

Dec. 12, 1939.

L. Q. PRESBY

2,183,045

PRINTING PRESS

Filed June 9, 1938

7 Sheets-Sheet 1

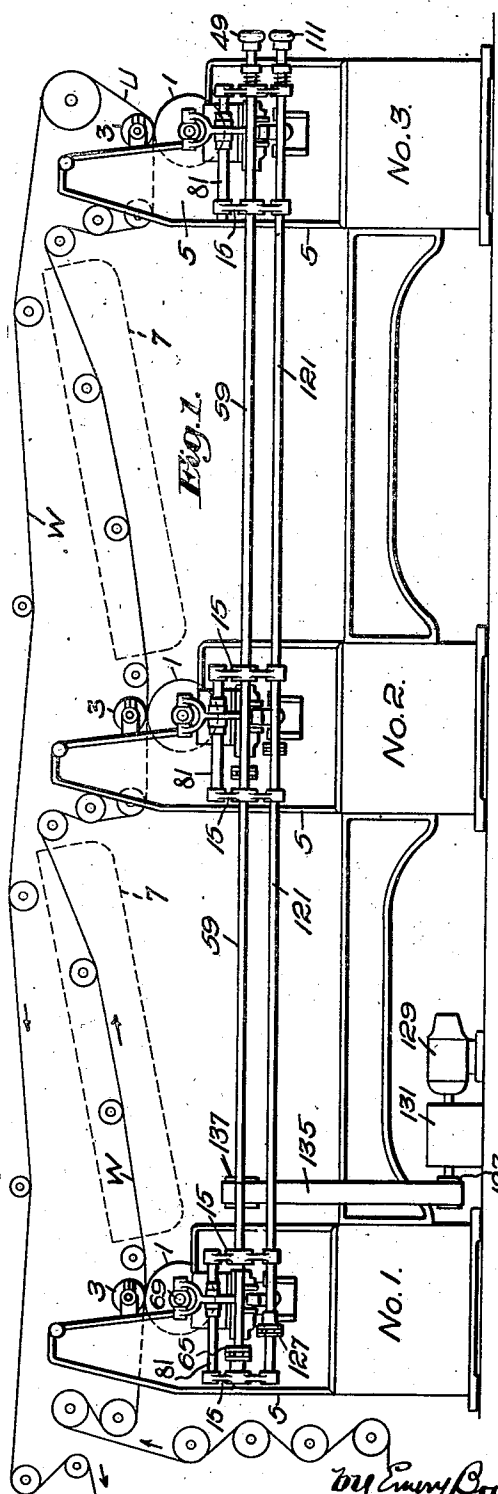


Fig. 1.

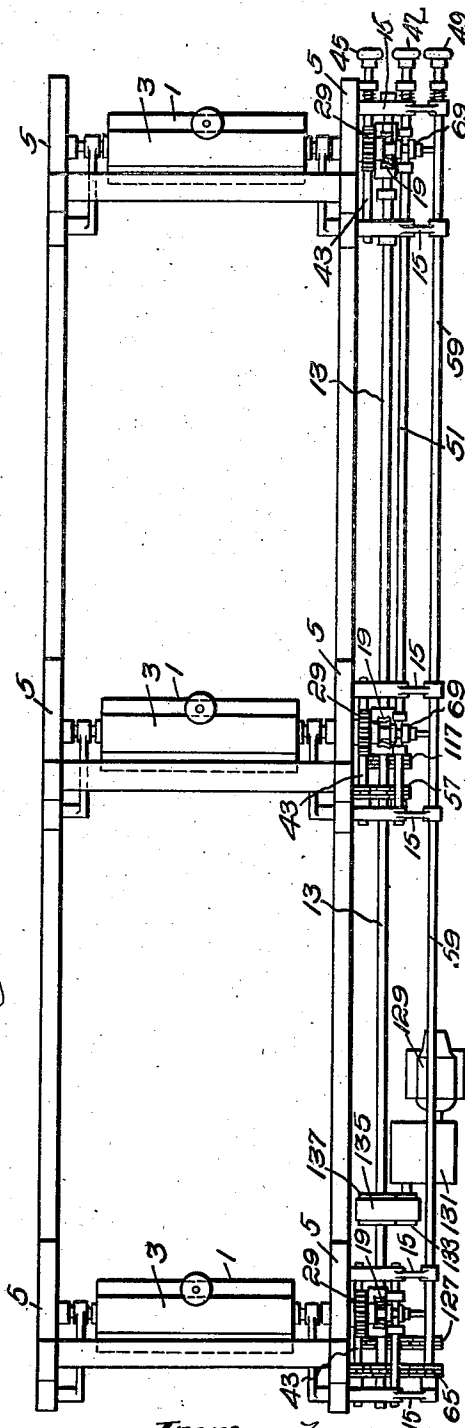


Fig. 2.

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Dec. 12, 1939.

