

L. W. SOUTHGATE.  
APPARATUS FOR HANDLING OFFSET WEBS.

No. 560,945.

Patented May 26, 1896.

Fig. 1.

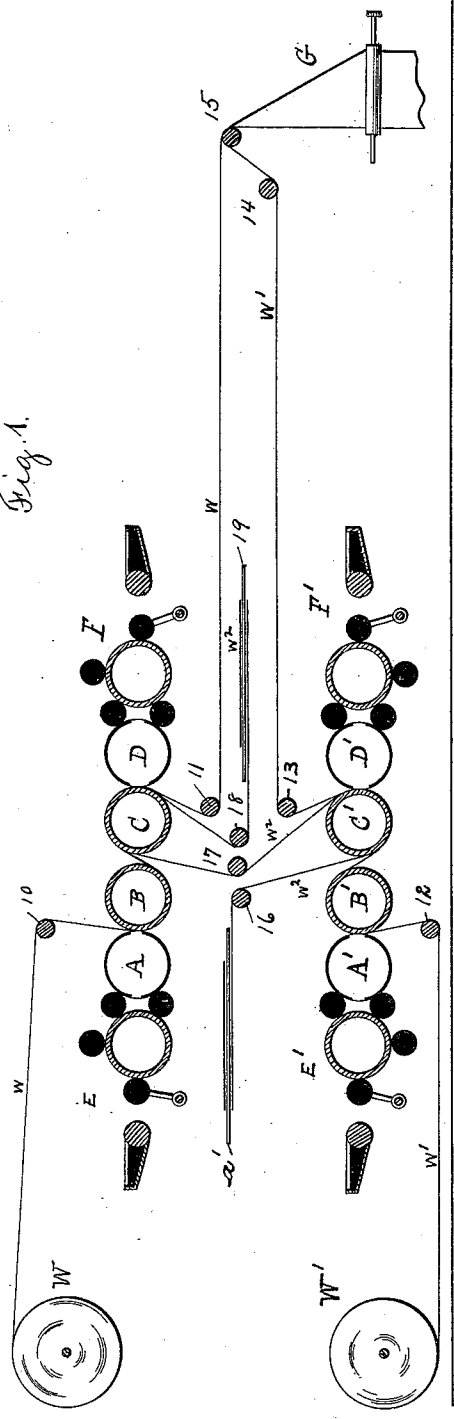
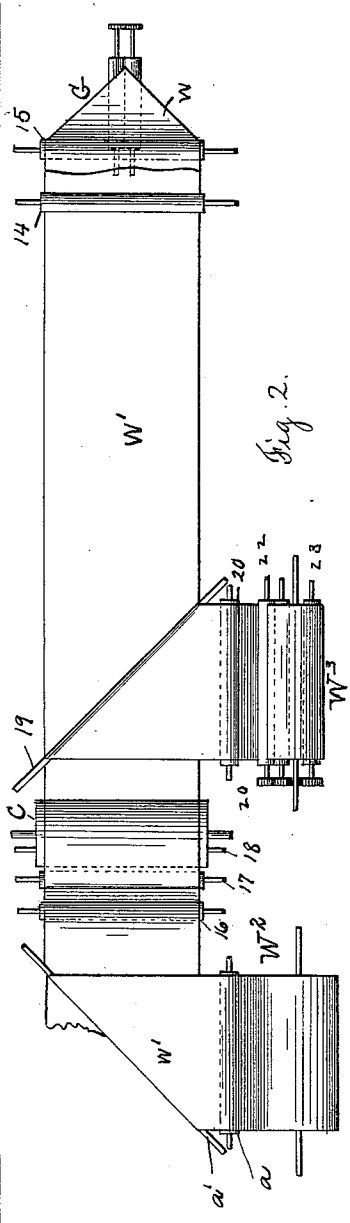


Fig. 2.



