

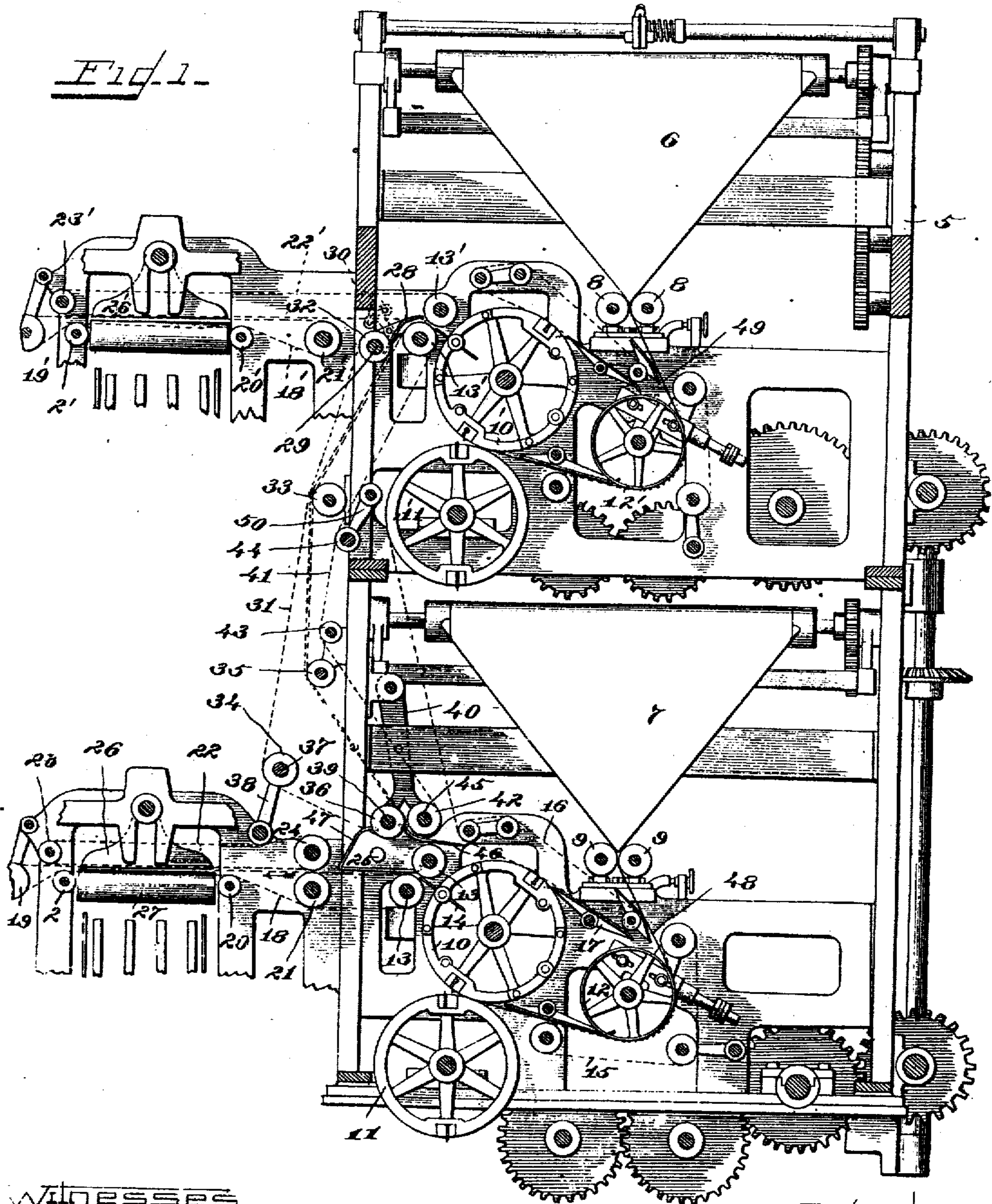
No. 812,923.

PATENTED FEB. 20, 1906.

S. G. GOSS.  
DELIVERY APPARATUS FOR PRINTING PRESSES.

APPLICATION FILED FEB. 10, 1900.

