Aug. 27, 1940. G. H. JONES 2,212,688

COOLING MEANS FOR ROTATING MANDREL BARS

Filed Nov. 23, 1938 2 Sheets-Sheet 1

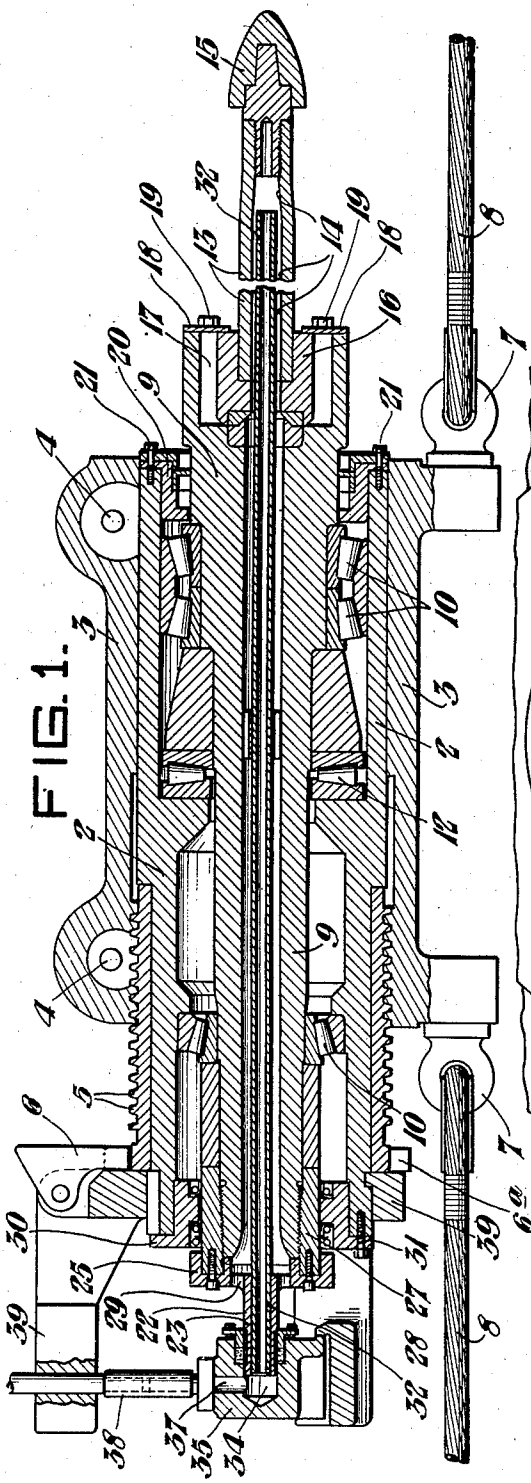


FIG. 1.

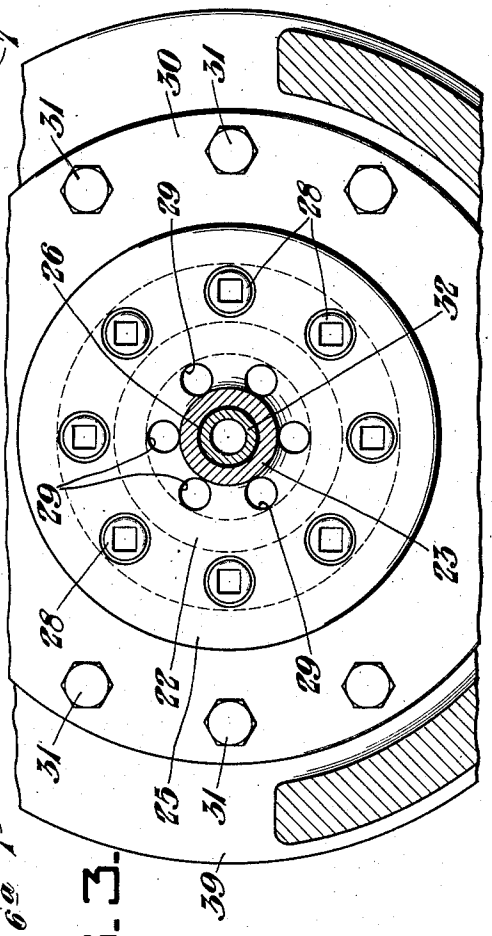


FIG. 3.

