

July 3, 1928.

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STRIP MILL

Filed Dec. 16, 1922

Fig. 1.

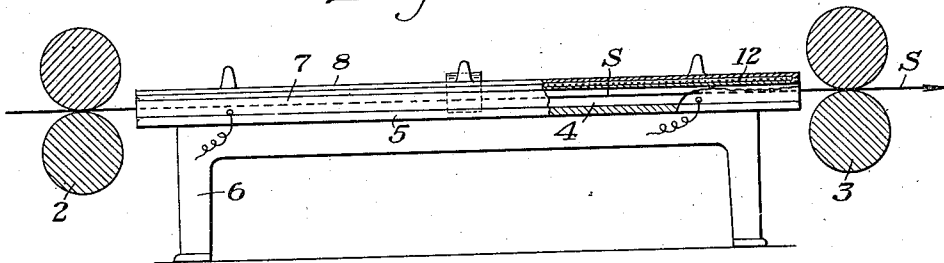


Fig. 2.

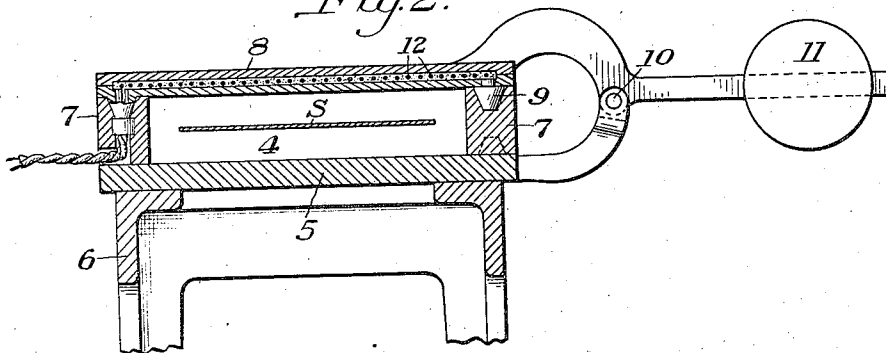
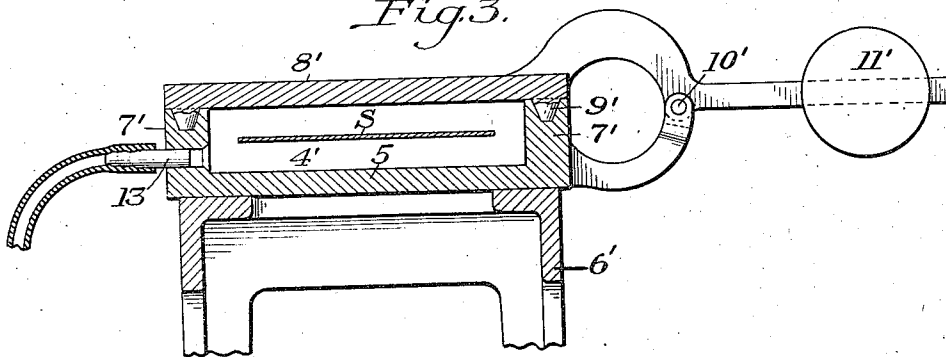


Fig. 3.



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STRIP MILL.

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The present invention relates broadly to strip mills and more particularly to mills of this character having means for adding heat to the material being rolled, for maintaining the material at a given temperature, or for preventing undue radiation of heat therefrom.

The term "strip" is used generically throughout the specification and claims as definitive of mills producing greatly elongated articles, as compared with the width or cross section, and may include wires, rods or the like.

It has heretofore been proposed in the art to which this invention relates to provide means for reheating the material between the roll passes or for heating the same as it is being rolled. The reheating means has frequently been objectionable, due to the loss of time and extra handling operations required, and the heating by rolling has been accompanied with considerable difficulty due to the cobbling or looping of the material, thereby resulting in damage to the heating means.

By the present invention, the foregoing objections are obviated, and there is provided means for maintaining the desired heat, conserving the initial heat or increasing the temperature of the material being rolled as it passes to successive roll stands.

In the accompanying drawings, there are illustrated more or less diagrammatically certain embodiments of the present invention, it being understood that these drawings do not define the limits of the invention, as changes may obviously be made in the construction and operation disclosed, without departing from the spirit or scope of my broader claims.

In the drawings:

Figure 1 is a side elevation, partly in section and partly broken away, illustrating one form of the present invention;

Figure 2 is a transverse sectional view through the chamber of Figure 1; Figure 2 being on an enlarged scale; and

Figure 3 is a view similar to Figure 2, but illustrating a modified embodiment of the invention.

In operating mills of the character to which this invention is particularly adapted, it frequently happens that the material cobbles or loops between the roll stands.

