

No. 638,308.

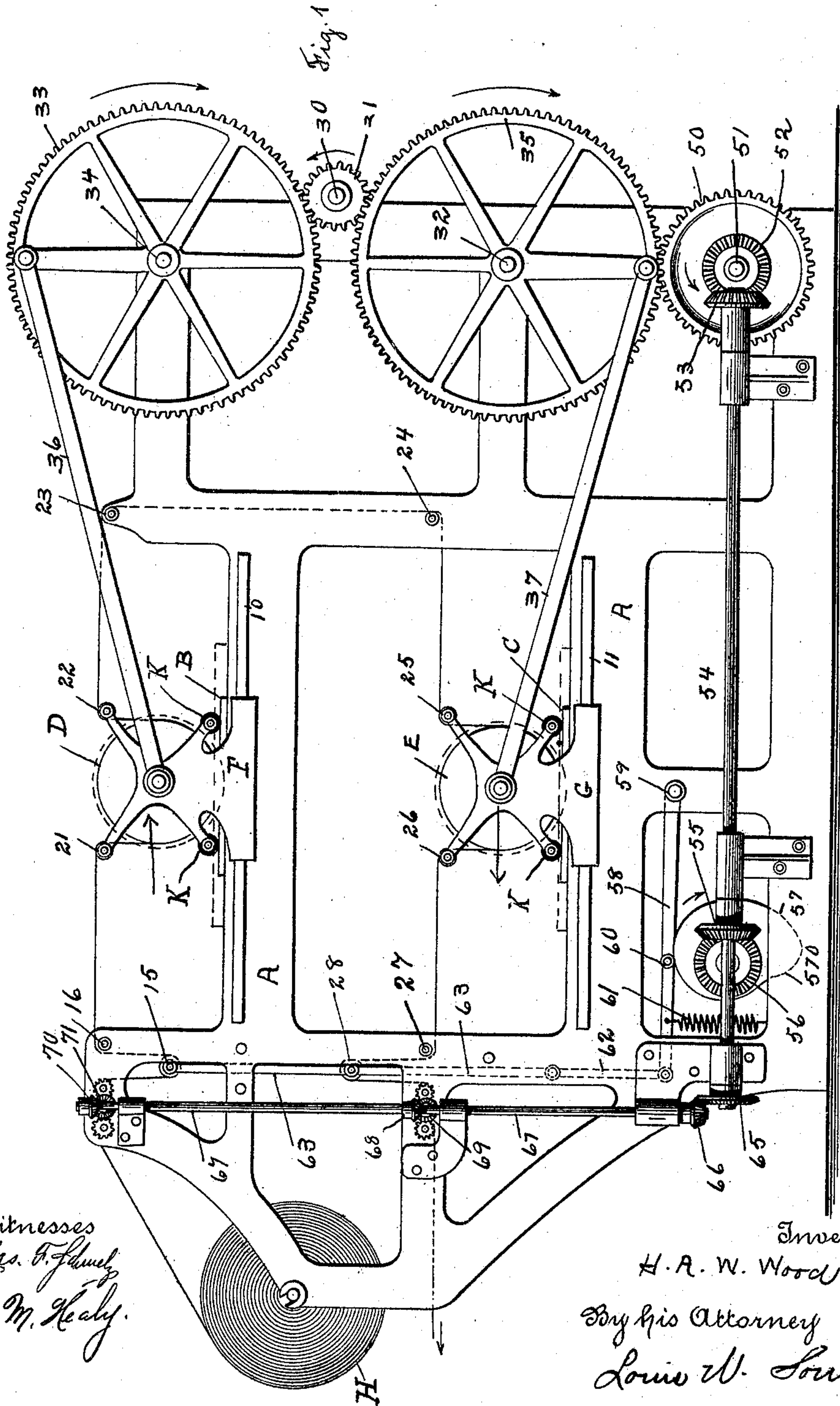
Patented Dec. 5, 1899.

H. A. W. WOOD.  
PRINTING MACHINE.

(Application filed Nov. 22, 1892.)

(No Model.)