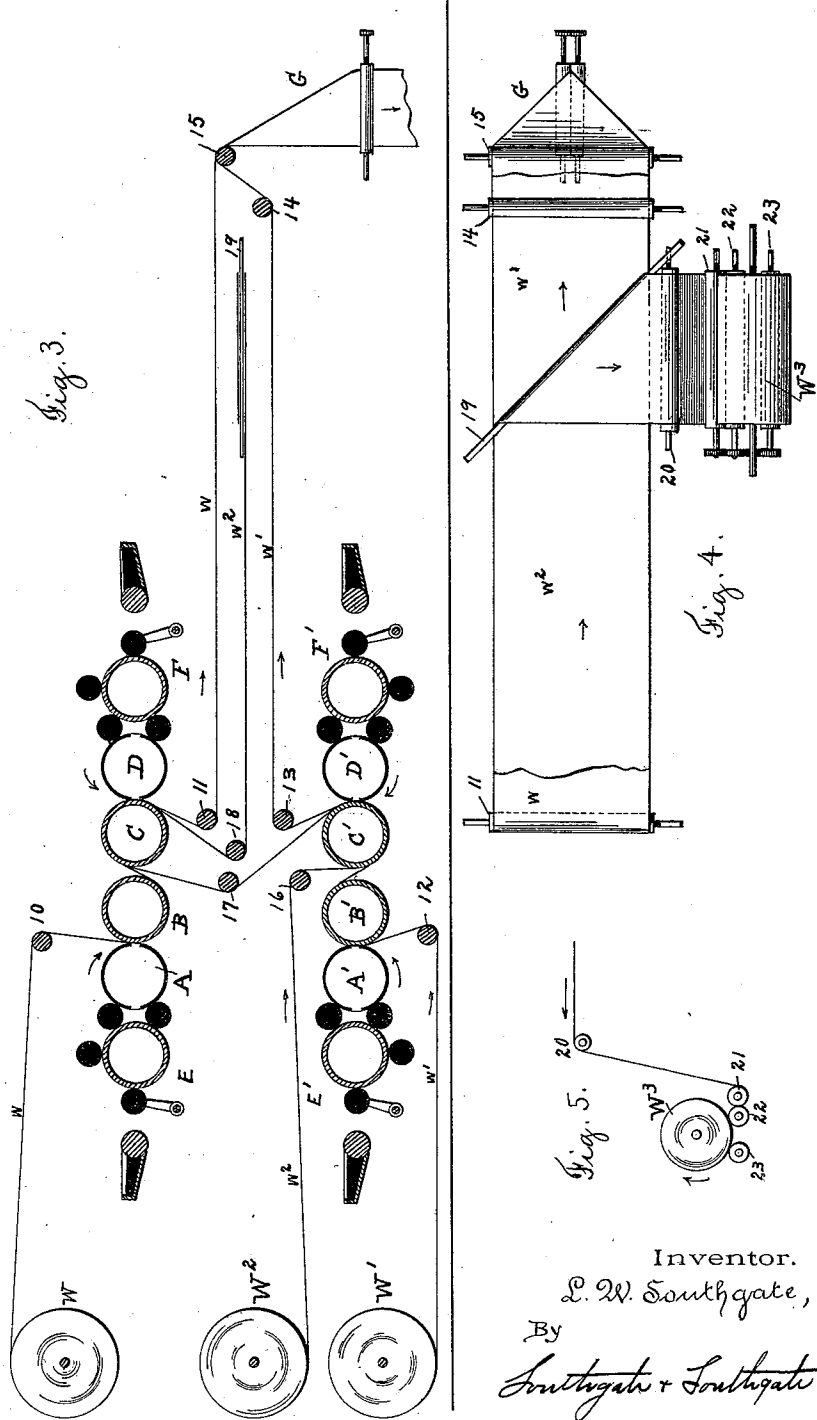
Witnesses.  
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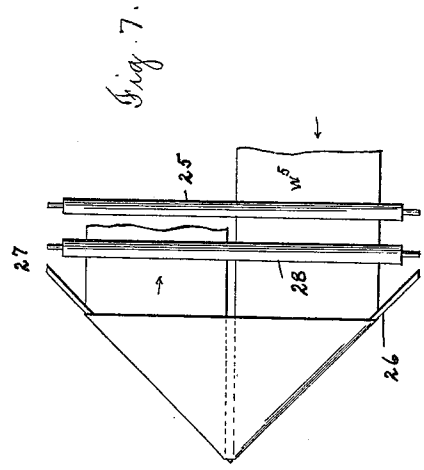
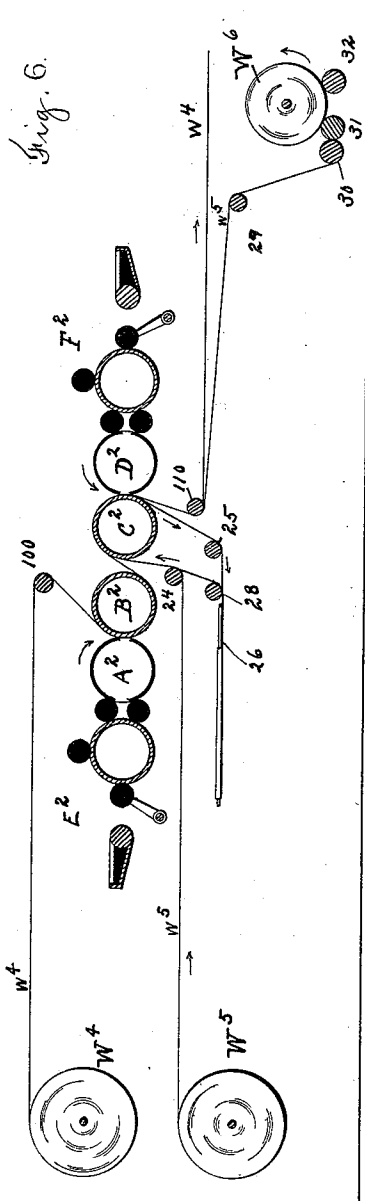
(No Model.)