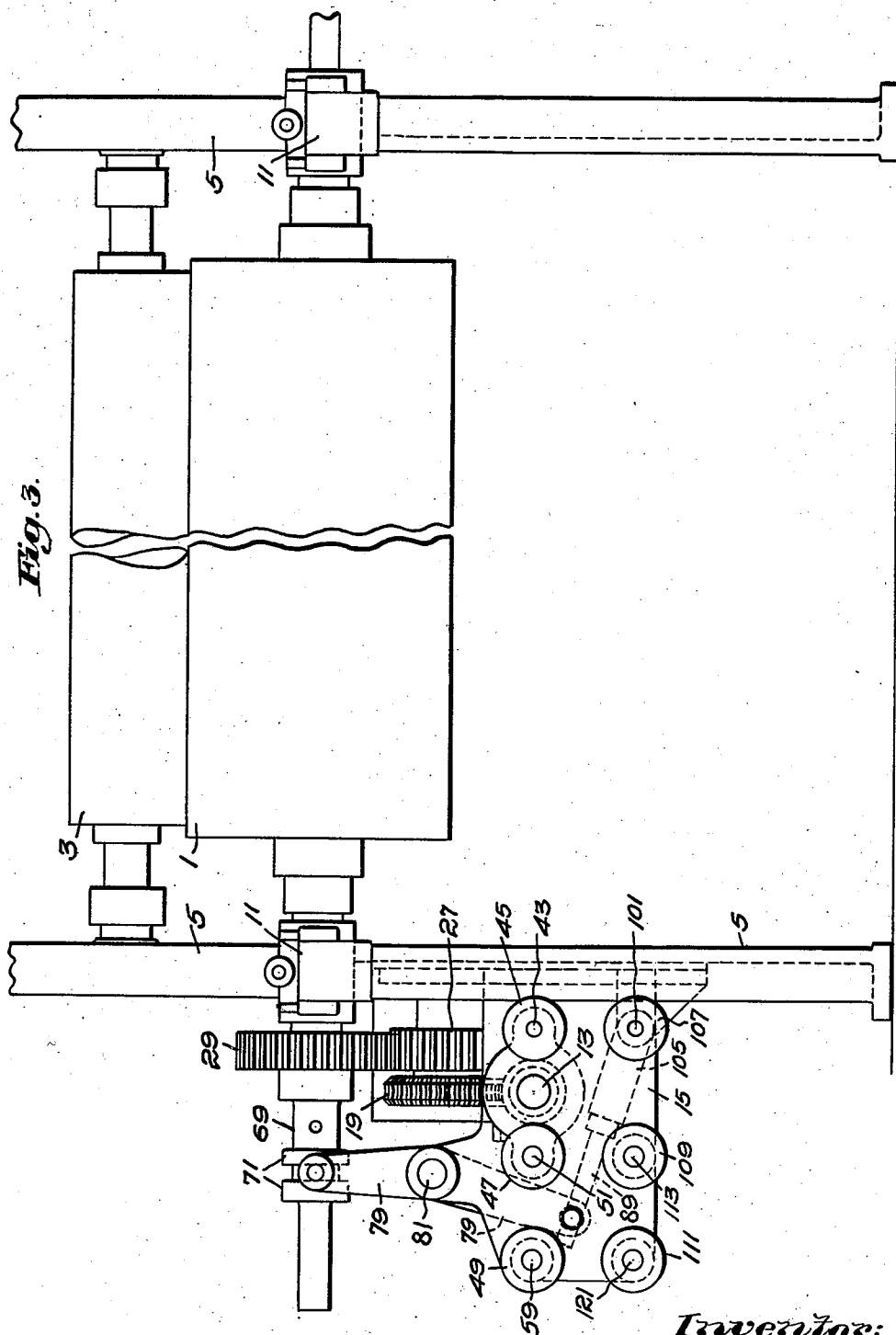
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7 Sheets-Sheet 2