6 SHEETS—SHEET 1.



WITNESSES

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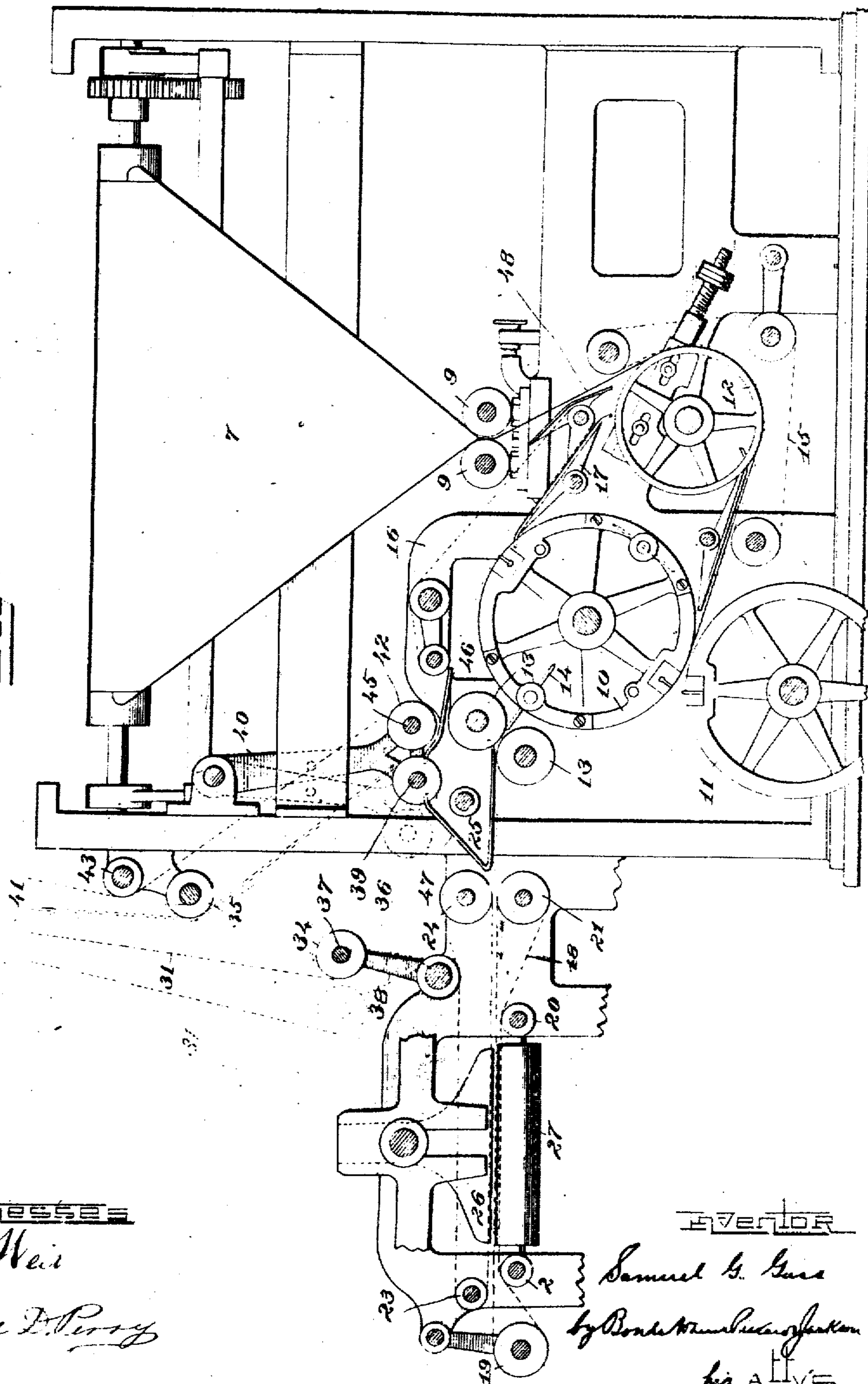
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6 SHEETS—SHEET 2.

Fig. 2.



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812,923.

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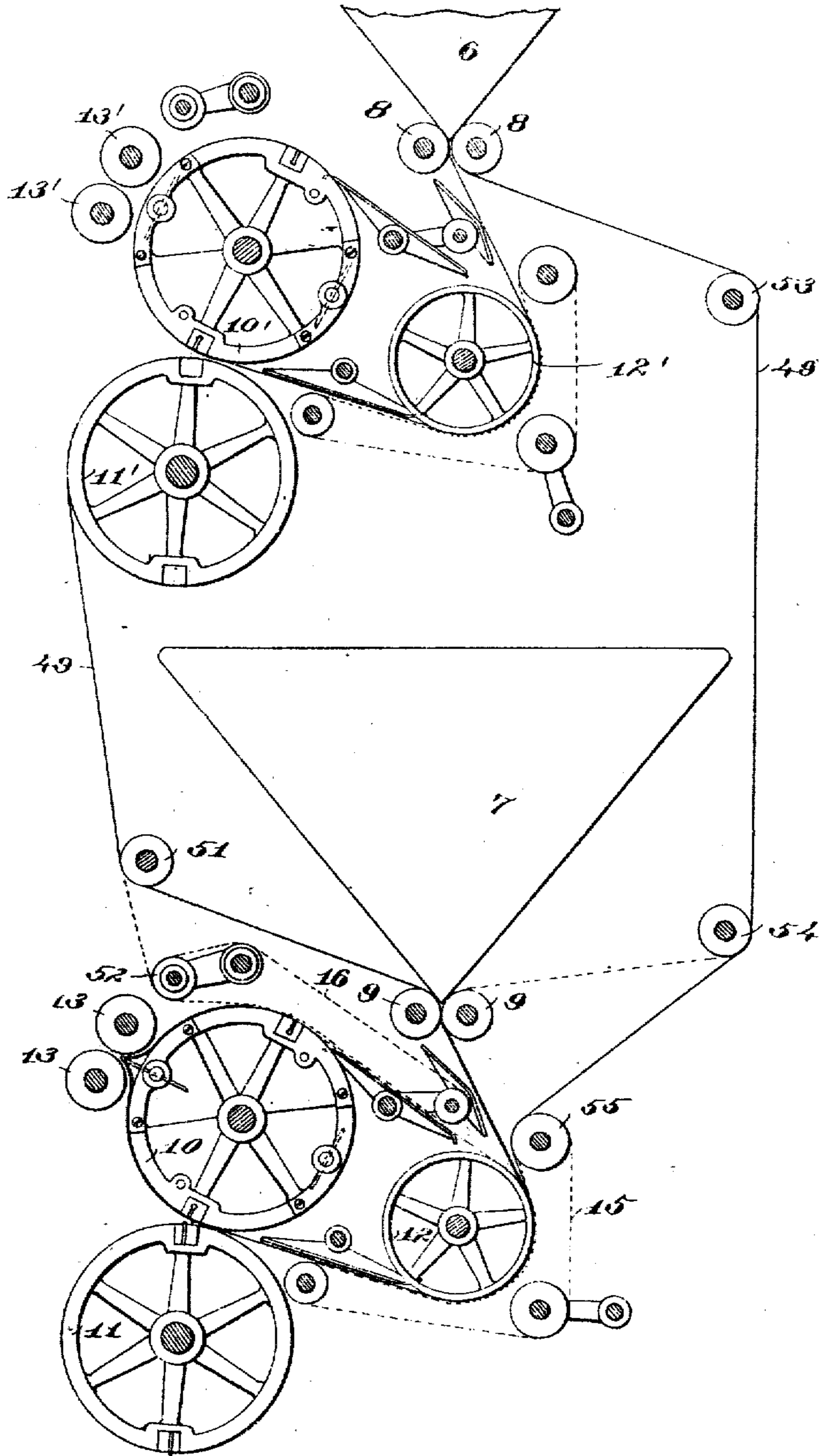
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6 SHEETS—SHEET 3.

