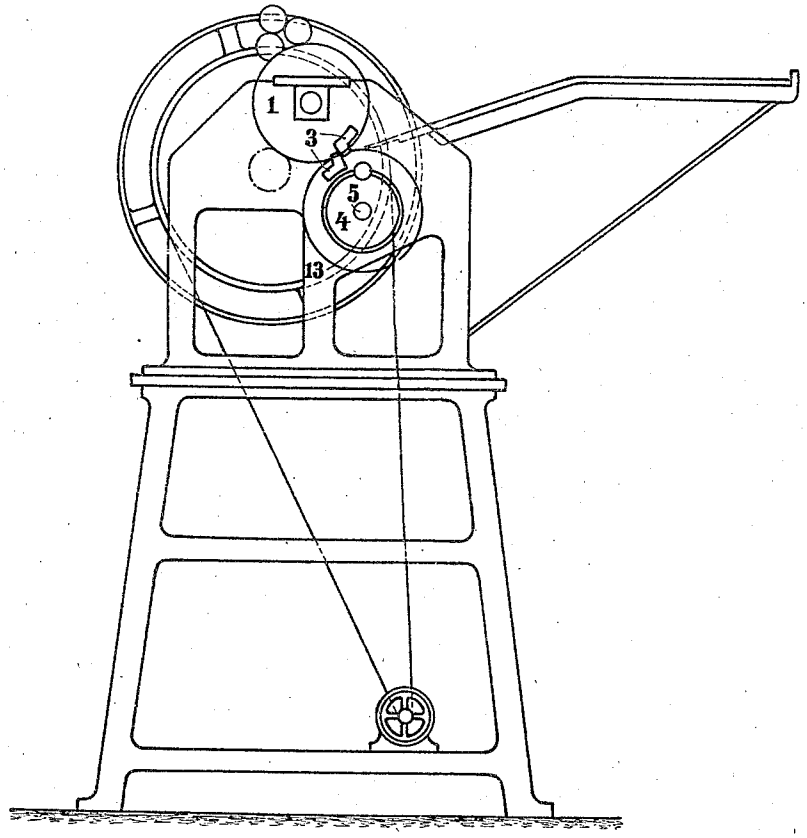
Feb. 9, 1926. 1,572,044

L. SCHWARZ

ROTATING PRINTING MACHINE

Filed Jan. 12, 1924 2 Sheets-Sheet 1

Fig.1.




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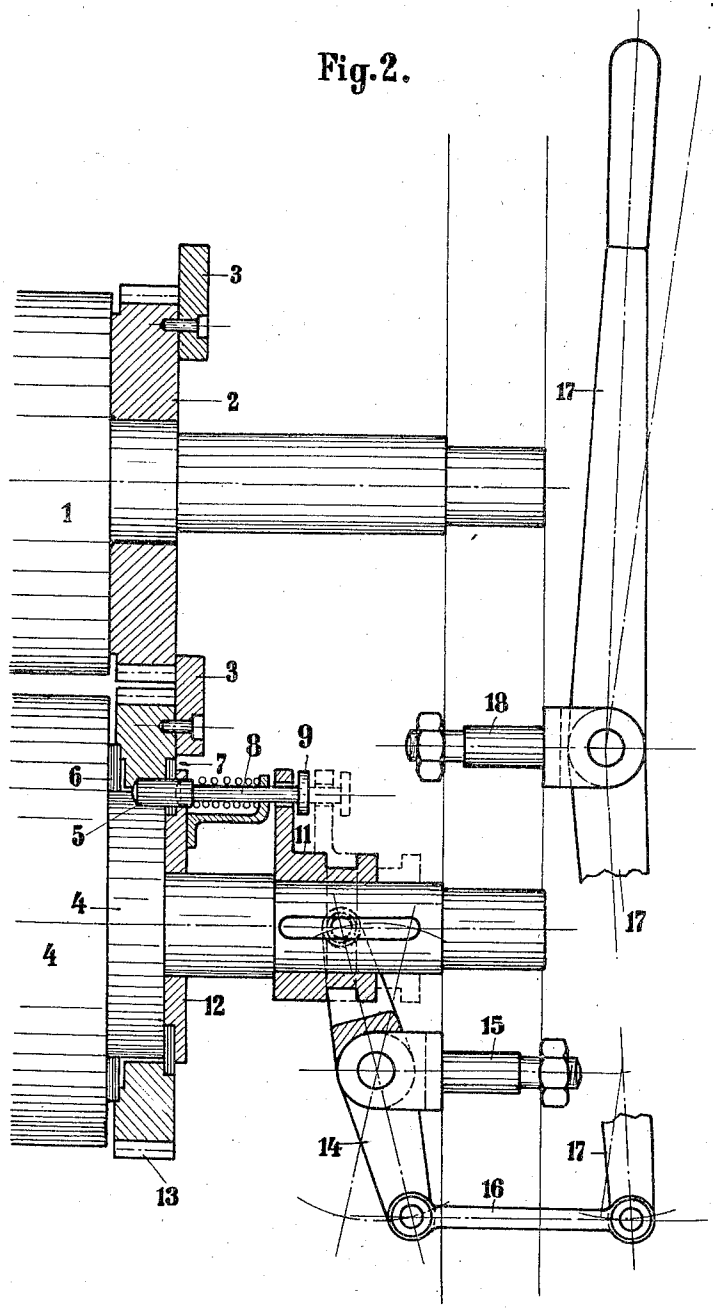
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Fig.2.




