June 16, 1931. C. A. RUPP 1,810,404

DRIVE AND CONTROL FOR PRINTING PRESSES

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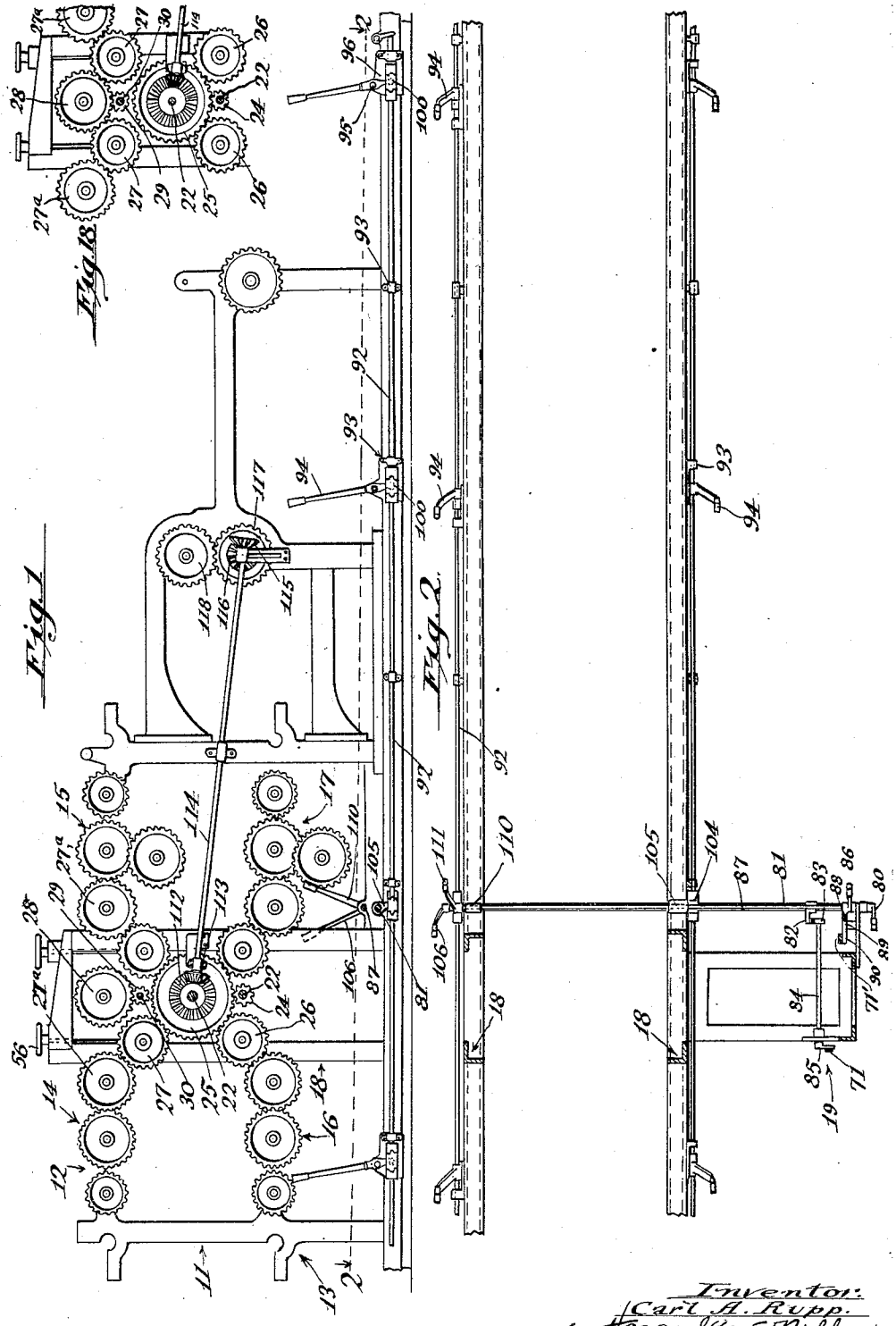

Fig. 1

Fig. 2

Fig. 1a

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DRIVE AND CONTROL FOR PRINTING PRESSES

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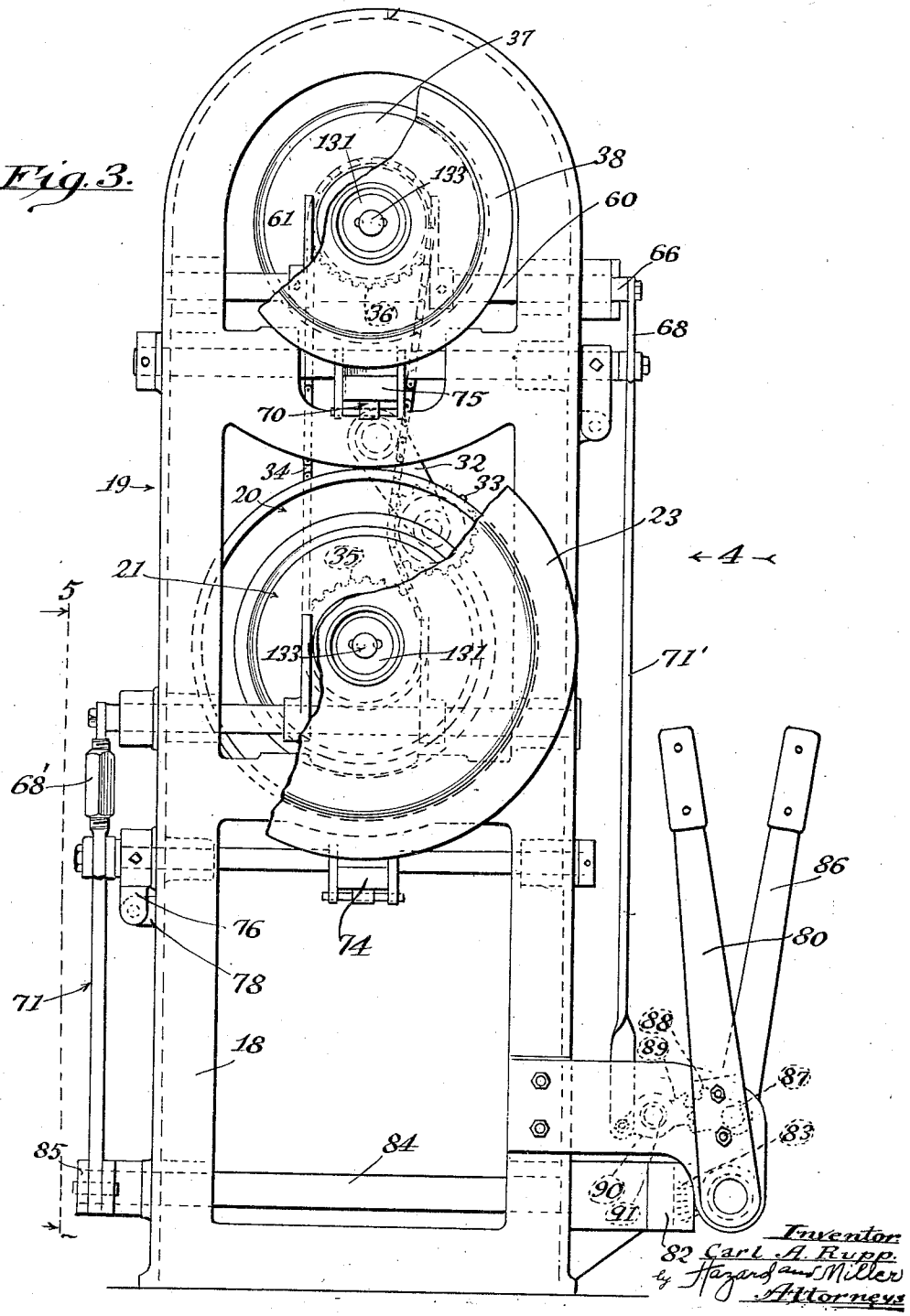
Fig. 3.



