

Nov. 25, 1930.

F. L. SNYDER

1,782,483

FORM ROLLING MACHINE

Filed Aug. 22, 1928

2 Sheets-Sheet 1

Fig. 1

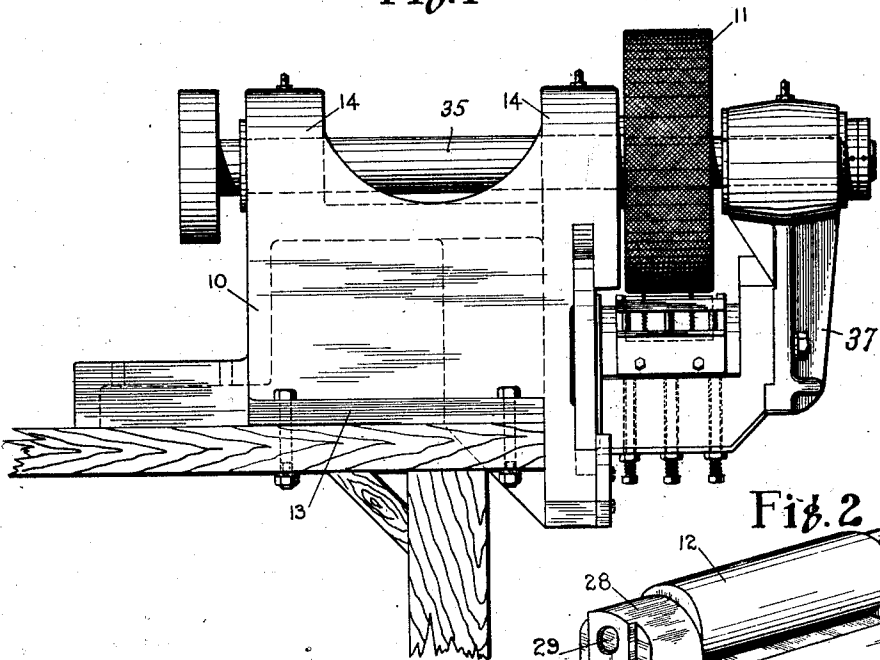


Fig. 2

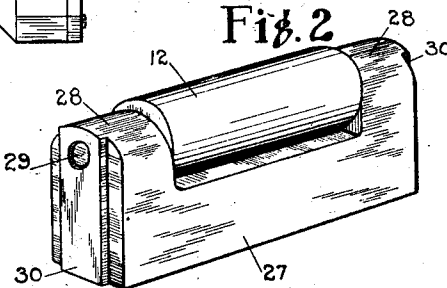
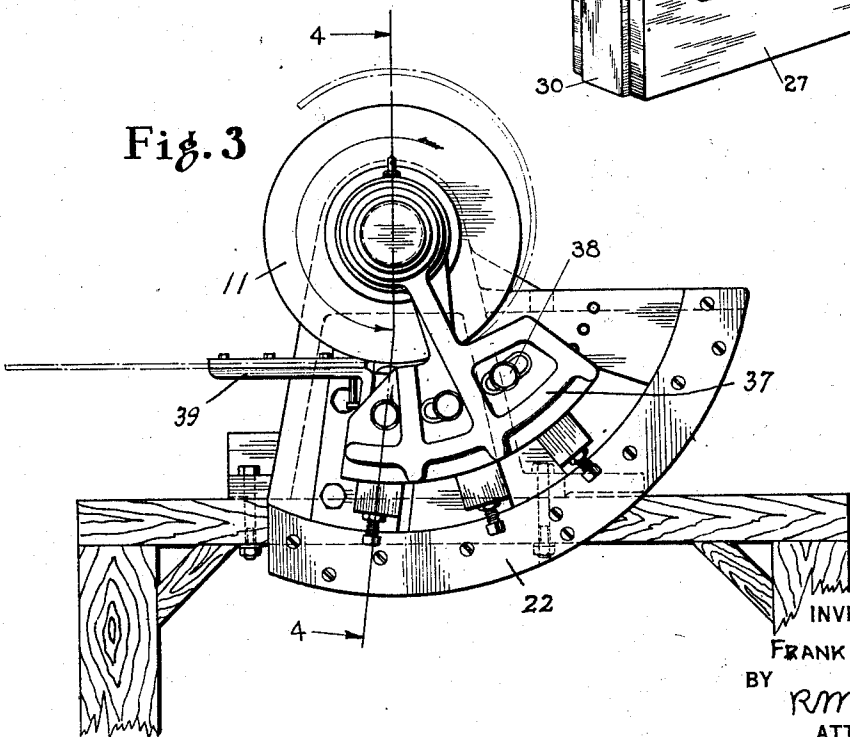