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# UNITED STATES PATENT OFFICE.

LEO SCHWARZ, OF STENDAL, GERMANY.

## ROTATING PRINTING MACHINE.

Application filed January 12, 1924. Serial No. 685,854.

*To all whom it may concern:*

Be it known that I, LEO SCHWARZ, a citizen of the German Republic, residing at Stendal, Germany, have invented new and useful Improvements in Rotating Printing Machines, of which the following is a specification.

In rotary machines for lithographic printing, it is necessary for one or more idle runs of the plate cylinder to be interposed between each rotation of the impression cylinder for the purpose of inking the printing plates. These idle runs have hitherto been effected in various ways. It has for instance been proposed to drive the impression cylinder from the plate cylinder by means of a ring of teeth provided on the latter, said ring of teeth meshing with a ring of teeth provided on the impression cylinder, projections being provided on the two cylinders for initiating the rotary movement of the impression cylinder after the ring of teeth thereon has run out of gear with the ring of teeth on the plate cylinder. The projections are arranged either so that their paths intersect at each revolution or so that they miss one another one or more times before their paths again intersect, the rings of teeth being of different diameters and the projections arranged so as to miss one another when the rings of teeth run out of gear whereby the plate cylinder will make an idle run until the paths of the projections again intersect and bring the rings of teeth into gear again.

The present invention has for its object to avoid drawbacks which occur in machines of the kind referred to as previously constructed in which, in order to avoid the paths of the cams intersecting when the printing operation is required to be discontinued, it is necessary to move the path of the cams out of the common vertical plane by lateral displacement of the lower cylinder in order to enable one projection to miss the other. The horizontal displacement of a cylinder, however, in consequence of the great weight of this iron member, requires a considerable expenditure of power, whereby when a sudden cessation of the run of the impression cylinder is required (for instance when the sheet of paper has not been gripped with it or when the hand or clothing of the layer on has been caught and is being drawn into the machine), there will be a tendency for the speed at which disconnection takes place to be retarded, which may at any time lead to accidents.

In order to avoid this cylinder displacement, according to the invention the ring of teeth on the impression cylinder is mounted so as to be capable of rotating loosely thereon, means being provided for releasably connecting the cylinder and ring of teeth so that by disengaging said means, the ring of teeth can rotate idly during the continued rotation of the printing or plate cylinder.

When the impression cylinder is to be transferred from its inoperative position into the printing position and the projections are to effect the engagement of the upper ring of teeth with the lower ring of teeth, a bolt is inserted into a hole bored half in the ring of teeth and half in the end wall of the cylinder, the ring of teeth which otherwise rotates loosely being thus rigidly connected to the cylinder carries the latter around with it.

This mode of locking the cylinder and ring of teeth by means of a bolt and hole ensures that the revolution and the registration of the impression cylinder with the printing cylinder is fixed mechanically, since there is only a single locking point.

The invention is illustrated by way of example in the accompanying drawings in which Fig. 1 is a side elevation of the improved printing machine and Fig. 2 shows the driving gear for the cylinder, partly in section.

