H. F. BECHMAN.

CYLINDER AND PLATE CLAMPING DEVICE FOR ROTARY PRINTING PRESSES.

APPLICATION FILED APR. 26, 1916.

1,317,647. Patented Sept. 30, 1919.

Fig. 1.

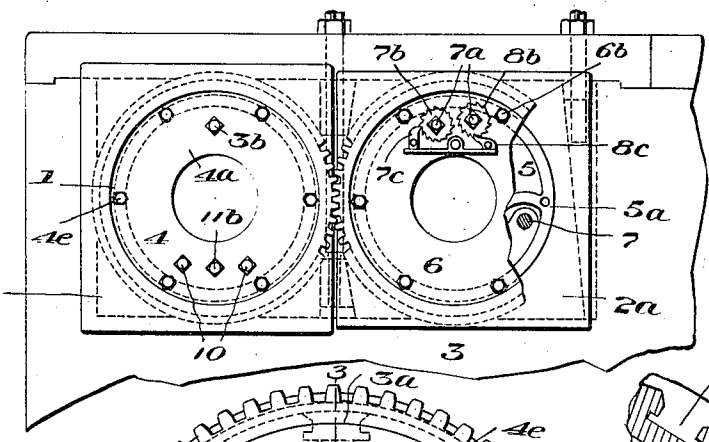
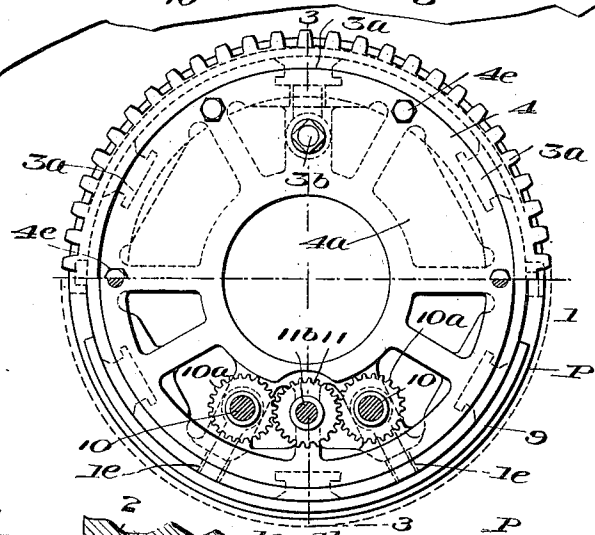


Fig. 2.



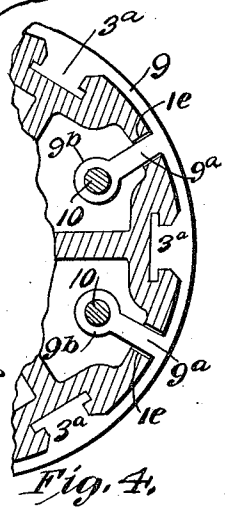
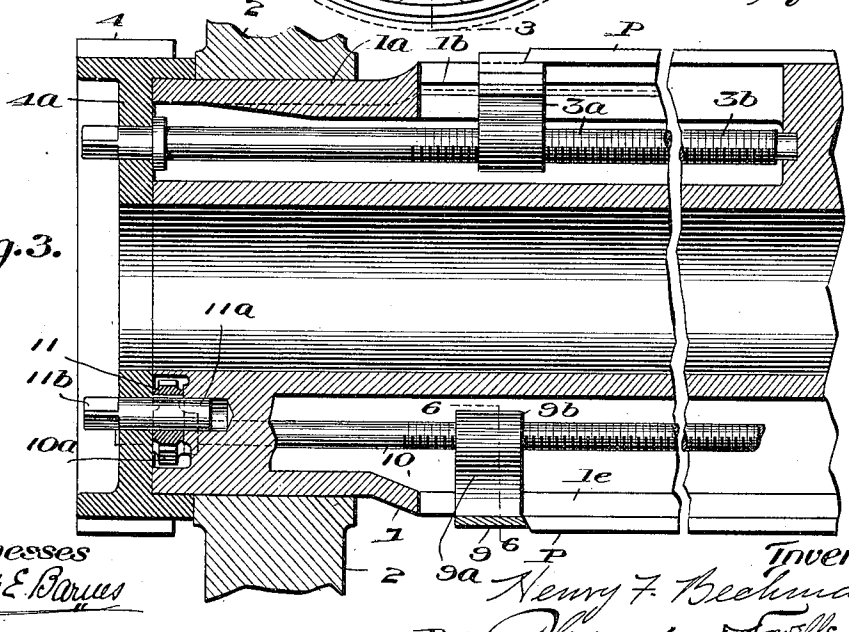


Fig. 4.

Fig. 3.



