May 1, 1928.

1,667,884

C. A. CREMER

SHEET MILL ROLL HEATER

Filed Nov. 15, 1924

3 Sheets-Sheet 1

Fig. 1.

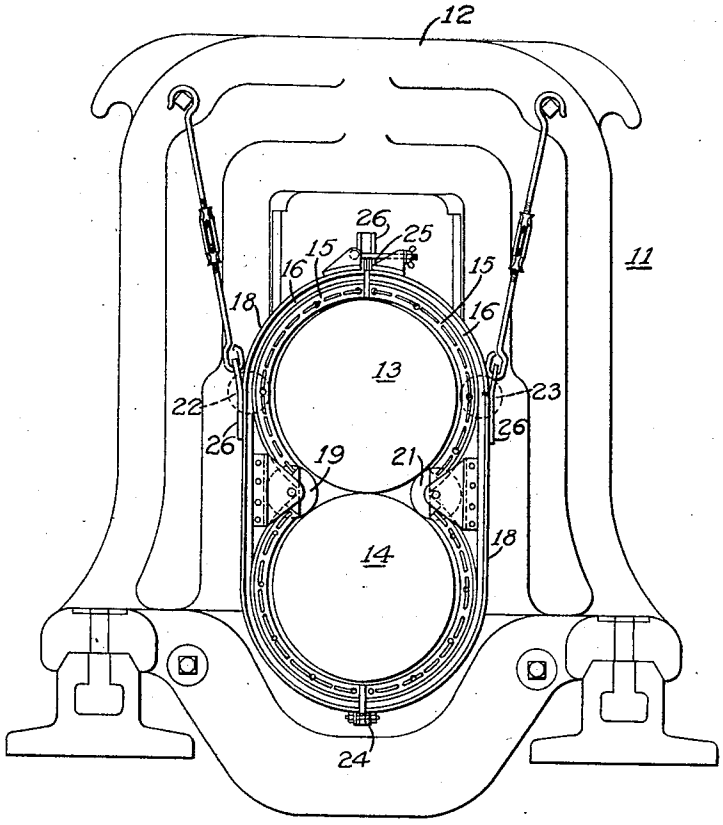
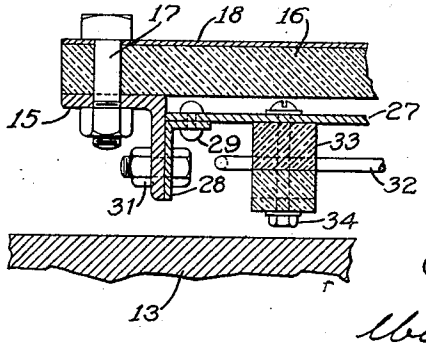


Fig. 2.



WITNESSES:

