

935,907.

Patented Oct. 5, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

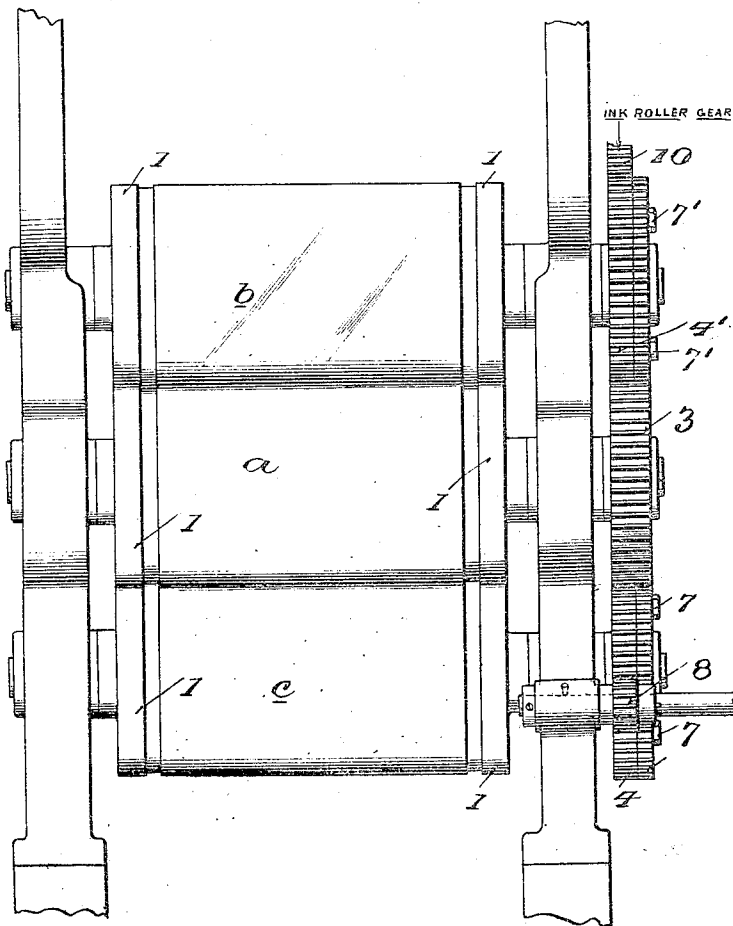
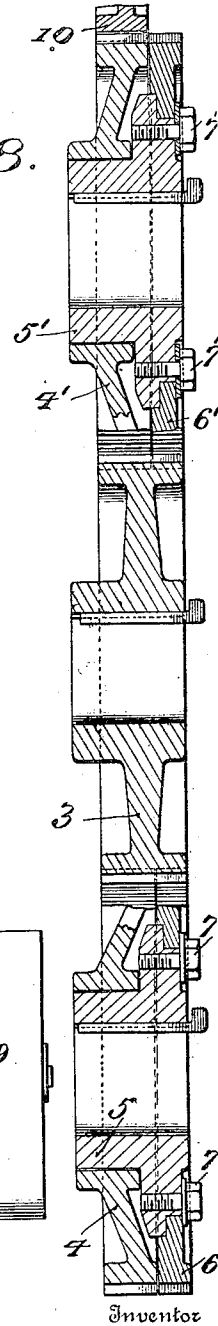


Fig. 8.



