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APPARATUS FOR THE CONTINUOUS TREATMENT OF METAL BODIES

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Fig. 1

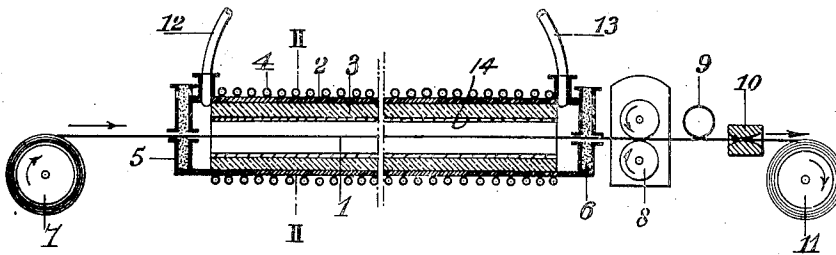
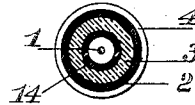


Fig. 2



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APPARATUS FOR THE CONTINUOUS TREATMENT OF METAL BODIES

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The present application will describe a process of continuous heat treatment of metallic pieces consisting essentially in raising the metal to the most favourable temperature for the treatment to be undergone, by means of an electric current and in particular by induced currents of high frequency.

The present invention has for its object an apparatus enabling the above process to be carried out and enabling in addition the heating to be effected in an active or neutral atmosphere, compressed or rarefied according to the needs of the particular case.

In particular an apparatus for the treatment of metallic pieces such as wires, bars, tubes and strips for rolling, wire drawing, hardening, tempering, etc. comprises immediately in front of a mechanical treating device, a tube having a heating winding connected to a source of electric current of high frequency, through which tube the metal to be treated is caused to pass at a convenient speed. Appropriate means are provided for regulating the intensity of current and the speed of the objects being treated.

Preferably the tube comprises two openings through which as may be needed, a vacuum can be produced within the tube, or the atmosphere can be compressed, or a current of gas which may be neutral or have active properties as the case may be, passed over the metal to be treated.

By way of example, several embodiments of such apparatus have been illustrated in the accompanying drawing.

Figure 1 is a longitudinal sectional view of an apparatus for rolling and drawing a wire or strip of steel.

Figure 2 is a section on the line II—II of Figure 1.

In the example shown in Figure 1 the purpose is to roll and draw a so-called "machine wire" which corresponds to the smallest diameter which can be obtained hot at the present time. The wire 1 is stretched by the usual

means along the axis of the tube 2. The latter is formed by a dielectric such as fused silica, lined on the inside with a heat insulator 3. The inductor is constituted by a winding formed of a tube 4 of copper, with internal circulation of water and connected with some source of electric current at high frequency. Packing glands 5 and 6 ensure gas tightness of the tube 2. Pipes 12 and 13 permit the interior of the tube 2 to be put into communication with a vacuum pump, or into a circuit of inert or active gas, under pressure or not. By this means in particular oxidation of the wire raised to a high temperature can be avoided.

The wire to be treated is rolled on a bobbin 7, the rolling mill 8 gives the metal the desired profile.

The wire can also be passed through a wire drawing die 10; a certain length of wire represented diagrammatically by a loop 9 can be provided between the rolling mill and the die for giving the necessary liberty for proper operation of the two devices.

In the example shown in Figure 2 there is provided in addition to the tube 2 of dielectric material and the heat insulating tube 3, a third tube 14 of graphite which is therefore raised to a high temperature and the wire 1 therefore heated by radiation from this tube 14.

The device is applicable particularly in cases where a metal of high electrical conductivity is being worked.

It is clear that the device shown is merely a particular example which can include manifold variations.

It should be mentioned that this invention can be applied to all metals, alloys and bodies in general worked at high temperatures.

I claim:

1. Apparatus for the continuous thermal treatment of metallic bodies comprising an air-tight tube of heat insulating material, the interior of this tube being provided with a

facing of material conductive of electricity, said tube being surrounded by an inductor coil connected to a source of high frequency electricity.

- 5 2. Apparatus for the continuous thermal treatment of metallic bodies comprising an air-tight tube of heat insulating material, the interior of this tube being provided with a facing of material conductive of electricity,
10 said tube being surrounded by an inductor coil connected to a source of high frequency electricity, said coil being itself tubular and having means for leading a current of cooling fluid through said tubular coil.

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