July 6, 1948. F. LAMATSCH 2,444,656

INKING MECHANISM FOR PRINTING MACHINES

Filed Aug. 24, 1945 2 Sheets-Sheet 1

Fig. 1.

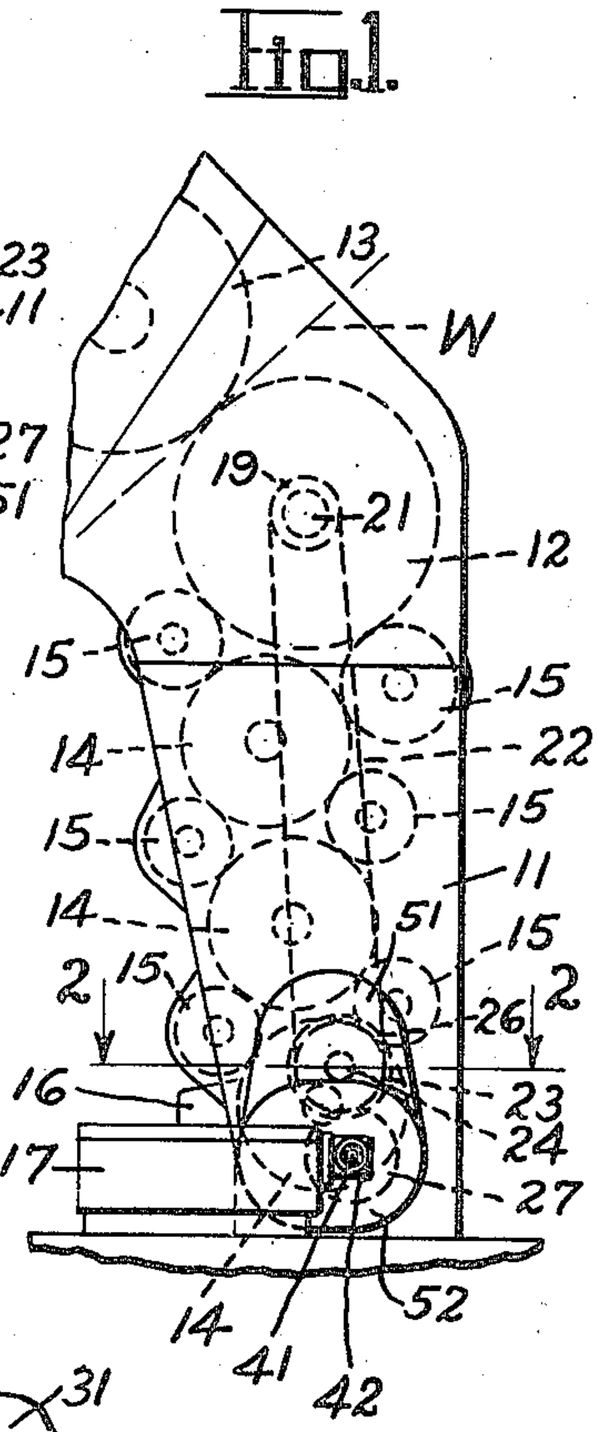


Fig. 2.

