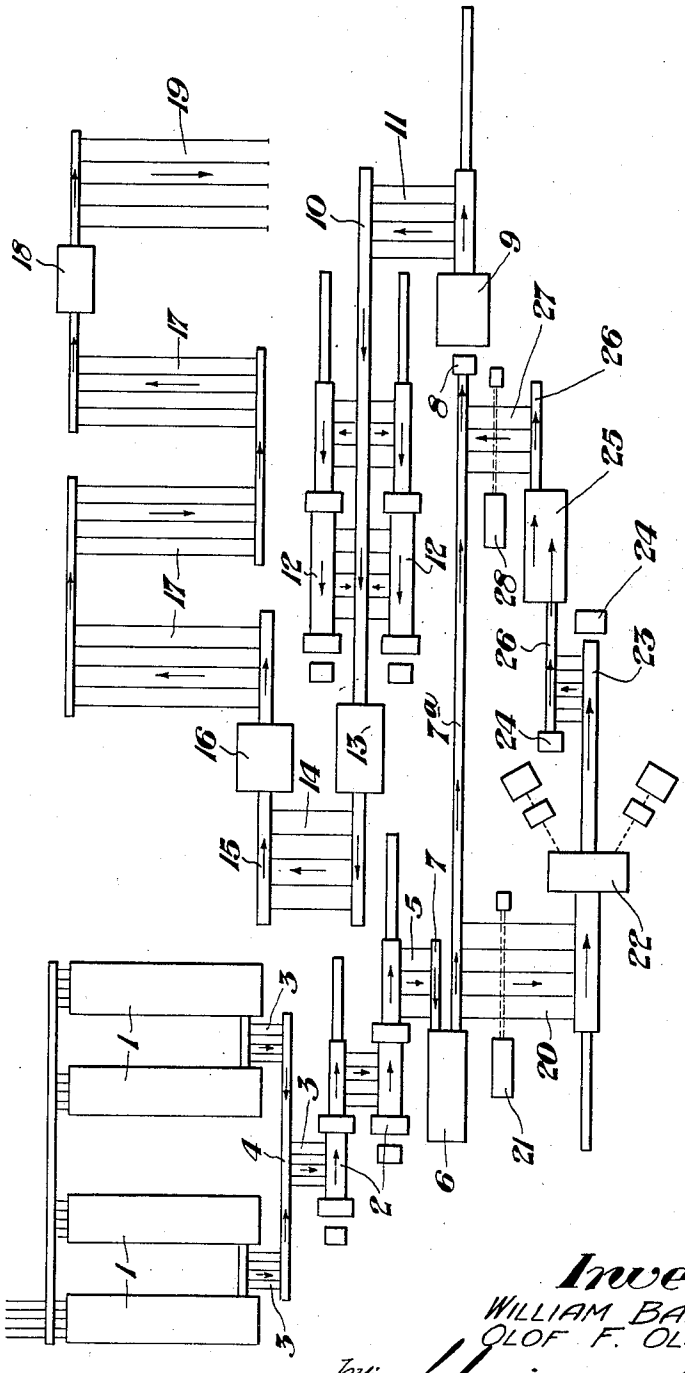
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TUBE MILL LAYOUT

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TUBE MILL LAYOUT

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2 Claims. (Cl. 80—11)

This invention relates to the manufacture of seamless tubes and particularly to a tube mill layout.

One of the objects is to arrange the units of this mill so that both large and small tubes may be rolled and yet the whole will not require the floor space necessary when using two separate and distinct mills for the different sized tubes as is conventional. Other objects will be understood from the following.

The accompanying drawing schematically illustrates the above layout and shows the new rolling mill specifically, the respective figures being as follows:

Figure 1 is a plan of the layout.

Figure 2 is a partial cross-section end elevation of the new mill showing the novel portion only.

Figure 3 is an end elevation of Figure 2 showing the horizontal rolls.

Figure 4 is an end elevation of Figure 2 showing the vertical rolls with their supports in cross-section.

Figure 5 is a vertical cross-section of a tube being rolled by the new mill.

