April 7, 1959 J. D. POPP 2,880,739

APPARATUS FOR QUENCHING AND REELING RODS

Filed Sept. 15, 1955 3 Sheets-Sheet 1

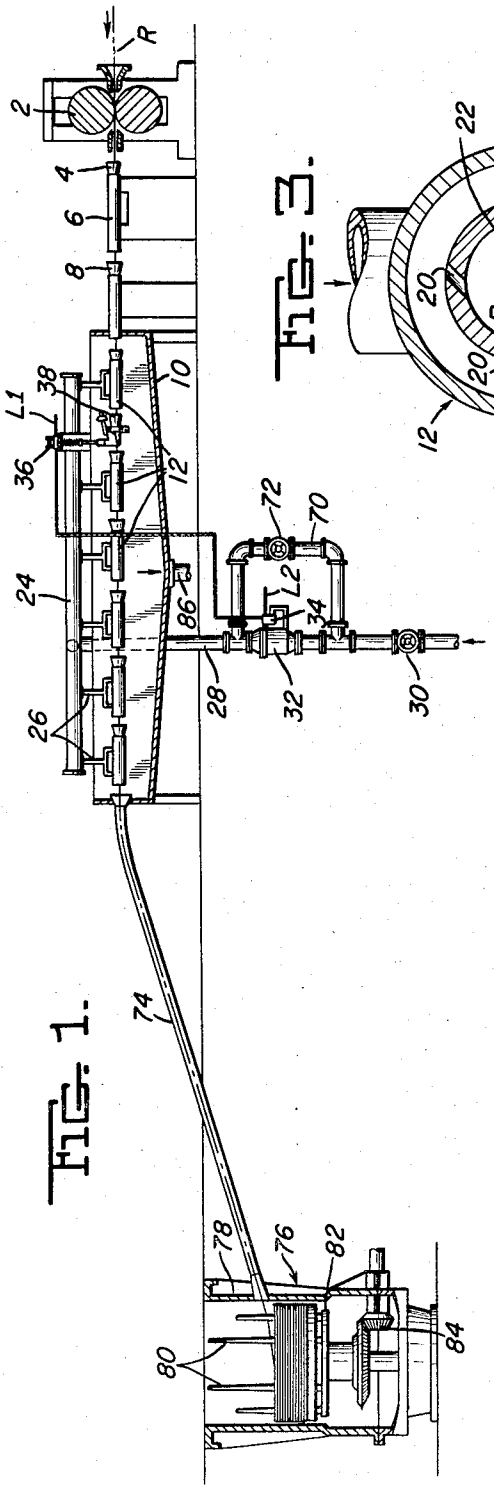


FIG. 1.

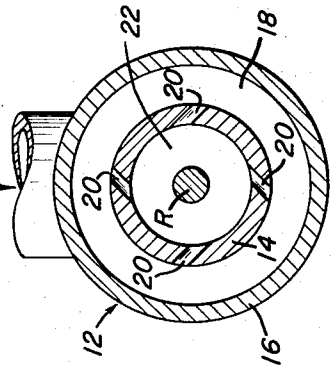


FIG. 3.

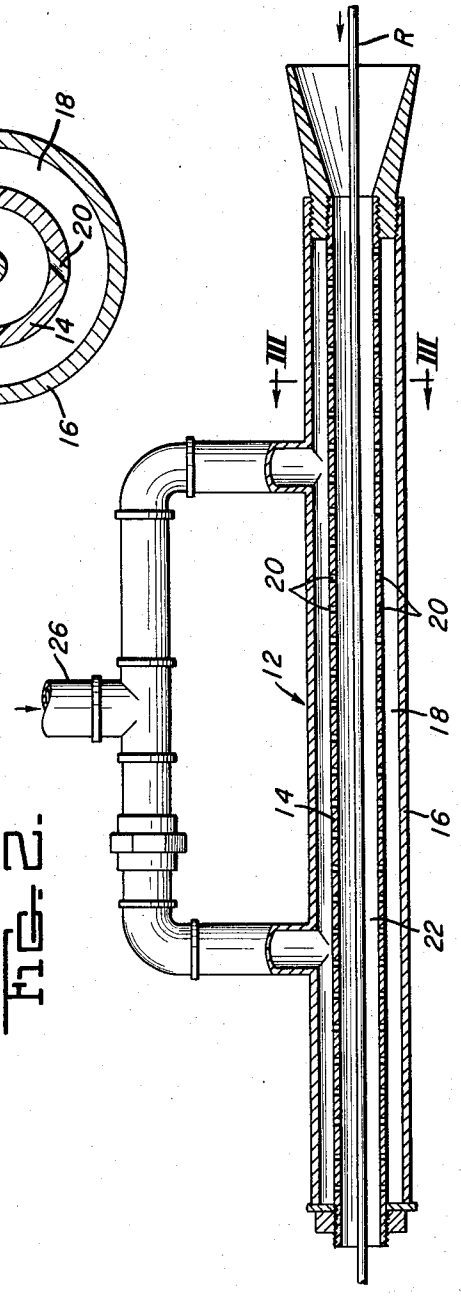


FIG. 2.

