Aug. 16, 1932. A. BÜTTNER 1,871,838

CYLINDER PRINTING PRESS

Filed Feb. 17, 1931 3 Sheets-Sheet 1

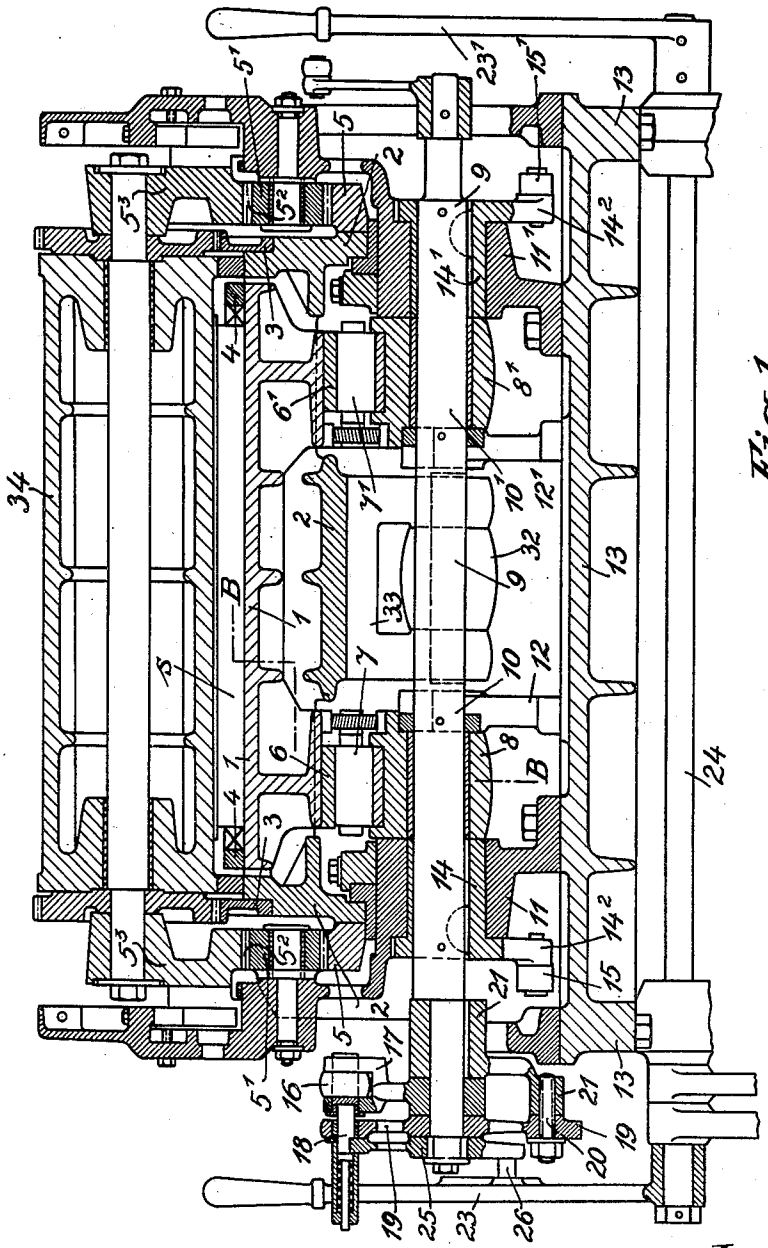


Fig. 1.