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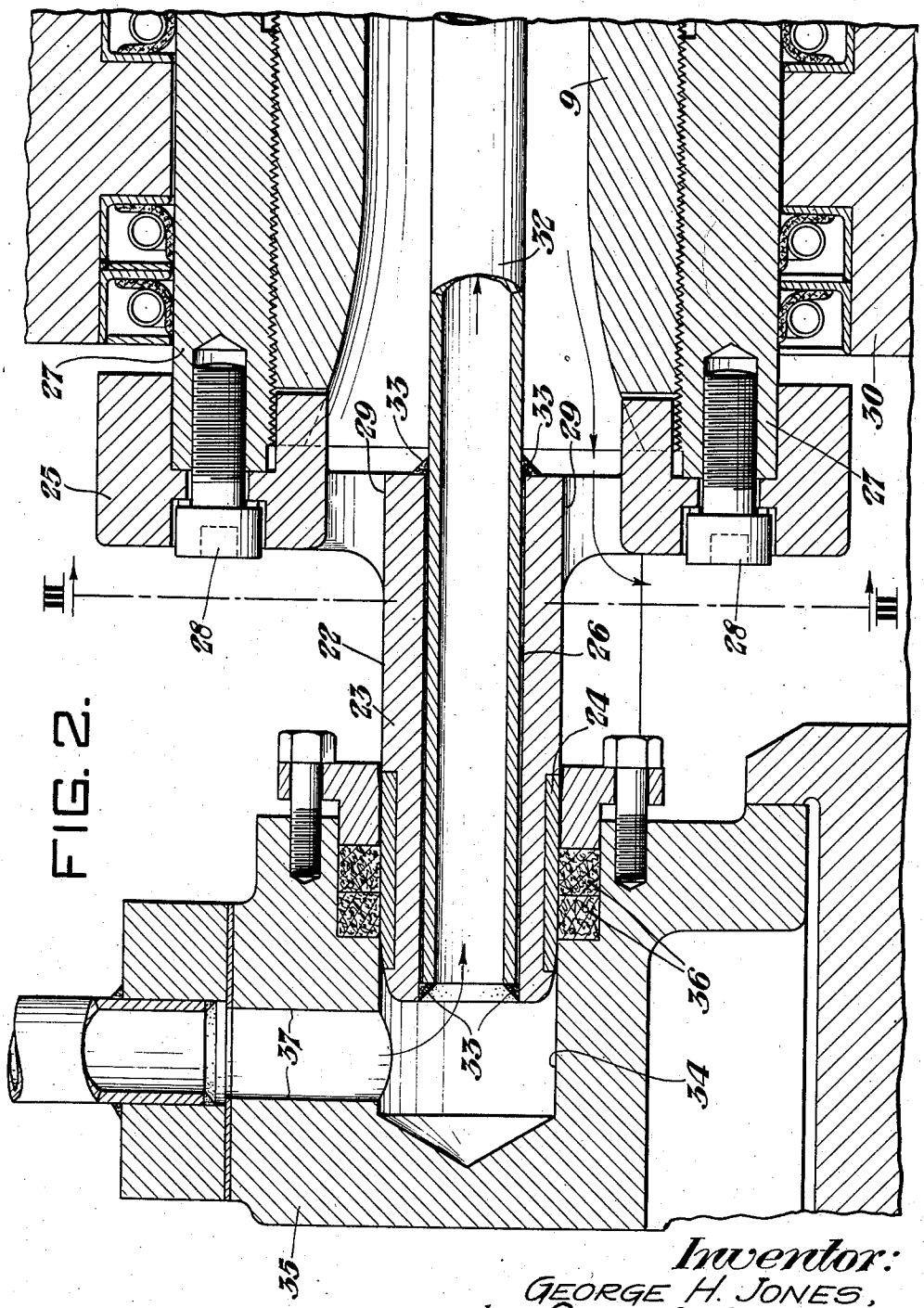


FIG. 2.

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COOLING MEANS FOR ROTATING MANDREL BARS

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Application November 23, 1938, Serial No. 242,125

5 Claims. (Cl. 80—13)

This invention relates to rotating mandrel bars and to a cooling means therefor; and, particularly, to an improved means for assembling the cooling means therein.

Various means and devices have been suggested and used for introducing a cooling fluid into rotating mandrel bars and the like for the purpose of maintaining the same at a relatively cool temperature during the use thereof. Such means or devices usually employed a fluid conveying pipe for introducing water as the cooling agent into the mandrel bars. It is necessary that these pipes be replaced from time to time, due to the wear and corrosion thereof, so it is important that they be assembled therein in a most convenient manner to thus expedite the replacement thereof. A number of different ways have been used for assembling such cooling pipes therein but most of them have been impractical and expensive and too much time was required for their replacement; also, these pipes, in most cases, were subjected to excessive wear due to the manner in which they were assembled therein, necessitating, of course, quite frequent replacements, which was inconvenient as well as expensive.

According to the present invention, there is provided an improved means for assembling these cooling pipes in connection with rotating mandrel bars and the like in which the pipes can be easily and quickly replaced in a relatively short time and one in which the wear thereon is reduced to a minimum, thereby eliminating the necessity of frequent replacements thereof.

