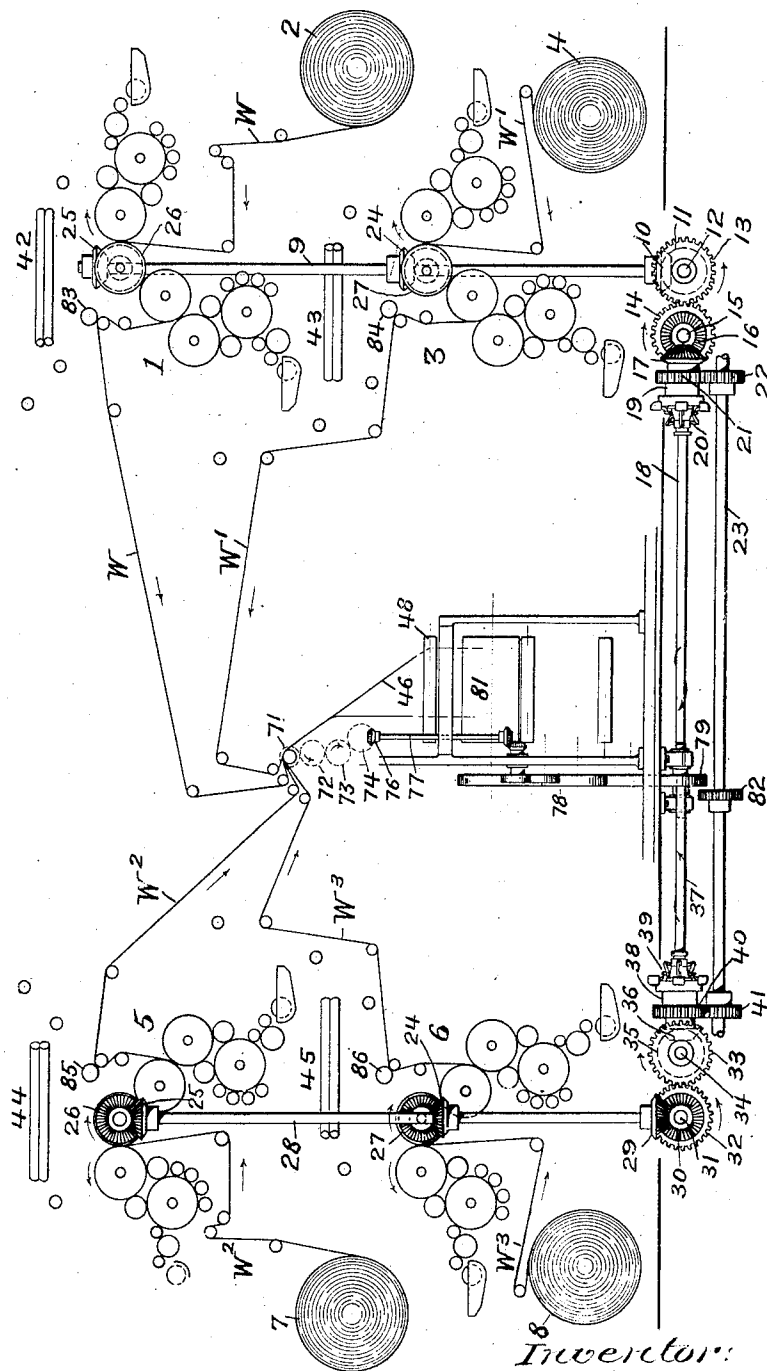


958,771.

O. ROESEN.
PRINTING MACHINE.
APPLICATION FILED JULY 6, 1906.

Patented May 24, 1910.
6 SHEETS—SHEET 1.

Fig. 1.