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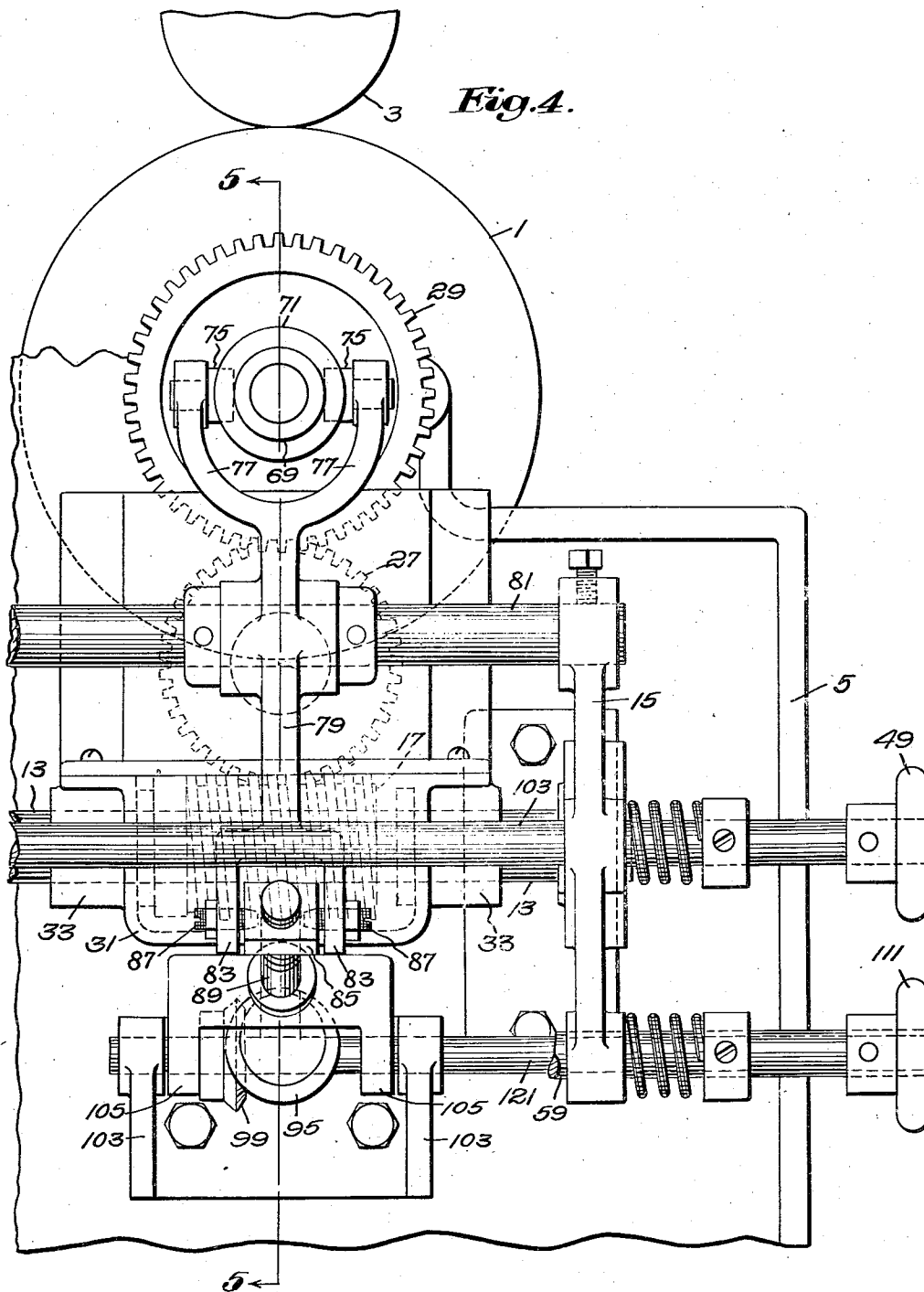
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7 Sheets-Sheet 3



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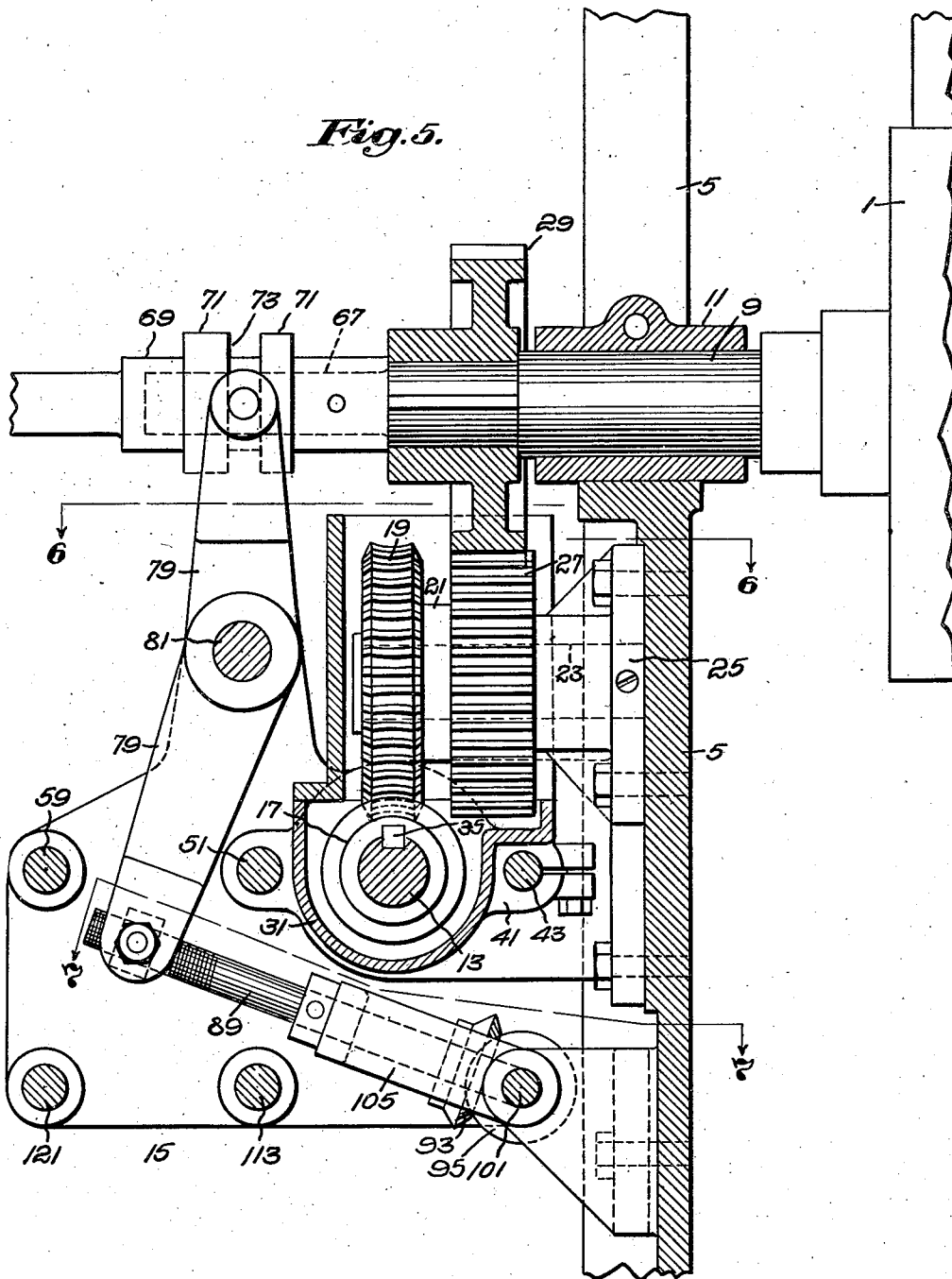
2,183,045

