Feb. 8, 1938. H. J. S. CROUCHER 2,107,978

JIG FOR USE IN METALING BEARINGS

Filed July 27, 1936 2 Sheets-Sheet 1

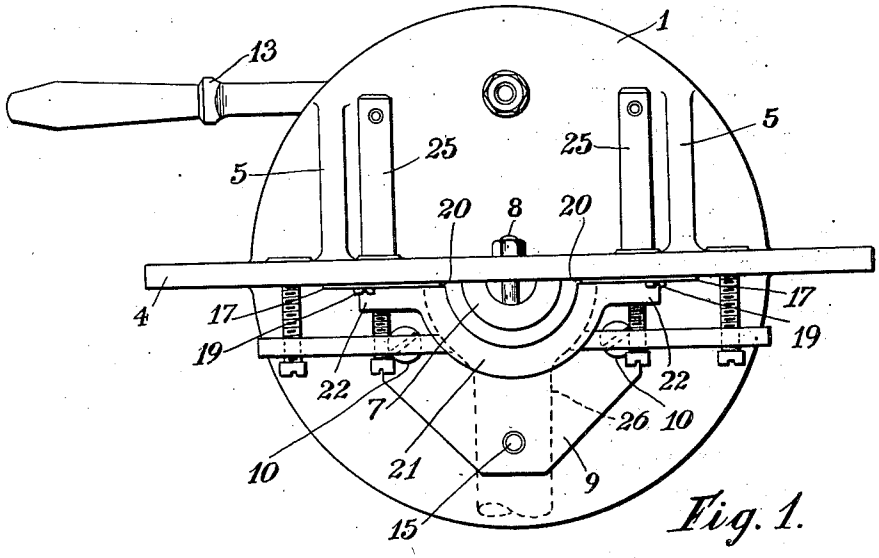
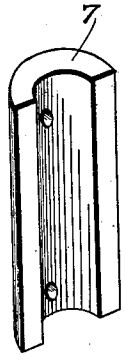
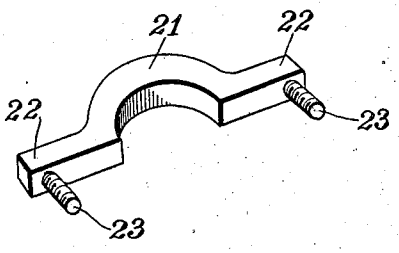


Fig. 1.





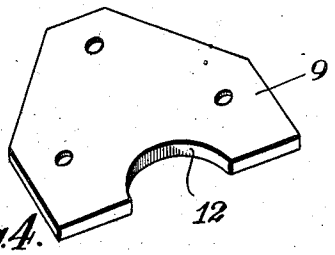


Fig. 4.

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JIG FOR USE IN METALING BEARINGS

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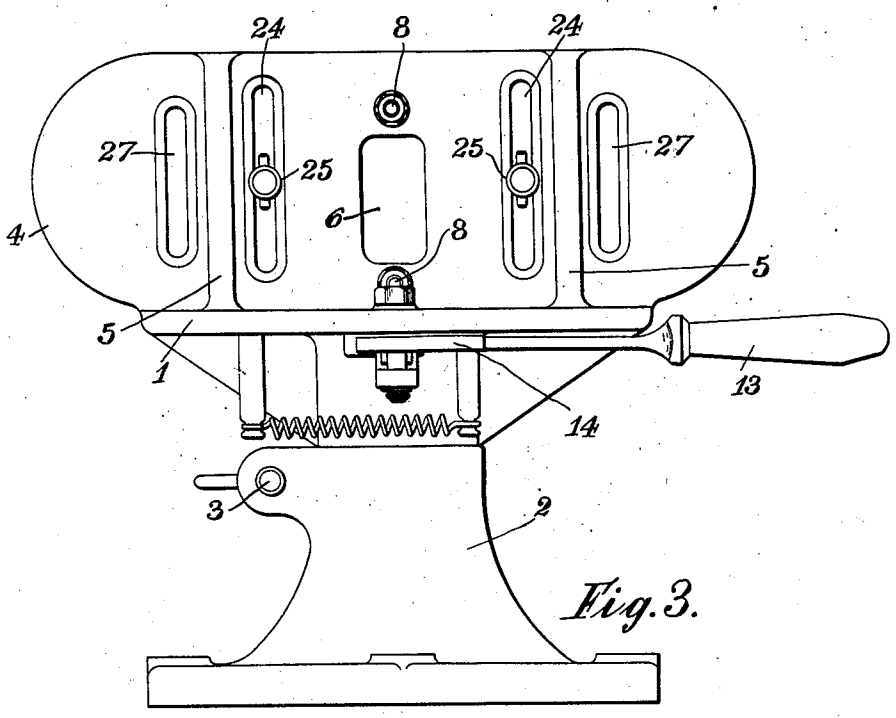


Fig. 3.