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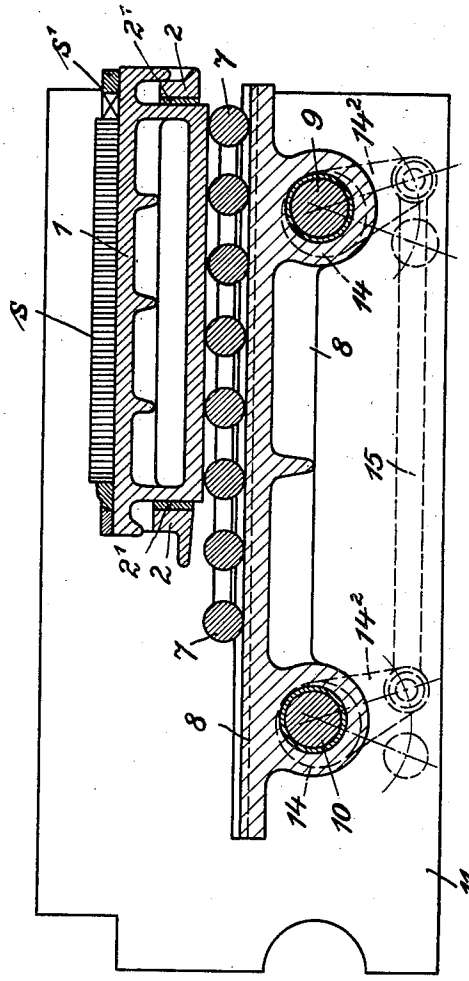


Fig. 2.

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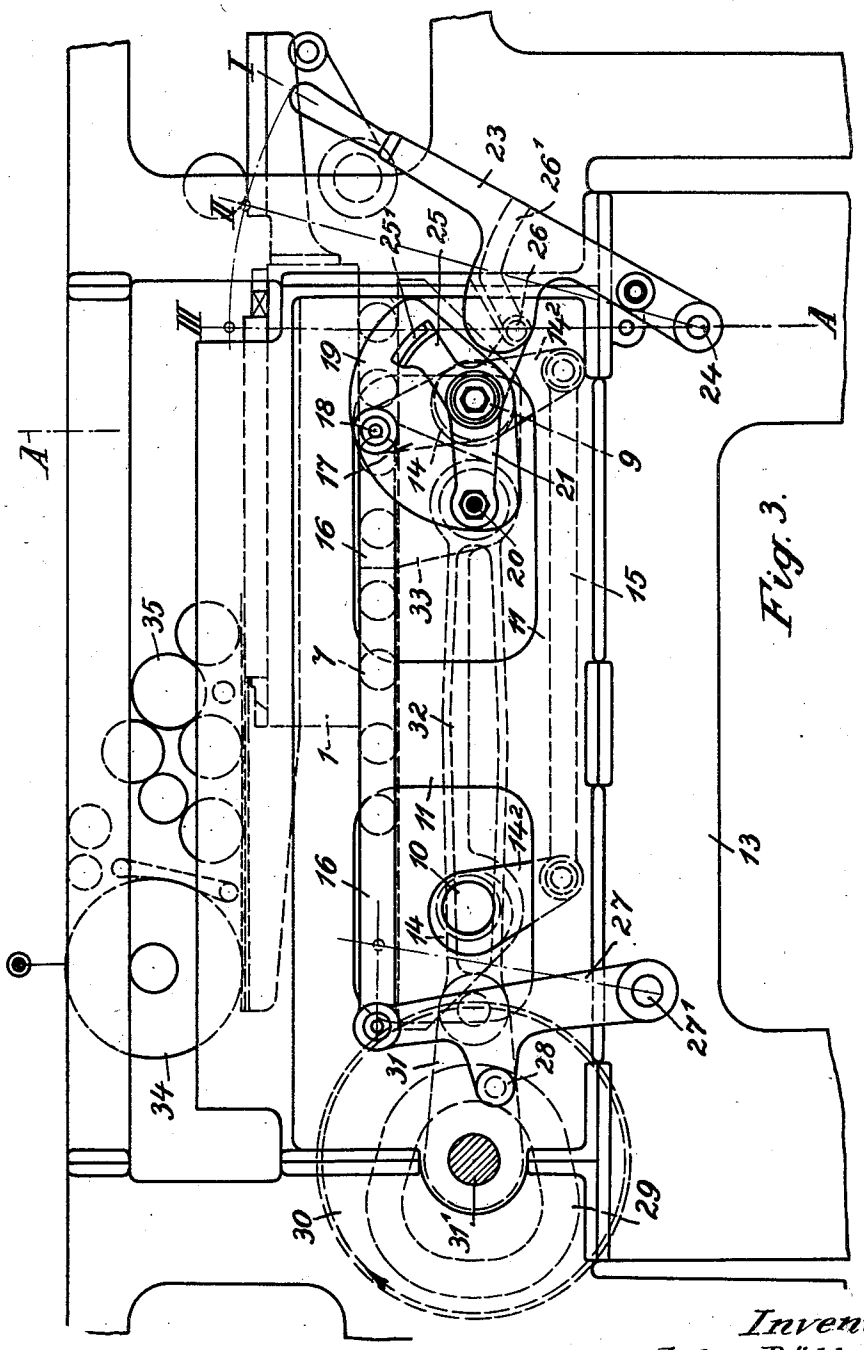