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7 Sheets-Sheet 4

Fig. 5.



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Dec. 12, 1939.

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2,183,045

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7 Sheets-Sheet 5

Fig. 6.

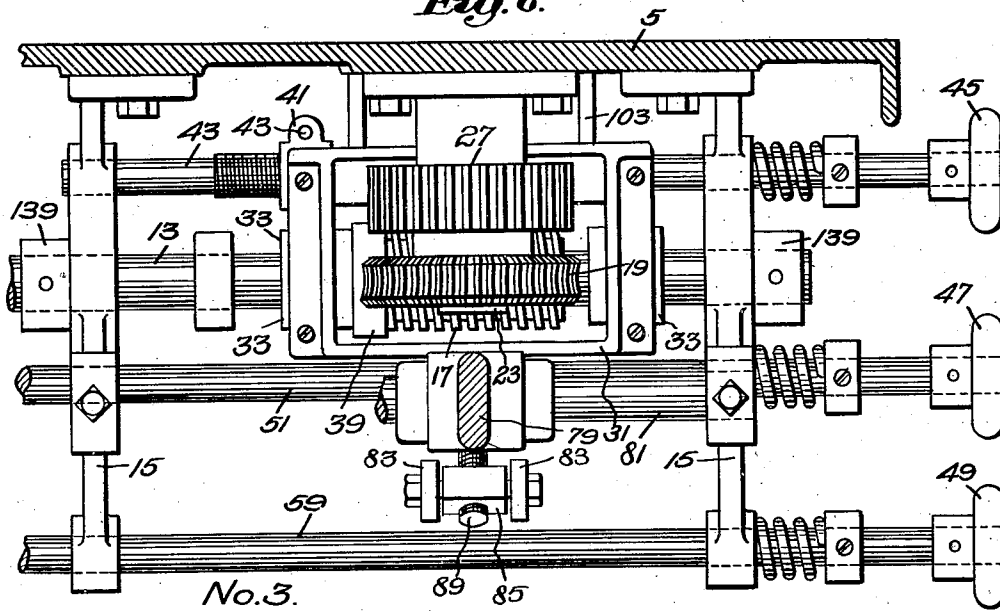
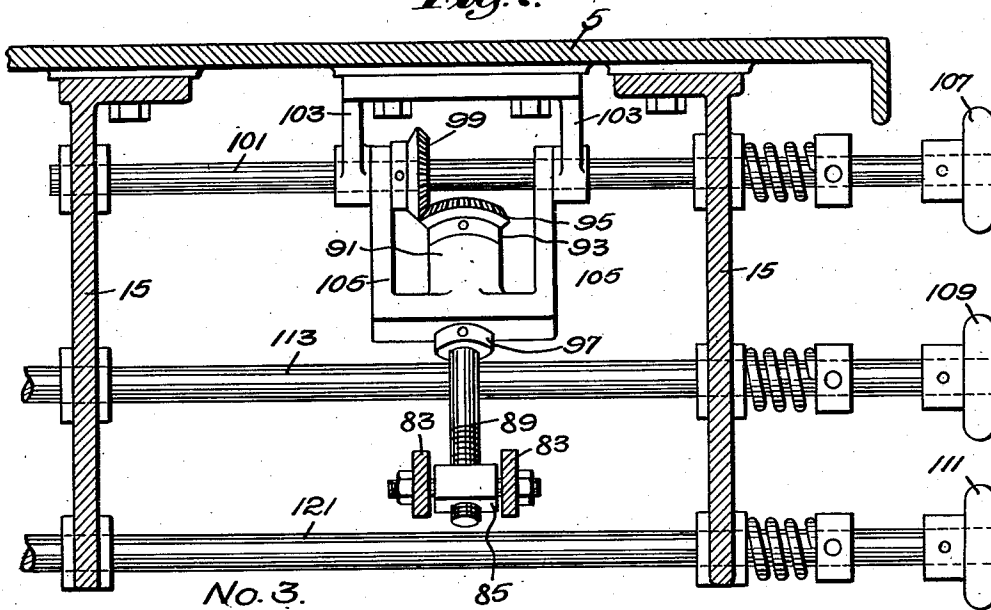