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DRIVE AND CONTROL FOR PRINTING PRESSES

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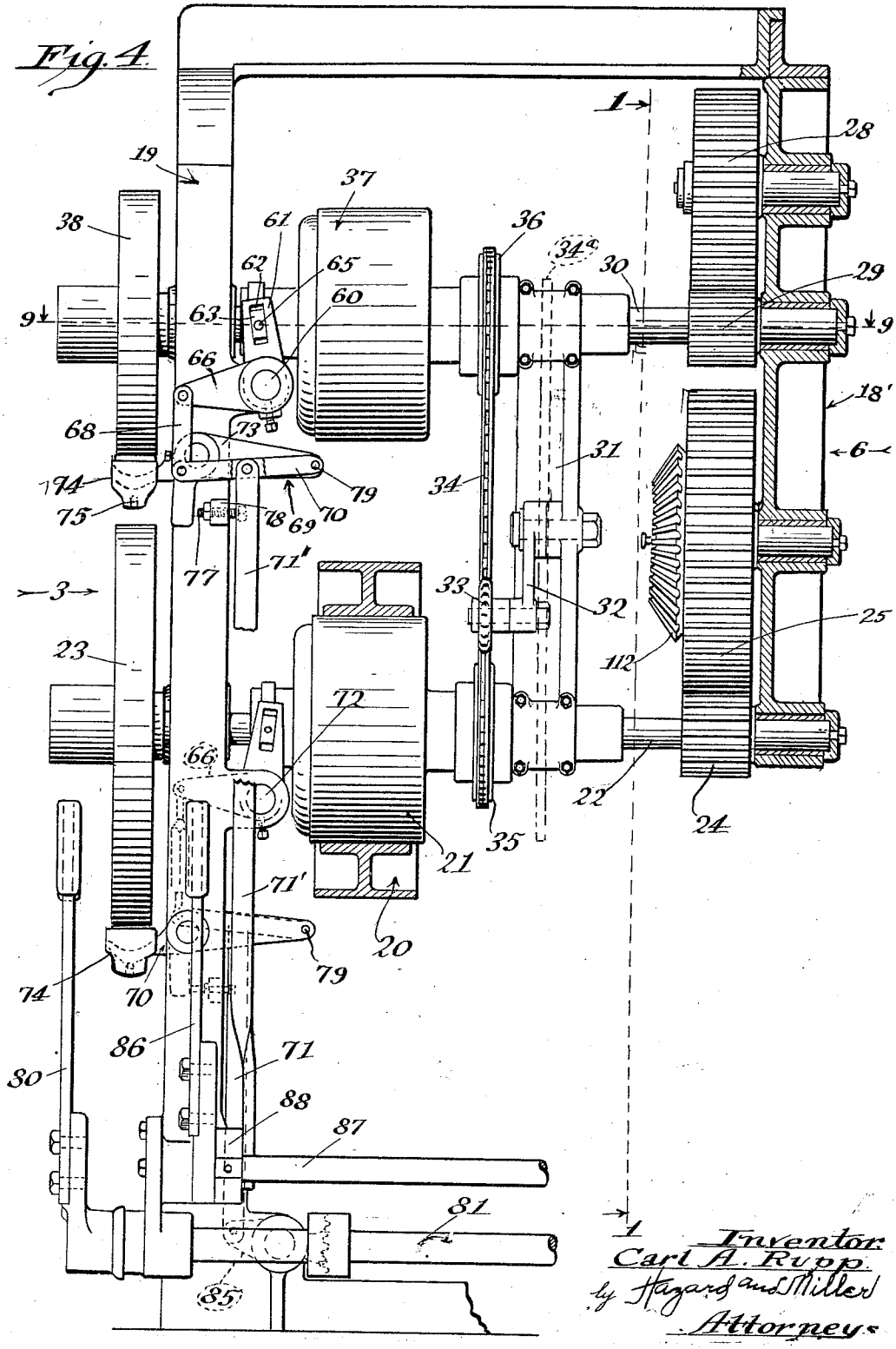
Fig. 4.



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DRIVE AND CONTROL FOR PRINTING PRESSES

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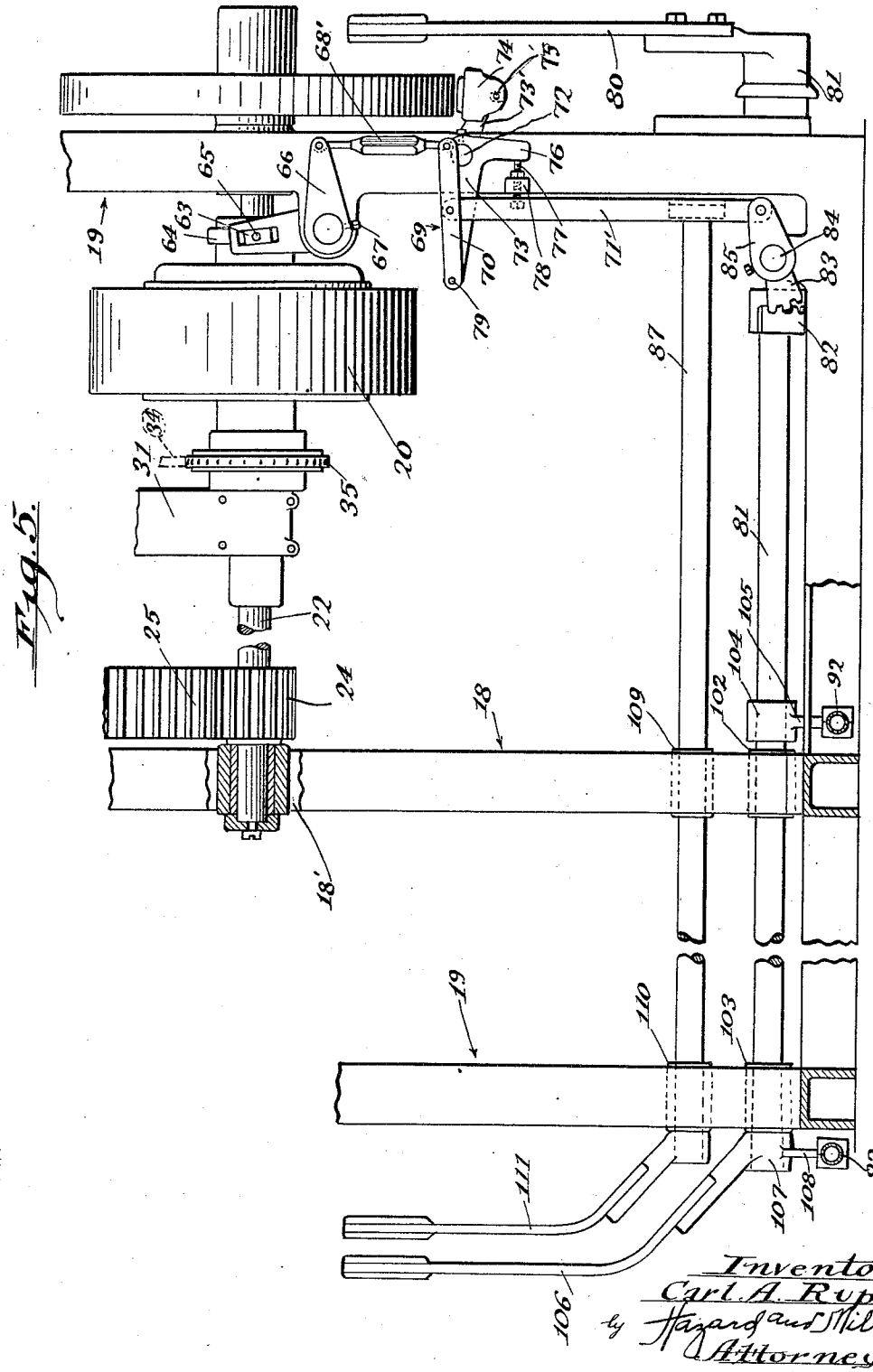