Fig. 3.



WITNESSES

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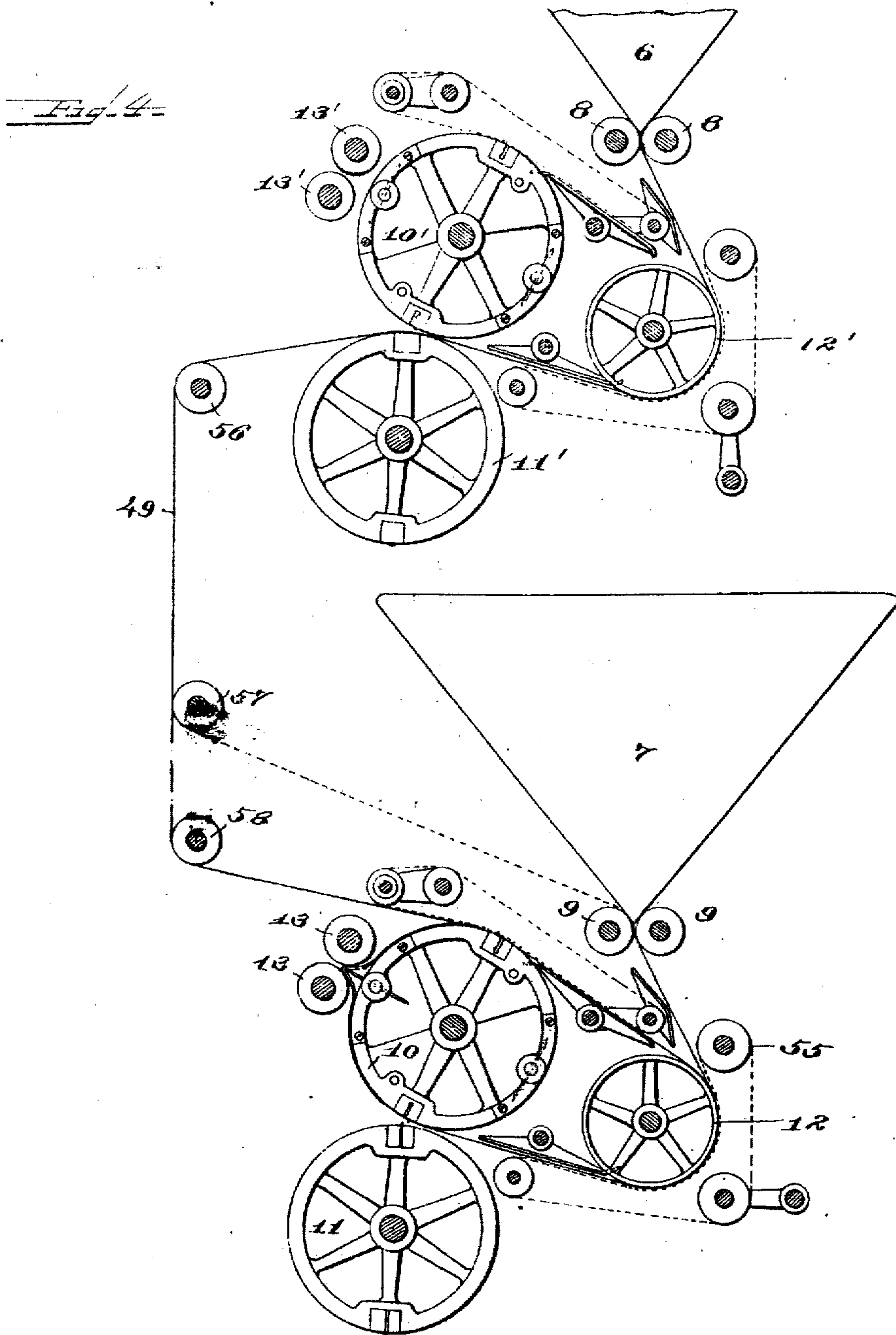
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DELIVERY APPARATUS FOR PRINTING PRESSES.

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6 SHEETS-SHEET 4.



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# UNITED STATES PATENT OFFICE.

SAMUEL G. GOSS, OF CHICAGO, ILLINOIS, ASSIGNOR TO GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## DELIVERY APPARATUS FOR PRINTING-PRESSES.

No. 812,923.

Specification of Letters Patent.

Patented Feb. 20, 1908.

Application filed February 10, 1900. Serial No. 4,740.