Fig. 7.



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2,183,045

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7 Sheets-Sheet 7

Fig. 10

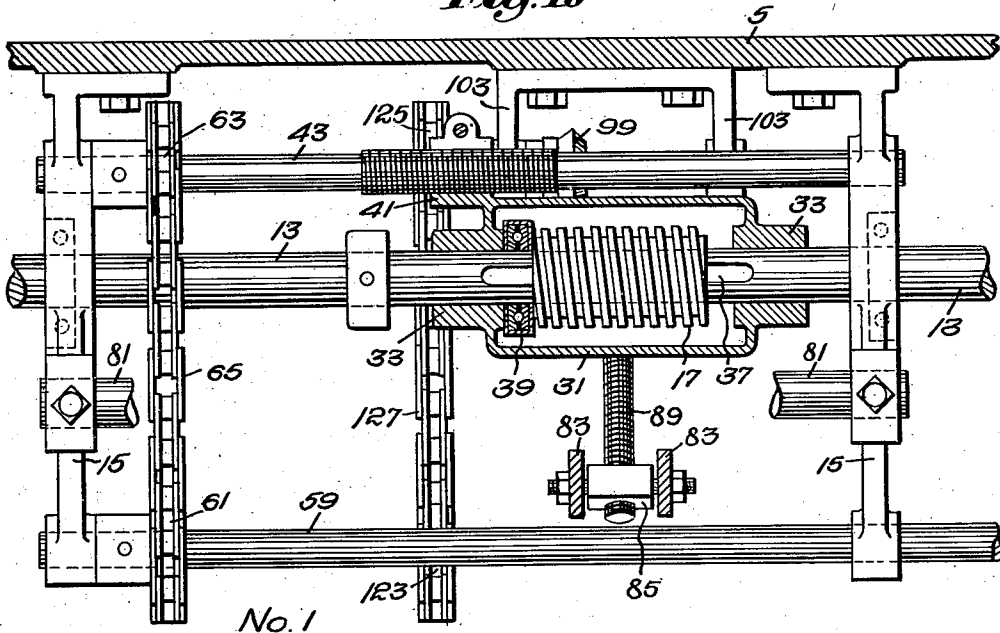
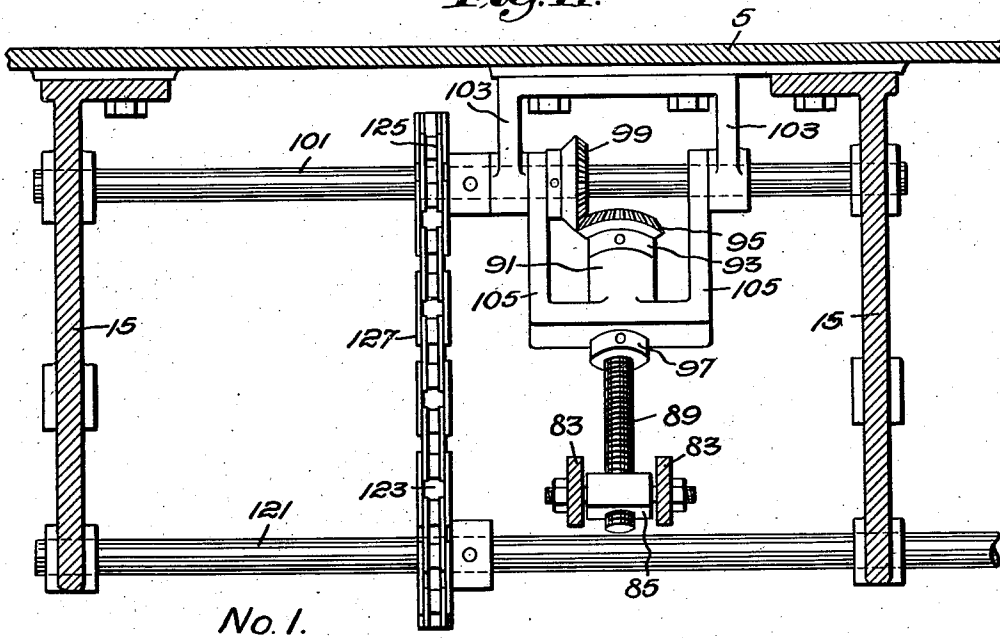


Fig. 11.