Fig. 5.

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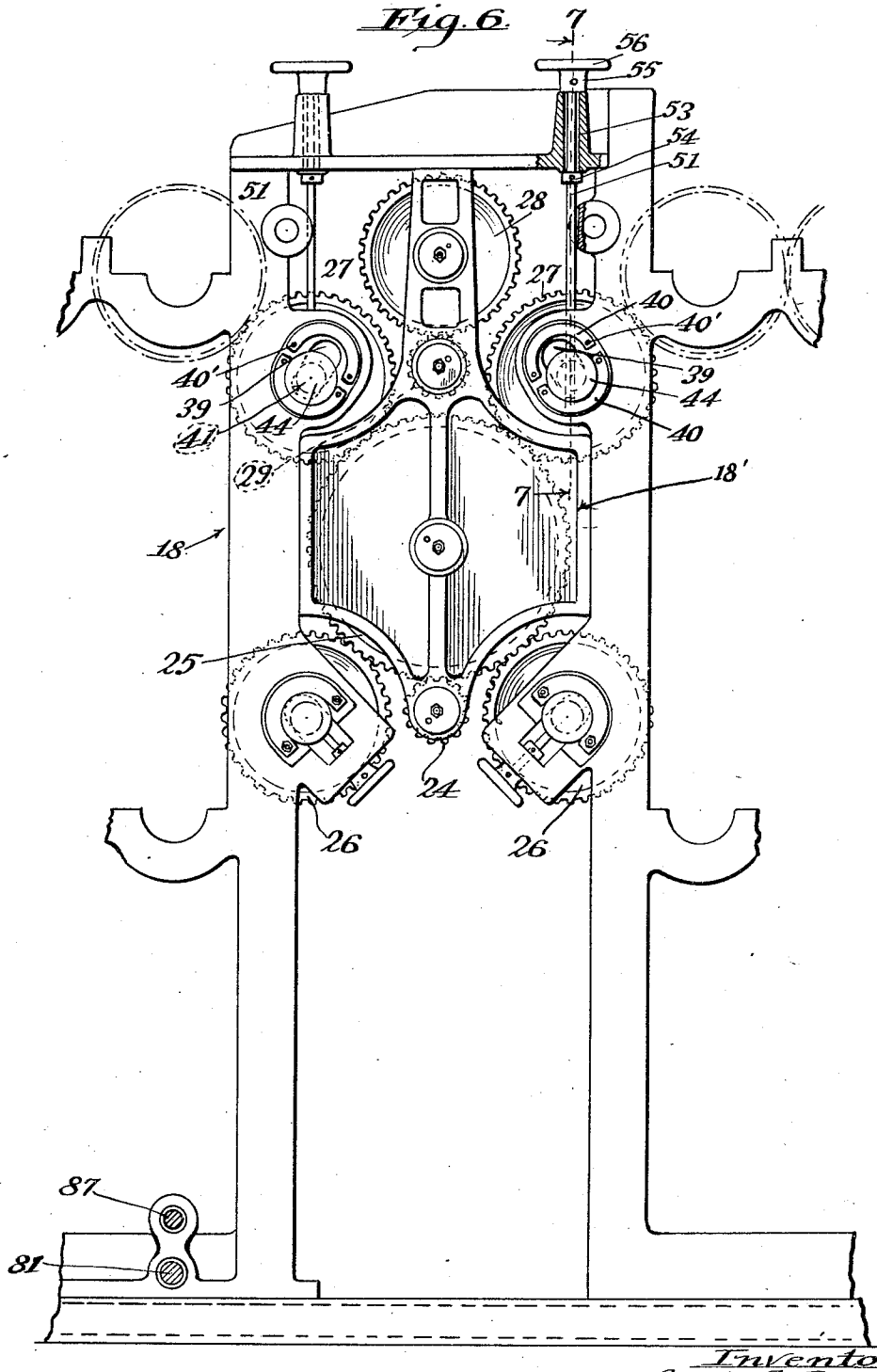
Fig. 6.



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DRIVE AND CONTROL FOR PRINTING PRESSES

