G. E. FOSTER.

ROLLING MILL.

APPLICATION FILED JAN. 17, 1920.

1,382,827.

Patented June 28, 1921.

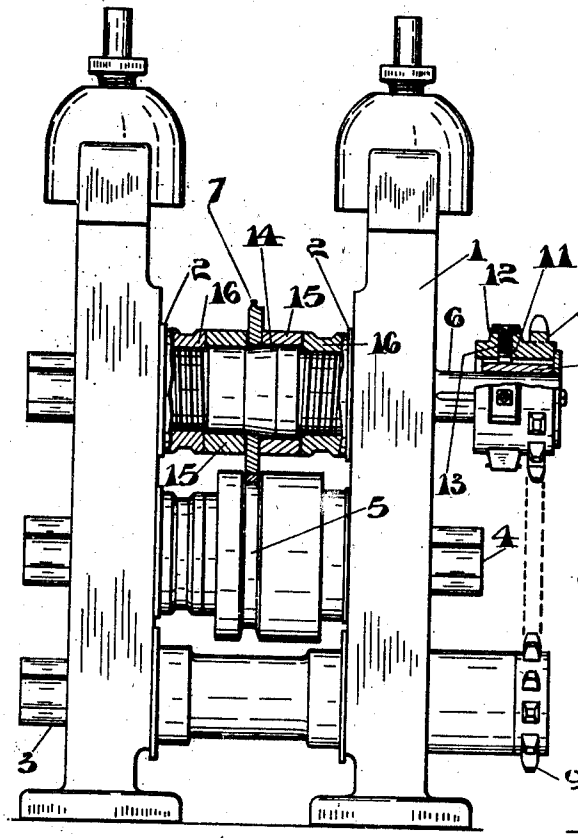


Fig. 1.

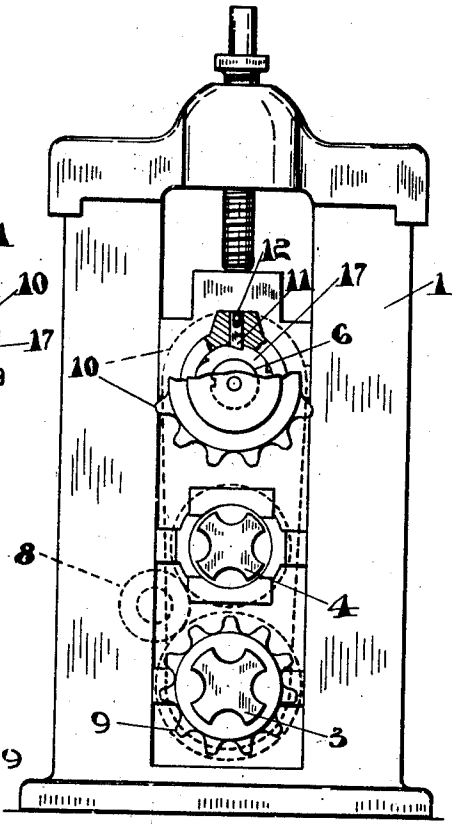


Fig. 2.



Fig. 4.

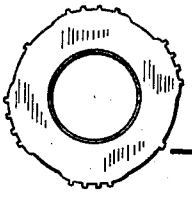


Fig. 3.

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ROLLING-MILL.

1,382,827. Specification of Letters Patent. Patented June 28, 1921.

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To all whom it may concern:

Be it known that I, GEORGE E. FOSTER, a citizen of the United States of America, and a resident of the city of Belleville, in the county of Hastings, Province of Ontario, Canada, have invented certain new and useful Improvements in Rolling-Mills, of which the following is a specification.

This invention relates particularly to rolling mills for rolling horse shoe blanks, and my object is to devise a mill which will operate with less wastage of material than the mills commonly employed.

In such mills the blanks pass between two forming rolls, each of which is driven, the speeds being the same. I find that with this arrangement many blanks are spoiled or else have to be rolled overlength and trimmed, and that to secure accurate results without waste it is necessary that one of the rolls should be driven only by its frictional contact with the blank when both rolls are cooperating to roll and punch the blank.

In the case of horse shoe blanks, I find that it is the bed roll which should be driven and that the creaser roll carrying the punches should, when operating on the blank, be driven only by the blank. I further find that the creaser roll will not operate properly if it is stationary at such times as the forward end of a blank comes into engagement with it, but that it should be moving nearly but not quite as fast as the blank and bed roll. This necessitates the provision of means permitting the roll to run faster than its driving means at such times as it is operating on the blank.