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UNITED STATES PATENT OFFICE

2,183,045

PRINTING PRESS

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Application June 9, 1938, Serial No. 212,732

3 Claims. (Cl. 101—181)

My invention relates to printing presses, and is more particularly concerned with means for driving and adjusting the several printing couples of a press having a plurality of such couples.

The invention will be best understood from the following description when read in the light of the accompanying drawings of an embodiment of the invention selected for illustrative purposes, the scope of the invention being more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is an elevation of a printing press according to the invention with parts omitted;

Fig. 2 is a plan of the press according to Fig. 1;

Fig. 3 is an elevation, on an enlarged scale with parts broken away, of the press according to Figs. 1 and 2 as viewed from the right;

Fig. 4 is an elevation, on an enlarged scale, of a fragment of the press unit marked No. 3 of Fig. 1;

Fig. 5 is a section on the line 5—5 of Fig. 4 with parts omitted;

Figs. 6 and 7 are respectively sections on the lines 6—6 and 7—7 of Fig. 5 with parts omitted;

Figs. 8 and 9 are sections of the press unit marked No. 2 of Fig. 1 corresponding to the sections shown by Figs. 6 and 7 respectively of the press unit marked No. 3; and

Figs. 10 and 11 are sections of the press unit marked No. 1 of Fig. 1 corresponding to the sections shown by Figs. 6 and 7 respectively of the press unit marked No. 3.

Referring to the drawings, the press illustrated comprises three printing couples each having a printing cylinder 1 and cooperating impression cylinder 3, the frame of the press comprising side standards 5 which rotatably support these cylinders. The web W, as shown by Fig. 1, is guided through these printing couples in series, driers indicated schematically at 7 being provided, if desired, for drying the ink applied by one printing couple before the web passes through the next successive couple. As illustrated, the web after it leaves the last couple to the right is guided in an upward direction so as to present a length U of the web, the printed side of which faces an operator standing at that end of the machine and facing the web. For convenience of description the couples and their associated parts are marked No. 1, No. 2 and No. 3 from right to left as viewed in Fig. 1.

In the machine illustrated each printing cylinder is so supported and driven that it may be adjusted both lengthwise and angularly. Each

cylinder is driven and adjusted in the same way by substantially the same mechanism, and therefore a description of one will suffice for all.

Referring particularly to Figs. 3 to 7, the printing cylinder 1 is fixedly carried by a shaft 9 which at opposite ends is rotatably supported in bearings 11 carried by the adjacent side standards 5, the shaft being slidable lengthwise in these bearings. For rotating the several shafts 9 is provided a common drive shaft 13 rotatably supported in brackets 15, a pair of which is carried at the outer side of each standard 5 at one side of the press. Splined to this drive shaft between each pair of brackets 15 is a worm 17. Meshing with the worm is a worm wheel 19, the hub 21 of which is rotatably mounted on a spindle 23 carried by a bracket 25 mounted between the brackets 15 on the outer side of the side standard 5. Fixed to the hub 21 of the worm wheel is a spur gear 27, and meshing with that spur gear is a spur gear 29 fixed to the drive shaft of the printing cylinder. By this construction in an obvious manner rotation of the drive shaft 13 is effective to rotate the printing cylinders.

Each worm 17 is received in a trough-shaped member 31 having end walls formed with perforated bosses 33 slidably mounted on the drive shaft 13 (see particularly Figs. 5 and 10). As shown, the worm which is splined to the drive shaft by means of a key 35 carried by the worm and a keyway 37 formed in the shaft abuts at one end with a ball thrust bearing 39 which bears against the adjacent boss 33 of the associated trough-shaped member. At its rear the trough-shaped member at one end thereof integrally carries a perforated boss 41 through which is screw-threaded a shaft 43. The thrust of the worm wheel 19 against the worm 17 holds the latter against the thrust bearing 39, and rotation of the shaft 43 is effective to slide the trough-shaped member 31 along the drive shaft 13 in either of opposite directions to move the worm with it. This movement of the worm is effective to rotate the associated printing cylinder shaft 9 in its bearings 11.

