

Sept. 14, 1943.

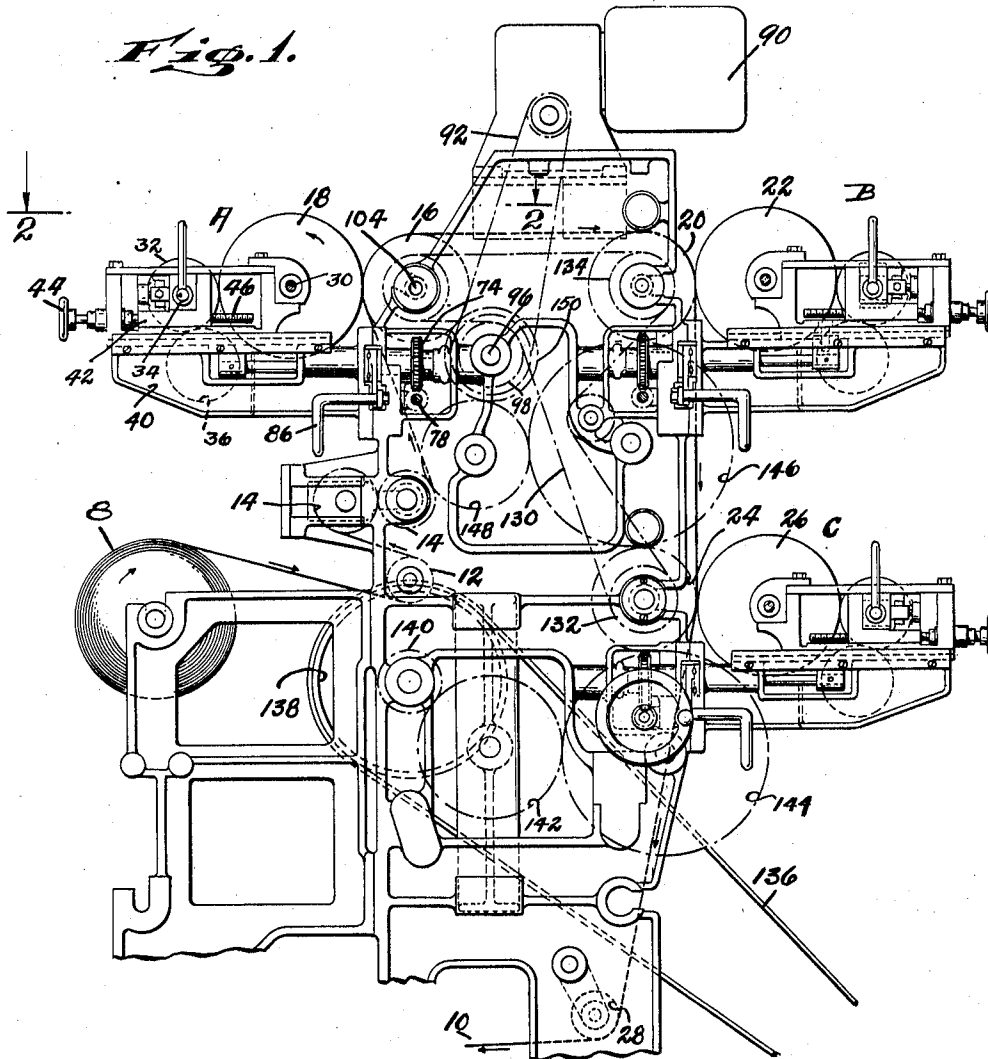
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2,329,454

