

No. 639,801.

Patented Dec. 26, 1899.

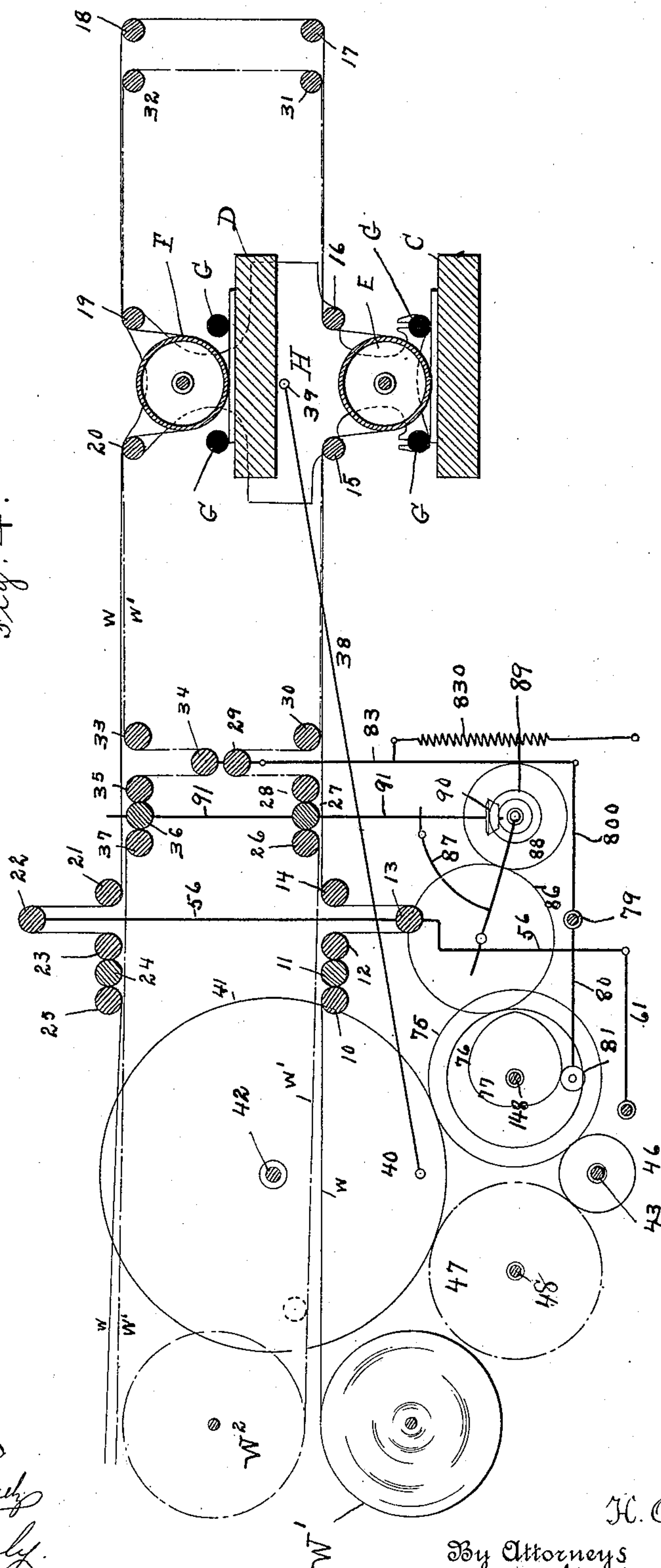
H. A. W. WOOD.
PRINTING MACHINE.

(Application filed Feb. 26, 1894. Renewed May 27, 1899.)

(No Model.)

4 Sheets—Sheet 3.

Fig. 4.



