(No Model.) 3 Sheets—Sheet 1.

H. A. W. WOOD.

REGISTERING DEVICE FOR PRINTING PRESSES.

No. 492,505. Patented Feb. 28, 1893.

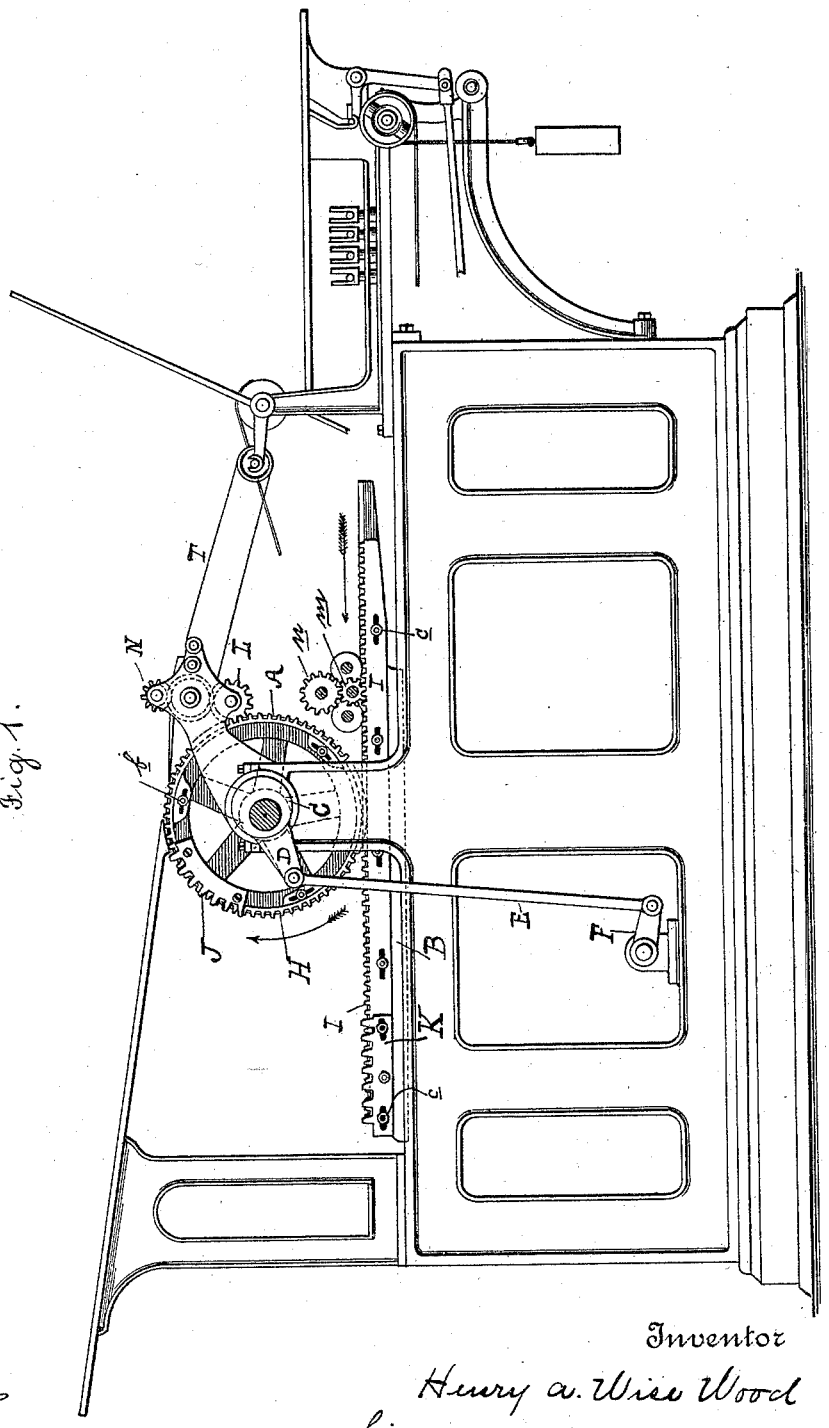

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