PRINTING MACHINE

Filed Oct. 23, 1940

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

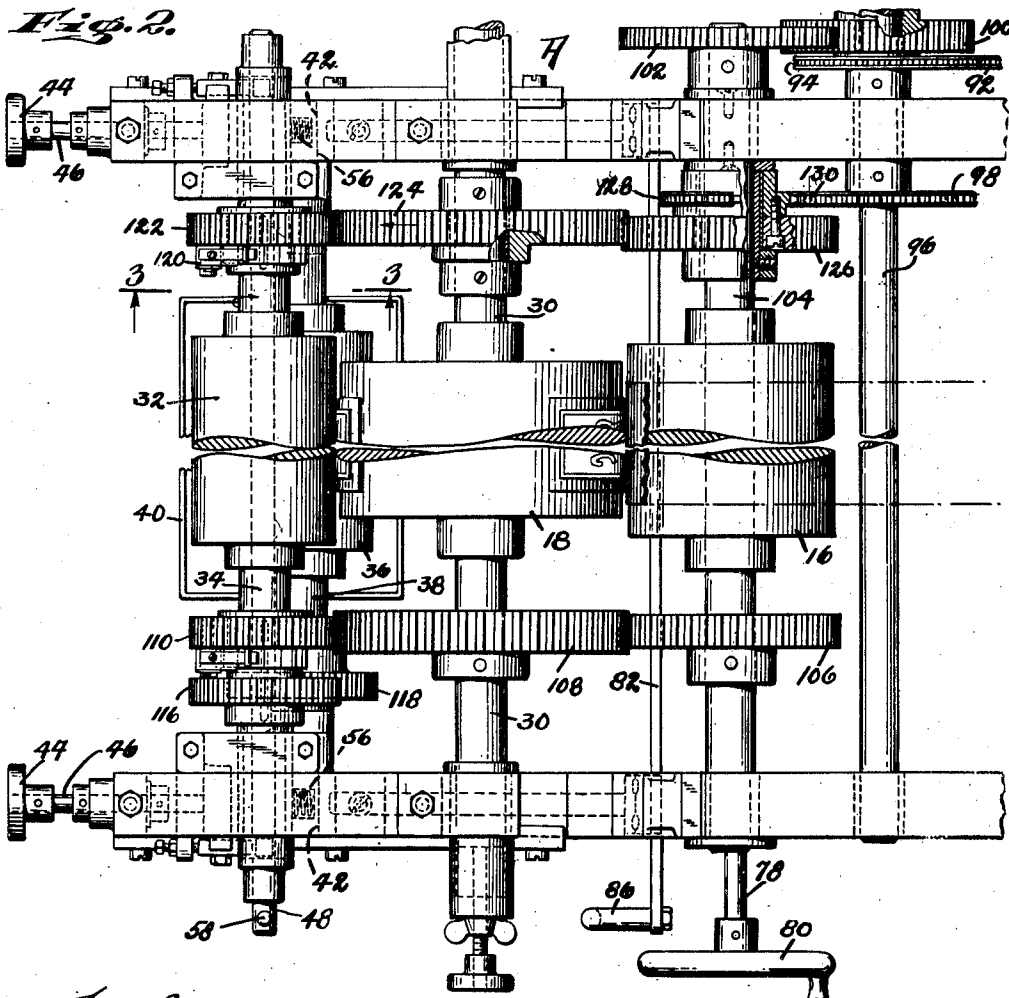


Fig. 3.

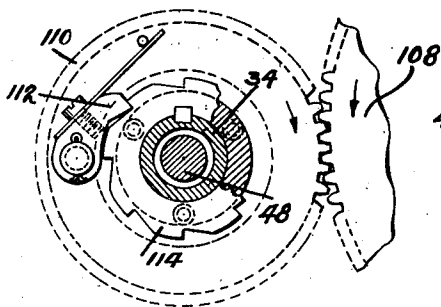
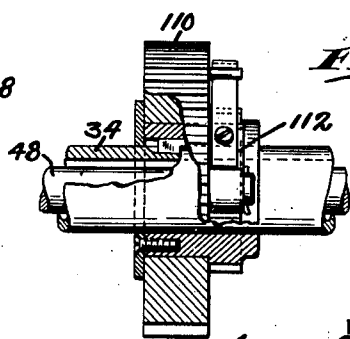


Fig. 4.