3 Sheets—Sheet 3.

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Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR HANDLING OFFSET WEBS.

SPECIFICATION forming part of Letters Patent No. 560,945, dated May 26, 1896.

Application filed January 14, 1895. Serial No. 534,896. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS W. SOUTHGATE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Apparatus for Handling Offset Webs, of which the following is a specification.

The aim of this invention is to improve the operation of printing-presses, and especially relates to an improved apparatus for handling an offset web.

I have illustrated in the accompanying three sheets of drawings various ways in which my invention may be carried out.

Referring to said drawings and in detail, Figure 1 represents a longitudinal sectional elevation of a two-deck rotary web-printing press with my invention applied thereto. Fig. 2 is a partial plan view of the parts shown in Fig. 1. Fig. 3 is a view similar to Fig. 1, showing a slightly-modified arrangement of the parts shown in Fig. 1. Fig. 4 is a view similar to Fig. 2 of the parts shown in Fig. 3. Fig. 5 is a detail of the rewinding mechanism for the offset web. Fig. 6 is a longitudinal sectional elevation of another form of printing-press with my invention applied thereto, and Fig. 7 is a plan view of the turner or deflector that I use in connection with the device shown in Fig. 6.

One of the problems of printing is the preventing of offset on the second-impression surface. As is well known in web-printing machinery, as the first printed side of the web necessarily runs over the second-impression surface ink will be deposited from the freshly-printed web on the second-impression surface and redeposited on succeeding portions of the web by the pressure of impression between the second-impression surface and the second-printing surface, thus causing a blurring or smearing, or what is technically known as "offset." This is one of the most, if not the most, serious drawback to effecting nice printing upon the rotary printing-press, which rotary press is the fastest press now known. One of the best ways now practiced for preventing this offset is the running of a supplemental or offset web between the second-im-

pression surface and the material to be printed, this offset web thus being interposed between the web to be printed and the second-impression surface, and thus preventing set-off of the ink from the web to be printed on said second-impression surface. Objection has been found to the use of this offset web on account of the cost of the material, and it has been further found that practically the life of the offset web is the number of times that the same can be used or unwound and rewound in roll form.