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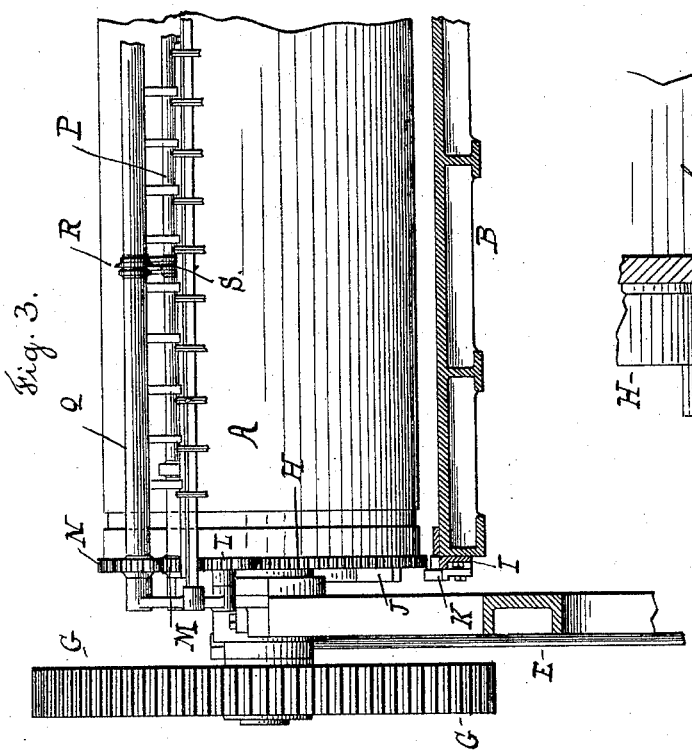

Fig. 3.

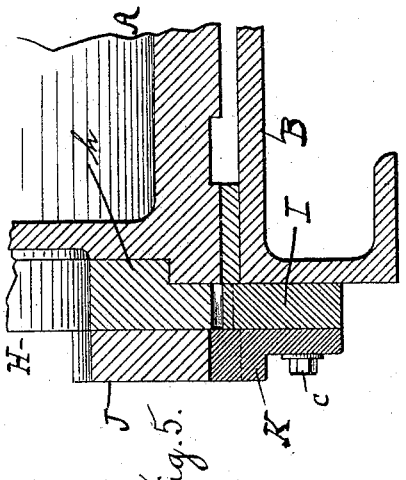

Fig. 5.

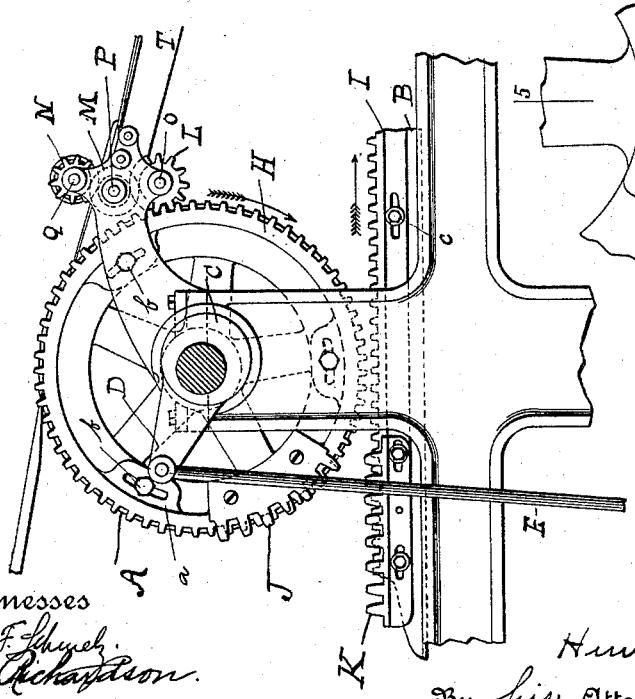

Fig. 2.