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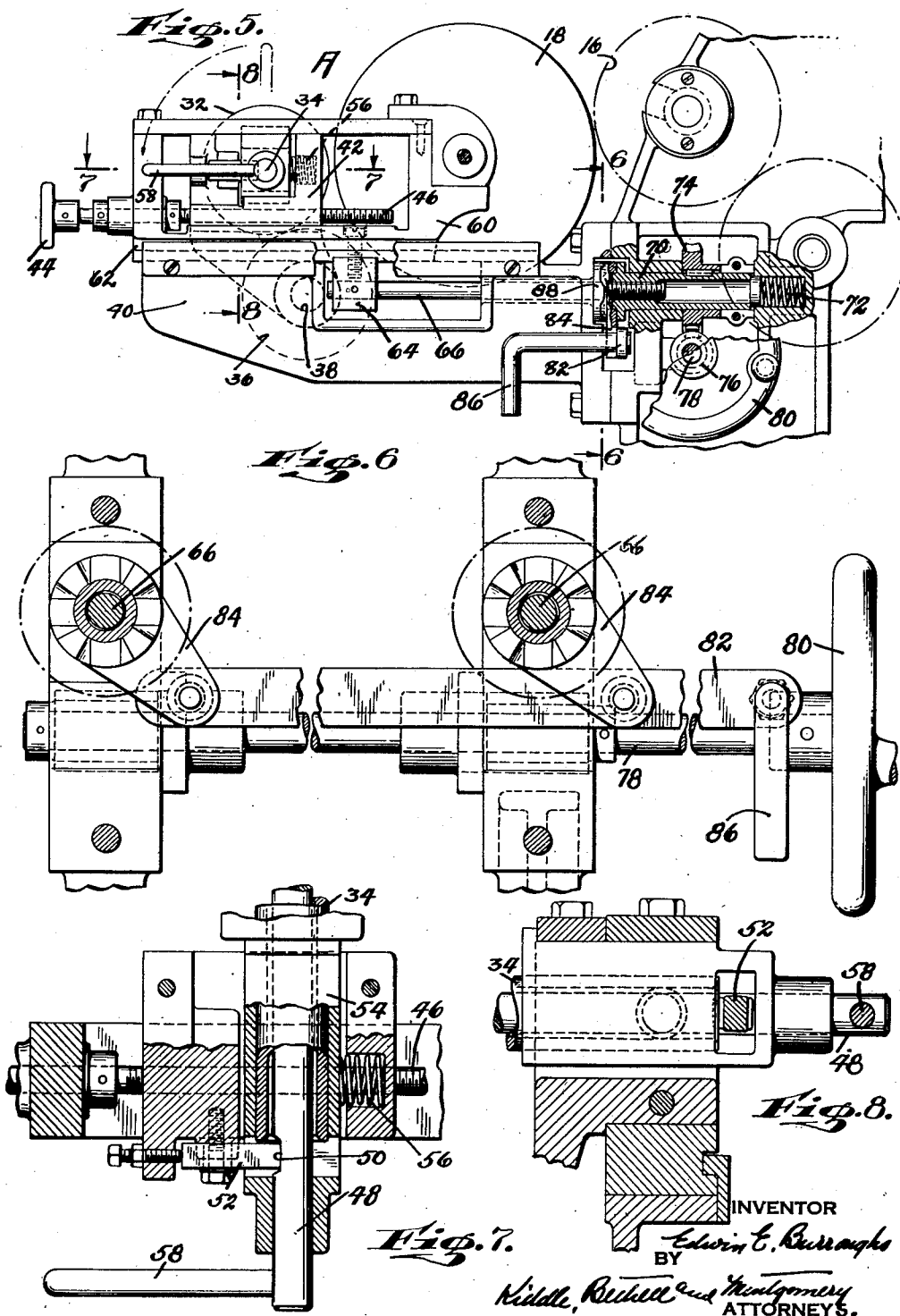
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,329,454

PRINTING MACHINE

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2 Claims. (Cl. 104-182)

This invention relates to an improvement in printing machines, capable of being operated as a multi-color or single color machine, and one of the objects of the invention is the provision of a construction wherein the transfer rollers and plate cylinders of each printing assembly can be moved away from the impression cylinder not only for the purpose of facilitating threading of the machine but so that the ink may be thoroughly worked up to the plate cylinder before actual printing is started, and whereby but one color may be printed, if desired, an auxiliary drive being employed for driving during this period. This drive is automatically overhauled by the main drive of the machine when the machine is finally started in operation.

A further object of my invention is a printing machine in which throw-offs are provided for the transfer rollers and plate cylinders, means being provided also for accurately positioning these elements with the minimum of effort and maximum of accuracy in setting the machine up for operation.

Further objects of the invention will appear from the description which follows.

In the drawings wherein I have illustrated one embodiment of my invention:

Fig. 1 is a side elevational view of the machine;
Fig. 2 is a plan view, some parts being shown in section taken along the line 2-2 of Fig. 1;
Fig. 3 is a view on the line 3-3 of Fig. 2;
Fig. 4 is a view taken at right angles to Fig. 3;
Fig. 5 is a view of one of the plate cylinder and transfer roller assemblies with one of the throw-off mechanisms shown in section;
Fig. 6 is a section on the line 6-6 of Fig. 5;
Fig. 7 is a section on the line 7-7 of Fig. 5; and
Fig. 8 is a section taken on the line 8-8 of Fig. 5.

Referring now to the drawings in detail: The machine, as illustrated, is adapted for single and multi-color work and hence embodies a plurality of plate cylinder and transfer and ink fountain roller assemblies A, B and C.