Fig. 3.

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UNITED STATES PATENT OFFICE

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CYLINDER PRINTING PRESS

Application filed February 17, 1931, Serial No. 516,424, and in Germany February 22, 1930.

My invention relates to cylinder printing presses in which the type foundation is capable of being raised and lowered to render possible a free return under the impression cylinder. The latter need not in this case be capable of being raised and lowered.

From the known devices of this kind, the device according to the invention is distinguished by the fact that the actual form carrier is arranged in a guiding frame connected with the driving means, moved to and fro, and running upon slide tracks, and runs independently of the guiding frame upon tracks capable of being raised and lowered.

The roller carriages supporting the actual form carrier preferably run upon tracks which can be raised and lowered by means of eccentrics or the like.

By the arrangement according to the invention, as contrasted with the known devices, the result is obtained that the gear teeth between the type foundation frame and the impression cylinder or impression cylinder carrier remain permanently in undisturbed engagement, because the type foundation frame only executes a reciprocating movement with the racks provided on the latter and with the mackle strips. Furthermore the actual form carrier is reliably guided and supported during the printing operation upon the running tracks, which are capable of being raised and lowered and which are independent of the slide tracks of the type foundation frame.

The driving of the eccentrics or the like that raise and lower the actual form carrier may be effected by means of a clutch capable of being engaged and disengaged during the operation of the press, in order to enable the type foundation to run idly when the form carrier is lowered.

The device according to the invention as applied to a cylinder printing press with oppositely moving printing members, is illustrated by way of example in one constructional form.

In the accompanying drawings, in which

Figure 1 shows a cross section on the line A—A in Fig. 3.

Figure 2 a longitudinal section through the type foundation on the line B—B in Figure 1, and

Figure 3 a side view of the press.

The type foundation or actual form carrier 1, is movably guided in a vertical direction in a frame 2. The lateral guidance of the type foundation 1 in the frame 2 is effected by hardened adjustable steel plates 2^1. The type foundation 1 carries merely the form s, with a locking frame s^1. To the guiding frame 2 are secured the racks 3 for the rotary movement of the impression cylinder 34, the mackle strips 4 for the latter, and also racks 5 which each mesh with a stationary toothed wheel 5^1 mounted in the machine frame and engaging with rack 5^2 secured to the supports 5^3 of the impression cylinder 34 to obtain the opposite movement of the impression members. The racks 3 and 5 remain in mesh without clearance during the up-and-down movements of the type foundation 1.

On the under side of the type foundation 1 are located running tracks 6 and 6^1 consisting of hardened steel rails, which run upon roller carriages 7 and 7^1. Running tracks 8 and 8^1 for the latter rest on the one hand upon a continuous shaft 9 and on the other hand upon short shafts 10 and 10^1, the inner ends of which are rotatably supported in brackets 12, 12^1 secured upon an under frame 13. Upon the continuous shaft 9 and the short shafts 10 and 10^1 are secured by key and pin eccentric bushes 14 and 14^1, which are supported in the side members 11 and 11^1 of the frame, and which all have the same eccentricity, and by means of which the raising and lowering movement of the type foundation 1 is effected in the manner hereinafter described.