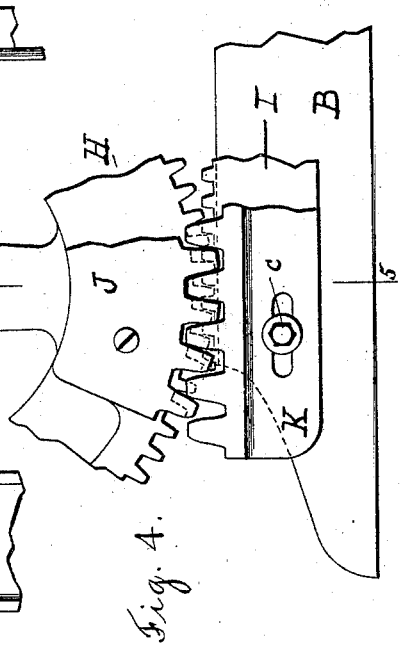

Fig. 4.

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(No Model.) 3 Sheets—Sheet 3.

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REGISTERING DEVICE FOR PRINTING PRESSES.

No. 492,505. Patented Feb. 28, 1893.

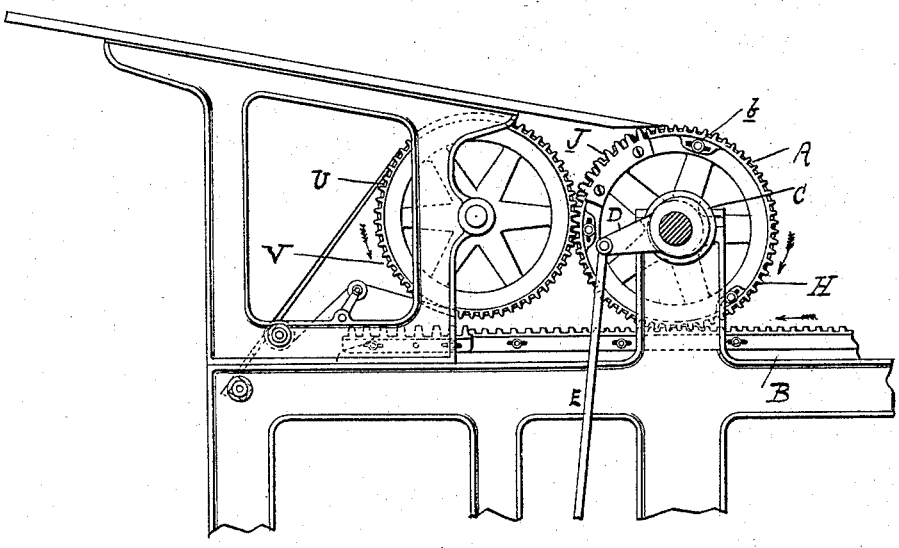

Fig. 6.

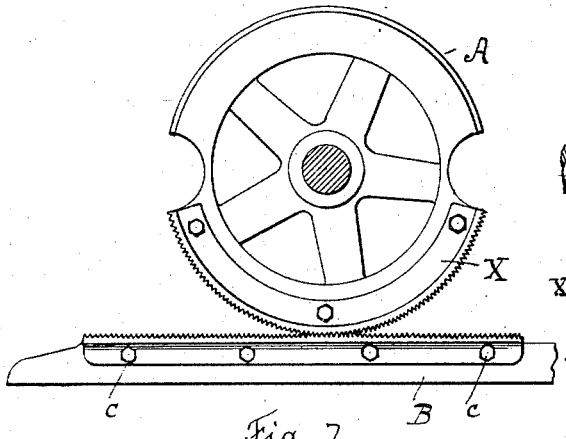

Fig. 7.

