(No Model.)

G. T. MURRAY.

BED AND CYLINDER PRINTING MACHINE.

No. 602,406. Patented Apr. 12, 1898.

Fig. 1.

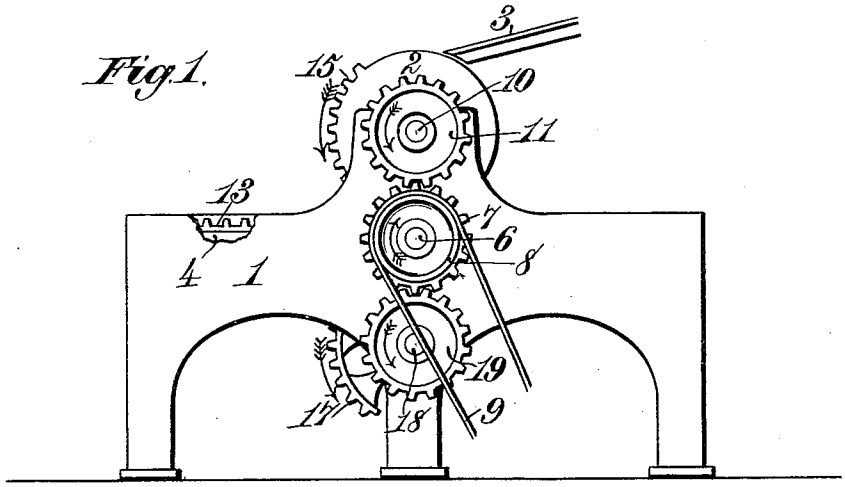


Fig. 2.

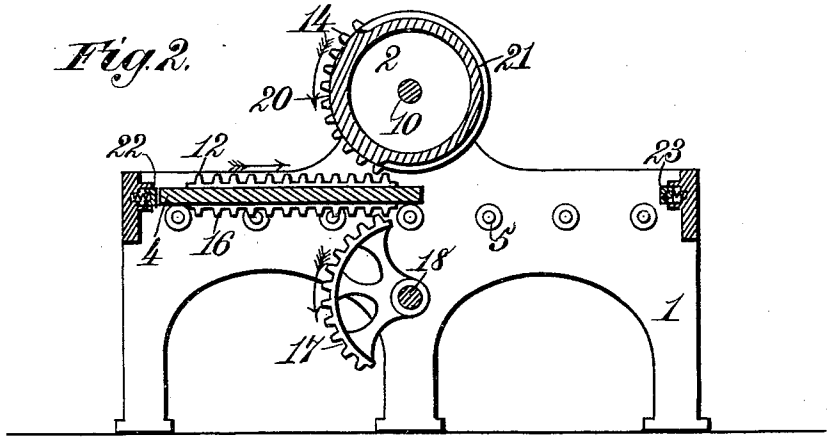
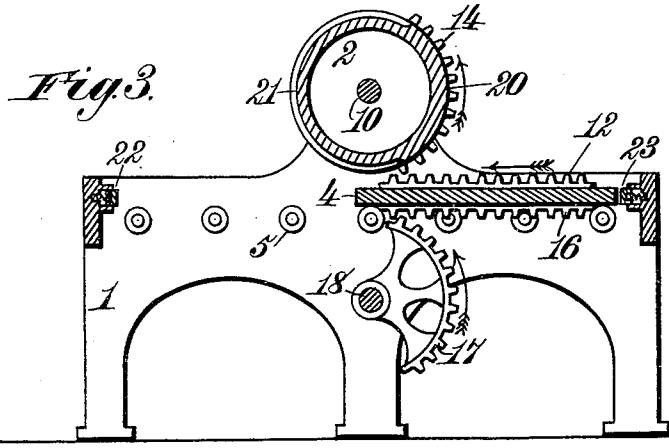


Fig. 3.



Witnesses.
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Att'y.

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UNITED STATES PATENT OFFICE.

GEORGE T. MURRAY, OF CORSICANA, TEXAS, ASSIGNOR OF ONE-THIRD TO GORDON PHIPPS, OF SAME PLACE.

BED AND CYLINDER PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 602,406, dated April 12, 1898.

Application filed November 11, 1897. Serial No. 658,202. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. MURRAY, a citizen of the United States, residing at Corsicana, in the county of Navarro and State of Texas, have invented new and useful Improvements in Bed and Cylinder Printing-Machines, of which the following is a specification.

My invention relates to improvements in bed and cylinder printing-machines, and more particularly to the means for operating and controlling the motion of the bed-plate thereof.

It is an object of my invention to provide an improved form and arrangement of gearing for a machine of this character in which the cylinder shall constantly be revolved in one direction, while the bed-plate is reciprocated back and forth beneath the cylinder, the impression being made during one movement of the bed-plate, and the cylinder being constructed to clear the bed-plate on the reverse movement thereof.

The general object or purpose of my improvements is to very largely increase the speed of a such machine while simplifying the operating mechanism.

In the accompanying drawings, illustrating my invention, Figure 1 is a view in side elevation of so much of a bed and cylinder printing-press as is necessary to illustrate the invention. Fig. 2 is a sectional view, taken on the line 2 2 of Fig. 1, showing the bed-plate at the beginning of the impression or forward movement; and Fig. 3 is a like view showing the bed-plate at the beginning of the shift or reverse movement.

