

No. 679,187.

Patented July 23, 1901.

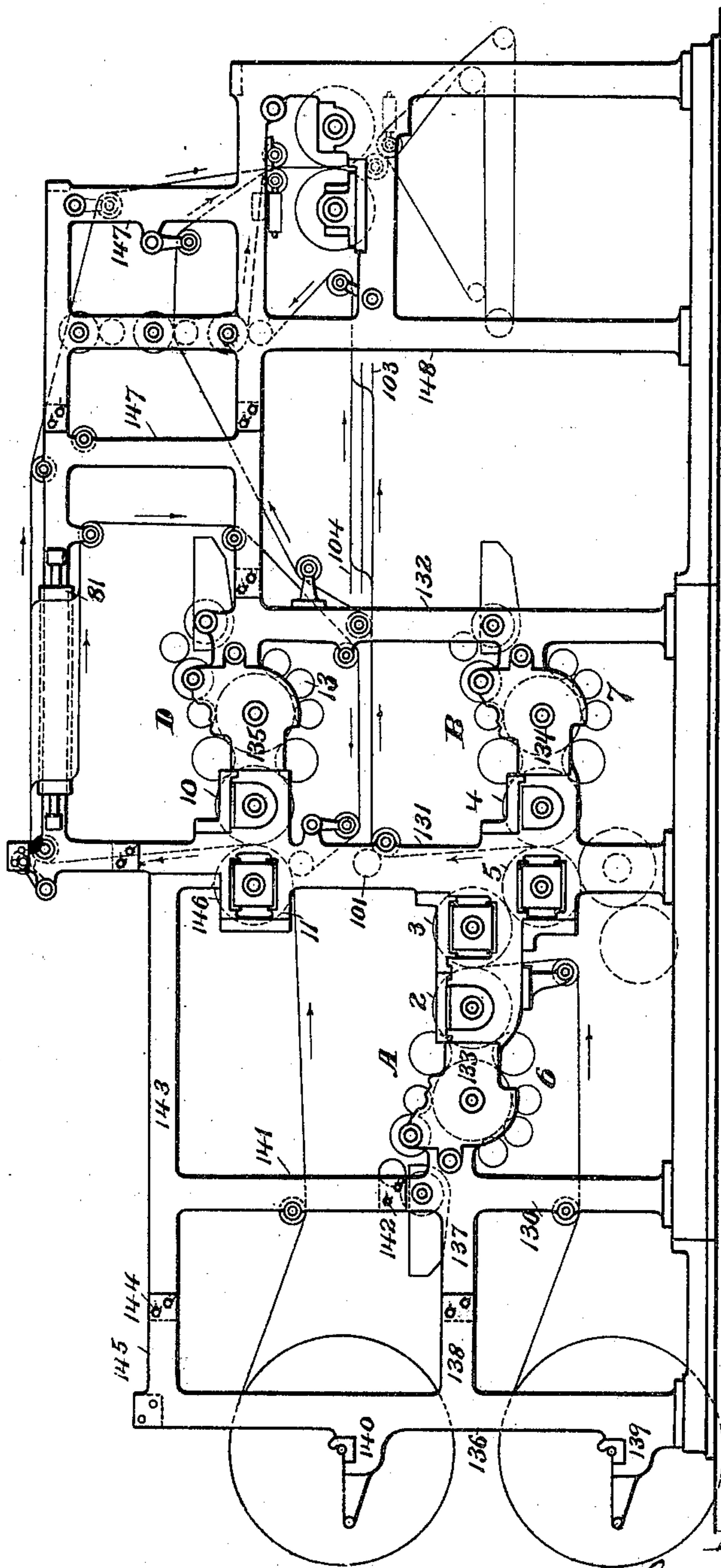
G. F. READ.
PRINTING MACHINE.