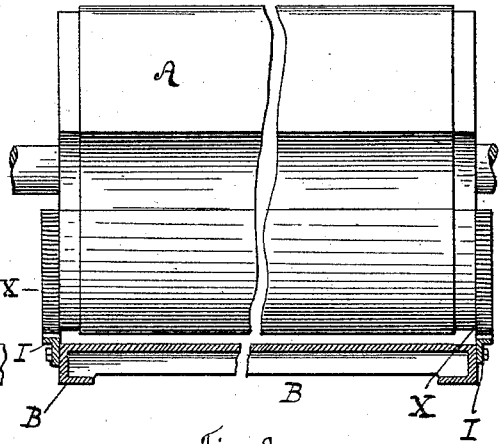

Fig. 8.

Witnesses
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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.

REGISTERING DEVICE FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 492,505, dated February 28, 1893.

Application filed February 8, 1892. Serial No. 420,782. (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 Registering Devices for Printing-Presses, of which the following is a specification.

The aim of this invention is to provide a device for securing absolute register between the impression cylinder and reciprocating bed of a multi-revolution cylinder printing press, and to this end the invention consists of the device described and claimed in this specification and illustrated in the accompanying three sheets of drawings, in which—

Figure 1 is a side elevation of a press with my improvement applied thereto, showing the bed making its printing stroke. Fig. 2 is a similar view of the cylinder and bed, on a slightly enlarged scale, showing the bed on its return or backward stroke. Fig. 3 is a front elevation of the device shown in Fig. 2. Figs. 4 and 5 are a side elevation and a section respectively showing the registering gearing, and Figs. 6, 7 and 8 illustrate modifications hereinafter referred to.

I will further describe my invention as applied to the well known two revolution press but with the understanding that the same may be applied to the three, four or any multi-revolution press. In presses of this character, the cylinder is continuously driven in the same direction and the bed is reciprocated back and forth under the cylinder. When the bed is making its printing or forward stroke, the cylinder is brought with pressure against the form so as to make the impression and when the bed is making its back or return stroke, the cylinder is raised so as to clear the form. As the gearing for reciprocating the bed and synchronously rotating the cylinder is so well understood, it has been thought unnecessary to show the same in this case and the same may be of any approved type. In this type of presses, great difficulty has been experienced in securing an absolute register of the bed and cylinder during the printing stroke; because necessarily so much gearing and so many connections are required between the bed driving mechanism and the cylinder, that the lost motion between said members and the give of the connections render it practically impossible for the cylinder and the type to come in contact twice absolutely in the same relation. To remedy this evil, I place a rack on the bed and a corresponding gear or segment upon the cylinder and I make the teeth or mesh of this gearing very shallow, so that the same will be out of mesh, during the return stroke of the bed, simply by virtue of the vertical lifting movement of the impression cylinder. Thus for example, if the vertical movement of the cylinder is four sixteenths of an inch, I may make the gearing mesh three sixteenths of an inch so that the same will clear one sixteenth of an inch when the cylinder is raised and the bed upon its return stroke. Dependence is preferably not placed on the registering mechanism to perform all the work of rotating the impression cylinder, but the usual gearing is also used in connection with the registering gearing to rotate the cylinder.

Referring now to the drawings, and in detail, A represents the impression cylinder, and B the reciprocating bed of an ordinary two revolution cylinder press. The shaft of the cylinder A may be journaled in eccentric bushings C, which are journaled in the side frames of the press—and these bushings have extending arms D which are connected by rods E to levers or arms F which are vibrated at the proper time by the usual suitable mechanism whereby the impression cylinder will be raised and lowered in the usual manner. Of course, so far as the scope of my invention is concerned, any other suitable mechanism could be used for raising and lowering the impression cylinder. The cylinder is supported in the usual manner by bearers when on the impression, and the cylinder is supposed to be rotated by the gear G in the usual manner, so as to turn continuously in the same direction. On the cylinder, preferably at the side thereof, I attach circumferential gearing, which preferably is in the form of a complete gear as H, and the said gear H may have an annular shoulder or collar *h* which is set into the cylinder so that the gear H will always be kept concentric with

the impression cylinder. This gear H has slotted lugs *a* and passing through these slots are the bolts *b* whereby the gear H may be adjusted relatively and fastened to the impression cylinder.