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Fig. 7

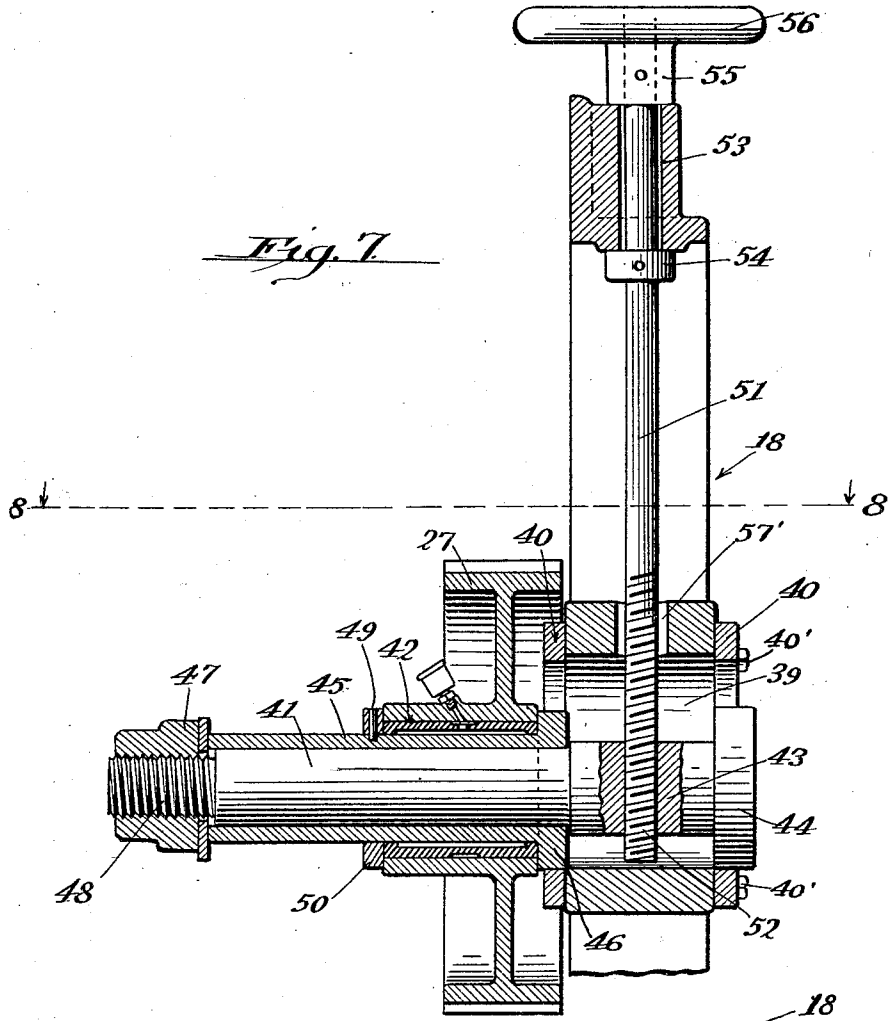
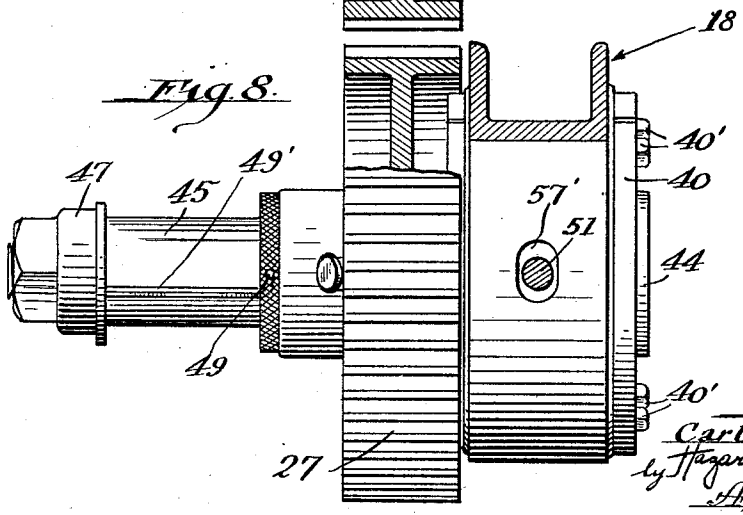


Fig. 8.



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DRIVE AND CONTROL FOR PRINTING PRESSES

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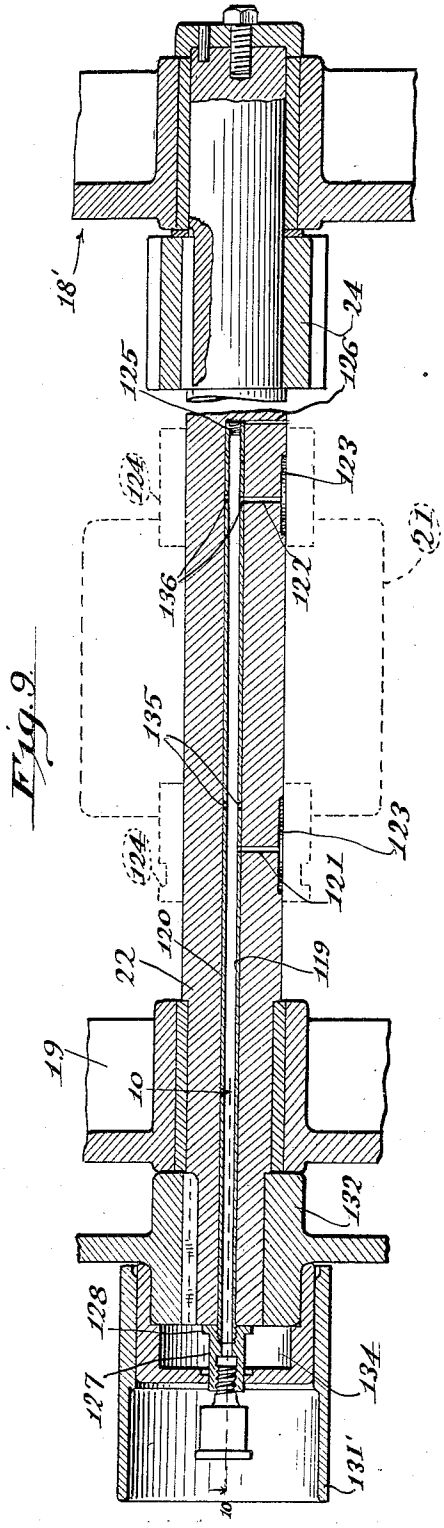

Fig. 9.

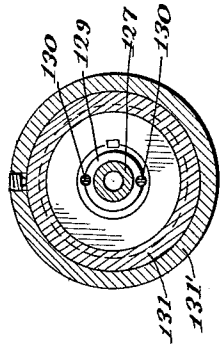

Fig. 12.

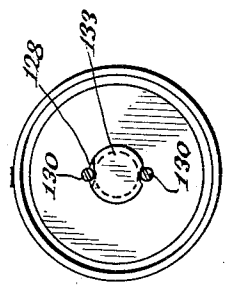

Fig. 11.

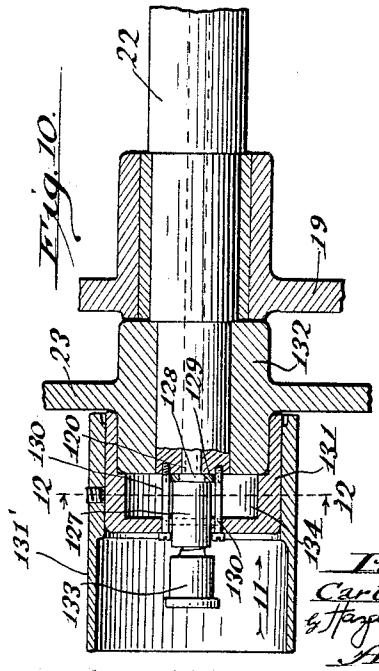

Fig. 10.

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DRIVE AND CONTROL FOR PRINTING PRESSES

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Fig. 13.

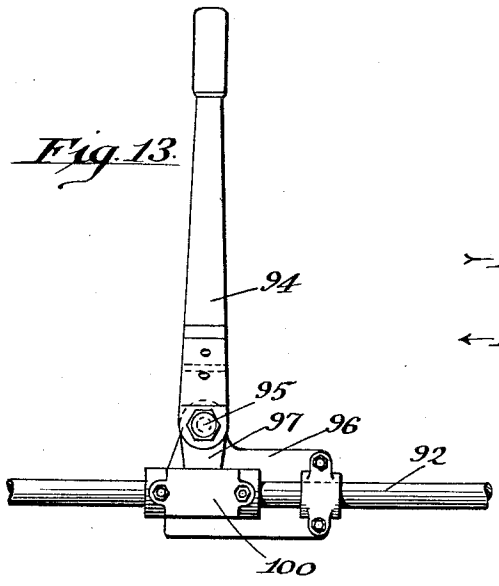


Fig. 14.