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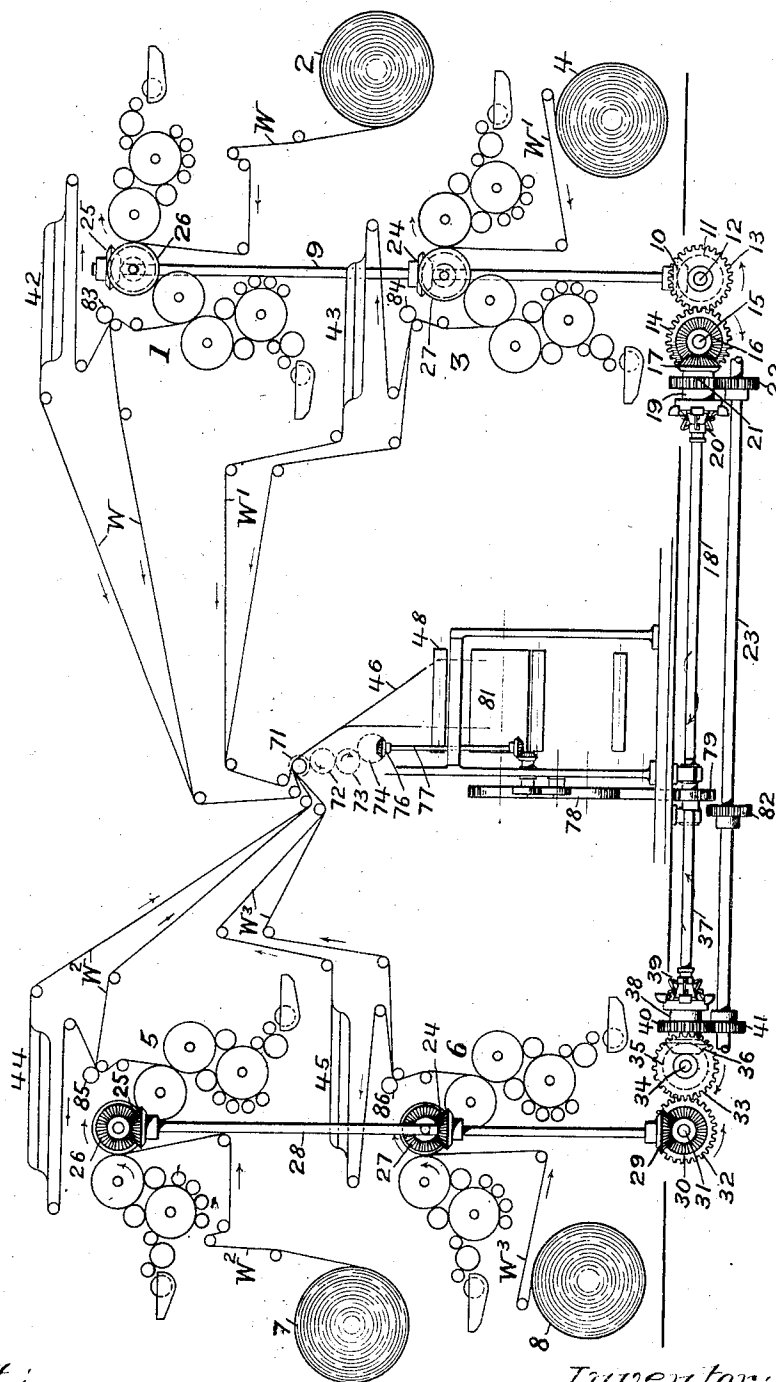
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6 SHEETS—SHEET 2.

Fig. 2.



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6 SHEETS—SHEET 3.