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3 Sheets-Sheet 2

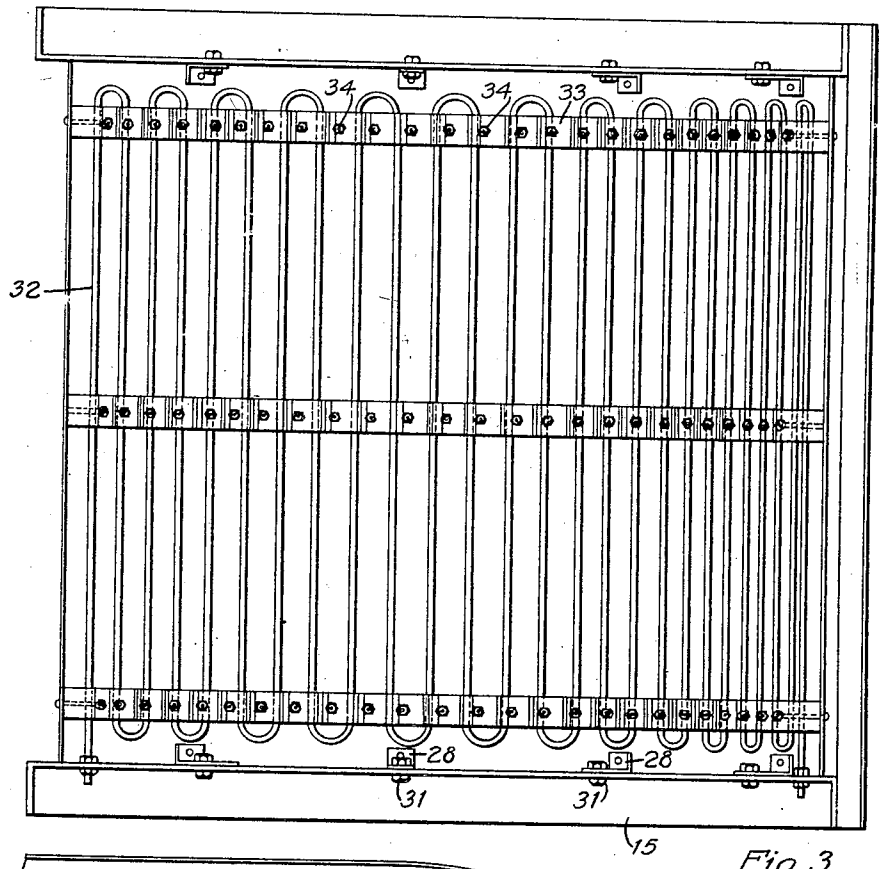


Fig. 3.

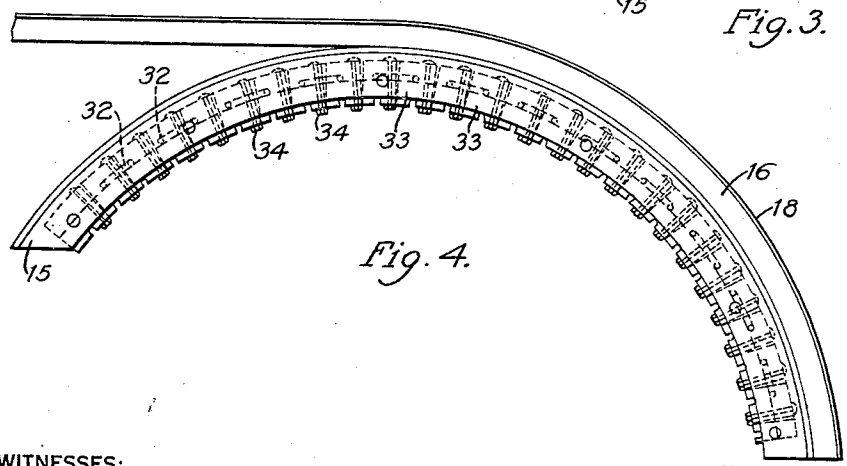


Fig. 4.

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SHEET MILL ROLL HEATER

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3 Sheets-Sheet 3

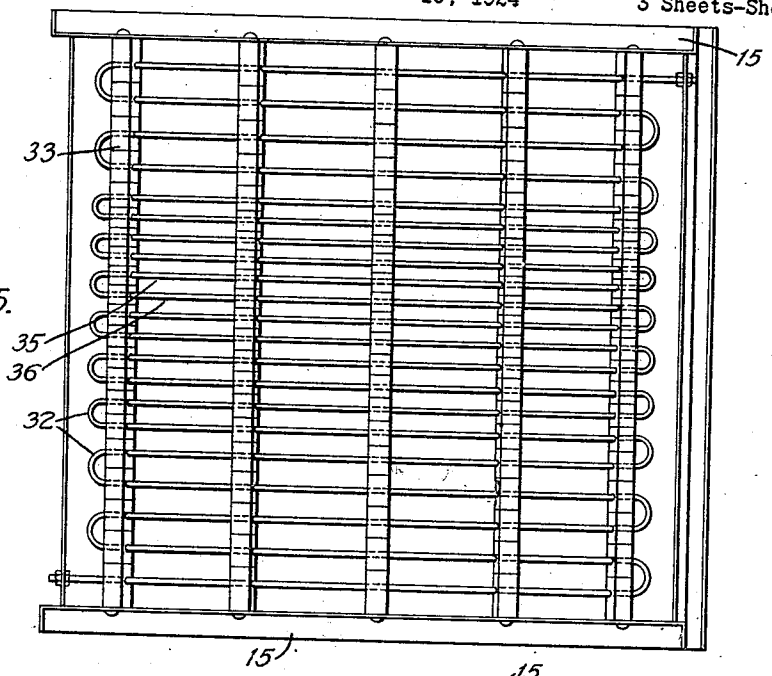


Fig. 5.