*To all whom it may concern:*

Be it known that I, SAMUEL G. GOSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Delivery Apparatus for Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to perfecting-presses of the multiple type, and is especially applicable to presses having a plurality of sets of printing mechanism placed one above another and arranged to be driven synchronously or separately.

One of the objects of my invention is to provide for collecting sheets from different webs after they have received one or more transverse folds and afterward giving the last fold to said sheets after they have been so collected. The advantage of this arrangement is that where a newspaper or pamphlet is printed in two or more sections all the sections of the paper after separately receiving their preliminary folds are finally folded together, so that they can be handled as a single paper, but nevertheless are readily separable without their being unfolded.

Further objects of my invention are to provide a construction which will admit of the operation above described and which will also permit webs or sheets from different longitudinal folders to be collected before the first transverse fold is made, to provide for separate or conjoint use of a plurality of sets of delivery apparatus, and for various arrangements and operations of delivery apparatus operated in connection with a plurality of sets of printing mechanism constructed and arranged to operate together or separately, so that papers of various sizes and made up of combinations of various webs may be produced.

In the accompanying drawings, Figure 1 is an end view of part of a printing-press, the cylinders, some of the driving mechanism, and the end of the press-frame being removed to better illustrate the delivery apparatus. Fig. 2 is a similar view of a part of one of the sets of delivery apparatus. Fig. 3 is a diagrammatic view illustrating certain of the ways in which the webs can be assembled. Fig. 4 is a similar view showing different ar-

rangements that may be made. Fig. 5 is a partial end view of a press embodying my invention; and Fig. 6 is a side elevation thereof, some parts being in section.

Referring to the drawings, 5 indicates the frame of a printing-press, and 6 7 longitudinal folders or formers mounted one above another therein. The former 6 operates in connection with an upper set of printing mechanism A, mounted in the frame 5, while the former 7 operates in connection with a lower set of printing mechanism B, mounted in said frame, as best shown in Fig. 6. Each of said sets of printing mechanism consists of two form-cylinders  $a$   $a'$   $b$   $b'$ , two impression-cylinders  $a^2$   $a^3$   $b^2$   $b^3$ , and suitable inking cylinders and rollers of the usual form for the form-cylinders. The cylinders of each set of printing mechanism are geared together in the usual way, and they are also arranged to be operated synchronously, intermediate gears  $c$   $d$  being provided for that purpose. The gear  $c$ , which is mounted on a stub-shaft so as to slide thereon, meshes with the gear of the cylinder  $b^2$  and with a portion of the gear  $d$ , which is a differential gear, as shown in Fig. 6. The gear  $d$  in turn meshes with the gear of the cylinder  $a^2$ , so that the two sets of printing mechanism may be connected to run in unison by moving the gear  $c$  into mesh with the two adjacent gears mentioned. By moving the gear  $c$  out on its shaft until it disengages said gears the two sets of printing mechanism are disconnected and may be operated separately, as hereinafter described.

The former 6 is provided at its apex with rollers 8 and at its base with a roller 8', both of which rollers are driven from the printing mechanism with which the former is used. For example, the rollers 8 of former 6 are driven from the inking-cylinder  $a^4$  of press A through a train of gears, as follows:  $a^4$   $a^5$   $a^7$   $a^8$   $a^9$ , shaft  $a^{10}$ , bevel-gears  $a^{11}$   $a^{12}$ , gears  $a^{13}$ ,  $a^{14}$ ,  $a^{15}$ ,  $a^{16}$ ,  $a^{17}$ ,  $a^{18}$ ,  $a^{19}$ ,  $a^{20}$ , and  $a^{21}$ , the latter two being carried by said rollers 8. The roller 8' is driven through gears  $a^{22}$ ,  $a^{23}$ ,  $a^{24}$ ,  $a^{25}$ ,  $a^{26}$ ,  $a^{27}$ ,  $a^{28}$ ,  $a^{29}$ ,  $a^{30}$ ,  $a^{31}$ ,  $a^{32}$ , and  $a^{33}$ , the latter being carried by the roller 8'. The gears  $a^{24}$  and  $a^{25}$  are on the same shaft, the latter being outside the press-frame and the former inside. One gear of each train, as  $a^4$  and  $a^{22}$ , is made to slide in its support, so that the rollers 8 8' may be disconnected from the print-

