

Aug. 27, 1940.

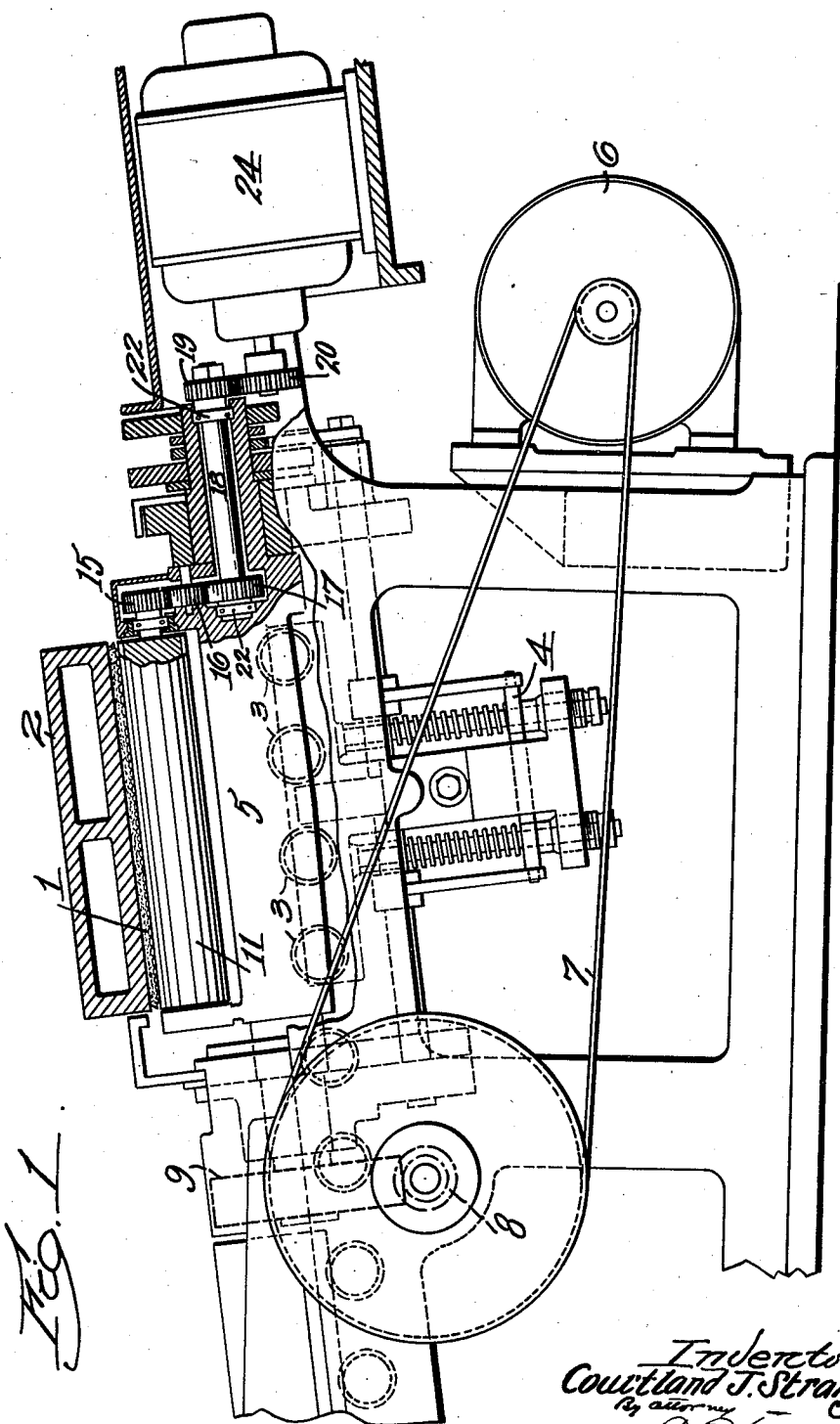
C. J. STRANG

2,213,110

PLATE FINISHING MACHINE

Filed Jan. 15, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

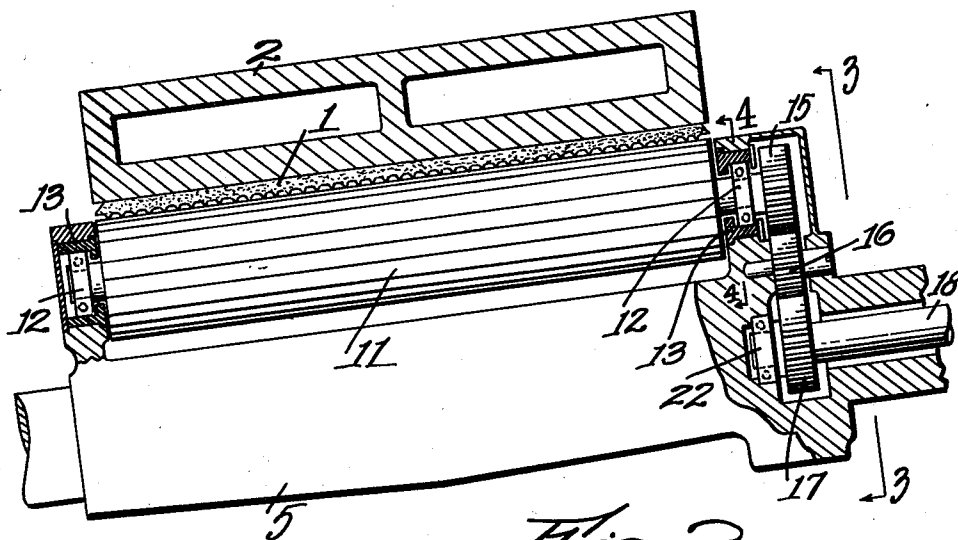


Fig. 2.

