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DRIVING MECHANISM FOR PRINTING PRESSES

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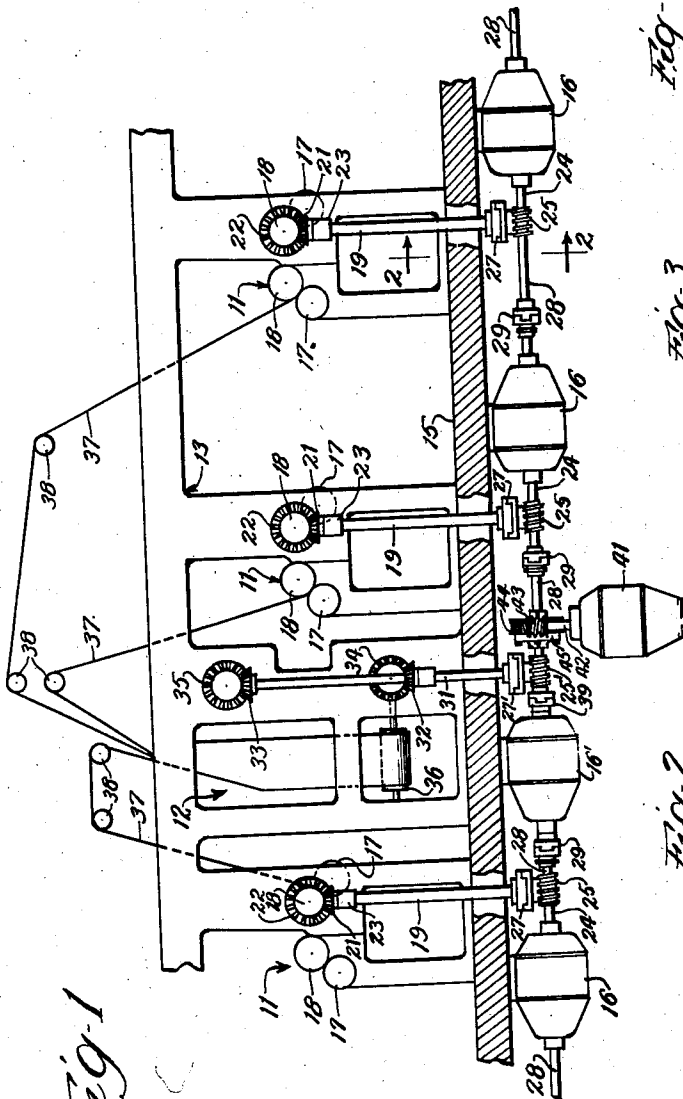
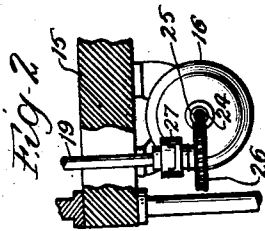
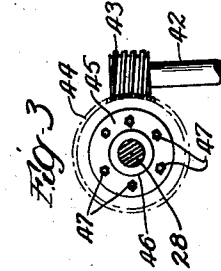
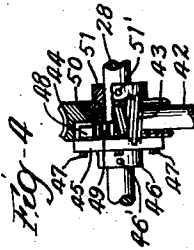


Fig. 1



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DRIVING MECHANISM FOR PRINTING PRESSES

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8 Claims. (Cl. 270-5)

This invention relates to printing press drives and more particularly to drives of the "unit" type in which a separate motor is employed for each unit of the press and preferably one for each folder, such a "unit drive" being described and claimed in my prior Patent No. 1,734,077 issued November 5, 1929. A variation of this form of drive is shown in Patent No. 1,877,387, issued September 13, 1932, in which the individual motors are arranged end-to-end beneath or in other convenient relation to the press. In a third patent, No. 1,857,818, issued May 10, 1932, individual inching motors are provided in association with the various press units whereby the cylinders may be turned in plating and the units which are grouped with a folder to form a particular press combination may be driven at inching speed in making ready for normal operation by the main drive motors.

The present invention provides in a drive system of the same general type to which the aforesaid patents relate, an auxiliary inching or slow speed motor associated with a press combination including a folder for driving the same at slow speed, either fixed or variable, covering a range of lower speeds for the press, said motor, in the embodiment of the invention shown in the drawing, being also adapted to drive at slow speed with the folder such press units, on either side thereof, as may be grouped with the folder to form a press. This auxiliary motor is preferably adapted to take care of the inching speed and the acceleration between such speed and the range of the regular unit drive motors, although manifestly it could be designed for inching speed only.

