

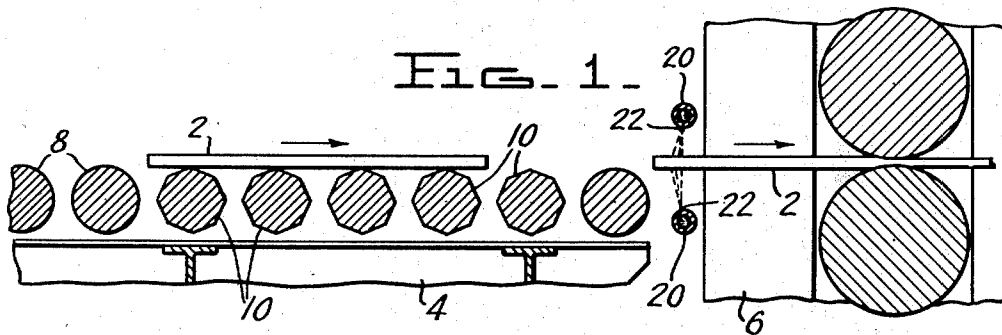
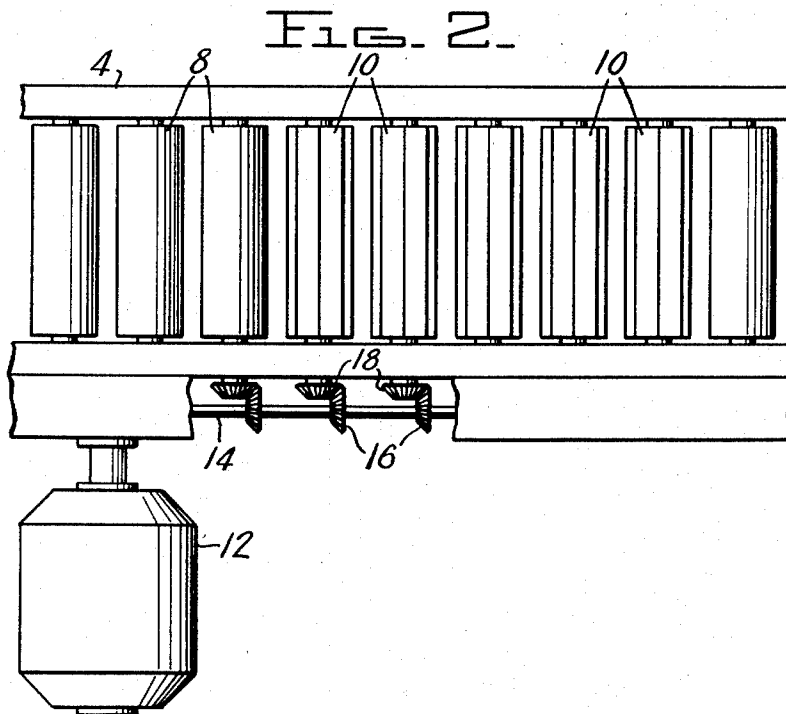
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2,535,890

APPARATUS FOR REMOVING SCALE

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## UNITED STATES PATENT OFFICE

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## APPARATUS FOR REMOVING SCALE

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2 Claims. (Cl. 29—31)

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This invention relates to apparatus for removing scale and especially for removing scale from a hot slab prior to its entry into a rolling mill. Failure to eliminate the scale causes scale pits which may result in rejection of the plate. Various methods are used to remove this scale. One of the most common methods is to spread salt over the surface of the slab and apply water thereto. The salt and water is carried on the slab into the rolls where the scale is loosened and blown from the slab. Another method is to spray high pressure water on the surfaces of the slab. Still another method is to pass the slab through a roughing mill stand known as the scale breaker. After passing through the scale breaker stand, the loosened scale is removed by jets of high pressure water. Other methods of removing scale are known, but they all have various drawbacks.

The common methods disclosed above all have the disadvantage that the descaling is done at the mill where the scale accumulates under the mill and mill tables and in order to remove the scale accumulations it is necessary to shut the mill down periodically. The salt and water method works very nicely on the top surface of the slab, but cannot be used on the bottom surface.

It is therefore an object of my invention to provide means for removing scale from the under side of a hot slab prior to rolling.

Another object is to remove the scale at a point which is accessible for easy removal of scale accumulations.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a schematic elevation, partly in cross section, showing the mill and mill approach table with the descaling rollers; and

Figure 2 is a plan view of the mill approach table.

Referring more particularly to the drawings, the reference numeral 2 indicates a hot steel slab being conveyed on the mill approach table 4 toward a roll stand 6. The mill approach table is provided with the usual round rolls 8 over part of its length, but part of the round rolls are replaced by non-circular rolls 10. As shown, the rolls 10 are provided with eight sides, but the number of sides may be varied according to the intensity of the impact necessary to knock the scale loose. In order to obtain longer roll wear, the corners thereof may be provided with beads of "Stellite" or other hard material. These also

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sharpen the corners and the beads may be rebuilt when necessary. The rolls are driven in synchronism from a motor 12 through the shaft 14, upon which is mounted identical bevel gears 16, each of which is in mesh with a bevel gear 18 mounted on the shaft of an octagonal roll 10. The octagonal rolls are arranged so that when a flat side of one roll is horizontal, the flat sides of all the other rolls are also horizontal. As the slab passes over these octagonal rolls, the rotating rolls raise the slab from one flat surface of each of the rolls to the roll corners and then drop it onto the next flat surface. As the rolls rotate, the sharp corners strike the bottom of the slab and tend to gouge into and fracture the scale. Continued rotation of the rolls lifts the slab to the high point and produces a scraping action on the bottom of the slab to further remove the already fractured scale as the slab starts to move downwardly. As the rolls continue to rotate the slab is dropped to its original horizontal plane, thus starting up vibrations which further loosen the scale to be removed. All of this scale falls into the pit under the approach table where it is accessible for easy removal. Some of the scale on the top side of the slab is also jolted loose and falls into the pit under the mill approach table.

Between the mill and the approach table may be two pipes 20 arranged over the top and bottom of workpiece 2 and provided with nozzles 22 which project water against the top and bottom of the slab. In order to remove the scale from the top of the slab, salt and water is preferably applied thereto and the scale removed in the usual manner. By the use of applicant's device the slab is delivered to the mill with the bottom side practically scale free and with the scale accumulating under the mill approach table. By combining the usual salt method of scale removing with applicant's device the entire slab is descaled.

While one embodiment of my invention has been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. Apparatus for removing scale from a slab, embodying a straight line conveyor table comprising a plurality of rolls with their axes in a common plane, parallel, and extending transversely to the line of conveyance, a series of said rolls intermediate said line, each being polygonal in cross section providing a plurality of flat sides

forming corners at their junctions, and means for rotating said rolls whereby said polygonal rolls will bump said slab up and down while said corners afford a scraping action.

2. Apparatus for removing scale from a slab according to claim 1 in which the rolls are octagonal and are provided with sharp, hard corners.

HAROLD W. BOUCK.

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