

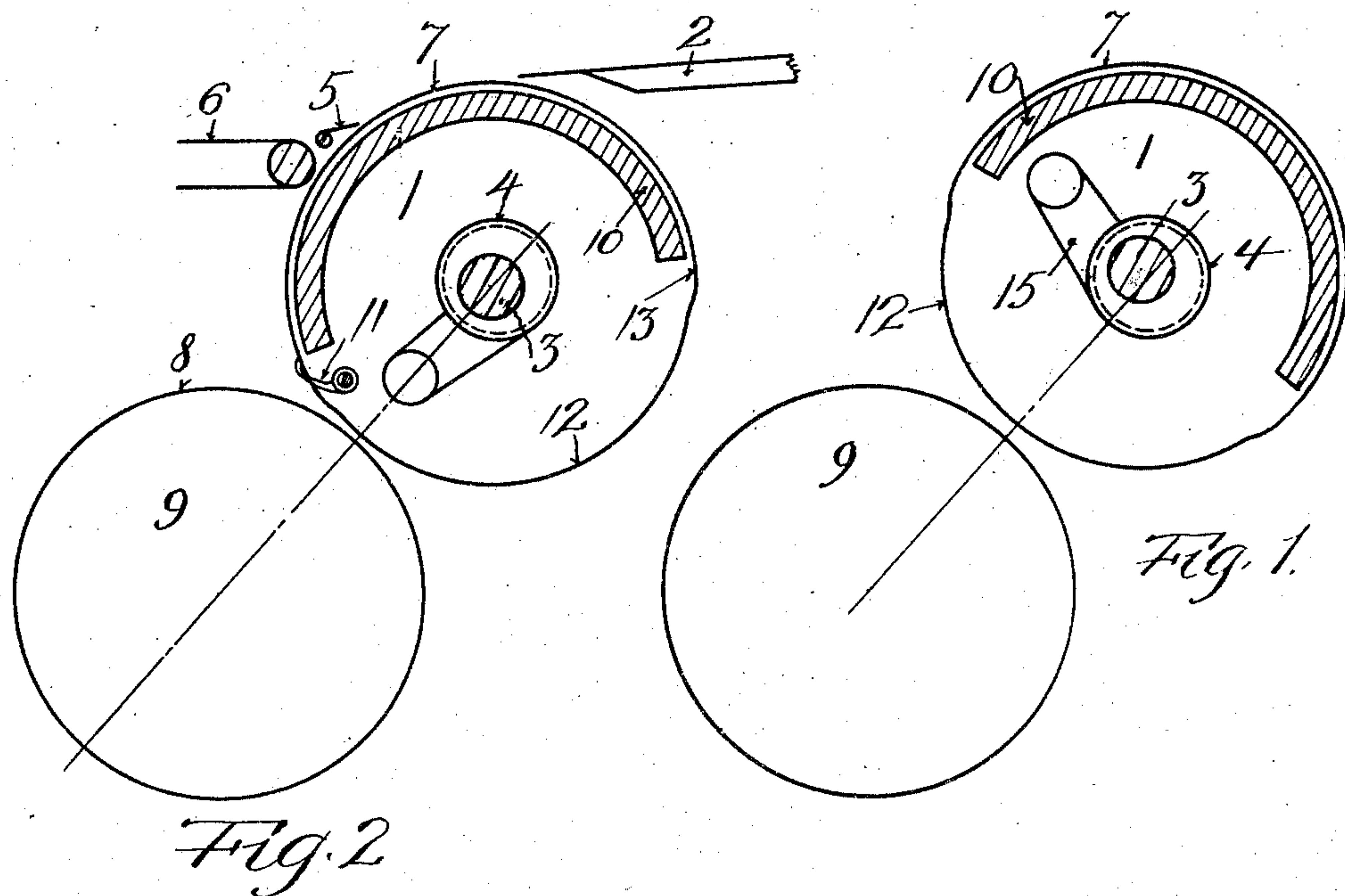
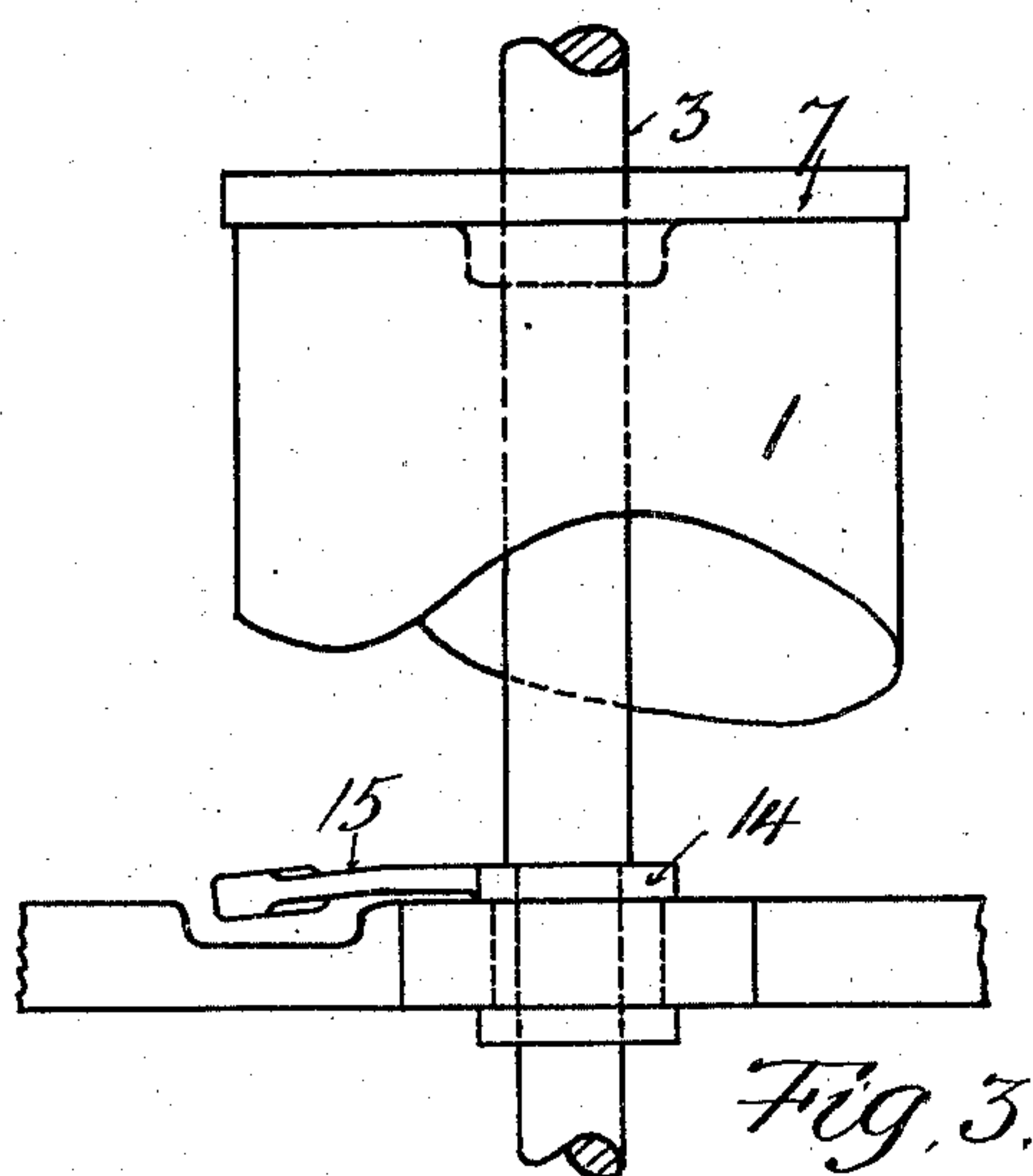
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**H. L. HETHERINGTON**