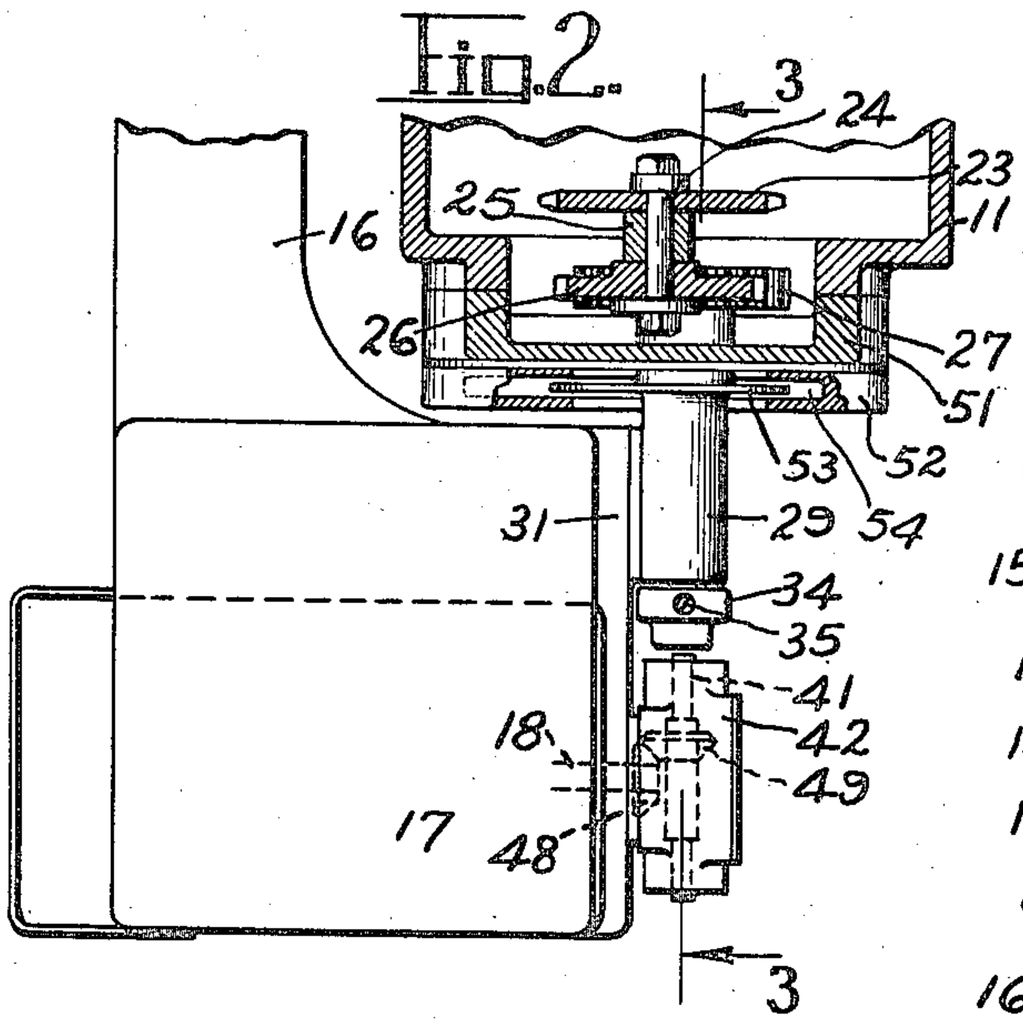