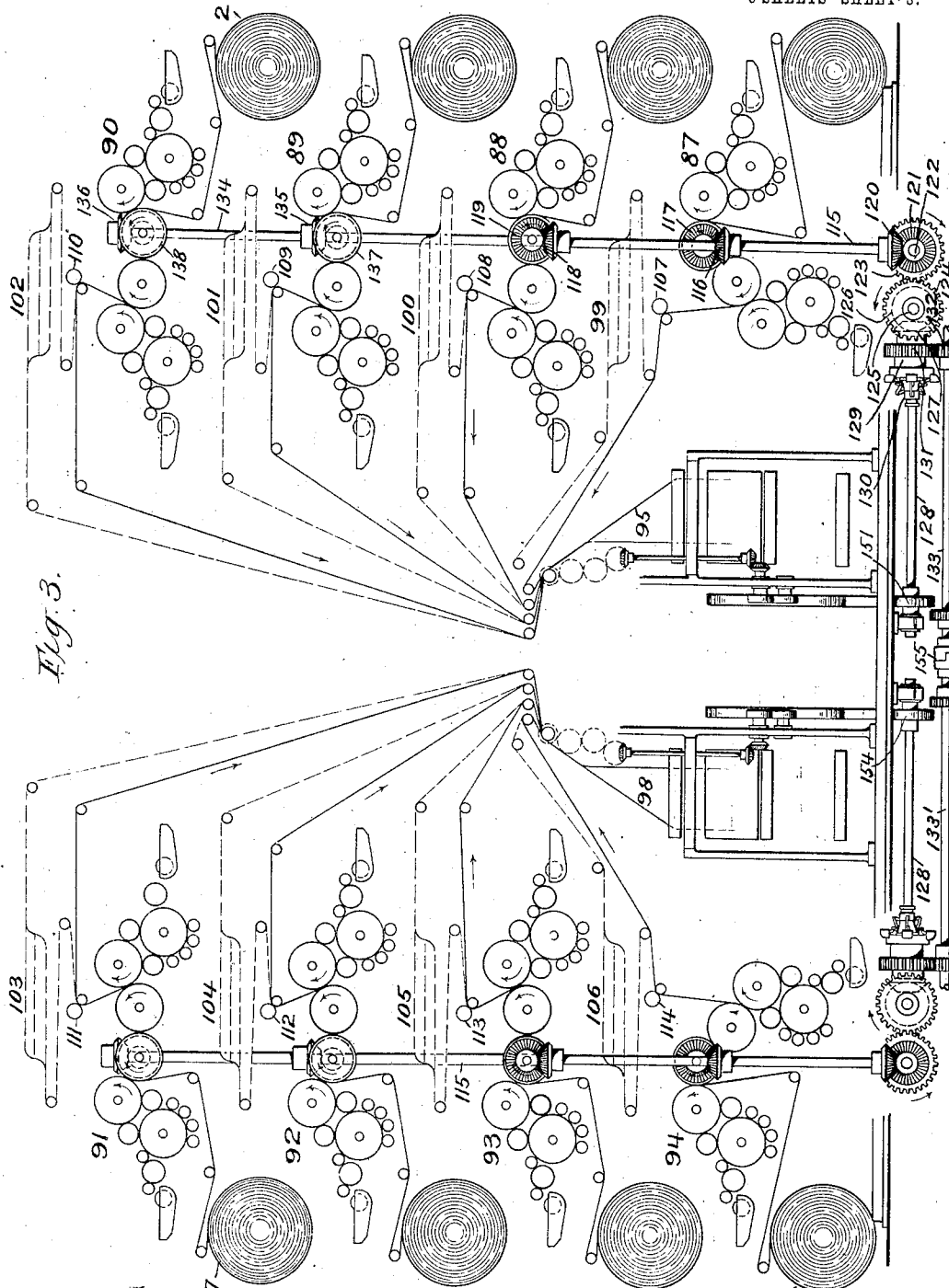


Fig. 3.

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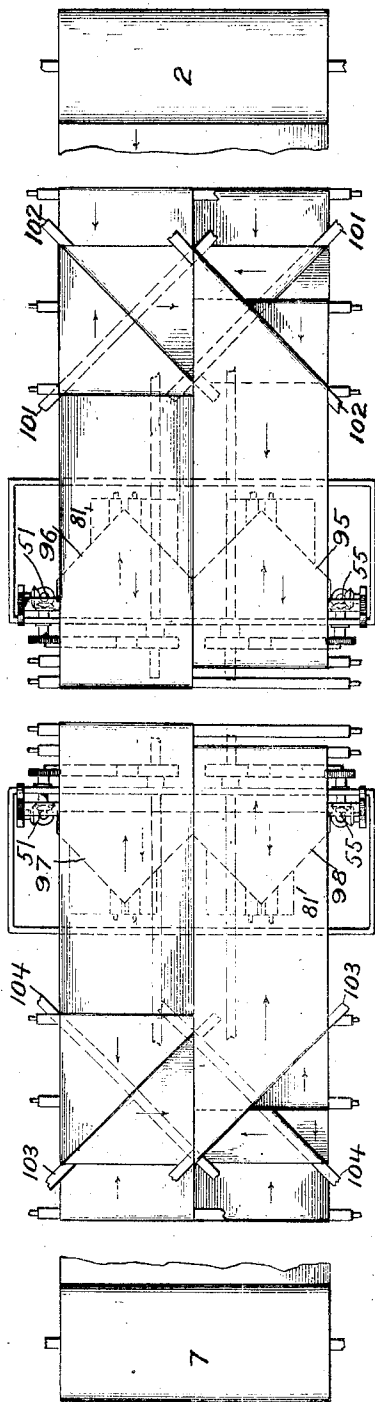
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6 SHEETS—SHEET 4.

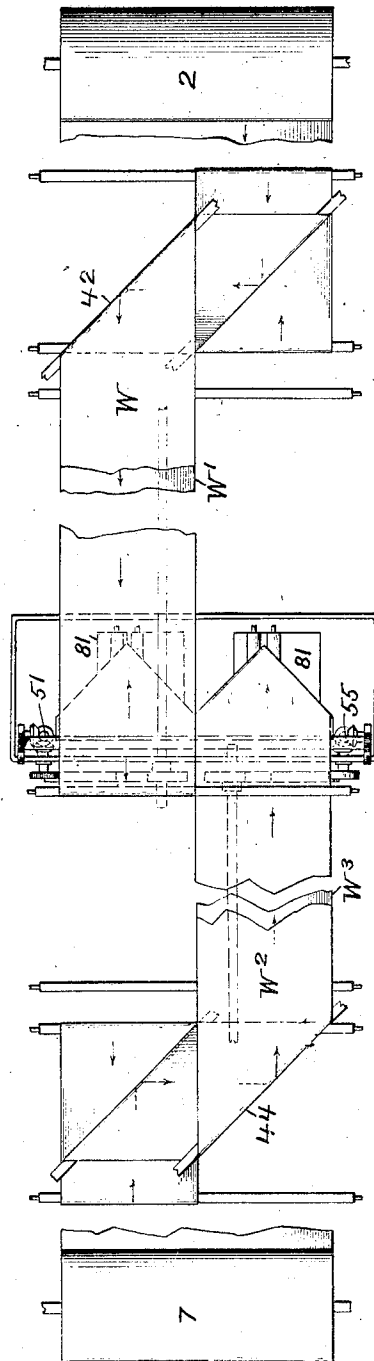
958,771.

Fig. 5.



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Fig. 4.



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6 SHEETS—SHEET 5.