On the bed, preferably at the side thereof, and in line with gear H, I attach the rack I. The rack I may be held in place by set screws *c* passing through slots in the same, whereby the rack may be adjusted longitudinally of the bed. The depth of the teeth or mesh of the gear H and the rack I is made less than the vertical movement of the impression cylinder, so that the same will clear each other when the bed is returning as shown in Fig. 2. As this gearing necessarily does not have much strength I preferably use also the usual starter segment J and short rack K to properly start the cylinder in register with the bed after which the registering gearing will insure the proper action. This starter mechanism may be fastened on the outside of the registering mechanism, as shown, and the same has the usual large and strong teeth for properly starting the bed. This starter mechanism therefore works nicely and in combination with the registering mechanism and relieves the latter of the strain incident to starting the bed in register with the cylinder and taking up the back lash.

It will be seen that the starter segment J is fastened rigidly to the register gear H, and that the starter rack K is rigidly fastened to the register rack I. By this means, it will be seen that the relation of the segment J to the register gear H, and that the relation of the starter rack K to the register rack I is always fixed. By this means, after the starter segment and starter rack are once fixed to their respective parts, they do not have to be altered or changed; and if the registering mechanism is properly set, the starter mechanism will, also, be properly set. Also, it will be seen that either the registering gear could be set slightly forward to compensate for wear, or the registering rack I slightly moved to compensate for wear; and with this operation, the starter segment and rack will be thereby, also, adjusted. Also, it will be seen that by making both the register gear and the register rack adjustable, they can be nicely set to mutually co-operate. While, of course, the starter segment and starter rack can be secured to the bed and cylinder in any desired manner, the described way is preferred.

It is understood, of course, that the improvements shown in this case can be applied to a multi cylinder press as well as to a single press. Also, other means could be employed for rendering the registering mechanism inoperative, as the bed makes its retrograde stroke so far as the combination of a starter mechanism with a registering mechanism is concerned; and there are other well known devices besides the starter rack and segment that may be used to properly start the cylinder and bed in action independent of the registering mechanism. Thus, it will be seen that my specific means for rendering the registering gearing inoperative is the cylinder lifting mechanism; and, also, that any other means which will render the registering mechanism inoperative, as the bed makes its retrograde or non-printing movement, is an equivalent, so far as the function covered by the combination is concerned.

The gear H of fine pitch on the end of the cylinder is very useful and may be made to accomplish a variety of functions. Thus the same may be used to drive the delivery mechanism, as is shown in the first two sheets of the drawings. In this instance, the gear H is used to drive the gears or pinions L, M and N on the shaft O, P and Q; and on the shafts P and Q may be placed slitters R and S, that will act to slit the sheet longitudinally as the same is delivered. On suitable pulleys on shaft P run the delivery tapes T and thus the same are driven from the register gear H.

Instead of driving a front delivery, gear H may be utilized to drive a back delivery, as in Fig. 6, which back delivery may consist of the transfer cylinder U and the usual fly mechanism and the transfer cylinder is driven from gear H by means of gear V as shown.

The full length registering rack I on the bed is very useful and the same may be used to positively drive the inking rolls as in Fig. 1 by means of gears *m* and *n* acting to drive the top or distributer roller of a cluster. This is an improvement over the common construction because when a registering rack has been used on the bed, the same has had too coarse teeth to be used to drive the inking rollers. So it is common to put another rack with fine teeth on the other side of the bed from the registering rack and use the latter to drive the inking rollers. It will be seen that my construction saves one rack over this method.