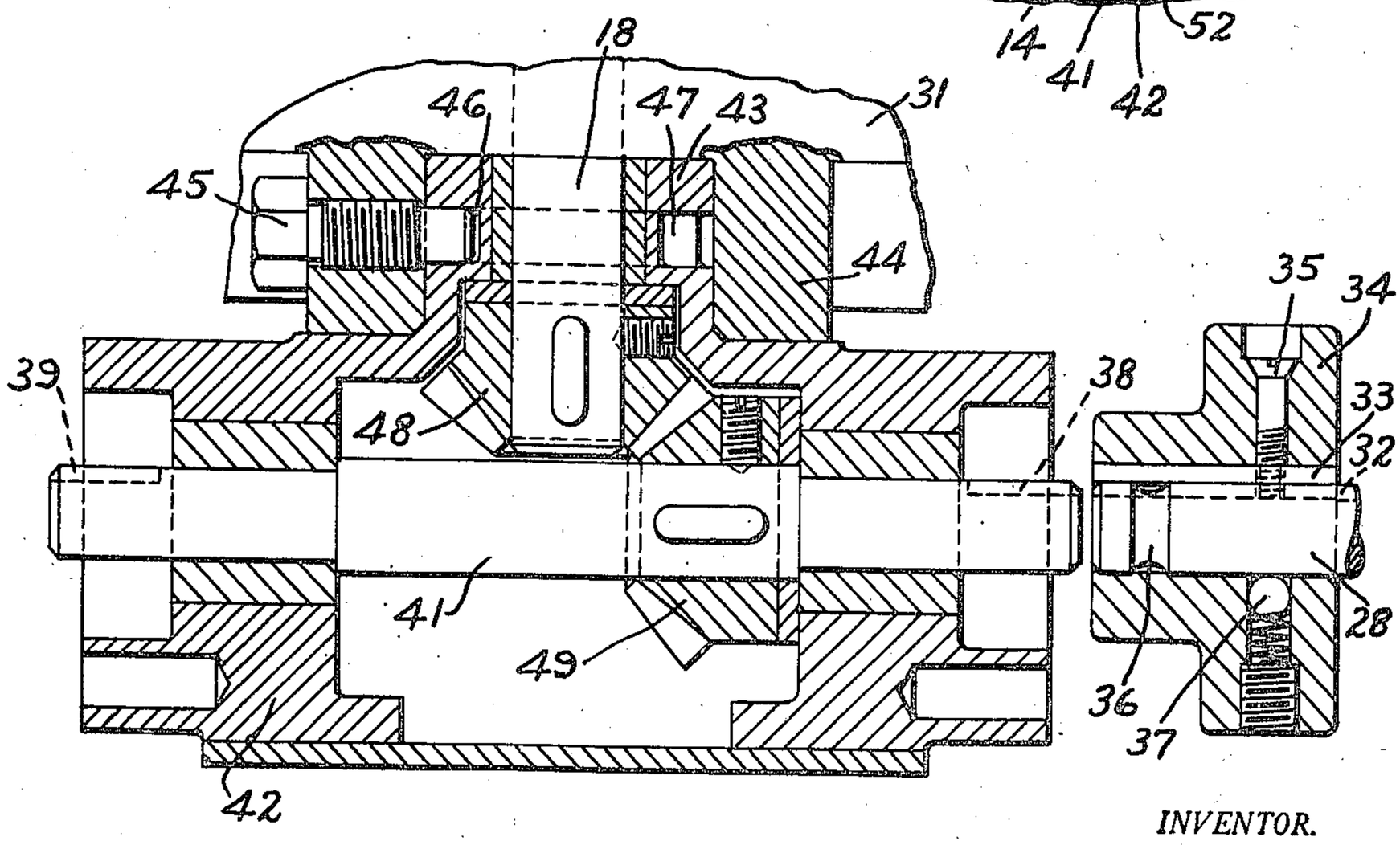


