

Dec. 24, 1968

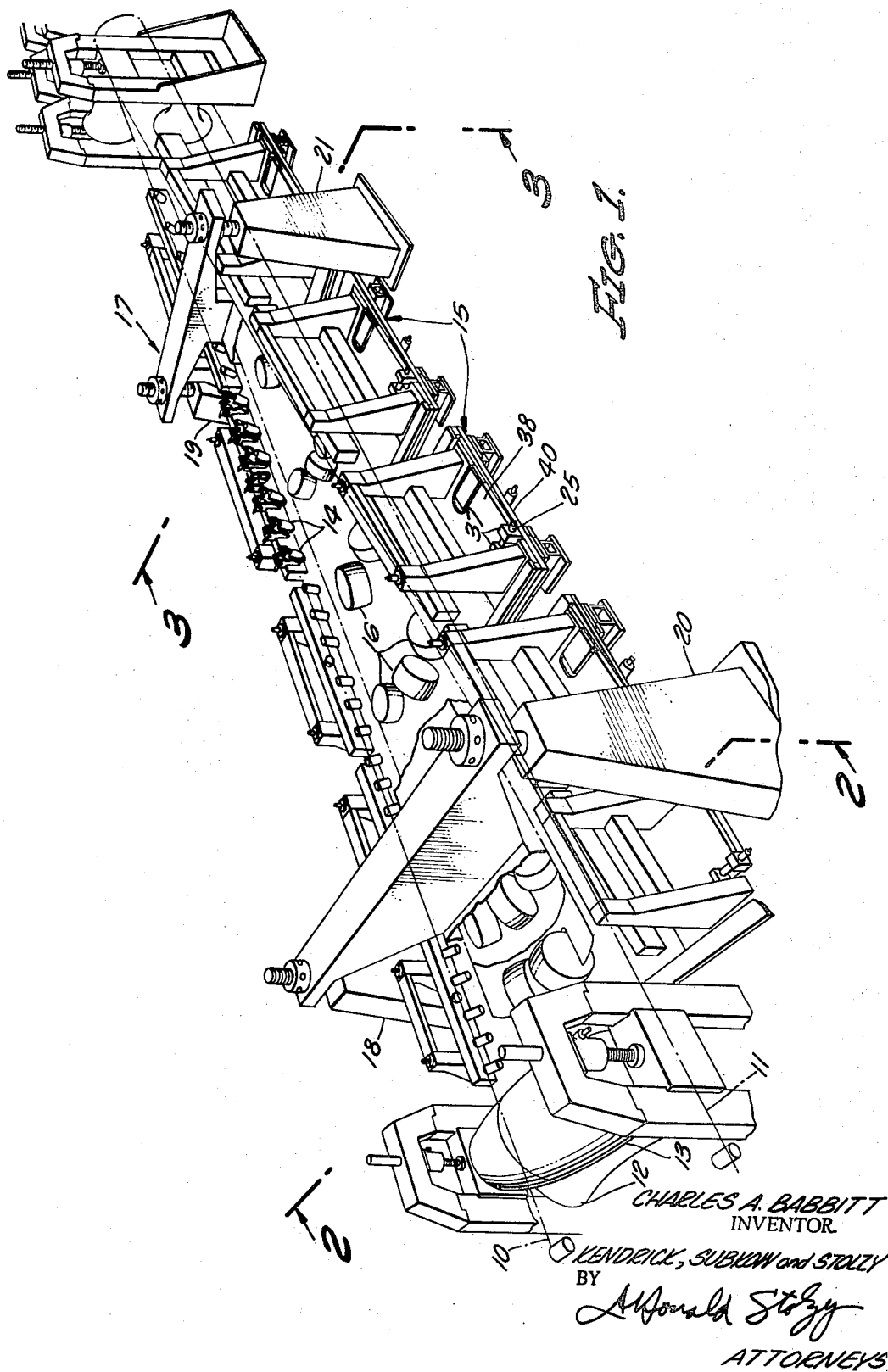
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3,417,591