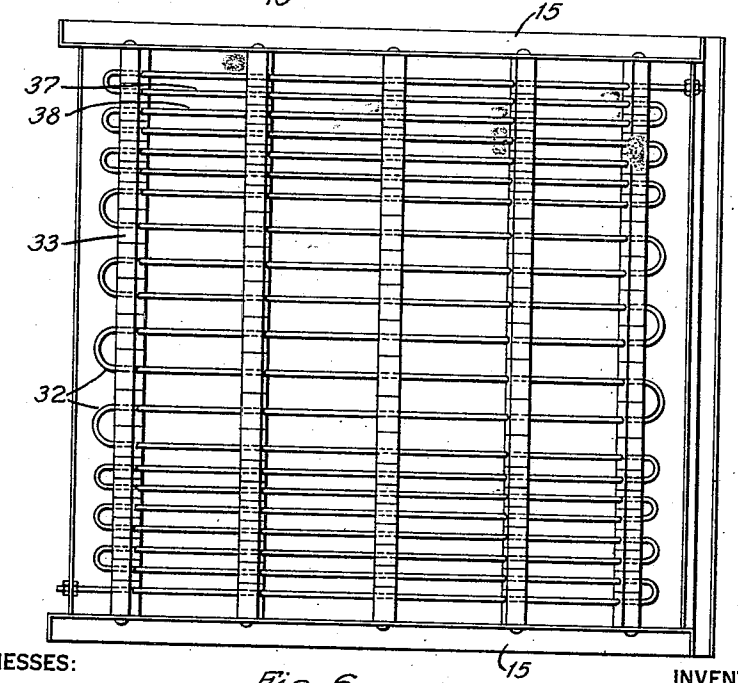


Fig. 6.

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Patented May 1, 1928. 1,667,884

UNITED STATES PATENT OFFICE.

CECIL A. CREMER, OF BELLEVUE, PENNSYLVANIA.

SHEET-MILL-ROLL HEATER.

Application filed November 15, 1924. Serial No. 750,123.

My invention relates to electric heating units and particularly to sheet mill roll heaters.

One object of my invention is to provide a simple and practical means for heating the rolls of a sheet mill.

Another object of my invention is to provide a sheet mill roll heater that may be easily installed and that will be substantially self-supporting.

A further object of my invention is to provide a sheet mill roll heater of such construction that the rolls of the sheet mill may be rotated while the heater is in operative position.

A still further object of my invention is to provide a sheet mill roll heater that is so constructed that it will maintain a substantially fixed position relatively to said rolls.

In practicing my invention, I provide a plurality of pairs of rigid angular resistor supporting members that conform substantially to the form of the rolls to be heated. A plurality of longitudinally extending return-bent resistor members are supported therebetween. The resistor supporting members serve as a support for a heat insulating member that extends substantially the entire length of the rolls and that is firmly held in operative position by means of a sheet of metal that is bolted to the resistor supporting members. A plurality of rollers are pivotally mounted on the resistor supporting members in such position that when the heating unit is in operative position, the rollers rest upon the lower sheet mill roll and are spaced from the upper roll by only a small fraction of an inch. Additional rollers are pivotally mounted in the resistor supporting members in such manner that they rest against the upper sheet mill roll. Opposing sets of resistor supporting members are clamped in operative position in any well known manner.

In the three sheets of drawings,

Figure 1 is a side elevational view of a sheet mill showing an electrical heating unit employed in my invention installed in operative position;

Fig. 2 is an enlarged detailed fractional view in lateral section, of the heating unit employed in my invention;

Fig. 3 is a top plan view of the heating unit;

Fig. 4 is a side elevational view of a portion of the heating unit employed in my invention;

Fig. 5 is a top plan view of another embodiment of the heating unit employed in my invention; and

Fig. 6 is a top plan view of still another embodiment of the heating unit employed in my invention.

A sheet mill generally indicated by the numeral 11 comprises a frame 12 for supporting a pair of rolls 13 and 14. A plurality of pairs of opposed resistor supporting members 15 of angle shape are arranged in such manner as to substantially encircle the rolls 13 and 14. Insulating members 16 are secured to resistor supporting members 15 in any suitable way such as by bolts 17 that also serve to secure a metallic sheet 18 against the outer surface of the insulating member 16. Rollers 19 and 21 are rotatably mounted on resistor supporting members 15 and are located between adjacent pairs thereof. Rollers 22 and 23 are pivotally mounted in resistor supporting members 15 adjacent to the upper roll 13.

The structure hereinbefore described provides a pair of opposed sets of resistor supporting members that are clamped together when in operative position in any suitable way by clamps 24 and 25. Lifting means 26 are provided to furnish a simple means of carrying the unit.

