

May 19, 1942.

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2,283,580

METHOD OF SURFACING THE BEARING METAL LAYER OF COMPOSITE BEARING STOCK

Original Filed Sept. 19, 1939 2 Sheets-Sheet 1

Fig. 1.

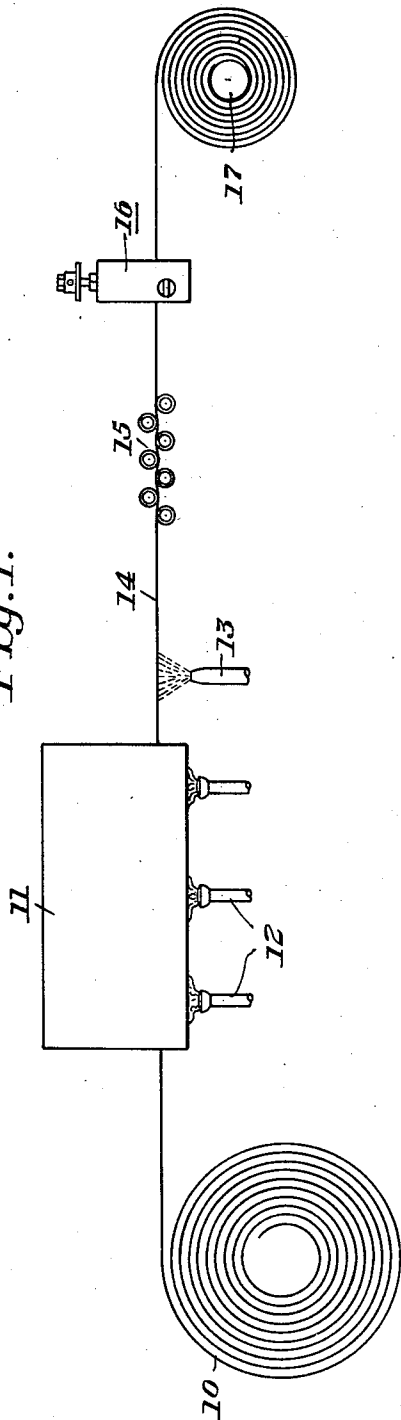
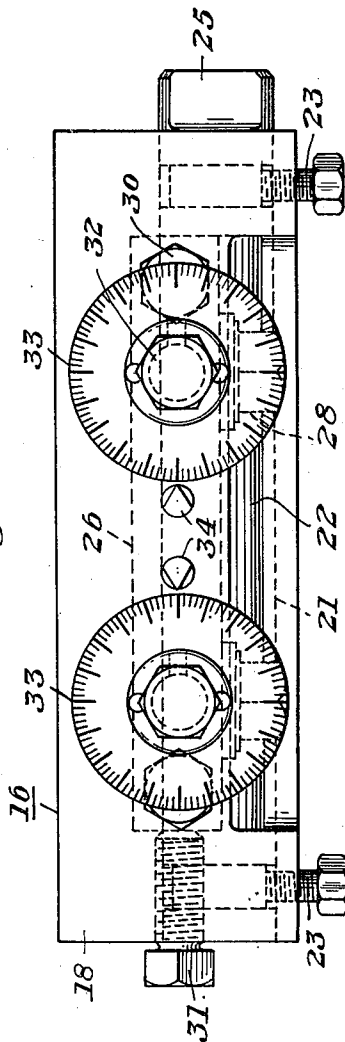


Fig. 2.