Witnesses
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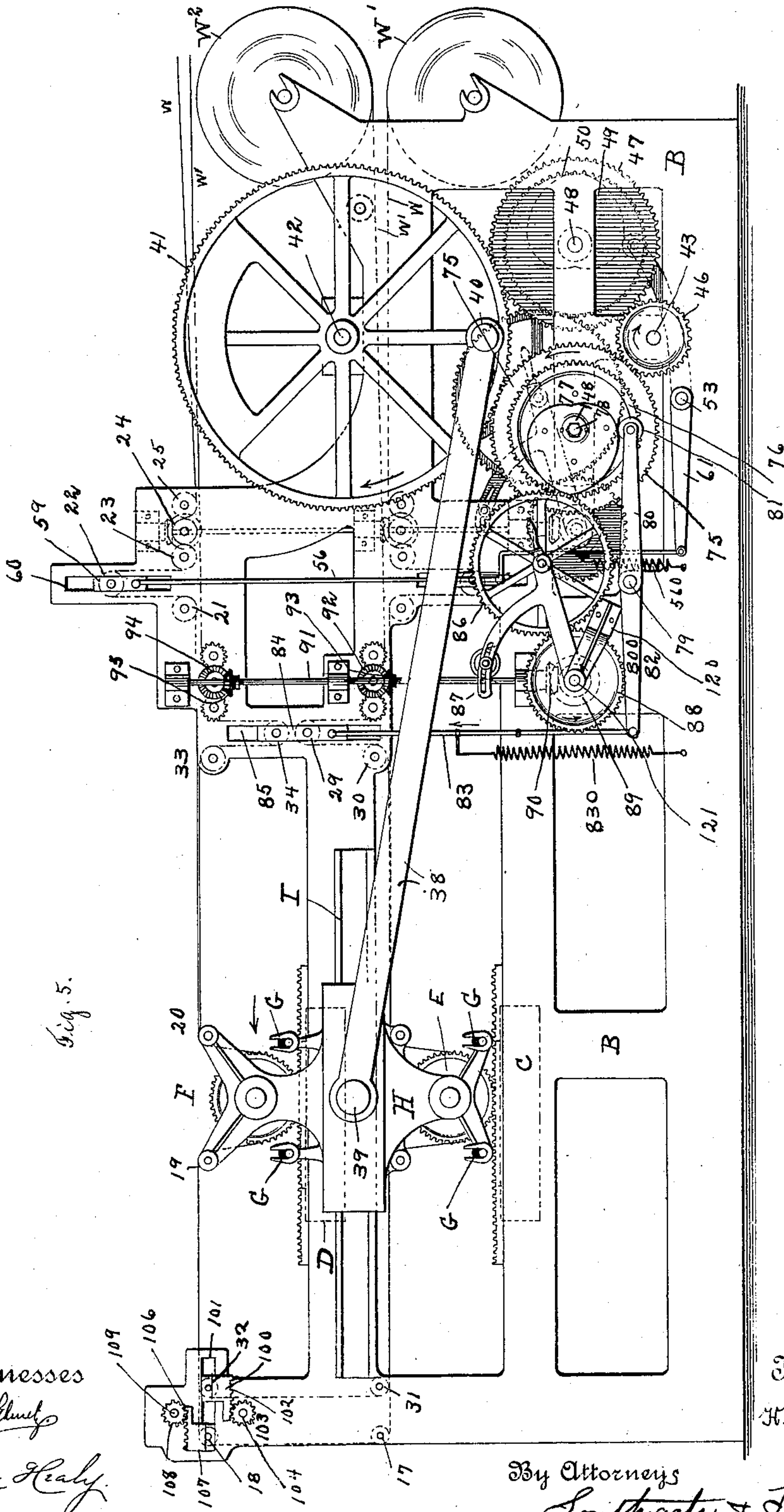


Fig. 5.

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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO THE CAMPBELL PRINTING PRESS AND MANUFACTURING COMPANY, OF SAME PLACE.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 639,801, dated December 26, 1899.

Application filed February 26, 1894. Renewed May 27, 1899. Serial No. 718,535. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Improvement in Printing-Machines, of which

5 The following is a specification.
The aim of my invention is to improve traveling-cylinder web-printing presses; and the same consists in providing means so that a single web or a plurality of webs can be run through such printing couple or couples and different lengths or numbers of forms used for each web, producing a different product from
15 each web. To do this, I provide separate web-manipulating mechanisms for each web and make each web-manipulating mechanism adjustable. I also make one or more of the web-manipulating mechanisms extend across the press, so that a web the width of the machine may be manipulated. Thus a traveling-cylinder web-press arranged after my invention may be used for a single width of web up to the extent of the machine, adjusted to get any
25 desired length of sheet, or for a plurality of webs side by side, from each of which webs sheets of any desired length within the range of the machine can be produced. It will be seen that all these changes and adjustments can be made simply in the manipulating devices for the web and that the printing mechanism does not have to be adjusted or altered in any degree, no matter whether one or more webs are used and no matter what length or
35 width of sheet is produced.