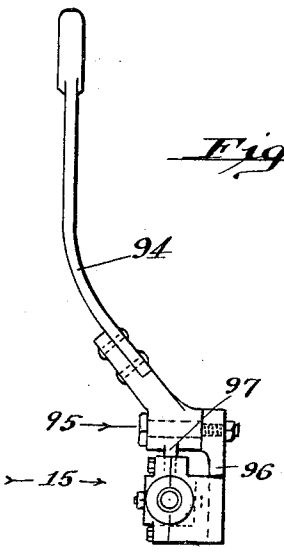


Fig. 15.

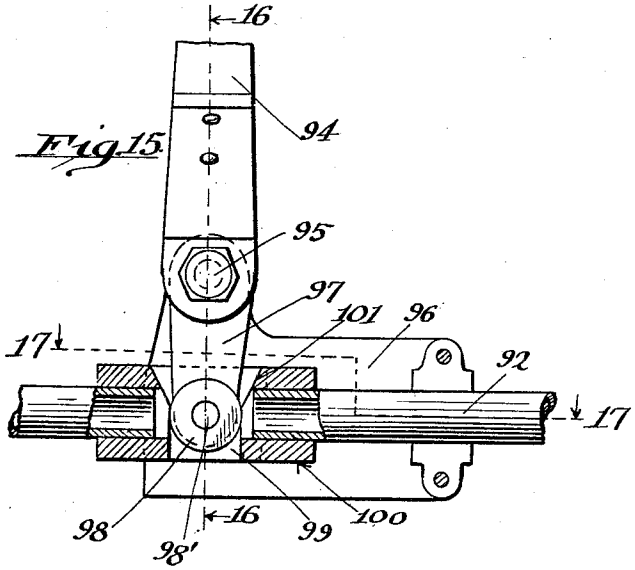


Fig. 16.

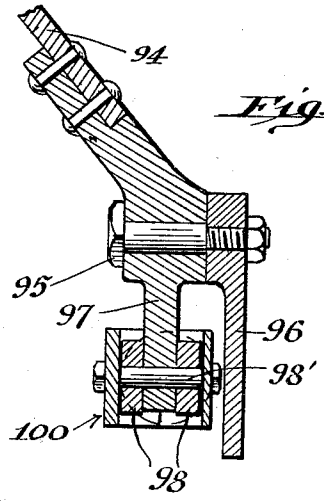
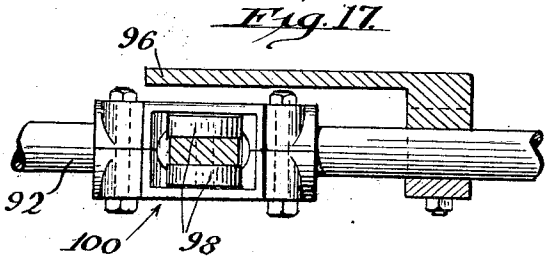


Fig. 17.



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Patented June 16, 1931 1,810,404

UNITED STATES PATENT OFFICE

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DRIVE AND CONTROL FOR PRINTING PRESSES

Application filed February 26, 1929. Serial No. 342,694.

My invention is a drive and control for printing presses.

My present invention relates to a drive and control for printing presses both for sheet delivery and rewinding into rolls after the printing operation.

My invention is illustrated as applied to a quadruple press, that is a press consisting of four printing units, two of these constituting the upper deck and two the lower deck of the press. The press is designed with rewinding mechanism for each of the decks. It frequently happens in rewinding when both decks are in operation, that one of the rewinding rolls will become wound to its full size before the other. In this case it is desirable to remove the fully wound roll and to start winding another roll in its place.

An object therefore of my invention is to accomplish this, by shutting down the deck which is in operation or winding, in other words to shut down the deck which has its roll fully wound and to still leave the other deck in operation. My invention therefore comprises a dual control for the upper and lower decks by which both of these decks may be operated at the same time or either one may be stopped and the other one continue in operation.

My invention applies to improvements in operating double deck quadruple presses having printing and re-winding and print and sheet delivery features. With such improvements it is not necessary in making changes to completely shut down the printing press and such changes with my improvements may be made in a minimum amount of time. The invention to be claimed pertains to the improvements.

For printing and rewinding I shift the transmission gears for the upper deck out of contact with the main drive gear and into contact with a secondary drive gear. This latter is operated through a shaft having a clutch by a pinion drive. This latter shaft is connected to the main shaft having the main clutch preferably by a sprocket and chain connection. For the printing of sheet delivery the sprocket chain connection may be disconnected.

Another object of my invention is in the simultaneous control of the opening or letting in of the clutch and applying brakes to bring the press to a quick stop and to effect a quick release for starting of the press.

A still further object of my invention is in connection with the clutch control having operating devices such as levers positioned at opposite sides of the press and distributed longitudinally thereof to actuate long shafts on the opposite sides of the press. In this connection a detail feature of my improvement is in utilizing longitudinal shafts which are given a longitudinal movement by the operating levers in counter-distinction to a rotary movement to operate the main clutch. By this procedure there is no lost motion on account of a torque or the like of the shaft.

A still further object and feature of my invention is in having a clutch throw-out operating lever or the equivalent, positioned at the end of the press, that is, at the end of the jogging table so that if desired the jogger handling the sheets may quickly stop the press.

Again another object and feature of my invention is a centre lubricating device by means of which the two clutch bearings can be lubricated from the outer extreme end of the clutch or drive shaft.

The above various features of my invention, together with characteristics are set forth in the following specification and claims, having reference to the drawings, in which:

Figure 1 is a diagrammatic side elevation and partial section on the line 1—1 of Fig. 4 in the direction of the arrows, of a press with certain features of my invention illustrated in connection therewith, certain parts being omitted for the sake of clearness of illustration. The illustration shows mainly the gear connections and the sliding clutch control rods or shafts;

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1 in the direction of the arrows, illustrating mainly the mounting of the clutch control rods and levers on opposite sides of the press;

Fig. 3 is a side elevation taken in the direction of the arrow 3 of Fig. 4 of the stand having the first drive and the clutches with the sprocket chain connection, the fly wheels and brakes;

Fig. 4 is an end elevation of the stand of Fig. 3 taken in the direction of the arrow 4 and showing certain parts of the main frame of the press;

Fig. 5 is an end elevation of part of the stand of Fig. 3 taken in the direction of the arrows 5 of Fig. 3, this being on an enlarged scale compared with the other drawings;

Fig. 6 is an inside elevation of part of the main frame of the press taken in the direction of the arrow 6 of Fig. 4, showing the mountings for the central gears of the press;

Fig. 7 is a detail vertical section on the line 7—7 of Fig. 6 in the direction of the arrows, showing the mounting for shifting the intermediate gears for the upper deck;

