

Sept. 13, 1938.

H. J. LUEHRS

2,129,699

INTAGLIO PRINTING PRESS

Filed May 27, 1937

3 Sheets-Sheet 1

Fig. 2

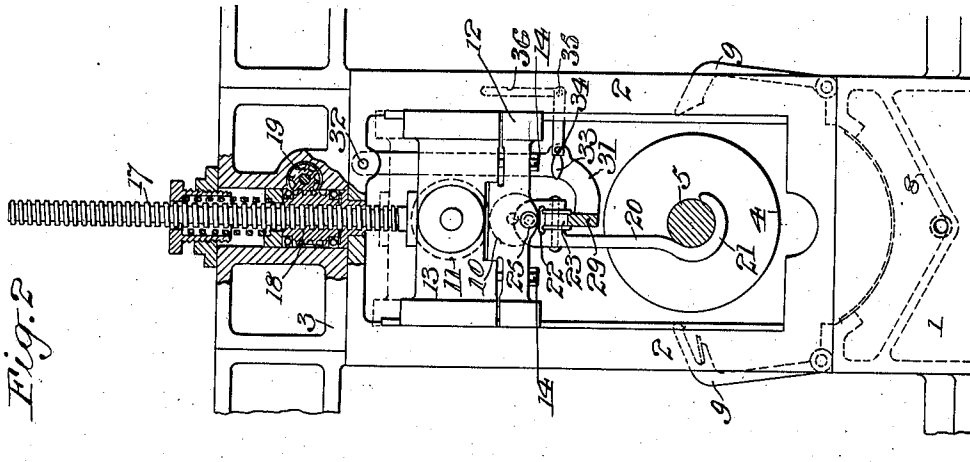
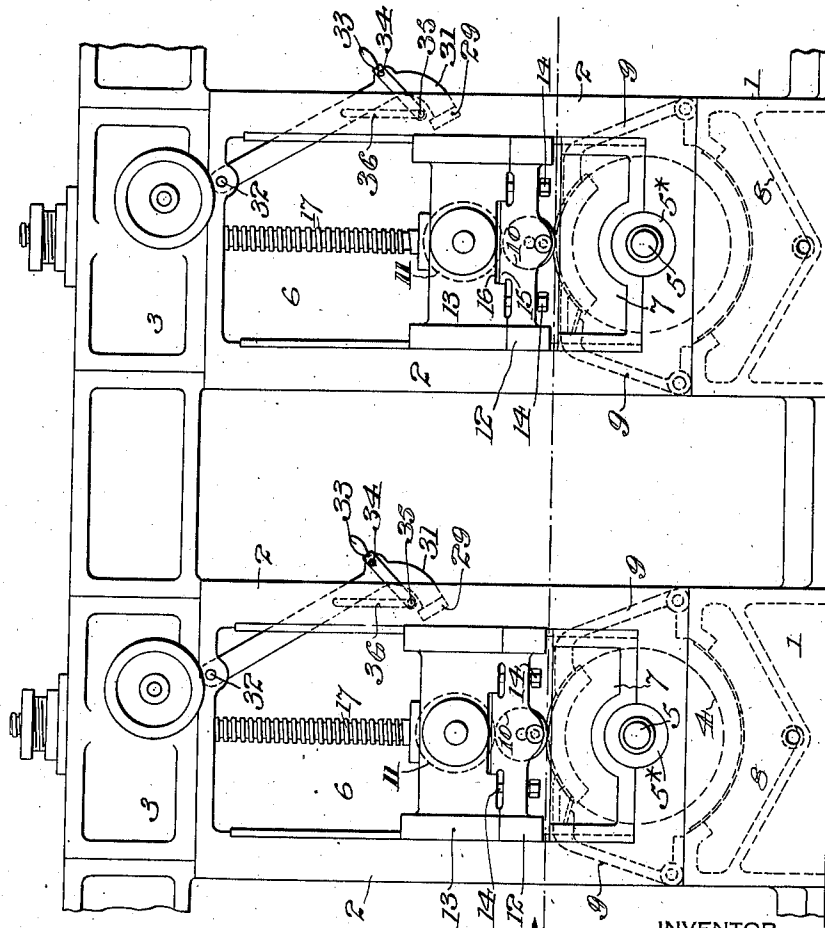