(Application filed Jan. 21, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



Attest:
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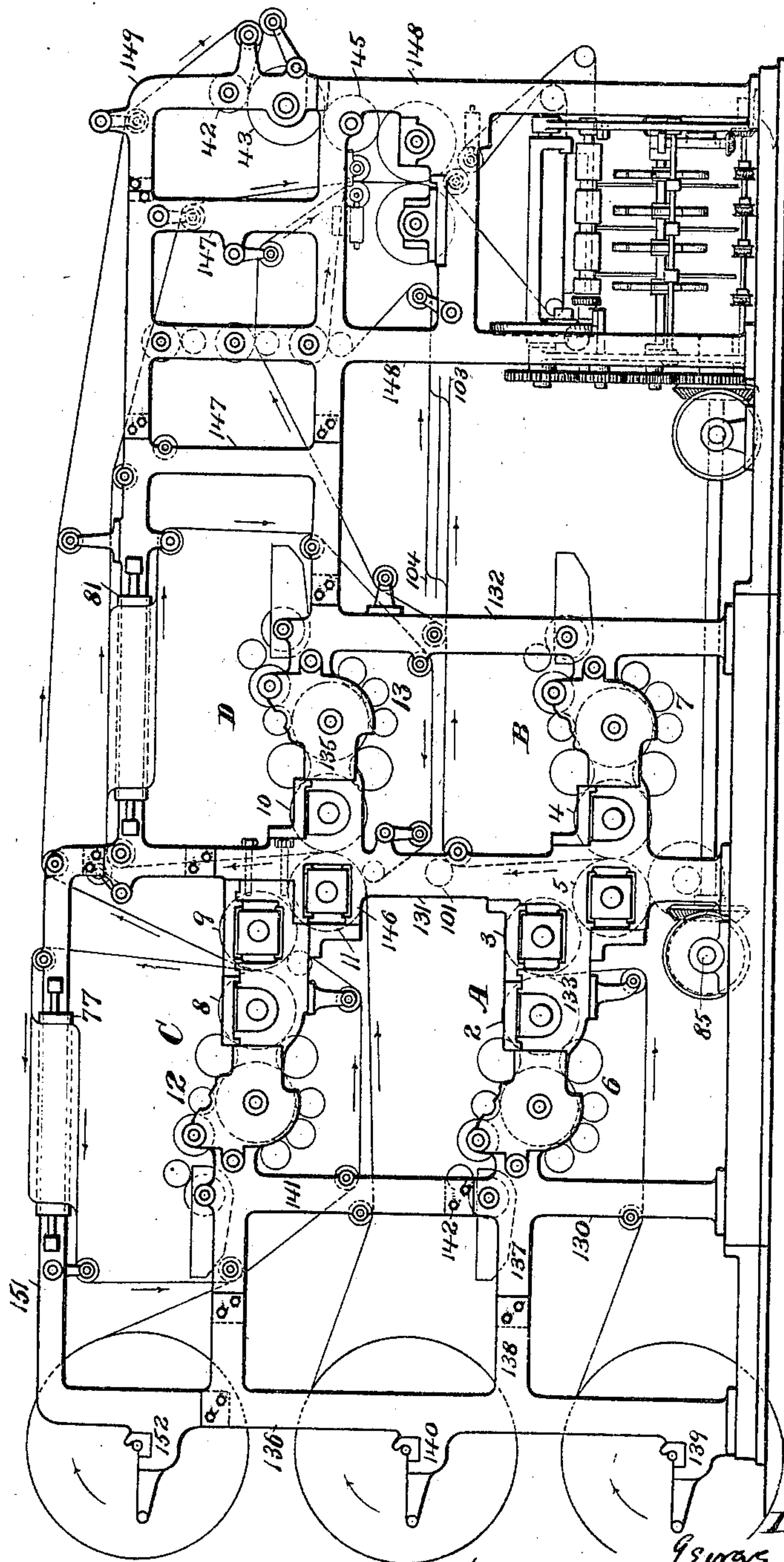
G. F. READ.
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(Application filed Jan. 21, 1901.)

(No Model.)

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Fig. 2.



