March 3, 1942. G. W. CHAMBERS 2,275,218

PLATE FORMING MACHINE

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Fig. 1.

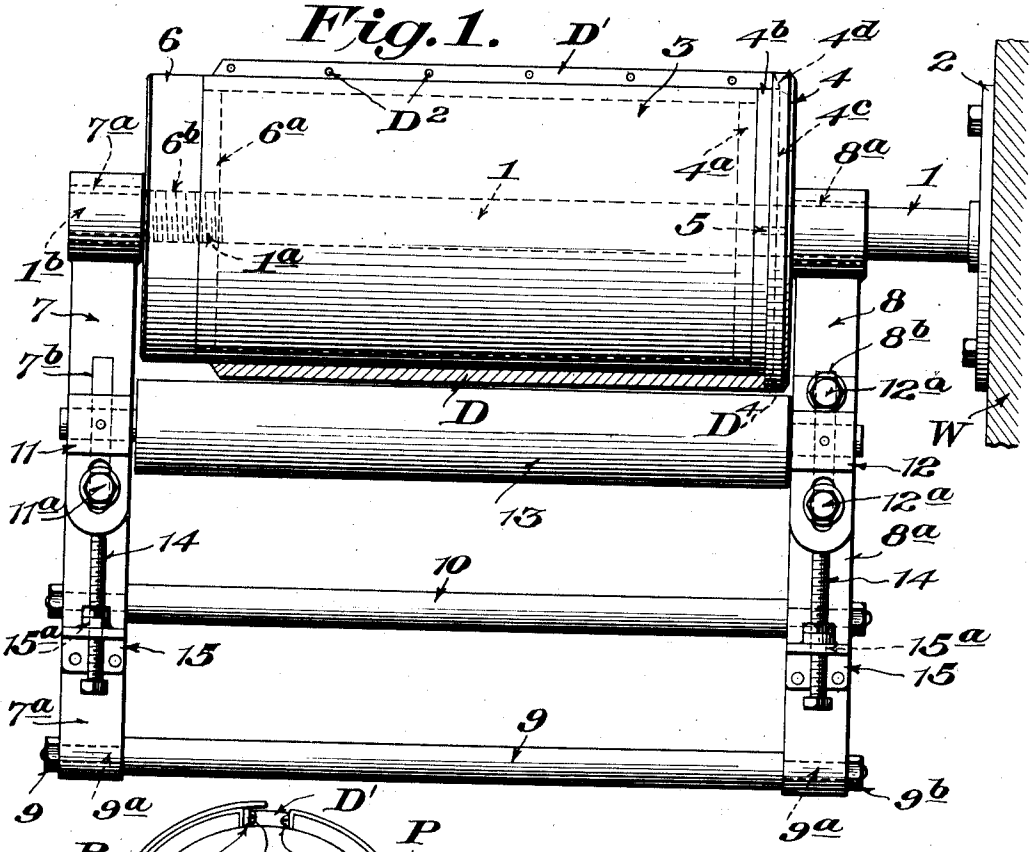
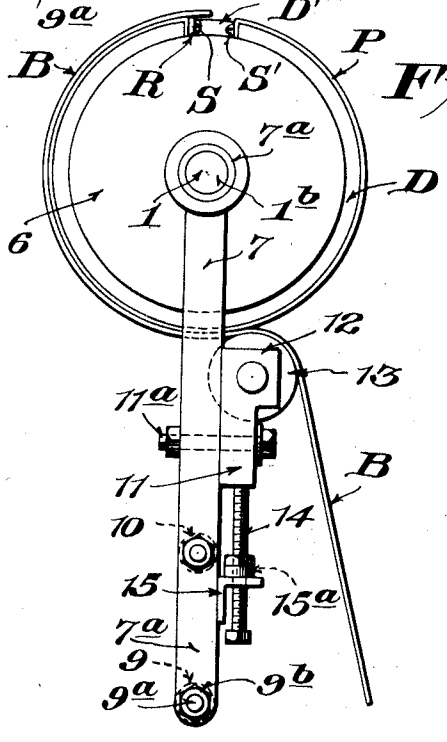


Fig. 3.



