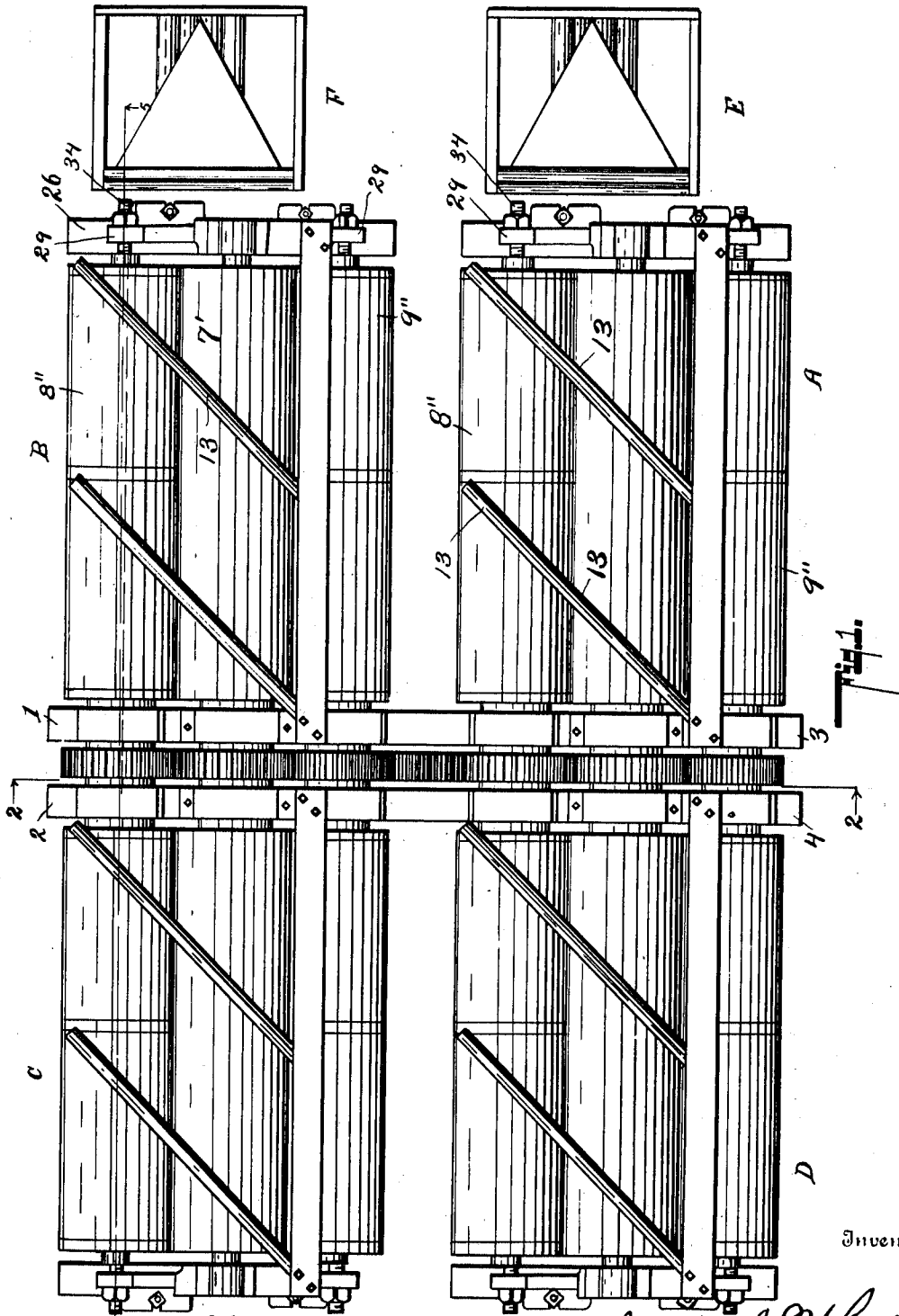


L. A. WHEAT.
 ROTARY PRINTING PRESS.
 APPLICATION FILED APR. 3, 1909.

990,178.

Patented Apr. 18, 1911.

3 SHEETS-SHEET 1



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3 SHEETS-SHEET 2.