ing mechanism. The former 7 is provided at its apex with rollers 9 and at its base with a roller 9', both driven from press B. This is accomplished as follows: E indicates a main drive-shaft which extends transversely relatively to the press and carries a pulley or fast and loose pulleys e, by which it is driven from any suitable source of power. Said shaft carries a gear (not shown) which meshes with the gear of cylinder b<sup>1</sup> for driving said press B, and it also carries a bevel-gear e', which meshes with a bevel-gear b<sup>4</sup>, mounted on a shaft b<sup>5</sup>, which extends longitudinally of the press and carries a pinion b<sup>6</sup> at its other end, the latter driving the rollers 9 through gears b<sup>7</sup>, b<sup>8</sup>, b<sup>9</sup>, b<sup>10</sup>, b<sup>11</sup>, b<sup>12</sup>, b<sup>13</sup>, and b<sup>14</sup>. The roller 9' is driven from shaft b<sup>5</sup> through gear b<sup>9</sup> and gear b<sup>15</sup>, which meshes with it, the gear b<sup>15</sup> being connected with a bevel-gear b<sup>16</sup> on the same short shaft, the latter in turn meshing with a bevel-gear b<sup>17</sup>, slidable on the lower end of a vertical shaft b<sup>18</sup>, so as to move into and out of mesh with gear b<sup>19</sup>. Near the upper end of shaft b<sup>18</sup> is a bevel-gear b<sup>20</sup>, which meshes with a bevel-gear b<sup>21</sup>, which in turn drives pinions b<sup>22</sup>, b<sup>23</sup>, and b<sup>24</sup>, the latter being carried by the roller 9'. The shaft b<sup>18</sup> is also arranged to drive the rollers 8 and 8', it being provided at its upper end with a bevel-gear b<sup>25</sup>, movable on said shaft to engage or disengage bevel-gear a<sup>26</sup>, as shown in Figs. 5 and 6; but this is not claimed herein, as, broadly, it forms the subject-matter of another application. Set A of printing mechanism is directly connected to the main driving-shaft E, so that it may be operated separately from set B by a vertical shaft F, driven from shaft E by bevel-gears e<sup>27</sup> f, mounted on shafts E and F, respectively, the gear e<sup>27</sup> being arranged to slide into or out of mesh with gear f, as shown in Fig. 5. At its upper end the shaft F carries a bevel-gear f', which meshes with a similar gear f'', mounted on the shaft of cylinder a<sup>1</sup>, as indicated by dotted lines in Fig. 6. While the shaft F, with its connections, is intended primarily for driving press A when press B is to remain idle, obviously it may also be used to couple the two presses together.

From the foregoing description it will be seen that either set of printing mechanism A or B may be driven alone or the two sets of printing mechanism may be coupled together to operate in unison.

Each set of printing mechanism is provided with a set of delivery apparatus which is adapted to operate in unison therewith and is driven therefrom. 10 indicates a combined cutting, collecting, and folding cylinder, which forms a part of the set of delivery apparatus of the lower set of printing mechanism and coöperates with a cutting-cylinder 11 to sever the lower web transversely into sheets. The cylinder 10 coöperates with a

collecting-cylinder 12 to collect sheets and also to conduct them from the former 7 to a pair of folding-rollers 13, driven in the usual way and arranged in proximity to the cylinder 10. For the purpose of effecting the first transverse fold the cylinder 10 carries a folding-blade 14, operated by suitable mechanism of any well-known type to thrust sheets properly into the bite of the folding-rollers 13. The cylinder 10 also is provided with the usual impaling-pins for carrying the leading end of the web partly around said cylinder.

So far as that portion of the set of delivery apparatus thus far described is concerned it, separately considered, has heretofore been patented to me and is not herein separately claimed. It will be sufficient for present purposes to state that the web passing down from former 7, by which it receives its longitudinal fold, thence passes around cylinder 12 to the cylinders 10 11, between which it passes, its leading end being impaled by the pins and carried by said cylinder into position to receive its first transverse fold. When the center of the sheet, which is severed from the web by the knives carried by the cylinder 11, arrives opposite the meeting line of the folding-rollers 13, the folding-blade 14 acts to thrust the doubled edge of said sheet into the bite of said rollers, which seize it and carry it between said rollers, making the first transverse fold. Where no collecting is necessary, as where eight-page papers are to be produced, the cylinder 10 is provided with two folding-blades, as shown in Fig. 2. Where collecting is to be done, as is usually necessary in printing sixteen-page papers, one of the folding-blades of the cylinder 10 is silenced or entirely removed, as shown in Fig. 1. In collecting, certain sheets are carried back and superposed on the web, as follows: The sheet to be superposed is severed at its rear margin from the web by the action of one of the knives of the cutting-cylinder 11. At this time the severed sheet extends half-way around the cylinder 10. The sheet then passes back over guides 17 to cylinder 12, where it meets and is associated with the third succeeding sheet, the latter being as yet unsevered from the web. The assembled sheets then pass together under cylinder 12, between cylinders 10 and 12, where the unsevered sheet is severed from the web, and thence up partly around cylinder 10, where they are folded together transversely between rollers 13 by the folding-blade 14.

15 indicates tapes which are arranged below and partly around the cylinder 12 and serve to guide the web around said cylinder. 16 indicates similar tapes arranged above and partly around the cylinder 10 to guide the sheets around said cylinder.

17 indicates guides arranged below the

lower portion of the tapes 16 to strip and support the sheets passing from the cylinder 10 to the cylinder 12.

18 indicates a series of tapes running on rollers 19 20 21 and the lower folding-roller 13, said rollers being arranged so that the upper surfaces of the tapes run substantially in a horizontal plane from said rollers 13.

22 indicates tapes arranged above and in juxtaposition to the tapes 18, said tapes 22 running on rollers 23 24, the roller 24 being arranged opposite the roller 21.

25 indicates a guide extending above and parallel with the tapes 18 from the upper folding-roller 13 to near the tape-rollers 24.

26 indicates a folding-blade, and 27 a pair of folding-rollers, for imparting a second fold to the sheets. The upper portions of the tapes 18 and the lower portions of the tapes 22 extend between the folding-blade 26 and the folding-rollers 27, so that as the sheets after receiving their first transverse fold at the folding-rollers 13 are conducted between the tapes 18 and 22 in the direction indicated by the arrow in Fig. 1 they are in a position to be acted upon by the folding-blade 26. Suitable mechanism (not shown) is provided for operating the folding-blade 26 at the proper time, so that as the sheets are brought under it they are properly folded. Such operating mechanism does not form a part of my present invention and may be of any suitable form, so that it is not deemed necessary to show it.