Referring to the drawings, the numeral 1 indicates the supporting-frame of the machine, carrying an impression-cylinder 2, feed-board 3, and reciprocating bed-plate 4, which latter is supported on friction-rollers 5, located on either side of the frame in the plane of movement of the bed-plate. Secured at one side of the frame of the machine is a fixed shaft 6, upon which is journaled a driving-gear 7, which may receive motion from a pulley 8, connected thereto and driven by a belt 9. A fly-wheel (not shown) may also be attached in a suitable manner to the driving-gear. The cylinder 2 has a journal 10, supported in bearings in the frame, and said journal has fixed to its outer end a gear-wheel 11, which meshes with the driving-gear 7. On the upper surface of the bed-plate 4, at either side thereof, are provided racks 12 13, and at each end of cylinder 2 are mutilated gears 14 and 15, which mesh with said racks at certain intervals, as will more clearly appear hereinafter. On the under side of the bed-plate 4 and centrally thereof is another rack 16, which is in mesh at certain intervals with a mutilated gear 17, which I will term the "shift-gear." Said shift-gear is fixed on a shaft 18, journaled in the frame of the machine, and at its outer end the shaft 18 has fixed thereon a gear-wheel 19, which meshes with the driving-gear 7. The shift-gear 17 is of the same diameter and has the same number of teeth as the mutilated gears 14 15 at the ends of cylinder 2, and the number of teeth on the gear-wheels 7, 11, and 19 are also the same.

The racks 12, 13, and 16 have each the same number of teeth, but each has one more tooth than the mutilated gear meshing with it. Thus in the drawings the racks are shown as having twelve teeth, while the mutilated gears have but eleven, thus affording eleven meshing spaces between the teeth of said racks for the eleven teeth of the mutilated gears. The arrangement of the gears, as will be clearly apparent, is such that in the movements of the bed-plate 4, to be presently described, said bed-plate and cylinder 2 will move at the same rate of speed and the shift-gear 17 will be driven, through the medium of gear-wheel 19 and shaft 18, at the same rate of speed as the mutilated gears 14 15, driven through the medium of gear-wheel 11 and shaft or journal 10.

The cylinder 2 is hollow and has, as is usual, an impression part 20, which is that part comprised between the mutilated gears 14 and 15, and a depressed or reduced portion 21, which in the revolution of the cylinder permits the bed-plate 4 to be shifted beneath it without coming in contact therewith. At each end of the bed of the press are provided suitable buffers or springs 22 23, which receive the impact of the bed-plate 4 and serve to limit its movement in either direction, respectively.

The operation is as follows, the various

gear-wheels and mutilated gears revolving in the directions indicated by the arrows: As shown in Fig. 2, the bed-plate 4, carrying the type, is about to be moved by the engagement of the mutilated gears 14 15 with the racks 12 13 beneath the impression part 20 of cylinder 2, which carries the sheet to be printed on. At this initial movement the teeth of the shift-gear 17, which, as before stated, moves at the same speed as the mutilated gears 14 15, but in a reverse direction when in mesh with the rack, have just turned out of engagement with the teeth of the rack 16. The bed-plate is now moved to the extreme limit of its forward movement, and the parts now assume the positions shown in Fig. 3. At this point the teeth of the mutilated gears 14 15 have turned out of engagement with their respective racks 12 13 and the shift-gear 17 has been revolved till its teeth are now in a position to engage the teeth of the rack 16 and shift the bed-plate beneath the reduced portion 21 of cylinder 2 to the initial position. (Shown in Fig. 2.) The cylinder 2 thus constantly revolves in one direction, while the bed-plate 4 is reciprocated back and forth beneath it, and by the arrangement and construction shown this may be done at a very high rate of speed.

While I have shown and described but one rack and shift-gear beneath the bed-plate, I may employ two or more shift-gears, with a complemental rack for each, if desired.

It will further be seen that the parts necessary to the operation of my machine are few in number and simple in operation and that machines could be constructed according to my invention at a comparatively low cost.

The combinations of elements hereinafter claimed may, without departure from my invention and by the exercise of mechanical skill, be adapted for useful operation in mechanisms other than printing-presses, and I wish it understood that I desire to avail myself of protection for such combinations of elements for all the uses to which they may be adapted.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a printing-press, the combination with a bed-plate having at its sides racks, of a revolving cylinder provided at its ends with mutilated gears adapted to engage with said racks at intervals, to move the bed-plate beneath the cylinder, and means for returning the bed-plate to its initial position comprising a rack on the under side of the bed-plate, a mutilated shift-gear adapted to engage with said rack when the teeth of the mutilated gears carried by the cylinder have turned out of engagement with the teeth of their racks, and means for revolving the shift-gear in the same direction to that of the said mutilated gears, substantially as described.

2. In a printing-press, the combination with a bed-plate having at its upper sides racks and on its under side a rack, of a cylinder journaled in the frame, carrying at its ends mutilated gears adapted to engage with the upper racks at intervals, a gear-wheel fixed on the end of the cylinder-journal, a driving-gear journaled on the frame and meshing with said gear-wheel, a shaft journaled in the frame, carrying a mutilated gear adapted to engage at intervals with the under rack, and a gear-wheel fixed on the end of said shaft and meshing with said driving-gear, substantially as described.

3. The combination with a plate having at its sides racks, and a rack on the under side of said plate, of a revolving cylinder provided at its ends with mutilated gears adapted to engage the racks at the side of said plate at intervals to move the plate in one direction, a mutilated shift-gear adapted to engage with the rack on the under side of said plate when the teeth on the mutilated gears carried by the cylinder have turned out of engagement with the teeth of their racks, and means for revolving the shift-gear and the mutilated gear in the same direction, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE T. MURRAY.

Witnesses:
JNO. H. RICE,
WALTER E. ELLIOTT.