At the right hand end of the machine are three hand wheels 45, 47 and 49 for rotating the shafts 43 associated with the three units of the press. As illustrated in Fig. 6, the hand wheel 45 is directly and fixedly connected to the shaft 43 for unit No. 3. The hand wheel 47 is fixedly carried by a shaft 51 supported by the brackets 15 of the press units Nos. 2 and 3, as clearly indicated by Figs. 6 and 8. Near its outer end adjacent unit No. 2 the shaft 51 carries a sprocket

wheel 53, and the adjacent shaft 43 a sprocket wheel 55, about which wheels passes a sprocket chain 57. By this construction, by rotating the hand wheel 47 the shaft 43 for unit No. 2 will be rotated to adjust the printing cylinder of that unit angularly. The hand wheel 49 in a similar manner is fixedly carried by a shaft 59 which is rotatably supported in the several brackets 15 and extends to unit No. 1 where it carries a sprocket wheel 61, the associated shaft 43 carrying a sprocket wheel 63, while around these sprocket wheels passes a chain 65, so that rotation of the shaft 59 is effective to adjust the associated printing cylinder of unit No. 1 angularly.

Referring particularly to Figs. 3, 4, 5 and 7, a projection 67 of each printing cylinder shaft 9 has fixed thereto a sleeve 69 integrally formed with a pair of spaced collars 71 to provide therebetween an annular groove 73. Received in this groove are rollers 75 (Fig. 4) carried at the inner sides of bifurcations 77 at the upper end of a lever arm 79. The lever arm, as illustrated is pivotally supported on a shaft 81, the shaft extending between the adjacent pair of brackets 15 and at opposite ends being fixedly supported thereby (see particularly Figs. 3 and 4). At its lower end the lever is bifurcated, as indicated at 83 (Fig. 4), and between the bifurcations is placed a nut 85 which is pivotally supported by pins 87 carried by the bifurcations. Screw-threaded into the nut is a rod 89 (see Fig. 7), the rod at its opposite end being rotatably received in a bearing 91 and having fixed thereto at opposite sides respectively of the bearing the hub 93 of a bevel gear 95 and a collar 97. As shown, the bevel gear 95 meshes with a bevel gear 99 fixed to the rotatable shaft 101, which shaft is rotatably supported by the adjacent bearing brackets 15 and bearing brackets 103 carried by the adjacent standard 5. The bearing 91 is integrally formed with arms 105 pivoted on the shaft 101 between and in abutting relation with the brackets 103. Rotation of the shaft 101 will rotate the bevel gear 99 so as to rotate the rod 89 to screw the latter through the nut 85. As longitudinal movement of the rod 89 is prevented the lever 79 thus will be caused to swing on the shaft 81 and move the printing cylinder shaft longitudinally in one or the other direction depending upon the direction of rotation of the shaft 101.

As shown, below the hand wheels 45, 47 and 49 are hand wheels 107, 109 and 111, respectively. As illustrated by Fig. 7 the hand wheel 107 is directly and fixedly connected to the shaft 101 for the unit No. 3. The hand wheel 109 is fixedly connected to a shaft 113 which is rotatably supported in the bearing brackets 15 associated with units Nos. 2 and 3, and terminates at the first mentioned unit as illustrated in Fig. 9. Adjacent the unit No. 2 the shaft 113 has fixed thereto a sprocket wheel 115 about which passes a chain 117, the latter also passing about a sprocket wheel 119 fixedly carried by the shaft 101 for that unit. Similarly the hand wheel 111 is fixedly carried by a shaft 121 rotatably supported in the bearing brackets 15 for the three units. This shaft extends through and terminates at unit No. 1 (Fig. 11), and by means of the sprocket wheels 123 and 125 and chain 127 is effective for rotating the shaft 101 for that unit. In an obvious manner by use of the hand wheels 107, 109 and 111 the printing cylinders for the units Nos. 1, 2 and 3 may be independently longitudinally adjusted.

The drive shaft 13 for the several couples may

be driven in any convenient manner as, for example, by the electric motor 129 which through a change speed gear, the casing of which is indicated at 131, drives a pulley 133, the latter being connected by a belt 135 to a pulley 137 on the shaft 13. Longitudinal movement of the drive shaft may be prevented in any convenient manner as, for example, by means of the collars 139 (Fig. 6) which cooperate with the adjacent brackets 15.

The electric motor and the change speed gear above described conveniently may be controlled by a switch and gear shifting mechanism readily accessible to the operator standing at the right hand side of the press as viewed in Fig. 1, in which position the printed side of the length U of the web is visible. By operation of the several hand wheels at that station he may adjust the several printing cylinders lengthwise and angularly so as to secure proper registry of the matter printed by the several couples while the press is rotating at a moderate speed or by viewing the web with a stroboscope or the like while it is moving at a higher speed.

It will be understood that within the scope of the appended claims wide deviations may be made from the form of the invention described without departing from the spirit thereof.