Witnesses

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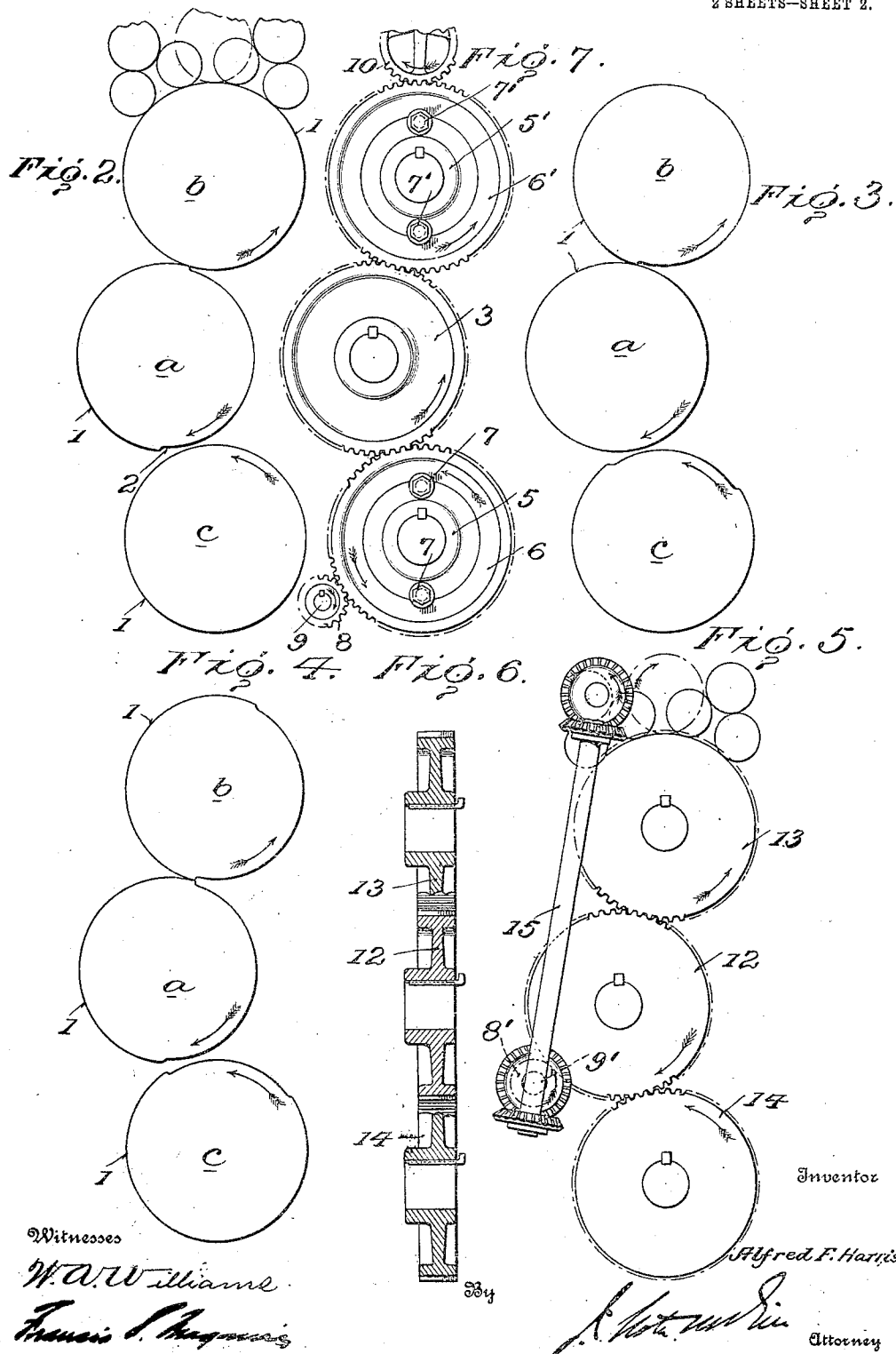
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Patented Oct. 5, 1909.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

ALFRED F. HARRIS, OF WARREN, OHIO, ASSIGNOR TO THE HARRIS AUTOMATIC PRESS COMPANY, OF NILES, OHIO, A CORPORATION OF OHIO.

PRINTING-PRESS.

935,907.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed November 21, 1909. Serial No. 463,765.

To all whom it may concern:

Be it known that I, ALFRED F. HARRIS, of Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Printing-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

As is well-known in the art of printing, streaks or blurs will occur whenever the printing members do not have a uniform face speed. In that class of printing machines known as offset or planographic presses of the rotary type this difficulty has been accentuated by the number of cylinders employed, and while it might readily be overcome as between two cylinders it frequently remains in respect to one of them and the third cylinder, since it will arise whenever there is improper packing of either the plate cylinder or the transfer cylinder, variations as small as one-thousandth of an inch being sufficient to cause streaks.

The primary object of my invention is to furnish simple and highly efficient means for overcoming all these difficulties especially in rotary presses of the offset or planographic type.

A secondary object is to provide means for carrying out my improvement in connection with offset presses now in use.

Briefly outlined, the main object of my invention is effected by having one cylinder drive another, independently of their intermeshing gears, throughout a portion of each revolution, the cooperation being discontinued for sufficient time to enable the driven cylinder to drop back and the gears to again get into register. This result is brought about by having the complementary cylinders of different diameters and providing each of them with cooperating bearers, the bearers of one or all the cylinders having breaks or interruptions. When the bearers of two cylinders are in engagement the cylinder of lesser diameter is driven by the one of greater diameter. When the breaks in the bearers of a cylinder are reached the driven or smaller cylinder drops back so that the intermeshing gears may get into register.