Fig. 4.



INVENTOR.
Frederick Lamatsch
BY Albert J. Horton

July 6, 1948. F. LAMATSCH 2,444,656

INKING MECHANISM FOR PRINTING MACHINES

Filed Aug. 24, 1945 2 Sheets-Sheet 2

Fig. 3.

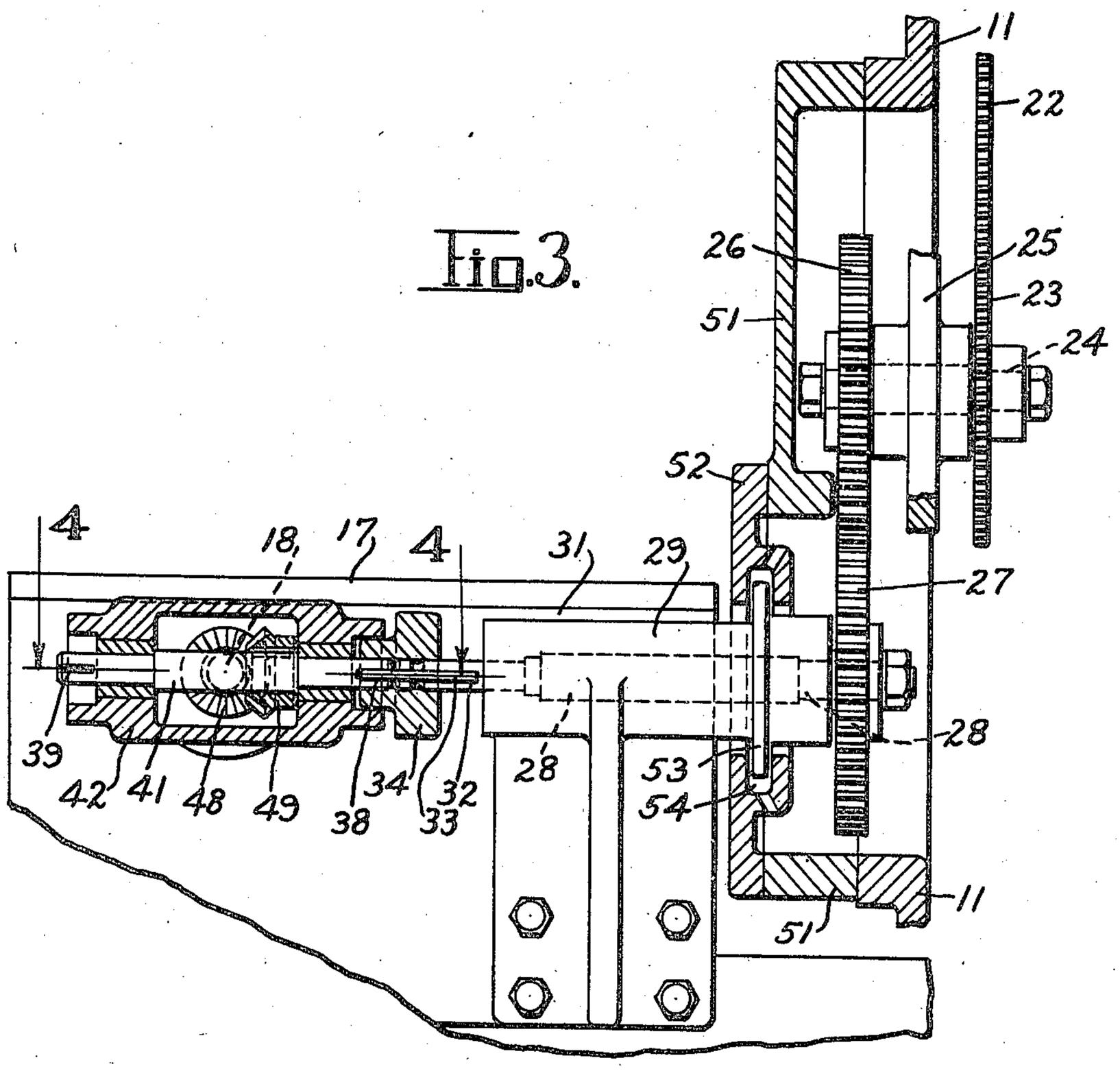
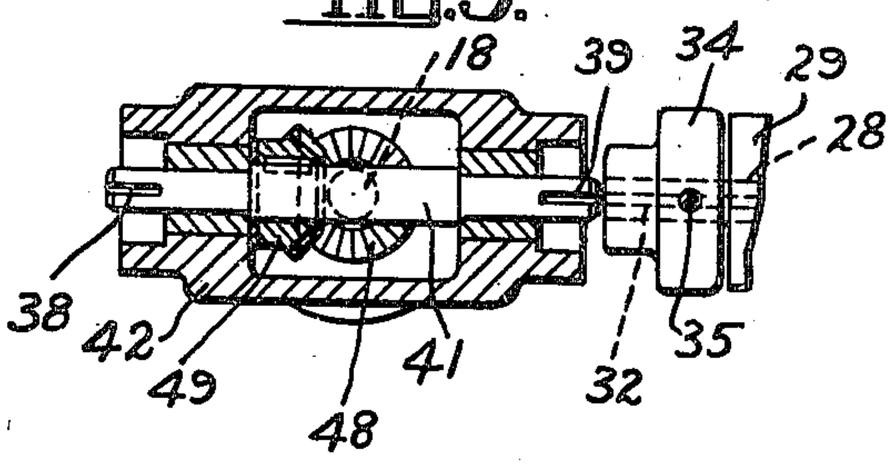


Fig. 5.



INVENTOR.
Frederick Lamatsch
BY Albert J. Horton

Patented July 6, 1948

2,444,656

UNITED STATES PATENT OFFICE

2,444,656

INKING MECHANISM FOR PRINTING MACHINES

Frederick Lamatsch, Grantwood, N. J., assignor to R. Hoe & Co., Inc., New York, N. Y., a corporation of New York

Application August 24, 1945, Serial No. 612,328

14 Claims. (Cl. 101—350)

1

This invention relates to rotary printing machines and more particularly to an ink pump driving mechanism for such machines.

In web printing machines having a plurality of web printing couples, each consisting of a plate or form cylinder and an impression cylinder, a series of inking cylinders, and an ink pump for supplying ink, through the instrumentality of the inking cylinders, to each of the printing couples, it is occasionally necessary to reverse the direction of rotation of some of the printing couples when it is desired to print the web in more than one color. In such an instance, due to the construction of the type of ink pump usually employed, the direction of drive for the ink pump supplying ink to the reversed printing couple must be maintained in the same direction as before the direction of drive of the printing couple was reversed.