Referring to the drawings, which illustrate a machine arranged after my invention, Figure 1 is a plan view of the general arrangement. Fig. 2 is a side elevation. Fig. 3 is a detail illustrating the interchangeable part for varying the length of the sheets. Fig. 4 is a section taken on the line 4 4 of Fig. 1, and Fig. 5 is a side elevation from the opposite side relatively to Fig. 2.

45 In the class of web-printing presses to which I have referred the width of the sheet can be varied by varying the width of the web used, and of course a plurality of webs could be used in the ordinary machine; but, as before explained, I have provided a separate web-manipulating mechanism for each of a plurality

of webs, and I preferably make each web-manipulating mechanism adjustable, so that by varying the length of the forms used the length of the sheets of each web can be varied. This enables me to obtain a full-width product upon a single web of any desired width or a product of any desired length and width within the limits of the machine upon each of a plurality of webs.

Referring now to the drawings and in detail, I will describe the machine which has been chosen to illustrate one specific application of my invention.

In detail, A and B represent two side frames of any desired shape. Arranged between these two side frames in any desired relative location are two type-beds, as C and D, and these beds, as specifically shown, are arranged horizontally and one above the other. Coöperating with the bed C is a traveling impression-cylinder E, and coöperating with the bed D is the traveling impression-cylinder F, these two impression-cylinders being mounted in the reciprocating carriers H, which carriers are mounted on guides I, arranged on the side frames, the arrangement of these parts being well understood.

At each side of each impression-cylinder may be arranged a form-inking roller G, as shown, and any suitable inking apparatus may be used, so that the forms will be properly inked for each impression, the details of the inking apparatus not being necessary here to show and discuss at length.

It will be seen that at the ends of the side frames are arranged bearings in which two web-rolls can be mounted.

In the press are arranged two web-manipulating mechanisms.

By the term "web-manipulating mechanism" I mean to include, broadly, any suitable mechanism that will manipulate the web.

By the term "feeding mechanism" I mean to include either the mechanism which feeds the web into or out of the press, as designated, and by the term "web-shifting mechanism" I mean to include the mechanism which gives the web its proper movement while the printing mechanisms are not in impression.

It will be seen that in the arrangement shown I have provided two independent web-

manipulating mechanisms, each consisting of a continuously-running feeding-in and feeding-out mechanism for the web, acting in conjunction with each of which is a web-shifting mechanism, which will replace the web or webs around the cylinder or cylinders while the printing mechanism is out of impression. These two web-manipulating mechanisms are practically independent of each other, and each is made adjustable, as hereinafter described, so that the length of sheet printed on each web can be varied as desired.

The first web-manipulating mechanism consists of the continuously-running feeding-in rollers 10, 11, and 12, the looping-roller 13 and the guide-roller 14, and the parts hereinafter described. From the guide-roller 14 the web passes to the guide 15, mounted in the carriers H, underneath the impression-cylinder E, and then up over the guide 16, also carried by the carriers. From the guide 16 the web passes to the stationary guide or roll 17, up over the adjustable register-roll 18, then around the guide 19, carried by the carriers, underneath the impression-cylinder F, and around the guide or roll 20, also carried by the reciprocating carriers H. From the guide or roll 20 the web passes to the stationary guide or roll 21, up over the looping-roller 22, and then may be delivered by any suitable delivery mechanism, as the continuously-running rollers 23, 24, and 25. This web-manipulating mechanism is preferably made to extend the full width of the press, so that any width of web within the full limit of the machine can be led through the press and handled by the same. This web-manipulating mechanism is also made adjustable, so that, if desired, any length of sheet can be printed on the web. It will be seen that the loopers 13 and 22 of this web-manipulating mechanism are arranged so that the loops have their ends away from each other.

The second web-manipulating mechanism will now be described.