Fig. 1



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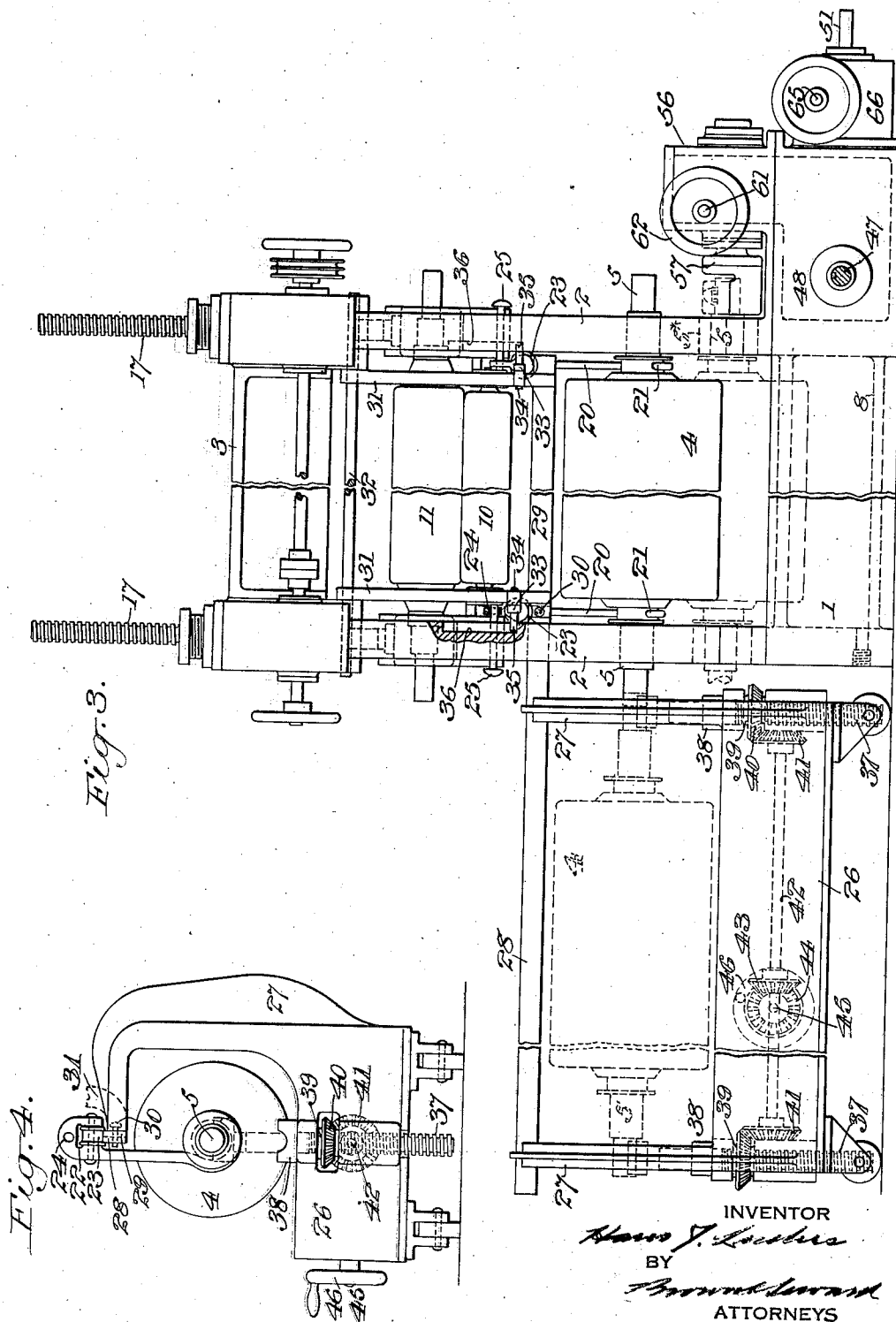
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Fig. 5.