Witnesses
Wesley E. Barnes

Inventor
Henry F. Bechman
By Alexander & Dowell Attys.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY F. BECHMAN, OF BATTLE CREEK, MICHIGAN, ASSIGNOR TO DUPLEX PRINTING PRESS COMPANY, OF BATTLE CREEK, MICHIGAN, A CORPORATION OF MICHIGAN.

CYLINDER AND PLATE-CLAMPING DEVICE FOR ROTARY PRINTING-PRESSES.

1,317,647. Specification of Letters Patent. Patented Sept. 30, 1919.

Application filed April 26, 1916. Serial No. 93,695.

To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, a citizen of the United States, residing at Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Cylinders and Plate-Clamping Devices for Rotary Printing-Presses; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is a novel improvement in printing machinery and has particular reference to the cylinders of rotary presses; and its object is to practically obviate the "spring" of such cylinders, which has heretofore been a source of great trouble in high speed rotary presses, and also to locate the devices for operating the plate adjusting clamps and the blanket adjusting devices, on the respective cylinders, exterior to the cylinder bearings and gears, so that they will be readily accessible from the outside of the side or end frames or bearings in which the cylinders are journaled, instead of said devices having to be located and operated intermediate the ends of the cylinders and the side frames or bearings in which the cylinder trunnions are mounted. This construction enables the press as a whole to be narrowed in width or shortened in length, according to whether the cylinders are arranged transversely or longitudinally thereof. The invention also includes novel means for clamping the plates on the plate cylinder.

In the present invention I dispense with any cylinder trunnions or shafts, and journal the ends of the cylinders directly in the bearings, and this enables me to arrange the adjusting devices for the blankets and plate clamps at the ends of the cylinders and outside of the bearings or frame.

The novel features of the invention will be hereinafter more fully explained in detail with reference to the accompanying drawings which illustrate plate and blanket cylinders and clamps embodying the invention, and so that others skilled in the art will be able to readily adapt and use the same. The essential features and novel combinations of parts for which protection is desired are set forth in the claims following said description.

In said drawings:

Figure 1 is a detail side elevation of part of a press, showing a printing couple comprising a plate and impression cylinder journaled in bearings therein.

Fig. 2 is an end elevation of my novel plate cylinder showing the plate-clamp adjusting means; the cylinder driving gear being partly broken away.

Fig. 3 is an enlarged detail vertical section on line 3—3, Fig. 2, of part of such plate cylinder.

Fig. 4 is a detail sectional view on line 6—6 Fig. 3 showing the novel plate-clamp.

The plate cylinder 1 and impression cylinder 5 may be in general similar to the cylinders now in use, with the important exception that the usual supporting shaft or supporting trunnions are dispensed with, and instead each cylinder is made long enough to practically extend through the side frames of the press. This enables the press to be narrowed or shortened because of the absence of end trunnions or shafts on the cylinders; and also enables the devices by which the plate clamps or the blanket adjusting devices are operated to be extended directly through the ends of the cylinder and bearings to the outside of the press frame.

The ends of the cylinders form the journals thereof and may be of substantially the same diameter as the body thereof, but are preferably slightly reduced.

Each end of the plate cylinder 1 is slightly reduced as indicated at 1^a to form the journal part thereof; and each journal 1^a is journaled in a box 2, which may be adjustably mounted in the frame 3 of the machine.

The boxes 2 and 2^a may be of any suitable construction and provided with any suitable means for adjusting the cylinders toward or from each other as usual in printing presses; the journal boxes being enlarged to properly accommodate the journal ends of the cylinders journaled therein.

The cylinder 1 may be provided with the usual slots 1^b for the accommodation of plate clamps 3^a of any suitable kind adapted to engage plates P on the cylinder; these clamps as shown are adjustable by means of screw-rods 3^b which may be journaled in said slots as shown in the upper part of Figs. 2 and 3. The outer ends of screw-rods 3^b may be journaled in openings in the web

portion 4^a of the cylinder gear 4, which is preferably fitted onto the outer end of cylinder 1, and may be rigidly secured thereto in any suitable way, bolts 4^e being indicated in the drawings.

The outer end of the screw-rod in the example shown projects through the web 4^a of the gear 4, and is squared for engagement of a suitable wrench by which the screw-rod can be turned so as to either cause clamp 3^a to engage plate P, or retract the clamp as usual. I prefer to use the plate clamping devices shown in the lower parts of Figs. 2, 3 and 4.

It will be seen that the plate-clamps can be adjusted from the outer side of the bearing or frame and outer end of the cylinder; which is very convenient to the pressman; and enables the press to be correspondingly shortened in length or narrowed in width as compared with the heretofore known styles of cylinders in which the adjusting devices had to be arranged adjacent the inner ends of the cylinder trunnions, and to the inside of the bearing and frame.

The cylinders may be made solid, but are preferably made hollow and ribbed, as indicated in dotted lines, in the usual manner to enhance their stiffness while reducing their weight.