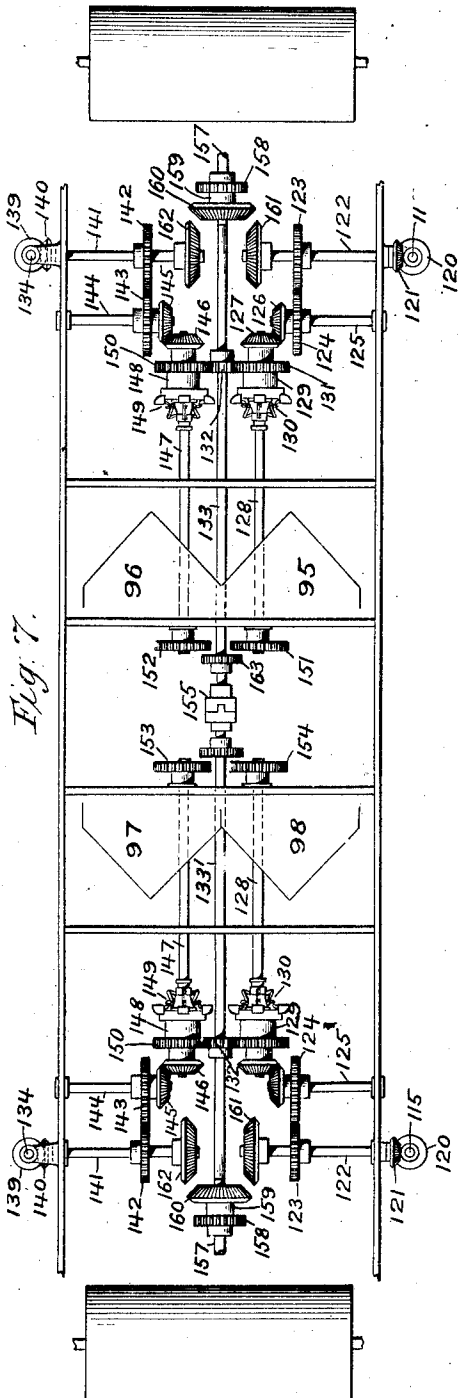


Fig. 7.

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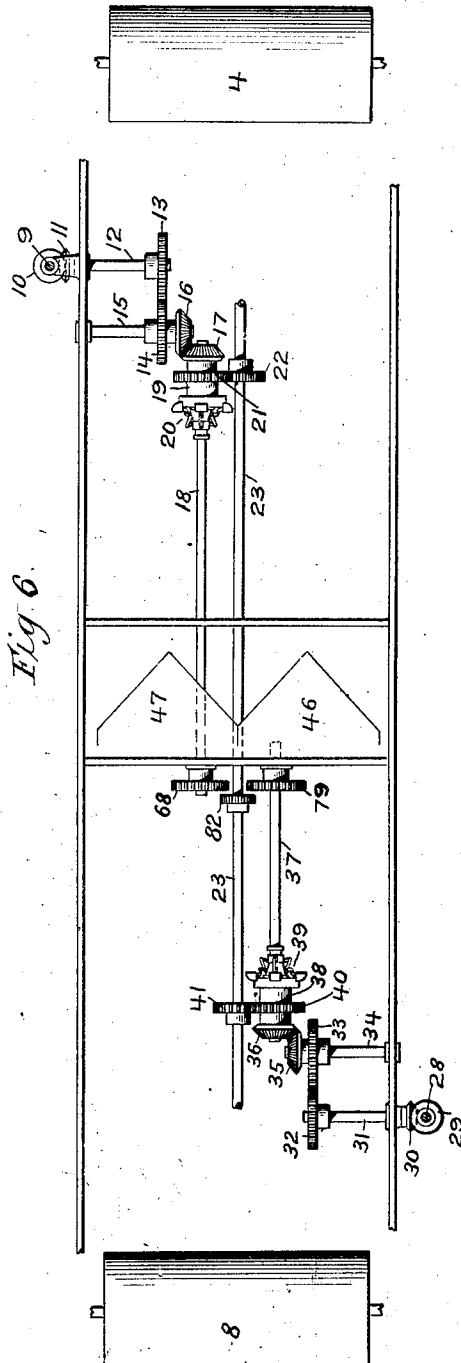


Fig. 6.

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APPLICATION FILED JULY 6, 1906.

958,771.

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6 SHEETS—SHEET 6.

Fig. 8.