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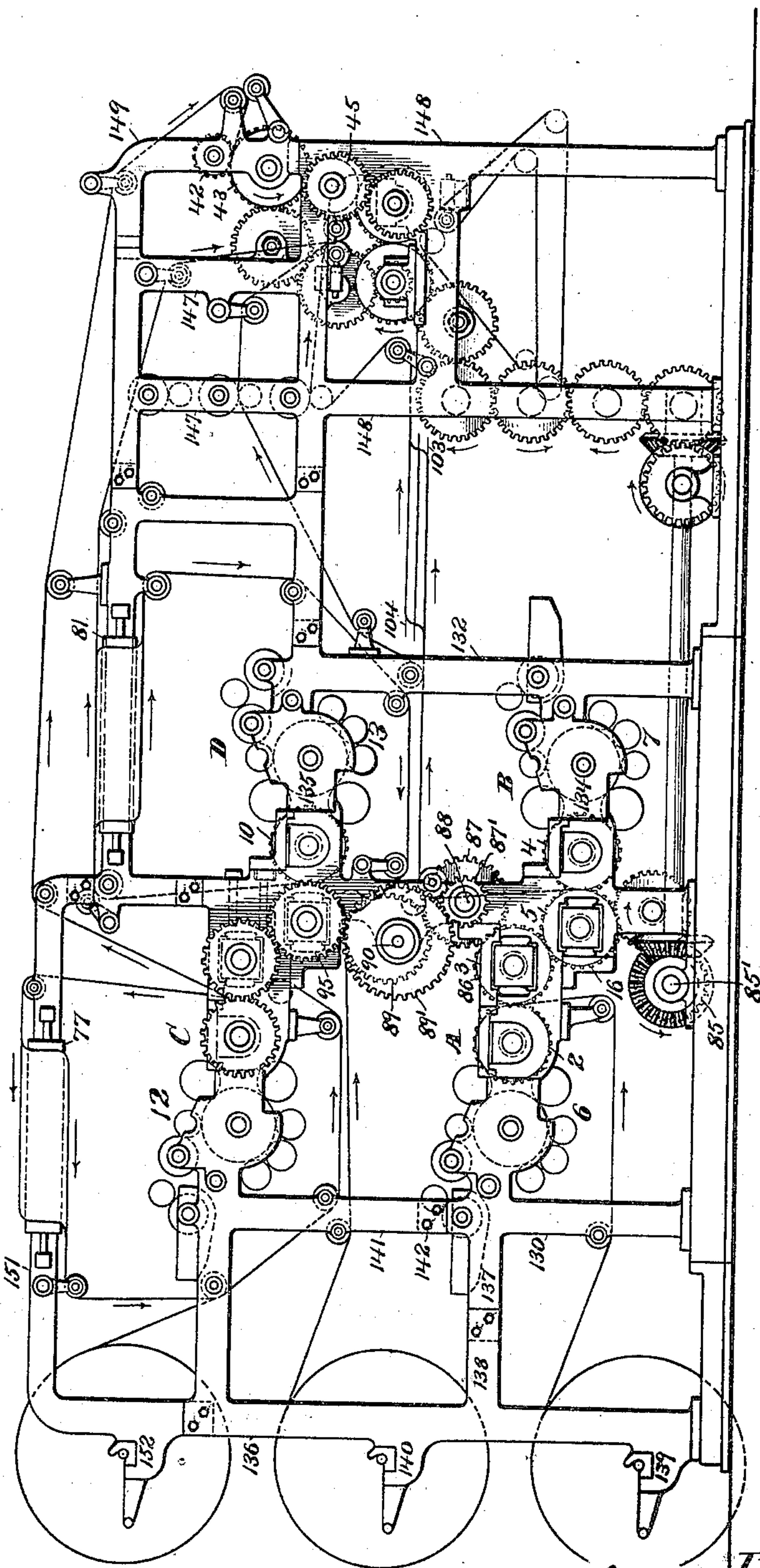
G. F. READ.
PRINTING MACHINE.

(Application filed Jan. 21, 1901.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE F. READ, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, OF
SAME PLACE.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 679,187, dated July 23, 1901.

Application filed January 21, 1901. Serial No. 43,971. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. READ, a citizen of the United States, residing at New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to improvements in printing-machines.