It is one of the objects of this invention to provide an improved means for assembling cooling pipes in connection with rotating mandrel bars and the like which will insure the positioning of the pipes centrally of the mandrel bars at all times.

It is another object of the invention to provide an improved means for assembling cooling pipes in connection with mandrel bars and the like which is rugged and, at the same time, simple and inexpensive in its construction.

Various other objects and advantages of this invention will be more apparent in the course of the following specification and will be particularly pointed out in the appended claims.

In the accompanying drawings there is shown, for the purpose of illustration, one embodiment which my invention may assume in practice.

In these drawings:

Figure 1 is a longitudinal section through a mandrel bar assembly with which my improved invention is incorporated;

Figure 2 is a similar enlarged section showing more fully the details of my invention; and,

Figure 3 is a section taken on the line III—III of Figure 2.

Referring more particularly to the drawings, there is shown a cylindrical housing 2 disposed in preferably a cylindrical movable carriage or thrust block 3. The carriage 3 is preferably held in position around the housing 2 by means of bolts 4. There is arranged, preferably adjacent the inner end of the housing 2 around the periphery thereof, a threaded portion 5 which is adapted to cooperate with a corresponding threaded portion arranged on the inner wall of the carriage 3 at one end thereof to securely position the same therein and to provide a means for adjusting the same relative thereto. There is also provided a pivotal locking member or dog 6 suitably arranged adjacent the inner end of the housing 2 which is adapted to cooperate with notches arranged in the periphery of an annular ring 6a mounted on the outer end of the housing so as to lock the same against accidental movement and to be disengaged therefrom only when it is desired to adjust the housing 2 relative to the carriage 3. There is positioned, preferably on the bottom of the carriage 3, a pair of downwardly extending lug portions, one at each end thereof, in each of which there is arranged an eye bolt 7 for the purpose of receiving the ends of actuating cables 8 or any other suitable actuating means. These cables may be actuated by any suitable means, not shown, for moving the rotating mandrel device to operable position and retracting the same therefrom.

There is disposed axially through the cylindrical housing 2, a rotatable hollow spindle 9 which is mounted in suitable bearings 10 and thrust bearing 12 positioned in the housing. There is arranged on the forward end of the spindle 9, beyond the housing 2, a mandrel bar 13 having an axially arranged opening 14 disposed therethrough. There is suitably attached to the outer end of the mandrel bar 13 a mandrel point or plug 15, and there is securely mounted on the inner end thereof preferably an annular member 16 which is disposed in an opening 17 in the end of the spindle 9 and held therein by means of suitable clamping plates 18 and the machine screws 19 so as to securely hold the mandrel bar in position on the end of the spindle. The outer end of the housing 2 is closed by means of an annular flanged member 20 arranged around the spindle 9 and attached to the end of the housing 2 by means of bolts 21.

According to the present invention, there is arranged on the inner end of the rotatable spindle 9 a pipe supporting member 22 having an outwardly extending cylindrical portion 23 with a hardened metallic wear-resisting ring 24 preferably inlaid therein around the outer surface, adjacent the end thereof. There is arranged on the inner end of the supporting member 22, a flange portion 25, and there is provided an axially arranged opening 26 therethrough. The supporting member 22 is preferably attached to the end of a spindle nut 27 arranged on the inner end of the spindle 9 by means of the flange portion 25 and machine screws 28. There preferably is concentrically arranged through the flange portion 25, a plurality of openings 29 for a purpose to be described later in the specification. The inner end of the housing 2 is closed by means of an annular flanged member 30 similar to the member 20 and attached to the end of the housing by means of bolts 31.

There is disposed within the axial opening 26 through the supporting member 22, a longitudinally extending cooling fluid conveying pipe 32 which extends through the spindle 9 and into the mandrel bar 13, preferably terminating a short distance from the outer end thereof. This cooling pipe 32 is securely attached to the supporting member 22, preferably by means of welding at 33, at each end thereof, but it will be understood that it may be attached thereto in any other suitable manner. Also, the outside diameter of the conveying pipe 32 is smaller than the diameter of the cylindrical axial openings in both the spindle 9 and the mandrel bar 13 so as to provide a space therebetween.

The outer end of the cylindrical portion 23 of the supporting member 22 is rotatably disposed in an opening 34 arranged in a stuffing box 35 suitably positioned adjacent the outer end of the supporting member. There is provided in the stuffing box and adapted to be arranged around the outer surface of the hardened metallic wear-resisting ring 24 carried by the cylindrical portion 23, packing rings 36 for sealing the end of the supporting member 22 against leakage.