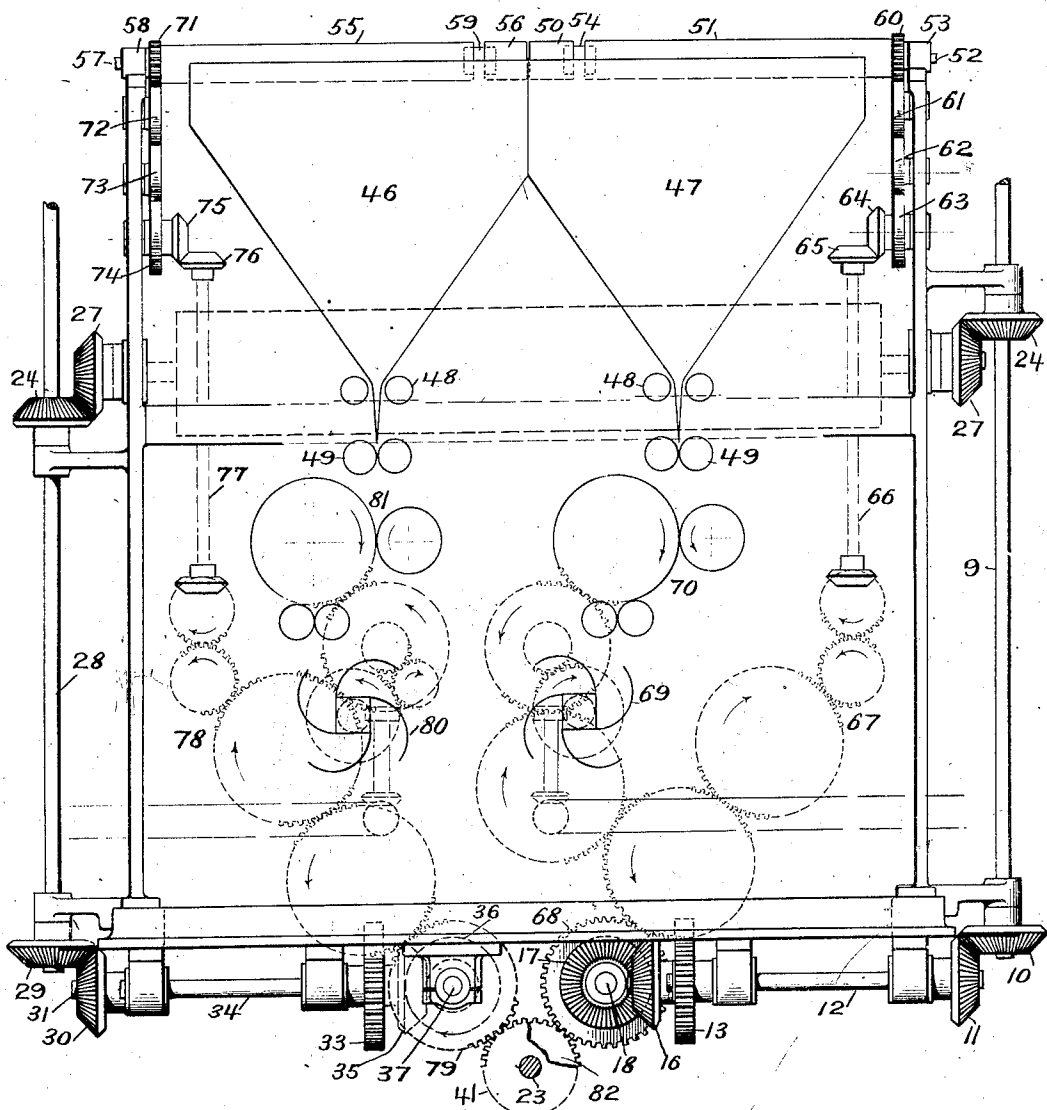
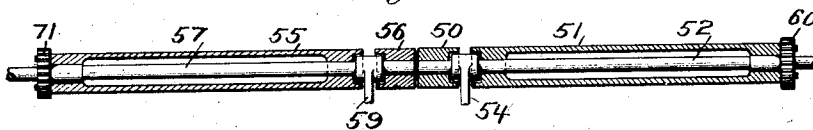


Fig. 9.



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UNITED STATES PATENT OFFICE.

OSCAR ROESEN, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO R. HOE AND CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PRINTING-MACHINE

958,771.

Specification of Letters Patent.

Patented May 24, 1910.

Application filed July 6, 1906. Serial No. 324,937.

To all whom it may concern:

Be it known that I, OSCAR ROESEN, a citizen of the United States, residing at New York city, county of New York, 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 certain improvements in web printing machines, and more particularly to that class of machines known as straight line machines, in which rotary printing couples are arranged with their cylinders in parallelism, the webs from the couples being led in a substantially straight line to longitudinal folders.

Generally speaking, the object of this invention may be said to be to improve printing machines of the class above generally described, in which a plurality of sets of rotary double wide perfecting couples are employed, each set of couples being used in connection with a single wide longitudinal folder, the construction being so arranged that each set of couples and the folder may be run independently of or simultaneously with the other set and its folder.

With this and other objects not specifically referred to in view, the invention consists in certain constructions and in certain parts, improvements and combinations as will be hereinafter fully described and then specifically pointed out.

35 Referring to the accompanying drawings—Figure 1 is a diagrammatic side elevation of one form of printing machine embodying the invention. Fig. 2 is a diagrammatic side elevation of the machine illustrated in Fig. 1 arranged to produce a different product. Fig. 3 is a diagrammatic side elevation of another form of printing machine embodying the invention. Fig. 4 is a plan view of the construction and arrangement illustrated in Fig. 2. Fig. 5 is a plan view of the construction and arrangement illustrated in Fig. 3. Fig. 6 is a plan view illustrating the driving mechanism employed in connection with the machine illustrated in Figs. 1 and 2. Fig. 7 is a plan view of the driving mechanism of the machine illustrated in Fig. 3. Fig. 8 is a diagrammatic front elevation of the folding mechanism employed. Fig. 9 is a sectional detail of a part of the folding mechanism.

Machines embodying the invention will include a plurality of sets of rotary double wide printing couples, all the cylinders of said couples being arranged in parallelism. These sets of couples may be variously arranged with respect to each other.