In an application filed by William Spalckhaver, Serial No. 36,190, filed November 12, 1900, there is described a printing-machine which embodies, among other things, a pair of printing-couples which are arranged to operate as a single machine and a second pair of printing-couples which are located over the first pair and which may be operated as a single machine and run either at full or a lesser speed, means being also provided whereby each couple of the second pair of couples may be operated either at full or lesser speed. The machine also embodies suitable mechanism by which either or both of the couples having the variable speed may be used as a double-ender, if desired, the object of the construction being to produce a machine which is capacitated for a large number of products. It sometimes happens, however, that a purchaser may not at the time of purchasing the machine need one which embodies all the features of the machine referred to. While at the time of purchasing he may be satisfied with a machine of lesser capacity, yet he desires a machine which can at small expense and with little trouble be converted into a machine which has a greater capacity.

40 The object of this invention is to produce a machine which may be readily convertible into a machine of greater or lesser capacity, according to the needs of the purchaser.

Figure 1 is a side view of the machine constructed in accordance with the invention and employing three couples, but with the driving-gearing omitted. Fig. 2 is a side view of the machine illustrated in Fig. 1, but having an additional couple added thereto and certain additions to the delivery mechanism, the driving-gearing being omitted.

Fig. 3 is a side view of the machine, illustrating the driving-gearing.

In constructing a machine in accordance with the invention each side frame includes a frame-section in which the couples which are used to form a machine of the lowest capacity are mounted. These frame-sections may be variously constructed. As shown, they consist of uprights 130 131 132. The uprights 130 131 are connected by webs or cross-bars 133, which serve to support the bearings of a printing-couple A, consisting of form-cylinder 2 and impression-cylinder 3. These bearings may be of any usual or desired form, and a specific description of them is not necessary. The webs or cross-bars 133 further serve to support an inking mechanism 6, which may also be of any usual or desired form. The uprights 131 and 132 are connected by cross-webs 134 135. The cross-webs 134 serve to support the bearings of the form-cylinder 4 of a couple B, the impression-cylinder 5 of said couple being preferably mounted in bearings in the uprights 131. The cross-webs 134 also support bearings for the inking mechanism 7 of said couple B. Similarly the cross-webs 135 support the bearings of the form-cylinder 10 of a couple D and the inking mechanism 13 of said couple, the impression-cylinder 11 of said couple being mounted in recesses in the uprights 131. The frame is further preferably provided with standards 136, which are connected to the frame-sections in any suitable manner. As shown, the upright 130 of each frame-section is provided with a projection 137, bolted to a similar projection 138 on a standard 136. The standards 136 are provided with suitable bearings 139 140, in which the web-rolls are mounted. In order to complete this end of the frame, removable filling-pieces of suitable design, which when the frame is constructed as described also serve to brace it, are provided. These filling-pieces are connected in any suitable manner to the frame-sections and preferably also to the standards. As shown, each filling-piece consists of an upright 141, which rests upon a frame-section and is secured thereto by bolts 142 or in any other suitable manner. The uprights 141 have preferably

cast in one piece therewith, although it may be secured thereto in any suitable manner, cross-bars 143. One end of each cross-bar is secured by bolts 144 or in any other suitable manner to a projection 145, extending from the standard 136. The other end of the cross-bar 143 may be connected to the frame-section in any suitable manner. As shown, it has a turned-down end which rests upon a ledge 146, extending from the upright 131.

In the machine now being described the couple D is intended when desired to be used as a double-ender. To this end a suitable transferring and reversing mechanism (indicated at 81) is provided. This transferring and reversing mechanism may be supported in any suitable manner, but is shown as supported by side frame-pieces 147, which are connected to the frame-sections before described and to side frames 148, which carry the folding and delivery mechanism, which may be of any preferred form. The form shown is that indicated in the application of William Spalckhaver, above referred to, and reference is made to that application for a description thereof, if one is necessary.