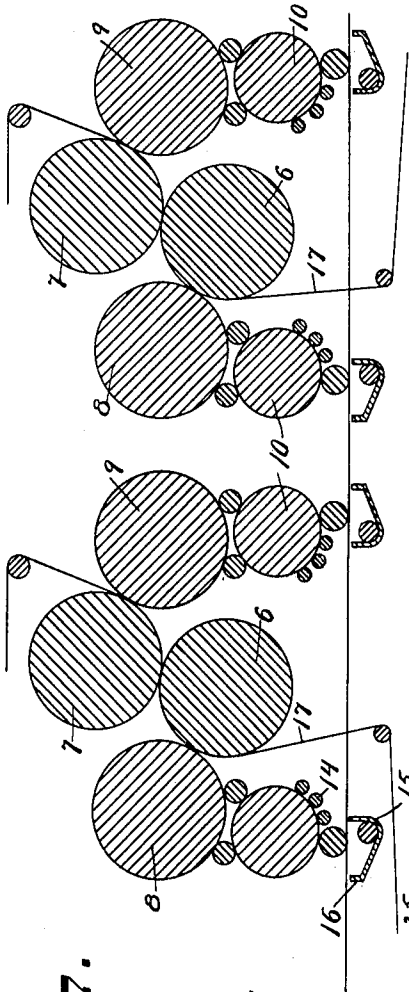


Fig. 7.

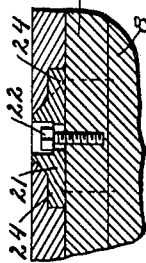


Fig. 8.

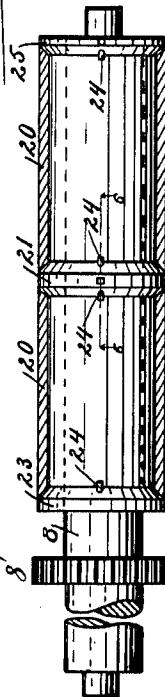


Fig. 5.

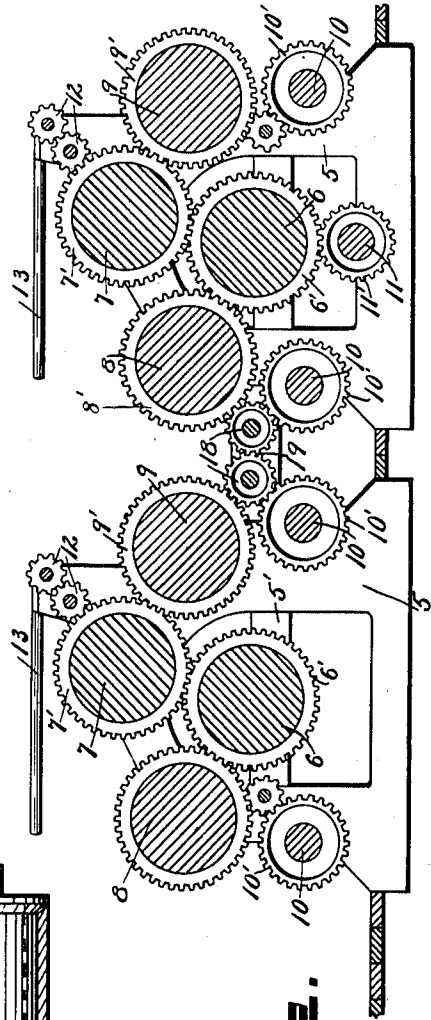


Fig. 2.

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 3 SHEETS—SHEET 3.

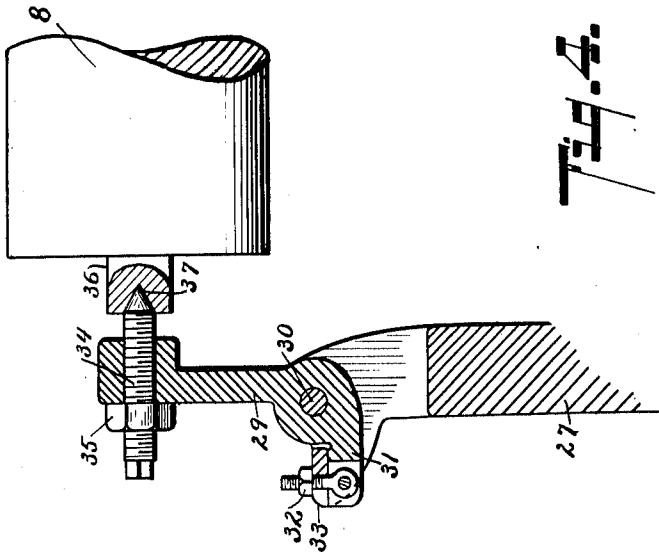


Fig. 4.

