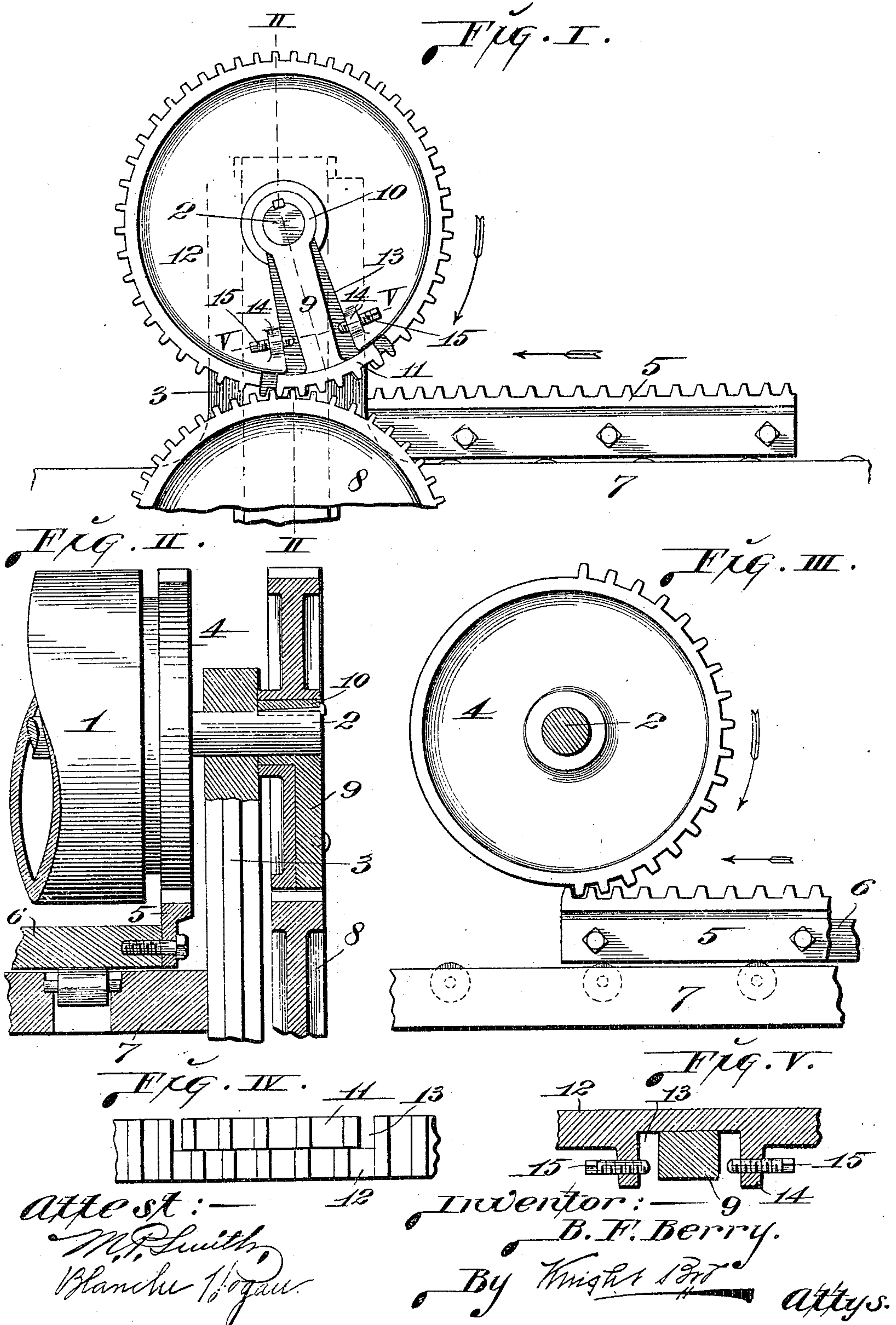


No. 819,716.

PATENTED MAY 8, 1906.

B. F. BERRY.
TWO REVOLUTION CYLINDER PRINTING PRESS.
APPLICATION FILED FEB. 16, 1905.



UNITED STATES PATENT OFFICE.

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TWO-REVOLUTION CYLINDER PRINTING-PRESS.

No. 819,716.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed February 16, 1905. Serial No. 245,857.