In the form of the machine shown the web from the lower couple is or may be divided by a slit 101, and when this is done one part of the web is transferred laterally by a web-transferrer of usual form, (indicated at 103 104.) In the machine now being described the couples A B are intended to always operate as a single machine, and the couple D is arranged to be driven at the same speed as the couples A and B.

With the machine so far described and assuming that each form-cylinder carries two pairs of forms, one form of each pair being arranged side by side with the columns parallel to the axis of the cylinder, a product of four, eight, or twelve pages may be obtained in an obvious manner.

Should a product of six pages be desired, couple D will be arranged in a manner to be hereinafter described to run at either full or half speed, and the machine will be provided with an accelerating mechanism, which may be of any suitable form, but will preferably be that disclosed in United States patent to T. M. North, No. 650,543, dated May 29, 1900, to which reference is made for a full description of this mechanism. This accelerating mechanism may be added in any desired manner, but preferably a pair of frame-pieces 149 is provided, said frame-pieces being secured to the side frames 147 in any suitable manner, as by bolts. The frame-pieces 149 will carry the cutting-cylinders 42 43 of the accelerating mechanism, and the variable-speed transfer-cylinder 45 may be mounted in bearings provided for it in the frames 148. By adding this accelerating mechanism, driving couple D at half-speed, and by running a half-width web on the couples A B a six-page paper will be produced. In the same manner by running a double-

width web on the couples A B a ten-page paper will be produced.

Should it be desired to increase the capacity of the machine, an additional couple will be provided. This couple will be a duplicate of the couple D and is preferably provided with a similar transferring and reversing mechanism and similar driving mechanism, so that any product varying by twos up to sixteen pages may be had. The additional couple may be provided for in any suitable manner. Preferably, however, the filling-pieces 141 143 will be taken out by removing the bolts 142 144 and a filling-piece substituted therefor which is similar in construction, except that it is provided with bearings for a couple C, consisting of form-cylinder 8 and impression-cylinder 9, and also bearings for an inking mechanism 12. The transferring and reversing mechanism 77 for the couple C when employed may be provided for in any suitable manner. Preferably, however, removable bent frame-pieces 151 will be provided, said frame-pieces being connected to the standards 136 and the uprights 131 by bolts or in any suitable manner. These frame-pieces will carry the supports for the transferring and reversing mechanism for the couple C. Preferably, also, these pieces will be provided with bearings 152 for the additional web-roll required, although this web-roll may be otherwise supported, if desired. With the machine arranged as has just been described the accelerating mechanism heretofore described will preferably be employed, although it may be omitted, if desired.

The preferred form of gearing employed in this machine is that illustrated in Fig. 3, which is the same in all substantial particulars as the gearing described in the application of William Spalckhaver, before referred to. For the purposes of this application it is sufficient to say that the power-shaft of the machine is indicated at 85', said shaft carrying a gear 85, which, through suitable connections, drives a gear 16 on the impression-cylinder 5, the remaining cylinders of the couples being provided with the usual intermeshing gears. The gear 86 on the impression-cylinder 3 meshes with a gear 87, which is located on the rear side of the machine, as it is seen in Fig. 3. This gear 87 meshes with a gear 89, from which the impression-cylinder 11 is driven. The form-cylinder 10 and the impression and form cylinders 8 and 9 are driven from the impression-cylinder 11 by intermeshing gears in the usual manner. The several parts of this train of gearing are located on the rear side of the machine, as seen in Fig. 3, and are therefore not shown in that figure. They correspond in all respects to the gearing illustrated in the Spalckhaver application, before referred to. This train of gearing serves to drive the couples at full speed. In order to drive the couples at a lesser speed, the shaft 88, which carries the gear 87, is provided with a small gear 87', which meshes

with a pinion 89', suitably mounted in the frame. This pinion 89' meshes with a gear 95, mounted on the shaft of the impression-cylinder 11, said gear being arranged as described in said Spalckhaver application, so as to run loose on the shaft when it is desired to drive the members of the couple C only at half-speed. The members of the train of gearing just described are so related as to drive the upper couples at half the speed of the lower couples. When it is desired to drive the couples C D at half-speed, the full-speed driving connections before described are interrupted by moving the pinion 89 outward on its stud, as described in the application above referred to. If the upper couples are to be driven at full speed, the half-speed driving connections will be interrupted by moving the pinion 89' outward on its stud 90.