Fig. 8 is a horizontal section on the line 8—8 of Fig. 7 in the direction of the arrows;

Fig. 9 is a horizontal section on the line 9—9 of Fig. 4 in the direction of the arrows, to illustrate the lubricating system at opposite ends of the clutches;

Fig. 10 is a detail horizontal section partly in elevation, showing the shaft in elevation, taken on the line 10—10 of Fig. 9 in the direction of the arrows;

Fig. 11 is an end elevation taken in the direction of the arrow 11 of Fig. 10;

Fig. 12 is a transverse section on the line 12—12 of Fig. 10 in the direction of the arrows;

Fig. 13 is a side elevation of one of the clutch control levers taken in the direction of the arrow 13 of Fig. 14;

Fig. 14 is an end elevation of Fig. 13 taken in the direction of the arrow 14;

Fig. 15 is an enlarged detail elevation taken in the direction of the arrow 15 of Fig. 14, with parts broken away;

Fig. 16 is a vertical detail section on the line 16—16 of Fig. 15 in the direction of the arrows;

Fig. 17 is a detail horizontal section on the line 17—17 of Fig. 15 in the direction of the arrows;

Fig. 18 is a partial elevation of the central gearing of Fig. 1, showing a different manner of driving the upper deck.

Referring first to Figs. 1 and 2, the main frame of the press is designated by the numeral 11, in which the upper printing deck is designated generally by the numeral 12 and the lower printing deck by the numeral 13. These decks have separate printing units designated 14, 15, 16 and 17. The printing units are more or less standard in construction, the gear connections however, being changed to be suitable for my invention. The main frame structure of the press has a central frame designated 18 in Fig. 2, in which the central drive gears and shafts are mounted in a main panel 18′.

A stand designated generally by the numeral 19 is mounted on one side of the central frame 18, being illustrated in side elevation in Fig. 3 and partly in plan in Fig. 2. This stand encloses the main drive pulley 20 which is mounted on the outside of a lower main clutch 21, this clutch being mounted on the shafting designated at 22, journaled in the stand 19 and in the main panel 18′. (Note Figs. 4 and 9.) The particular construction employed is not part of my immediate invention and is not set forth in detail. The features have to do mainly with the connections and operation of the clutch.

A main fly wheel 23 is connected to the shaft 22 to rotate therewith when the clutch is engaged. A lower pinion 24 is connected to the shaft 22 and is always in mesh with a main drive gear 25 which is journaled on the panel 18′. This gear is always in mesh with gears 26 which drive the lower deck of the press actuating the printing units 16 and 17.

One manner of driving the upper deck is indicated in Fig. 1. The gears 27 which are on movable axes are shown in mesh with the main gear 25. These gears are constantly in mesh with the two gears 27^a of the upper printing units 14 and 15 of the upper deck. Therefore by this arrangement the upper and lower decks are driven through the medium of the main clutch 21, the shaft 22, the pinion 24 and the main gear 25.

As an alternative drive for the upper deck, the gears 27 may be shifted out of mesh with the main gear 25 in the manner to be described hereunder in detail and shifted into driving connection with a secondary driving gear 28 mounted on a fixed axis and supported in the panel 18′. Such shifted position is indicated in Fig. 18. The drive for the gear 28 is by means of an upper pinion 29 on a shaft 30 which is journaled in the panel 18′ and in the stand 19 (note Fig. 4). There is a spreader 31 mounted between the shafts 22 and 30. This spreader carries a sprocket tightening idler arm 32 having an idler sprocket 33 thereon which engages the sprocket chain 34, this chain taking over a lower sprocket 35 connected to one element of the clutch 21 and such element being always driven by the pulley 20 and another sprocket 36 connected to an element of the upper clutch 37. This upper clutch 37 when one element is driven through the sprocket 36, is designed to connect the shaft 30 in such drive. The shaft 30 carries a fly wheel 38.

By this construction when the gears 27 are shifted to their upper position in mesh with the gear 28, the drive to the lower deck remains through the shaft 22, the pinion 24, the gear 25 and gears 26, but the drive to the upper deck is through the sprocket 35, the upper clutch 37, the shaft 30, upper pinion

29, gear 28 and gears 27, thereby driving the upper units. This therefore drives both decks from the main drive. If it is desired to stop the upper deck, the upper clutch 37 may be thrown out and the sprocket chain will continue rotating the clutch element connected to the sprocket gear 36, but the shaft 30 will remain at rest. Or alternatively the lower clutch 21 may be disconnected from the lower shaft 22, thereby stopping the pinion 24 and the main gear 25, bringing the lower deck to rest and the upper deck being driven through the sprocket chain and the upper clutch 37 connected to drive the upper shaft 30. These alternative drives are the type used for printing and rewinding. The first type of drive with the gears 27 in their lowered position is for printing and sheet delivery and for sheet delivery operations it is desirable to slacken the sprocket idler 33 and disconnect the sprocket chain from the sprocket wheels 35 and 36, allowing such chain to rest on the spreader 31 as shown by 34^a.

The manner of shifting the gears 27 is substantially as follows, having reference particularly to Figs. 6, 7 and 8: The upper part of the central frame 18 is provided with slots 39. Connected on opposite sides of these slots 39, there are a pair of adjustable segmental rings 40. These have a thru-bolt 40′ connection, allowing accurate adjustment. The studs 41 carrying the gears 27 which are rotatably mounted have suitable bushings 42 (note Fig. 7) and have a central hub portion 43 fitting freely in the slots 39, and on the inner side there is a circular head 44 which engages the frame on surrounding portions of the slot 39 and fits in the inner surface of the segmental rings 40. On the outside there is a sleeve 45 on the stud 41 having a circular shoulder portion 46 which fits against the outside of the frame on surrounding portion of the slots 39 and in the outer segmental ring 40. This sleeve may be jammed tight by means of a nut 47 on the screw threaded end 48 of the stud 41.

In order to disengage the teeth of the gears 27 from the teeth of the gear 25 or 28, it is necessary to be able to slide the gears 27 mounted longitudinally on the stud 41 which is accomplished by sliding the pin 49 in an angular featherway 49′, the pin being connected to a collar 50. In the normal rotation of the gears the pin is held in the circumferential part of the featherway and when shifted in the longitudinal portion the gear 27 may be shifted out of or into engagement with its corresponding gear.

In order to shift the gears 27 I utilize a pair of shifting screws 51 which have a threaded end 52 threaded through the hubs 43 of the studs 41. These screws have a loose fit in a substantially vertical opening 53 in the top of the frame (see Fig. 7). The screws are held in adjusted position by collars 54 and 55, there being handwheels 56 on the top of each screw and these screws pass through the slot 57′ in the frame structure surrounding the slots 39. To shift the gears 27 from the position to mesh with the gears 25 or 28 or vice versa, the adjustable segment rings 40 are previously properly adjusted and bolted in fixed positions so that they offer a positive stop limit when the circular heads 44 of the stud 41 and the circular shoulder portion 46 of the clamping sleeve 45 are shifted through the medium of the shifting screws 51. The heads 54 and shoulders 46 seat themselves against the inner surface of the segmental rings 40. When the studs 41 are so shifted then the gears 25 may be slid into mesh with either the gear 25 or the gear 28, the circular heads 44 forming positive stops and therefore accurately centering the studs 41.

