Sept. 11, 1934. B. C. MOISE 1,973,687

TUBE MILL

Filed Feb. 23, 1932 2 Sheets-Sheet 1

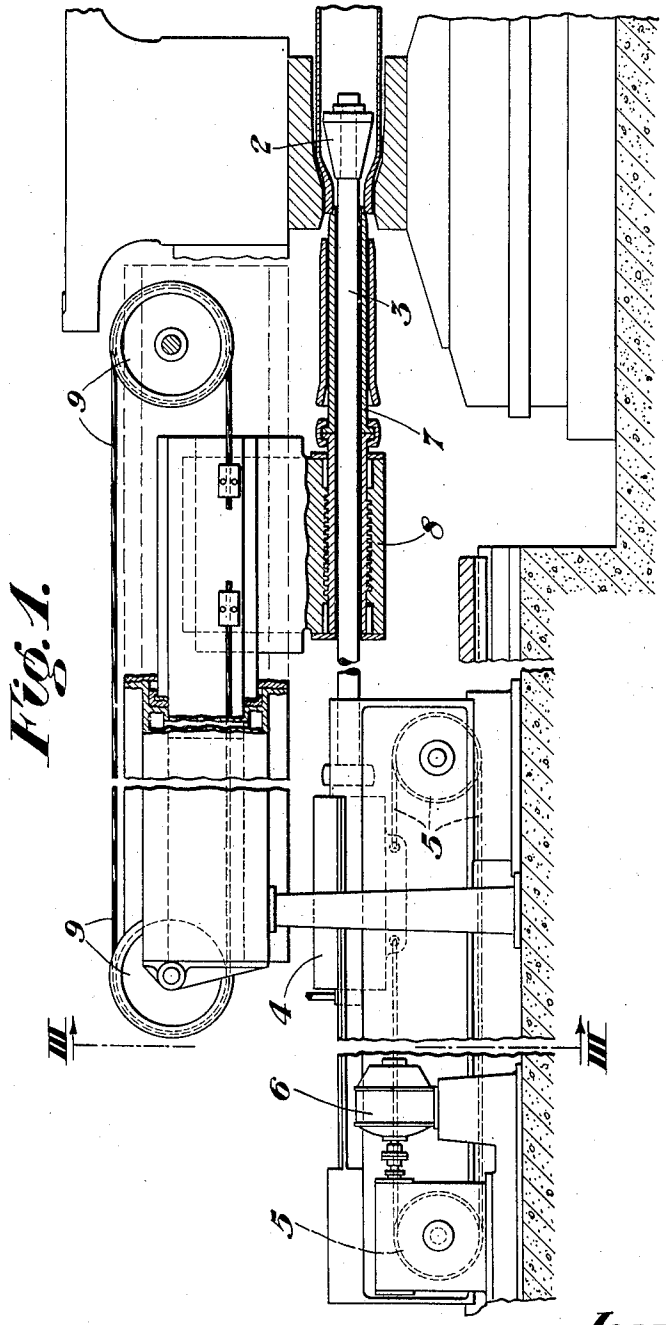


Fig. 1.