The reciprocating movement of the type

foundation 1, with the frame 2, is effected in the usual manner by means of a crank 31 secured to a main shaft 31^1. To this crank is attached a connecting rod 32, the other end of which is pivoted to a bracket 33 secured to the frame 2. By means of the toothed wheel 5^1 stationarily supported on each side of the machine, the type foundation moves in the opposite direction to the impression cylinder 34 and to the inking mechanism 35 (Fig. 3) connected therewith.

Each of the four eccentric bushes 14 and 14^1 is provided with a downwardly directed lever arm 14^2. These lever arms are connected on both sides of the machine by rods 15 and 15^1. In this manner the oscillating movement transmitted to the continuous shaft 9 is uniformly imparted to the four eccentric bushes. The oscillating movement of the shaft 9 is produced by a rod 16, one end of which is connected with a lever 17, which is turnable upon the shaft 9. Beside the lever arm 17, is freely rotatable upon the shaft 9 a disc 19, which carries a tappet pin 18, subject to spring action. This pin engages in a bore located axially in relation to the pivot connecting the lever 17 and the rod 16, and normally connects the lever 17 with the disc 19. In the latter is arranged a bolt 20, which connects the disc 19 with a lever 21. The latter is arranged fast upon the shaft 9. By the tappet pin 18 and the bolt 20, the lever 17, the disc 19 and the lever 21 are connected with one another and jointly execute the oscillating movement imparted to them by the rod 16, which is transmitted by the lever 21 to the shaft 9, and therefore to the four eccentric bushes 14 and 14^1.

The rod 16 is connected with a lever 27 (Fig. 3) which is rotatable upon a pivot 27^1 on the underframe 13 of the press. To a lateral projection on this lever 27 is secured a roller 28, which engages in a cam groove 29 in the driving wheel 30 secured upon the main shaft 31^1. On each side of the machine is arranged an engaging and disengaging lever, 23 and 23^1 respectively, which are both secured by pins to the continuous shaft 24 supported in the machine frame.

The engaging and disengaging lever 23 is provided with a cam groove 26^1 (Fig. 3) with which there engages a pin 26, which is secured to one arm of a bell-crank lever 25. This bell-crank lever is freely rotatable upon the shaft 9 and has at its free end a wedge surface 25^1 which can be brought by shifting the lever 23 into the range of oscillation of the tappet pin 18, whereby the latter is pulled out of the lever 17, for the purpose of cutting out the drive of the shaft 9.

The method of operation of the apparatus described is as follows:

The engaging and disengaging lever 23 can be brought from either side of the machine, into three different positions, indicated in the drawing, namely:—

Position I, in which the machine runs with the printing in action.

Position II, in which the machine runs with the printing stopped and

Position III, in which the machine is stationary.

In the position I of the lever 23, the type foundation 1, with the frame 2, is moved to and fro by the connecting rod 32 oppositely to the impression cylinder 34 and inking mechanism 35. At the same time the four eccentric bushes 14 and 14^1 are rotated in one direction and the other, from the cam groove 29, in such a way that the type foundation runs back in a lowered position underneath the impression cylinder and rises again during the printing stroke.

If the lever 23 is moved into the position II, the bell-crank lever 25 arranged loose upon the shaft 9 is rocked by means of the cam groove 26^1 of the lever 23 in such a way that the wedge surface 25^1 of the lever 25 passes into the range of oscillation of the bolt 18 or of a projection provided on the latter, whereby the bolt is pulled out of the lever 17. The connection between the disc 19 and the lever 17 is thereby released, and the latter swings freely upon the shaft 9. Since the bolt 18 can only be drawn out by means of the wedge surface 25^1, in the position of the lever 17, in which the type foundation is lowered, the latter remains in the lowered position and the printing is stopped. Only when the wedge surface 25^1 is brought into the position I again, out of reach of the tappet pin 18, by moving back the lever 23, can the said tappet pin spring into the notch in the lever 17 again.