The immediate mechanism for shifting the clutches and operating the brakes acting on the fly wheels is substantially as follows, having reference particularly to Figs. 3, 4 and 5. Such mechanism is substantially the same for the upper and lower clutches and therefore only one will be described:

A clutch rocker shaft 60 is journaled in suitable lugs on the outer portion of the stand 19 and carries a clutch operating arm 61 on each side of movable element with a slot 62 therein in which there is a slidable block 63 engaging the clutch collar 64 by means of a clutch pin 65, thereby shifting the movable element of the clutch. An arm 66 is secured to the rocker shaft 60 by a set screw 67 and has a link 68 connected thereto. In regard to the upper clutch, this link is shown as of a fixed length, whereas in regard to the lower clutch it is indicated as adjustable, being designated 68′. The links 68 and 68′ are each pivotally connected to upper and lower similar levers 69 and 69′, which latter are each made of a pair of straps 70, and midway of the length of each lever there is a pivotally connected long lever, such levers being designated 71 and 71′.

A brake rocker shaft 72 is journaled in suitable bosses on the stand 19 and carries a brake actuating arm 73 in which the inner end is pivotally connected to the double lever 69. This actuating arm 73 operates between the two straps 70 which form the double lever 69. The shaft 72 has a brake carrying hub 73′ which carries the brake shoe 74 connected thereto by a pin and slot connection 75. A depending bell crank end 76 forms part of the lever 73 and is adapted to contact with an adjusting screw 77 mounted on a box 78 on the stand 19. The lever 73 is pivotally connected to the straps 70 of the lever 69 as indicated by the pivot 79.

The manner of operation of the clutches is substantially as follows:

In Fig. 5 the clutch shifting mechanism is indicated with the clutch thrown in and with the brake free. To open the clutch and apply the brake, a downward movement of the link 71 causes a combined movement of the double lever 69 operating on the pivot 79 and the lever 73 being on the pivot 72. This gives an upward movement of the brake shoe 74, this bearing against the periphery of the fly wheel. Such action brings the lever 73 to rest so that the double lever 69 can move as if on a fixed pivot 79. The further downward movement of the double lever 69 through the medium of either the link 68 or 68′ gives a downward motion to the arm 66 rocking the shaft 60 and shifting the arm 61 to move the clutch collar 64 and hence the movable element of the clutch to open the clutch. As above mentioned both the main lower clutch and the upper clutch operate in the same manner. When it is desired to throw in the clutch and release the brake, an opposite or upward movement is given to the link 71 which causes a combined upward movement of the double lever 69 and the lever 73. The lever 73 pivots as above mentioned on 72 until the bell crank end 76 contacts with the adjusting screw 77. Such action withdraws the brake shoe from the periphery of the fly wheel and in preventing further movement of the lever 73, causes the double link to move as if on the fixed pivot 79, thereby giving an upward thrust on the links 68 and 68′ and hence shifting the clutch collar from the open to the closed clutch position.

The manual control of the lower or main clutch is substantially as follows:

The hand lever 80 located in front of the stand 19 is mounted on a rock shaft 81. This rock shaft has a segmental gear 82 projecting from one side which meshes with a segmental gear 83 on the longitudinal shaft 84 extending across the stand 19 from one side to the other. This shaft has an arm 85 which is pivotally connected to the lower end of the link 71. (Note Figs. 3, 4 and 5.)

The manner of operation of the upper clutch is effected by a hand lever 86 which is connected to a rock shaft 87 extending transversely of the stand 19. This rock shaft carries a segmental gear 88 which meshes with a segmental gear 89 on a double arm 90 pivoted on the stud 91. This double arm 90 is connected to the long link designated 71′ of the upper clutch.

The apparatus for controlling the main lower clutch from opposite sides of the printing press and at different points along these sides utilizes a pair of longitudinal rods 92, these being positioned adjacent the base of the machine and slidable in guides 93. Positioned along the sides of the press there are a series of hand levers 94 mounted on pivots 95 secured to fixed brackets 96. These levers have downwardly extending ends 97 which carry two rollers 98 on a stud 98′. These rollers engage in a transverse slot 99 in connecting coupling 100 which connect the different sections of the rod 92. This coupling is shown as having the slot tapered on one side as indicated at 101 (note particularly Figs. 1, 2 and 13, through 17). Therefore by the action of rocking the hand levers 94 in a direction longitudinal of the press, the rods 92 may be given a longitudinal sliding motion. I find it satisfactory to use round steel tubing for lightness; these also having sufficient stiffness to prevent any bending.

In order to transmit the motion from the rod 92 on the side remote from the main clutch, that is on the side remote from the stand 19 and also from the side having the stand, the shaft 81 is conducted through a journal 102, on the frame 11 and 103 on the opposite side of the press. On the side having the stand 19 there is a hub 104 clamped to the shaft 81 and this has a depending arm 105 which carries rollers similar to the rollers 98 operating in a vertical slot in a coupling similar to the coupling 100 shown in detail in Figs. 15 and 16. Therefore when any of the hand levers 94 on the side of the machine having the stand are operated they shift the rod 92 and hence transmit a rocking motion to the shaft 81, thereby actuating the main clutch and the brake for the main shaft.

At the side of the machine opposite the stand 19 there is a hand lever 106 which has a hub 107 directly connected to the rock shaft 81. Therefore by operating this hand lever the shaft 81 may be oscillated and the main clutch operated. A downward extension 108 from the hub 107 has rollers similar to the rollers 99 operating in a slot similar to the slot 101 and in the coupling 100 and thus when any of the hand levers 94 distributed lengthwise of the printing press on the side opposite the stand is actuated it gives a rocking movement to the cross shaft 81, hence operating the main clutch.

The upper clutch may be operated from one position on each side of the press and this is effected by conducting the rock shaft 87 through journals 109 and 110 in the main frame of the press and mounting of hand levers 86 and 111 on the opposite ends of the shaft 87. Therefore when such shaft is rocked by the levers 111 and 86, it operates the upper clutch and the upper brake.

A drive motion is carried from the gear 25 through a large bevel gear 112 meshing with a bevel pinion 113 carried by a longitudinal shaft 114 which has a bevel gear 115 meshing with a bevel gear 116 on the gear 117 meshing with the gear 118. These latter gears are utilized to drive the cutting and delivery section of printing press.

In order to selectively lubricate the bearings of either the upper or lower clutches,

I utilize the construction illustrated in Figs. 9 to 12 which may be considered as operating in connection with the shaft 22. The shaft has a longitudinal bore 119 which has a reciprocal grease tube 120 mounted therein. There are lateral transverse grease ducts 121 and 122 from the bore 119 and these lead into longitudinal grooves 123 to the clutch bearings indicated dotted in 124.