Further objects and advantages of the invention will be apparent from the following specification, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

Referring to the drawing:

Fig. 1 is a fragmentary elevational view showing a portion of a unit type press and driving mechanism therefor embodying my invention, the drawing being largely diagrammatic;

Fig. 2 is a view taken on the section line 2-2 of Fig. 1 illustrating the driving connection between the armature shaft of one of the unit drive motors and the power take-off shaft leading to the unit driven by said motor;

Fig. 3 is an elevational view of the worm drive and overrunning clutch assembly whereby the power from the auxiliary slow speed motor is

transmitted to the mechanism to be driven thereby; and

Fig. 4 is a detail view, partially in section, of the parts shown in Fig. 3, being taken on a plane at right angles to the view shown in Fig. 3.

The invention is shown in said drawing applied to a unit type press, of which several units, indicated by the reference character 11, and one folder, indicated by the numeral 12, are shown, the same being mounted in a frame 13 supported upon a floor 15 beneath which are mounted in end-to-end relationship a plurality of unit drive motors 16, and a folder drive motor 16', it being understood that there is a separate motor 16 for each unit and that Fig. 1 is a fragmentary view of a line of presses and folders, there being a separate motor for each unit and preferably one for each folder, in accordance with the disclosure of my prior Patent No. 1,734,077 above-mentioned. Each unit comprises two printing couples comprising an impression cylinder 17 and a plate cylinder 18, said cylinders being geared together in the usual manner and adapted to be driven by means of a power take-off shaft 19 carrying at its upper end a bevel pinion 21 meshing with a bevel gear 22 carried by one of the press cylinders, said shaft being supported in suitable vertical bearings, the upper one of which is indicated by the numeral 23, and the lower one of which is omitted for convenience in illustration.

The shafts 19 are driven from their respective motors 16 by means of an armature shaft 24, a worm 25 thereon, and a worm gear 26 carried at the lower end of said shaft 19, which is formed in sections which are adapted to be connected together by means of a clutch 27 of standard form.

Adjacent motors are connected together by means of shaft sections 28, which serve to equalize the speed of the several motors which may be operating together in any particular press combination. Clutches 29 are provided between the motors so that those most remote from the folder in any particular press group may be dropped out, thus silencing all units excepting those which it is desired to use with the folder in any given operation of the press.

The folder motor 16' drives a shaft 31 through a worm 25' and clutch 27' similar to the worms 25 and clutches 27 associated with the unit drive motors, said shaft 31 carrying bevel pinions 32 and 33 meshing, respectively, with bevel gears 34 and 35, through which the folder mechanism is driven in the usual manner. The gear 34 is oper-

actively connected with the lower folder rollers, one of which is indicated at 36, and the gear 35 is connected with the upper rollers (not shown). The webs 37 from the several press units pass over guide rollers 38, and are directed into the folder in standard fashion, the web supply being from web reels in the basement from which the webs are led up through the floor into the press units in the well-known manner.

10 A clutch 39 is interposed between the motor 16' and the worm 25' so that said motor may be disconnected from the folder and from the motors at the right hand side thereof, as shown in Fig. 1, if occasion should demand.

15 The motors 16 and 16' may be either alternating or direct current motors, as may be desired for particular installations, and are wired for selective operation and control in manner which will be understood by those skilled in the art. Said motors are adapted to operate the units and the folder at a range of operating speeds required for normal press operation, and may be generally referred to as full-speed motors since they are designed for normal operating speeds and not for "inching" speed or lower speeds than those included in the normal operating range.

In accordance with my invention, I provide an auxiliary inching and slow speed motor, indicated by the reference numeral 41, said motor being shown diagrammatically in Fig. 1 as being in vertical position, although it will be understood that it may be arranged in horizontal position and supported from the press frame or substructure in any suitable manner. The armature shaft of said motor is indicated at 42 and carries a worm 43 meshing with a worm wheel 44 mounted loosely on the shaft section 28 between the motor 16' and the motor 16 at the right thereof. Said worm wheel 44, when driven by the worm 43, serves to rotate the shaft section 28 and the worm 25' by means of an overrunning clutch shown in detail in Fig. 4. Said clutch comprises a clutch disc 45 formed with a collar 46, secured by a pin 46' to the shaft 28, said disc having therein a plurality of pawl pins 47 carrying pawls 48 positioned adjacent a ratchet ring 49 secured by means of pins 50 to the worm wheel 44 which is held between the disc 45 and a collar 51 secured to the shaft 28 by means of a pin 51'. It will be evident that when said worm wheel 44 is driven by the worm 43, the ratchet ring 49, being in engagement with the pawls 48, will rotate the clutch disc 45, which in turn will rotate the shaft 28 from which the folder is driven by means of the worm 25', clutch 27' and shaft 31, as above described. When the motor 41 is not operating, the shaft 28 and clutch disc 45 may rotate without effect upon the worm wheel 44, the pawls 48 at this time riding freely over the teeth of the ratchet ring 49.