26, 27, and 28 represent continuously-running feeding-in rollers, 29 a looping feeding-in roller, and 30 a guide or roll to which the web is led from the looping-roller 29. From the roller 30 the web passes around the guide 15, under the impression-cylinder E, and up over the guide 16. From the guide or roll 16 the web manipulated by the second web-manipulating mechanism passes up over the guide 31 to the adjustable registering-roll 32. From this point the web carried by the second web-manipulating mechanism passes over the guide 19, under the impression-cylinder F, and up over the guide 20. From this point the web passes to the stationary guide or roll 33, under the looping-roller 34, and then to any suitable delivery mechanism, as the continuously-running rollers 35, 36, and 37. It will be seen that the loopers 29 and 34 of this second web-manipulating mechanism are so arranged that the points or ends of the loops will face each other. This second web-manipulating mechanism

is also, preferably, extended the entire width of the press and is also, preferably, made adjustable.

By the peculiar arrangement of loopers pointed out it will be seen that the loopers of one web-manipulating mechanism will not strike or interfere with the web carried by the other web-manipulating mechanism.

The gearing for driving the various apparatus before referred to may be arranged as follows: Each of the carriers H may have a wrist-pin 39 arranged therein, and a link or pitman 38 connects the same to crank-pins 40, carried by the crank-gears 41, which are mounted on the ends of the shaft 42, journaled in suitable bearings in the side frames.

43 represents a shaft which may be made the driving-shaft of the machine and which may have tight and loose pulleys 44 and 45 arranged thereon, by which means power may be applied to operate the machine.

On each end of the shaft 43 is arranged a pinion 46, the front pinion of which meshes with a gear 47, which is mounted on the end of a transverse shaft 48, and this gear 47 meshes with and drives the front crank-gear 41. The pinion or gear 46 on the rear end of the shaft 43 meshes with and drives a gear 75, mounted on the back end of the transverse shaft 48, and this gear 75 meshes with and drives the rear crank-gear 41. The ratio between the gears 41, 47, and 75 is preferably made two to one, so that the web-manipulating mechanisms will properly act so that the web or webs will be shifted or respaced when the cylinder or cylinders is or are out of impression at either end of the bed or beds.

By the gearing before described the impression-cylinders will be moved forward and backward over the form-beds.

The gearing for driving the web-manipulating mechanism first described may be arranged as follows: The end of the shaft 48 on what I term the "front" side of the press is arranged to receive a change cam and gear 49 and 50, which parts constitute a single piece, which may be held in place on the end of the shaft 48 by means of a suitable key and nut 51. The gear 50 has a hub 52 extending into the cam 49, as shown, and these two parts are rigidly fastened together. As many of these change gears and cams are provided as it is desired to obtain various lengths of sheets from this first web-manipulating mechanism, and it will be seen from the description which hereinafter follows that all that is necessary to vary the length of the sheet manipulated by this first web-manipulating mechanism is to vary or change this single piece or part.

53 represents a transverse shaft, on the front end of which is mounted an arm 54, which carries a roll 55, which bears on the cam 49. Also mounted on this shaft 53 are arms 540 and 61, which connect by suitable links, as 56, to a block 57, which is mounted in suitable guideways 58 in the frames, and also to

blocks 60, which are mounted in suitable ways 59 in the frames. These blocks 57 and 60 carry the looping-rollers 13 and 22 of the first web-manipulating mechanism, and suitable 5 springs 560 may be used to keep the roller 55 properly in engagement with the cam.

62 represents a suitable sweep which carries an intermediate 63, which is adapted to mesh with the gear 50, and by setting the 10 sweep the gear 63 can be made to mesh with various-sized gears 50. The sweep 62 is mounted on a shaft 65, which is journaled in a bracket 66 and in the frame A, and also mounted on this shaft 65 is a gear 64, which 15 is in constant engagement with the intermediate 63. Also arranged on this shaft 65 is a bevel-gear 67, which meshes with a bevel-gear 68, fastened on the lower end of a vertical shaft 69, mounted in suitable bearings upon the frame A, as shown. From this vertical 20 shaft the continuously-running feeding-in rollers 10, 11, and 12 may be driven by means of bevel-gears 70 and 71, and also the continuously-running delivery-rollers may be 25 driven, as by means of the bevel-gears 72 and 73. By this means it will be seen that the web-manipulating mechanism is controlled by the single change-piece and that by varying this single change-piece the speed of the 30 continuously-feeding-in and continuously-feeding-out rollers and the action of the loopers are properly varied, so that the length of the sheet manipulated by this first manipulating mechanism may be quickly and readily 35 adjusted by changing this single piece.