Referring to the drawings, 1 is the printing cylinder, 2 the ring of teeth fixed thereon and 4 is the impression cylinder provided with a ring of teeth 13 meshing with the ring of teeth 2 and mounted on the cylinder 4 so as to be capable of rotating loosely thereon. The ring of teeth 13 is prevented from making direct metallic contact with the cylinder by means of fiber rings 6, 7 between which the ring 13 is held by means of a disk 12. The projections 3 initiate the engagement of the rings of teeth 2 and 13. A double armed lever 17 is pivoted on a bracket 18 fixed to the frame of the machine and its lower arm is connected by means of a link 16 to the lower arm of a double armed lever 14 pivoted on a bracket 15 also fixed to the frame of the machine. The upper arm of the lever 14 engages a circumferential groove provided

in a sliding sleeve 11 which is provided with an upwardly extending projection through which slides a bolt 8 having a thickened part 5 which slides in a hole provided in the disk 12. The bolt 8 is adapted to pass into a hole bored half in the end of the cylinder 4 and half in the ring of teeth 13 and is capable of being retracted against the action of coil spring by means of the projecting part of the sleeve 11 which engages behind a head 9 on the outer end of the bolt.

The machine is operated as follows: When the operating lever 17 is rocked in the anti-clockwise direction it tends to force the guiding sleeve 11 inwards through the intermediary of the link 16 and lever 14. The sleeve 11 thus allows the bolt 8 to move to the left under the action of the coil spring and the thickened end 5 to pass into the hole bored half in the impression cylinder and half in the ring of teeth 13, and lock the cylinder to the ring of the teeth 13. The two projections 3 then engage and the impression cylinder 4 is rotated by the printing cylinder 1. Actuation of the lever 17 in the opposite direction causes the parts to disengage. Thus the ring of teeth 13 of the impression cylinder driven by the upper cylinder may be rotated, even when no impression is being made, and after each second revolution the paths of the projections on the rings of teeth cross each other in the known manner. If this crossing takes place when the ring of teeth 13 is locked to the impression cylinder, the latter is caused to rotate; if the ring of teeth is disengaged, it rotates idly, while the cylinder 4 with the grippers remains stationary. The impression cylinder 4 is arrested after each printing operation by means of a suitable arresting device acting on the shaft of the impression cylinder. The impression cylinder through the intermediary of the flange 12 rotates the sleeve 11, which comes to rest on the impression cylinder becoming stationary, with the bolt 8 always opposite the hole in the wall of the cylinder, it being only necessary, for enabling engagement to take place, for the recess in the ring of teeth to come into position, opposite the thickened end of the bolt 8 in order to ensure a locking of the parts taking place by the thickened end 5 being forced in.

Thus for stopping the impression cylinder, displacement of the cylinder is not longer necessary, but only disengagement of the ring of teeth from the cylinder. This has the following result: While the displacement of a cylinder for putting it out of operation has to be at least equal to the width of the ring of teeth, in order to cause one projection to miss the opposing projection, in the case of the locking arrangement, according to the present invention it is not necessary for the sleeve and the pin to be displaced by more than a millimeter for releasing or locking the parts.

Thus it is no longer necessary to overcome a considerable weight, so that the engagement is effected practically instantaneously owing to the short distance through which the parts have to be moved and the small amount of power expended. Hence with this construction it is possible to stop the cylinder instantaneously, if started at the wrong time, whereby idle running without paper or damage is prevented.

What I claim and desire to secure by Letters-Patent is:

1. A rotary printing machine, comprising in combination, a printing cylinder, an impression cylinder, means for rotating the impression cylinder intermittently so as to enable the printing cylinder to make one or more idle runs between each rotation of the impression cylinder, said means consisting of a ring of teeth provided on the printing cylinder, a second ring of teeth loosely mounted on the impression cylinder and capable of meshing with the ring of teeth on the printing cylinder, projections provided on the said cylinders for initiating the rotary movement of the impression cylinder, and means for releasably connecting the impression cylinder to the second ring of teeth, so that by disengaging said means the second ring can rotate idly during the continued rotation of the printing cylinder while the impression cylinder is stationary.

2. A rotary printing machine, comprising in combination, a printing cylinder, an impression cylinder, a ring of teeth provided on the printing cylinder, a second ring of teeth loosely mounted on the impression cylinder and capable of meshing with the ring of teeth on the printing cylinder, projections provided on said cylinders for initiating the rotary movement of the impression cylinder, a bolt for releasably locking the second ring of teeth to the impression cylinder, said second ring and impression cylinder having a hole provided half in the ring and half in the cylinder for receiving the said bolt, whereby when the bolt is engaged in the said hole it locks the second ring of teeth to the impression cylinder and at the same time insures the correct register of the impression cylinder with respect to the printing cylinder.

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

LEO SCHWARZ.