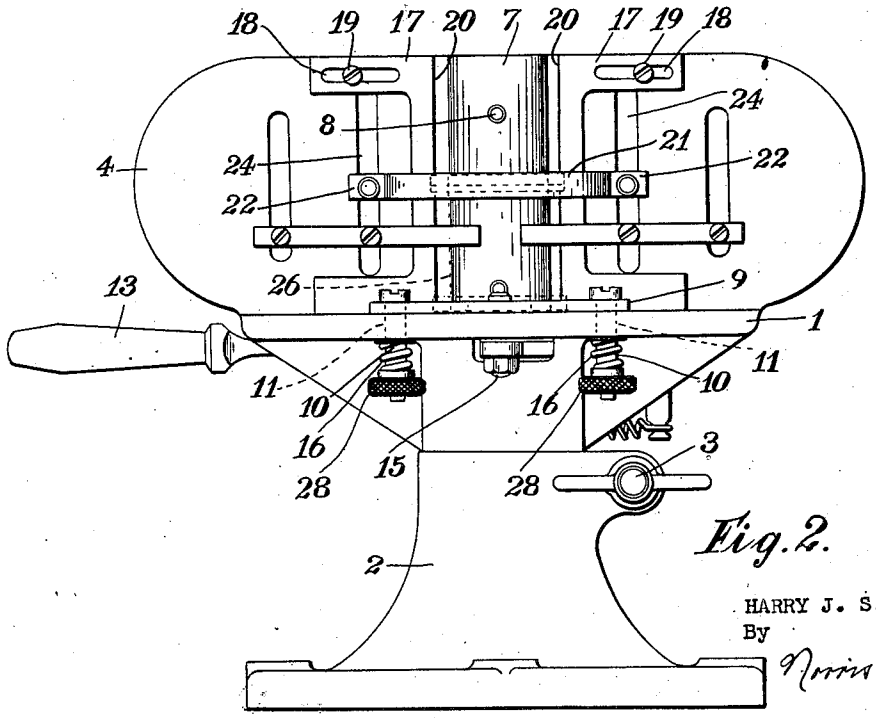


Fig. 2.

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JIG FOR USE IN METALING BEARINGS

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3 Claims. (Cl. 22—123)

This invention relates to an improved method of metaling split bearings and to improvements in jigs for use in carrying out the method by casting anti-friction metal linings in the parts of the bearing shell.

The primary object of the invention is to enable the metaling operation to be carried out without submitting the bearing shell to an excessive temperature.

The improved method of metaling bearings according to the invention consists in mounting the bearing shell with one side on a table or the like, and with the extremities of the shell in abutting engagement with a support arranged perpendicular to the table and with a mandrel of a size corresponding to the inside diameter of the required casting arranged within and spaced from the inner surface of said shell, pouring molten bearing metal into the space between the shell and the mandrel and applying a flame to the surface of the mandrel away from the bearing shell.

The improved jig for use in carrying out the improved method comprises a table or platform, an apertured support arranged perpendicular to the table, a mandrel adapted to occupy a position against the support and over the aperture therein and means for clamping the bearing shell in a position on the platform with its ends in abutting engagement with the support at each side of the mandrel.

The improved jig enables the metaling operation to be carried out without necessitating the use of fireclay, asbestos or other luting for preventing leakage of the molten metal, as has been necessary in the past when metaling bearings by known methods. The improved jig may also include means to enable suitable lateral bearing metal extensions or runner heads to be cast simultaneously with the metaling operation and end abutment faces of the metal lining lying proud of the ends of the shell part so that a good flush joint can subsequently be made between the parts of the bearing.