The gearing for driving and adjusting the second web-manipulating mechanism is substantially like that described in connection with the first manipulating mechanism and 40 is arranged at the back of the press, as shown in Fig. 5.

On the rear end of the shaft 148 is fitted a change gear and cam 76 and 77, which may be held in place by a nut 78 and which is arranged substantially like the change gear and 45 cam 50 and 49 of the first web-manipulating mechanism.

79 represents a transverse shaft, on the end of which is arranged an arm 80, which carries 50 a roll 81, bearing on the change-cam 77. Also arranged on this shaft 79 are arms 800 and 86, which connect by suitable links or connections 83 to blocks 84, mounted in suitable bearings 85 in the frames, and which blocks 55 carry the looping-rollers 29 and 34, and by this means the loopers of the second web-manipulating mechanism will be properly actuated. Suitable springs 830 may be arranged to keep the roller 81 against the cam, as shown.

60 87 represents a suitable sweep which carries an intermediate 86, which intermediate, by setting the sweep, is adapted to mesh with the change-gear 76. This sweep is mounted on a shaft 121, which is journaled in a bracket 65 120 and in the side frame B, and mounted on this shaft is a gear 88, which is in constant

mesh and engagement with the intermediate 86. By this means any desired change-gear 76 can be used, and by setting the sweep it can transmit motion to the second continuously-running feeding-in and feeding-out 70 mechanisms. Also arranged on the shaft 121 is a bevel-pinion 89, which meshes with and drives a bevel-pinion 90, arranged on the vertical shaft 91, and from this vertical shaft 91 75 the continuously-running feeding-in rollers of the second manipulating mechanism may be driven by means of the bevel-gears 92 and 93, and the second continuously-running feeding-out mechanism may be driven by means 80 of the bevel-gears 94 and 95. Thus the second web-manipulating mechanism can be adjusted for any desired length of sheet.

The registering-roll 18 of the first web-manipulating mechanism is mounted in suitable 85 blocks 106, which are mounted in ways 101 in the frames A and B, and these blocks 106 have racks 107, engaging which are pinions 108, arranged on a transverse shaft 109, journaled in the frames. Engaging one of the pinions 90 108 is a worm 110, which may be manipulated by any suitable means, and by this means the registering-roll 18 can be adjusted. The registering-roll 32 of the second web-manipulating mechanism is mounted in blocks 100, 95 which also run in the ways 101. These blocks have teeth 102, which engage pinions 103, arranged on the transverse shaft 104. Engaging one of these pinions 103 is a worm 105, which may be manipulated in any suitable 100 way, and by this means the registering-roll 32 can be properly adjusted. By this means it will be seen that the registering-roll of each web-manipulating mechanism can be adjusted independently of the other. 105

By the arrangements thus described it will be seen that the press can be arranged for a great variety of work. For instance, a full-width web can be carried through the machine and manipulated either by the first or 110 second set of web-manipulating mechanisms, as desired, and, if desired, when only one web-manipulating mechanism is in use the other web-manipulating mechanism can be rendered inoperative by removing the change 115 gear and cam of the same.

When only a single web is used in the machine, the same can of course be made of any width desired, and any length of sheet can be printed by adjusting the change-gearing. 120 Further, it will be seen that two independent webs can be led through the machine and each manipulated by one of the web-manipulating mechanisms. The width of these webs can be made as desired, provided the sum of the 125 same is not greater than the total width of web that can be run through the machine—for instance, a one-quarter-width web and a three-quarter-width web may be used, a one-third width web and a two-third-width web 130 may be used, or each web may be made of one-half the capacity of the press. Further,

it will be seen that the length of sheet produced on either web can be easily adjusted by the gearing before described.

The two webs need not necessarily be of such added width as to equal the full capacity of the machine. They may be of any width, provided the added widths do not exceed the full capacity of the machine.

As shown, the web w' , led from the highest web-roll W^2 , is wider than the web w led from the web-roll W' . The web w' is led through the parts I have termed the "second web-manipulating mechanism," and the web w is led through the parts I have termed the "first web-manipulating mechanism." This arrangement greatly increases the capacity of presses of the class described, for many times it is desired to have independent lengths, and, further, this arrangement does not interfere with the press being used to print on a single web, which can be made of any width up to the capacity of the machine.

