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G. L. FULK

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PRINTING PRESS CYLINDER

Filed June 2, 1927

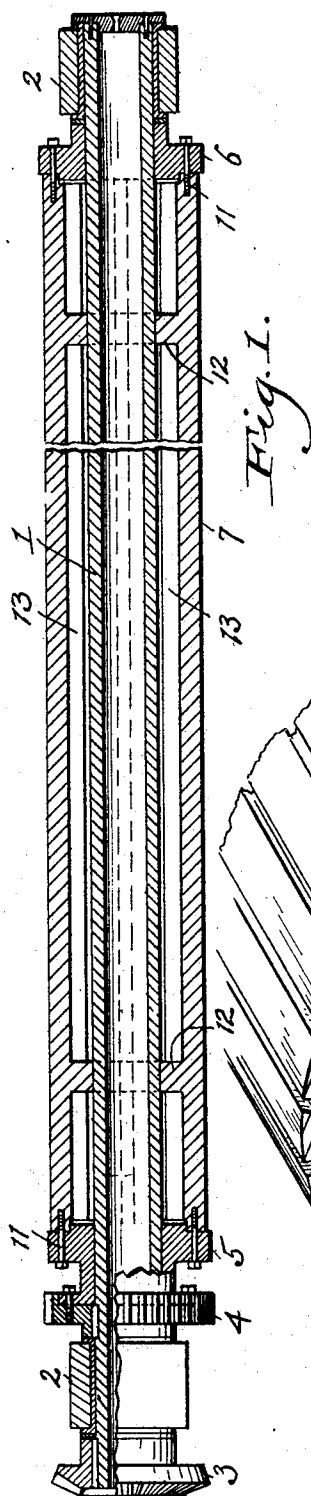


Fig. 1.

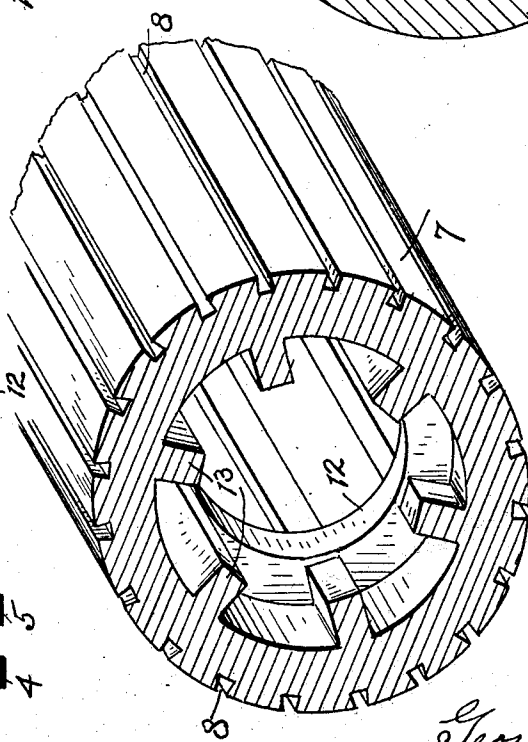


Fig. 2.

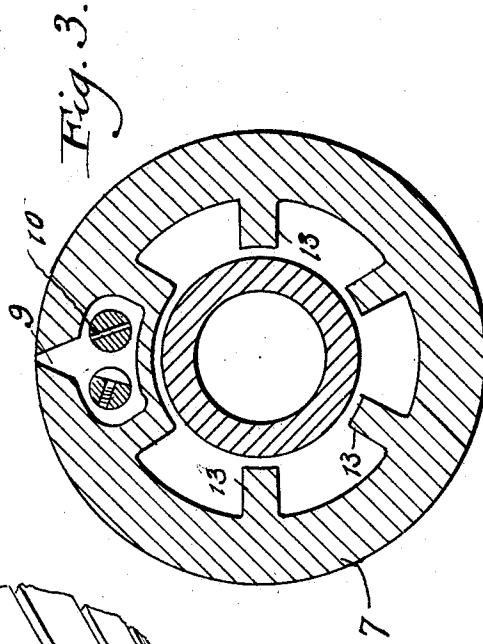


Fig. 3.

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PRINTING-PRESS CYLINDER

Application filed June 2, 1927. Serial No. 196,126.

This invention relates to printing press cylinders, and more particularly to long plate and tympan cylinders for large presses. In large printing presses having long printing cylinders which are supported in pairs at the end thereof, the cylinders have a tendency to sag in the middle and it has always been necessary to compensate for the sagging of the cylinders by wrapping additional layers of paper upon the central portion of the tympan cylinder in order to maintain the necessary pressure between the cylinders at the center thereof. Further, it has always been necessary to make the long cylinders of a diameter considerably greater than cylinders of smaller presses in order to obtain the necessary rigidity to prevent excessive sagging between the widely spaced bearings. The increase in the diameter of the cylinders adds to the cost thereof, makes the interchange of cylinders more difficult, makes it necessary to increase the number of plates on the plate cylinder and increases the labor incident to the changing of the plates in setting up the cylinders for a new job of printing.