This tendency makes it somewhat difficult to provide means for heating the material while it is being rolled. Attempts have been made to provide special driving means for the different roll stands, whereby the speed thereof is maintained in such manner as to prevent the existence of slack between the roll passes. The present invention is adapted for use either with mills having special driving means of this character or with a mill driven in the usual manner.

In Figure 1, there are illustrated the rolls 2 of one pass and the rolls 3 of a succeeding pass, these rolls being adapted to successively operate upon a strip S of suitable material. Arranged between the roll passes and adapted to extend to points adjacent thereto is a muffle or heating chamber 4, adapted to substantially enclose that portion of the strip S between the roll passes. As illustrated in Figures 1 and 2, this means may comprise a base 5, supported in any desired manner, as by standards 6, to maintain the same at the proper elevation with relatively movable sides 7 and a top 8. The sides 7 may be held against accidental displacement by suitable dowels 9, these dowels however, preferably constituting a comparatively loose fit with the sockets provided therefor. The cover 8 may be formed of sections or in any other desired manner, but is preferably so mounted as to be easily movable to open position. This may be accomplished by providing a pivotal mounting 10, for the cover and a counterbalance 11.

With a construction of the character described, it will be apparent that if the strip should cobble between the roll passes, it will be effective for opening the cover 8, and if necessary, removing the sides 7. In this manner, the normal tendency of the strip to cobble is not prevented.

In Figure 3, there is illustrated a slightly modified embodiment of the invention, in which figure parts corresponding to parts already described are indicated for sake of conciseness with the same reference characters having a prime affixed thereto. In this construction, the sides 7' are illustrated as being integral with the base 5, although it will be apparent that the construction in this respect is immaterial. The main difference resides in the form of heating means provided. In the form shown in Figure 2, I

have illustrated a suitable electrical resistance 12, while in the form shown in Figure 3, there may be provided burners 13, for liquid or gaseous fuel.

5 In operation, if it is merely desired to prevent undue radiation of heat from the material being rolled, additional heat need not be supplied to the enclosing chamber. On the other hand, sufficient heat may be
10 supplied thereto to maintain a given temperature or additional heat may be furnished to increase the temperature of the material as it passes from one stand of rolls to the succeeding stand.

15 The advantages of this invention arise from the provision of a substantially enclosed chamber which may be easily opened by the material being rolled. Further advantages of the invention arise from the
20 provision of heating means in a chamber of this character whereby any desired temperature conditions may be maintained as the material is being rolled.

I claim:

25 1. In a continuous mill, material-receiving and heating means between successive roll stands adapted to receive the material being rolled as it leaves one stand and substantially enclose the same while remaining substantially out of contact therewith during
30 normal operation, said means having at least one side adapted to be opened by the cobbling of the material being rolled and being of such dimensions as to freely receive
25 the material and permit the free passage of heat entirely around the same, and means for heating the material during its passage through said heating means, substantially as described.

40 2. In a mill, an elongated material-receiving means adapted to receive and substantially enclose the material being rolled, said means having at least one substantially counter-balanced side adapted to be opened
45 by the cobbling of said material, said side being mounted to normally return to closed position, substantially as described.

3. A heating means for rolling mills comprising an elongated chamber adapted to
50 freely receive and normally remain substantially out of contact with the material being rolled and of such dimensions that the material does not occupy supporting relationship to the walls of the chamber, said chamber having at least one side openable to per-

mit cobbling of said material, and electrical heating means for said chamber, substantially as described.

4. A heating means for rolling mills, comprising an elongated chamber adapted to
60 freely and loosely receive and normally remain substantially out of contact with the material being rolled, at least one substantially counterbalanced side for said chamber to permit movement thereof as the material
65 cobbles, and means for supplying heat to said chamber, substantially as described.

5. In a mill, material receiving means adapted to substantially surround the material being operated upon and having heating means embedded in at least one wall
70 thereof, the material receiving means having a portion adapted to recede outwardly to prevent injury to the heating means upon movement of the material.

6. In a mill, material receiving means adapted to substantially surround the material being operated upon and having electric heating means in at least one wall
80 thereof, the material receiving means having a yieldable portion permitting cobbling of the material therein without injury to the heating means.

7. In a mill, material receiving and heating means adapted to normally substantially
85 surround the material being operated upon and having a wall thereof movable away from the material upon transverse movement of the material, such wall being adapted to return to its normal position when
90 not held outwardly.

8. In a mill, material receiving means adapted to normally substantially surround the material being operated upon and having a wall thereof movable away from the
95 material, such movable wall having connected thereto heating means for heating the material.

9. In a mill, material receiving means adapted to normally substantially surround
100 the material being operated upon and having a wall thereof movable away from the material upon transverse movement of the material, such movable wall having connected thereto heating means for heating the material and being adapted to return to its
105 normal position when not held outwardly.

In testimony whereof I have hereunto set my hand.

FLORENCE C. BIGGERT, JR.