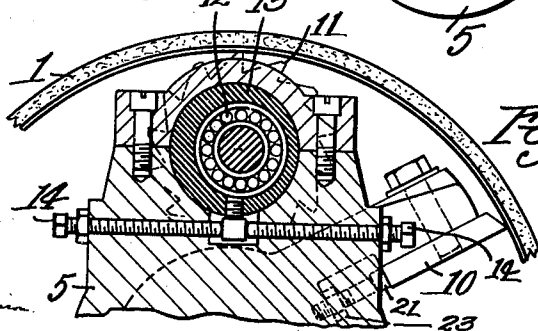
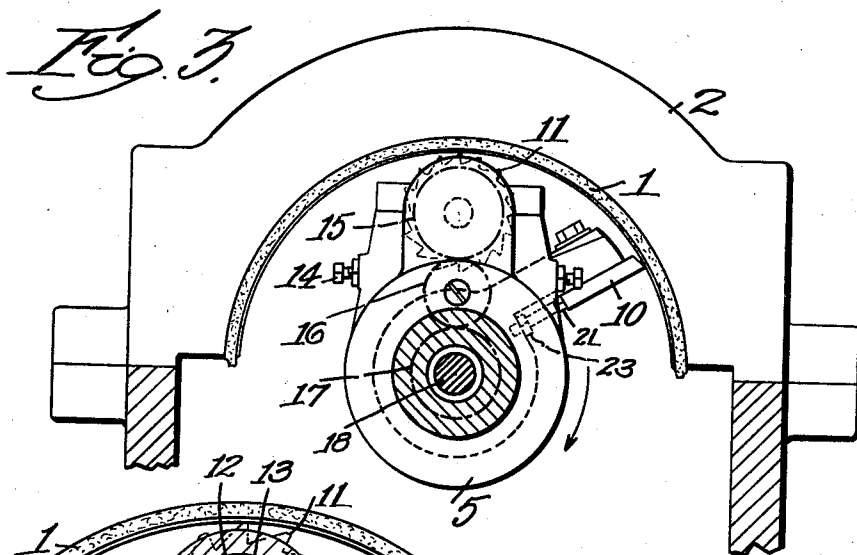


Fig. 4.

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UNITED STATES PATENT OFFICE

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PLATE FINISHING MACHINE

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3 Claims. (Cl. 29—21)

This invention relates to an improved means for finishing more accurately and with less distortion the inner surface of a cast stereotype plate.

5 The principal objects of the invention are to provide a shaving knife of the ordinary type and means for driving said shaving knife in a circular path, concentric with the outer surface of the stereotype plate, in combination with a rotary cutter following said knife for providing the finish shaving of the plate and rendering it more accurate; to provide separate and independent means for rotating the cutter at the proper speed during the driving of the cutter bodily in a circular path; to arrange said shaving knife and rotary cutter in such a relative manner that the knife precedes the rotary cutter, removing part of the excess metal on the inner surface of the plate and also pressing the plate into more intimate contact with the inner surface of the shaving arch and the rotary cutter will follow it with the plate in accurate position, taking off the rest of the surplus metal and thus producing a more accurately finished inner concave surface of the stereotype plate than has been the case heretofore, and to provide means for adjusting radially the position of the straight bladed advance cutter so as to accurately finish the inner surface of the plate.

30 Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

35 Fig. 1 is a longitudinal sectional elevation of a plate finishing machine constructed in accordance with this invention;

Fig. 2 is a side view of the same;

40 Fig. 3 is a sectional view on the line 3—3 of Fig. 1 showing in elevation the end of the machine, and

Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

In order to divide up the shaving of the concave side of a curved stereotype printing plate an advance shaving blade of the ordinary type is used to take off only part of the metal removed by the corresponding blade in previous constructions and also to force the plate up into a finished arch. Said blade is followed in this machine by a planetary cutter which rotates always on its own axis and simultaneously rotates bodily on the axis of the arch. The second cutter removes the rest of the surplus material on the inside of the plate but only after the inside of the plate has been firmly and accurately fixed in the arch.

This results in a much better shaving of the plate because the finishing cut is made after the plate has been set back into its final position in the arch and after it is practically impossible for the plate to move or shift during this shaving operation.