The relative arrangements of the printing mechanisms may be greatly varied and departed from, the same not being essential to my invention.

The feeding mechanisms are not necessarily continuous feeding-in and feeding-out mechanisms, as intermittent devices could be substituted therefor and still come within the scope of my invention.

Any system of gearing that will give, preferably, a various length of sheet, as desired, can be used without departing from the scope of my invention.

As I have used the term "web-manipulating device" or "web-manipulating mechanism" in this specification and accompanying claims I mean to include by the same any mechanism that will properly manipulate and control the web in the machine, and where I have used the term "web-feeding device" I have reference to the mechanism that either feeds the web into or out of the press or which performs both of these operations, and where I have used the term "web-shifting device" I have reference to the mechanism which gives the web its intermittent action. By this terminology or nomenclature it will be seen that the term "web-manipulating device" covers any mechanism which will control and properly manipulate a web.

Many other forms of web-manipulating mechanisms besides that shown are known and can be used without departing from the scope of my invention as expressed in the claims. The details and arrangements herein described may be greatly varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination in a web-printing press of a form-bed, a traveling impression-cylinder coacting therewith, guides whereby a full-

width web or two independent webs can be led through the machine, two web-manipulating devices, and means whereby the same may be set so that a different length of sheet can be produced on each web when two webs are run through the machine without changing or altering the printing mechanism, substantially as described.

2. The combination in a web-printing press of two form-beds, a traveling impression-cylinder coacting with each form-bed, guides whereby a full-width web or two independent webs can be led through the printing-couples, two web-manipulating devices, and means whereby the same may be set so that a different length of sheet can be produced on each web when two webs are run through the machine without changing or altering the printing mechanism, substantially as described.

3. The combination in a web-printing press of a form-bed, a traveling impression-cylinder coöperating therewith, guides whereby two independent webs can be led through the machine, a web-manipulating device for each web, and means whereby the lengths of the sheets printed on each web can be varied, substantially as described.

4. The combination in a web-printing press of two form-beds and two traveling impression-cylinders, guides whereby two webs can be led through the printing-couples, a separate web-manipulating device for each web, and means whereby the lengths of sheets printed on each web can be varied, substantially as described.

5. The combination of a web-printing press of two form-beds, a traveling impression-cylinder coacting with each form-bed, guides whereby two independent webs can be led through the printing-couples, and a separate web-manipulating device for each web extending the full width of the machine, substantially as described.

6. The combination in a web-printing press of two form-beds, a traveling impression-cylinder coacting with each form-bed, guides whereby two independent webs can be led through the printing-couples, separate web-manipulating devices for each web extending the full width of the machine, and means for adjusting each web-manipulating mechanism, substantially as described.

7. The combination in a web-printing machine of the class described of two independent web-manipulating mechanisms each comprising a feeding-in and feeding-out mechanism, and a web-shifting device composed of two loopers, the loops of one manipulating device facing oppositely or turned oppositely from the loops of the other web-manipulating mechanism, substantially as described.

8. The combination with a web-printing press of the class described of two web-manipulating devices, each extending the entire width of the machine, and a registering-roll for

each manipulating mechanism also extending the full width of the machine, substantially as described.

5 9. The combination in a web-printing press of a form-bed, a traveling impression-cylinder coacting therewith, guides whereby two independent webs can be led through the machine, and two manipulating devices, each consisting of continuously-running feeding-
10 in rolls and continuously-running feeding-out rolls, two loopers, and means for properly actuating the loopers, substantially as described.

15 10. The combination in a web-printing press of two form-beds, a traveling impression-cylinder coacting with each form-bed, guides

whereby two independent webs can be led through the printing-couples, separate web-manipulating devices for each web extending the full width of the machine, each consisting 20 of means for continuously feeding the web into and out of the press, two loopers, and means for properly actuating the loopers, substantially as described.

In testimony whereof I have hereunto set 25 my hand in the presence of two subscribing witnesses.

H. A. WISE WOOD.

Witnesses:

LOUIS W. SOUTHGATE,
E. M. HEALY.