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**PRESS**

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## UNITED STATES PATENT OFFICE

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## PRESS

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My invention relates to presses, and more particularly to the bearers associated with the printing elements of the press. In a two revolution flat bed printing press the impression cylinder is in contact with the bearers on the bed only during the printing stroke, and when the cylinder is moved down into position ready for the printing stroke, the lowering mechanism can move down freely and without distortion. When the cylinder lifts after the printing stroke has been completed, the lifting operation takes place after the cylinder is free of the bearers. In such cases the mechanism for raising and lowering the impression cylinder is not put under extreme strain or resistance while the operation of raising or lowering the cylinder is actually taking place. In a rotary press, however, where the impression cylinder and form cylinder are both rotary members, the bearers, which are the members which come into direct contact and are arranged at the ends of the cylinder, are round that is to say, they extend completely around the circumference of the cylinder as heretofore constructed. It will be apparent that as the impression cylinder is moved toward the form cylinder to bring about the printing relation, the bearers will be in contact with each other as soon as the impression cylinder moves down into printing position, and on the other hand, the bearers will be in contact at the instant the cylinder begins its lifting movement. It is common in rotary presses to arrange the cylinders for very close or tight contact during the printing operation. That is to say, it is customary to have these cylinders approach from ten to fifteen one-thousandths of an inch closer together than what is commonly called kiss contact, in order to obtain good impression. The impression cylinder is moved into and out of impression position by suitable cams and levers which are arranged to be at or about dead center when the impression cylinder is in the final printing position. If the bearers of the cylinders are in contact throughout the whole revolution of the cylinders, as in former practice, then when the cylinder lifting device begins to move the impression cylinder into

printing position the bearers of the two cylinders may come into contact before the cylinder moving mechanism has reached its extreme position, and this causes the cylinder lifting device to be seriously strained. As a result, the action of the cylinder raising and lowering device is not exactly the same on each succeeding impression, which will naturally affect the registry of the press. Also when the cylinder is being lifted the bearers are in tight contact and in some cases the rotation of the cylinder has a tendency to draw the cylinders toward each other, and this works against the lifting mechanism, so that the latter is again strained in this operation also. The object of the present invention is to relieve the pressure of the bearers while the impression cylinder is being moved into printing position, and in the full embodiment of my invention to relieve the pressure at the time the lifting mechanism commences to lift the impression cylinder out of the printing position. In carrying out the invention in the simplest form, the bearers of at least one of the cylinders of a couplet is mutilated. This may be accomplished by cutting away a portion of the bearers of either the plate or impression cylinder, or both.

In the drawings forming part of this application,

Figure 1 is a sectional view of one of the couplets of a rotary press, consisting of an impression and form cylinder, in which view the impression cylinder is shown lifted or out of printing position, for delivery of the printed sheet,

Figure 2 is a similar view with additional parts, and showing the impression cylinder in its lower or printing position, and

Figure 3 is a plan view thereof.

It will be understood that my invention may be applied to any rotary printing press whether it be of the single or multi-color type, whether it be of the single or two-revolution type, and whatever type of cylinder-lifting mechanism is used, but in the present case it is only necessary to illustrate the invention as applied to one couplet of a two-revolution press, since its application to other couplets will be a mere duplication. In the drawing



I have shown in Figure 1 one of the couplets of a rotary printing press in which 1 is the impression cylinder and 9 is the form or plate cylinder, which carries the printing plate or form. The cylinder 1 is mounted, in accordance with common practice, upon the cylinder shaft 3, which is provided with eccentric boxes 4 which carry the cylinder shaft, and these eccentrics are adapted to raise and lower the impression cylinder with its shaft a slight extent, in order to separate the impression and form cylinders during the delivery revolution of the press and to move the cylinders into close or printing contact during the printing stroke. In a single revolution press the separation only occurs when the cylinder is tripped. The mechanism for operating the eccentrics may be any of those well known in the art, and a detailed description of such mechanism is unnecessary to an understanding of the present invention. It is sufficient to indicate that the lever arm 15, projecting from the eccentric is usually operated upon by suitable levers and links to place the impression and form cylinders in the two positions indicated by Figures 1 and 2.