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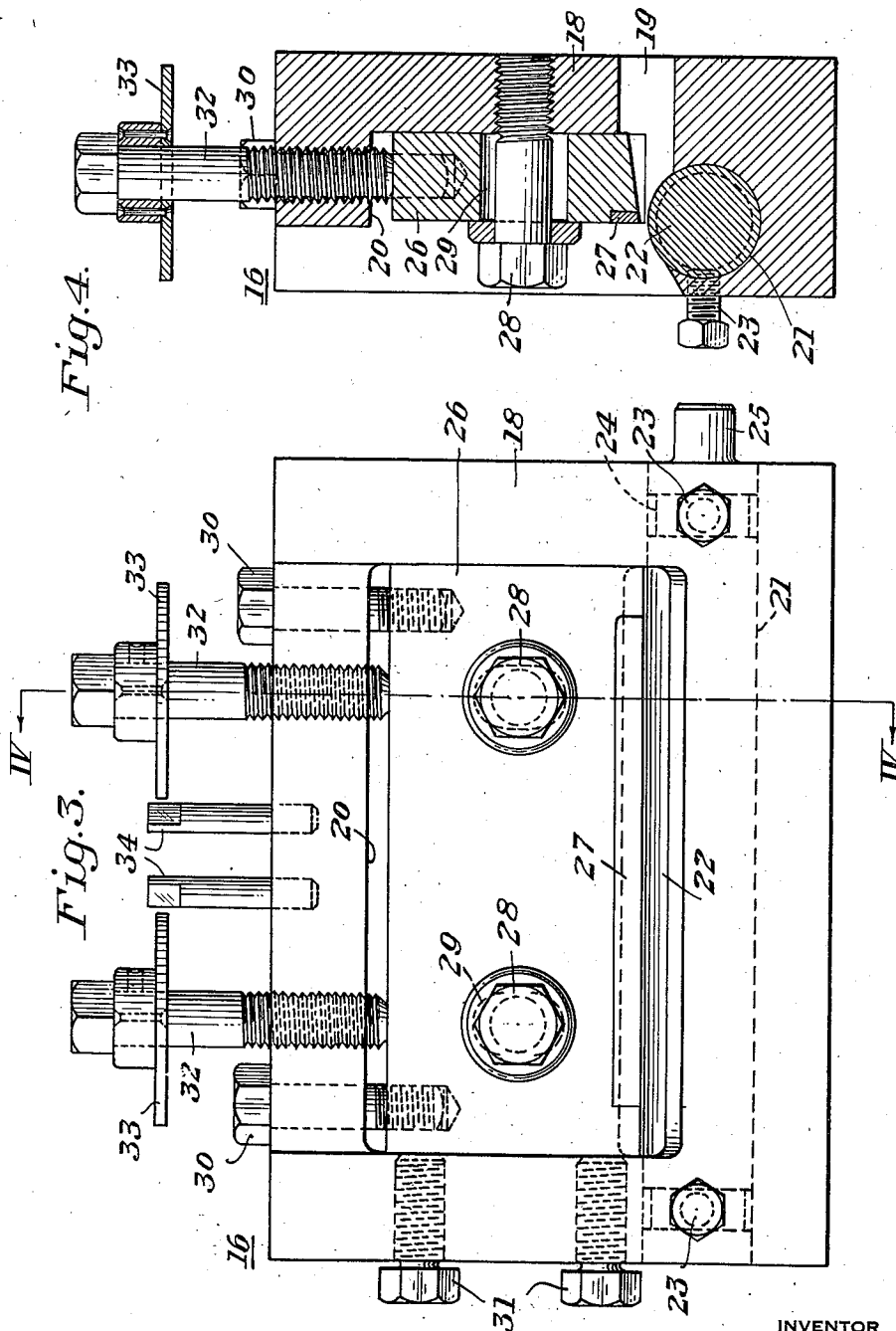
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METHOD OF SURFACING THE BEARING
METAL LAYER OF COMPOSITE BEARING
STOCK

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Original application September 19, 1939, Serial No. 295,594. Divided and this application October 16, 1940, Serial No. 361,396

2 Claims. (Cl. 29—149.5)

This invention relates to a method of progressively finishing an elongated work-piece such as a length of strip and, in particular, to the planing of a coating of bearing metal bonded to a strip of backing metal, e. g., steel.

This is a division carved from my copending application Ser. No. 295,594, filed September 19, 1939.

It has been proposed heretofore to machine the surface of a layer of bearing metal bonded to a backing strip by passing the coated strip under a rotary cutter. It has been found, however, that because of the spacing of the teeth on the cutter, it is necessary to move the strip under the cutter at a relatively low speed in order to secure the desired smooth finish. Even when operated at a low speed, this practice does not produce as high a degree of smoothness on the finished surface as is desired. In addition, the milling cutter produces a multitude of small chips and considerable oxidation thereof results because of the heat generated by the cutting operation and the large surface exposed to the atmosphere.

I have invented a novel method which overcomes the aforementioned limitation and makes it possible to finish the surface of a coating of bearing metal on a backing strip at high speed and, at the same time, to produce a smooth surface thereon. In a preferred practice of the invention, I draw a coated strip through a roller leveler, then through a block having a slot therein. I support the strip on a bearing or supporting member in the form of a roll mounted in the block adjacent the slot. I remove the surface of the coating by a planing tool also mounted in the block and adjustable toward and from the supporting member. Thus when strip is drawn through the slot and the planing tool advanced into engagement with the layer of bearing metal, the strip is supported by the bearing roll and the surface of the layer of bearing metal is removed by the planing tool across the entire width of the strip, leaving a finished surface of a high degree of smoothness. The chips removed are of large size and may be returned to the coating bath for remelting with little or no loss by oxidation.

The following detailed description of the preferred practice of the invention refers to the accompanying drawings in which:

Figure 1 is a diagrammatic elevation showing a strip coating line;

Figure 2 is a plan view of the surfacing device;

Figure 3 is a front elevation thereof; and

Figure 4 is a section taken along the line IV—IV of Figure 3.

Referring now in detail to the drawings, a loose coil of steel strip 10 is passed through a coating device of known construction indicated generally at 11. The device is preferably provided with burners 12 for maintaining a bath of bearing metal such as babbitt or the like in molten condition for flowing onto the upper surface of the strip in a coating layer of the desired thickness. Since apparatus for coating backing strip with a layer of bearing metal is already well known, it is unnecessary to describe the device 11 in greater detail.

A water spray nozzle 13 is preferably located at the exit end of the device 11 and is so arranged as to discharge a spray or jet onto the coated strip indicated generally at 14, to chill and set the layer of bearing metal deposited thereon.

