The present invention relates generally to apparatus for handling material and more particularly to a spacer shoe for a lift magnet.

When steel is rolled from ingot to slab form, a variety of ingot defects and some defects arising during heating and rolling may be carried through to appear on the surface of the slab. It is necessary to remove these defects before the steel is converted further into finished product. The operation of removing the surface defects from slabs or other semi-finished steel products is known as “conditioning.” In present day mills the bulk of slabs produced are conditioned by scarfing.

In scarfing steel slabs it is usual practice to condition one surface of the slab and then turn the slab over by means of a lift magnet suspended from the hook of an overhead crane to present the opposite surface for conditioning. This is accomplished by lowering the lift magnet to the surface of the slab, energizing the magnet and then lifting the slab from the conditioning bed. After the slab has been elevated a few feet the magnet is de-energized to cause the slab to fall back onto the scarfing bed. Prior to my invention various methods were used to cause the slab to turn over as it dropped from the de-energized magnet. One such method involved lowering the lift magnet so that it engaged only a portion of one side of the upper surface of the slab. Then when the slab was elevated in off-centered position on the lift magnet and released the side not engaged would fall first causing the slab to turn over 180° as it dropped to the scarfing bed. This procedure was not positive in operation in that the slab would not turn every time it was dropped so that it was frequently necessary to repeat the operation. This practice was also dangerous in that a slab being lifted in such an off-centered position relative to the lift magnet would sometimes fall without warning before the magnet was de-energized thus creating a hazardous condition for workmen in the area.

It is, accordingly, the primary object of my invention to provide a spacer shoe adapted to be attached to a lift magnet used for lifting a steel slab or the like to cause one side of the slab to fall before the other when the lift magnet is de-energized while holding the slab suspended in generally horizontal position.

This and other objects of the invention will be made clear during the following detailed description which refers to the accompanying drawing illustrating a present preferred embodiment. In the drawings:

Figure 1 is a perspective view showing the bottom and side of a lift magnet provided with the spacer shoe of the invention;

Figure 2 is a perspective view showing the top and side of a lift magnet provided with the spacer shoe of the invention lifting a slab; and

Figure 3 is an end view showing a lift magnet equipped with the spacer shoe of the invention in operation.

Referring more particularly to the drawings reference numeral 2 designates a lift magnet adapted to be suspended from an overhead crane (not shown) and having the spacer shoe, designated generally by reference numeral 4 of the invention attached hereto. The spacer shoe 4 is made of non-magnetic stainless steel or other non-magnetic material in a generally U-shaped form having bottom legs 6 and upper legs 8 connected together by means of webs 10. The lower legs 6 are connected together by means of a cross member 12 and upper legs 8 are connected together by means of a cross member 14. The spacer shoe frame is dimensioned to embrace one edge of the lift magnet 2 with the bottom legs 6 and cross member 12 extending partially across the lift face of the magnet 2. The webs 10 are adapted to fit against the side of the magnet and the top legs 8 to extend partially across the top of the magnet. Screw bolts 16 are threaded through the extremities of the upper legs 8 to engage the top of the magnet so as to secure the spacer shoe thereto.

In operation, referring now to Figure 3, when it is desired to turn over a slab S being conditioned on a scarfing bed B the energized lift magnet 2 with the spacer shoe 4 affixed thereto is lowered onto the slab S and is then lifted to elevate the slab a short distance above the scarfing bed in a generally horizontal position as shown in solid lines. After the slab S has been thus elevated, the lift magnet is deenergized. This causes the slab S to drop away from the lift magnet. Since one side of the slab has been spaced from the lift face of the magnet by the spacer shoe it will drop first causing the slab to turn over 180° as it falls back onto the scarfing bed, as shown by broken lines in Figure 3. Thus, the spacer shoe of the invention makes it possible to turn slabs over in an orderly, precise and safe manner with a lift magnet without the assistance of a floorman.

Although I have disclosed herein the preferred embodiment of my invention, I intend to cover as well any change or modification therein which may be made without departing from the spirit and scope of the invention as defined by the following claims.

I claim:

1. A spacer shoe for a lift magnet comprising a length of non-magnetic material disposed on the lift face of the magnet adjacent one edge thereof, and means for affixing said length to said magnet.

2. A spacer shoe for a lift magnet comprising a generally U shape clamp of non-magnetic material, said clamp being dimensioned to embrace one edge of the magnet with one leg thereof extending partially across the lift face of the magnet, and means for securing said clamp on said magnet.

No references cited.