2 Sheets—Sheet 1.



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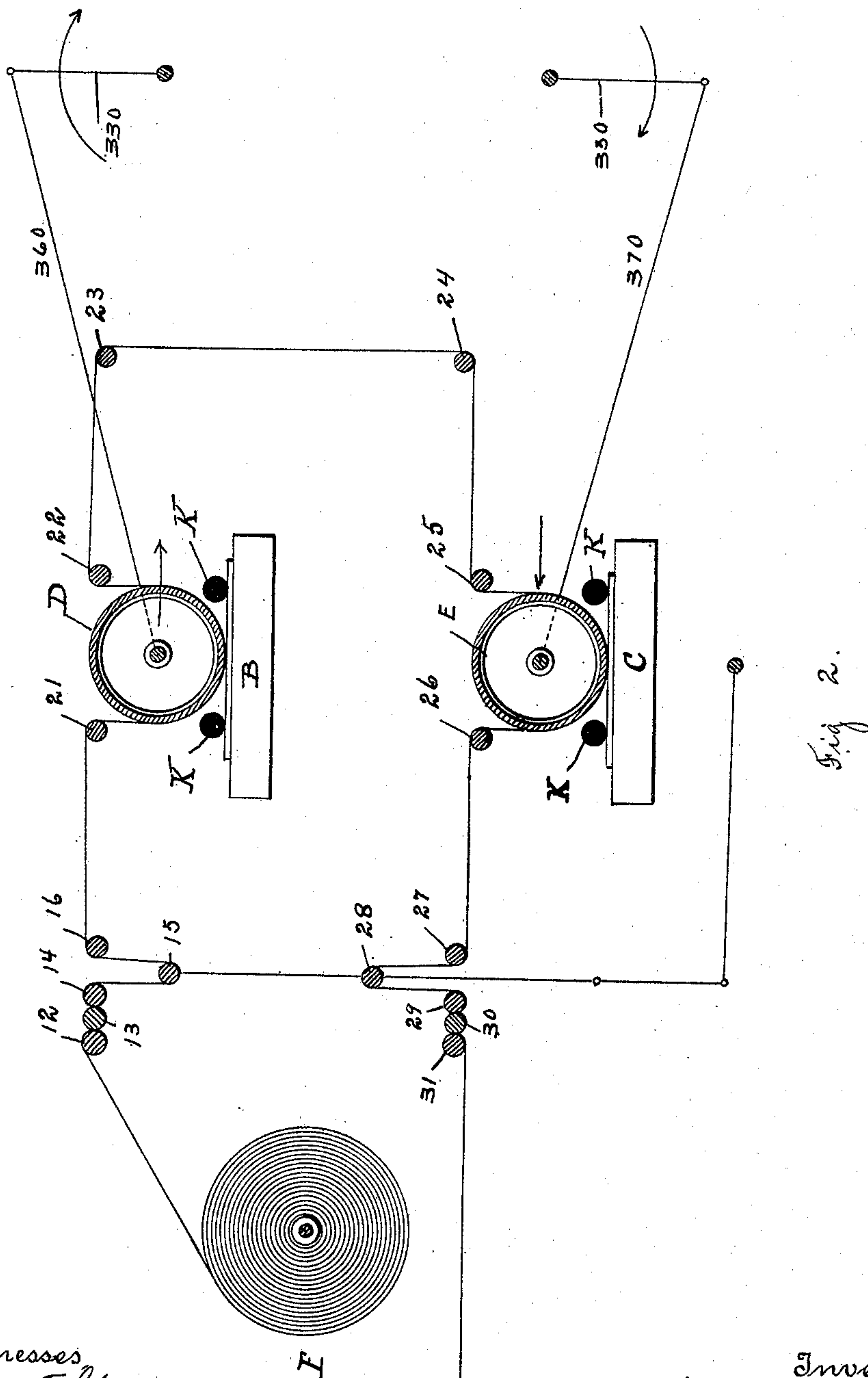


Fig. 2.

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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. 638,308, dated December 5, 1899.

Application filed November 22, 1892. Serial No. 452,866. (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 the following is a specification.

The aim of this invention is to improve that class of printing-machines which are known in the art as "reciprocating-cylinder" printing-machines; and the invention consists in the combination, in a perfecting form of this machine, of two impression members which are mounted in separate carriages and are preferably moved in opposite directions, whereby the tension of the web will always be in the same direction and whereby the jar of the machine will be counterbalanced.

To this end the invention consists of the device described and claimed in this specification and illustrated in the accompanying two sheets of drawings, in which—

Figure 1 is a side elevation of one form of machine embodying my improvements, and Fig. 2 is a sectional diagrammatic elevation illustrating the arrangement of parts.