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APPARATUS FOR QUENCHING AND REELING RODS

Filed Sept. 15, 1955 3 Sheets-Sheet 2

FIG. 4.

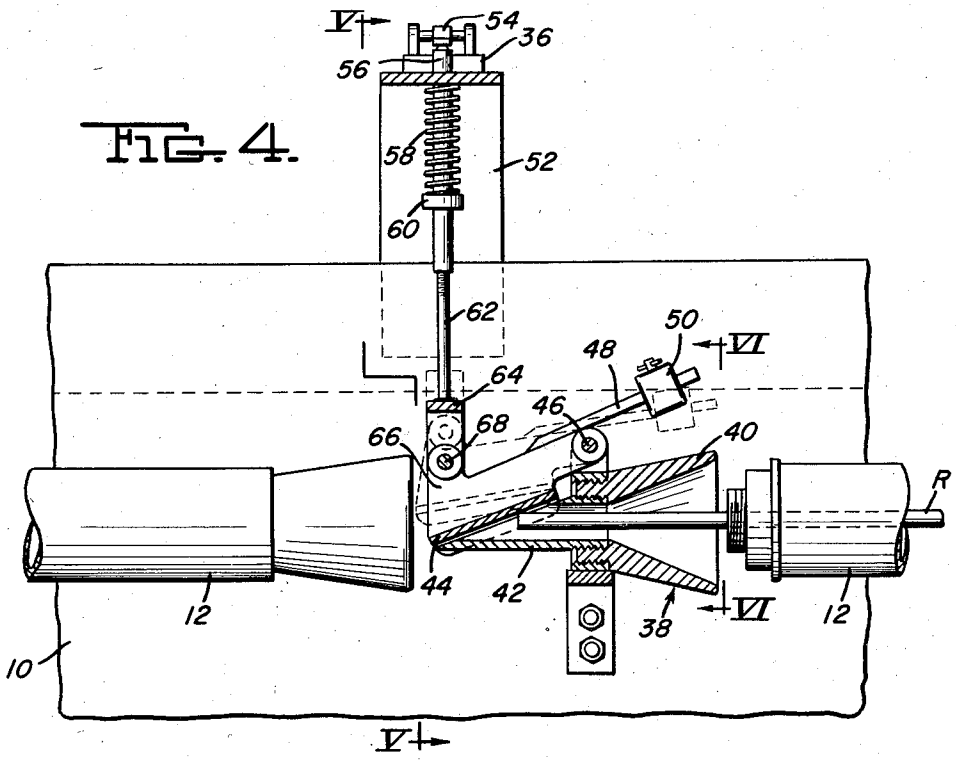


FIG. 5.

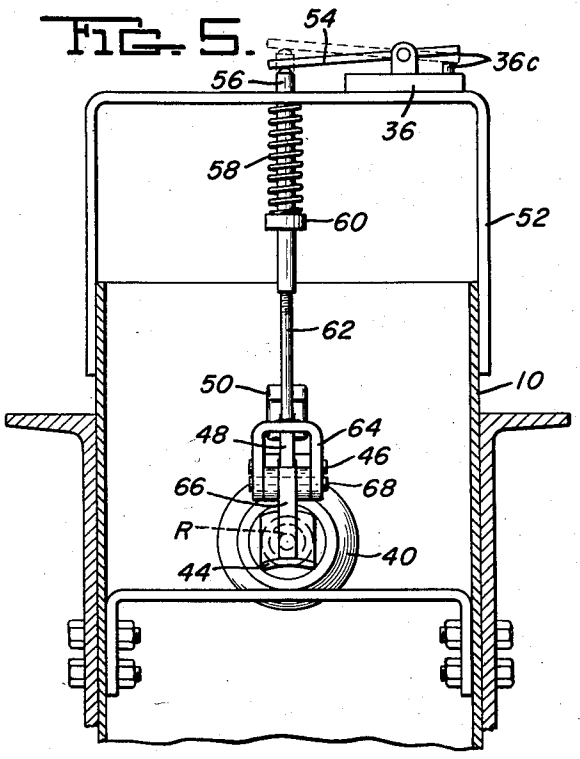
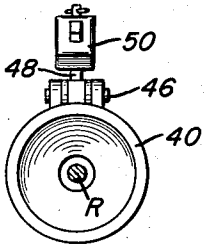


FIG. 6.