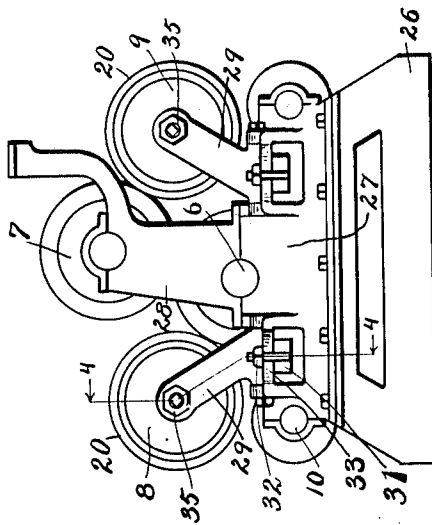


Fig. 5.

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UNITED STATES PATENT OFFICE.

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ROTARY PRINTING-PRESS.

990,178.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed April 3, 1909. Serial No. 487,678.

To all whom it may concern:

Be it known that I, LYMAN A. WHEAT, a citizen of the United States, residing at the city of Battle Creek, county of Calhoun, State of Michigan, have invented certain new and useful Improvements in Rotary Printing-Presses, of which the following is a specification.

This invention relates to improvements in rotary printing presses, particularly of the tubular plate type.

The objects of this invention are: First, to provide an improved construction of a rotary printing press which shall be very compact and very efficient in use. Second, to provide an improved construction of cylindrical plate printing press or rotary printing presses in which the frame-work and driving mechanism are greatly simplified. Third, to provide an improved construction of rotary printing presses in which the tubular plates can be readily inserted and removed. Fourth, to provide an improved construction of plate cylinder means for rotary presses.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a plan view of a quadruple press embodying the features of my invention. Fig. 2 is a sectional elevation view through my improved quadruple press, taken on a line corresponding to line 2—2 of Fig. 1. Fig. 3 is a detail and elevation view of one of the perfecting mechanisms taken from the left end of mechanism C. Fig. 4 is an enlarged detail sectional view taken on a line corresponding to line 4—4 of Fig. 3. Fig. 5 is a detail view, partially in section and with the shaft shown in sections, taken on a line corresponding to line 5—5 of Fig. 1. Fig. 6 is an enlarged detail sectional view on line 6—6 of Fig. 5, showing

the means of securing and adjusting the supporting ring between the plates and of locking the plates against rotation on the mandrel. Fig. 7 is a detail sectional elevation transversely through the rollers of the perfecting mechanisms at one side, showing the arrangement of the same, the various rollers and parts being indicated in diagrammatic or conventional form.

In the drawing, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the reference characters, each perfecting mechanism is indicated generally by the reference letters A, B, C, D, such perfecting mechanisms being substantially duplicates and supported in pairs as A—D, B—C on the central frame-work 3—4 and 1—2 respectively. Each central frame, of which there are four, is substantially identical, and consists of an arch 5 across which there is a supporting bar or beam 5'. Within the arch is supported the impression cylinder shaft 6' between the frames. In suitable bearing boxes on the outside of the arch is supported the impression cylinder shaft 7 which is provided with a gear 7' meshing with the gear 6' of the shaft 6. Toward the front and the rear of each arch are supported the printing cylinder shafts 8 and 9, which are driven by the central gears 8' and 9' located between the central frames. The gear 8' meshes with the gear 6', and the gear 9' meshes with the gear 7' in each instance. Shafts 10 for the ink drums are arranged below and at each side and are driven by suitable gears 10'. Power is delivered by means of the shaft 11 and its gear 11', and the perfecting mechanisms are coupled together by the intermediate gears 18—18 supported on the connecting bar or yoke 19 which couples together the frames 1—2 to the frames 3—4. Such gears 18 serve as the intermediate gears between the inner ink drum gears and the printing cylinders at each side.

Beneath each printing cylinder are suitable inking mechanisms 14, 15 and 16.