Referring to the drawings and in detail, A A represent the usual side frames, between which are secured the form-beds B and C, and these form-beds B and C are shown as arranged over one another, although this arrangement is not necessary to the invention. Coacting with the bed B is the reciprocating impression-cylinder D, and coacting with the bed C is the reciprocating impression-cylinder E, and these impression-cylinders are connected to move in opposite directions, as hereinafter described. The impression-cylinders may have gears on the sides of the same, which may mesh with stationary racks in the usual manner, so that as the cylinders are reciprocated they will be kept in proper register with the form-beds. The cylinder D is mounted in suitable carriages or frames F, which are mounted on the guideways 10, formed on the frames A, and the impression-cylinder E is mounted in similar frames or carriages G, mounted on the ways 11, secured to the main frames A. The carriages F and G also carry the ordinary form or inking rollers K, to which ink is supplied in any of

the usual manners and by which the forms on the bed are inked as the cylinders are moved to and fro.

F represents the web-roll, which is mounted at one end of the frame in any of the usual manners, and referring to the diagram, it will be seen that the web from this roll is led around the rolls 12, 13, and 14, then around the looping feeding-roller 15, around the stationary roll 16, then around the rolls or guides 21 and 22, carried by the carriages or frames F, and thus around the impression-cylinder D, then around the stationary rolls or guides 23 and 24, one of which may be adjustable for the purpose of obtaining register, then around the rollers or guides 25 and 26, carried by the frames G, to the stationary roll 27, up over the looping-roll 28, and then around the delivering-rollers 29, 30, and 31. This course of the web will cause the same to be perfected by the impression-cylinders from forms placed on the two beds.

30 represents a shaft, which may be the driving-shaft, and on the same is arranged a pinion 31, which meshes into and drives the two gears 33 and 35, whereby the two gears 33 and 35 will turn in the same direction. These gears 33 and 35 are mounted on the ends of shafts 34 and 32, and on the other ends of these shafts are arranged cranks 330 and 350, as shown in the diagrammatic figure. The gear 33 and the crank 330 are connected by pitmen 36 and 360 to the shaft of the impression-cylinder D, and the gear 35 and the crank 350 are connected by pitmen 37 and 370 to the shaft of the impression-cylinder E, and these pitmen, as shown, are arranged oppositely or at one hundred and eighty degrees to each set, whereby as the gearing is revolved the impression-cylinders D and E will be reciprocated in opposite directions.

From the gear 35 a gear 50 is driven, which gear 50 is mounted on the short shaft 51, journaled in the main frame, and on this shaft is arranged a bevel-gear 52, which meshes with and drives gear 53, fastened on the shaft 54. Arranged on this shaft 54 is a bevel-gear 55, which meshes with and drives a bevel-gear 56, and on the same shaft with this bevel-gear 56 are arranged cams 57, which have shoulders 570 and which are designed to impart any



proper rising-and-falling movement to the looping-rolls.

The looping-rollers 15 and 28 are mounted in suitable arms 63, which are mounted in the main framing in any desired manner and have connected to the ends thereof pitmen 62, which connect to arms 58, pivoted on a shaft 59, which arms 58 have rollers 60 bearing on the cams 57. This mechanism will impart to the looping-rollers 28 and 15 the desired up-and-down motion, and the gearing is so proportioned that the cams 57 will turn twice for each complete reciprocation of the impression-cylinders and so proportioned that the looping-rollers will be raised when the impression-cylinders are off the form-beds in either direction, whereby the web will be shifted when the impression-cylinders are reversing in either direction, but whereby the web will be fed into and fed out of the press continuously and during the printing operation. The web between the rollers 16 and 27 will remain stationary. Of course the cams can be designed and proportioned so that the shift of the web will take place as desired while the cylinders are not in impression. The shaft 54 is continued and has on the end thereof a bevel-gear 65, which meshes with and drives a pinion 66, fast on the shaft 67, and on this shaft 67 is arranged a bevel-gear 68, which meshes with a bevel-gear 69, arranged on the end of the roll 30, and the rolls 29, 30, and 310 are geared together, as shown, whereby they will be continuously turned. Also arranged on the shaft 67 is a bevel-gear 70, which meshes with and drives a gear 71, fast on the shaft of the roll 13, and the rolls 12, 13, and 14 are geared together, as shown, whereby they will continuously turn to draw the web from the roll and feed the same to the looping-roller 15. Springs 61 are arranged as shown and are adapted to keep the rolls 60 against the cams 57.