By my invention I so handle the offset web that between one unwinding and one rewinding the offset web is led between a plurality of impression-surfaces and a plurality of webs to be printed, or between a plurality of impression-surfaces and different sections of the same web that is to be printed, and is thus utilized a number of times at each operation.

In still further carrying out my invention, I preferably lead the offset web so that one side is utilized in connection with one impression-surface and the other side in connection with the other impression-surface, thus always presenting a clean or dry side to the material to be printed. I preferably so handle the offset web, although this last step is not essential to the broad scope of my invention, as I may use the same side of the offset web a number of times. It will thus be seen that I may apply my invention to a printing-press which is adapted to print either a plurality of webs or a wide web. Examples of such presses are those in which a number of printing mechanisms are used in one machine—as, for example, in the ordinary two-deck printing-press, or the printing-press in which a plurality of impression-cylinders coact with each type-cylinder—or, again, I may apply my invention to a single impression-surface by leading the offset web twice between each impression-surface and different sections of the material to be printed, and as I hereinafter use the terms "an impression-surface" and "another impression-surface" one part of said impression-surface will then be an impression-surface and the other part another impression-surface.

I may use my invention as last described either in connection with a single or multi width press.

By my invention, as hereinafter specifically described, and illustrated in the accompanying drawings, I can save practically one-half the cost of the offset web and greatly reduce the number of rolls and devices for handling the offset web.

Referring now to the device illustrated in the first two sheets of the drawings, it will be seen that I have therein shown the application of my invention to a two-deck rotary web-printing press. The printing mechanism consists of two rotary web-printing presses arranged one over the other: The top printing-press consists of the first printing-cylinder A, the first-impression cylinder B, the second-impression cylinder C, and the second printing-cylinder D. The printing-cylinders A and D have any of the usual inking mechanisms, as E and F, arranged to cooperate therewith. The web  $w$  for the first printing-press is drawn from a web-roll W, and is led into the top of the printing mechanism, as over a guiding-roller 10, and then around the impression-cylinders B and C, as shown. From the second-impression cylinder C the web  $w$  is led around a roller 11 and then to a roller 15. The second printing mechanism consists of the two printing-couples A' B' and C' D', and the usual inking apparatuses E' and F', arranged as before described. I preferably lead the web  $w'$  to the second printing mechanism from underneath the same, as from the web-roll W' up over the guiding-roller 12, then around the impression-cylinders B' and C', over the guide-rollers 13 and 14 to the guide-roller 15, where the two webs  $w$  and  $w'$  unite, and then pass to any suitable folding and delivery apparatus G. As thus far described the mechanism consists of an ordinary two-deck rotary printing-press, with the exception of the way the webs are led in and through the printing mechanism. As shown, the web for the upper press is led from the top of the upper printing-press and the web for the lower press is led in from beneath the same. This leaves the two second-impression cylinders C and C' accessible, so that a single offset web, by the practice of my invention, can be led around the same. This offset web is designated in the drawings as  $w^2$  and is drawn from a roll W<sup>2</sup>.

In the first sheet of the drawings the offset web  $w'$  is shown as passing from the web-roll W<sup>2</sup> up over a guide-roller  $a$ , and then around a forty-five-degree turner-bar  $a'$  to a roller 16. This is a simplified and preferred arrangement, as it enables the offset-web roll to be placed at the side of the machine, so that the attendant can easily watch both the unwinding and rewinding of the offset web.

