

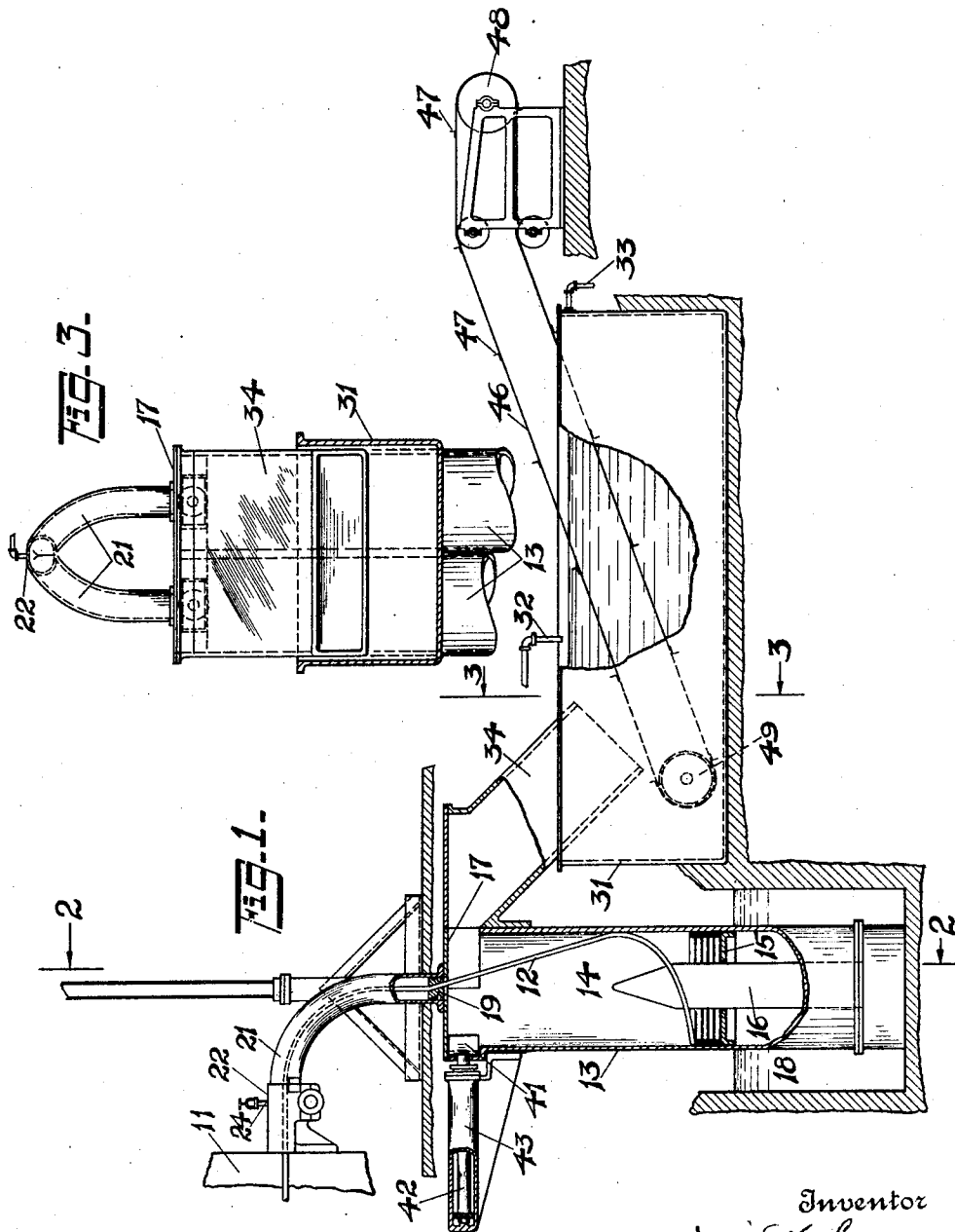
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1,739,620

