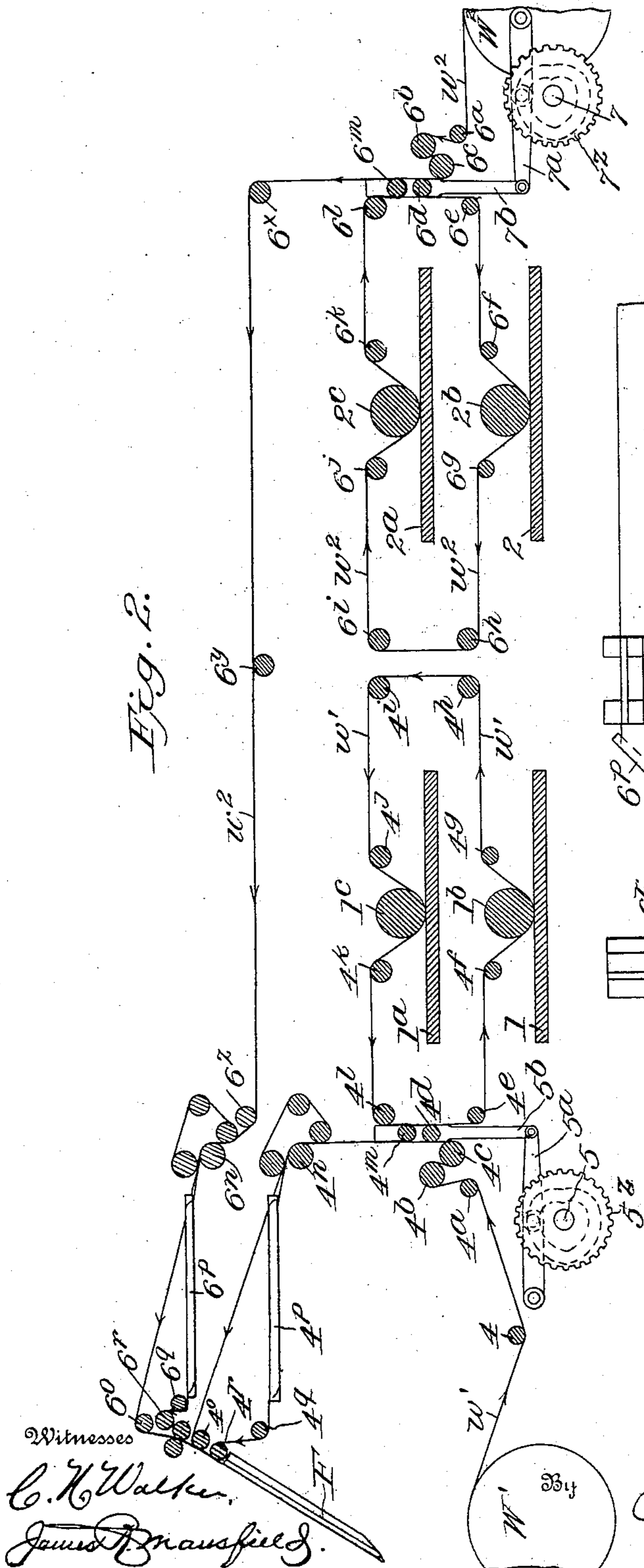


Fig. 3.

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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.

PRINTING-PRESS.

No. 856,126.

Specification of Letters Patent.

Patented June 4, 1907.

Application filed August 27, 1906. Serial No. 332,169.

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 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 flat bed web printing presses of the "duplex" type, disclosed in the patent to Joseph L. Cox, No. 478,503, of July 5, 1892, and the object of the present invention is to increase the capacity of such presses, and enable them to produce as many as sixteen newspaper pages at each operation.

The press contains four beds and four reciprocating impression cylinders and is so arranged that any even number of pages may be printed in this machine from two to sixteen. In this machine I employ two sets of equalizers or web-looping devices to handle the respective webs and two sets of feeding and delivery mechanisms. The feeding mechanisms are located at the opposite ends of the press adjacent to the rolls of paper, while the delivery mechanisms are both located near one end of the press and adjacent to the folding mechanism. All the mechanisms are operated from one prime driving shaft and in unison, but two of the beds and cylinders and their co-acting devices may be put out of operation when it is desired to print only eight pages or less.