In Fig. 3 I have shown the offset-web roll as placed at the end of the press and the web  $w^2$  drawn directly to the roller 16. Otherwise than the mounting of the offset-web roll

the mechanism shown in the first two sheets of the drawings is practically the same. From the web-roll 16 the offset web  $w'$  is then led around the second-impression cylinder C' and between the same and the web to be printed,  $w'$ , then from this second-impression cylinder C' up over a guide-roller 17, and then between the second-impression cylinder C and the web to be printed,  $w$ . From the second-impression cylinder C the offset web is led onward around a roller 18, then over a forty-five-degree turner-bar 19, which will turn the offset web laterally out of the press, then around a roller 20 to a rewinding device, as 21, 22, and 23, where the offset web is rewound into a roll W<sup>3</sup>, so that the same can be used over again. By this passage of the offset web through the press it will be seen that the offset web prevents contact of either the web  $w$  with the second-impression cylinder C or of the web  $w'$  with the second-impression cylinder C'. Also it will be seen that the side of the offset web that is used between the impression-cylinder C' and the web  $w'$  is laid against the impression-cylinder C and that the other side of the offset web is used between the impression-cylinder C and the web  $w$ . Thus one side of the offset web is used in the lower press and the other side of the offset web in the upper press, whereby I can use both sides of the offset web, or perfect the offset web, so to speak, in one operation. Of course the offset web could be led first to the impression-cylinder C, and second to the impression-cylinder C', if so desired. Therefore it will be seen that I have but one offset web in a double press and that I utilize both sides of the offset web at one operation. This will substantially save one-half the cost of preventing offset and greatly simplify the construction, as but one rewinding device and one offset-web-handling mechanism has to be provided. My offset web may be thus used in many other arrangements of presses besides that of the two-deck.

Another way in which I may practice my invention is illustrated in the third sheet of the drawings. In this device I have shown a single printing mechanism consisting of the two printing-couples A<sup>2</sup> B<sup>2</sup> and C<sup>2</sup> D<sup>2</sup>, with the usual inking apparatuses E<sup>2</sup> and F<sup>2</sup>. The web to be printed is designated by  $w^1$  and is led from a web-roll, as W<sup>4</sup>, over a guide-roller 100, then around the impression-cylinders B<sup>2</sup> and C<sup>2</sup>, as shown, and then around a roller 110 to any suitable delivery apparatus. The offset web for use in connection with this device is designated by  $w^5$  and is led either at the end or side of the press, as desired. The offset web first passes around a roller 24 and then around the second-impression cylinder C<sup>2</sup>, then around a roller 25, and then is deflected laterally over the turners 26 and 27, as shown in the plan view in Fig. 5, and then the offset web is led around the rollers 28 and 29, and again around the second-

impression cylinder C<sup>2</sup>, but in a path at one side from which the same was first led around the impression-cylinder C<sup>2</sup>. From this path around the impression-cylinder C<sup>2</sup> the offset web passes around the rollers 110 and 29 and then to a suitable rewinding device, as the rollers 30, 31, and 32, and is rewound into a roll W<sup>6</sup>. This rewinding device may be arranged either as shown or at the side of the press. By this passage of the web through the press it will be seen that the offset web passes twice around the second-impression cylinder C<sup>2</sup>, and thus intervenes between the said second-impression surface and different sections of the same web to be printed. Also it will be seen that both sides of the offset web are used, as the web, by passing around the peculiar deflector described, has its movement reversed, so that the web is practically turned. Further, it will be seen that the clean side of the web will run around the roller 25, the turners 26 and 27, and over the roller 24, whereby these parts will not become smeared as the device is used. This way of using an offset web may be applied either to a single-width or a multiwidth web, the offset web being of one-half the width of the web to be printed, and thereby practically saving one-half the cost of the offset web. As the offset web turns twice over the second-impression cylinder C<sup>2</sup> the same will run so that it will prevent contact of any of the first-printed part of the web to be printed with any portion of the second-impression cylinder, the margin allowing sufficient play between the two paths of travel for the offset web around the impression-cylinder.