While the driving connections described are effective for the purpose for which they are intended, they form no part of the present invention, and any other suitable driving connections may be substituted for them.

It is also to be understood that the instrumentalities by which the invention is carried into effect may be varied widely.

The invention is not therefore to be limited to the specific constructions described in the foregoing specification.

What is claimed is—

1. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by the frame-sections and located above the pair of couples, removable filling-pieces connected to the frame-sections and located above the pair of couples, and suitable associating and delivery mechanism, substantially as described.

2. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by the frame-sections and located above the pair of couples, a pair of standards carrying roll-supports connected to the pair of frame-sections, removable filling-pieces connected to the standards and the frame-sections and located above the pair of couples, and suitable associating and delivery mechanism, substantially as described.

3. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, removable filling-pieces consisting of uprights and cross-bars, the upright of each filling-piece resting on and being connected to a frame-section, and the cross-bar of each filling-piece being connected to a frame-section, and suitable associating and delivery mechanism, substantially as described.

4. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional

printing-couple supported by said frame-sections and located above the pair of couples, a pair of standards having roll-supports connected to the frame-sections, removable filling-pieces consisting of uprights and cross-bars, the upright of each filling-piece resting on and being connected to a frame-section, and the cross-bar of each filling-piece being connected to a frame-section and a standard, and suitable associating and delivery mechanism, substantially as described.

5. The combination with a pair of frame-sections, each section being provided with a supporting-ledge, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, a pair of standards carrying roll-supports connected to the frame-sections, removable filling-pieces consisting of uprights and cross-bars, the upright of each filling-piece resting on and being connected to a frame-section, and the cross-bar of each filling-piece being connected to a standard and resting on the ledge of a frame-section, and suitable associating and delivery mechanism, substantially as described.

6. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, transferring and reversing mechanism for said additional couple, removable filling-pieces connected to the frame-sections and located above the pair of couples, and suitable associating and delivery mechanism, substantially as described.

7. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, transferring and reversing mechanism for said additional couple, a pair of standards carrying roll-supports connected to the pair of frame-sections, removable filling-pieces connected to the standards and the frame-sections and located above the pair of couples, and suitable associating and delivery mechanism, substantially as described.

8. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, means for driving the pair of couples and the additional couple at the same or different speeds, transferring and reversing mechanism for said additional couple, removable filling-pieces connected to the frame-sections and located above the pair of couples, suitable side frames, suitable associating and delivery mechanism mounted in said side frames, a pair of removable frame-pieces connected to the side frames, and an accelerating mechanism, members of which are mounted in said

removable frame-pieces, substantially as described.

9. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, means for driving the pair of couples and the additional couple at the same or different speeds, transferring and reversing mechanism for said additional couple, a pair of standards carrying roll-supports connected to the pair of frame-sections, removable filling-pieces connected to the standards and the frame-sections and located above the pair of couples, suitable side frames, suitable associating and delivery mechanism mounted in said side frames, a pair of removable frame-pieces connected to the side frames, and an accelerating mechanism, members of which are mounted in said removable frame-pieces, substantially as described.

10. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, removable filling-pieces connected to the frame-sections, a printing-couple supported by said filling-pieces and located above the pair of couples, and suitable associating and delivery mechanism, substantially as described.

11. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, a pair of standards carrying roll-supports connected to the pair of frame-sections, removable filling-pieces connected to the standards and the frame-sections, a printing-couple supported by said filling-pieces and located above the pair of couples, and suitable associating and delivery mechanism, substantially as described.

12. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, removable filling-pieces consisting of uprights and cross-bars, the upright of each filling-piece resting on and being connected to a frame-section, and the cross-bar of each filling-piece being connected to a frame-section, a printing-couple supported by said filling-pieces and located above the pair of couples, and suitable associating and delivery mechanism, substantially as described.

13. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, a pair of standards carrying roll-supports connected to the pair of frame-sections, remov-

able filling-pieces consisting of uprights and cross-bars, the upright of each filling-piece resting on and being connected to a frame-section, and the cross-bar of each filling-piece being connected to a frame-section and a standard, a printing-couple supported by said filling-pieces and located above the pair of couples, and suitable associating and delivery mechanism, substantially as described.

14. The combination with a pair of frame-sections, each section being provided with a supporting-ledge, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, a pair of standards carrying roll-supports connected to the pair of frame-sections, removable filling-pieces consisting of uprights and cross-bars, the upright of each filling-piece resting on and being connected to a frame-section, and the cross-bar of each filling-piece being connected to a standard and resting on the ledge of a frame-section, a printing-couple supported by said filling-pieces and located above the pair of couples, and suitable associating and delivery mechanism, substantially as described.

15. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by the frame-sections and located above the pair of couples, a transferring and reversing mechanism for said couple, removable filling-pieces connected to the frame-sections, a printing-couple supported by said filling-pieces and located above the pair of couples, removable frame-pieces connected to the frame-sections, a transferring and reversing mechanism carried by said frame-pieces, said transferring and reversing mechanism operating in connection with the couple carried by the filling-pieces, and suitable associating and delivery mechanism, substantially as described.

16. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by the frame-sections and located above the pair of couples, a transferring and reversing mechanism for said couple, a pair of standards carrying roll-supports connected to the frame-sections, removable filling-pieces connected to the standards and to the frame-sections, a printing-couple supported by said filling-pieces and located above the pair of couples, removable frame-pieces connected to the standards and the frame-sections, said frame-pieces being provided with roll-supports, a transferring and reversing mechanism carried by said frame-pieces, said transferring and reversing mechanism operating in connection with the couple carried by the filling-pieces, and suitable associating and delivery mechanism, substantially as described.

17. The combination with a pair of frame-sections, of a pair of printing-couples sup-

ported by said frame-sections, an additional printing-couple supported by the frame-sections and located above the pair of couples, a transferring and reversing mechanism for said couple, means for driving the pair of couples and the additional couple at the same or different speeds, removable filling-pieces connected to the frame-sections, a printing-couple supported by said filling-pieces and located above the pair of couples, means for driving said couple at the same speed with or at a lesser speed than the pair of couples, removable frame-pieces connected to the frame-sections, a transferring and reversing mechanism carried by said frame-pieces operating in connection with the couple carried by the filling-pieces, a pair of removable frame-pieces, and an accelerating mechanism, members of which are mounted in said removable frame-pieces, substantially as described.

18. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by said frame-sections and located above the pair of couples, means for driving the pair of couples and the additional couple at the same or different speeds, a transferring and reversing mechanism for said additional couple, a pair of standards carrying roll-supports connected to the frame-sections, removable filling-pieces connected to the standards and the frame-sections, a printing-couple supported by said filling-pieces and located above the pair of couples, means for driving this couple at the same speed with or at a lesser speed than the pair of couples, removable frame-pieces con-

nected to the standards and the frame-sections, a transferring and reversing mechanism carried by said frame-pieces operating in connection with the couple carried by the filling-pieces, a pair of removable frame-pieces, and an accelerating mechanism, members of which are mounted in said removable frame-pieces, substantially as described.

19. The combination with a suitable frame, of suitable means mounted therein for printing upon a plurality of webs, means for driving the printing means which operates upon one of the webs at varying speeds, a pair of removable frame-pieces suitably connected to the machine-frame, and an accelerating mechanism, members of which are mounted in said removable frame-pieces, substantially as described.

20. The combination with a pair of frame-sections, of a pair of printing-couples supported by said frame-sections, an additional printing-couple supported by the frame-sections and located above the pair of couples, means for driving said couples at the same or different speeds, a transferring and reversing mechanism for the additional couple, a pair of removable frame-pieces, and an accelerating mechanism, members of which are mounted in said removable frame-pieces, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE F. READ.

Witnesses:

F. W. H. CRANE,
L. ROEHM.