Fig. 3



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2 Sheets-Sheet 2

Fig. 4

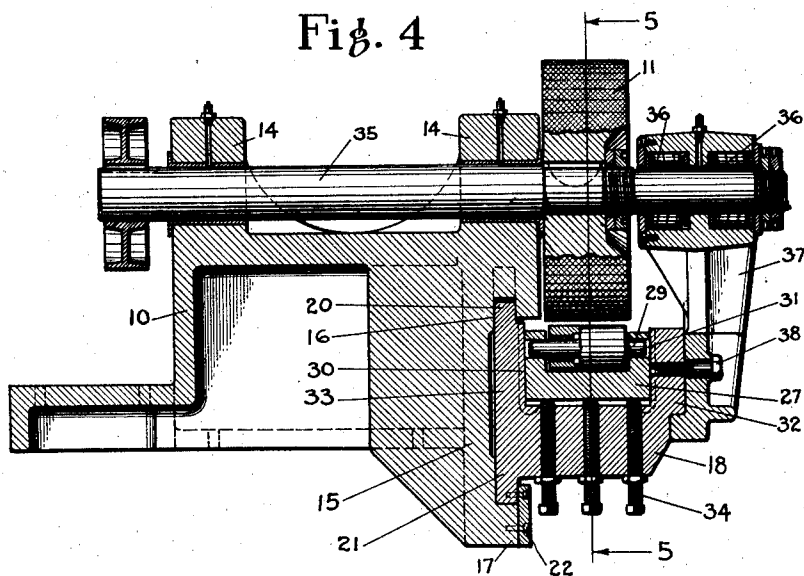


Fig. 5

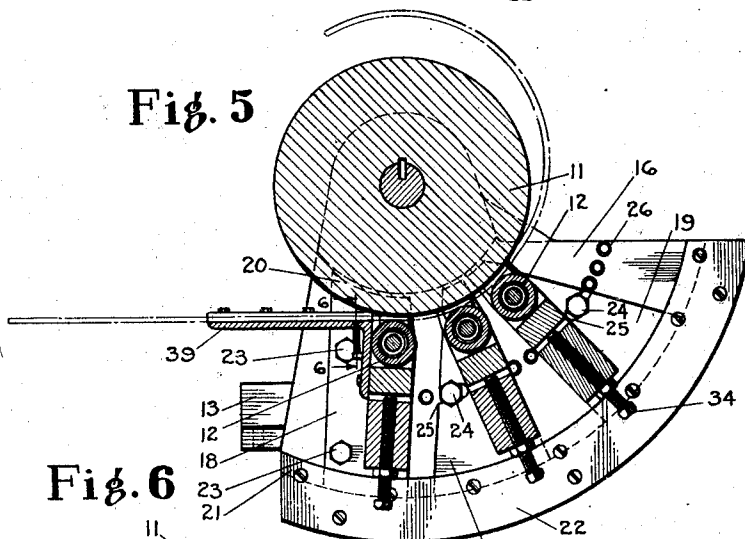
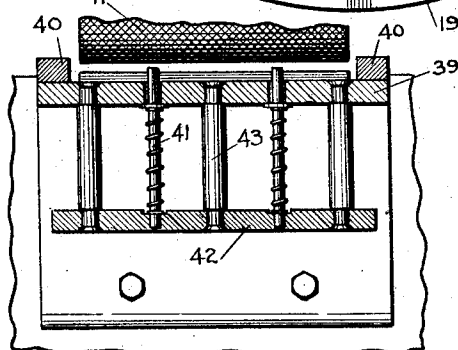


Fig. 6



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UNITED STATES PATENT OFFICE

FRANK L. SNYDER, OF CLEVELAND, OHIO, ASSIGNOR TO THE WHITE MOTOR COMPANY,
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FORM-ROLLING MACHINE

Application filed August 22, 1928. Serial No. 301,304.