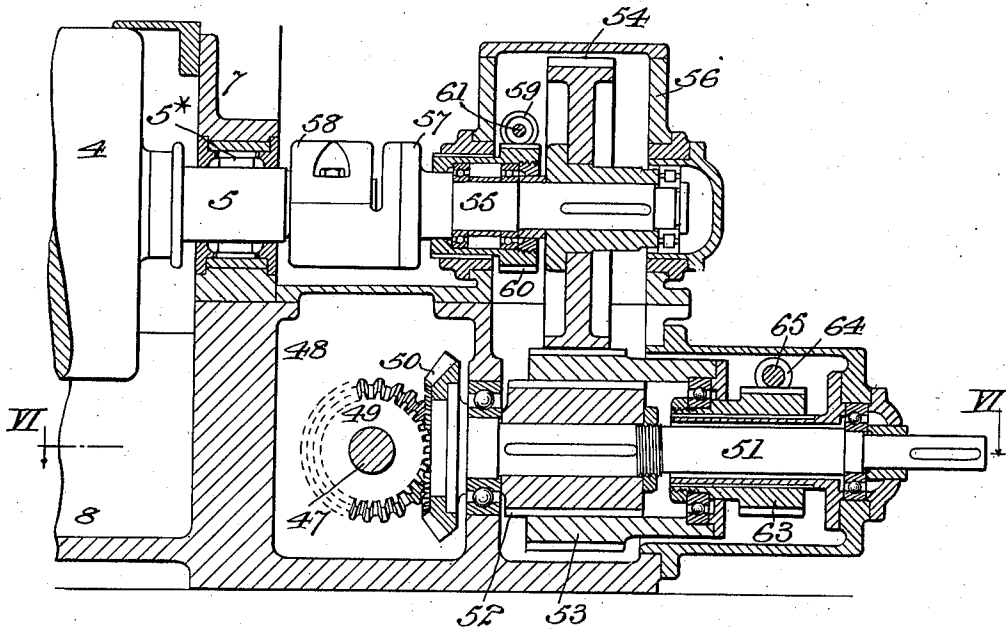
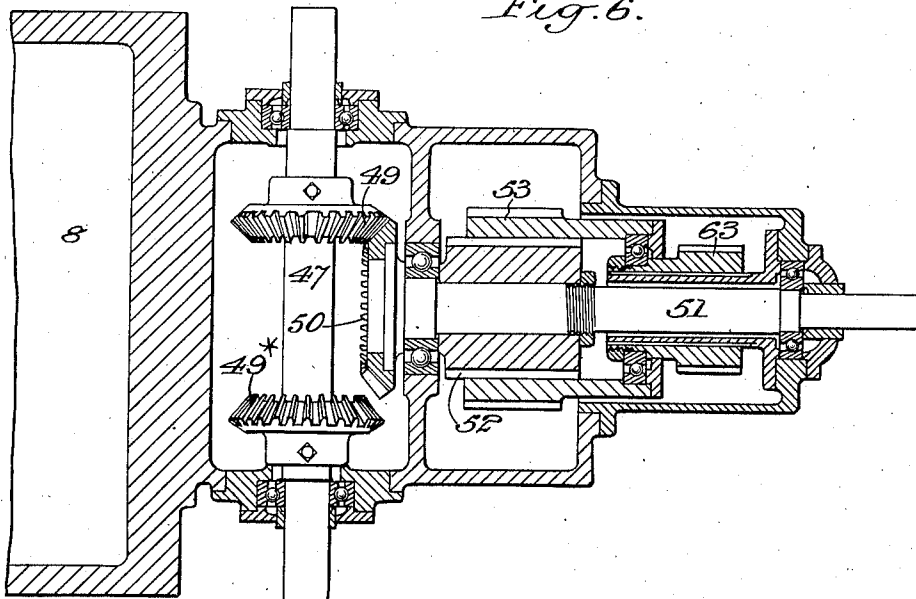


Fig. 6.



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2,129,699

INTAGLIO PRINTING PRESS

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Application May 27, 1937, Serial No. 145,112

18 Claims. (Cl. 101—1)

My invention comprises an intaglio printing press unit in which the design cylinder may be removed from and inserted into the unit by an endwise movement through a window in one of the side frames of the unit.

My invention also comprises a printing press unit in which the design cylinder may be moved vertically out of and into the ink fountain and also into position to be removed and inserted by an endwise movement through the window in a side frame of the unit.

My invention also comprises means for carrying the design cylinder endwise into and out of the printing press unit through one of the side frames, said means including a track rail having movable cooperating sections, the support for one of the rail sections being preferably a truck for moving its rail section longitudinally into and out of its cooperative position with respect to the other rail section, and the support for the other rail section being preferably hinged to swing its rail section laterally into and out of its operative position.

My invention further comprises means for removably securing the rail sections together and also a common means for locking the laterally swinging rail section in its operative and inoperative positions.