Metallic sheets 27 extend laterally between adjacent pairs of resistor supporting members 15 and are suitably secured thereto by angle members 28 and bolts 29 and 31. A resistor member 32 extends longitudinally of the rolls between the resistor supporting members 15 and is supported by an electrically insulating member 33 that is secured by bolt 34 to sheet 27. The resistor element comprises a plurality of longitudinally extending return-bent convolutions that are supported by a plurality of electrically insulating members 33 but I do not wish to be limited to the structure as described as other means for mounting the resistor unit may be employed without departing from the spirit of my invention.

I prefer to use a resistor of this construction as I have found that in a system where the rotation of the roll members is desired, a high temperature gradient is necessary be-

tween the resistor member and the rolls, and a resistor member of this construction provide a suitably high temperature for effectively heating the roll.

In Figures 5 and 6 I have shown other embodiments of my invention in that the convolutions of the resistor member extend laterally of the sheet mill rolls.

To provide concentrated heating effects, the intermediate portions of the resistor member 32 as at 35 and 36 are spaced more closely together than at the outer portions of the resistor and again concentrated heating may be accomplished at the outer portions by constricting the parallel extending portions of the resistor 32 as at 37 and 38.

In assembling, the unit resistor members 32 are mounted in the insulating members 33 and securely bolted to sheet 27 by bolts 34. The sheet 27 is then secured to resistor supporting members 15 and rollers 19 and 21, 22 and 23 are mounted thereon. The opposing sets of resistor supporting members 15 are then bolted to heat insulating members 16 and sheet 18 and placed in proper operative position on rolls 13 and 14 in such manner that rollers 19 and 21 ride on the lower roll 14, and rollers 22 and 23 rest against the upper roll 13. The opposed sets of resistor supporting members are then clamped securely together as at 24 and 25.

It is obvious, that a structure of this kind is supported from the rollers 19 and 21 and. more particularly, by the lower roll, in such manner that the resistor 32 is adjacent to, but removed from, the rolls 13 and 14. The rolls 13 and 14 may then be rotated and if a tendency for the heating unit to shift its position arises, the rollers 22 and 23 prevent any substantial change from the proper operative position. By rotating the rolls 13 and 14 an even heating thereof is accomplished, and it is obvious that a unit of this structure is simple to install and practical in operation. It is obvious that the rollers 19 and 21 will support the heating units in proper operative positions relatively to the two rolls, irrespective of their diameters. That is, the heating units are properly positioned where the diameter of the rolls is a maximum, as when new, and also when it is a minimum, as when they have been worn and turned down repeatedly.

Various modifications and changes may be made without departing from the spirit and scope of the invention, and I desire therefore that only such limitations shall be placed thereon as are imposed by the prior art or are set forth in the appended claims.

I claim as my invention:

1. In a sheet mill roll heater, the combination with a pair of rotatably mounted rolls to be heated, of an electrical heating unit supported by one only of said rolls and so located as to permit free rotation of said rolls, and means for maintaining said heater in its proper operative position relatively to said rolls irrespective of the direction of rotation thereof.

2. In a sheet mill roll heater, the combination with a pair of rotatably mounted rolls to be heated, and an electrical heating unit for heating said rolls, of means associated with said unit for supporting the same on only one of said rolls while rotating and for locating said unit relatively to said rolls.

3. In a sheet mill roll heater, the combination with a roll-supporting frame and a pair of rolls, of an electrical heating unit for heating said rolls, having a pair of rigid, opposed, resistor supporting frames so shaped as to conform substantially to the contour of said rolls, a plurality of refractory, insulating members supported thereby and a bare resistor member having a plurality of return bent convolutions supported by said insulating members.

4. In a sheet mill roll heater, the combination with a roll supporting frame and a pair of rolls, of an electrical heating unit for heating said rolls having a frame, a plurality of insulating refractory members supported thereby and a bare resistor member having a plurality of return-bent convolutions supported by said insulating members.

5. In a sheet mill roll heater, the combination with a pair of rolls to be heated, of an electric heating unit for heating said rolls and means for so supporting said heating unit that it is independent of variations in the diameters of said rolls resulting from wear thereof.

6. In a sheet mill roll heater, the combination with a pair of rolls to be heated, of an electric heating unit for heating said rolls, and means comprising a roller for so supporting said heating unit on the lower roll only that it is independent of variations in the diameter of said rolls resulting from wear thereof.

In testimony whereof, I have hereunto subscribed my name this 11 day of November, 1924.

CECIL A. CREMER.