Referring more particularly to the construction illustrated in Figs. 1, 2, 4, 6, 8 and 9, the printing machine therein illustrated comprises a deck of rotary double wide printing and perfecting couples, indicated at 1, these couples operating on a web W derived from a web roll 2. Beneath this set of couples is another deck of rotary double wide printing and perfecting couples, indicated at 3, these couples operating on a web W' derived from a web roll 4. The couples 1 and 3, in the construction illustrated, form a set. At the other end of the machine, there is a similar set of rotary double wide couples 5, 6, these couples operating on webs W², W³ derived from rolls 7, 8 respectively.

The sets of couples may be driven by any suitable mechanism, the character of which will vary according to the arrangement of the sets. In the construction illustrated in the figures referred to, the couples 1 and 3 are driven from a standing shaft 9, this shaft being provided on its lower end with a miter gear 10 which is in mesh with a miter gear 11 on a shaft 12 suitably supported in the frame. This shaft 12 is provided with a gear 13 driven by a gear 14 on a shaft 15. This shaft 15 is driven by a miter gear 16 which is in mesh with a miter gear 17 fast on a shaft 18. Loosely mounted on the shaft 18 is a collar 19 which may be clutched to or unclutched from the shaft by means of a clutch of suitable construction indicated at 20, this clutch being fast on the shaft. This collar 19 is provided with a gear 21 which is in mesh with a gear 22 on a power shaft 23. The shaft 9 is provided with miter gears 24, 25 which are in mesh respectively with miters 26, 27, these miters serving to transmit the motion, through mechanism not necessary to describe, to the printing couples.

The mechanism for driving the couples 5, 6 is similar to that already described, that is to say, it embodies a standing shaft 28 driven by a miter 29 from a miter 30 mounted on a shaft 31, this shaft being driven by intermeshing gears 32, 33 from a shaft 34. This shaft 34 is provided with a miter 35

which is in mesh with a miter 36 on a shaft 37. This shaft 37 has loosely mounted thereon a collar 38 which collar may be clutched to or unclutched from the shaft by means of a clutch, indicated at 39. Mounted on this collar is a gear 40 which is in mesh with a gear 41 on the shaft 23 before referred to.

In the best constructions embodying the invention, a web transferring mechanism will be employed with each deck of couples, so that, if desired, that part of the web printed on one end of the double wide couples of a deck may be transferred and associated with the part of the double wide web printed on the other end of the couples of the deck. In the construction shown, web transferring mechanisms, marked 42, 43, 44 and 45 are used with the decks 1, 3, 5 and 6 respectively. In the construction illustrated, web transferring mechanisms consisting of arrangements of bars well-known in the art are employed. A specific description of them is, therefore, unnecessary.

In machines constructed in accordance with the invention, a single wide longitudinal folder will be employed in connection with each set of couples. In the construction illustrated in Figs. 1, 2, 4, 6, 8 and 9, two folders are employed, these folders being marked 46 and 47, each folder being provided with the usual bending rolls 48 and nipping rolls 49. Suitable web guides, illustrated in the drawings but not necessary to specifically describe, serve to direct the webs from the sets of couples to the forwarding rolls of the longitudinal folding mechanism. In the particular construction illustrated, the folder 47 is provided with a forwarding roll consisting of two sections 50, 51, this roll being mounted on a shaft 52. This shaft is journaled in a bearing 53 on the frame and in a bracket 54 which is suitably supported on the frame. Similarly, the folder 46 is provided with a forwarding roll consisting of two sections 55, 56, these sections of this roll being mounted on a shaft 57. This shaft 57 is supported in a bearing 58 on the frame and also in a bracket 59 suitably secured to the frame. By making each roll of independent sections, as shown, and locating the inner brackets which carry the roll shafts between the sections, it is possible to bring the ends of the forwarding rolls of the folders close together, which is desirable when the machine is running on certain products. These forwarding rolls may be driven by any suitable mechanism. In the construction illustrated, the shaft 52 is provided with a gear 60 which meshes with a gear 61 in mesh with an idler 62 driven from a gear 63 mounted on the hub of a miter gear 64. This miter gear 64 is in mesh with a similar gear 65 on a standing shaft 66 driven by a train of gearing 67

(see dotted lines in Fig. 8) from a gear 68 mounted on the shaft 18 before referred to, (see Fig. 6). This train 67 may also serve to drive any usual delivery, such as a rotary fly 69, and the cutting and folding rolls, diagrammatically indicated at 70. The shaft 57 of the forwarding roll of the folder 46 is provided with a gear 71 which may be driven from a gear 72, this gear being in mesh with an idler 73. This idler 73 is driven from a gear 74 on the hub of a miter gear 75 which is driven by a miter 76 on the standing shaft 77. This standing shaft is driven by a train 78 from a gear 79 on the shaft 37 before referred to, (see Fig. 6). This train 78 may drive any usual delivery, such as a rotary fly 80, and the cutting and folding rolls diagrammatically indicated at 81.

The machine so far described is capable of being run to produce products of various descriptions. As arranged in Fig. 1, the double wide webs W , W' , W^2 , W^3 are led by suitable web guides to the forwarding rolls of the folders, the webs being associated as they pass over these rolls. With this arrangement, a suitable slitter will, of course, be employed to divide the double wide webs before they pass over the folders. With this arrangement, both sets of couples and the folders run in unison or in synchronism, and the product produced is two sixteen page papers after collection.