Filed May 24, 1928

2 Sheets-Sheet 1



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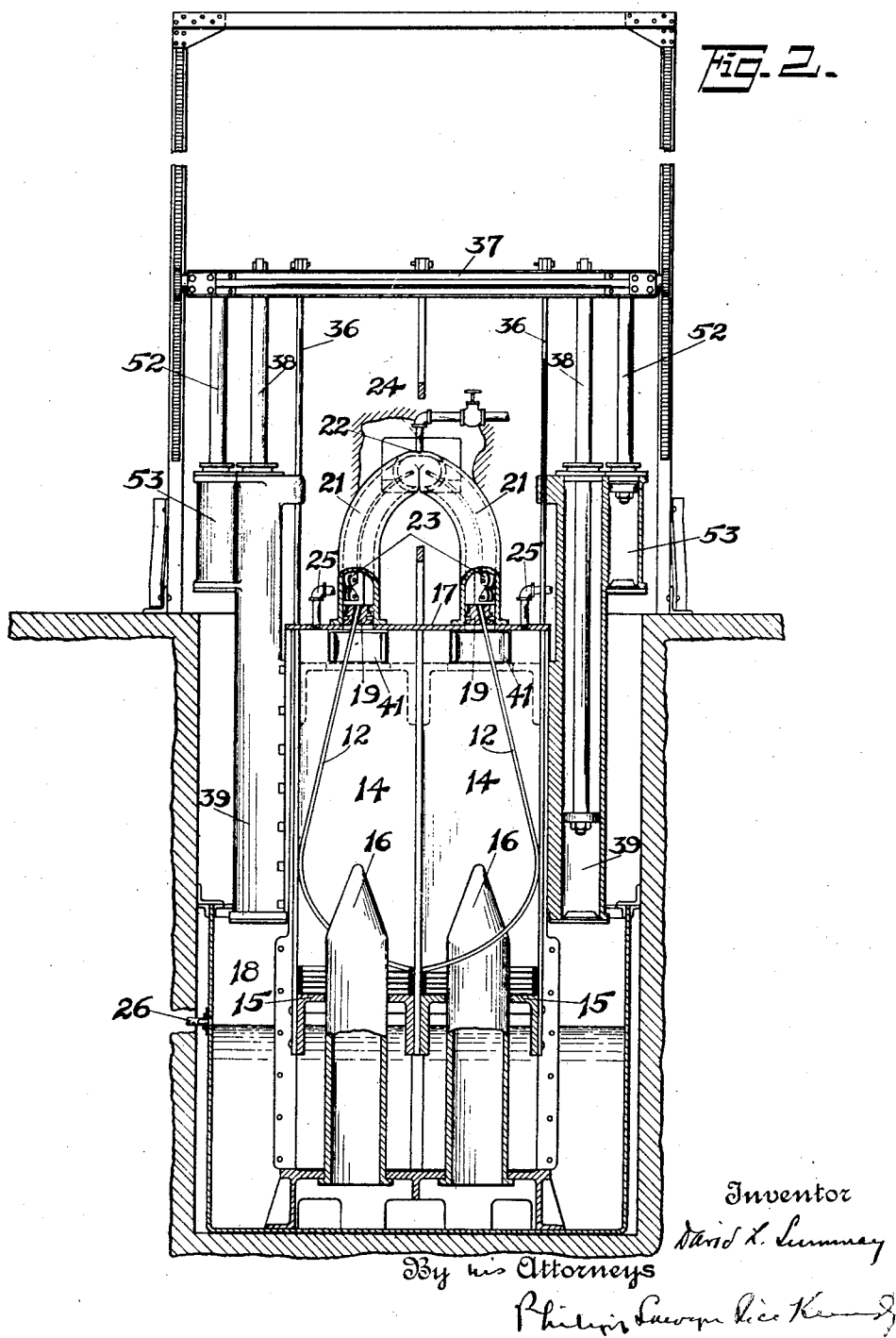
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UNITED STATES PATENT OFFICE

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METAL COILING APPARATUS

Application filed May 24, 1928. Serial No. 280,149.

This invention relates to metal coiling apparatus.

It is an object of the invention to provide apparatus for effectively and economically coiling and cooling extruded stock without oxidation of the metal.

