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APPARATUS FOR QUENCHING AND REELING RODS

Original Filed March 13, 1950

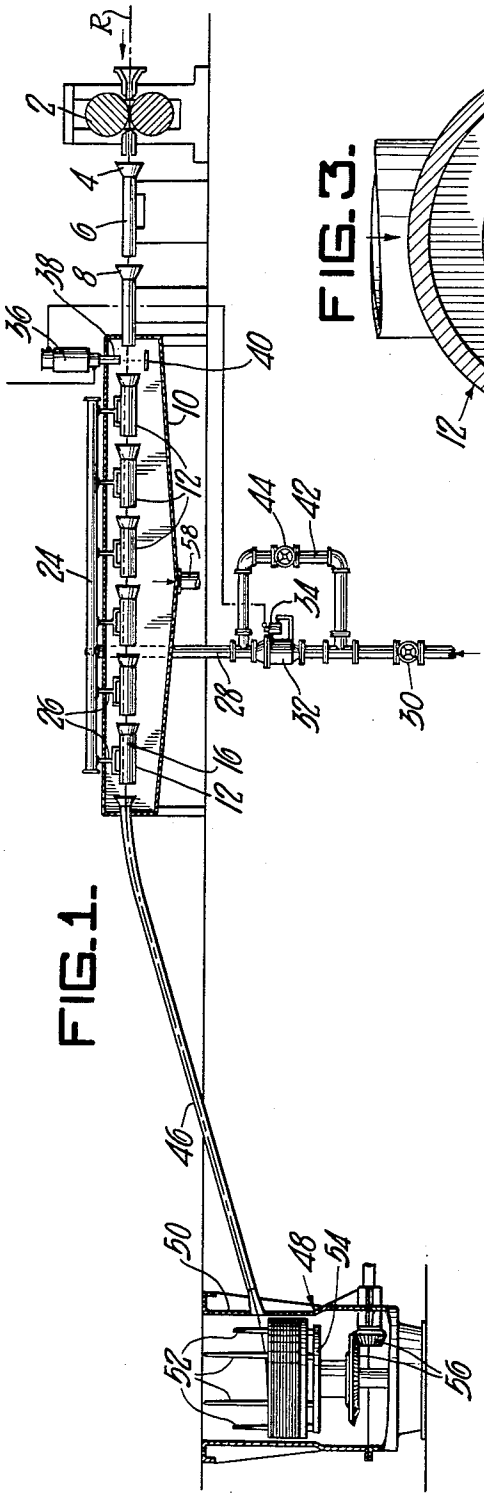


FIG. 1.

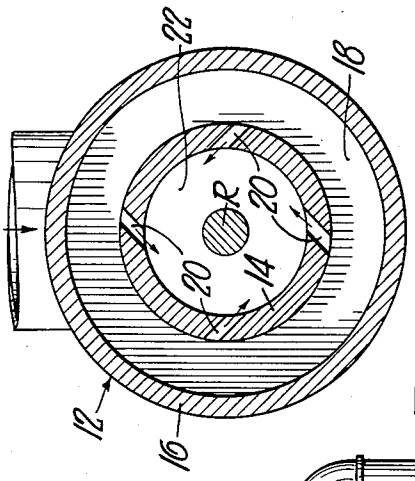


FIG. 3.

FIG. 2.

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APPARATUS FOR QUENCHING AND REELING RODS

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Original application March 13, 1950, Serial No. 149,351, now Patent No. 2,658,012, dated November 3, 1953. Divided and this application August 14, 1953, Serial No. 374,200

2 Claims. (Cl. 134—57)

This invention relates to apparatus for quenching and reeling rods and is a division of my copending application, Serial No. 149,351, filed March 13, 1950, now Patent No. 2,658,012, dated November 3, 1953. In order to form as little scale as possible on hot rolled steel rods, the hot rolled rods are quenched with water as they emerge from the last pass of the mill prior to being reeled into bundles. The water quenching makes it possible to cool the rods from a temperature between approximately 1700° and 2000° F. down to a temperature of between about 1000° and 1600° F. Rods which have been so drastically quenched become so stiff that the leading end of the rod as it is fed into the rapidly revolving reel mechanism will not wrap itself about the pins of the reel but instead will cobble or bunch together into a mass of twisted scrap.

It is therefore an object of my invention to provide apparatus for reeling hot rolled rods that will overcome the above mentioned difficulties.

This and other objects will be more apparent after referring to the following description and attached drawings, in which:

Figure 1 is a schematic view of the apparatus of my invention;

Figure 2 is an enlarged view, partly in section, of a detail of Figure 1; and

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

Referring more particularly to the drawings, the reference numeral 2 indicates the last roll stand of a hot rod mill. Rod R passes through the roll stand 2 into the bell mouth 4 of a guide pipe 6 and then into a bell mouth 8 leading into the water cooler box 10. The water quenching means consists of a number of sectional elements 12 within the box 10. As shown in Figures 2 and 3, each of the elements 12 is made up of concentric tubes 14 and 16 having a space 18 therebetween. The inner tube 14 is provided with a plurality of holes 20 therein drilled at an angle of 45° to a radius through the wall thereof in order to allow water to enter the inner portion 22 of the pipe 14 through which the rod R passes. Water is delivered into the space 18 from a header 24 through branch pipes 26. A pipe 28 connects the header 24 to the main water line. The flow of the water into the pipe 28 is manually controlled by means of valve 30 and is automatically controlled by means of a quick acting water

valve 32 which is operated by a solenoid 34. The solenoid 34 is controlled by means of a contactor 36, which in turn, is operated by an electric eye 38. A polished reflector 40 is located on the opposite side of the pass line from the electric eye 38. In order to provide for manual operation, a by-pass 42 is provided around the valve 32. A manually operated valve 44 is provided in the by-pass 42. The rod R passes from the cooling box 10 through a pipe 46 to the reel 48. The reel 48 has a housing 50 within which are guide pins 52 mounted on a member 54 which is rotated by means of gearing 56.

The operation of the device is as follows:

When the rod R passes under the electric eye 38, the electric eye is energized to operate contactor 36 which in turn energizes the solenoid 34 to open quick acting valve 32. This starts the flow of water into the header 34, thence into the space 18 and then through the holes 20 to spray the rod passing therethrough. I have found that the speed of the incoming rod is so great that by the time the photoelectric cell actuates solenoid 34 to open valve 32 and fill the cooling sections 12 with water to quench the rod, between 25 and 65 feet of rod will have passed through the sections 12. This uncooled portion of the rod will readily wrap itself about the pins 52 of the reeler, thus eliminating cobbling. Once the rod is securely wrapped around the pins of the reel, the quenched rod will follow without damage. After the rod R passes from under the electric eye 38, the valve 32 will close and water will drain from the cooling sections 12 into the cooling box 10 and hence through a drain pipe 58. The apparatus will then be ready to receive the next rod. If the normal time delay is insufficient to permit enough uncooled rod to pass into the reeler 48, the solenoid 34 may be provided with a time delay to give the necessary time interval. If desired, the method could be carried out by manually opening the valve 44 at the desired time.

While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. Apparatus for quenching and reeling hot rolled rods comprising water quenching means through which the rod passes, an electric eye on the entry side of said quenching means in line with the path of travel of said rods, a reel at the exit side of said quenching means for receiving said rod, a conduit for supplying water to said quenching means, a valve in said conduit, a solenoid for opening and closing said valve, and means operable by said electric eye to energize said solenoid.

2. Apparatus for quenching and reeling hot rolled rods according to claim 1 having a by-pass conduit around said valve and a valve in said by-pass conduit.

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