When the machine is run with all the couples and the folders in unison, it may be desirable, in order to secure perfect synchronism, to introduce a locking gear between the driving gears 68, 79 before referred to as the primary driving gears for the folders. A sliding locking gear 82 may be mounted on the shaft 23, such a gear being illustrated in Figs. 6 and 8.

Aside from the arrangement just referred to and other arrangements by which different products may be produced, which arrangements need not be specifically referred to, because they will be understood by those skilled in the art, the machine is capable of being run as two entirely independent machines. Fig. 2 illustrates one arrangement by which this result may be effected. In this construction, when the machine is to be arranged in the manner indicated, the locking gear 82, if the same is employed, is slid out of engagement with the gears 68, 79. The set of couples 1 and 3 and folder 47 cooperating therewith, together with its connected agencies, may now be driven from the shaft 23 through the medium of the clutch 20 (the driving being controlled through the clutch 20) without driving the couples 5, 6 or the folder cooperating therewith, the clutch 39 in this case being arranged so that the collar 38 runs loose on the shaft 37. If it be desired to produce a

sixteen page product from the set of couples 1, 3, this may be effected by slitting the double wide webs, slitters 83, 84 being used. One half of each of the slit double wide webs is transferred laterally by means of the transferers 42, 43 and the four single width webs are led over the folder 47. Similarly, a sixteen page product may be obtained from the set of couples 5, 6 by employing the transferers 44, 45 and the slitters 85, 86. This arrangement of the machine is illustrated in Figs. 2 and 4. It will be understood, of course, that with this arrangement, the two sets of couples, together with their folders, are running substantially as two independent machines, each machine being capable of stopping and starting, or such other manipulations as may be necessary, entirely independently of the other machine. This makes it possible, therefore, to produce two entirely different products on the machine when it is running as illustrated in Fig. 2, or to produce duplicate products when it is running as illustrated in Fig. 1. It will be understood, of course, that the products produced by the arrangement shown in Fig. 1 need not be duplicate products, and that the arrangement shown in Fig. 2 need not produce different products, but the machine has the capacity indicated.

In the construction just described, the sets of couples are arranged at opposite ends of the machine. Constructions containing the invention lend themselves readily, however, to different arrangements of the couples. In the construction shown in Figs. 3, 5 and 7, four sets of couples are employed and four folders.

Referring to Fig. 3, a deck of rotary double wide printing and perfecting couples is indicated at 87 and another deck at 88, these decks 87, 88 forming a set. Above these decks are two more decks of rotary double wide printing and perfecting couples, indicated at 89 and 90, these decks forming a set. On the other side of the machine are four more decks of similar couples marked 91, 92, 93 and 94 respectively. The decks 91, 92 form a set and the decks 93 and 94 form a set. In the construction previously described, a single wide longitudinal folder is employed with each set, the folder coöperating with the set of couples 87, 88 being marked 95, the folder coöperating with the set of couples 89, 90 being marked 96, the folder coöperating with the set of couples 91, 92 being marked 97 and the folder coöperating with the set of couples 93, 94 being marked 98. As before, web transferers may be employed with each set of decks, these transferers being indicated at 99, 100, 101, 102, 103, 104, 105, 106. Slitters 107, 108, 109, 110, 111, 112, 113 and 114 are employed in connection with these transferers.

The lower set of couples 87, 88 may be driven from a standing shaft 115, through intermeshing miter gears 116, 117, 118, 119. This shaft may be driven by intermeshing miters 120, 121, the miter 121 being mounted on a shaft 122. This shaft 122 may be driven by intermeshing gears 123, 124, the gear 124 being mounted on a shaft 125 which is provided with a miter 126. This miter 126 meshes with a miter 127 on a shaft 128. This shaft 128 has loosely mounted thereon a collar 129 which may be clutched to or unclutched from the shaft by a clutch indicated at 130. The collar 129 is provided with a gear 131 which meshes with a gear 132 on a main driving shaft 133. The set of couples 89, 90 may be driven by a standing shaft 134, this shaft being provided with miters 135, 136 which mesh with miters 137, 138. These miters drive the cylinders through usual agencies. The shaft 134 is provided on its lower end (see Fig. 7) with a miter 139 which meshes with a miter 140 on a shaft 141. This shaft 141 is driven by intermeshing gears 142, 143 from a shaft 144, which shaft is provided with a miter 145 in mesh with a miter 146 fast on a shaft 147. This shaft 147 has a clutch collar 148 loosely mounted thereon which is clutched to and unclutched from the shaft by means of a clutch 149. This collar 148 is provided with a gear 150 which is in mesh with the gear 132 before referred to.

The connections by which the set of couples 91, 92 and the set of couples 93, 94 are driven are exact duplicates of those already described and, therefore, specific description of the same is not regarded as necessary, further than to say that the power is derived from a main driving shaft 133 which, in the best constructions, will be arranged in line with the shaft 133 before referred to.

The four folders employed are exact duplicates of the two folders already described, each folder being capacitated to be independently driven in connection with the set of couples with which it coöperates. The main driving gear for the folder 95 (see Fig. 7) is indicated at 151; the driving gear for the folder 96 at 152; the driving gear for the folder 97 at 153, and the driving gear for the folder 98 at 154.