In Figure 2 I have indicated at 2 the feed table from which the sheets are fed to the impression cylinder 1 and at 5 there is shown one of the stripper fingers which remove the sheets from the cylinder and direct them upon the delivery device, one end of which is shown at 6. As stated above, there are several ways of arriving at the results under the present invention, but in the drawing I have shown by way of example, a bearer 8 on the form cylinder 9, of standard size, or, in other words, this bearer extends completely around the form cylinder as in present practice. The bearer 7, however, on the impression cylinder 1, extends but partway around this cylinder, or, in other words, the bearer is mutilated so that the portion 12 is of smaller diameter than the portion 7. The actual impression portion of the cylinder 1 is shown at 10 and this is the portion which carries the sheet to be printed into contact with the type or form on the cylinder 9. At 11 I have indicated one of the grippers which co-operate with the impression surface of the member 10, to grip the leading edge of the sheet for the purpose of carrying the sheet around with the impression cylinder. I have shown the bearer 7 of this impression cylinder extending through a greater number of degrees than the impression member 10.

In the drawings the impression cylinder 1 will revolve in a counterclockwise direction, and as stated above, the impression cylinder is shown down or in printing position in Figure 2, whereas it is shown in its raised or separated position in Figure 1. The impression cylinder in Figure 2 has been moved toward the form cylinder 9 by the usual raising and lowering device acting through the

eccentrics 4; and when this movement into printing position has been completed, as shown in Figure 2, the eccentrics are on the dead center line passing between the axes of the impression and form cylinders, or about on the dead center line, where these parts are able to withstand great pressure without distortion. The position of the higher portion 7 of the bearer of the impression cylinder is such that it does not come into contact with the bearer 8 of the form cylinder 9 until just after the cylinder 1 has been lowered to printing position, as shown in Figure 2. While the cylinder 1 is being lowered, the lower or mutilated portion 12 is opposite the bearer 8, and these surfaces do not come into contact and therefore there is no appreciable resistance to the operation of the lowering device; and the latter is therefore not put under distortion stresses while the lowering operation is taking place. Just after the impression cylinder is lowered to the position shown in Figure 2, the bearer 7 comes into contact with the bearer 8 just before the impression surface 10 commences to press the sheet into rolling contact with the form or plate on the cylinder 9. The bearer 7 continues in contact with the bearer 8 until the impression portion 10 of the cylinder 1 has passed the cylinder 9, or until the sheet has been completely printed. Then the bearer portion 7 rides off the bearer 8 as the mutilated portion 12 comes opposite the latter and it is while this portion 12 is opposite the bearer 8 that the cylinder lifting device raises the cylinder 1 into the position shown in Figure 1. It is, therefore, apparent that the pressure between the bearers 7 and 8 is released before the eccentric 4 begins to lift the cylinder 1, so that the strain of this pressure is relieved before the cylinder 1 starts to lift.

Having described my invention, what I claim is:

1. In a press the combination of a printing couplet comprising co-operating revolvable cylinders, means for automatically raising and lowering one of said cylinders in relation to the other during the normal operation of the press, to place said cylinders into and out of printing relation periodically, one of said cylinders having an impression surface extending partially around the same and co-operating bearers on said cylinders, the bearers of at least one of said cylinders being mutilated and the higher portion of said mutilated bearers being approximately co-extensive with said impression portion of one of said cylinders.

2. In a press the combination of a printing couplet comprising co-operating revolvable cylinders, means for automatically raising and lowering one of said cylinders in relation to the other during the normal operation of the press, to place said cylinders into and out of printing relation periodically, one



of said cylinders having an impression surface extending partially around the same, co-operating bearers on said cylinders, the bearers of one of said cylinders being mutilated and the higher portion of said mutilated bearers extending through an arc for a greater degree than the said impression portion of one of said cylinders.

3. In a press the combination of a printing couplet comprising co-operating revolvable cylinders, means for automatically raising and lowering one of said cylinders in relation to the other during the normal operation of the press, to place said cylinders into and out of printing relation periodically, said cylinders having co-operating bearers adapted to contact with each other to limit the approach of said cylinders in relation to each other, the bearers of one of said cylinders being mutilated whereby the higher portion thereof extends only partially around said cylinder, said raising and lowering means being adapted to operate while the lower portions of said mutilated bearers are opposed to the bearers of the opposing cylinder.

Signed at New London, county of New London, and State of Connecticut the 2nd day of April, 1928.

HOWARD L. HETHERINGTON.