TUBE MILL

Filed Oct. 21, 1965

2 Sheets-Sheet 1



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TUBE MILL

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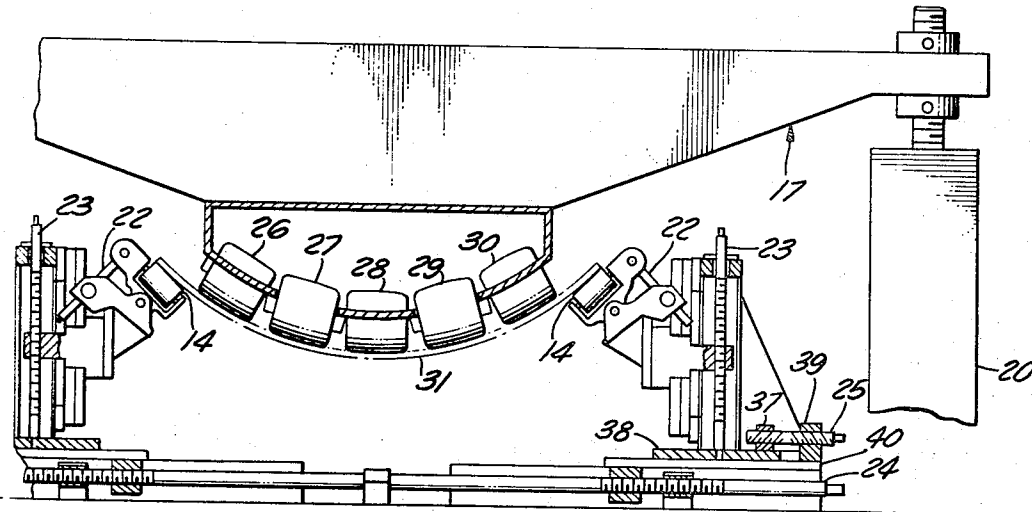


FIG. 2.

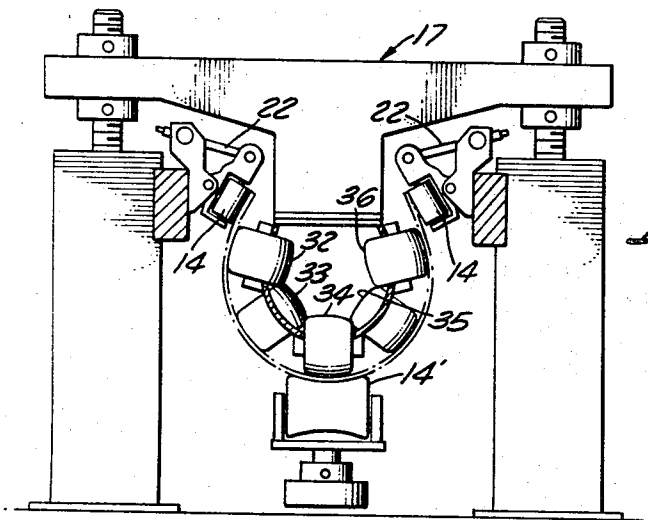


FIG. 3.

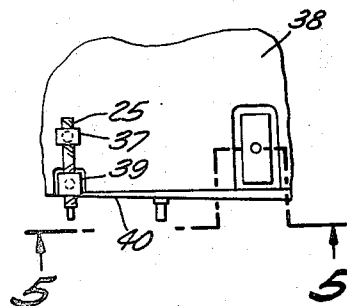


FIG. 4

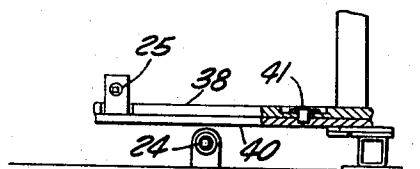


FIG. 5.

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3,417,591

TUBE MILL

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1 Claim. (Cl. 72—181)

ABSTRACT OF THE DISCLOSURE

A continuous sheet of metal from which tubing is to be made has its outer edge margins engaged throughout the forming process by rollers spaced along the path of movement. A plurality of sets of rollers are disposed generally above the sheet and engage the sheet major surface at what is to be the interior of the tubing. The sets include mutually spaced rollers arranged transversely of the sheet where adjacent sets engage areal surfaces of the sheet which are not engaged by rollers of adjacent sets.

The invention relates to the art of making tube and pipe, and more particularly to a machine for rolling a strip of metal into the shape of a tube and welding the edges of the strip together.

In the past, it has been the practice to use only strip edge support rolls in a tube mill except near where welding is performed. In addition, it has been difficult to use one tube mill to roll various sizes of tube. It also has been necessary to use several driven forming rolls at synchronized speeds.

In accordance with the device of the present invention, the above-described and other disadvantages of the prior art are overcome by providing a tube mill including a set of strip edge support rolls to support and shape a strip of metal and a set of upper rolls to hold the strip in contact with the lower rolls.