The second object of my invention is effected by providing the transfer cylinder

with a fixed gear and the impression and plate cylinders with fixed and idler gears, the idler gears being utilized for receiving and transmitting power.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a rear elevation showing my improvements applied to a rotary planographic press. Fig. 2 is a diagrammatic view showing the break or interruption in the bearers of the transfer cylinder. Fig. 3 is a similar view showing breaks in the bearers of the plate cylinder and impression cylinder. Fig. 4 shows breaks in the bearers of all three cylinders. Fig. 5 shows the driving power applied to the transfer cylinder. Fig. 6 is a sectional view of the gearing of Fig. 5. Fig. 7 is a face view and Fig. 8 an enlarged vertical sectional view of the gearing of Fig. 1.

My improvement will be described primarily in its relation to offset or planographic rotary printing presses, but is capable of a wide range of use, and hence is not confined to presses of this character. The invention may also be employed in two revolution machines. I have found that, in a press of the type shown, by making the transfer cylinder *a* of an almost inappreciably greater diameter than the plate cylinder *b* and the impression cylinder *c*, and driving both of the latter cylinders by the transfer cylinder, streaking will be entirely obviated. Around each of the cylinders I place fixed bearers 1 which become parts of the cylinders.

I have shown in Fig. 2 the bearers of the transfer cylinder as having breaks or interruptions 2, but if desired the bearers of the transfer cylinder may be continuous and those of the plate cylinder and impression cylinder formed with interruptions (see Fig. 3) or there may be interruptions in the bearers of each cylinder (see Fig. 4.) The relative diameters to which I have referred are through the several bearers. The working portions of the transfer cylinder and plate cylinder are built up by packing to bring their diameters at those portions into correspondence with the diameters through their respective bearers.

In three-cylinder or planographic presses the diameter of the working portion of the

impression cylinder equals the diameter through the bearers without the use of packing. As customary the several cylinders are geared together, and each cylinder is affixed to its respective shaft. The driving power for the plate cylinder and the impression cylinder is derived from the transfer cylinder, and as the bearers of the latter engage the bearers of either of the other cylinders such cylinder, together with its shaft and gear, is thereafter, while such engagement continues, caused to move at a uniform speed with the transfer cylinder irrespective of the mesh of their gears, but when the breaks or interruptions in the continuity or regularity of the bearers of the transfer cylinder reach the bearers of the other cylinder the latter will fall back to permit its gear to again get into register with the gear of the transfer cylinder. Hence the cylinder of lesser diameter is, during a portion of its revolution, driven wholly by direct engagement with the cylinder of greater diameter, and the gears are again brought into register during the remainder of such revolution.

While I do not restrict myself to any exact difference in the respective diameters of the several cylinders, I might here state that in certain styles of offset presses I have found that the stated results are obtained if the diameter of the transfer cylinder, through its bearers, exceeds the diameters of the plate cylinder and the impression cylinder, through their bearers, by but a few thousandths of an inch, the diameters of the two latter cylinders being equal. The breaks or interruptions in the bearers may be formed either by omitting segments thereof or by reducing the thicknesses of the bearers for a short distance, sufficient to allow of a relative retrograde movement between intermeshing gears, so that the gear of the smaller cylinder may fall back into register with the gear of the larger cylinder.

In the drawing I have shown the transfer cylinder as having a fixed gear 3. The gear of the impression cylinder is shown as composed of an idler 4 loose on hub 5 of the toothed ring of a sectional gear 6, which hub is keyed to the shaft of the impression cylinder. The toothed portion of gear 6 is detachably secured to its hub by a series of screws 7, and by loosening these screws the impression cylinder may be readily adjusted by hand to secure its proper positioning relatively to the transfer cylinder. The driving pinion 8 on the operating shaft 9 is shown as meshing with the idler gear 4 which in turn drives gear 3 of the transfer cylinder, and the latter in turn drives the impression cylinder through gear 6. This same form of gearing is employed on the plate cylinder, the idler 4' being utilized to drive the inking mechanism through gear 10, while the plate

cylinder itself is driven by gear 3 in mesh with sectional gear 6', whose hub 5' is keyed to the plate cylinder shaft.