This invention relates to machines for form-rolling strips of sheet material.

One of the objects of this invention is to construct a machine which may be adjusted to produce annular bands of variable diameters.

Another object of this invention is to provide for ready renewal of such rolling elements as are subjected to the greatest wear, and furthermore to arrange an adjustment for these elements which may be expeditiously positioned.

Another object of this invention is to construct a rolling machine which will form an arcuate band of regular curvature from a strip of material which has been fabricated previous to the forming operation.

Other objects will hereinafter appear.

The invention itself will be more readily understood from the description of one practical embodiment thereof, illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of an assembled rolling machine shown in conjunction with a work bench.

Figure 2 is a detailed view, in perspective, of one of the rolling elements.

Figure 3 is an end elevation of the machine shown in Figure 1, and includes in dotted lines a partly formed piece of stock.

Figure 4 is a longitudinal section taken on line 4—4 of Figure 3.

Figure 5 is a transverse section on line 5—5 of Figure 4.

Figure 6 is a detail view, partially in section, the plane of the section being indicated by the line 6—6 in Figure 5.

Referring to the drawing, the machine illustrated is designed for rolling automobile brake bands. It comprises generally a frame member 10, a master roller 11, and a plurality of smaller idler rollers 12 circumjacently disposed in relation to the form roller, and having radial adjustment thereto.

In detail the frame 10 embodies a flanged base 13, a pair of axially aligned journal bearings 14, and a recessed end wall 15 which is adapted to receive and hold the rolling adjuncts. The end wall 15 comprises a vertically disposed web machined with an arcu-

ate groove 16 and a circumjacent bearing ledge 17 which contribute to the support of a fixed roller-supporting bracket 18 and a pair of adjustable idler roller brackets 19.

As will be seen in Figures 4 and 5, the bracket 18 is provided with a pair of spaced oppositely extending flanges 20 and 21, the former being disposed within the groove 16, and the latter being supported upon the ledge 17 interjacent the wall 15 and a plate 22 affixed to the edge of the ledge. The bracket 18 is further secured to the frame by cap-screws 23 which extend through perforations in the rear wall of the bracket into threaded apertures formed in the wall 15.

The adjustable brackets 19 have the same general formation as the bracket 18, and are slidably mounted upon the frame by means of oppositely disposed flanges which, as in the case of the bracket 18, fit within the groove 16 and the groove formed by the wall 15 and the plate 22. Each of these brackets is secured in place by a cap-screw 24 which, after insertion through a slot 25 in the rear wall of the bracket, is turned into one of a plurality of threaded apertures 26 arcuately arranged in wall 15 for registration with the slot 25 of each bracket.

When it is desired to adjust one of the brackets 19, the cap-screw 24 is either loosened or removed, depending upon whether or not the adjustment is in excess to that permitted by the slots 25. If it is found necessary to remove the cap-screw, it is reinserted within the aperture 26 registering with slot 25 after adjustment.

The rollers 12 are adjustably supported upon the brackets 18 and 19 by means of slidably mounted saddle members 27. These saddle members, as clearly shown in Figures 4 and 2, are provided with bosses 28 which support the roller axles 29, and with tongues 30 which slide within guide grooves 31 formed in the side walls 32 and 33 of the respective brackets. Adjustability of the saddles 27 and the associated rollers 12 is obtained through the provision of a plurality of set-screws 34 mounted in the base of each bracket. The set-screws 34 bear against the bases of the saddle members, and may be manipulated to cause

either a vertical or a slight angular movement of saddle members and rollers.

The form roller 11 is keyed upon a driven shaft 35 journaled within the heretofore described bearings 14 and a pair of antifriction bearings 36 mounted in the upper end of a supporting bracket 37. The lower end of the bracket 37 is secured to the outer faces of roller brackets 18 and 19 by means of cap-screws 38 which extend through perforations formed in the webs of the bracket 37 into threaded apertures formed in the roller brackets 18 and 19. The apertures for the screws 38 which secure the bracket 37 to the brackets 19 are elongated as shown in Figure 3, and permit the previous described adjustment of the brackets 19.