The schematic figure shows a bank of billet heating furnaces 1 from which hot billets are conveyed to piercing mills 2 by means of the usual inclines 3 and conveying tables 4. These piercing mills are two in number, the second being of slightly larger construction so as to further enlarge the roughened pierced billet leaving the first mill. When the repierced billet leaves the second mill 2 it is rolled down an incline 5 and carried into a reheating furnace 6 by a conveying table 7. Here the billet is reheated for rolling.

If the billets are intended for relatively small sized tubes they leave the reheating furnace 6 and travel on a straight pipe conveyer 7^a through a sinking-sizing machine 8 and through a continuous plug or rolling mill 9. The construction of this last mill will presently be explained in detail. For descriptive purposes it is enough to say that this continuous rolling mill is constructed so that by a single straight-through pass it rolls the pierced billet into a tube. The sinking-sizing machine 8 has a single stand of rolls constructed to form the truest circular pass mechanically possible and functions to slightly reduce and true up the pierced billet.

This tube is transferred from the rolling mill 9 to a conveying table 10 over an incline 11. Reeling machines 12 are located on either side of the table 10 where they perform their usual function. After leaving one of these reeling machines the pierced, rolled and reeled billet is conveyed by the same table 10 to a sizing machine 13 where its outside diameter is corrected to the desired size. Leaving this machine it rolls down an incline 14 to a conveying table 15 which passes it between a pair of cross rolls 16 and onto conventional cooling tables 17. After cooling on these tables the tube is passed through a straightening machine 18 and is discharged to an inspection table 19.

In case the pierced billets charged in the furnace 6 are to be rolled into relatively large sized tubes they are shunted from the conveying table 7^a down an incline 20 past a scale blower 21 and into a rotary mill 22. This mill is of large and sturdy construction and rolls a billet into a tube of much greater size than could be conveniently accomplished by the rolling mill 9. This large tube leaves the rotary mill 22 on a conveying table 23 which brings it to a pair of rotary end shears 24 arranged to cut its crop ends.

The tube in this case is so large that it cools quite rapidly and must be reheated before further working. This is done in a second reheating furnace 25 arranged adjacent the shears 24, the tube being carried to and beyond this furnace by conveying tables 26.

The table 26 on the outlet side of the furnace 25 is higher than the long conveying table 7^a, and an incline table 27 carries the tube from one to the other, a scale blower 28 being arranged to clean its interior. This last is not so necessary with the smaller tubes because they do not accumulate much scale when only reheated once. The tube is then rolled further in the mill 9 and continues or this may be omitted and the tube completed without this second rolling.

Summarizing the above, the billet heating furnaces 1, piercing mills 2 and the reheating furnace 6 are all arranged so that hot pierced billets are ready for delivery to the continuous rolling mill 9. Also, should the rough pierced billet need rolling to such size that it cannot be handled by this rolling mill, it may be shunted through the rotary mill 22, reheating furnace 25 and then rolled in the mill 9 or passed on. The advantages of this layout are obvious to mill men or to any one who has seen the extreme amount of floor space required by seamless tube mills that roll both large and small diameter pipe.

Although a specific form of this invention has been shown and described in accordance with the patent statutes, it is not intended to limit its scope exactly thereto, except as defined by the following claims.

We claim:

1. A mill layout including billet heating furnaces, piercing mills and a reheating furnace arranged in succession and provided with means for carrying billets heated in said furnace from one unit to another; a continuous rolling mill, reeling machines and tube shape-correcting machines arranged in succession and provided with means

for conveying tubes from one to another; means for conveying pierced billets from said reheating furnace to said continuous rolling mill; and a rotary mill and a second reheating furnace arranged in conjunction with said last named means and provided with means for shunting heated billets from said first reheating furnace through said rotary mill, second reheating furnace and back for delivery to said continuous mill.

2. A mill layout including billet heating furnaces, piercing mills and a reheating furnace all arranged in a group for tandem operation; a continuous rolling mill, reeling machines, tube shape-correcting machines and cooling tables also all arranged in a group for tandem operation and further so that said rolling mill is in line with but remote from said reheating furnace; a rotary mill and second reheating furnace arranged to one side of the line between said first reheating furnace and said continuous rolling mill; and means for selectively transferring billets from said reheating furnace directly to said continuous rolling mill or to said rotary mill and second reheating furnace and then to said continuous rolling mill.

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