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APPARATUS FOR QUENCHING AND REELING RODS

Filed Sept. 15, 1955 3 Sheets-Sheet 3

FIG. 7.

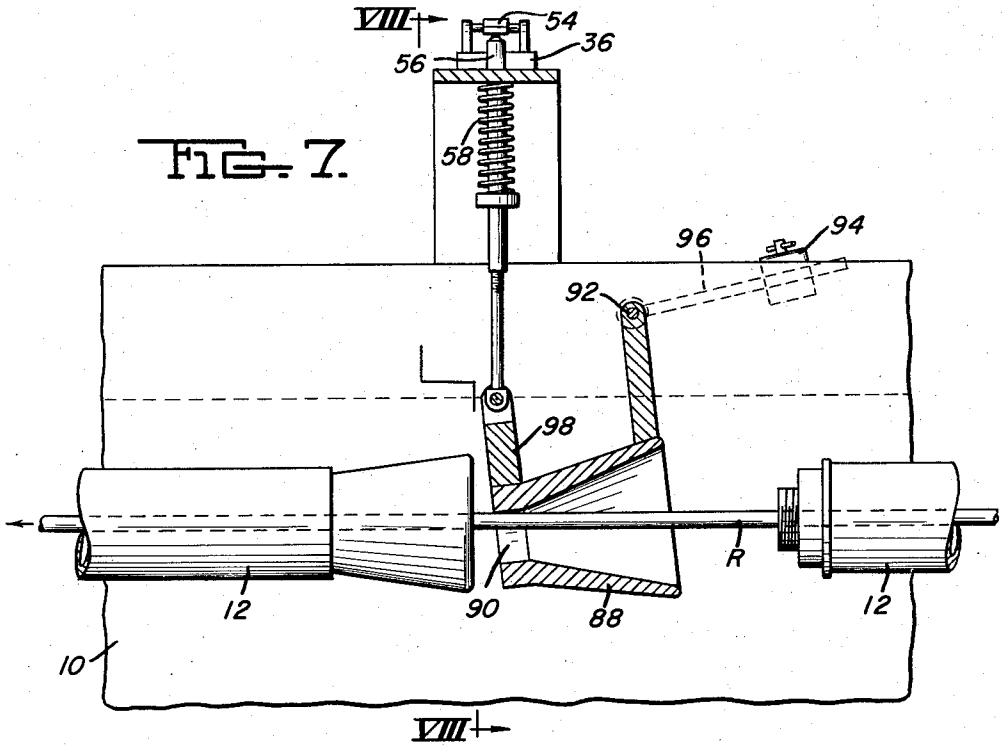
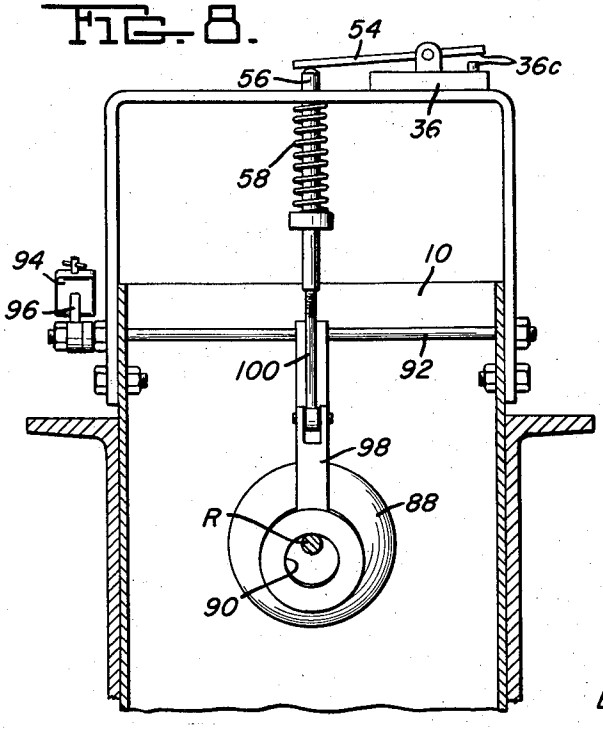


FIG. 8.



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APPARATUS FOR QUENCHING AND REELING RODS

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Application September 15, 1955, Serial No. 534,576

2 Claims. (Cl. 134—46)

This invention relates to apparatus for quenching and reeling rods and more particularly for quenching hot rolled rods with water as they emerge from the last pass of the mill prior to being reeled into bundles. Apparatus suitable for this purpose is shown in the patent to Strachan No. 2,658,012, dated November 3, 1953. However, that apparatus utilizes an electric eye to operate a valve for supplying water to the rod and I have found that the electric eye becomes dirty in use with the result that the cooling water is not supplied to the rod in some instances.

