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LOCKING OF STEREOPLATES OR PRINTING SURFACES TO THE CYLINDERS OF ROTARY PRINTING MACHINES

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FIG. 1

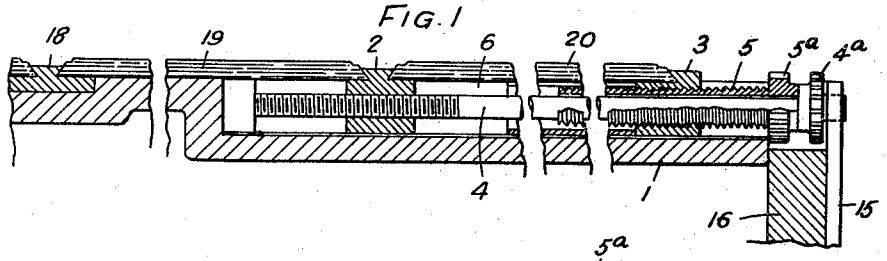


FIG. 2

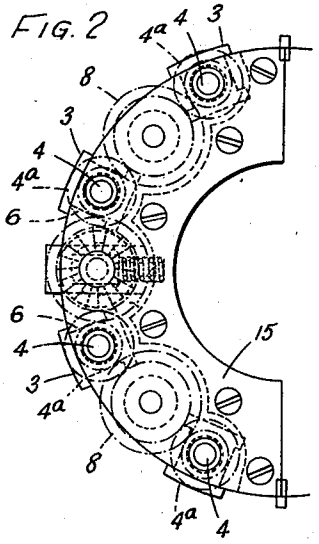


FIG. 3.

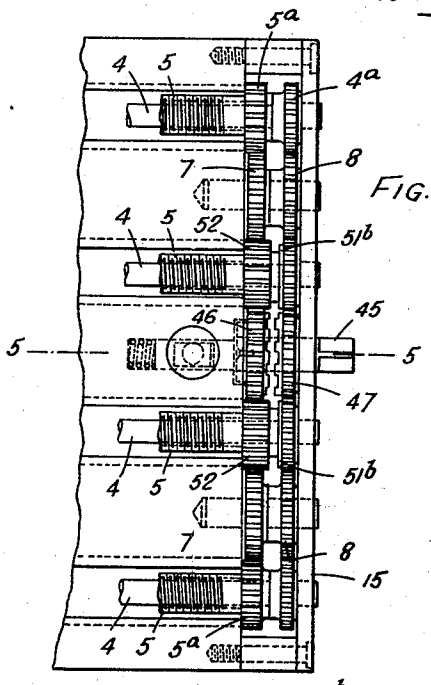


FIG. 6.

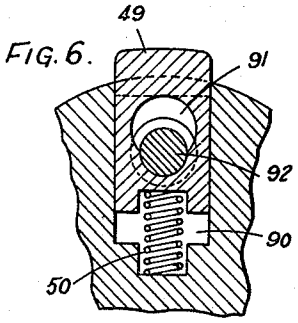


FIG. 5

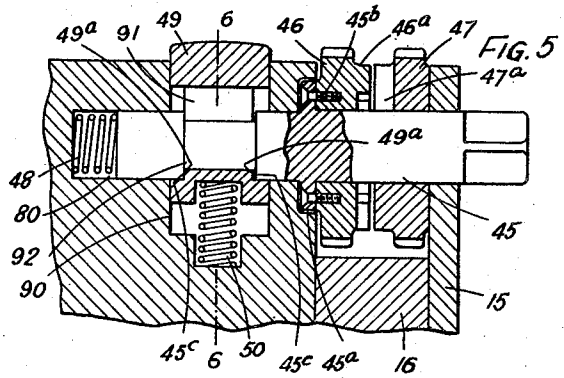
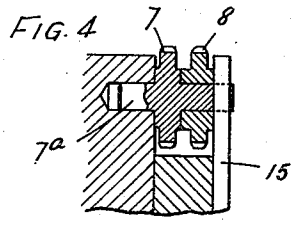


FIG. 4



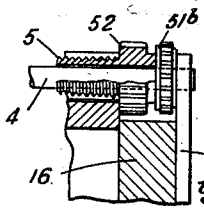


FIG. 7.

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UNITED STATES PATENT OFFICE

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LOCKING OF STEREO-PLATES OR PRINTING SURFACES TO THE CYLINDERS OF ROTARY PRINTING MACHINES

Application filed April 10, 1931, Serial No. 529,172, and in Great Britain March 17, 1931.

This invention relates to an improvement in or modification of the invention described and claimed in the specification of the co-pending application for Letters Patent of the United States of America, Serial No. 525,280, filed March 25, 1931.

In the aforesaid specification means for locking stereo plates or printing surfaces to the cylinders of rotary printing machines is described and the present invention has for its object an improved form of mechanism for operating the screwed rods and sleeves which carry the various dogs for locking the plates or printing surfaces.