The coated strip next passes through a roller leveler indicated diagrammatically at 15, which flattens the strip and removes any bends or similar deformations therefrom. The strip then passes through a surfacing device 16 and is coiled on a recoiler 17. The strip is pulled from the coil 10 through the coating mechanism 11, the leveler 15 and the surfacing device 16, by the tension exerted thereon by the coiler 17.

Referring now to Figures 2, 3 and 4, the surfacing device 16 comprises a block 18 adapted to be securely held in any convenient manner on a suitable support (not shown). The block 18 has a slot 19 extending from the front to the back thereof. The block also has a recess or window 20 therein which is of a width somewhat less than the block. The width of the slot 19 is preferably about the same as that of the recess 20.

A transverse bore 21 extending through the block 18 intersects the slot 19. A rounded bearing or supporting member in the form of a roll 22 is disposed in the bore 21. The roll is held in place by screws 23 which enter annular grooves 24 formed near the ends of the roll. The screws 23 engage the roll loosely to permit rotation of the latter as desired and one end of the roll is flattened as at 25 to permit it to be turned by a suitable wrench.

A planing tool 26 is adjustably positioned in the recess 20 and extends substantially the full width thereof. It is provided with an insert 27 of a hard cutting alloy, adjacent its lower forward edge. As shown in Figure 3, the insert 27 extends substantially the full width of the tool 26. Screws 28 extending through slots 29 in the tool 26 hold it against the rear wall of the recess 20.

The tool 26 is suspended in proper position relative to the roll 22 by screws 30 turning freely in holes in the portion of the block 18 overhanging the recess 20 and threaded in tapped holes in the upper edge of the tool. By turning the screws 30, the tool 26 may be raised or lowered after loosening the screws 28. When the tool has been adjusted, the screws 28 may be tightened to hold the tool firmly in the block. Lateral clamping screws 31 are threaded through the end of the block and engage an end of the tool to clamp it firmly against the other end of the block when properly positioned therein.

The setting of the tool 26 may be appropriately selected by hold-down screws 32 threaded through the portion of the block 18 overhanging the recess 20 and engaging the upper edge of the tool 26. The screws 32 have graduated discs 33 thereon which cooperate with index fingers 34 extending upwardly from the block 18. The tool may be adjusted to any desired extent, either upwardly or downwardly, by releasing the screws 30 and 31 and then turning the screws 32 to the desired extent, as indicated by the graduations on the discs 33 and the index fingers 34. When the screws 32 have been properly set, the screws 30 are tightened up and finally the screws 31. As will be apparent from Figures 1 and 4, the strip 14 is drawn through the slot 19 and the tool 26 lowered until the cutting edge of the insert 27 engages the layer of bearing metal to the desired depth. The backing strip is supported on the roll 22 and as the composite strip is pulled through the device 16, the tool 26 takes a cut off the surface of the layer of bearing metal across the entire width of the strip, leaving a smooth, highly finished surface on the bearing metal layer. The strip may be pulled through the surface of the device 16 as rapidly as it can be satisfactorily coated by the mechanism 11. The chips of bearing metal removed by the planing tool are of considerable length and extend in one piece across the full width of the strip. They may thus be easily collected for return to the coating bath 11 for remelting.

The invention is characterized by numerous advantages which will be readily apparent. The surfacing device 16 is simple and relatively inexpensive in construction. The cutting edge of the planing tool may be ground accurately so as to provide a flat surface across the width of

the finished strip. The entire width of the strip, furthermore, is surfaced simultaneously. Since the insert on which the cutting edge is formed is composed of a hard cutting alloy, it may be used for a considerable time without necessity for re-grinding, because the bearing metal is relatively soft and easy to cut. The supporting roll 22 may be rotated intermittently to distribute the wear uniformly therearound and maintain the strip in proper position relative to the cutting edge of the tool 26.

A further important advantage is that, as previously mentioned, the chips produced by the planing tool are large and are free from oxidation. It is thus feasible to return them directly to the coating bath for remelting. This eliminates the remelting loss of 8% or 9% experienced with the chips produced by the apparatus previously used which, as stated, are oxidized and therefore require refining before the metal can be used again.

Although I have illustrated and described a preferred practice of the invention, it will be recognized that changes in the procedure disclosed may be made without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. In a method of making bearing stock, the steps including chilling and roller leveling a backing strip having a layer of bearing metal bonded thereto, then pulling it between a planing edge extending the full width of said layer, and an abutment engaging said backing strip, thereby removing the top portion of said layer in a single cut and providing a surface finished to a high degree of smoothness.

2. In a method of making strip suited for use as stock in the manufacture of composite bearings, the steps including roller leveling a backing strip having a layer of bearing metal cast thereon and pulling it between a planing edge extending the full width of the layer and an abutment engaging said backing strip, thereby removing in a single cut the surface of said layer as cast, and providing said layer with a surface finished to a degree of smoothness similar to that characterizing babbitt-lined bearing shells after boring.

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