With a press thus organized the operation is substantially the same as that of the ordinary perfecting form of reciprocating impression-cylinder presses, the advantage over the same being that the impression-cylinders move in opposite directions, whereby the strain or tension on the web due to the pull of the impression-cylinders will all be in the same direction and there will be no slack thereby created between the impression-cylinders. Thus in the drawings the impression-cylinder D is shown as moving to the right and the impression-cylinder E as moving to the left. This will put all the strain on the web in a direction to pull the same from the roll 16, whereby no slack will be created between the impression-cylinders to affect the register. In the other movement of the cylinders the cylinder E will move to the right as the cylinder D moves to the left, and therefore all the pull will come on the roll 27. The feeding, of course, takes place when the impression-cylinders are off the forms, and it is immaterial, so far as the feed-

ing is concerned, that the impression-cylinders are off the forms in opposite directions. I am able to obtain an advantageous arrangement by my construction, in that I use two independent carriages for the cylinders and can thereby decrease the weight of these parts and guide each separately. So far as this mounting of each impression-cylinder in a separate carriage is concerned it is not necessary to reciprocate the carriages in opposite directions, as so far as the scope of this part of my invention is concerned the carriages and impression-cylinders could be reciprocated in the same direction.

It is not necessary to the broad scope of my invention to arrange the beds one over the other, as they could be arranged in any of the well-known manners; but I have shown that arrangement as embodying one form of machine to which my invention may be applied. Of course the web could be led over the lower bed first and then over the upper bed.

An especial advantage of my invention consists in the fact that two independent sets of carriages are used in a web-perfecting traveling-cylinder press and a separate driving mechanism is used to positively reciprocate each set of carriages in opposite directions. This is a point of great utility, as by this construction the jar of one cylinder is not imparted through the carriages to the other. For example, if there were a number of cuts in the form placed on the lower bed the jar of the lower cylinder while passing over the same would not affect the action of the upper impression-cylinder, which would be the case if a single set of carriages were used for both cylinders or a set of carriages for each cylinder connected or tied together.

The details and arrangement of parts herein shown and 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 printing-press of two form-beds, a reciprocating impression-cylinder coacting with each form-bed, means for leading a web around said impression-cylinders, and from one to the other, and a reciprocating mechanism for the impression-cylinders, adapted to move them alternately in opposite directions, substantially as described.

2. The combination in a web-printing press, of two form-beds, a traveling impression-cylinder coacting with each form-bed, means for reciprocating said impression-cylinders oppositely relatively to one another, suitable web-guides and web-manipulating mechanism, substantially as described.

3. The combination in a web-perfecting printing-press of the side frames, two form-beds secured thereto, two sets of guides ar-



5 ranged on said frames, two sets of carriers independently mounted on said guides, an impression-cylinder journaled in each of said sets of carriers, means for independently and positively moving said sets of carriers forward and backward on said guides, suitable web-guides, and web-manipulating mechanism, substantially as described.

10 4. The combination in a printing-press of two form-beds, a reciprocating impression-cylinder coacting with each form-bed, and mechanism for alternately reciprocating said cylinders in opposite directions, consisting of two oppositely-arranged crank mechanisms, and gearing for rotating said cranks in the same direction, substantially as described.

15 5. The combination in a printing-press of two form-beds arranged one over the other, a reciprocating impression-cylinder arranged to coact with each of said form-beds, means for moving said impression-cylinders alternately in opposite directions, suitable web-guides adapted to lead a web through the press, and from one impression-cylinder to the other, and a suitable web-feeding mechanism, substantially as described.

20 6. The combination in a printing-press of two form-beds, a reciprocating impression-cylinder arranged to cooperate with each of said form-beds, means for moving said impression-cylinders in opposite directions, web-guides adapted to direct a web alternately around said impression-cylinders, and means for drawing said web forward around the impression-cylinders, substantially as described.

25 7. The combination in a printing-press of two form-beds, arranged one over the other, a

reciprocating impression-cylinder adapted to coact with each of said form-beds, oppositely-arranged crank driving mechanisms adapted to move said impression-cylinders alternately in opposite directions, web-guides adapted to direct a web around said impression-cylinders, and from one impression-cylinder to the other, and a feeding mechanism adapted to pull forward the web around said impression-cylinders, when they are off their respective form-beds in opposite directions, substantially as described.

30 8. The combination in a web-printing machine of two stationary form-beds, a traveling impression-cylinder coacting with each form-bed, means for reciprocating the impression-cylinders in opposite directions, web-guides, and a web-feeding device arranged to shift the web in the press when the cylinders are off impression in either direction, substantially as described.

35 9. The combination in a traveling-cylinder printing-press of two side frames, two sets of carriers independently mounted on said side frames, an impression-cylinder mounted in each set of carriers, means for reciprocating said impression-cylinders positively in opposite directions, suitable web-guides, and web manipulating or feeding devices, substantially as described.

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

H. A. WISE WOOD.

Witnesses:

LOUIS W. SOUTHGATE,  
HARRY C. GREEN.