According to the invention the operating mechanism comprises a spindle mounted in a recess in the end of the printing cylinder and rotatably supported in the cylinder and plate. Between the cylinder and the end plate the spindle carries two gear wheels one secured thereon and the other loose thereon. Clutch teeth are formed on the opposed faces of the two gear wheels so that if the spindle is moved longitudinally the two wheels will be clutched together. The recess in which the spindle is mounted is provided with a spring which presses on the inner end of the spindle and tends to force the clutch teeth into engagement. Within the recess the spindle engages a locking member vertically slidably in a slot in the cylinder and seated on a spring which normally forces a part of the member into engagement with an abutment or abutments formed on the spindle and so positioned that when engaged by the member the spindle is positively held in position with the gear wheels declutched. The member projects up to or beyond the surface of the cylinder so that it can be depressed by hand. On depressing the member the spindle is released and is moved longitudinally to clutch the gear wheels. To declutch the wheels the spindle is pressed inwardly when the spring pressed member again engages the spindle automatically and holds it positively locked against axial movement with the gear wheels declutched. The printing cylinder is fitted with screwed rods and sleeves with pairs of gear wheels as described in the aforesaid specification and the above operating mechanism is intended to operate the rods and sleeves on one half of the cylinder. A second similar operating mechanism will be arranged to operate the rods and sleeves on the other half of the cylinder.

To enable the invention to be fully understood it will now be described by reference to the accompanying drawings in which:—

Fig. 1 is a longitudinal sectional elevation of a portion of one half of a four plate wide printing cylinder shewing the mechanism for operating the locking dogs as described in the aforesaid specification;

Fig. 2 is an end elevation thereof shewing operating mechanism according to the present invention, and

Fig. 3 is a plan view thereof with the surface of the cylinder opened flat.

Fig. 4 is a sectional elevation of a detail of the locking members.

Fig. 5 is a sectional elevation on line 5—5, Fig. 3 drawn to a larger scale and shewing the operating mechanism according to the invention, and

Fig. 6 is a sectional elevation on the line 6—6 Fig. 5 and

Fig. 7 is a sectional elevation of a further detail of the locking members.

As in the aforesaid specification it will be understood that Fig. 1 represents the upper portion of one half only of a four plate wide cylinder 1 shewing two plates 19, 20, the centre margin 18 and one set of locking means for these two plates only.

In the complete cylinder similar plates and locking means are provided on the other upper half and also on the lower halves of the cylinder. The pairs of plates are locked by a series of dogs arranged in grooves around the periphery of each half of the cylinder, the operating means being arranged around the corresponding halves of the end plates as shewn in Fig. 2. The other half of the periphery will have two more pairs of plates with a similar series of dogs and grooves and the locking means will be arranged around the lower half of the end plates. The locking means on each end plate are exactly the same. The following de-

scription refers to the upper portion of one half only of the cylinder 1.

As shewn the half cylinder 1 is provided with two sets of dogs 2 and 3 slidably mounted in grooves 6. From Fig. 2 it will be seen that there are four sets of grooves 6 each with a set of dogs therein.

Since the construction and operation of each set of dogs is the same, only one set will be described with reference to Fig. 1. The dog 3 is mounted on an externally threaded hollow sleeve 5, the outer end of which is flanged and formed with gear teeth 5*a*. Through this sleeve a rod 4 passes freely, having a screwed end which engages a screwed opening in the dog 2. The screwed portions of the rod 4 and the sleeve 5 have the same number of threads per inch and the outer end of the rod is flanged and formed with gear teeth 4*a*, equal in number to the teeth 5*a*. The rod 4 is supported in the end plate 15 and a packing piece 16 is introduced between the end of the cylinder and the plate to form an annular recess for containing the various gear wheels. As shewn in Fig. 2 there are four rods 4 and between each pair of rods a pair of gear wheels 7 and 8 are mounted which gear with the wheels 5*a* and 4*a* respectively on the adjacent rods. Each pair of wheels 7 and 8 are mounted as shewn in Fig. 4, that is to say the wheel 7 is integral with a spindle 7*a* supported in a hole in the cylinder end and in the end plate 15, while the wheel 8 is freely mounted on said spindle 7*a*.

The pair of wheels 46, 47 mounted between the central pair of grooves 6 (Fig. 2) are intended to control the operation of the other wheels and to this end as shewn in Figs. 2, 3, 5 and 6 the spindle 45 is squared at its outer end and is mounted in a recess 80 in the cylinder and is supported in the end plate 15. The inner end of the spindle bears on a spring 48. The spindle is also formed with a flange 45*a* to which a gear wheel 46 is secured by screws 45*b* and a gear wheel 47 is loosely mounted on the spindle. The wheel 47 is held against endwise movement by the end plate 15 and by shrouds 51*b* on the adjacent gear wheels (see Fig. 3). The opposed faces of the wheels 46, 47 are formed with clutch teeth 46*a*, 47*a* respectively. A plunger 49 is mounted in a vertical slot 90 in the cylinder and the spindle 45 passes therethrough the opening 91 being such that the plunger can move up and down over the spindle. The spindle is formed with a reduced portion 92 forming shoulders 45*c* adapted to engage shoulders 49*a* on the inner bottom surface of the plunger 49 when the latter is forced upwards by the spring 50 on which it rests. Referring to Fig. 3 it will be seen that the two gear wheels 52 on the spindles adjacent to the wheels 46, 47 have wider faces to accommodate the clutching movement.