The present invention has for its object to provide long printing cylinders of relatively small diameter which are so constructed and supported that they do not sag between their bearings, making it unnecessary to provide extra windings of paper on the tympan cylinder and making it unnecessary to provide a greater number of plates on the plate cylinder.

With the above and other objects in view, the invention may be said to comprise construction illustrated in the accompanying drawings hereinafter described and particularly set forth in the appended claims, together with such variations and modifications thereof as will be apparent to one skilled in the art to which the invention appertains.

Reference should be had to the accompanying drawings forming a part of this specification in which:

Fig. 1 is a longitudinal section through the printing cylinder, its supporting shaft and bearings;

Fig. 2 is a sectional perspective view of a plate cylinder; and

Fig. 3 is a transverse section through a tympan cylinder.

As shown in the accompanying drawings the cylinders are supported upon a tubular shaft 1 which is journaled in bearings 2 in the opposite sides of the press frame, a tubular shaft being employed for the reason that this form of shaft has the necessary rigidity and due to its lightness does not sag between bearings. As is well understood in the art, the plate and tympan cylinders of a printing press are mounted side by side with their peripheries in contact and are driven in opposite directions to feed the paper between them. One of the supporting shafts is provided with a bevel gear 3 by which it may be driven, and the shafts are provided with gears 4 which intermesh so that one cylinder is driven from the other. The gear 4 is mounted upon the inside of the bearing 2 at one side of the press and has rigidly attached thereto one of the end members 5 of the cylinder, the other end member 6 of the cylinder fitting upon the shaft 1 immediately to the underside of the bearing 2 at the opposite side of the frame. The cylinder proper, indicated by the numeral 7, is in the form of a casting mounted between the end members 5 and 6, the plate and tympan cylinders being identical in construction except that the plate cylinder is provided exteriorly with longitudinal grooves 8 in which the plates are fastened, and the tympan cylinder is provided with a peripheral slot 9 and fastening devices 10 securing the end of the paper wrapped about the cylinder. The cylinder 7 is rigidly attached to the end members 5 and 6 by means of bolts 11 and rotates with the shaft. At a point spaced inwardly from each end thereof and between the end and the center, the cylinder is provided with integral internal annular ribs 12 which bear upon the tubular shaft 1 to provide supports for the cylinder on the shaft 1 intermediate the ends and center thereof. In order to further stiffen the cylinder, the cylinder is provided with regularly spaced longitudinally extending internal ribs 13 which extend from the ends of the

cylinder to the annular ribs 12 and from one annular rib to the other, the ribs 13 being of less height than the ribs 12 so that the inner edges thereof are out of contact with the shaft 1.

By utilizing printing cylinders constructed and supported as above described, I have been enabled to use 106 inch cylinders of 10 inch diameter which is the standard size for shorter cylinders and these long cylinders of small diameter have no perceptible sag and it is unnecessary to provide additional layers of paper upon the center of the tympan cylinder. The bearing ribs 12 impose the weight of the cylinder upon the tubular shaft at points between the bearings and the middle portion of the shaft. Due to the relatively short span between the ribs 12, the cylinder does not sag under its own weight. The ribs 13 being out of contact with the shaft, the weight of the cylinder is imposed on the shaft at the ribs 12 only, and since these ribs are relatively close to the end bearings, the shaft is enabled to carry the load without sagging. Furthermore, since the shaft is out of contact with the cylinder between the ribs 12, it may bend slightly independently of the cylinder.

Having thus described my invention, I claim:

1. In a printing press, the combination with a tubular shaft having bearing supports at the opposite ends thereof, of a hollow printing cylinder mounted on said shaft between the bearing supports, end members for said cylinder bearing upon said shaft, said cylinder having an internal diameter greater than the external diameter of the shaft, said cylinder having an internal annular rib spaced inwardly from each end member and bearing upon the shaft between the end of the cylinder and the center thereof for supporting said cylinder between said end members.

2. In a printing press, the combination with a tubular shaft having bearing supports at the opposite ends thereof, of a hollow printing cylinder mounted on said shaft between the bearing supports, said cylinder having an internal diameter greater than the external diameter of the shaft, said cylinder having end members fitting upon the shaft adjacent the bearing supports and having an internal annular rib spaced inwardly from each end member and bearing upon the shaft between the end of the cylinder and the center thereof, said cylinder having also longitudinally extending angularly spaced internal ribs extending from the ends thereof to said annular ribs and between said annular ribs, said longitudinal ribs being of less height than said annular ribs whereby their edges are spaced from the shaft.

3. In a printing press, the combination with a shaft having spaced bearing supports,

of a hollow elongated printing cylinder on said shaft between said bearing supports, end members for supporting the end portions of said cylinder, and an internal annular rib formed integrally with said cylinder and adapted to bear upon said shaft between said end members for supporting the intermediate portion of said cylinder.

In testimony whereof, I hereunto affix my signature.

GEORGE L. FULK.