In order to accomplish these purposes, the cast stereotype plate 1 to be finished is held tightly in the shaving arch 2 by means of a plurality of rollers 3 actuated by a lifting mechanism 4. The opposite edges of the plate 1 rest on the tops of these rollers and the lifting mechanism which is shown merely holds them up in the arch on both sides, as has been done heretofore. The shaving knife bar 5 arranged longitudinally is rigidly mounted in bearings and revolves about the longitudinal center of the concave inner surface of the shaving arch 2. The shaving knife bar 5 is driven by an electric motor 6, or other means, through a belt 7, worm 8 and worm gear 9, in the present instance, in the direction indicated by the arrow in Fig. 3. The shaving knife bar 5 carries the substantially radial shaving knife 10 and a rotary cutter 11. The shaving knife 10 is adjustably mounted so as to move radially to control the radius of the first cut on the inside surface of the printing plate. The adjustment of the shaving knife through adjusting screws 21 and nuts 23 controls the amount of excess metal removed from the inside of the stereotype plate by this cutter, of course. The action of the shaving knife, is such that part of the excess metal on the inner surface of the stereotype plate is removed. At the same time the action of the shaving knife pushes the plate into closer proximity with the inner surface of the shaving arch.

The rotary or planetary cutter 11 is supported at each end by anti-friction bearings 12 mounted in eccentric bushings 13. Said eccentric bushings are free to rotate within spaces provided in the shaving knife bar 5. An electric motor 24 at the entrance end of the machine drives the rotary cutter 11 in a planetary path by means of a gear 15 mounted on the extreme end of the rotary cutter and gears 16 and 17, the rotary cutter drive shaft 18 and gears 19 and 20 associated therewith. The rotary cutter drive shaft 18 is supported by anti-friction bearings 22 within the shaving knife bar 5. It is so located that the longitudinal center line of said shaft coincides with the longitudinal center line of said shaving knife bar. By means of adjusting screws 14 located on opposite sides of the eccentric bushings 13, said bushings can be radially adjusted within the spaces provided for them within the shaving

knife bar 5. This controls the depth of the finishing cut taken on the inside surface of the plate 1. The cutting action of the rotary cutter is inherently easy as there is little thrust on the plate.

- 5 The excess metal remaining on the inside surface of the stereotype plate 1 after the shaving knife 10 has removed part of the metal is accurately removed without distorting the plate. This is possible because the knife 10 is also forcing the stereotype plate into closer conformity to the concave finished surface of the shaving arch.

An accuracy of finish on the inside surface of the plate is obtained by this invention which is greater than the accuracy of finish in the inside surface of a similar plate obtained by shaving with a single knife because the first action of this invention is to force the stereotype plate into close conformity with the shaving arch without distorting or deforming said plate. The removing of the other part of the excess metal is a comparatively easy process not only on account of the comparative thickness of the excess metal removed but also on account of the rotary cutting operation.

- 25 This inner surface is finished, and leaves a proper backing for the plate so that the type surface thereon will fit this surface and not be likely to be injured at any point. There is only sufficient of the excess metal on the inside surface of the plate removed by said shaving knife to secure the desired conformity of the plate to the arch so that the plate is not deformed or distorted by the cutting action. The desired plate shaped with the type surface to conform with the inner concave surface of the shaving arch is obtained without the usual distortion by a shaving knife which takes off the entire surplus metal and thus has a much deeper cut than is the case here.

- 40 Should the shaving knife press up, non-printing surfaces, however, the plate will have sufficient spring to react to proper position by the time the rotary cutter comes along, and thus a truly finished plate is obtained.

- 45 Having thus described my invention and the advantages thereof, I do not wish to be limited

to the details of construction herein described, otherwise than as set forth in the claims, but what I claim is:

1. In a finishing machine for stereotype printing plates, the combination of a rotary longitudinal shaving knife bar, a radial knife substantially fixed thereon for cutting surplus material from the inside of a stereotype plate in the preliminary cutting operation and forcing and firmly seating the plate in the arch, and a rotary cutter rotating on an axis parallel with the axis of said bar and rotating bodily about the axis of the bar arranged to follow the knife for finishing the same inside surface of the plate after it is forced back to its seat and shaved by the knife.

2. In a stereotype plate finishing machine, the combination of an arch having a concave finished inner surface for receiving the type surface of a stereotype plate, a longitudinal shaving knife bar within said arch having a substantially radial knife for performing the preliminary cutting operation and seating the plate in the arch firmly, a rotary cutter following the knife for finishing the same interior surface having an axis parallel to the axis of the shaving knife bar, means for adjusting the shaving knife radially toward and from the arch, means for rotating the shaving knife bar on its axis, and means for rotating the rotary cutter on its own axis.

3. In a stereotype plate finishing machine, the combination of an arch having a concave finished inner surface for receiving the type surface of a stereotype plate, a longitudinal shaving knife bar within said arch having a substantially radial knife for performing the first cutting operation and seating the plate in the arch firmly, a rotary cutter behind the radial knife for finishing the interior partly finished surface having an axis parallel to the axis of the shaving knife bar, means for adjusting the rotary cutter toward and from the arch, means for rotating the shaving knife bar on its axis, and means connected with the last named means for rotating the rotary cutter positively on its own axis while it is moving about the axis of the shaving knife bar.

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