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Fig. 2.

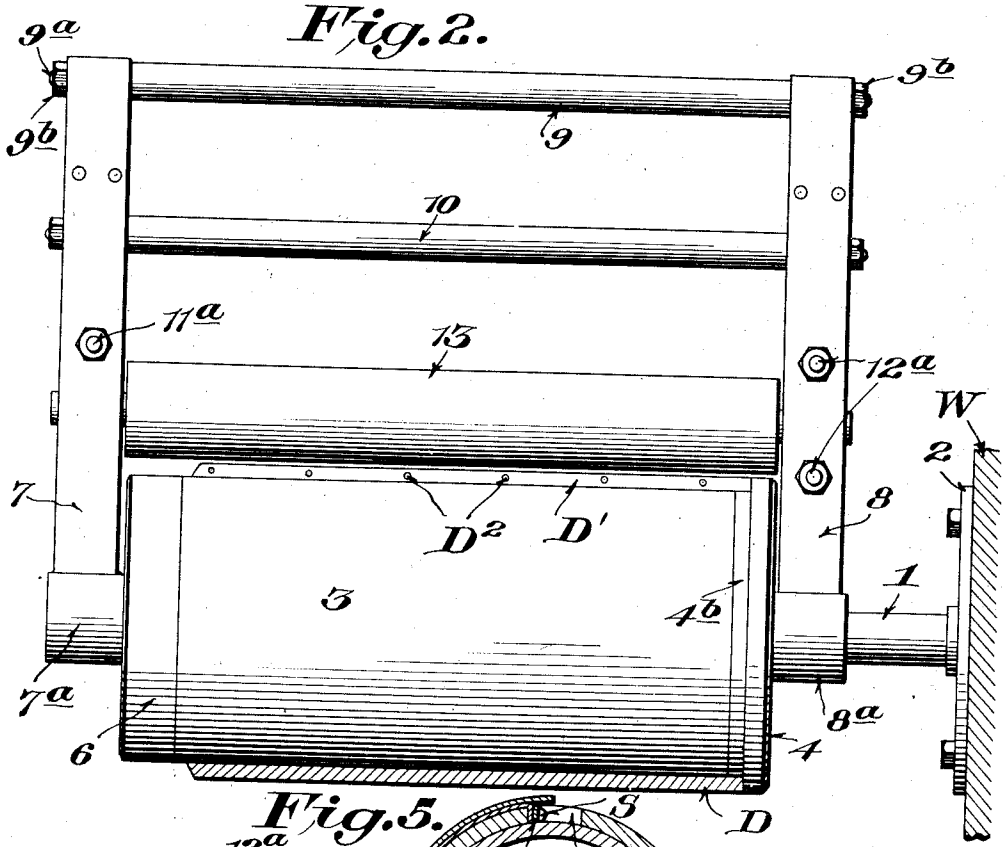


Fig. 5.

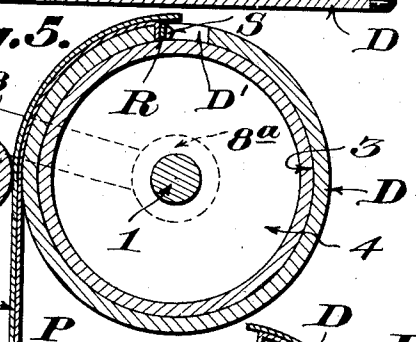


Fig. 4.