Many arrangements of this machine are possible by which widely varying products may be produced. As indicated in Fig. 3, all the couples of the machine and the folders are running in unison. When this arrangement is employed, the shafts 133 and 133' should, to insure perfect synchronism, be connected by means of a suitable jaw clutch, the construction of which is well understood and which is indicated at 155. If it be desired to run the sets independently, the parts of this jaw clutch are separated.

Each set of couples together with its folder may now be run independently of every other set, the mechanism operating in the same way as the mechanism described in connection with the machine illustrated in Figs. 2 and 4.

If desired, the two sets of couples on one end of the machine may be run in unison and independently of the other two sets. This may be effected through the mechanism already described, but to avoid driving through clutch gearing and to insure absolute synchronism additional driving mechanism is provided which may be employed for this purpose. This additional driving mechanism (see Fig. 7) includes, in the particular construction illustrated, a shaft 157 which is located above the main driving shaft 133 and is driven from it through a pair of gears, one of which is represented at 158. This gear 158 is fast on a collar 159 which also carries a miter gear 160. This collar is capable of being slid on the shaft 157 so as to bring the miter 160 in mesh with two miters 161, 162 on the shafts 122, 141 respectively. Similar unison driving gearing may be provided for the couples at the other end of the machine. When this unison driving gear is provided, it is also desirable to provide a sliding locking gear 163 which may be slid in between the gears 151, 152 before referred to.

Changes and variations may be made in the construction by which the invention is carried into effect. The invention is not, therefore, to be limited to the specific constructions herein shown and described.

What is claimed is:—

1. The combination with a printing mechanism comprising a set of rotary double wide printing and perfecting couples, the cylinders of which are parallel, of a single wide longitudinal folder co-acting therewith, a web transferring mechanism co-operating with this set of couples, a second set of couples, the cylinders of which are parallel with the cylinders of the first set, a web transferring mechanism, a single wide longitudinal folder co-acting with the second set, said longitudinal folders being arranged side by side, and means for driving either set and its folder either independently of or simultaneously with the other set and its folder.
2. The combination with a printing mechanism comprising a set of rotary double wide printing and perfecting couples, the cylinders of which are parallel, of a single wide longitudinal folder co-acting therewith, a web transferring mechanism co-operating with this set of couples, a second set of couples, the cylinders of which are parallel with the cylinders of the first set, a web transferring mechanism, a single wide longitudinal folder co-acting with the second set,

said longitudinal folders being arranged side by side, means for driving either set and its folder either independently of or simultaneously with the other set and its folder, and means for driving either folder independently of its printing mechanism.

3. The combination with two sets of printing mechanisms, said sets facing each other and each set comprising a plurality of superposed rotary double wide perfecting couples, all the cylinders of the couples being parallel, of a longitudinal folding mechanism located between the sets, said mechanism including two independently operated folders arranged side by side, means for leading all the webs printed on the couples in a straight line to the folding mechanism, and means for transferring laterally the single wide web perfected on either end of any couple and associating it with the single wide web perfected on the other end of the same couple, so that after association these webs may be led in a straight line to one of the side by side folders, the other side by side folder being inoperative if desired.

4. The combination with two sets of printing mechanisms, said sets facing each other and each set comprising a plurality of rotary double wide perfecting couples, all the cylinders of the couples being parallel, of two independently driven folders arranged side by side, means for leading all the webs printed on one end of all the couples in a straight line to one folder, and means for leading all the webs printed on the other end of the couples in a straight line to the other folder, means for transferring laterally the single wide web printed on either end of any couple and associating it with the single wide web printed on the other end of the same couple, so that these webs may be led in a straight line to one of the side by side folders.

5. The combination with two sets of printing mechanisms said sets facing each other and each set comprising a plurality of superposed decks of rotary double wide printing couples, all the cylinders of the couples being parallel, of a web transferer for each deck so arranged that the webs printed on opposite ends of any couple may be associated, two independently operating folding mechanisms arranged side by side, guides whereby the webs printed on one end of the double wide couples may be led to one folder and the webs printed on the other end of the double wide couples to the other folder, and guides whereby the webs either associated or unassociated may be led to a folder.

6. The combination with a double wide rotary printing machine all the cylinders of which are parallel, of web transferring means whereby the web or webs printed on one side of said machine may be associated with the web or webs printed on the other

side of the same machine, a single wide longitudinal folder arranged to receive the webs from said machine and driven in synchronism with the machine, a second double wide rotary printing machine, the couples of which are parallel to the couples of the first printing machine, web transferring means whereby the web or webs printed on one side of said second machine may be associated with the web or webs printed on the other side of the same machine, a single wide longitudinal folder arranged to receive the webs from said second machine and driven in synchronism with that machine, the folders be-

ing arranged side by side, guides whereby the webs from both machines may be caused to run simultaneously over both folders, or the webs from each machine may be led to its own folder, and means whereby the product of each folder may be independently delivered.

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

OSCAR ROESEN.

Witnesses:

OTTO L. RAABE,
JOSEPH F. KARG.