The web of paper 17 is threaded through the press, as indicated in Fig. 7, being de-

livered underneath the machine from a roll supported in any suitable manner, upwardly between the printing cylinder 8'', which is supported on the shaft 8, and the impression cylinder 6'' supported on the shaft 6, thence along the impression cylinder 6'' and upwardly between the impression cylinder 7'' and the printing cylinder 9'', thence out between a pair of guide rollers 12—12, which are suitably geared together, and thence to the angle bars 13, which permit the paper to be turned at right angles and delivered to folding mechanisms E, F, which are preferably at one end of the machine, although they may be located in any convenient position.

To produce larger machines, perfecting mechanisms with their frame-work as here shown could be superposed, or they could be added to indefinitely on the same floor level, except in such instances, they would, of course, be occupying additional floor space.

The plates 20 are tubular in form and slip onto the printing cylinders, being bored out to fit the same substantially, and are slotted to be engaged by suitable lugs or pins 24 on the locking rings on the printing cylinders, which retain said plates in place against rotation.

The inner ring 23 is stationary, the metal ring 21 is removable and is secured adjustably in place on the printing cylinder 8'' by a suitable set screw 22, and the outer ring 25 is moved into place in the outer end of the outer tubular plate and is secured in position exactly the same as the central ring 21 is secured. Because the shafts carrying these cylinders are supported between a pair of frames 1—2 or 3—4, as the case may be, and are driven from a gear between the same, and because they are made of a maximum size, they are, in many instances, sufficiently rigid to do ordinary printing without any supports at their outer ends, but I find, in practice, that it is desirable to provide some support for the outer ends of these various shafts when of considerable length. Those of the impression cylinders are inserted in suitable bearing boxes as also are the outer ends of the shafts 10 of the ink drums. These bearings are in a frame casting 27 which is secured to a base 26 at the outer end with the exception of the bearing for the upper impression cylinder shaft 7, which is on the upper side of a block 28, the under part of which serves as a boxing for the outer end of the shaft 6.

To permit free access to the outer ends of the printing cylinders I provide a swinging arm 29 in each instance, which is supported on a pin or shaft 30, so that it will swing down as on a hinge. A laterally-projecting arm 31 is provided with a clamping bolt 32, by which the same is secured to a suit-

able projecting lug or bracket 33 on the side of the frame 27. In the upper end of this arm 29, I provide a conical screw-threaded pin 34 which is locked in place by a lock nut 35. This is arranged to support the outer end of the printing cylinder shaft by engaging the projecting end 36 thereof, which has a conical depression 37 to receive the end of the conical pin 34. This provides adequate support for the outer end of the printing cylinder, and is a structure which can be very readily dropped down out of the way when inserting or removing the tubular stereotype or electrotype plates. However, as before remarked, unless the cylinders are quite long, it will not be found necessary to support the outer ends of the shafts of the printing cylinders in this way, and I desire to claim the same thus supported and also to claim the same broadly whether thus supported or not. I also desire to remark that the plates could be secured to the printing cylinders by the usual methods employed, or by the methods that I have illustrated in my concurrent applications for patents, but the methods preferred by me in this style of machine is that here illustrated. This secures a shaft for supporting the type plates of maximum size and is a very convenient method of inserting or removing the same. Many other variations will occur to the person skilled in this art which may be utilized without departing from my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a rotary printing press, the combination of pairs of perfecting mechanisms, each including printing and impression cylinders; central gears between the mechanisms of said pairs; shafts for the impression cylinders and printing cylinders extending the length of said pair of perfecting mechanisms; supporting frames for the shafts each side of the said central gears and in proximity thereto; supporting bearings for the outer ends of said shafts, those for the printing cylinders being pivoted to swing away from the ends of the said printing cylinders; intermediate yokes between the frames of the pairs carrying intermediate gears for coupling the said perfecting mechanisms together; and driving means engaging the gear of one of the said perfecting mechanisms, all coacting substantially as described and for the purpose specified.

2. In a rotary printing press, the combination of a pair of perfecting mechanisms, including printing and impression cylinders; shafts for the impression and printing cylinders extending the length of said pair of perfecting mechanisms; central gears between the mechanisms of said pair; supporting boxes for the said shafts each side of

said central gears and in proximity thereto; supporting bearings for the outer ends of said shafts, those for the printing cylinders being pivoted to swing away from the ends of said printing cylinders to permit the insertion or removal of tubular plates; tubular plates, adapted to fit on the said printing cylinders; suitable means for securing the said plates on the said cylinders, coacting for the purpose specified.