It is also of great importance that the creaser roll be and remain concentric with its arbor as otherwise blanks are rolled alternately long and short which necessitates all blanks being rolled extra length and then trimmed, which results in waste.

My object therefore is to devise constructions which will enable the rolls to operate as hereinbefore described and for securing the creaser roll to its arbor in such a way that any wear of the roll on the arbor may be immediately taken up and the roll held securely, yet detachably, in position.

I attain my object by means of the constructions hereinafter described and illustrated in the accompanying drawings in which—

Figure 1 is a front elevation, partly in section, of a rolling mill constructed in accordance with my invention;

Fig. 2 an end elevation of the same, partly in section;

Fig. 3 a front elevation of the creaser roll; and

Fig. 4 a side elevation of the same.

In the drawings like numerals of reference indicate corresponding parts in the different figures.

1 is the frame of the apparatus suitably shaped to support the parts. In this frame the rolls and arbors are carried in the usual manner, the upper roll being provided with adjustable bearings 2 which are of any ordinary type employed in rolling mills and which require no detailed description. 3 is a shaft journaled in the frame, 4 the arbor of the lower roll 5 and 6 the arbor of the creaser roll 7. The shaft 3 and arbor 4 are synchronously driven, as, for example, by gearing 8 shown in dotted lines, and will in practice by driven in any suitable manner. The arbor of the upper roll is independently driven from the shaft 3, though it might, of course, be driven from any part moving in synchronism with the lower roll. While I do not desire to limit myself to the specific gearing, I prefer to secure to the shaft a sprocket wheel 9 which, by means of a suitable sprocket chain, will drive the sprocket wheel 10, which is concentrically supported on the arbor 6, but is not secured thereto.

Between the sprocket wheel 10 and the arbor is located means whereby the srocket wheel may drive the arbor, while the arbor is free to rotate, if necessary, at a higher speed than the sprocket wheel. For this purpose I employ a ratchet wheel 17 secured to the shaft and engageable by a plurality of spring actuated dogs 11 slidably supported in the hub of the sprocket wheel 10. These dogs are held in place by the pins 12 and are recessed to receive the coil springs 13 which bear against the dogs and against these pins.

From the construction described it follows that if the sprocket wheels 9 and 10 be properly positioned that the creaser roll will be continuously driven at a slightly less

speed than the lower roll 5 and that as soon as it engages with the blank it may be driven by its engagement with the blank at substantially the same peripheral speed as the blank which will be slightly greater than the normal peripheral speed of the roll.

It is further evident that by changing one or both sprockets and substituting sprockets of different sizes it is possible to use creaser rolls of greater or less diameter than the bed roll, and in each case positively drive the bed roll at a greater speed than the creaser roll, while permitting the latter to be frictionally driven at the same peripheral speed as the bed roll.

The creaser roll, it will be noted, fits on a central coned portion 14 of the arbor 6. On each side of the roll is located a collar 15 loose on the arbor. Each collar at its outer side is engaged by a nut 16 threaded on the arbor. By suitably tightening up the left hand nut, the creaser roll is tightly jammed on the coned enlargement 14 of the arbor and may be steadied by tightening up the right hand nut 16. The creaser will thus always be held perfectly tight and perfectly concentric with the arbor. If the creaser roll is to be removed and replaced, this may be done by slackening up the left hand nut and tightening up the right hand nut, when the creaser will be backed off the coned enlargement 14.

In practice, of course, as in ordinary rolling mills, means will be provided for the lateral adjustment of the lower roll, but such forms no part of the present invention.

What I claim as my invention is:—

1. In a rolling mill, the combination of an arbor having a coned enlargement intermediate of its ends; a creaser roll bored to fit on said enlargement; a collar loose on the arbor at each side of said roll adapted to engage its sides; and nuts threaded on the shaft, one at each side of the roll, adapted to engage the collars.

2. In a rolling mill, the combination of a frame; a bed roll having an arbor journaled in the frame; a creaser roll having an arbor journaled in the frame; a shaft journaled in the frame parallel to the roll arbors; gearing between the shaft and the bed roll arbor; a sprocket wheel on the projecting end of the shaft; a sprocket wheel on the projecting end of the creaser roll shaft; a sprocket chain connecting said sprocket wheels; and means permitting the part to which one of the sprocket wheels is connected to run ahead of the sprocket wheel, the other sprocket wheel being rigidly secured in position.

Signed at Belleville, Ontario, this 3rd day of January, 1920.

GEORGE EDWARD FOSTER.