With this general object in view, the invention consists in the features, combinations, details of construction and arrangements of parts which will first be described in connection with the accompanying drawings and then more particularly pointed out.

In the drawings:

Figure 1 is a view in side elevation, with parts in section, and largely diagrammatic, of apparatus constructed in accordance with the invention;

Figure 2 is a sectional view (enlarged) taken on the line 2—2 of Fig. 1; and

Figure 3 is a detail view showing part of the apparatus in end elevation.

Referring to the drawings, 11 indicates the delivery end of an extrusion press. This may be of any suitable construction, for example, that shown in a co-pending application Serial No. 94,334. This press is arranged to extrude two rods or wires 12 side by side.

There is provided means for coiling the extruded stock and cooling the same in a non-oxidizing atmosphere. This may be accomplished by coiling the rods in a closed chamber, transferring the coils to a cooling tank, and setting up a non-oxidizing medium adjacent the path of travel of the stock from the press to the tank.

While the coiling means may vary in construction, in that here shown as an example, below the end of the extrusion press are two cylindrical housings 13 forming coiling chambers 14. In each chamber is an annular rod-receiving platform 15 surrounding a central post 16. The two chambers are closed at the top by a common cover 17 and at the bottom by a water bath located in a pit 18.

Located centrally above each post 16 is a rotary whipping or coiling block 19 having an oblique bore through which the rod passes. As the block is rotated, which may be accomplished in any suitable manner, the rod is laid in a coil on platform 15 as indicated in

the drawing and as described in the co-pending application referred to.

While the rods may be fed to the whipping blocks in any suitable manner, this may be conveniently accomplished by feeding rolls such as described in the application referred to. As here shown, extending from the delivering end of the extrusion press to the whipping blocks, which are located at the top of chambers 14, are conduits or housings 21 having a common receiving portion 22. These housings are curved outwardly and downwardly to constitute proper paths for the extruded rods in their passage from the press to the coiling chambers. Fig. 2 indicates feeding rollers 23 in housings 21, these rollers being omitted from Fig. 1 for simplicity of illustration.

There is provided means for setting up a non-oxidizing medium along the path of the extruded rods. This may be accomplished, for example, by steam, carbon dioxide or other suitable gas. In the present exemplification, at the receiving end of housings 21 is a pipe 24 for delivering a water spray or stream. This stream entering housings 21 and passing, in part, down along the feeding rollers, falls on the hot extruded stock and forms steam. Located in the cover 17 of the coiling chambers are a plurality of pipes 25 for delivering sprays into chambers 14. These sprays also form steam by falling on the hot metal.

Pit 18 has an overflow pipe 26 to maintain the water bath level.

Adjacent the coiling chambers is a cooling tank 31 containing a cooling bath, for example, water. An inlet pipe 32 and overflow pipe 33 enable a constant bath level to be maintained. Opening out of the upper ends of coiling chambers 14 is a common transfer spout 34 the lower open end of which is sealed by being located below the water level in tank 31. After the coiling of a pair of rods has been completed, platforms 15 are raised to bring the coils in line with the mouth of spout 34. While this may be accomplished in any suitable manner, as here shown as an example, the platforms are connected by links 36 with a cross head 37. Con-

5 nected to this cross head are the piston rods 38 of two fluid pressure units 39. As is more fully described in the application referred to, the lower ends of cylinders 39 may be connected through control valves (not shown) with a fluid pressure system. The upper ends may be direct connected in the pressure line and thus under what may be termed constant return pressure. To raise the crosshead, these valves are opened and the pistons are advanced, the return pressure being ineffective because of the differential in piston area.

10 This raising of the crosshead elevates the platforms to a position to be pushed into spout 34.

15 To transfer the coils from the platforms, as here shown as an example, opposite the mouth of spout 34 are two arcuate pushers 41 mounted on the ends of piston rods 42 of fluid pressure units 43. By means of power applied in cylinder 43 pushers 41 are advanced to push the two coils from platforms 15 into spout 34. The transferred coils slide down the spout into the water bath of tank 31 to be cooled thereby.