Said motor 41 may thus be employed to drive the folder and such units as are grouped therewith by means of the clutches 29, and is so designed that it is suitable for inching speed when the webs are being threaded through the press units and into the folder in making ready for starting a regular run of the press, and said motor may also be employed in operating the press at slow speed between the inching speed and the range of speed of the regular unit drive motors 16 and 16'. If desired, individual inching motors might be provided for the press units, as shown in Patent No. 1,857,818, above referred to, in which case the auxiliary motor 41 could be

employed as an inching motor for the folder only and could serve for low speed operation of the folder alone or with the units grouped for operation therewith.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

What I regard as new and desire to secure by Letters Patent is:

1. In a unit type printing press comprising a plurality of printing units and a folder, individual full-speed motors, one for each unit and one for the folder, transmission mechanism whereby the units and folder are driven by their respective motors, and an auxiliary motor operatively connected with a press combination comprising a folder and the units grouped to operate therewith whereby said folder and units may be driven as a group at speed below the normal range of said full-speed motors.

2. In a unit type printing press comprising a plurality of printing units and a folder, individual full-speed motors, one for each printing unit, mechanism whereby the units are driven by their respective motors, and an auxiliary motor operatively connected with a press combination comprising a folder and the units grouped to operate therewith whereby said folder and units may be driven as a group at speed below the normal range of said full-speed motors.

3. In a unit type printing press comprising a plurality of printing units and a folder, individual full-speed motors, one for each printing unit, mechanism whereby the units are driven by their respective motors, and an auxiliary motor operatively connected with a press combination comprising a folder whereby the same may be driven as a group at lower speed than the normal operating range of speed of the press.

4. In a unit type printing press comprising a plurality of printing units and a folder, individual full-speed motors, one for each printing unit, mechanism whereby the units are driven by their respective motors, an auxiliary motor for driving a press combination comprising a folder and the units grouped therewith at slow speed, and means including an overrunning clutch whereby said folder and units may be operated at slow speeds by said auxiliary motor and may be operated as a group at higher speed by said full-speed motors without effect upon said auxiliary motor.

5. In a unit type printing press comprising a plurality of printing units and a folder, individual main drive motors for said units and folder, transmission mechanism whereby the units and folder are driven by said motors, and an auxiliary motor operatively connected with a press combination comprising a folder and the units grouped to operate therewith for driving the same as a group at slow speeds below the normal range of said main motors.

6. In a unit type printing press comprising a plurality of printing units and a folder, individual main drive motors for said units and folder, transmission mechanism whereby the units and folder are driven by said motors, an auxiliary motor operatively connected with a press combination comprising a folder and the units grouped to operate therewith for driving the same at slow speeds below the normal range of said main motors, and means whereby units in desired number at either side of the folder may be grouped for op-

eration therewith and arranged for operation as a group by said auxiliary motor for slow speeds and individually by said main motors for higher speeds.

5 7. In a unit type printing press comprising a plurality of printing units and a folder, individual full-speed motors, one for each printing unit, arranged in end-to-end relationship adjacent the press, means for equalizing the speed of said motors, mechanism whereby the units are driven by their respective motors, and an auxiliary motor operatively connected with a press combination comprising a folder whereby the same may be driven as a group at lower speed than the normal
10 operating range of speed of the press.
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8. In a unit type printing press comprising a plurality of printing units and a folder, individual main drive motors for said units and folder arranged in end-to-end relationship adjacent the press, means for equalizing the speed of said motors, transmission mechanism whereby the units and folder are driven by said motors, and an auxiliary motor operatively connected with a press combination comprising a folder and the units grouped to operate therewith for driving the same as a group at slow speeds below the normal range of said main motors. 5 10

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