The stuffing box 35 has an opening 37 arranged therein communicating with the opening 34 and adapted to receive a suitable flexible inlet hose 38. The inlet hose 38 is preferably supported by means of a clamp or bracket 39 arranged on the inner end of the housing 2.

It will be understood that, when in operation, the mandrel bar 13, the spindle 9, together with the supporting member 22, and the fluid conveying pipe 32 carried thereby revolve and the water or other cooling fluid is continually introduced into the openings 34 and 37 in the stuffing box 35 by means of the inlet hose 38 and passes into and through conveying pipe 32 into the interior of the mandrel bar 13 to cool the same. The water or cooling fluid then flows back on the outside of the conveying pipe 32 in the space therebetween through the spindle 9 and out through the openings 29 in the flange portion 25 of the supporting member 22 to a suitable drain or other receiving means arranged at that end of the mandrel bar assembly.

As a result of my invention, it will be seen that the supporting member 22, together with the conveying pipe 32 carried thereby, can be easily and conveniently removed and replaced should it be necessary, and that the conveying pipe 32 is not subjected to any undue wear other than corrosion.

While I have shown and described one embodiment of my invention, it will be understood that this embodiment is merely for the purpose of illustration and description and that various other forms may be devised within the scope of my invention, as defined in the appended claims.

I claim:

1. A device of the class described including, in combination, a rotatable spindle having an axially arranged opening therethrough, a fluid cooled mandrel bar disposed on one end of said spindle and having an opening axially arranged therein for receiving a cooling fluid, supporting means having an axial opening arranged therethrough disposed on the opposite end of said spindle, a cooling fluid conveying means arranged in the axial opening of said supporting means and securely attached thereto, said conveying means extending from said supporting means through the axial opening in said spindle and into the axial opening in said mandrel bar, stationary means arranged adjacent the outer free end of said supporting means, said stationary means having an opening arranged therein into which the outer free end of said supporting means is adapted to be disposed, means carried by said stationary means which is adapted to fit tightly around the outer surface of said supporting means to securely seal the end thereof against leakage during rotation thereof, and means for supplying a cooling fluid to the opening in said stationary means so that it will pass into and through said means into said mandrel bar.

2. A device of the class described including, in combination, a rotatable spindle having an axially arranged opening therethrough, a fluid cooled mandrel bar disposed on one end of said spindle and having an opening axially arranged therein for receiving a cooling fluid, a supporting member having an axial opening arranged therethrough disposed on the opposite end of said spindle, a cooling fluid conveying pipe arranged in the axial opening of said supporting member and securely attached thereto, said conveying pipe extending from said supporting member through the axial opening in said spindle and into the axial opening in said mandrel bar, a stationary stuffing box arranged adjacent the outer free end of said supporting member, said stuffing box having an opening arranged therein into which the outer free end of said supporting member is adapted to be disposed, means carried by said stuffing box which is adapted to fit tightly around the outer surface of said supporting member to securely seal the end thereof against leakage during rotation thereof, and means for supplying a cooling fluid to the opening in said stuffing box so that it will pass into and through said pipe into said mandrel bar.

3. A device of the class described as defined in claim 2 wherein the fluid conveying pipe is securely attached to the supporting member by means of welding.

4. Means for supplying a fluid to the interior of a rotatable hollow mandrel bar including, in combination, a flange-like supporting member attached to the end of the mandrel bar, said supporting member having an opening arranged therethrough with a plurality of holes arranged therearound in the flanged portion thereof, means associated with said supporting member for conveying a fluid through the opening therein into said mandrel bar, stationary means arranged adjacent the outer free end of said supporting member having an opening arranged therein into

which the outer free end of said supporting member is rotatably disposed, means carried by said stationary means which fits tightly around said supporting member to securely seal the end thereof against leakage, and means for supplying a fluid into and through the opening in said stationary means whereby the same will pass through the supporting member and the fluid conveying means associated therewith into the mandrel bar and out through the plurality of holes arranged in the flanged portion of the supporting member.

5. Means for supplying a fluid to the interior of a rotatable hollow mandrel bar including, in combination, a flange-like supporting member attached to the end of the mandrel bar, said supporting member having an opening arranged axially therethrough with a plurality of holes concentrically arranged therearound in the flanged portion thereof, a fluid conveying pipe securely arranged in the axial opening of said supporting member and extending therethrough into said mandrel bar, a stationary stuffing box disposed around the outer end of said supporting member and having an opening therein communicating with the end of the opening in said supporting member, means carried by said stuffing box which fits tightly around said supporting member to seal the end thereof against leakage, and means for supplying a fluid into and through the opening in said stuffing box whereby the same will pass through the supporting member and pipe carried thereby into the mandrel bar and out through the plurality of openings arranged in the flanged portion of the supporting member.

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