3. In a rotary printing press, the combination of a pair of perfecting mechanisms, including printing and impression cylinders; shafts for the impression and printing cylinders extending the length of said pair of perfecting mechanisms; central driving gears between the mechanism of said pair; supports and boxes for the said shafts each side of said central gears and in proximity thereto; tubular plates adapted to fit on the said printing cylinders and removable over the ends of the same and suitable means for securing the said plates on the said cylinders, coacting for the purpose specified.

4. In a rotary printing press, the combination of a pair of perfecting mechanisms, including printing and impression cylinders; shafts for the impression and printing cylinders extending the length of said pair of perfecting mechanisms; central driving gears for said shafts; and supports and boxes for the said shafts each side of said central gears and in proximity thereto whereby tubular plates can be put over the ends of said cylinders, coacting for the purpose specified.

5. In a rotary printing press, the combination of a pair of perfecting mechanisms, including printing and impression cylinders; central gears between the mechanisms of said pair; shafts for the type or plate cylinders extending the length of said pair of perfecting mechanisms; supports and boxes for the said printing cylinder shafts at each side of the said central gears and in proximity thereto; swinging supports with supporting pivots for the outer ends of the said printing cylinder shafts to permit the insertion or removal of tubular plates; and tubular plates, adapted to fit on the said printing cylinders, coacting for the purpose specified.

6. In a rotary printing press, the combination of a pair of perfecting mechanisms, including printing and impression cylinders; central driving gears between the mechanisms of said pair; shafts for the printing cylinders extending the length of said pair of perfecting mechanisms; supporting boxes for the said printing cylinder shafts at each side of the said central gears and in proximity thereto; tubular plates adapted to fit on the said printing cylinders and removable over the ends thereof, coacting for the purpose specified.

7. In a rotary printing press, the combina-

tion of a pair of perfecting mechanisms including printing and impression cylinders; central driving gears between the mechanisms of said pair; shafts for the printing cylinders extending the length of said pair of perfecting mechanisms; and supporting boxes for the said printing cylinder shafts at each side of the said central gears and in proximity thereto, whereby tubular plates can be put over the ends of said cylinders, coacting for the purpose specified.

8. In a rotary printing press, the combination with suitable shafts, of central driving gears therefor, with supports and boxings at each side in proximity thereto; cylinders arranged on the said shafts toward each end; printing plates on said cylinders, said plates being removable over the ends of said cylinders, and removable rings for securing said plates thereon, coacting for the purpose specified.

9. In a rotary printing press, the combination with suitable shafts, of central driving gears thereon, with supports and boxings at each side in proximity thereto; and plate cylinders arranged on the said shafts toward each end and removable over the ends thereof, coacting for the purpose specified.

10. In a rotary printing press, a printing couple comprising a plate cylinder and an impression cylinder, the plate cylinder having end and intermediate journal bearings, the end bearings being removable to permit tubular plates to be slipped endwise on or off the cylinder.

11. In a rotary printing press, a printing couple comprising a plate cylinder and an impression cylinder, the plate cylinder having end journals and an intermediate journal, the end bearings for the end of the plate cylinder being removable to permit tubular plates to be slipped endwise on or off the ends of the cylinder at either side of the intermediate bearing.

12. In a rotary printing press, a printing couple comprising a plate cylinder and an impression cylinder, each cylinder having end and intermediate bearings, the end bearing of the plate cylinder being removable to permit tubular plates to be slipped endwise on or off either end of the plate cylinder at either side of the central journal when the bearings are removed.

13. In a rotary printing press, a printing couple comprising a plate and an impression cylinder, the plate cylinder having end and intermediate journal bearings, the end bearings being removable to permit plates to be slipped on or off the end of the cylinder; and tube plates adapted to be slipped endwise on or off the cylinder when the end journals are removed.

14. In a rotary printing press, the combination of a plate cylinder having end and intermediate journal bearings, the end bear-

ings for the cylinder being removable; tube
plates adapted to be slipped endwise on or
off the cylinder at either side of the inter-
mediate bearing thereof, when the proper
5 end bearing is removed, and means for lock-
ing these tube plates on the cylinder.

In witness whereof, I have hereunto set

my hand and seal in the presence of two
witnesses.

LYMAN A. WHEAT. [L.S.]

Witnesses:

EDWIN C. LEWIS,

ERWIN A. SALISBURY.