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METHOD OF STRAIGHTENING METAL BARS

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Fig. 1

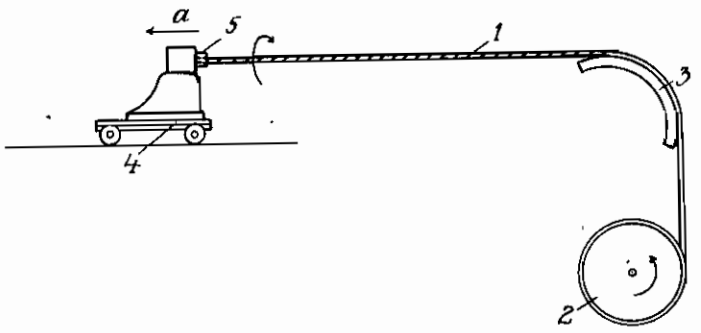
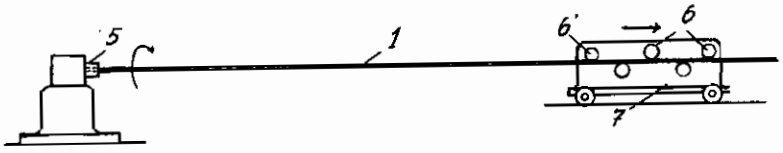


Fig. 2



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METHOD OF STRAIGHTENING METAL BARS

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The invention relates to a method of straightening metal bars.

Hitherto metal bars have been straightened in straightening machines in which the bars are positively guided between pairs of rolls, any kinks or bends being thereby removed. These straightening machines are heavy and expensive, the method of straightening the bars is comparatively protracted and costly, and the resulting product is not really straight but a bar with small, mutually compensating bends. Moreover, there is no testing of the material, so that defective bars are also treated in the straightening machines. The thicker the bar to be treated, the more expensive the straightening machine, or the more difficult or impossible is it to obtain a properly straightened product.

Present-day practice aims at coiling even comparatively thick bars on reels direct after hot rolling, in order to obtain at will bars of maximum length and to save room. However, this endeavour is checked by the inadequacy of the existing straightening machines and straightening methods.

The present invention remedies these defects by a new and improved method of straightening bars of any convenient cross section, which method comprises twisting the bars individually either in the cold or when hot. In the former case, consolidation of the bar material takes place.

According to the kind and sectional dimensions of the material, the twisting may be accompanied or not by the application of a supplementary axial tensioning of the bar. In some cases it may be desirable, or necessary, to apply a constant tension to the cross section of the bar during the twisting operation under the condition that, in the case of bars which shorten in twisting, the spacing of the clamps is shortened, whilst, in the case of bars which stretch in twisting, the clamps are moved further apart.

The bars may also be suitably straightened by first twisting them in one direction of rotation and then, to the same extent, in the other. This treatment is particularly suitable for straightening bars the cross section of which differs from the circular form. The twisting in one direction may be done with the bar hot and in the other direction in the cold, whereby a consolidation of the bar material takes place.

In carrying out the method of the invention the bar to be straightened may be unwound from a reel and clamped in the twisting head of a torsioning machine. The material may also, for example, be unwound from a reel and so twisted at the same time that the length of the portion of bar being twisted stretches during the operation. For this purpose, either the twisting head, or the braking device, can be arranged so as to be longitudinally movable, for example by being mounted on rollers or a carriage or the like. A clamping head may advantageously be replaced by a device which brakes the torsional and axial movement. By this means any tensional stress which may be required can be maintained at a constant value.

Experience has shown that even stout sections can also be completely straightened and entirely freed from all links and bends resulting, for example, from rolling, forging, the cold bed, etc., and also those due to the original coiling on the reel. Furthermore, the method according to the invention is simple and inexpensive and, at the same time, the twisting serves to test the quality of the bars under treatment, since bars containing defects in the material rupture when twisted.

For carrying out the process according to the invention, any convenient twisting machine with rotatable clamping head can be employed, care being preferably taken to enable an axial tension stressing to be applied to the cross section of the bars to be twisted.

Two modes of carrying out the method into effect are represented diagrammatically by Figs. 1 and 2 of the accompanying drawing to which reference will now be made.

As shown in Fig. 1, the bar 1 to be straightened is unwound from a reel 2 on which it has been previously wound direct after hot rolling. The said bar is guided over a fixed curved guide member 3 and its end is clamped in the twisting head 5 of a torsioning machine mounted on a carriage 4 for displacement in the direction of the arrow *a*. As the twisting head 5 is rotated to twist the bar 1 the torsioning machine is movable to apply a tension to the bar.

According to Fig. 2 the bar 1 to be straightened by twisting passes between the rollers 6 of a braking device 7 which in this instance is movable axially of the bar as represented by the arrow *b*, the torsioning machine being stationary.

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