The improved jig according to the invention is illustrated by way of example in the accompanying drawings, in which

Fig. 1 is a plan view,

Figs. 2 and 3 are front and rear elevations respectively, and

Fig. 4 shows views of separable or adjustable parts.

Referring to the drawings, a flat metal table or platform 1 is mounted on a suitable supporting base 2, being conveniently rotatable thereon if desired, any convenient clamping device 3 being provided to enable the platform to be fixed with regard to the base 2. Upon the platform 1 is carried a fixed support in the form of a plate 4 carried in a vertical plane. Brackets 5 may be provided and the platform 1, support 4 and brackets 5 may be conveniently formed as a single casting.

At the centre of the vertical plate is formed a large aperture 6 and over this aperture at the side of support 4 away from brackets 5 is fixedly mounted a semi-cylindrical mandrel or moulding piece 7, the external diameter of which corresponds to the interior diameter of the half bearing to be cast.

The hollow mandrel is secured to the support 4 by bolts 8, and with its axis vertical and its lower end and longitudinal flat surfaces in close abutting engagement with platform 1 and support 4 respectively.

On the platform 1 and outside the mandrel 7 is mounted a sliding plate 9 (Figs. 1, 2 and 4) in connection with the platform 1 through pins 10 and slots 11 in platform 1. The edge of this sliding plate 9 towards the mandrel 7 is provided with a half round recess 12, the diameter of which corresponds to the external diameter of the metal casting, or of the runner heads thereon, to be formed. Any convenient form of adjusting device such as a pivoted handle 13 having an enlarged end 14 with a cam slot therein (not shown) for co-operation with a pin 15 depending from plate 9 through a guide slot in platform 1, may be provided to enable the sliding plate 9 to be moved towards and away from the mandrel 7, and it will be understood that in the position of use the recess 12 in the sliding plate 9 and the mandrel 7 are co-axial.

Compression springs 16 may be provided on the guide pins 10 beneath the platform 1 to retain the sliding plate 9 in the desired set position.

Against the surface of the vertical plate 4 at each side of the aperture 6 are mounted thin metal gauges 17 in the form of U shaped plates or strips (Figs. 1 and 2). The limbs of the U of each gauge 17 lie horizontally and the upper limb of each is slotted as at 18 for co-operation with a locking screw 19 to enable the gauges 17 to be clamped to the vertical plate 4 with their vertical edges 20 appropriately spaced from the side edges of the mandrel 7.

A yoke piece 21 (Figs. 1, 2 and 5) is also provided, the internal diameter of which corresponds to that of the recess 12 in the sliding plate 9 and this yoke piece at each end is furnished with lugs 22 carrying bolts 23 which pass through ver-

tical elongated slots 24 formed in the vertical plate 4 and engage hand operated nuts 25 to enable the yoke 21 to be clamped in a position where it is spaced by the width of the bearing 26 to be metaled above the sliding plate 9, and with its inner boundary also co-axial with the mandrel 7.

Further vertical elongated slots 27 formed in the vertical plate 4 serve as guides for adjustable bars 29, for the purpose of clamping the half bearing shell 26 in the jig.

It will be understood that sets of mandrels 7, sliding plates 9 and yokes 21 are provided, these being readily interchangeable and mounted on the platform 1 and support 4 according to the size of the bearing to be dealt with or thickness of the casting required.

In use the half bearing shell 26 such as one half of the big end of a connecting rod is cleaned and tinned in the usual manner. The selected mandrel 7 is bolted over aperture 6 in support 4 and the selected sliding plate 9 connected to platform 1 by passing pins 10 through slots 11 and applying the springs 16 and thumb nuts 28, and the plate 9 then slid into engagement with support 4.

The half bearing shell 26 is placed in position resting on the sliding plate 9 and symmetrically enveloping the mandrel 7 and with the abutment surfaces of the shell against the surfaces of the adjustable gauges 17. In this position the lower inner edge of the bearing shell 26 is in register with the edge of the recess 12 in the sliding plate 9. The gauges 17 are adjusted in position on support 4 through screws 19 until their adjacent vertical edges register with the vertical inner edges of the half bearing shell 26. The half bearing shell 26 is clamped in this position by the adjustable clamps 29 and the yoke 21 is mounted in position, resting on the upper end of the half bearing shell where the edge of the recess in the yoke registers with the inner upper edge of the shell, and clamped in position.