Instead of using gear H to drive the bed in register, a segment may be used to accomplish the function of registering. In Fig. 7 segments X are shown in mesh with racks on each side of the bed and these segments and racks are arranged so as to form bearers for the cylinder, thereby further simplifying the construction. The teeth shown in this modification consist of fine milling instead of gear teeth. Thus my arrangement of registering devices may be further utilized to simplify the construction of the press in a great many directions.

The other parts of the press have not been specifically described or illustrated as the operation of the same is well known, and the press as a complete structure is supposed to operate in any of the well known ways. The peculiar registering mechanism shown in this case, and, also, the combination of the same with a positive driving mechanism for the cylinder, whereby the cylinder could be turned on its printing movement both by the positive driving mechanism, and by the register-

ing mechanism is not claimed in this case, as this is claimed in another application filed by me October 19, 1892, Serial No. 449,393.

The details and arrangements of parts herein shown 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. In a multi-revolution cylinder press, the combination of the impression cylinder, the reciprocating bed, registering gearing connected to turn with said impression cylinder, a co-operating registering rack on the bed, means for connecting this registering mechanism so that the same will be in mesh as the bed makes its forward or printing movement, and so that the same will be inoperative as the bed makes its retrograde movement, gearing for continuously rotating the impression cylinder in the same direction, and a starting mechanism adapted to positively start the cylinder and bed in register, for the purpose described.

2. In a multi revolution cylinder printing press, the combination of the impression cylinder, the reciprocating bed, means for raising and lowering said impression cylinder, means for continuously revolving the impression cylinder, registering gearing connected to turn with the impression cylinder, a co-operating rack on the bed, the mesh or the depth of the teeth of these instrumentalities being less than the vertical movement of said cylinder, whereby the same will be in mesh as the bed makes its forward or printing movement, and so that the same will be inoperative as the bed makes its retrogade movement, and means independent of this registering mechanism for positively starting the cylinder and bed in register, for the purpose described.

3. In a multi-revolution cylinder press, the combination of the impression cylinder and reciprocating bed, means for raising and lowering said impression cylinder, circumferential gearing on the impression cylinder, a co-operating rack on the bed, the mesh or the depth of the teeth of these instrumentalities being less than the vertical movement of the said impression cylinder, and a starting segment and rack secured to said cylinder and bed respectively, for the purpose described.

4. In a multi-revolution cylinder press, the combination of the impression cylinder and reciprocating bed, means for raising and lowering said impression cylinder, registering gearing on the impression cylinder, a co-operating rack on the bed, the mesh or the depth of the teeth of these instrumentalities being less than the vertical movement of the said impression cylinder, a starter segment secured to said gearing on the impression cylinder, and a starter rack secured to the register rack on the bed, for the purpose described.

5. In a multi-revolution cylinder press, the combination of the impression cylinder and reciprocating bed, means for raising and lowering said impression cylinder, registering gearing on the impression cylinder, a co-operating rack on the bed, the mesh or the depth of the teeth of these instrumentalities being less than the vertical movement of the impression cylinder, one of these instrumentalities being adjustable, a starter segment secured to the registering gearing carried by the cylinder, and a starter rack secured to the registering rack carried by the bed, for the purpose described.

6. In a multi-revolution cylinder press, the combination of the impression cylinder and reciprocating bed, means for raising and lowering said impression cylinder, registering gearing on the impression cylinder, a co-operating rack on the bed, both this gearing and rack being adjustable, the mesh or the depth of the teeth of these instrumentalities being less than the vertical movement of said impression cylinder, and a starter segment and rack secured to the registering mechanism, for the purpose described.

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

HENRY A. WISE WOOD.

Witnesses:
LOUIS W. SOUTHGATE.
JAMES J. RAFFERTY.