The paper to be printed may be taken from supply roller 8 and discharged from the machine, for example, at 10.

As will be seen from the drawings, the paper passes from the supply roller 8 about a guide roller 12, tensioning rollers 14, between impression cylinder 16 and the plate cylinder 18 of assembly A, from thence about impression cylinder 20, between it and plate cylinder 22 of assembly B, then downwardly between impression cylinder 24 and plate cylinder 26 of assembly C, and from thence about roller 28, finally discharging from the machine at 10.

One of the objects of my invention, as above pointed out, is the provision of throw-offs for the plate cylinders 18, 22 and 26 and for the transfer rollers as well as means for adjusting the inking

and transfer rollers as well as the plate cylinders with the minimum of effort and maximum of accuracy. Inasmuch as the assemblies A, B and C are duplicates of each other, a description of one of these assemblies will be sufficient for a clear understanding of them all.

It will be seen from an inspection of Figs. 1 and 2, for example, that the plate cylinder 18 of assembly A is carried on a shaft 30 mounted in suitable bearings. The ink transfer roller 32 cooperating with this plate cylinder is mounted on shaft 34. The cooperating ink fountain roller 36 is mounted on a shaft 38, and as will be understood is rotated in the ink in fountain 40.

The ink transfer roller 32 and its shaft 34 are mounted in slides 42 adapted to be moved toward and away from the plate cylinder 18 by rotation of hand wheels 44 carried on the threaded shafts 46 which pass through the slides 42.

In addition to the adjustment of the ink transfer roller 32 with respect to the plate cylinder 18 just described, I provide also a quick throw-off for the ink transfer roller 32. This takes the form of a rod 48 which extends through the hollow shaft 34 carrying the ink transfer roller 32. Adjacent each end of the shaft 34 the rod 48 is provided with a cutout 50 which cooperates with a fixed lug 52. The bearings 54 for the shaft 34 are movable laterally, as will be seen from Fig. 7, and are backed by coil springs 56.

The rod 48 is provided with a handle 58 by which it can be given a partial turn. Normally the operating handle 58 will be in vertical position, as shown in Fig. 1, but when it is desired to throw the ink transfer roller 32 out of contact with the plate cylinder 18, as illustrated in Fig. 5, then the handle 58 is moved to a horizontal position which brings the cutouts 50 in register with the lugs 52 and allows the springs 56 to actuate the shaft 34 and hence the ink transfer roller to the left, as viewed in Fig. 5, out of contact with the plate cylinder.

It will be understood, of course, that by moving the lever 58 back to vertical position again the transfer roller will be moved into engagement with the plate cylinder with initial pressure.

The lugs 52 are adjustably mounted as is apparent from Fig. 7 so that the pressure of the ink transfer roller 32 against the plate cylinder 18 is quite accurately arrived at depending upon the positioning of these lugs. The final adjustment of the pressure of the transfer roller against the plate cylinder is effected by the threaded shaft 46 above referred to.

As above mentioned, each one of the assemblies A, B and C is provided with means whereby the plate cylinder of each assembly may be moved bodily to one side to carry the plate cylinders toward and away from their respective impression cylinders.

In this connection it will be seen that the plate

cylinder 18 and ink transfer roller 32 along with the adjusting rod 46 are carried in frames 60 slidable in ways 62 toward and away from impression cylinder 16. Below these slides are blocks 64 pinned to rods 66 at each side of the machine, these blocks being in turn rigidly united to the frames 60.

Threaded on the ends of the rods 66 remote from the blocks 64 are nuts 70 each backed by a coil spring 72. Keyed to each nut is a worm wheel 74 and meshing with each of these worm wheels is a worm 76 on a shaft 78 which extends parallel to the axis of the impression cylinder and plate cylinder. The shaft 78 is provided with a handwheel 80. Upon rotation of the handwheel 80 it will be quite apparent that the rods 66 will be drawn to the right or left, as the case may be, so as to carry the entire assembly toward or away from the impression cylinder depending upon the direction of rotation of the handwheel.

For a quick throw-off and throw-on, that is, for a quick movement of the assembly toward and away from the impression cylinder I provide a plate 82 which extends across the machine and connected to this plate at each side of the machine is a lever 84. At the outer end of the plate 82 I provide a handle 86. The levers 84 are cammed at their outer ends where they cooperate with fixed cams 88. By moving the handle 86 toward or away from the machine to effect end-wise movement of the plate 82, it will be apparent that the levers 84 will be rocked to cause the nuts 70 to move to the left under the action of the spring 72 to force the assembly away from the impression cylinder or to restore the assembly to its initial position at which point the plate cylinder is in the desired contact with the impression cylinder, as the case may be.