A practical embodiment of my invention is represented in the accompanying drawings, in which

Fig. 1 represents two adjacent intaglio printing press units in side elevation with the parts in their printing position, the laterally swinging track rail section being shown automatically locked in its inoperative positions;

Fig. 2 represents a printing press unit in side elevation, partly in section, with the cover members of the ink fountain shown swung back to their open position and the end sealing members of the ink fountain removed, the laterally movable rail section being shown locked in its operative position and the design cylinder being shown in its raised position suspended from the track rail;

Fig. 3 represents an end view of a printing press unit and a side view of the loading truck cooperating therewith, the design cylinder being shown in full lines in its suspended position and in dotted lines in its operative position within the unit and also in dotted lines in its position when carried by the loading truck;

Fig. 4 represents an end view of the loading truck with the cylinder shown in full lines while still suspended from the truck rail section the

printing unit rail section being shown in its operative position in dotted lines, and the truck support for the design cylinder being also shown in its operative position in dotted lines;

Fig. 5 represents, on a larger scale, a detail vertical central section through the reversible drive for the design cylinder; and

Fig. 6 represents a detail horizontal section taken in the plane of the line VI—VI of Fig. 5.

The intaglio printing press may consist of any desired number of printing press units. In the present instance I have shown two printing press units of corresponding construction.

Each printing press unit comprises a base 1, two interchangeable side frames 2, 2, and a top 3. The design cylinder is denoted by 4 and its shaft by 5, which shaft is mounted in removable bearings 5*, 5* in the side frames 2, 2 at the lower end of corresponding windows 6, 6 therethrough, said windows being sufficiently large to permit the endwise removal and insertion of the design cylinder when in its raised position, as will be hereinafter more fully explained.

End sealing members 7, 7 are removably placed in the lower portions of the windows 6, 6 and form the upper half bearings for the design cylinder shaft 5.

The ink fountain bowl 8 is formed in the base 1 integral therewith, which bowl is surmounted by interchangeable swinging cover members 9, 9, hinged at the top of the base. These cover members coact with the design cylinder 4 and the end sealing members 7, 7 to effectively close the ink fountain when the design cylinder is in its lowered operative position therein. These cover members 9, 9 respectively carry the inking and wiping mechanisms, not shown herein, of any well known or approved form.

The impression and back-up rolls 10 and 11 are provided, respectively, with pairs of heads 12, 12 and 13, 13, which heads are slidably mounted along their respective side walls of the windows 6, 6 in the side frames 2, 2. Each impression roll head 12 is secured, with a slight lost motion, to its back-up roll head 13 by bolts 14, 14 with the back-up and impression rolls in their proper rolling contact when the heads are lowered. When the heads are raised the impression roll 10 drops slightly away from its contacts with the back-up rolls 11. A tongue and groove connection 15, 16 is provided between the back-up and impression roll heads to properly guide the rolls into their proper coactive position.

The mechanism mounted in the top 3 of the frame for raising and lowering the impression

and back-up rolls, and, when required, the design cylinder 4, may be of any well known or approved construction, that illustrated herein being shown, described and claimed in United States Letters
 5 Patent No. 2,076,241, dated April 6, 1937. In this raising and lowering mechanism the non-rotatable screws 17, 17 which extend upwardly from the back-up roll heads 13, 13 carry wide faced helical gears 18, 18 which are rotated in either
 10 direction by worm gears 19, 19 driven from a suitable source of power, not shown herein.

The suspension means which I have shown for moving the design cylinder by means of the impression and back-up rolls vertically into and
 15 out of the ink fountain when both of the cover members are thrown back out of the way comprises, in the present instance, a pair of hook bars 20, 20 adapted to be removably engaged with the impression roll heads and the design
 20 cylinder. The lower end of each of these bars is provided with a hook 21 for receiving and retaining the shaft 5 of the design cylinder at the opposite ends of the cylinder. The upper end of this cylinder bar is provided with an open recess 22 within which there is mounted a traction
 25 wheel 23. This upper end is also provided with a hole 24 for receiving the inner end of a removable locking pin 25 carried by the impression roll head 12.