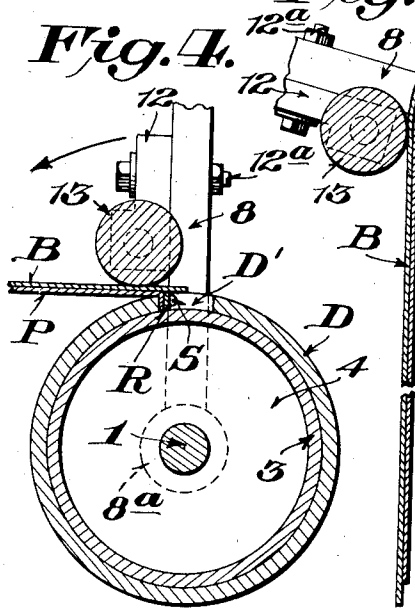
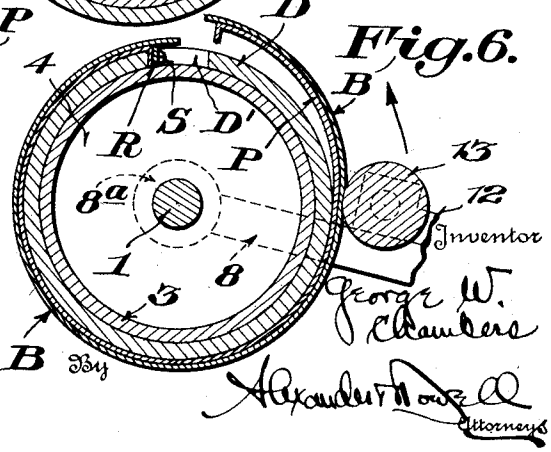


Fig. 6.



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UNITED STATES PATENT OFFICE

2,275,218

PLATE FORMING MACHINE

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Application August 14, 1940, Serial No. 352,633

5 Claims. (Cl. 153—46)

This invention is a novel machine and method for bending flexible engraved printing plates, usually formed of thin zinc sheets, around the exterior of cylindrical dummy plates provided with longitudinal gaps, whereby the flexible printing plates may be readily mounted on the dummy plates with their ends secured to the respective side walls of the gaps to form printing members which may be used on the plate cylinders of printing presses interchangeably with the customary cast stereotype printing plates, the combined thickness of each flexible printing plate together with the dummy plate on which it is mounted equalling that of the stereotype plate.

The principal object of my invention is to provide a machine of the above type comprising a fixed drum adapted to support a cylindrical dummy plate provided with a gap, which dummy plate may be slipped over the end of the drum and secured thereon; also a freely revolvable frame mounted on the ends of the drum and carrying a pressure roll which may be adjusted towards or from the periphery of the drum, whereby when one end of the flexible printing plates is secured to one side wall of the gap in the dummy plate which is mounted on the drum, the frame may be revolved as hereinafter explained around the drum to roll the flexible printing plate around the exterior of the dummy plate, a suitable blanket being interposed between the flexible printing plate and roll to protect the engraved surface thereof, after which operation the other end of the flexible printing plate may be secured to the opposite side wall of the gap in the dummy plate, thereby providing a composite printing member.

I will explain the invention with reference to the accompanying drawings, which illustrate one practical embodiment thereof to enable others familiar with the art to adopt and use the same; and will summarize in the claims, the novel features of construction, and novel combinations of parts, for which protection is desired.

In said drawings:

Fig. 1 is a front elevation of my novel machine showing the parts in normal position, and the machine mounted on a support, and indicating the dummy plate mounted thereon.

Fig. 2 is a view similar to Fig. 1 showing the revolvable frame swung into upended position above the drum.

Fig. 3 is an end view of the machine shown in Fig. 1, and showing the dummy plate and flexible printing plate mounted thereon, and indicating the use of the blanket to protect the printing plate during the rolling operation.

Figs. 4, 5 and 6 are vertical sections illustrating various steps in the plate rolling process.

As shown, the machine preferably comprises a fixed shaft 1, having a bracket plate 2 at one end thereof whereby the shaft may be readily mounted on a vertical wall W or other fixed support so as to project horizontally at a convenient height above the floor.