35 The upper set of printing mechanism A is provided with a set of delivery apparatus similar to that just described, the corresponding parts of which are numbered with the corresponding prime numbers, with the exception that the tapes of the upper delivery apparatus, which extend from the folding-rollers 13' to the folding-blade 26', are arranged somewhat differently from the tapes 18-22, the tapes 22' being arranged to run on the upper folding-roller 13' and the roller 23', while the tapes 18' run on rollers 19', 20', and 21'. The delivery apparatus connected with the upper former 6 is provided with a switch 28, adjustably mounted on a shaft 29 and provided with a lever 30, by which the switch may be operated. Said switch is arranged so that it may be moved to intercept the sheets just after they pass between the folding-rollers 13', as shown in Fig. 1, and direct the folded sheets downward instead of permitting them to pass between the tapes 18' and 22'. When desired, however, the switch 28 may be adjusted so as not to intercept the sheets, in which case they will pass on from the folding-rollers 13' between the tapes 18' and 22' to the folding-blade 26'.

31 indicates tapes which run on rollers 32, 33, 34, 35, and 36. The rollers 32 are mount-

ed on the shaft 29, which carries the switch 28. The rollers 33, 34, and 35 are suitably mounted in the frame of the press, the roller 34 being mounted on a shaft 37, carried by rocking arms 38, as shown in Figs. 1 and 2. The rollers 36 are mounted on a shaft 39, carried by a swinging arm 40, pivotally supported in the frame of the press.

41 indicates a second set of tapes, which cooperate with the set of tapes 31 to form a path to conduct sheets from the folding-rollers 13' to the tapes 18 and 22 of the lower set of delivery apparatus or to the collecting-cylinder 10, as may be desired. Said tapes 41 are run on the rollers 13' 33 35 and rollers 42, 43, and 44. The rollers 42 are mounted on a shaft 45, carried by the swinging arm 40, which is suitably bifurcated to support the shafts 39 and 45 in parallelism and in proximity to each other, as shown in Figs. 1 and 2. The roller 44 is carried by swinging arms 50, mounted in the frame of the press, as shown in Fig. 1.

46 indicates a guide adapted to guide sheets from the rollers 36 and 42 when in the position shown in Figs. 1 and 2 to the upper surface of the collecting-cylinder 10.

47 indicates a guide adapted to conduct sheets from the rollers 36 42 to the rollers 21 24 when said rollers 36 42 are in the position shown in dotted lines in Fig. 2.

48 indicates the web from the lower former 7, and 49 the web from the upper former 6.

The operation of the apparatus as thus far described is as follows: When it is desired to deliver the product from the upper and lower sets of printing mechanism separately, the web 49 after passing over the former 6 is conducted around the cylinder 12' between the cutting-cylinders 10' 11' and the sheets are either folded separately or collected and folded. When folded separately, the cylinder 10' is provided with two folding-blades, as already described, each of which is operated by appropriate mechanism of any suitable well-known type to project the folded edge of the sheet into the bite of the rollers 13', after which the folded sheet passes between the tapes 18' 22' to the folding-blade 26', where it receives a second fold. For this operation the switch 28 is turned down out of operative position. The web from the lower set of printing mechanism after passing over the former 7 is treated in the same way by the lower set of delivery apparatus. When it is desired to associate the sheets printed by both sets of printing mechanism, the switch 28 is moved into the position shown in Fig. 1, its upper end extending slightly above the tapes 22'. The sheets received by the folding-rollers 13' are thereby deflected and caused to pass down between the adjacent surfaces of the tapes 31 41 to the guide 47, the rollers 36 42 being then in the position

shown in dotted lines in Fig. 2. This is accomplished by simply swinging the arm 40 to the left and adjusting the arms 38 and 50 to maintain the tapes at the requisite tension. From the guide 47 the sheets pass between rollers 21 and 24, where they meet the sheets coming from the lower cutting and collecting devices which have received their first transverse fold at the rollers 13. It will thus be seen that when the sheets from the two printing mechanisms are assembled both have already received a transverse fold. They are then conducted together to the folding mechanism 26, where they together receive the second fold. If it be desired to collect from the two sets of printing mechanism without first cutting and folding the sheets from the upper set of printing mechanism, both folding-blades of the cylinder 10' are silenced and the cutting-blades of the cylinder 11' are removed. The leading end of the web is then passed around the lower folding-roller 13' and down between the tapes 31-41 to the rollers 36-42, which are then in the position shown in Fig. 1 and in full lines in Fig. 2. The web then passes over guide 46 to the upper surface of the cylinder 10, thence between said cylinder and tapes 16 over guides 17 to the cylinder 12, where it meets the web from the former 7 and is then cut, folded, and delivered with said web.

In Figs. 3 and 4 I have illustrated several modified arrangements for securing the assembling of the products of the two sets of printing mechanism in web form. In one arrangement instead of conducting the web from the former 6 over the lower folding-roller 13', as just described, the web is conducted around the cutting-cylinder 11', which is divested of its cutting-blades, and thence passes down to the former 7, being conducted over a guide-roller 51 to the rollers 9 at the apex of the former 7, between which it passes with the web from the former 7. In lieu of this arrangement the web 49 may pass from the cylinder 11' around a tape-roller 52, which carries the tapes 16 directly to the cylinder 10, passing between said cylinder and the tapes 16, as shown in dotted lines in Figs. 1 and 3. Still another arrangement consists in conducting the web 49 from the rollers 8 at the apex of the former 6 over guide-rollers 53-54, arranged at one side, to the rollers 9, as shown in dotted lines in Fig. 3, or over a third guide-roller 55 to the cylinder 12, as shown in full lines in Fig. 3. The roller 55 is preferably one of the rollers which carry the tapes 15. The arrangement just described avoids conducting the web through a part of the collecting mechanism on the upper set of printing mechanism.