In view of this requirement an object of this invention is to provide means to maintain the direction of rotation of a driven first member constant regardless of the direction of rotation of a second member from which the first member is driven.

Another object is to provide in a printing machine, driving printing means, ink pump mechanism driven by the printing means drive, and means to maintain the same direction of drive of the said ink pump mechanism when the drive of the printing means is reversed.

Still another object of this invention is to provide in combination with a printing machine having a plurality of printing couples, an ink pump for each printing couple and driven from the respective printing couple, a mechanism disposed between and in connection with the ink pump drive and the printing couple drive, to drivingly connect them, and adapted to be actuated to maintain the initial direction of drive of the ink pump when the direction of drive of the printing couple is reversed.

A further object of this invention is to provide in a rotary printing machine an ink pump driving mechanism of generally improved construction, whereby the same will be simple, durable, and inexpensive in construction, as well as convenient, practical, serviceable and efficient in use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combinations and arrangements of parts, and in the details of construction hereinafter described and claimed.

A preferred embodiment of the invention is

2

illustrated in the accompanying drawings, wherein:

Figure 1 is a schematic broken end view of a portion of a rotary web printing machine showing a printing couple, inking cylinders and an ink pump driving mechanism having the features and principles of this invention embodied therein;

Figure 2 is an enlarged plan view, partly in section, of the ink pump and the driving mechanism of the invention, as seen on the line 2—2 of Figure 1;

Figure 3 is an enlarged side view, partly in section, as viewed on line 3—3 of Figure 2, and showing the ink pump driving mechanism, the parts being shown in one operating position;

Figure 4 is an enlarged sectional view taken on line 4—4 of Figure 3;

Figure 5 is a partial view similar to Figure 3 with a part of the pump driving mechanism in a position to maintain the same direction of the drive for the ink pump, when the direction of drive of the printing couple is reversed from that shown in Figure 3.

Referring now to the drawings wherein like reference numerals designate like parts throughout the several views, the reference numeral 11 (Figure 1) denotes a gear housing attached to a side frame of a printing unit of a printing machine having a plate or form cylinder 12 and an impression cylinder 13, between which a web W is fed, and also ink distributing cylinders 14, and ink distributing rollers 15. Ink is supplied to the lowermost ink distributing cylinder 14 in a well known manner by means of an ink rail 16 attached to and supplied with ink from an ink pump 17, which may be of the type shown in Smith Patent 1,348,900, granted August 10, 1920. The ink pump 17 is provided with an operating shaft 18 through which operating mechanism (not shown) is driven, to force ink through the ink rail 16 onto the lowermost ink cylinder 14. The plate, or form cylinder 12, is driven by the printing machine drive (not shown) in the usual manner, which drive, as is well known, may be reversed to reverse the direction of rotation of the cylinders 12 and 13 when desired.

The pump driving mechanism as herein shown, comprises a sprocket wheel 19 secured upon a shaft 21 of the plate cylinder 12 and, through a chain 22, drives a sprocket 23 (Figure 3) secured upon one end of a jack shaft 24, supported in a bracket 25, secured to the gear housing 11. A spur gear 26 is secured upon the other end of the jack shaft 24 and meshes with a spur gear 27

secured to one end of a shaft 28 supported in a bracket 29 secured upon a casing 31 of the pump 17.

The end of the shaft 28, opposite the end upon which the spur gear 27 is secured, is provided with a keyway 32 in which a coupling key 33, secured to a coupling sleeve member 34 by a screw 35, is adapted to slide. A circumferential groove 36 (Figure 4) is formed in the shaft 28 adjacent its end to receive a spring pressed ball 37 carried by the sleeve 34 to releasably retain the sleeve in a desired position on the shaft 28, where it will engage the key 33, either in a key slot 38 or in a key slot 39, formed in the opposite ends of a shaft 41, which is mounted in a housing 42 and supported thereby in axial alignment with the shaft 28.