Fig. 5 shows the mechanism in the declutched position that is to say the clutch teeth on wheels 46, 47 are disengaged and the spindle 45 is positively held against longitudinal movement by the shoulders 49*a* on the plunger 49 engaging the shoulders 45*c* on the spindle. The spindle however can be rotated by applying a spanner to the outer squared end and thus the wheel 46 will be rotated which in turn rotates all the wheels 52, 5*a* turning all the screwed sleeves 5 and operating the dogs 3. To operate the rods 4 and the sleeves 5 simultaneously the plunger 49 is depressed to disengage the spindle 45 when the spring 48 moves the spindle axially causing the gear wheels 46, 47 to be clutched together. Thus turning of the spindle 45 will now cause all the gear wheels to be operated and all the dogs 2, 3. To disengage the wheels 46, 47 the squared end of spindle 45 is pressed towards the cylinder 1 which causes the shoulders 45*c* to ride over the shoulders 49*a* allowing the plunger 49 to rise under the pressure of the spring 50 into the position shewn in Fig. 5 in which the wheels 46, 47 are again positively held in the unclutched position.

It will be understood that the above described operating mechanism can be used with any of the arrangements described in the aforesaid specification and that various modifications of the method of locking the spindle in position with the gear wheels unclutched are possible.

We claim:—

1. In a printing cylinder and in combination, printing surfaces on the cylinder, sets of locking dogs slidable in grooves in the cylinder engaging the printing surfaces, a set of screwed sleeves for operating one set of dogs, a set of screwed rods passing through the sleeves for operating another set of dogs, means on the cylinder end for supporting the rods, a gear wheel on each rod end, a gear wheel on each sleeve end, both wheels being independently rotatable and outside the end of the cylinder, a set of spindles rotatably mounted on the cylinder end one between each pair of screwed rods, two gear wheels on each spindle of the set independently rotatable and gearing with the gear wheels on the adjacent screwed rods and sleeves, the gear wheels on one of the spindles having a clutching action to provide operating mechanism for turning simultaneously all the screwed rods independently of the sleeves or all the rods and sleeves together for the purposes described.

2. In a printing cylinder according to claim 1 and in combination operating mechanism for the geared rods and sleeves carrying dogs wherein the clutching spindle is rotatably mounted in a recess in the printing cylinder and supported in the end plate thereof and

capable of longitudinal movement, one of the clutching gearing wheels being fixed on the spindle, the companion clutching gear wheel being loose on the spindle, clutch teeth on the opposed faces of the gear wheels, a spring normally pressing the spindle so that the clutch teeth on the two wheels are in engagement, and a locking member movable positively to hold the spindle in the position in which the gear wheels are unclutched for the purpose described.

3. In a printing cylinder operating mechanism according to claim 1 and in combination operating mechanism for the geared rods and sleeves carrying dogs wherein the clutching spindle is rotatably mounted in a recess in the printing cylinder and supported in the end plate thereof and capable of longitudinal movement, one of the clutching gearing wheels being fixed on the spindle, the companion clutching gear wheel being loose on the spindle, clutch teeth on the opposed faces of the gear wheels, a spring normally pressing the spindle so that the clutch teeth on the two wheels are in engagement, said spindle being formed with an abutment, and a spring-pressed sliding locking piece mounted to engage the abutment to hold the spindle with the gear wheels in the unclutched position.

4. In a printing cylinder operating mechanism according to claim 1 and in combination operating mechanism for the geared rods and sleeves carrying dogs wherein the clutching spindle is rotatably mounted in a recess in the printing cylinder and supported in the end plate thereof and capable of longitudinal movement, one of the clutching gearing wheels being fixed on the spindle, the companion clutching gear wheel being loose on the spindle, clutch teeth on the opposed faces of the gear wheels, a spring normally pressing the spindle so that the clutch teeth on the two wheels are in engagement, said spindle being formed with an abutment, and a spring-pressed sliding locking piece mounted to engage the abutment to hold the spindle with the gear wheels in the unclutched position, said locking piece being movable in a substantially vertical slot in the cylinder and supported on a spring, the spindle passing freely through the locking piece and having a reduced portion forming said abutment, which abutment is adapted to engage a portion of the locking teeth for the purpose described.

In testimony whereof we have signed our names to this specification.

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