20 There is provided means for delivering the coils from the cooling tank. Although capable of various constructions, as here shown as an example, traveling through the cooling tank is an endless belt 46 having a plurality of spaced cleats 47. The belt is driven by a pulley 48 located outside the tank and passes over a guide pulley 49 located near the bottom of the tank. This gives the belt an upward slanting path out of the tank with its lower end located under spout 34. As the coils slide down the spout into the cooling bath they drop onto belt 46 and, being engaged by cleats 47, are carried upward through the bath and out of the tank. At the upper end of the belt the coils may be removed in any suitable manner. If desired, carbon dioxide or other suitable gas can be delivered above the surface of the water in tank 31 as a non-oxidizing medium.

45 By the time the coils reach this point of removal the metal has been cooled. As the travel of emergence from the pass to the point of removal from the cooling tank is in a non-oxidizing atmosphere or medium, oxidation of the hot metal is prevented.

To return the platforms to initial position, the valves controlling cylinders 39 are closed and the pistons move down under constant return pressure, thus lowering the crosshead. The pushers 41 are similarly reversed.

50 There is provided means for fixing the initial or normal position of the platform. To this end, located below crosshead 37, but disconnected therefrom, are two piston rods 52, of relatively short fluid pressure units 53. The lower ends of these cylinders are valve controlled and the upper ends are under constant return pressure. When the crosshead is raised, as above described, it moves away

from these piston rods. Upon reverse movement of the crosshead, under return pressure in units 39, piston rods 52 serve as stops to position the platforms in coil-receiving position. That is, units 53 being kept under variable pressure, when the descending crosshead strikes the ends of piston rods 52, the variable pressure of units 53 is effective over the return pressure of units 39 and the crosshead is stopped by the ends of piston rods 52.

70 If it is desired to cool the platforms, after delivery of a pair of coils by pushers 41, units 53 as well as units 39, are put under return pressure. Consequently, piston rods 52 are withdrawn from stop position and the pistons of units 39 can, therefore, make their full stroke. This causes platforms 15 to be lowered into the water bath in pit 18 and so cooled.

80 To return the parts to initial position, under these conditions, units 53 are put under variable pressure and so advanced. The ends of piston rods 52 engaging crosshead 37 push the same upwardly thus raising the platforms. Meanwhile units 39 are under return pressure and their pistons are merely drawn upwardly by the dominant pressure of units 53. The full stroke of piston rods 52 determines initial position of the crosshead and platforms and by maintaining variable pressure on units 53 the crosshead is held in this position until variable pressure is again applied to units 39 to raise the platforms to discharge the next pair of coils.

90 Pressure fluid may be applied to the several units and the units controlled in any suitable manner, for example, as described in the copending application referred to, in which certain features of the apparatus here described are claimed.

What I claim is:

1. In combination with an extrusion press, a substantially closed chamber, means for causing extruded stock to be coiled in said chamber as it comes from the press, and means for setting up a non-oxidizing medium in said chamber.

2. In combination with an extrusion press, a substantially closed chamber, means for causing extruded stock to be coiled in said chamber as it comes from the press, means for setting up a non-oxidizing medium in said chamber, a cooling tank, a substantially closed passage between said chamber and said tank, and means for transferring the coiled stock from the chamber to the tank.

3. In combination with an extrusion press, a substantially closed chamber, means for directing the extruded stock from the press to said chamber and causing it to be coiled therein, and means for setting up a non-oxidizing medium along the path of the stock to said chamber and in said chamber.

4. In combination with an extrusion press, a substantially closed chamber, means for di-

recting the extruded stock from the press to said chamber and causing it to be coiled therein, and means for applying a water spray to the hot metal in its path to the chamber and in the chamber, whereby the stock is delivered and coiled in a steam bath.

5. In combination with an extrusion press, a substantially closed chamber, means for directing the extruded stock from the press to said chamber and causing it to be coiled therein, a cooling tank, means for maintaining a substantially constant water level in said tank, a spout leading from the coiling chamber to the tank and having its discharge end below the water level in the tank, and means for transferring the coiled stock from the chamber to the tank.

In testimony whereof, I have hereunto set my hand.

DAVID L. SUMMEY.