The housing 42 is pivotally mounted to swing about the axis of the pump operating shaft 18 by a cylindrical lug 43, formed on the housing 42 and rotatably supported within a sleeve 44 formed on the pump casing 31 for such purpose. When the end of the shaft 41 that carries the slot 38 is disposed adjacent to the outer end of the shaft 28 (Fig. 4) the housing 42 is locked in position by a screw 45 screw-threaded through the sleeve 44 and entering a locating hole 46 provided in the lug 43. If the housing 42 is rotated into the position shown in Figure 5, the screw 45 then enters a locating hole 47 when screwed into the sleeve 44. In both instances the housing is secured in position to axially align the shaft 41 with the shaft 28.

The pump operating shaft 18 is arranged to enter the housing 42 through the cylindrical lug 43 and, within the housing, has a bevel gear 48 secured thereto. The bevel gear 48 is arranged to mesh with a bevel gear 49 secured to the shaft 41 rotatably supported in the housing 42. When the housing 42 is swung 180 degrees about the axis of the shaft 18 to the position shown in Figure 5, the bevel gear 49 will be disposed on the opposite side of the bevel gear 48 from its position, as shown in Figures 3 and 4. A reverse direction of rotation may then be imposed upon the shaft 41, by reversing the rotation of the printing cylinders 12 and 13, but the direction of rotation of the pump operating shaft 18 will not be changed.

By providing the drive arrangement shown, (Figure 3), the sprocket 19, the chain 22, the sprocket 23, and the spur gears 26 and 27 may be disposed within the gear housing 11 in which all of the gears for drivingly connecting the cylinders 12 and 13, the cylinders 14, and the rollers 15 are contained. To cover the spur gears 26 and 27 the housing 11 is provided with a cover 51 and the bracket 29 extends through a supplemental cover 52 attached to the cover 51. A flange 53, provided on the bracket 29, and a groove 54 formed in the cover 52 forms an oil baffle and prevents leakage of oil from the housing 11.

The pump casing 31 is mounted in a well known manner on the ink rail 16, which is arranged to be moved horizontally toward or away from the ink cylinder 14, by means that may be the same as shown in Morris Patent 1,791,508. When the rail is thus moved, the bracket 29, the shaft 28 and the gear 27 move horizontally with it and in respect to the gear 26. The groove 54 and the adjacent hole through the cover 52, are elongated horizontally (Figure 2) to permit the required horizontal movement of the gear 27 with the bracket 29.

Assume that the printing machine (Figure 1) is to be operated with the cylinder 12 rotating clockwise. Operation of the ink pump 17 will be required, and its shaft 18 must rotate clockwise, as seen in Figure 3. The operator will slide the coupling sleeve 34 toward the housing 42 to connect the shafts 28 and 41 by means of the key 33 (Figure 3). The key 33 will now lie partly in the keyway 32 of the shaft 28 and partly in the keyway 38 of the shaft 41. The ball 37 then locks the sleeve 34 in its driving position. The pump 17 will now be properly driven by the printing machine drive through the instrumentality of the cylinder shaft 21, the sprocket 19, the chain 22, the sprocket 23 the spur gears 26 and 27, the shaft 28, the key 33, the shaft 41, the bevel gears 49 and 48, and the pump operating shaft 18.

Now should it be required to feed the web W between the printing cylinders 12 and 13 in a reverse direction and rotate the cylinder 12 counterclockwise without reversing the direction of rotation of the pump operating shaft 18, the coupling sleeve 34 is drawn away from the housing 42 to remove the key 33 from the slot 38 in the shaft 41, the screw 45 is removed from the hole 46 in the lug 43, and the housing 42 is rotated in the sleeve 44 one hundred and eighty degrees, to the position shown in Figure 5. The screw 45 is now entered into the hole 47 in the lug 43 to lock the shaft 41 in axial alignment with the shaft 28. The coupling sleeve is now slid toward the housing 42 to enter the key 33 into the slot 39 in the shaft 41. The reversed direction of rotation of the shaft 28 occasioned by reversing the direction of rotation of the cylinders 12 and 13 will be counteracted and the pump operating shaft 18 will be driven clockwise and in the same direction as in the first instance. The use of the spur gears 26 and 27 positioned as shown permits bodily adjustment of the pump 17 and rail 16 horizontally to move the rail away from and return it to the ink distributing cylinder 14, when required for occasional cleaning.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof. Obviously, the parts illustrated in Figure 4 may be rearranged so that the gear 48, instead of being secured to the shaft 18, would be secured to the shaft 28, and the housing 42 in place of being rotatable about the shaft 18 would be rotatable about the shaft 28. Then the coupling member 34 would be slidable on the shaft 18 instead of on the shaft 28. This arrangement would produce the same results, as the illustrated embodiment. Another variation in the design illustrated would be to provide two coupling members 34, one on each end of the shaft 41. Then by rotating the housing 42 and the shaft 41, either of the coupling members could be moved into operative engagement with the shaft 28. Other variations will occur to anyone versed in the art, and therefore it is desired that the illustrated embodiment be considered in all respects as illustrative and not restrictive.