The means for removing and inserting the design cylinder by an endwise movement thereof through a side frame window may be constructed, arranged and operated as follows: A wheel truck
 30 26 has overhanging arms 27, 27 uprising from the ends of the truck, which arms form a support of a horizontally disposed design cylinder carrying track rail section 28. This track rail section is adapted to be moved longitudinally into position to cooperate with a laterally swinging track rail
 35 section 29, a locking pin 30 being provided for securing the ends of the track rail sections 28 and 29 together in their coactive positions. This laterally swinging track rail section 29 is carried by the lower ends of arms 31, 31 pivoted to the
 40 tops of the side frames 2, 2 by a rod 32.

The common means which I have shown for locking the laterally swinging rail section 29 in either its operative or inoperative position is as follows: A hand lever 33 is pivoted at 34 to each
 45 swinging arm 31. The shank of this lever is provided with a pin 35 which slides in a vertical groove 36 in the inner face of one of the side frames 2, 2. The relationship of the pin 35 and its groove 36 to the pivot 34 is such that when
 50 the lever 33 is thrown to the limit of its movement in one direction or the other the rail section 29 is locked in its operative or inoperative position.

The truck 26 is also provided with a vertically
 60 movable supporting means for transferring the design cylinder 4 from and to the track rail section 29, which supporting means is herein shown as comprising a pair of vertically movable non-rotatable screws 37, 37 having bearing supports
 65 38, 38 at their upper ends, which bearing supports are arranged in position to engage the shaft 5 at the opposite ends of the design cylinder 4. A common manually operated means may be employed for raising and lowering these non-rotatable screws 37, 37, which means is shown herein
 70 as comprising nuts 39, 39, which carry bevel gears 40, 40 meshing with the bevel gears 41, 41 fixed to a longitudinally disposed rotary shaft 42. This rotary shaft 42 has fixed thereon a bevel
 75 gear 43 which meshes with a bevel gear 44 car-

ried by a rotary cross shaft 45. This cross shaft 45 is provided with a hand wheel 46 exterior to the truck.

The means which I have shown for rotating the design cylinder in either direction comprises a
 5 main drive shaft 47 which is suitably mounted in a housing 48 formed integral with the base 1, which drive shaft has a bevel gear connection 49, 50 or 49*, 50 with a shaft 51 which has a wide faced gear 52 fast thereon. This wide faced gear 52 meshes with the interior tooth portion
 10 of a gear 53, the exterior portion of which gear meshes with a gear 54 fast on a shaft 55 mounted in a suitable housing 56 surmounting the drive shaft housing 48. This shaft 55 is removably
 15 connected to the shaft 5 of the design cylinder through a two-part coupling 57, 58. The side register is accomplished by the endwise movement of the design cylinder when its shaft is coupled to the shaft 55 by providing the shaft
 20 55 with a spiral gear 59 which meshes with a spiral gear 60 on a cross shaft 61 provided with a hand wheel 62 exterior to the housing 56.

The circumferential register of the design cylinder 4 is accomplished by providing the shaft
 25 51 with a spiral gear 63 which meshes with a gear 64 on a cross shaft 65 which is provided with a hand wheel 66 exterior to the housing 48.

In operation, it will be assumed that the parts are in their operative positions shown in Fig. 1,
 30 the rail section 29 being shown locked in its inoperative position. If it be desired to remove the design cylinder 4 from the printing press unit, the following steps are taken. The web is broken to permit the cover members 9, 9 of the
 35 ink fountain to be swung back out of the way of the design cylinder. The design cylinder shaft 5 is uncoupled from its driving shaft 55 and the end sealing members 7, 7 and the bearings 5*, 5* are removed. The pair of hook bars 20, 20
 40 are engaged at their lower ends with the design cylinder shaft 5 and at their upper ends with the impression cylinder heads 12, 12. The raising and lowering mechanism is then operated through the non-rotatable screws 17, 17, the
 45 back-up cylinder heads 13, 13, the impression cylinder heads 12, 12 and the hook bars 20, 20 to raise the back-up roll, the impression roll and the design cylinder. The rail section 29 may then be swung down from its inoperative position
 50 to its operative position. The truck 26 is then moved into position to bring its rail section 28 into alignment and engagement with the adjacent end of the rail section 29. The two rail sections are then secured together by the locking pin 30. The raising and lowering mechanism
 55 is then operated to slightly lower the design cylinder and the impression and back-up rolls until the traction wheels 23, 23, carried on the hook bars 20, rest on the track rail section 29, thereby transferring the weight of the design cylinder from the raising and lowering mechanism to the track rail section. The locking pin 25 is then removed and the impression and back-up rolls are raised sufficiently to permit the tops of the
 60 cylinder bars to clear the impression roll head. The design cylinder may then be moved endwise along the track rail sections 29, 28 to the desired position on the truck. The lifting screws 37, 37 of the truck may then be raised until their
 65 bearing members 38, 38 engage and slightly lift the design cylinder shaft and thereby release the hook bar traction wheels from the track rail section 28. The weight of the design cylinder will thus be transferred from the track rail sec-
 70 75

tion to the truck. The hook bars may then be removed and the track rail sections released by removing the locking pin 30. The design cylinder may then be transported by the truck to any desired point.