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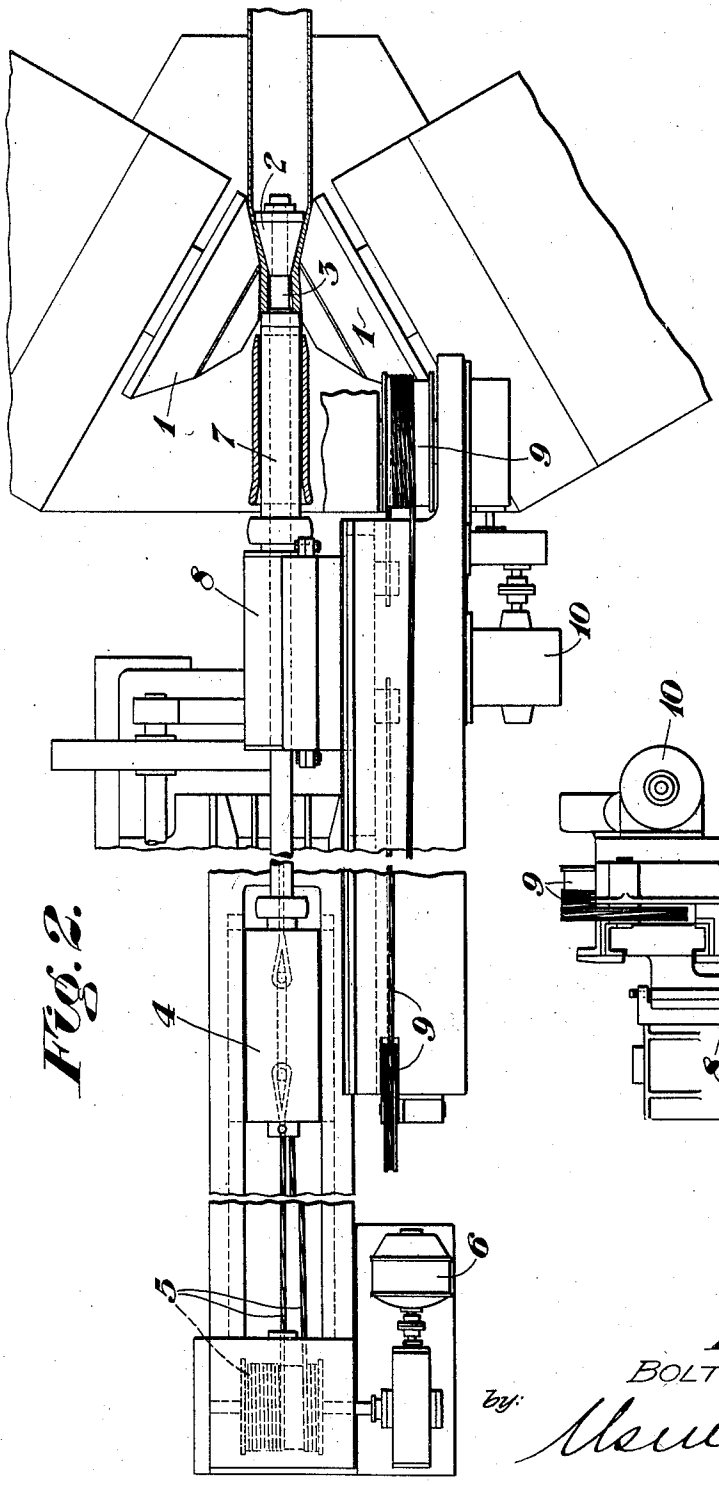


Fig. 2.

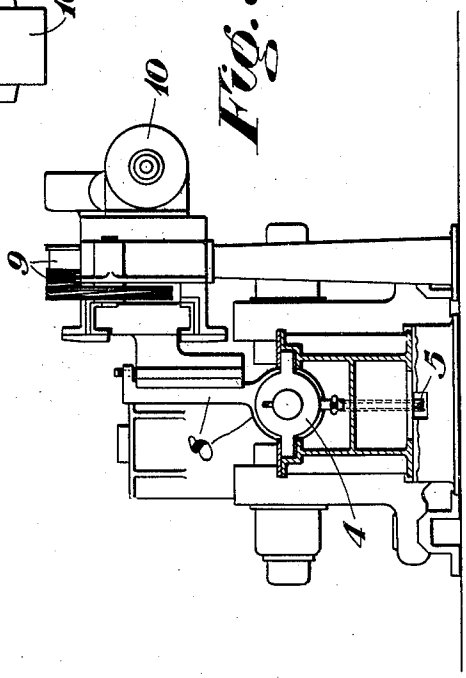


Fig. 3.

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UNITED STATES PATENT OFFICE

1,973,687

TUBE MILL

Bolton C. Moise, Pittsburgh, Pa.