Attached to the roller bracket 18 in close proximity to the roller 11, there is a guide plate 39 which accommodates the translation of the stock between the forming rollers. This plate is preferably provided with guide strips 40 and with spring-pressed plungers 41 which prevent reentrance of the stock between the rollers 11 and 12 after being formed. The plungers 41 are guided at their lower ends by a plate 42 supported beneath the plate 39 by shouldered columns 43 (see Fig. 6).

In the practice of this invention, strips of sheet material are fed between the driven roller 11 and the idler rollers 12, the latter of which have been adjusted to accommodate the stock and to effect the required distortional influence thereupon to form an annulus of the desired size. As will be readily apparent, the distortional influence can be altered by either a circumferential or radial adjustment of the rollers 12 with respect to the roller 11.

It is often desirable to fabricate the stock previous to the forming operation, in which case, the difficulty of rolling the stock into annuli or regular arcuate curvature is greatly enhanced due to the tendency of the stock to bend only at apertured or otherwise weakened portions when subjected to distortional strain. In the machine herein disclosed, the stock after initial distortion is held in close association with roller 11 by the circumferentially adjustable rollers 12. As a result, any irregularities of material size induced in the stock during initial distortion are later removed by the adjacent surfaces of the roller 11 and the circumferentially adjustable rollers 12.

While I have described the illustrated embodiment of my invention in some particularity, obviously many variations and modifications thereof will occur to those skilled in the art to which this invention appertains, I do not, therefore, limit myself to the precise details shown and described, but claim as my invention all embodiments coming within the scope of the appended claims.

What I claim is:

1. In a form-rolling machine, a frame, a large roller journaled in said frame, a plurality of members slidably mounted upon said frame for adjustment in arcuate paths concentric with said large roller, means for rigidly securing said members to said frame, small rollers mounted on said members adapted to cooperate with said large roller to form the stock, and means carried by said members for adjusting said small rollers radially with respect to said large roller.

2. In a form-rolling machine, the combination of a plurality of rollers which cooperate to form the stock, and movable means normally obstructing the entrance to the passage between said rollers, and preventing the re-entrance of the stock between said rollers after being formed.

3. In a form-rolling machine, a plurality of rollers which cooperate to form the stock, a plate to guide the stock between said rollers, and yieldably mounted means associated with said plate normally obstructing the entrance to the passage between said rollers, and preventing the re-entrance of the stock between said rollers after being formed.

4. In a form-rolling machine, the combination of a frame, a driven roller journaled in said frame, a plurality of members slidably mounted upon said frame for movement in arcuate paths concentric with said driven roller, means for securing said members in adjusted positions about said driven roller, idler rollers mounted on said members adapted to cooperate with said driven roller to form the stock, and means carried by said members for adjusting said idler rollers radially with respect to said driven roller.

5. In a form-rolling machine, the combination of a frame, a driven roller journaled in said frame, a plurality of members slidably mounted upon said frame for movement in arcuate paths concentric with said driven roller, means for securing said members in adjusted positions about said driven roller, idler rollers adapted to cooperate with said driven roller to form the stock, slidably mounted upon said members for radial movement with respect to said driven roller, and means for adjusting said idler rollers radially with respect to said driven roller.

6. In a form-rolling machine, the combination of a frame, a driven roller journaled in said frame, a plurality of members slidably mounted upon said frame for movement in arcuate paths concentric with said driven roller, means for securing said members in adjusted positions about said driven roller, idler rollers adapted to cooperate with said driven roller to form the stock, slidably mounted upon said members for movement toward and away from said driven roller, and adjustable means for supporting said rollers in adjusted positions with respect to said driven roller.

7. In a form-rolling machine, the combination of a plurality of cooperating forming rollers comprising a driven roller, an idler roller separately adjustable toward and away from said driven roller and about said driven roller.

8. In a form-rolling machine, the combination of a plurality of cooperating forming rollers comprising a driven roller, an idler roller adjustable toward and away from said driven roller, and a second idler roller separately adjustable toward and away from said driven roller and about said driven roller.

In testimony whereof I hereunto affix my signature this 1st day of August, 1928.

FRANK L. SNYDER.

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