What I claim is:

1. In a printing machine a device for drivingly connecting a first shaft adapted to have its direction of rotation reversed, to a second shaft required to be driven only in one direction of rotation, the said device comprising a third shaft, a support mounted to be rotated about the axis of the second shaft and carrying the third shaft to selectively present either end of the third shaft

in connectible position with an end of the first shaft, a gear on the second shaft in mesh with a gear on the third shaft, and means to connect the end of the first shaft with the selected end of the third shaft presented thereto.

2. In a printing machine having an ink distributing member, an ink pump, means to direct ink from said pump to the ink distributing member, a first shaft driven by the printing machine and adapted to have its direction of rotation reversed, a second shaft for operating the ink pump and required to be rotated only in one direction, and a reversible drive unit for drivingly connecting said first and second shafts to drive the second shaft in its required direction of rotation from the first shaft driven in either direction of rotation; a drive unit reversing means comprising an intermediate third shaft mounted to be swung about the axis of the second shaft to selectively present either of its ends adjacent to an end of the first shaft, means to drivingly connect the selected end of the third shaft to the adjacent end of the first shaft, and means drivingly connecting said second shaft to said third shaft.

3. In a rotary printing machine having a driven form cylinder, means to supply ink to said form cylinder including an ink pump having an operating shaft and mechanism including a reversible drive unit to drive the pump shaft from a shaft driven from the printing machine in the same direction of rotation regardless of the direction of rotation of the form cylinder; a drive unit reversing means comprising a driving shaft, a driven shaft, an intermediate shaft member operable to drivingly connect the said shafts, the said intermediate shaft member being operably connected by bevel gears to one of the said shafts and supported with its axis perpendicular thereto and in alignment with the other shaft, a coupling member on the said other shaft adapted to engage an end of the said intermediate shaft member, and means to reverse the position of the intermediate shaft member whereby either end thereof may be so engaged.

4. In a printing machine that may be driven selectably in either of two directions and has an ink pump required to be driven in only one direction, and a coupling mechanism selectably positionable in one position when the printing machine is driven in one direction and in a second position when the printing machine is driven in a reverse direction; a coupling mechanism comprising three shafts, two of which are positioned perpendicular to one another, and the third of which is positioned in axial alignment with one of the said two shafts, mounted for swinging movement about the axis of the other of the two said shafts and drivingly connected thereto, whereby the third shaft may be swung to bring either of its ends adjacent an end of the aligned shaft for coupling thereto to form a reversible drive connection between the first two said shafts.

5. In a printing machine having driven rotatable members adapted to have their direction of rotation reversed, an auxiliary device to be driven from a said driven rotatable member in one direction only and a reversible drive unit for so driving the auxiliary device; a drive unit reversing means comprising a driving shaft, a driven shaft, and means for reversibly connecting said shafts, said means comprising a support mounted to pivotally swing about the axis of the driven shaft, a first bevel gear on said driven shaft, an intermediate shaft carried by the support to swing therewith and have its ends selectively disposed adjacent an end of the driving shaft, a second bevel gear on the intermediate shaft in mesh with the first gear, and means to drivingly connect a selected end of the intermediate shaft to the driving shaft when the selected intermediate shaft end is so disposed adjacent the said driving shaft end.