The mandrel 7 is now heated to bring it to a suitable temperature, by means of a blow lamp or the like applied through the aperture 6 in the support 4 from the back and molten bearing metal is poured into the space between the mandrel 7 and the interior of the half bearing shell 26 from above the yoke 21.

It is necessary to continue the application of heat to the mandrel 7 for an appreciable period of time in order to maintain the bearing metal in a molten state and to ensure that the tinning or lining of the half bearing 26 melts and alloys with the bearing metal, and during this time a feeder rod or stirrer may be used to assist in dispelling foreign matter, air bubbles and the like.

It will readily be seen that by the application of the heat through the mandrel 7, that is to say to the bearing metal from the side away from the shell 26, the temperature to which the latter needs to be heated is much lower than has been the case hitherto when the heat to maintain the bearing metal molten has been applied through the bearing shell itself. Thus the shell is less affected during the operation and in particular the serious risk of burning the tinning with the consequent failure of the bearing lining to adhere, is eliminated.

The spaces between the wall of the recess 12 in the sliding plate and the mandrel 7 and between the inner surface of the yoke 21 and mandrel 7 extend below and above the shell 26 and serve to mould side extensions, which can subsequently be machined to form the thrust faces of the bearing. At the same time the size of the yoke 21 is such as to permit the formation of a runner extension or runner head into which any foreign matter or dross floats while the metal remains molten, and this can of course be subsequently removed by machining. The side gauges 17 set back the half bearing shell 26 from the vertical support 4, so that the formed casting, when solid, extends slightly beyond the extremities of the half bearing shell 26 so that good flush joints with the other half bearing can subsequently be made.

It is also found that as a result of the application of the heat from the side of the mandrel 7 away from the bearing shell, the latter may remain so cool that any molten metal which may leak from the mould towards the exterior is immediately chilled and solidified so that no appreciable total leak occurs. Thus the laborious application of fireclay, asbestos and other luting to the moulds to prevent leakage is rendered unnecessary.

I claim:

1. A jig for use in metaling bearings comprising a flat apertured metal face-plate, a hollow partly cylindrical mandrel adapted to be secured to said face-plate with the longitudinal edges of the mandrel in engagement with the flat surface of the face-plate on each side of the aperture therein so that a defined passage is left between the interior surface of the mandrel and the face-plate to which heat may be applied by means of a flame through the aperture in the face-plate, and means for fixing the bearing shell to be metaled in desired relationship with said mandrel and face-plate.

2. A jig for use in metaling bearings comprising a rigid platform, a flat apertured metal face plate rigidly located with respect to said platform and at right angles thereto, a hollow partly cylindrical mandrel adapted to be secured to said face plate with the lower end of the mandrel abutting the surface of the platform and with the longitudinal edges of the mandrel in engagement with the flat surface of the face plate on each side of the aperture therein so that a defined passage is left between the interior surface of the mandrel and the face plate to which heat may be applied by means of a flame through the aperture in the face plate, a flat recessed plate adapted to lie on the surface of the platform with the recess therein embracing the mandrel and with the parts of the edges at each side of the recess in engagement with the face plate, and means for fixing the bearing shell to be metaled in desired relationship with said mandrel, face plate and recessed plate to form a mould to receive the bearing metal to be cast.

3. A jig for use in metaling bearings comprising a rigid platform, a flat apertured metal face plate rigidly located with respect to said platform and at right angles thereto, a hollow partly cylindrical mandrel adapted to be secured to said face plate with the lower end of the mandrel abutting the surface of the platform and with the longitudinal edges of the mandrel in engagement with the flat surface of the face plate on each side of the aperture therein so that a defined passage is left between the interior surface of the mandrel and the face plate to which heat may be applied by means of a flame through the aperture in the face plate, gauge strips adapted to lie against the surface of the face plate at

each side of the hollow mandrel, means for adjustably securing said gauge strips to the face plate, a flat recessed plate adapted to lie on the surface of the platform with the recess therein embracing the mandrel and with the parts of the edge at each side of the recess in engagement with the lower ends of the gauge strips, and means for fixing the bearing shell to be metaled in desired relationship with said mandrel, gauge strips and recessed plate to form a mould to receive the bearing metal to be cast.

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