The invention will be further explained in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a complete 16-page duplex press; Fig. 2 is a diagrammatical longitudinal section through such press, showing the web printing, feeding, looping and delivering mechanisms; Fig. 3 is a detail plan view of the delivery end of such press.

The press comprises four type beds 1, 1^a, 2, 2^a, type beds 1, 2, being preferably in one plane, and type beds 1^a, 2^a, in one plane, but above and parallel with the beds 1 and 2. With the beds co-act reciprocating impression cylinders 1^b, 1^c and 2^b, 2^c; the cylinders 1^b, 1^c, being mounted in cross-heads 3, slidably journaled upon the side frames of the press substantially as in the well known du-

plex machine, while the cylinders 2^b, 2^c are journaled in similar cross-heads 3^a mounted on the side frames of the press, in line with the cross-heads 3 and connected with the latter by rods 3^b, so that all the cylinders can be reciprocated simultaneously over their respective beds. The cross-heads 3 are connected by pitman rods 3^c to crank gears 3^d, which are constructed substantially as in the duplex press, and when rotated impart reciprocatory movements to the cross-heads 3, 3^a and the cylinders journaled therein. The beds 1, 1^a are adapted to print one web, and the beds 2, 2^a are adapted to print another, when producing sixteen pages in one color.

The web *w*, (which is printed on beds 1, 1^a by cylinders 1^b, 1^c), is led in from roll *W* under guides 4 and 4^a to the feeding-in rolls 4^b, 4^c, and thence passes over looping roller 4^d, down under fixed guide 4^e to a guide 4^f, (traveling with the cylinder 1^b), then between bed 1 and cylinder 1^b, up over a guide 4^g, (traveling with the cylinder 1^b); thence under and over stationary guides 4^h and 4ⁱ; back over a guide 4^j (traveling with cylinder 1^c) then between cylinder 1^c and bed 1^a, up over a guide 4^k (traveling with the cylinder 1^c),—thence to guide 4^l, down under looping roller 4^m, up to delivery rolls 4ⁿ, where the web is divided, one half of the web passing direct to roller 4^o at the head of a folder former *F*, while the other half of the web is turned over deflectors 4^p, and then led over guides 4^q and 4^r to the former *F*, where it is assembled with the other half of the web.

The parts thus described are constructed to operate substantially as in the Cox patent, and the duplex press above referred to; the feeding rolls 4^b and 4^c being operated by gearing from the shaft 5, which operates a lever 5^a carrying the frame 5^b, upon which the looping rollers 4^d and 4^m are mounted; and the delivery rollers 4ⁿ are driven in the same time as the feed rollers 4^b, 4^c by suitable gearing from the main shaft, as in the well known duplex press. The second web *w*² is led in from roll *W*² (at the end of the press opposite roll *W*)—under a guide 6^a to the feeding rollers 6^b, 6^c, up over looping roller 6^d, down to guide 6^e, over guide 6^f (traveling with cylinder 2^b), thence between cylinder 2^b and bed 2; and up over guide 6^g, (traveling with cylinder 2^b), thence over guides 6^h and 6ⁱ to guide 6^j (traveling with

cylinder 2^c), then down between cylinder 2^c and bed 2^a, and up over a guide 6^k, (traveling with cylinder 2^c), then back to guide 6^j, down under looping roller 6^m, then over guides 5 6^x, 6^y and 6^z, to delivery roller 6ⁿ,—which is above the delivery 4ⁿ,—at which point the web *w*² is slitted and one half of said web passes to the folder over roller 6^o, and the other half is turned over the angle bars 6^p,—10 (similar to the angle bars 4^p), and led thence under a roller 6^q, and up over roller 6^r to the former F, being assembled at the former with the web *w*¹.

The feeding rollers 6^b, 6^c are driven by 15 gearing from the shaft 7, which corresponds to shaft 5 and carries a cam which actuates a lever 7^a operating the frames 7^b upon which the looping rollers 6^d and 6^m are mounted, these parts being practically the same as the 20 similar parts for operating the web *w*¹,—and the shaft 7 is driven from the shaft 5 by means of bevel gearing and shafting, as indicated in Fig. 1 of the drawings at 5^z 5^x, 5^y and 7^x, 7^y, 7^z or in any other suitable manner.

