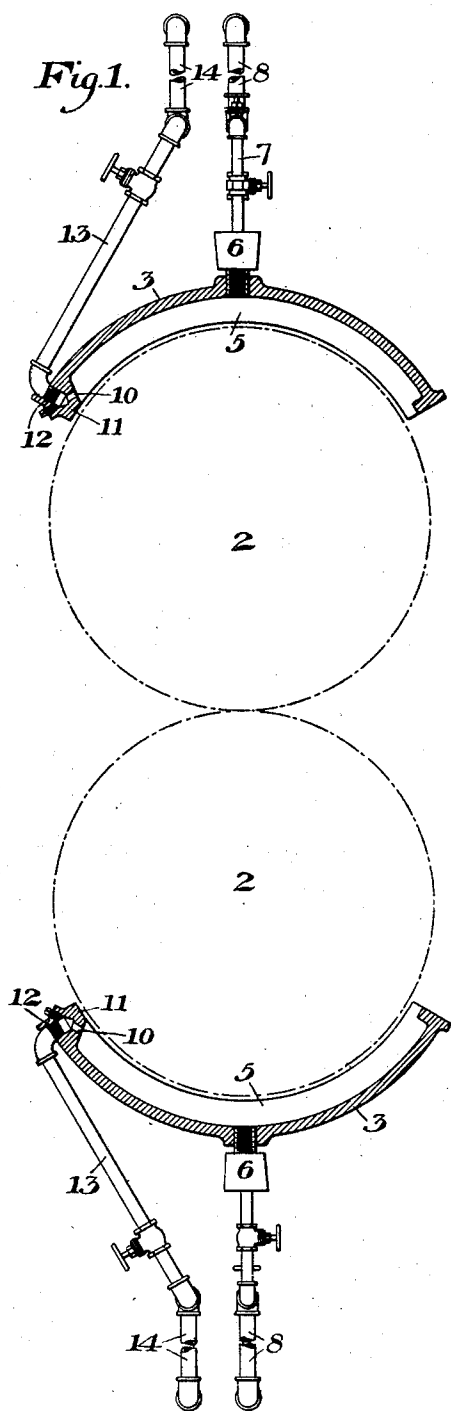


No. 737,571.

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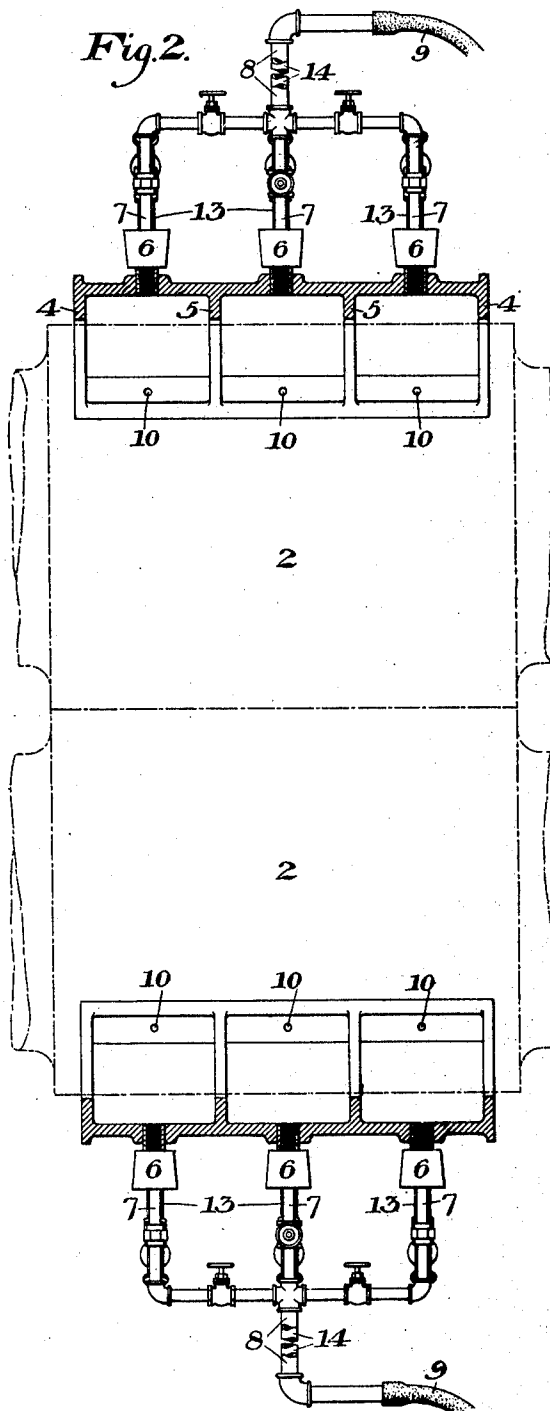
C. W. BRAY.
ROLL HEATING AND COOLING APPARATUS.
APPLICATION FILED NOV. 5, 1902.

NO MODEL.



WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES W. BRAY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE AMERICAN TIN PLATE COMPANY, OF ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ROLL HEATING AND COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 737,571, dated September 1, 1903.

Application filed November 5, 1902. Serial No. 130,131. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. BRAY, of Pittsburg, Allegheny county, Pennsylvania, have invented a new and useful Roll Heating and Cooling Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a vertical section showing a two-high set of rolls provided with my improved apparatus, and Fig. 2 is a sectional front elevation of the same.

My invention relates to apparatus for varying the temperature of rolls in rolling-mills, to control their contour, and keep them of the desired shape.

In rolls for rolling sheets the rolls are turned slightly concave, so that as they expand under the heat of the metal they will be brought to proper shape; but it is found in practice that the rolls cannot be kept of the proper shape, as the metal is fed irregularly and the rolls will contract during the intervals and produce irregular sheets. My invention is designed to overcome this difficulty and to provide both heating and cooling means by which the different parts of the roll-body may be kept of the desired shape and size independently of the heat from the metal being rolled.

In the drawings, 2 2 are the rolls of a mill for rolling sheets, which may be either a set of rolls in a continuous mill or an ordinary separated mill. Above the upper roll and below the lower roll I place my improved heating and cooling mechanisms, which are duplicates of each other. Each consists of a curved shield 3, which extends around a portion of the roll-body and is provided with end flanges 4, which are closely adjacent to the periphery of the roll-body. A curved heating-chamber is thus afforded, by which a quick and effective action is obtained. In order to regulate the different parts of the length of the roll, I preferably divide the heating-chamber into different chambers, of which I have shown three, by intermediate transverse

curved partitions 5, similar to the end flanges. The mixers and burners 6 extend through holes in the different chambers, preferably at an intermediate point above the center of the roll-body, and the mixers may be connected by branches 7 with a gas-main 8, which may be connected by flexible tubing 9 with a gas-supply main. The shield and burners may be supported in position over the roll-body in any suitable manner.

To provide for cooling the roll-body or a part thereof, I provide air-inlets 10 for the different chambers, these inlets preferably being at one end, as shown in Fig. 1. At this end the shield is preferably provided with a thickened portion 11, into which the air-nozzles 12 project. The air-nozzles are connected by valved branches 13 with an air-pipe 14, which extends parallel with the gas-pipe and may be secured thereto. This pipe may also be supplied with air through a flexible hose. The end of the shield opposite to the air-inlet is left with an opening to allow exit of the gases, this opening preferably extending throughout the length of the shield. In using the device in starting the mill the burners are lighted and gas supplied to all the chambers, thus heating up the roll-body until it is brought to the proper shape. Rolling is then begun, and as the rolling continues the roll is kept of the proper shape by turning on or off the burners, by regulating the supply of gas to each burner, and by admitting air instead of heated gases to any or all of the chambers. The operator by observing the sheets can determine what part of the roll to heat or cool and is enabled to thus keep it in the proper condition, since he can heat or cool any part of its length to any amount desired.

The advantages of my invention result from the means for using a cooling-gas, such as air, in combination with the heating means, also from the use of the curved shields, which gives a quick and effective action, and, further, from the use of the chamber, which enables one part of the body to be heated or cooled independently of the other parts. The position of the shields is also important,

since they are out of the way and in no way interfere with the feeding in or out of the metal.

Many variations may be made in the form and arrangement of the apparatus without departing from my invention.

I claim—

1. A rolling-mill having mechanism for heating a roll and mechanism for applying a cooling medium to the same roll; substantially as described.

2. A rolling-mill having a heating-burner arranged to heat one of the rolls, and a valved pipe connected to a source of gaseous supply and arranged to direct a cooling-gas upon the same roll-body; substantially as described.

3. A roll having a curved shield partially inclosing the roll, and provided with an inner chamber, which is open on the roll side, and a heating-burner directed into the said chamber; substantially as described.

4. A roll having a curved shield embracing a portion of its periphery and provided with partitions, and valved burners directed into the chambers formed by the partitions; substantially as described.

5. A roll having a curved shield extending over its top and open to the face of the roll, and an air-pipe leading into the shield; substantially as described.

6. A roll having a curved shield, and a valved burner, and valved air-pipe leading thereto; substantially as described.

7. A roll having a curved shield extending throughout the major part of its length and embracing a portion of its periphery, said shield having transverse partitions forming chambers, each chamber having inlets for the heating and cooling medium; substantially as described.

8. A rolling-mill having a curved shield above the upper roll, and embracing the upper part of its periphery, said shield having an inlet for a heating medium; substantially as described.

9. A pair of rolls having shields located above the upper roll and below the lower roll, and heating-burners projecting into the shields; substantially as described.

10. A rolling-mill having a curved shield below the lower roll and open to the face of the roll, and a heating-burner projecting into said shield; substantially as described.

In testimony whereof I have hereunto set my hand.

CHARLES W. BRAY.

Witnesses:

GEO. B. BLEMING,
H. M. CORWIN.