The plate cylinder is provided with a plurality of slots 1^b for the engagement of plate clamps 3^a; usually three clamps are provided for each plate; and it is desirable to operate these clamps simultaneously so as to engage or release a plate quickly, and save the time and trouble required to independently operate a plurality of clamps to lock or release a plate.

As shown in the lower part of Figs. 2 and 3 and in Fig. 4 three of the clamps 3^a may be rigidly connected with or formed on an arc-shaped bar 9 which is provided intermediate each adjacent bar or clamp with an inwardly projecting bracket 9^a which extends through a slot 1^e in the plate in the ends of the cylinder and carries on its inner end a nut or threaded portion 9^b which is engaged by a threaded rod 10. Each rod 10 has its inner end journaled in the cylinder and its outer end is supported in the web 4^a of the gear 4. Keyed or fixed on each rod 10 is a pinion 10^a which meshes with a pinion 11 on a stub shaft 11^a journaled in the end of the cylinder and the web 4^a. The outer end 11^b of shaft 11^a is preferably squared for engagement of a wrench.

By turning shaft 11^a motion will be simultaneously imparted by pinion 11 to gears 10^a, and the rods 10 simultaneously turned thereby so as to move the bar 9 and clamps attached thereto longitudinally of the cylinder. By reason of the arrangement of the brackets 9^a the pressure will be transmitted equally to all of the clamps connected with bar 9; and said clamps can all be simultaneously quickly and uniformly pressed against the plate; or can be disengaged therefrom at will.

I do not herein claim the blanket adjusting devices, which form the subject matter of a divisional application filed June 13, 1917, Serial No. 174,555.

What I claim is:

1. In combination, a plate cylinder having plate clamps, an arc-shaped bar connected with a plurality of said clamps and provided with inwardly projecting brackets in the wall of the cylinder, and means engaging said brackets to longitudinally move the bar.

2. In combination, a plate cylinder having plate clamps, an arc-shaped bar connected with a plurality of said clamps and provided with a plurality of inwardly projecting brackets extending through slots in the wall of the cylinder, and means engaging said brackets to longitudinally move the bar.

3. In combination, a plate cylinder, a bar provided with inwardly projecting brackets, threaded shafts engaging said brackets, pinions on said threaded shafts, means for simultaneously operating the threaded shaft pinion and plate clamps operated by said bar.

4. In combination, a plate cylinder, a bar provided with a plurality of inwardly projecting brackets, threaded shafts engaging said brackets, pinions on said threaded shafts, an intermediate pinion for simultaneously operating the threaded shaft pinions; and plate clamps operated by said bar.

5. In combination, a plate cylinder having plate clamps, an arc-shaped bar connected with a plurality of said clamps and provided with inwardly projecting brackets extending through slots in the wall of the cylinder and means for simultaneously moving said brackets, substantially as described.

6. In combination, a plate cylinder having plate clamps, an arc-shaped bar connected with a plurality of said clamps and provided with inwardly projecting brackets extending through slots in the wall of the cylinder, parallel threaded shafts engaging said brackets, pinions on said shafts, an intermediate shaft, and a pinion thereon engaging the pinions on the threaded shafts for simultaneously operating the latter, substantially as described.

7. In combination with a press frame and bearings; of a trunnionless cylinder of substantially uniform diameter throughout having its ends journaled in and extending through said bearings; plate clamps, and clamp adjusting devices each eccentrically disposed and extending through the end of the cylinder and accessible at the outer side of the bearing.

8. In a printing press having bearings; a trunnionless plate cylinder having a body and end journals of substantially uniform diameter; the journals of said cylinder extending through said bearings; plate clamps on said cylinder; and plate clamp adjusting devices lying within and eccentrically of the axis of the cylinder and extending through a journal of the cylinder and the adjacent bearing and accessible from the outer side of such bearing.

9. In combination, a trunnionless plate cylinder having a body and end journals all of substantially uniform diameter; bearings in which the journals of said cylinder are mounted, the journals of the cylinder extending through said bearings; a driving gear on one end of one of the cylinder journals adjacent the bearing; plate clamps on the cylinder; and plate clamp adjusting devices lying within and eccentrically of the axis of the cylinder and extending through one journal of the cylinder, the adjacent bearing and said gear, and accessible from the outer side of the press.

10. A trunnionless cylinder for printing presses having end journals of substantially the same diameter as its body, plate clamps slidably mounted on said cylinder, and means for adjusting said plate clamps disposed within and eccentrically of the axis of the cylinder and extending through the journals thereof and accessible at the outer ends thereof.

11. In a printing press, the combination of a frame, and bearings thereon; with a trunnionless cylinder having a body and end journals all of substantially uniform diameter, and journaled in said bearings at the outer side of the frame, plate clamps slidably mounted on said cylinder, and means for adjusting said plate clamps disposed within and eccentrically of the axis of the cylinder and extending through the journals thereof and accessible at the outer ends thereof.

In testimony that I claim the foregoing as my own, I affix my signature.

HENRY F. BECHMAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."