This arrangement of gearing has been found advantageous for certain forms of offset presses now in use, but my invention is not confined to the employment of gearing constructed as here outlined. If desired, the inking mechanism may be separately operated, that is, by means independent of the cylinder gearing, and in that event the gears of all three cylinders may be fixed directly thereto and the same results obtained in respect to the avoidance of streaks by applying the driving power direct to the transfer cylinder. Thus, in Fig. 5, I have shown pinion 8' of the driving shaft 9' in direct mesh with gear 12 of the transfer cylinder, which latter is in mesh with the fixed gear 13 of the plate cylinder and the fixed gear 14 of the impression cylinder. In this arrangement the inking mechanism is driven by a separate shaft 15 actuated by the driving shaft 9'.

I claim as my invention:—

1. In a printing press having two cylinders, each cylinder being affixed to its respective shaft, and one of said cylinders being of greater diameter than the other, means for rotating each cylinder and its shaft, and means for causing the cylinder of lesser diameter together with its shaft to be driven by the other cylinder during a portion of its revolution, independently of its rotating means.

2. In a printing press having two cylinders and intermeshing gears, each cylinder being affixed to its respective shaft, and one cylinder being of greater diameter than the other, means on the former cylinder for driving the cylinder of lesser diameter together with its shaft, independently of the gears, during a portion of its revolution.

3. In a printing press having two cylinders, each cylinder being affixed to its respective shaft, and one of said cylinders being of greater diameter than the other, means for causing the cylinder of lesser diameter together with its shaft to be driven by the other cylinder during a portion of its revolution, such means comprising co-operating bearers on both cylinders, and means for permitting a retrograde movement of the cylinder of lesser diameter at another portion of its revolution.

4. In a planographic press having a plate cylinder, a transfer cylinder and an impression cylinder, each cylinder being affixed to its respective shaft, and said transfer cylinder being of greater diameter than the other cylinders, means for rotating said cylinders, and means for causing the plate cylinder together with its shaft to be driven by the transfer cylinder during a portion of its

revolution independently of its rotating means.

5. In a planographic press having a plate cylinder, a transfer cylinder and an impression cylinder, said transfer cylinder being of greater diameter than the other cylinders, means for rotating said cylinders, and means for causing the impression cylinder to be driven by the transfer cylinder during a portion of its revolution independently of its rotating means.

6. In a planographic press having a plate cylinder, a transfer cylinder and an impression cylinder, said transfer cylinder being of greater diameter than the other cylinders, means for rotating said cylinders, and means for causing the plate cylinder and the impression cylinder to be driven by the transfer cylinder during portions of their revolutions independently of their rotating means.

7. In a planographic press having a plate cylinder, a transfer cylinder and an impression cylinder, said transfer cylinder being of greater diameter than the other cylinders, means for rotating said cylinders, and means for causing the plate cylinder and the impression cylinder to be driven by the transfer cylinder during portions of their revolutions independently of their rotating means, such former means comprising cooperating bearers on the several cylinders, the bearers of one of two co-acting cylinders being formed with breaks or interruptions.

8. In a planographic press having a plate cylinder, a transfer cylinder and an impression cylinder, said transfer cylinder being of greater diameter than the other cylinders, means for rotating said cylinders, and means for causing the plate cylinder and impression cylinder to be driven by the transfer cylinder during portions of their revolutions independently of their rotating means, such former means comprising cooperating bearers on the several cylinders, the bearers of

the transfer cylinder being formed with breaks and interruptions.

9. In a printing press having two cylinders, an inking mechanism having a gear, a fixed gear on one cylinder, and a fixed gear and an idler gear on the other cylinder both in mesh with the first mentioned fixed gear, said idler gear being also in mesh with the inking mechanism gear.

10. In a printing press having two cylinders, a fixed gear on one cylinder, a sectional gear having a hub fixed to the other cylinder, means for binding said sections together, an idler gear loose on said hub and in mesh with said fixed gear, and a driving shaft having a pinion in mesh with said idler gear.

11. In a printing press having two cylinders, an inking mechanism having a gear, a fixed gear on one of said cylinders, a sectional gear having a hub fixed to the other cylinder, means for binding said sections together, and an idler gear loose on said hub and in mesh with said fixed gear and also with the gear of the inking mechanism.

12. In a printing press having a plate cylinder, a transfer cylinder and an impression cylinder, a gear fixed on said transfer cylinder, fixed gears on said plate cylinder and impression cylinder in mesh with the gear of the transfer cylinder, idler gears loose on the hubs of the gears of said plate and impression cylinders, a driving shaft having a pinion in mesh with the idler gear of the impression cylinder, and means for operating inking mechanism actuated by the idler gear of the plate cylinder.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

ALFRED F. HARRIS.

Witnesses:

WALTER H. SMITH,
C. G. HARRIS.