To all whom it may concern:

Be it known that I, BENJAMIN F. BERRY, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Two - Revolution Cylinder Printing-Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In the use of two-revolution cylinder printing-presses, as in other forms of printing-presses, it is common practice to pack the impression-cylinder with sheets of paper to compensate for the unevenness of the type or form printed from or for the existence of low type among higher type, all of which are carried by the bed of the press. This packing has the effect of increasing the periphery of the impression-cylinder, and as a consequence the periphery of the cylinder does not rotate in proper conformity to the positively-driven bed, as provided for in the original construction of the press, and a dragging effect is produced upon the type or form, due to which the printing accomplished is blurred and imperfect.

My invention relates to a similar improvement in two-revolution cylinder printing-presses to that shown and described in application for Letters Patent filed by me December 17, 1904, Serial No. 237,194, the object of the improvement being to provide a limited degree of play in the driving-gear associated with the spindle of the press-cylinder during the printing action, thereby permitting travel of the cylinder and bed in harmony and obviating conflict between the cylinder and bed gearing and the cylinder-driving gear.

Figure I is an end elevation of the parts of a printing-press to which my improvements relate. Fig. II is a vertical section taken on the irregular line II II, Fig. I, with one end of the press-cylinder and the bed-rack-engaging gear-wheel shown in elevation. Fig. III is an elevation of the cylinder-carried bed-rack-engaging gear-wheel and fragments of the bed and its rack and the bed-support. Fig. IV is a view of a portion of the periphery of the cylinder-driving gear-wheel and the toothed segment associated with said gear-wheel. Fig. V is an enlarged cross-section taken on line V V, Fig. I.

1 designates the impression-cylinder of a two-revolution printing-press provided with spindles, one of which (indicated by the numeral 2) is shown in Figs. I to III, inclusive. This spindle is rotatably supported in a side frame member 3 of the press.

4 is a bed-rack-engaging gear-wheel fixed to the spindle 2, and 5 is the rack carried by the form-bed 6, with which said gear-wheel is adapted to mesh. The bed 6 is mounted upon a support 7.

8 is a power gear-wheel.

No invention *per se* is herein claimed for the parts thus far described, they being common to two-revolution cylinder printing-presses.

9 designates a crank-arm that is provided with a hub 10, fixed to the cylinder-spindle 2. This crank-arm has at its free end a toothed segment 11, the teeth of which at the center thereof are spaced apart and are of a size corresponding with the teeth of the power gear-wheel 8, with which said segment is adapted to intermittently engage. The teeth at the ends of said segment are spaced apart more widely than those at the center.

12 designates a gear-wheel loosely mounted upon the hub 10 of the crank-arm 9 and so positioned relative to the power-wheel 8 as to travel in continuous mesh therewith. At the side of the gear-wheel 12 at which the crank-arm 9 is located is a pocket 13, in which said crank-arm is seated, the said pocket being enlarged at the peripheral-toothed portion of the wheel to permit movement of the crank-arm segment therein. Projecting from the gear-wheel 12 at opposite sides of the pocket 13 are ears 14, in which are seated adjustment-screws 15, that serve to limit the movement of the gear-wheel with respect to said crank-arm which occupies a position between said screws.

In the practical use of a printing-press having my improvement incorporated therein the operation is as follows: The power gear-wheel 8 rotates continuously by power suitably applied thereto and the form-bed is continually reciprocated by the driving mechanism associated therewith and actuating it in the usual manner. During the rotation of the power-wheel 8 rotation is imparted to the loosely-mounted gear-wheel 12, with which said power-wheel meshes, and as a conse-