Fixedly mounted on the shaft 1 is a drum adapted to hold and support a cylindrical dummy plate D having a gap D', said drum preferably comprising a cylindrical member 3 of external diameter corresponding with the internal diameter of dummy plate D, and of length somewhat greater than that of said dummy plate. At the end of member 3 adjacent bracket 2, is a head 4 preferably fixedly secured on shaft 1 by a key 5 so as to prevent axial movement and rotation thereon, said head having a portion 4*a* adapted to fit within the member 3 and secured thereto by any suitable means. Head 4 also has a portion 4*b* forming a continuation of the outer surface of member 3 and is provided at its outer end with an exterior annular flange 4*c* (Fig. 1) which may be undercut as at 4*d* to receive the correspondingly shaped edge of dummy plate D. At the opposite end of member 3 is a head 6 forming a continuation of the member 3 and having a portion 6*a* adapted to fit within the end of member 3. Head 6 has an axial bore 6*b* engaging a threaded portion 1*a* of shaft 1 whereby the members 3, 4 and 6 are maintained in assembled relation on shaft 1. Beyond the head 6, the projecting end of shaft 1 is reduced in diameter as at 1*b*.

Rotatably mounted upon shaft 1 embracing the ends of drum 3—4—6, is a frame consisting of arms 7 and 8 having bearings 7*a* and 8*a* respectively journaled on shaft 1 beside heads 6 and 4 respectively, said arms being connected together at their outer ends by a bar 9 having reduced threaded ends 9*a* passing through bores in the arms 7 and 8 and secured by nuts 9*b* whereby said arms 7 and 8 will be rigidly connected together, said bar 9 also forming a handle for facilitating rotation of the frame 7—8—9 around the drum.

Preferably a second bar 10, similar to bar 9, is similarly connected with arms 7 and 8 intermediate the ends thereof, said bar 10 also forming a handle and serving to prevent wracking or twisting of the frame 7—8—9.

Arms 7 and 8 are provided with axially disposed slots 7*b*, 8*b* respectively disposed adjacent the periphery of member 3, and adjustable bearings 11 and 12 are mounted upon the bars 7 and 8, respectively, supporting the shaft of a metallic precision tooled roll 13 which is freely rotatable in the frame 7—8—9—10 and is adapted to roll the flexible printing plate P around the dummy plate D which is mounted upon the member 3. Bearings 11 and 12 are secured to arms 7 and 8 by bolts 11*a*, 12*a* pass-

ing through slots in the bases of the bearings and through the slots 7*b*, 8*b* of arms 7 and 8, whereby said bearings may be adjusted longitudinally of the arms to vary the distance of roll 13 from the periphery of member 3.

Bearings 11 and 12 are maintained in their adjusted positions not only by the bolts 11*a*, 12*a* respectively, but also by means of set screws 14, which engage the outer ends of the bases of the respective bearings, said set screws being mounted in brackets 15 secured upon the arms 7 and 8 respectively and having threaded bores 15*a* for the reception of the set screws 14.

The outer arm 7 of the revolvable frame 7—8—9 is sufficiently narrow opposite the periphery of member 3, so that the dummy plate D may be slipped onto the member 3 over head 6 until the leading end of the dummy plate engages the undercut recess 4*d* in the flange 4*c* of head 4, as shown in Figs. 1 and 2, the arm 7 passing between the side walls of the gap D' in the dummy plate. When so disposed the dummy plate D is locked in position on member 3 by a pin (not shown).

The flexible engraved printing plate P, which is to be mounted on the dummy plate D, is of length equal to the length of the peripheral portion of dummy plate D plus the thickness of the walls at both sides of gap D', and each end of plate P is provided with a spaced series of holes therein through which screws S—S' (Figs. 4—5—6), may be passed to fasten the ends of plate P to the side walls of gap D', the holes in plate P being adapted to register with tapped bores D2 in the side walls of gap D'.