It will be understood that to insert a design cylinder into the printing press unit the series of operations hereinabove described should be reversed.

The parts shown and described, but not claimed herein, form the subject matter of my copending application filed of even date herewith, its Serial No. being 145,111.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not intend to be limited to the particular embodiment herein shown and described, but

What I claim is:

1. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

2. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, supports therefor, means for moving the supports, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

3. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, a support for one of the rail sections, means for moving the support in an endwise direction, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

4. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, a support for one of the rail sections, means for moving the support in a lateral direction, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

5. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, supports therefore, means for moving one of the supports in an endwise direction, means for moving the other support in a lateral direction, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

6. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, a design cylinder, means for moving it vertically into and out of position to be carried by the rail sections and means whereby the design cylinder may be moved along the rail sections endwise through a side frame.

7. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, supports therefor, means for moving the supports, a design cylinder, means for moving it vertically into and out of position to be carried by the rail sections and means whereby the design cylinder may be moved along the rail sections endwise through a side frame.

8. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, a support for one of the rail sections, means for moving the support in an endwise direction, a design cylinder, means for moving it vertically into and out of position to be carried by the rail sections and means whereby the design

cylinder may be moved along the rail sections endwise through a side frame.

9. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, a support for one of the rail sections, means for moving the support in a lateral direction, a design cylinder, means for moving it vertically into and out of position to be carried by the rail sections and means whereby the design cylinder may be moved along the rail sections endwise through a side frame.

10. In an intaglio printing press, side frames, a track rail comprising separate aligned cooperating sections, supports therefor, means for moving one of the supports in an endwise direction, means for moving the other support in a lateral direction, a design cylinder, means for moving it vertically into and out of position to be carried by the rail sections and means whereby the design cylinder may be moved along the rail sections endwise through a side frame.

11. In an intaglio printing press, side frames, a track rail comprising separate aligned sections, means for moving the sections into and out of their aligned cooperative positions, means for locking one of the sections in its operative position, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

12. In an intaglio printing press, side frames, a track rail comprising separate aligned sections, means for moving the sections into and out of their aligned cooperative positions, means for locking one of the sections in its inoperative position, a design cylinder, and means whereby it may be moved along the rail sections endwise through a side frame.

13. In an intaglio printing press, side frames, a track rail comprising separate aligned sections, means for moving one of the rail sections laterally into and out of its cooperative position, means for moving the other rail section longitudinally into and out of its cooperative position, means for locking the laterally movable section in its operative position, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

14. In an intaglio printing press, side frames, a track rail comprising separate aligned sections, means for moving one of the rail sections laterally into and out of its cooperative position, means for moving the other rail section longitudinally into and out of its cooperative position, means for locking the laterally movable section in its inoperative position, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

15. In an intaglio printing press, side frames, a track rail comprising separate aligned sections, means for moving them into and out of their cooperative positions, a common means for locking one of the rail sections in both its operative and inoperative positions, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

16. In an intaglio printing press, side frames, a track rail comprising separate aligned sections, means for moving one of the sections laterally into and out of its cooperative position, means for moving the other section longitudinally into and out of its cooperative position, a common means for locking the laterally movable section in both its operative and inoperative positions, a design cylinder and means whereby it may be moved

along the rail sections endwise through a side frame.

17. In an intaglio printing press, side frames, a track rail comprising separate alined sections, means for moving them into and out of their cooperative positions, means for removably securing the rail sections together in their cooperative positions, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

18. In an intaglio printing press, side frames, a

track rail comprising separate alined sections, means for moving one of the sections, laterally into and out of its cooperative position, means for moving the other section longitudinally into and out of its cooperative position, means for removably securing the rail sections together in their cooperative positions, a design cylinder and means whereby it may be moved along the rail sections endwise through a side frame.

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