quence the crank-arm 9, fixed to the cylinder-spindle, is carried intermittently to the power-wheel, so that its segment 11 will be brought into mesh therewith at intervals. The parts
 5 are so timed that upon each forward stroke of the form-bed 6 the forward end of the bed-rack 5 is brought into juxtaposition with the rack-engaging gear-wheel 4 simultaneously with the movement of the crank-arm seg-
 10 ment to the power-wheel 8. The crank-arm is thereby placed in direct engagement with the power gear-wheel and it is rotated momentarily in a positive manner, due to such engagement, and acts to rotate the impres-
 15 sion-cylinder 1 and rack-engaging gear-wheel 4 positively for a sufficient period to cause said rack-engaging gear-wheel to enter into mesh with the first few teeth of the bed-rack 5. Immediately after this engagement is accom-
 20 plished the crank-arm segment becomes separated from the power-wheel 8 to continue rotation with the crank-arm while the impression-cylinder is rotating, and although the gear-wheel 12 continues in mesh with the
 25 power-wheel there is sufficient lost motion present between these wheels to prevent direct driving action of the impression-cylinder through the medium of the power-wheel, due to the loose mounting of the gear-wheel 12
 30 and the play between said wheel and the crank-arm 9. This being the fact, the form-bed is permitted to impart rotation to the impression-cylinder through the medium of the rack 5 and rack-engaging gear-wheel 4
 35 during the continued forward stroke of said bed, while the printing action is being carried out. By this arrangement the form-bed and impression-cylinder are caused to travel in uniformity, as the bed serves to drive the cyl-
 40 inder during the printing action and the cylinder-driving members being subject to the play mentioned while continuing to rotate are placed out of conflict with the movement of the cylinder and bed, so that the move-
 45 ment of the cylinder by the bed will not be interfered with. By spacing the teeth at the ends of the crank-arm segment 11 more widely apart than at the center of the seg-
 50 ment the segment enters more freely into mesh with the teeth of the power gear-wheel 8 and becomes separated from said teeth more readily on each engagement of these members, while the innermost teeth being made to correspond to the teeth of said power
 55 gear-wheel act to impart the positive driving movement to the segment. The adjustment-screws 15, carried by the gear-wheel 12 at both sides of the crank-arm, serve to limit the degree of rotation of said gear-wheel in
 60 either a forward direction or a rearward direction. The gear-wheel 12 is therefore restricted in its play in both directions of rotation of which it is susceptible, and as a consequence only the requisite degree of move-

ment of the gear-wheel relative to the crank- 65 arm 9 is secured to cause the crank-arm to properly enter into engagement with the power-wheel 8 and perform the office for which it is intended.

I claim as my invention—

1. In a cylinder printing-press, the combi- 70 nation of a cylinder, a bed adapted to move into driving connection with said cylinder, means for rotating said cylinder arranged to be periodically thrown out of driving action 75 during the rotation of said cylinder, and means for restricting the movement of a member of said cylinder-rotating means in two directions of rotation, substantially as set forth. 80

2. In a cylinder printing-press, the combi- 85 nation of a cylinder, a bed adapted to move into driving connection with said cylinder, a driving member loosely associated with said cylinder, a driven member having fixed con- 85 nection with said cylinder, and means for restricting the movement of said loosely-associated driving member in two directions of rotation with respect to said fixed driving mem- 90 ber, substantially as set forth.

3. In a cylinder printing-press, the combi- 95 nation of a cylinder, a bed adapted to move into driving connection with said cylinder, a driving member loosely associated with said cylinder, a crank-arm having fixed connec- 95 tion to said cylinder, and means for restricting the movement of said loose driving member in two directions of rotation with respect to said crank-arm, substantially as set forth.

4. In a two-revolution cylinder printing- 100 press, the combination of a reciprocatory form-bed, a rotatable impression-cylinder adapted to be thrown into gear with said form-bed, a power-wheel, a loosely-mounted gear-wheel associated with said cylinder, and 105 a crank-arm having fixed engagement with said cylinder and mounted adjacent to said loose gear-wheel to be brought periodically into engagement with said power-wheel, sub- 110 stantially as set forth.

5. In a two-revolution cylinder printing- 115 press, the combination of a reciprocatory bed, a cylinder geared to said bed, a crank-arm having fixed connection to said cylinder and provided with a toothed segment, a gear- 115 wheel loosely associated with said crank-arm, and a power gear-wheel arranged in mesh with said loose gear-wheel, and adapted to engage said crank-arm segment, substan- 120 tially as set forth.

6. In a two-revolution cylinder printing- 125 press, the combination of a reciprocatory bed, a cylinder geared to said bed, a crank-arm having fixed connection to said cylinder, and provided with a toothed segment, a gear- 125 wheel loosely associated with said crank-arm and provided with a pocket in which said arm is seated, and a power-wheel arranged in

mesh with said loose gear-wheel and adapted to engage said crank-arm segment, substantially as set forth.

7. In a two-revolution cylinder printing-
5 press, the combination of a reciprocatory bed,
a cylinder geared to said bed, a crank-arm
having fixed connection to said cylinder and
provided with a toothed segment, a gear-
wheel loosely associated with said crank-arm
10 and provided with a pocket in which said arm

is seated, a power-wheel arranged in mesh with said loose gear-wheel and adapted to engage said crank-arm segment, and adjustment-screws carried by said loose gear-wheel at opposite sides of said crank-arm, substantially as set forth. 15

BENJAMIN F. BERRY.

In presence of—

NELLIE V. ALEXANDER,
BLANCHE HOGAN.