6. In a rotary printing machine having a driven form cylinder, means to supply ink to said form cylinder including an ink pump having an operating shaft and mechanism including a reversible drive unit to drive the pump shaft, from a shaft driven from the printing machine, in the same direction of rotation regardless of the direction of rotation of the form cylinder; a drive unit reversing means comprising a driving shaft, a driven shaft, an intermediate shaft drivingly connected to the driven shaft and being disposable in position to have either of its ends connected to the driving shaft, and means to connect either end of the intermediate shaft to the driving shaft.

7. Mechanism according to claim 6, in which the said intermediate shaft is carried by a support rotatable for so disposing it in position for so connecting either of its ends to the driving shaft.

8. Mechanism according to claim 7, in which the said support is rotatable about the axis of the driven shaft for so disposing the intermediate shaft in axial alignment with the driving shaft.

9. In a rotary printing machine having a driven form cylinder, means to supply ink to said form cylinder including an ink pump having an operating shaft and mechanism including a reversible drive unit to drive the pump shaft, from a shaft driven from the printing machine, in the same direction of rotation regardless of the direction of rotation of the form cylinder; a drive unit reversing means comprising a driving shaft, a driven shaft, an intermediate shaft drivingly connected to the driven shaft, a support for the intermediate shaft rotatable to present a selected end of the shaft in position to be connected to the driving shaft, means to connect the driving shaft to the end of the intermediate shaft presented thereto, and means to releasably lock the intermediate shaft support in shaft connecting position.

10. In a rotary printing machine having a driven form cylinder, means to supply ink to said form cylinder including an ink pump having an operating shaft and mechanism including a reversible drive unit to drive the pump shaft, from a shaft driven from the printing machine, in the same direction of rotation regardless of the direction of rotation of the form cylinder; a drive unit reversing means comprising a driving shaft, a driven shaft, an intermediate shaft drivingly connected to the driven shaft, a support for the intermediate shaft rotatable to present a selected end of the shaft in position in alignment with the driving shaft, each end of the intermediate shaft being provided with coupling means, and a coupling member drivingly connected to the driving shaft and operable to engage the coupling means on the intermediate shaft ends to drivingly connect said shafts.

11. Mechanism according to claim 10, comprising also means for aligning the intermediate shaft and the driving shaft and for releasably locking the intermediate shaft support in shaft aligning position.

12. Mechanism according to claim 10, in which

the coupling member connected to the driving shaft is slidable thereon and comprising also means for locking said coupling member against sliding movement thereon.

13. In a printing machine having an inking cylinder, an ink distributing member moveable toward and away from the inking cylinder, an ink pump moveable with the ink distributing member and a drive unit for reversibly connecting the ink pump to the machine drive for driving the same in the same direction when the printing machine is running in either direction; drive unit mechanism comprising a drive gear, a driven gear meshing therewith and supported for movement tangentially thereof, a drive shaft secured to the said driven gear and driven thereby, a moveable support for said drive shaft, a driven shaft rotatably carried by the said support, a bevel gear secured to the end of the driven shaft, a housing rotatably mounted on said support, a third shaft rotatably carried by the housing and having coupling engaging means on both ends, a bevel gear in mesh with the first bevel gear and secured to a mid portion of the third shaft, the two coupling engaging means of the third shaft being alternatively positionable for engagement with the coupling carried by the said drive shaft.

14. In a rotary printing machine having a driven form cylinder, means to supply ink to said form cylinder including an ink pump having an operating shaft and mechanism including a reversible drive unit to drive the pump shaft, from a shaft driven from the printing machine, in the same direction of rotation regardless of the direction of rotation of the form cylinder; a drive unit reversing means comprising a driving shaft bearing a coupling member, a driven shaft having a bevel gear, a gear housing rotatable about the axis of the driven shaft and rotatably supporting an intermediate shaft with extremities arranged to be connected to the coupling member and having a second bevel gear secured in position to mesh with the first bevel gear, the driving and driven shaft being so disposed that the gear housing may be turned to engage either end of the intermediate shaft with the coupling member and thereby permit reversal of rotation of the driving shaft without changing the direction of rotation of the driven shaft.

FREDERICK LAMATSCH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,374,523	Pitt	Apr. 12, 1921
2,182,984	Hacmac	Dec. 12, 1939
2,351,012	Carpenter	June 13, 1944
2,351,013	Carpenter	June 13, 1944
2,384,996	Hanson	Sept. 18, 1945