In the position III of the lever 23 the driving of the machine is disconnected and the latter is stationary.

For this purpose the lever 23 is connected by means of link work with a clutch (not shown), situated upon the driving shaft 31^1 of the press, in such a manner that the clutch is disengaged when the lever 23 is moved from the position II into the position III, and is reengaged on the lever being moved in the opposite direction.

The arrangement of the cam groove 26^1 in the lever 23 is such that the machine, upon the drive being connected, that is to say, upon the lever 23 being moved out of the position III into the position II, at first runs with the printing stopped.

What I claim is:

1. A cylinder printing press, comprising, in combination, a form carrier adapted to be moved to and fro; tracks upon which the carrier can be moved as stated, a guiding frame for the said carrier and adapted to be moved to and fro with said carrier, means for thus moving said guiding frame and

carrier, and means for raising and lowering said carrier.

2. A cylinder printing press, comprising, in combination, a form carrier adapted to be moved to and fro, tracks upon which the carrier can be moved as stated, a guiding frame for the said carrier and adapted to be moved to and fro with said carrier, means for thus moving said guiding frame and carrier, and means for raising and lowering said tracks and carrier.

3. A cylinder printing press, comprising, in combination, a form carrier adapted to be moved to and fro, rollers supporting the carrier, and tracks supporting said rollers, a guiding frame for said carrier and adapted to be moved to and fro with said carrier, means for thus moving said guiding frame and carrier, and means for raising and lowering said tracks.

4. A cylinder printing press, comprising, in combination, a form carrier adapted to be moved to and fro, tracks upon which the carrier can be moved as stated, a guiding frame for the said carrier and adapted to be moved to and fro with said carrier, means for thus moving said guiding frame and carrier, eccentrics so arranged as to be adapted to raise and lower said tracks and carrier, and means for turning said eccentrics.

5. A cylinder printing press, comprising, in combination, a form carrier adapted to be moved to and fro, rollers supporting the carrier, and tracks supporting said rollers, a guiding frame for said carrier and adapted to be moved to and fro with said carrier, means for thus moving said guiding frame and carrier, eccentrics so arranged as to be adapted to raise and lower said tracks, and means for turning said eccentrics.

6. A cylinder printing press, comprising, in combination, a form carrier adapted to be moved to and fro, rollers supporting the carrier, and tracks supporting said rollers, a guiding frame for said carrier and adapted to be moved to and fro with said carrier, means for thus moving said guiding frame and carrier, eccentrics so arranged as to be adapted to raise and lower said tracks, means for turning said eccentrics, and a clutch inserted between these means and the said eccentrics and adapted to be engaged and disengaged during the operation of the press.

7. A cylinder printing press, comprising, in combination, a form carrier adapted to be moved to and fro, rollers supporting the carrier, and tracks supporting said rollers, a guiding frame for said carrier and adapted to be moved to and fro with said carrier, means for thus moving said guiding frame and carrier, eccentrics so arranged as to be adapted to raise and lower said tracks, means for turning said eccentrics, a clutch inserted between the eccentrics and the means for turning them, a disengaging means for said clutch, and a lever for actuating said disengaging means, substantially as and for the purpose set forth.

8. A cylinder printing press, comprising in combination, a form carrier adapted to be moved to and fro, rollers supporting the carrier, and tracks supporting said rollers, a guiding frame for said carrier and adapted to be moved to and fro with said carrier, means for thus moving said guiding frame and carrier, eccentrics so arranged as to be adapted to raise and lower said tracks, means for turning said eccentrics, a clutch inserted between the eccentrics and the means for turning them, a disengaging lever for said clutch, and an engaging and disengaging lever for the press, this lever being connected with the first mentioned lever, substantially as and for the purpose set forth.

In testimony whereof I have affixed my signature.

ARTUR BÜTTNER.