I claim:

1. A printing press having, in combination, a printing couple comprising a printing cylinder, means comprising a longitudinally slidable shaft coaxial with the cylinder for adjusting said cylinder lengthwise, a lever for sliding said shaft, means for swinging said lever about an axis transverse to said shaft comprising a screw-threaded rod member and cooperating nut member, means pivotally connecting one of said members to said lever, a part carried for swinging about an axis parallel to the axis of swinging of said lever, the other of said members being supported by said part for rotation about an axis transverse to the axis of swinging of the lever, and means for rotating the last mentioned member.

2. A printing press having, in combination, a printing couple comprising a printing cylinder, means comprising a longitudinally slidable shaft coaxial with the cylinder for adjusting said cylinder lengthwise, a lever for sliding said shaft, means for swinging said lever about an axis transverse to said shaft comprising a screw-threaded rod member and cooperating nut member, means pivotally connecting one of said members to said lever, a part carried for swinging about an axis parallel to the axis of swinging of said lever, the other of said members being supported by said part for rotation about an axis transverse to the axis of swinging of the lever, and means for rotating the last mentioned member comprising a gear fixed thereto and a meshing driving gear.

3. A printing press having, in combination, a printing couple comprising a printing cylinder, means comprising a longitudinally slidable shaft coaxial with the cylinder for adjusting said cylinder lengthwise, a lever for sliding said shaft, means for swinging said lever about an axis transverse to said shaft comprising a screw-threaded rod member and cooperating nut member, means pivotally connecting one of said members to said lever, a part carried for swinging about an axis parallel to the axis of swinging of said lever, the other of said members being supported by said part for rotation about an axis transverse to the

axis of swinging of the lever, and means for rotating the last mentioned member comprising a rotatable driving gear coaxial with the axis of swinging of said part.

5 4. A printing press having, in combination, a printing couple comprising a printing cylinder, means comprising a longitudinally slidable shaft coaxial with the cylinder for adjusting said cylinder lengthwise, a lever for sliding said shaft, 10 means for swinging said lever about an axis transverse to said shaft comprising a screw-threaded rod member and cooperating nut member, means pivotally connecting one of said members to said lever, a part carried for swinging about an axis 15 parallel to the axis of swinging of said lever, the other of said members being supported by said part for rotation about an axis transverse to the axis of swinging of the lever, means for rotating the last mentioned member comprising a rotatable bevel driving gear coaxial with the axis of 20 swinging of said part, and a bevel gear meshing therewith fixed to the last mentioned member.

5. A printing press having, in combination, a printing couple comprising a printing cylinder, 25 means comprising a longitudinally slidable rotary shaft coaxial with the cylinder for moving said cylinder endwise, a lever mounted for swinging transversely of said shaft, a thrust connection between said shaft and lever, a nut carried by 30 said lever for relative swinging about an axis transverse to said shaft, a rotary driven shaft transverse to the axis of said slidable shaft, an arm rotatably mounted on said driven shaft, a rod screw-threaded through said nut, which rod 35 is rotatably mounted on said arm with its axial line intersecting the axial line of said driven shaft, and a bevel gear connection between said rod and driven shaft.

6. A printing press having, in combination, a 40 plurality of spaced independent printing couples through which a web is adapted to pass successively, each of which couples comprises a printing cylinder, a common driving means for all of said printing cylinders, separate means at each of 45 said couples for adjusting the printing cylinder thereof axially and rotatively relative to said driving means independently of the printing cylinders of each of the other couples, said separate means each comprising a rotary actuating member, and a separate means for operating each of 50

said actuating members, which means extend from the several couples to a common station past which the web, being operated upon by said couples, is adapted to pass after it has been operated upon by all of said couples; and separate means, 5 comprising closely adjacent manually operated members at said station, for operating said means which operate said actuating members.

7. A printing press having, in combination, a 10 plurality of spaced independent printing couples through which a web is adapted to pass successively, each of which couples comprises a printing cylinder, a common driving means for all of said printing cylinders, separate means at each of 15 said couples for adjusting the printing cylinder thereof axially and rotatively relative to said driving means independently of the printing cylinders of each of the other couples, said separate means each comprising a rotary actuating member, and a separate rotary shaft for operating 20 each of said actuating members, which shafts extend from the several couples to a common station past which the web, being operated upon by said couples, is adapted to pass after it has been operated upon by all of said couples, and 25 closely adjacent hand-wheels at said station for independently rotating said shafts.

8. A printing press having, in combination, a 30 plurality of spaced independent printing couples through which a web is adapted to pass successively, each of which couples comprises a horizontal printing cylinder, side frames for supporting said cylinders, a common driving means for said cylinders, separate means at each of said couples for adjusting the printing cylinder thereof 35 axially relative to said side frames and rotatively relative to said driving means, each of which means comprises a rotary actuating member, a plurality of rotary horizontal parallel shafts for independently operating said actuating members, 40 which shafts are carried by said side frames and severally extend in pairs from each of said couples to a common station past which the web, being operated upon by said couples, is adapted to pass 45 after it has been operated upon by all of said couples, and closely adjacent rotary members at said station for independently rotating said shafts.

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