In accordance with an outstanding feature of the invention, the upper rolls are suspended from a yoke which may be removed from the machine and replaced with another yoke having rolls of a different size. Such a change may be made easily and quickly. It is also an advantage of the present invention that the lower rolls are automatically adjustable so that a quick change in pipe size may be made.

The upper rolls also hold the metal strip stiff in the machine. This means that only one driven forming roll need be employed.

The above-described and other advantages of the present invention will be better understood from the following description when considered in connection with the accompanying drawings.

In the drawings which are to be regarded as merely illustrative:

FIG. 1 is a perspective view of a tube mill constructed in accordance with the present invention;

FIG. 2 is a sectional view of the mill taken on the line 2—2, shown in FIG. 1;

FIG. 3 is a sectional view of the mill taken on the line 3—3 shown in FIG. 1;

FIG. 4 is an enlarged top plan view of an adjustment shown in FIG. 1; and

FIG. 5 is a sectional view of the structure taken on the line 5—5 shown in FIG. 4.

In FIG. 1, the edges of a strip of metal are indicated at dotted lines 10 and 11. It will be noted that the edges 10 and 11 converge toward a point of seam welding, as is conventional. Forming rolls at 12 and 13 are provided. These forming rolls are driven. However, these are the only forming rolls driven in the machine. A series of strip edge support rolls are provided at 14 on a stan-

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chion 15. A plurality of upper rolls 16 are suspended from a yoke 17 fixed to posts 18, 19, 20 and 21.

Yoke 17 extends the entire distance from posts 18 and 20 to posts 19 and 21. However, yoke 17 is broken away nearly all of this distance in FIG. 1 to show rolls 16 more clearly.

As shown in FIG. 2, the angular position of strip edge support rolls 14 are adjustable by lead screws 22. The height of strip edge support rolls 14 are adjustable by lead screws 23. The spacing of strip edge support rolls 14 are adjustable by a lead screw 24. The angular position of stanchion 15 is adjustable by lead screws 25. As shown in FIG. 2, upper rolls 26, 27, 28, 29 and 30 are carried by yoke 17. Note will be taken that rolls 27 and 29 are located in one row and that rolls 26, 28, 29 and 30 are located in another row. Note will be taken that rolls 27 and 29 engage a strip of metal 31 at alternate adjacent areas relative to those areas which rolls 26, 28 and 30 engage. The same is true of five similar lower rolls 32, 33, 34, 35 and 36, shown in FIG. 3. Also shown in FIG. 3 is a lowermost forming roll 14'.

The angular adjustment of each stanchion 15 is identical. For this reason, only one adjustment will be described as shown in FIGS. 1, 4 and 5. Lead screw 25 is threaded through a nut 37 fixed to a plate 38. Another nut 39 is fixed to a plate 40. As shown in FIG. 5, plates 38 and 40 are pinned at 41. Each stanchion 15 therefore rotates about the axis of a corresponding pin 41.

From the foregoing, it will be appreciated that the use of upper rolls 16 with strip edge support rolls 14 makes metal strip 31 stiff within the machine. For this reason, it is only necessary to drive a single pair of forming rolls 12 and 13. Further, due to the use of yoke 17 with upper rolls 16, yoke 17 may be replaced with a small yoke with a different set of upper rolls. Strip edge support rolls 14 may then be adjusted by the several adjustments illustrated easily and quickly to change the operation of the machine. These adjustments are made by lead screws 22, 23, 24 and 25.

Although only one specific embodiment of the present invention has been described and illustrated herein, many changes and modifications will of course suggest themselves to those skilled in the art. This single embodiment has been selected for this disclosure for the purpose of illustration only. The present invention should therefore not be limited to the embodiment so selected, the true scope of the invention being defined only in the appended claim.

What is claimed is:

1. A mill for the continuous forming of tubing from a flat metal strip moving along a definite path, comprising: a plurality of strip edge support rolls located at spaced intervals along the path for engaging the margins of the strip on the major surface that is to be the outside of the tube when formed, said edge support rolls being arranged in two identical sets, one at each side of the strip; and a plurality of sets of upper rolls aligned in succession to engage the major area of said strip that is the inside of the tubing when formed, the sets of upper rolls including spaced rolls arranged transversely of the strip and engaging the strip at areas other than those lying opposite the edge support rolls, said rolls of adjacent sets of said upper rolls engaging strip areas lying between rolls of immediately adjacent sets.

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