Application February 23, 1932, Serial No. 594,622

3 Claims. (Cl. 80—13)

This invention relates to seamless pipe and tube mills, and particularly to expanding and rolling mills which shape up the rough shells that come from the piercing mills.

These expanding and rolling mills use a pair of rolls to draw the rough shells over mandrels or expanding plugs that are supported inside these shells by long bars. Generally these rolls are shaped to impart a rotary as well as a forward movement to these shells, the mandrel bars being rotatively mounted to accommodate this. The combined effect of this rotary motion and longitudinal push causes these bars to whip badly, the plugs or mandrels leaving the true centers of the shells and resulting in an irregular product. In addition to this, the rolls slip to a certain extent on the shells and slow up their passage through the mills.

One of the objects of the present invention is to provide a mill having a mandrel or plug supported in an improved manner that insures greater steadiness, and constructed to reduce roll slippage to a minimum. Other objects will be made apparent by the following disclosure.

A mill constructed according to the present invention is characterized by a tension bar that supports the plug or mandrel between the rolls and is associated with a ram that pushes the shells over this mandrel and through the rolls at substantially the theoretical speed the shells should acquire from these rolls.

The association between the bar and ram is such that the former is steadied by the latter as the shell moves forward, this preferably being accomplished by providing the ram with a bore through which the bar passes.

A specific example of a rotary rolling mill constructed according to the present invention is illustrated by the accompanying drawings; Figure 1 being a cross-sectioned side elevation, Figure 2 a partially cross-sectioned plan, and Figure 3 an end elevation cross-section taken from the line III—III in Figure 2.

This mill includes a pair of rolls 1 of the conventional axially inclined type, that forces shells over an expanding mandrel 2.

This mandrel, in the present instance, is held in position between these rolls by a water cooled tension bar 3 rotatably mounted in a thrust bearing 4. This thrust bearing may be longitudinally moved by means of a cable and drum arrangement 5 driven by a motor 6. In the operation of the mill, this mandrel bar is run back by means of the motor driven cable arrangement so that the rough shell may be rolled into position for feeding into the rolls 1, the bar then being moved forward through the shell's interior and the mandrel attached to its end prior to the rolling operation.

A ram 7, carried in a thrust bearing 8 moved by a cable and drum arrangement 9 driven by a motor 10, is used to push these shells over the mandrel between the rolls. In this instance, the ram and bearing are bored to receive the bar, thus forming coactively mutual bearing surfaces and more steadily supporting the mandrel. This ram is run back with the rod to permit placement of a shell and is then, the rod having been returned to mandrel holding position, run forward until it pushes against the end of this shell.

As it pushes this shell through the rolls it constantly supports the mandrel bar, this being especially advantageous while the end of the shell is passing over the mandrel, as it is then that a crop-ended and otherwise deformed tube is generally formed.

Preferably, the ram is run at the theoretical speed the shell should be drawn by the rolls 1, as this will completely eliminate roll slippage. However, the advantages of the invention are substantially retained should only an approximation of this speed be attained, as the rolls are even then relieved of a great part of the burden of drawing the shell over the mandrel.

Although a specific form of the invention has been disclosed in accordance with the patent statutes, it is not intended to limit its scope thereto, except as defined by the appended claims.

I claim:

1. A tube mill including a set of working rolls which axially rotate the work while causing it to move longitudinally, a mandrel, a rotative tension bar positioning said mandrel between said rolls and steadying means slidably associated with said bar so that it may follow the tail end of work passing over said mandrel.

2. A tube mill including a set of working rolls which axially rotate the work while causing it to move longitudinally, a mandrel, a rotative tension bar positioning said mandrel between said rolls, and a ram supportingly associated with said bar to push work over said mandrel.

3. A tube mill including a set of working rolls which axially rotate the work while causing it to move longitudinally, a mandrel, a rotative tension bar positioning said mandrel between said rolls, and a ram arrangement for pushing work over said mandrel, said ram arrangement and tension bar being constructed and arranged to coactively steady the latter.

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