A closure plug 125 is fitted in the inner end of the tubing 120 and there is a bleeder duct 126 leading from the end of the bore 119 to the surface of the shaft. The outer end of the grease tube 120 has a coupling 127 mounted thereon, preferably being screw threaded. This coupling has a flange 128 with grooves 129 in its periphery which grooves are engaged by studs 130 screwed into the end of the shaft and through a cap disc 131, this cap disc being illustrated as fitting over the hub 132 of one of the fly wheels. By this construction the coupling 127 is forced to rotate with the shaft and hence the grease tube also rotates with the shaft and cannot rotate relatively thereto. The sleeve 131′ mounted on the cap 131 is to protect the operators from having their clothing caught in the rotating grease cup.

A grease cup 133 is secured to the end of the coupling 127 and by pulling out on the grease cup the coupling may be slid outwardly through the space 134 between the cap disc 131 and end of fly wheel hub thereby pulling the grease tube 120 and shifting the port 135 to a register with grease duct 121 and the port 136 out of register with grease duct 122. In this position grease may be forced into the outer clutch bearing nearest the stand 19. In a similar manner, when the grease cup is pushed upon to its innermost position as shown in Fig. 9, the grease port 136 will come to register with grease duct 122 and the port 135 will come out of register with duct 121 and make it possible to force grease into the remote bearing of clutch.

The bleeder duct 126 serves as an escape for any grease that may collect between end of the tube 120 when pulled out and end of bore 119 which would hamper getting tube 120 back to its inner position.

Various changes may be made in the principles of my invention without departing from the spirit thereof as set forth in the description, drawings and claims.

I claim:

1. A printing press having an upper and a lower deck, a main drive shaft operated through a clutch from a source of power, a main drive gear operated by said shaft, a gear train for each deck meshing with the main transmission gear, one of said trains being disconnectible therefrom and adapted to mesh with a secondary transmission gear, a secondary drive shaft to operate the secondary transmission gear, and means to drive the secondary power shaft from the source of power through the medium of a secondary clutch.

2. A printing press having an upper and a lower printing deck, a main drive shaft having a clutch connecting said shaft from the source of power, a main transmission gear adapted to drive both decks, means to disconnect the gear drive from one of the decks to the main transmission gear, a secondary transmission gear to drive one of the decks when said gear drive is disconnected from the main shaft.

3. A printing press having an upper and a lower printing deck, a main drive shaft operated through a main clutch from a source of power, a main transmission gear driven by such shaft, a train of gears operating the lower and upper decks from the main gear, a secondary transmission gear, means to shift the gear train for the upper deck from the main to the secondary transmission gear, a secondary power shaft driving the secondary gear and having a secondary clutch thereon, means to drive the secondary power shaft through the main clutch and through the secondary clutch by a transmission mechanism.

4. A printing press having in combination an upper and a lower printing deck, each having two printing units, a main drive shaft having a main clutch driven from a source of power, a main transmission gear driven by the main shaft, gear trains operating from the main transmission gear to drive the units of the lower and upper presses, said gear train for the upper units being disconnectible from the main transmission and connectible to a secondary transmission gear, a secondary drive shaft operating the secondary transmission gear, a secondary clutch on the secondary shaft, and means to transmit motion from a rotating element of the main clutch driven by the source of power to a rotating element of the secondary clutch, said clutches being engageable and disconnectible with the main and secondary drive shafts.

5. A printing press comprising in combination a plurality of printing decks, means to drive both of said decks by power transmitted through a main clutch, or by power transmitted through a main and a secondary clutch, said clutches being operable independently one of the other, whereby one of the decks may be stopped and the other deck may be driven or vice versa, or both of the decks may be driven through the main clutch, a clutch control rod extending longitudinally of the press on opposite sides thereof, and means to connect such rod to the main clutch from either side of the press to control the main clutch.

6. A printing press comprising in combination a plurality of printing decks, means to drive both of said decks by power transmitted through a main clutch, or by power transmitted through a main and a secondary

clutch, said clutches being operable independently one of the other, whereby one of the decks may be stopped and the other deck may be driven or vice versa, or both of the decks may be driven through the main clutch, a pair of clutch operating rods extending longitudinally on opposite sides of the press, said rods being shiftable longitudinally with means to operate the main clutch by either of said rods, and a shaft extending transversely of the press and having operating handles on opposite sides and a connection from said shaft to the secondary clutch, whereby the secondary clutch may be operated from a single position on opposite sides of the press.

7. A printing press having an upper and a lower printing deck, a main drive shaft having a clutch connecting said shaft to a source of power, a secondary drive shaft having a clutch, a geared connection from the main shaft to the lower deck, a geared connection from the secondary drive shaft to the upper deck, a sprocket and chain connection between the two shafts, said sprocket and chain connection being disconnectible and a geared connection from the lower to the upper deck.

8. A printing press having an upper and a lower printing deck, a main drive shaft operated through a main clutch from a source of power, a main transmission gear driven by such shaft, a geared connection from the main gear to the lower deck, a secondary gear train from the main gear to the upper deck, an upper drive shaft having a clutch, and a geared connection to the upper deck through the secondary transmission gears and a disconnectible sprocket and chain connection between the two shafts, said secondary gears being shiftable to engage the main gear or to be driven from the upper shaft.

9. A printing press having an upper and a lower printing deck, a main drive shaft operated through a clutch from a source of power, a pinion on said shaft meshing with the main transmission gear, a geared connection from the main transmission gear to the lower deck, a shiftable geared connection from the main transmission gear to the upper deck, an upper shaft having a clutch, a second pinion on said upper shaft, an idler gear driven by said second pinion, said idler gear being adapted to actuate the shiftable transmission to the upper deck, a disengageable sprocket and chain connection between the two shafts and a brake for each of the shafts, each brake being interconnected with the clutch of the shaft on which it operates.

10. In a printing press, a press frame having a central frame mounted therein, the frame having a slot having segmental rings at the ends, a shiftable stud mounted in the slot and having means to engage the said segmental rings, a slidable gear on the stud and means to shift the gear on the stud longitudinally of the slot, said shiftable gears being adapted to form a transmission between a lower drive gear and an upper drive gear in accordance with the position of the stud in the slot.

11. In a printing press having a press frame, a lower and an upper printing deck, a main power shaft, a gear drive from the main power shaft to the lower deck, an upper shaft, a sprocket and chain connection, a central frame having a panel mounted therein, said frame having a pair of slots with a segmental ring at the end of each slot, a stud shiftable in each slot and having means to engage the segmental ring of the slot, the ring forming a limit of movement, a gear on each stud and means to drive the gears on the studs either from the lower shaft or from the upper shaft, the said gears on the studs driving the upper deck.

12. In a printing press having a press frame, a shaft extending longitudinally thereof and having couplings therein, each coupling having a slot therethrough, a series of pivotally mounted levers each having a roller engaging in a slot, whereby on rocking of any lever the said shaft may be shifted longitudinally.

13. A printing press having a main frame structure with rolls and gears for driving said rolls mounted therein, a central frame in the main frame, a panel secured in the central frame, a stand positioned at one side of the central frame, lower and upper shafts each having a clutch journaled in the stand and in the panel, a geared connection from said shafts to the gears operating the rolls, and a sprocket and chain drive from the lower to the upper shaft.

In testimony whereof I have signed my name to this specification.

C. A. RUPP.