Of course, if in any of the devices described a single web to be printed should be used, my offset web can be used exactly as in the ordinary press. Thus, for example, if in the two-deck press but one of the presses was to be used the offset web can still be used between the single second-impression cylinder and the single web to be printed; or, again, in the press in which the offset web is used to protect a plurality of sections of the web to be printed, if but a single-section web is to be run through the printing mechanism, the offset web would be run around the second-impression cylinder, so as to protect the same, and the deflecting device then would not be necessary. In this instance the offset web would be led in substantially in line with the path in which the same is led to the rewinding device.

As I use the terms "an impression-surface" and "another impression-surface" in the claims I mean to comprehend either the impression-surfaces of two presses, as in the devices illustrated in the first two sheets of the drawings, or the two parts of one impression-surface over which the offset web is led, as in the device shown in the third sheet of the drawings.

The above-described arrangements illus-

trate some of the various ways in which my invention may be practiced.

My invention may be applied to many other forms of presses and is independent of the particular printing mechanism to which the same is applied, and I have selected these forms to illustrate to those skilled in the art the way my invention may be practiced.

The details and gearing of the printing mechanisms and of the rewinding mechanism are not shown or described at length in this case, as the same are well understood and may be arranged by the ordinary printing-press designer.

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

1. The combination with a printing-press having a plurality of second-impression surfaces and capacitated to print a plurality of webs or a plurality of sections of webs, of means for leading an offset web between said impression-surfaces and said plurality of webs or said plurality of sections of webs, whereby said offset web is used a number of times at each operation, substantially as described.

2. The combination with a rotary web-printing press of means for leading an offset web between an impression-surface and a web or section of web to be printed, and then between another impression-surface and another web or section of web to be printed, whereby the offset web is used twice at each operation, substantially as described.

3. The combination with a rotary web-printing press, of means for leading an offset web between an impression-surface and the material to be printed and then between another impression-surface and the material to be printed, so that one side of the offset web is utilized in connection with one impression-surface and the other side in connection with the other impression-surface, substantially as described.

4. The combination with a rotary web-printing press having a plurality of second-impression surfaces, of means for leading an offset web around one of said impression-surfaces, and guiding devices adapted to lead the web then around another of said impression-surfaces, so that one side of the offset web will be utilized in connection with one impression-surface and the other side in connection with the other impression-surface, substantially as described.

5. The combination with two rotary printing-presses arranged one over the other, guiding devices adapted to lead the web from the top into the upper printing mechanism, guiding devices adapted to lead the web to the lower printing mechanism from beneath the same, and guides arranged so that an offset web will be led around both of the second impression surfaces, substantially as described.

6. The combination with two rotary web-  
printing presses arranged one over the other,  
guiding devices for leading the web to be  
printed into the upper press from the top side  
5 of the same, guiding devices adapted to lead  
the web to be printed in the lower press into  
the press from beneath the same, and guid-  
ing mechanism adapted to direct an offset  
web around both the second-impression cyl-  
10 inders so that one side of the offset web will  
be utilized in connection with one impression-  
cylinder and the other side in connection with  
the other impression-cylinder, substantially  
as described.

15 7. The combination with two rotary web-  
printing presses arranged one over the other,  
means for leading the web to be printed in  
the upper press into the top of the same,  
means for leading the web to be printed in  
20 the lower press into the bottom of the same,  
guiding mechanism adapted to direct an off-

set web around both the second-impression  
cylinders, a turning device adapted to turn  
the offset web laterally out of the press after  
the same has thus been used, and a rewinding 25  
device, substantially as described.

8. The combination with two rotary web-  
printing presses arranged one over the other,  
of guides arranged to lead a single offset web  
around both second-impression cylinders, and 30  
turning devices arranged so that the offset  
web may be led laterally into and out from  
the printing mechanism, substantially as de-  
scribed.

In testimony whereof I have hereunto set 35  
my hand in the presence of two subscribing  
witnesses.

LOUIS W. SOUTHGATE.

Witnesses:

PHILIP W. SOUTHGATE,  
CHARLES F. SCHMELZ.