All of the arrangements illustrated in Fig. 3 avoid the use of tapes for conducting the web from the former 6 to the delivery appa-

atus of the former 7. Fig. 4 illustrates a slightly different arrangement by which the web 49 after passing around the cylinder 12' and over the cutting-cylinder 11' is conducted over guide-rollers 56-57, arranged at one side of the press, to the rollers 9 at the apex of the former 7, as illustrated partly in dotted lines in Fig. 4, or is conducted over rollers 56-58 directly to the collecting apparatus of the former 7, as shown in full lines in Fig. 4. This arrangement also avoids the use of tapes for conducting the web from the upper former to the delivery mechanism of the lower former.

It will of course be understood that whenever the products of a plurality of sets of printing mechanism are delivered together the two sets of printing mechanism are connected to run synchronously, as hereinbefore described, and that they are disconnected when the sets of delivery apparatus are operated independently of each other. It will be understood further, that while I have shown only two sets of printing mechanism and two sets of delivery apparatus any desired number may be provided and operated, as described.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. In a delivery apparatus for printing-presses, the combination with a plurality of longitudinal folders arranged one above another of a plurality of transverse-folding devices, and means for assembling sheets from said folding devices after they have been folded transversely, substantially as described.

2. In a delivery apparatus for printing-presses, the combination with a plurality of longitudinal folders arranged one above another of a plurality of transverse-folding devices, means for assembling sheets from said folding devices after they have been folded transversely, and means for imparting an additional fold to said assembled sheets, substantially as described.

3. In a delivery apparatus for printing-presses, the combination of a plurality of longitudinal folders arranged one above another, transverse-folding mechanism, means for either assembling sheets from said transverse-folding mechanism after they have been folded transversely, or for assembling longitudinally-folded webs before folding them transversely, substantially as described.

4. In a delivery apparatus for printing-presses, the combination of a plurality of sets of printing mechanism, a set of delivery apparatus for each of said sets of printing mechanism, each of said sets of delivery apparatus being adapted to separately deliver the product of the set of printing mechanism with which it is connected each of said sets of delivery apparatus comprising transverse cutting and folding mechanism, a second folding

device cooperating with each of said sets of delivery apparatus for folding the sheets again after they have received the first transverse fold, and means for assembling sheets from said sets of delivery apparatus before receiving the second fold and after they have received the first transverse fold, substantially as described.

5. In a delivery apparatus for printing-presses, the combination of a plurality of sets of printing mechanism arranged one above another, means for connecting and disconnecting said sets of printing mechanism so that they may be run together or independently, a set of delivery apparatus for each of said sets of printing mechanism, each of said sets of delivery apparatus comprising mechanism for severing the web transversely and for imparting the first transverse fold thereto, and means for associating the sheets from one of said sets of delivery apparatus with those of another of said sets of delivery apparatus after they have received a transverse fold, substantially as described.

6. In a printing-press, the combination of a plurality of sets of printing mechanism arranged one above another, means for running said sets of printing mechanism separately or together, means for folding the webs of said printing mechanisms longitudinally, transverse-folding mechanism for each set of printing mechanism, means for associating transversely-folded sheets from one of said transverse-folding mechanisms with those of another of said transverse-folding mechanisms, and means for conducting a web from one of said sets of printing mechanism, after it has been folded longitudinally, to and associating the same with the web of another of said sets of printing mechanism, means for cutting the associated webs into sheets and folding said sheets transversely.

7. In a printing-press, the combination of a plurality of sets of printing mechanism, a set of delivery apparatus for each of said sets of printing mechanism, each set of delivery apparatus having transverse-folding mechanism, means for running said sets of printing mechanism together or separately, means for delivering the product of each of said sets of printing mechanism independently, and means for conducting sheets, after folding them transversely, from one of said sets of delivery apparatus to the other, substantially as described.

8. In a printing-press, the combination of a plurality of sets of printing mechanism arranged one above another, means for driving said sets of printing mechanism synchronously, a set of delivery apparatus connected with each of said sets of printing mechanism, means for delivering the product of each of said sets of printing mechanism independently of the other, mechanism for conduct-

ing the product of one of said sets of delivery apparatus to another set of delivery apparatus after it has received a transverse fold, and a switch for controlling the operation of said delivery apparatus, substantially as described.

9. In a printing-press, the combination of a plurality of sets of printing mechanism, means for driving said sets of printing mechanism independently or together, a set of delivery apparatus for each of said sets of printing mechanism, and associating mechanism arranged to be operated to associate the products of said sets of printing mechanism either before or after they receive the first transverse fold, substantially as described.

10. In a printing-press, the combination of a plurality of sets of printing mechanism arranged one above another, means for driving said sets of printing mechanism separately or together, a set of delivery apparatus connected with each of said sets of printing mechanism, means for either conducting the web from one of said sets of printing mechanism to and associating it with the web of another of said sets of printing mechanism and afterward cutting the associated webs into sheets, or for associating separate sheets from one of said sets of printing mechanism with those of another of said sets of printing mechanism, substantially as described.