25 The shaft 5^w which transmits motion from the gears 5^x to gears 7^y may be formed in two sections connected by a coupling member 5^v, of any suitable construction, so that the right-hand feeding and looping mechanisms can be put out of operation when de- 30 sired, by slipping said clutch out of engagement with one section.

The delivery mechanism 6ⁿ may be driven at the same speed as the delivery mechanisms 4ⁿ by intergearing them, as indicated in 35 Fig. 1 of the drawings at 6^w, or in any other suitable manner, the essential point being that the feeding and delivery mechanisms for both sections of the press must operate at the 40 same time and to the same extent, so that both webs will be delivered to the former in proper time and position.

Each section (beds 1, 1^a or 2, 2^a) of the press is adapted to print eight pages, using a 45 full width web. If it is desired to print less than 16 pages,—which is the full capacity of the press,—a narrow width web may be printed on one section and wide web on the other, so that a ten, twelve or fourteen page 50 paper can be produced. When eight pages or less are to be printed in one color, the right-hand section may if desired be put out of operation by disconnecting the clutch 5^v and disconnecting the connecting rod 3^b 55 from the cross head 3. The described press may also be used for multi-color work, that is to say, one web can be perfected in one color and additionally printed or perfected in multi-colors also. For example, the web 60 *w*¹ after being printed on one side from bed 1, can be led across to and between bed 2 and cylinder 2^b and printed in color thereon on the same side; then led over guides 6^e and 6^f, back between cylinder 2^c and bed 2^a, to 65 receive a perfecting impression in color, if de-

sired; and then passed between bed 1^a and cylinder 1^c, where it receives another perfecting impression in another color, and then passed on over roller 4^l to the delivery, as indicated in the drawings. Similarly the web 70 *w*² could be led through both sets of printing devices. If desired, in printing multi-color, the web *w*¹ could be led through both looping mechanisms, but I consider this unnecessary. A web could also be perfected in one color, 75 and have a colored impression applied on one side only by passing it between but three of the four sets of beds and cylinders; furthermore the one web could be led through the machine so as to be printed on one lower bed, 80 say 1, and perfected on the bed 2^a without receiving any color impression, as when it is not desired to print the web on any bed, it can be easily led directly across the cylinder of such bed instead of under such cylinder. 85

It will be obvious that the press can be threaded in various ways so as to print a web on one side only by but one of the beds or by two of the beds when coloring or perfecting a web. 90

By having the feeding mechanisms at the opposite ends of the press, the two sets of beds can be brought very close together, so that the actual printing part of the complete machine is short, and it is practical to thread 95 the web through the several beds for multi-color printing as above suggested.

Having described my invention what I claim as new and desire to secure by Letters Patent is:— 100

1. In a printing press, the combination of two adjacent sets of printing mechanisms each comprising two parallel stationary beds and two co-acting impression cylinders; with web feeding mechanism at each end of the 105 press, a web looping mechanism at each end of the press, delivery mechanism at one end of the press, and a folder whereat all the webs are assembled.

2. In a printing press, the combination of 110 two adjacent sets of printing mechanisms each comprising two parallel stationary beds and two co-acting impression cylinders, the upper beds of said printing mechanisms being substantially in the same plane, and the 115 lower beds being in substantially the same plane, and the adjacent beds and mechanisms being arranged end to end,—with web feeding mechanism at each end of the press, a web looping mechanism at each end of the 120 press, delivery mechanism at one end of the press, and a folder whereat all the webs are assembled.

3. In a printing press, the combination of two web perfecting mechanisms, each comprising a pair of parallel stationary beds arranged one over the other and impressing devices co-acting with the beds, the beds in adjacent mechanisms being arranged end to end and closely adjacent, web feeding devices at 130

the outermost end of each perfecting mechanism, web looping devices adjacent to each feeding mechanism, a pair of web delivery mechanisms, guides for directing webs through the printing mechanisms to the delivery mechanisms, and a folder.

4. In a printing press, the combination of two web perfecting mechanisms each comprising a pair of parallel beds arranged one over the other and impressing devices co-acting with the beds, the beds in adjacent mechanisms being arranged end to end and closely adjacent, web feeding devices at the outermost end of each perfecting mechanism, and web looping devices adjacent to each feeding mechanism, and a pair of web delivery mechanisms at one end of the press, guides for directing webs through the printing mechanisms, a folder at the end of the press adjacent to the delivery mechanisms, and means for assembling the webs at the folder.