From the description thus far given it will be seen that I have provided a printing press in which the several assemblies of plate cylinder and transfer roller can be moved toward and away from the impression cylinder and that this may be done quickly or slowly. It will be seen also that means have been provided whereby the transfer roller and ink fountain roller of each assembly may be moved quickly away from the plate cylinder, means being provided also whereby the position of the ink fountain roller and transfer roller with respect to the plate cylinder may be controlled slowly and very accurately.

As above pointed out, one of the objects of my invention is the provision of auxiliary driving mechanism whereby the rollers of the several assemblies A, B and C may be rotated to insure that the ink is in good condition for the plate cylinders before beginning the actual printing operation.

Referring to this part of my invention, it will be seen from the drawings that at the upper part of the machine I provide a motor 90 driving a sprocket chain 92. This chain is carried by a sprocket 94 rigidly mounted on a shaft 96, this shaft carrying sprocket 98 and gear 100. The gear 100 meshes with gear 102 which is rigidly mounted on the shaft 104 carrying the impression cylinder. Pinned to the shaft 104 is gear 106 meshing with gear 108 on the shaft 30 carrying the plate cylinder. The gear 108 in turn meshes with gear 110 on the shaft 34 of the ink transfer roller 32, this gear carrying the pawl 112 of an overrunning clutch, the ratchet 114 of the clutch being keyed to the shaft 34. The transfer roller and the ink fountain roller are geared together by gears 116 and 118.

The opposite end of the shaft 34 carries the pawl 120 of an overrunning clutch, the pawl of which is carried on the face of a gear 122. This gear 122 meshes with a gear 124 on the shaft 30 of the plate cylinder gear 124 in turn meshing with gear 126 which is mounted on a sleeve on, but independent of shaft 104 of the impression cylinder. The hub of the gear 126 carries sprocket 128 for sprocket chain 130 which passes about the sprocket 98 on the shaft 96. This chain 130 passes from the sprocket 98 to the sprocket 132 for the assembly C and about the sprocket 134 of the assembly B. It will be apparent, therefore, that the rollers of the three assemblies A, B and C will be driven by the auxiliary driving motor 90.

The main drive for the machine is from the belt 136. It will be seen from an inspection of the drawings that the shaft for the pulley 138 of this main drive carries a gear 140 meshing with an intermediate gear 142 in mesh with gear 144. This gear in turn drives the impression cylinder 24, plate cylinder 26 and the transfer and inking rollers of the assembly C. The gear of the impression cylinder 24 meshes with intermediate gear 146 in turn driving the impression cylinder 20, plate cylinder 22 and transfer and inking rollers of assembly B. The gear 146 also meshes with a gear 148 which, through gear 150, drives the impression cylinder 16, as well as the plate cylinder, transfer and inking rollers of assembly A.

It will be understood that when the main drive overruns the auxiliary motor 90 then the auxiliary motor 90 is shut off.

It will be seen from all of the foregoing that I have provided a printing machine which by reason of its adjustability is adapted for single and multi-color work. It will be seen, furthermore, that means have been provided whereby the ink and transfer rollers are thoroughly inked initially by driving the same through an auxiliary drive initially, this drive eventually being overhauled by the main drive.

It is to be understood that changes may be made in the details of construction and arrangement of parts hereinabove described without departing from the spirit and scope of my invention.

What I claim is:

1. A printing machine comprising in combination, an ink transfer roller and plate cylinder assembly, frames carrying the transfer roller, means for moving the frames and roller bodily toward and away from the plate cylinder, a transfer roller shaft, a second shaft passing through the said transfer roller shaft, a fixed lug cooperating with a cam surface on said second shaft, and means for oscillating the said second shaft whereby said lug and cam surface will effect bodily movement of the transfer roller in said frames relatively to the plate cylinder.

2. A printing machine comprising in combination, an ink transfer roller and plate cylinder assembly, frames carrying the transfer roller, means for moving the frame and roller bodily toward and away from the plate cylinder, a hollow shaft supporting the transfer roller, a second shaft passing through the hollow shaft, a cutout in the second shaft, a lug cooperating therewith, whereby upon oscillation of the second shaft the transfer roller is moved bodily toward and away from the plate cylinder.

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