In operation, the revolvable frame 7—8—9 is first raised into position shown in Fig. 2 wherein the same is up-ended above the member 3, and the dummy plate D is then slipped over head 6 until the forward end engages flange 4*c* of head 4, the outer arm 7 passing through gap D' of plate D. Dummy plate D is then locked into position on member 3 by a pin or the like. After dummy plate D has been mounted on the drum, the roller frame 7—8—9 is dropped out of the way or into lowered position shown in Fig. 1, and one end of the flexible metallic engraved plate P is then secured by screws S against one side wall of the dummy plate gap D', a flat steel bar R being preferably disposed between the screw heads and the end of plate P, as shown in Fig. 4, to prevent any possible stretching of the metal of plate P between the screw holes during the rolling operation. The distance between roll 13 and the member 3 is then properly adjusted not only for the thickness of dummy plate D and printing plate P, but also for a blanket B (Figs. 4—5—6) which may consist of a number of superimposed sheets of newsprint paper or the like, which blanket is placed over the printing side of the engraved plate P. The roller frame 7—8—9 is then rotated upwardly in the direction of the arrow (Fig. 4) and over the gap D' to flange the fixed end of the printing plate P and the engraved plate P is then rolled around the periphery of dummy plate D smoothly for about a quarter of the way around the dummy plate as shown in Fig. 5. The frame 7—8—9 is then rotated upwardly in the reverse direction and back across the gap D', and the partially bent engraved plate P is removed, and its ends are reversed, and a second bend is then similarly made on the other end of printing plate P, but in this operation the frame 7—8—9 is rolled entirely around the member 3, so that when the revolution of the frame is completed, the first flanged end of plate P will fall exactly into place against its respective wall of gap D', as indicated in Fig. 6, and the roll 13 may be positioned to hold the trailing end of plate P in such position until the screws S' (Fig. 3) have been inserted. Thus after the machine is used to bend the plate P and roll it around the dummy plate D, causing it to hug the periphery thereof, the roll 13 further serves to hold the plate P thereon while the screws S' are inserted. While the use of bar R is not essential, it makes a much smoother, snugger bend at the ends of the plate, so snug in fact that the screws S' may be removed from the tail end of plate P and the plate will not come off the dummy plate while the plate is on the press.

I do not limit my invention to the exact form shown in the drawing for obviously changes may be made therein within the scope of the claims.

I claim:

1. A machine for rolling flexible printing plates around cylindrical dummy plates having longitudinal gaps of less than 180° arcuate length, comprising a fixed member adapted to support a dummy plate through internal engagement therewith; a frame mounted coaxially of the dummy plate and adapted to be rotated around the same; said frame comprising arms journaled coaxially of the fixed member at opposite sides thereof and connected together at their outer ends to form a rigid structure, one of said arms being of thickness less than the width of the gap in the dummy plate whereby the dummy plate may be slipped over the end of the fixed member; and a presser roll freely journaled in the frame opposite the member and adapted to contact with said dummy plate; whereby when a flexible printing plate is secured at one end to one side wall of the gap in the dummy plate mounted on the member and the frame rotated, the printing plate will be rolled around said dummy plate.

2. In a machine as set forth in claim 1, bearing blocks adjustably mounted on the arms in which the ends of the presser roll are journaled; and means for locking the blocks in adjusted position.

3. In a machine as set forth in claim 1, said fixed member comprising a fixed shaft; a circular head fixedly mounted on said shaft; a second circular head spaced from the first head and having a threaded engagement with said shaft; and a cylindrical member between the heads respectively and forming a continuation of the peripheral surfaces of the heads.

4. In a machine as set forth in claim 1, said fixed member comprising a fixed shaft; a circular head fixedly mounted on said shaft; a second circular head spaced from the first head and having a threaded engagement with said shaft; and a cylindrical member supported by the heads respectively and forming a continuation of the peripheral surfaces of the heads; and an exterior annular flange on one of said heads adapted to engage the end of the dummy plate mounted on the fixed member.

5. In a machine as set forth in claim 1, means for adjusting the presser roll towards or from the drum, comprising bearing blocks adjustably mounted on the arms in which the ends of the presser roll are journaled; and set screws on the arms engaging the outer ends of the blocks for locking same in adjusted position.

GEORGE W. CHAMBERS.