5. In a printing press, the combination of two web perfecting mechanisms, each comprising a pair of parallel beds arranged one over the other and cylinders co-acting with the beds, the beds in adjacent mechanisms being arranged end to end and closely adjacent, web feeding devices at the outermost end of each perfecting mechanism, web looping devices adjacent to each feeding mechanism, a pair of web delivery mechanisms, guides for directing webs through the printing mechanisms to the delivery mechanisms, and a folder; with means whereby two cylinders and their co-acting, feeding, looping and delivery mechanisms can be put out of operation.

6. In a printing press, the combination of two web perfecting mechanisms each comprising a pair of parallel stationary beds arranged one over the other and cylinders co-acting with the beds, the beds in adjacent mechanisms being arranged end to end and closely adjacent, web feeding devices at the outermost end of each perfecting mechanism, and web looping devices adjacent to each feeding mechanism, a pair of web delivery mechanisms at one end of the press, guides for directing webs through the printing mechanisms, a folder at the end of the press adjacent to the delivery mechanisms, and means for assembling the webs at the folder; with means for simultaneously operating all the cylinders, gearing for driving the feeding mechanisms, the looping mechanism, and the delivery mechanisms in unison; and means whereby one pair of cylinders and their co-acting, feeding, looping and delivery mechanisms can be put out of operation.

7. In a printing press, the combination of two web perfecting mechanisms, each comprising a pair of parallel beds and co-acting cylinders arranged one over the other, the beds in adjacent mechanisms being arranged end to end and closely adjacent, web feeding

devices at the outermost end of each perfecting mechanism, and web looping devices adjacent to each feeding mechanism, a pair of web delivery mechanisms at one end of the press, guides for directing webs through the printing mechanisms, a folder at the end of the press adjacent to the delivery mechanisms, and means for assembling the webs at the folder; with means for operating the feeding, looping and delivery mechanisms in unison, and means whereby one pair of cylinders and their co-acting feeding, looping and delivery mechanisms may be put out of operation.

8. The combination, in a printing press, of two adjacent stationary beds arranged substantially in the same plane, two superposed stationary beds above and parallel with the first beds, a reciprocating cylinder co-acting with each bed, guides for directing a web or webs between the beds and cylinders, a web-feeding mechanism at each end of the press, gearing between said feed mechanisms, a web looping mechanism at each end of the press, gearing between the looping mechanisms and the respective feed mechanisms, web delivery mechanisms, and a folder.

9. The combination, in a printing press, of two adjacent stationary beds arranged substantially in the same plane, two superposed stationary beds above and parallel with the first beds, a reciprocating cylinder co-acting with each bed, web guides, a web-feeding mechanism at each end of the press, a web looping mechanism at each end of the press, a pair of delivery mechanisms at one end of the press, gearing for operating said web feeding, looping and delivery mechanisms synchronously, a folder adjacent to the delivery mechanisms; and means for directing the webs from the delivery mechanisms to the folder.

10. The combination, in a printing press, of two adjacent stationary beds arranged substantially in the same plane, two superposed stationary beds above and parallel with the first beds, a reciprocating cylinder co-acting with each bed, web guides, a web-feeding mechanism at each end of the press, a web looping mechanism at each end of the press, a pair of delivery mechanisms at one end of the press, gearing for operating said web feeding, looping and delivery mechanisms synchronously, a folder adjacent to the delivery mechanisms; and means for directing webs from the delivery mechanisms to the folder; guides whereby one or more webs may be directed through the press and printed by said beds, means whereby one set of cylinders can be thrown out of operation, and means whereby the corresponding web feeding and looping mechanisms can be put out of operation.

11. The combination in a printing press, of two adjacent stationary beds arranged sub-

stantially in the same plane, two superposed stationary beds above and parallel with the first beds, a reciprocating cylinder co-acting with each bed, guides for directing a web or
5 webs between the beds and cylinders, a web-feeding mechanism at each end of the press, gearing between said feed mechanisms, a web looping mechanism at each end of the press, gearing between the looping mechan-
10 isms and the respective feed mechanisms, web delivery mechanisms, and a folder; guides whereby one or more webs may be di-

rected over said beds, means whereby one set of cylinders can be thrown out of operation, and means whereby the corresponding web feeding and looping mechanisms can be
15 put out of operation.

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

HENRY F. BECHMAN.

In presence of—

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