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;

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

Figure 4 is an enlarged view of a detail of Figure 1;

Figure 5 is a view taken on the line V—V of Figure 4;

Figure 6 is a view taken on the line VI—VI of Figure 4;

Figure 7 is a view, similar to Figure 4, showing a modification thereof; and

Figure 8 is a view taken on the line VIII—VIII of Figure 7.

Referring more particularly to the drawings, 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 in an electric circuit including a power source L1 and L2 and a switch 36. A guide 38 is arranged between two of the sections 12. The guide 38 consists of a bell mouth 40 and an extension 42 having a cover 44 pivotally mounted on a pin 46. The lower end of cover 44 is in line with the path of movement of rod R. An arm 48 on cover 44 extends rearwardly from the pin 46 and has a counterweight 50 adjustably

mounted thereon. The switch 36 is mounted on a bracket 52 secured to the water cooler box 10. A lever arm 54 pivoted intermediate its ends has one end connected to switch contact 36C and the other end in line with a rod 56. A spring 58 surrounds the rod 56 with one end abutting bracket 52 and the other end abutting a shoulder 60 on the rod 56. An externally threaded rod 62 is threaded into the lower end of rod 56. The lower end of rod 62 has bifurcations 64 with a portion 66 of cover 44 extending upwardly therebetween and pivotally connected thereto by means of pin 68.

In order to provide for manual operation, a by-pass 70 is provided around the valve 32. A manually operated valve 72 is provided in the by-pass 70. The rod R passes from the cooling box 10 through a pipe 74 to the reel 76. The reel 76 has a housing 78 within which are guide pins 80 mounted on a member 82 which is rotated by means of gearing 84.

The operation of the device is as follows:

When the rod R contacts the concave bottom end of cover 44 the cover 44 moves upwardly around its pivot 46 to the broken line position shown in Figure 4. Very little force is necessary for this purpose because of the counterweight 50. This pivoted movement raises rods 56 and 62 causing lever arm 54 to move to the broken line position of Figure 5, thus closing contacts 36C of switch 36 to complete a circuit to energize solenoid 34 to open quick acting valve 32. This starts the flow of water into the header 24, thence into the space 18 and then through the holes 20 to spray the rod passing therethrough. The uncooled forward end portion of the rod will readily wrap itself about the pins 80 of the reeler, thus eliminating cobbling. Once the rod is securely wrapped around the pins 80 the quenched rod will follow without damage. After the rod R passes from under the cover 44 the spring 58 will bias the rods 56 and 62 downwardly to return the cover to its normal position, thus opening contacts 36C so that 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 86. The apparatus will then be ready to receive the next rod.

In the embodiment of Figures 7 and 8 a guide 88 is provided which, in place of a cover, has a portion 90 normally in line with the path of travel of the rod R. The guide 88, including the portion 90, is pivotally mounted for movement with pin 92. A counterweight 94 is mounted on the end of an arm 96 which like guide 88 is fixed for rotation with pin 92. An arm 98 attached to guide 88 is pivotally connected to a rod 100 corresponding to rod 62. The rod 100 is threaded into rod 56. The construction and operation of this embodiment is otherwise the same as that of Figures 4, 5 and 6.

While two embodiments of my invention have 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 a hot rolled rod comprising water quenching means through which the rod passes, a guide associated with said water quenching means through which the rod passes, the entry end of said guide being bell-mouthed to receive said rod, said guide having an axial opening therethrough, a portion on said guide normally in line with the path of travel of said rod, means pivotally mounting said portion for actuation by said rod, 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, an electric circuit for supplying current to said solenoid, a switch in said circuit, means connected to

said portion for operating said switch when said rod is in contact with said portion, and resilient means biasing said portion to its normal position when said rod is out of contact with said portion.

2. Apparatus for quenching and reeling a hot rolled rod comprising water quenching means through which the rod passes, a guide associated with said water quenching means through which the rod passes, the entry end of said guide being bell-mouthed to receive said rod, said guide having an axial opening therethrough, a pivotally mounted cover for said guide, the lower end of said cover being in line with the path of travel of said rod for actuation by said rod, a counterweight for said cover, 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 electric circuit for supplying current to said solenoid, a normally open switch in said circuit, means connected to said cover for closing said switch when said rod is in contact with said cover, and resilient means biasing said cover to closed position when said rod is out of contact with said cover.

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