11. The combination with printing mechanism, of a plurality of delivery mechanisms arranged one above another, each of said delivery mechanisms having transverse-folding devices, and means operating in connection therewith for delivering sheets therefrom, means for assembling sheets from said folding devices after they have been folded transversely, and means for imparting an additional fold to the assembled sheets, substantially as described.

12. In a delivery apparatus for printing-presses, the combination of a plurality of longitudinal folders, a plurality of transverse-folding mechanisms, and means for either assembling sheets from said transverse-folding mechanisms after they have been folded transversely, or for assembling longitudinally-folded webs before folding them transversely, substantially as described.

13. In a delivery apparatus, the combination of a plurality of folding devices for imparting the first fold to sheets after they have been severed from the web, means for supplying sheets to said folding devices, and means for conducting folded sheets from one of said folding devices to and associating them with folded sheets from the other folding device, and then again folding the associated sheets, substantially as described.

14. The combination with a plurality of sets of printing mechanism arranged one above another, of a plurality of transverse-

folding devices, separate means operating in connection with each of said transverse-folding devices for delivering sheets therefrom, means for assembling sheets from said folding devices after they have been folded transversely, and means for imparting an additional fold to the assembled sheets, substantially as described.

15. In a printing-press, the combination of a plurality of sets of printing mechanism, mechanism operating in connection with each of said sets of printing mechanism for folding sheets after they have been severed from the web, and means for conducting folded sheets from one of said folding mechanisms to the other folding mechanism and there imparting to them an additional fold, substantially as described.

16. In a printing-press, the combination of a plurality of sets of printing mechanism, mechanism operating in connection with each of said sets of printing mechanism for folding sheets after they have been severed from the web, and means for conducting folded sheets from one of said folding mechanisms to the other folding mechanism, and there folding them with sheets from the other set of printing mechanism, substantially as described.

17. In a delivery apparatus, the combination of a plurality of folding devices for imparting the first fold to sheets after they have been severed from the web, means for driving said folding devices separately or together, and means operating in connection with each of said folding devices for separately delivering sheets or for assembling and folding together sheets from said folding devices, substantially as described.

18. In a printing-press, the combination of a plurality of sets of printing mechanism, means for running said sets of printing mechanism separately or together, transverse-folding mechanism for each set of printing mechanism, means for associating transversely-folded sheets from one of said transverse-folding mechanisms with those of another of said transverse-folding mechanisms, and means for conducting a web from one of said sets of printing mechanism to and associating it with the web of another of said sets of printing mechanism, substantially as described.

19. In a printing-press, the combination of a plurality of sets of printing mechanism, means for running said sets of printing mechanism separately or together, means for folding the webs of said printing mechanisms longitudinally, transverse-folding mechanism for each set of printing mechanism, means for associating transversely-folded sheets from one of said transverse-folding mechanisms with those of another of said transverse-folding mechanisms, and means for conducting a web from one of said sets of printing mechanism, after it has been folded longitu-

dinally, to and associating the same with the web of another of said sets of printing mechanism, means for cutting the associated webs into sheets and folding said sheets transversely.

20. In a printing-press, the combination of a plurality of sets of printing mechanism, means for driving said sets of printing mechanism separately or together, a plurality of sets of delivery apparatus, each having transverse-folding mechanism, means for conducting a web from one of said sets of printing mechanism to and associating the same with the web of another of said sets of printing mechanism or for conducting the webs from the different sets of printing mechanism to different sets of delivery apparatus and separately severing them into sheets and folding the sheets transversely, and afterward associating transversely-folded sheets from said sets of delivery apparatus, substantially as described.

21. In a delivery apparatus for printing-presses, the combination of a plurality of longitudinal folders, a plurality of transverse-folding mechanisms, and means for either assembling folded sheets from said transverse-folding mechanisms after they have been folded transversely or for assembling longitudinally-folded webs, substantially as described.

22. In a delivery apparatus for printing-presses, the combination of a plurality of sets of printing mechanism, means for connecting and disconnecting said sets of printing mechanism so that they may be run together or independently, a set of delivery apparatus for each of said sets of printing mechanism, each of said sets of delivery apparatus comprising mechanism for severing the web transversely and for imparting the first transverse fold thereto, and means for associating the sheets from one of said sets of delivery apparatus with those of another of said sets of delivery apparatus after they have received the first transverse fold, substantially as described.

23. In a printing-press, the combination of a plurality of sets of printing mechanism, means for driving said sets of printing mechanism synchronously, a set of delivery apparatus connected with each of said sets of printing mechanism, means for delivering the product of each of said sets of printing mechanism independently of the other, mechanism for conducting the product of one of said sets of delivery apparatus to another set of delivery apparatus after they have received the first transverse fold, and a switch for controlling the operation of said delivery apparatus, substantially as described.

24. In a printing-press, the combination of a plurality of sets of printing mechanism, means for driving said sets of printing mechanism,

anism separately or together, a set of delivery apparatus connected with each of said sets of printing mechanism, means for either conducting the web from one of said sets of printing mechanism to and associating it with the web of another of said sets of printing mechanism and afterward cutting the associated webs into sheets, or for associating separate sheets from one of said sets of printing mechanism with those of another of said sets of printing mechanism, substantially as described.

25. In a printing-press, the combination of printing mechanism arranged to print a plurality of products, a plurality of sets of delivery apparatus, and associating mechanism arranged to be operated to associate said products either before or after they receive the first transverse fold, substantially as described.

SAMUEL G. GOSS.

Witnesses:

ALBERT H. ADAMS,  
JOHN L. JACKSON.