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Krall et al.

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[54] DEVICE FOR HORIZONTAL
CONTINUOUS CASTING OF PLATES

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72/269

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Primary Examiner—J. Spencer Overholser

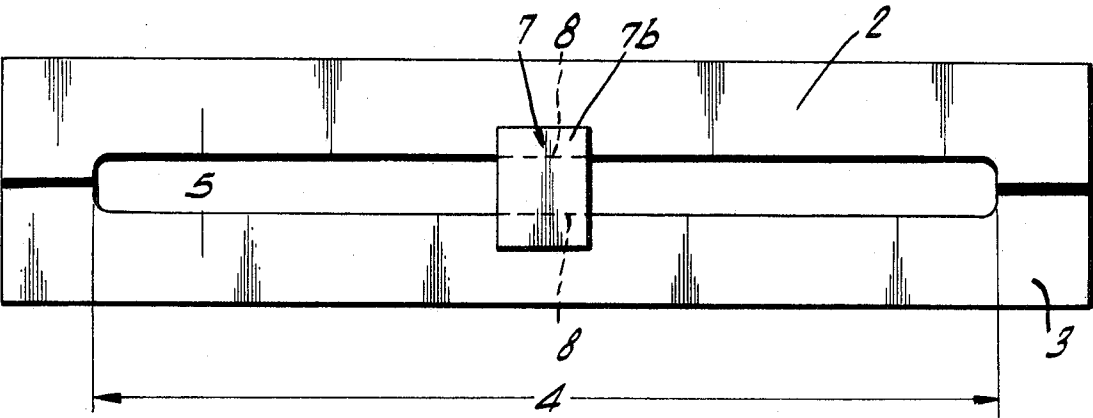
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[57] ABSTRACT

A die for continuous casting of bar stock is adapted to be received in an outer cooler and made up of a lower part and an upper part having a rectangular in transverse cross section passageway therebetween which is of relatively greater width than height. To prevent the parts from coming towards each other when heated, a spacer or distance piece of refractory material is inserted therebetween at the casting material entrance end and at about the center widthwise location. This distance piece has a stem projecting into the passageway to hold the parts apart and a cap thereon abutting the adjacent entrance ends of the parts of the die to prevent the distance piece from moving on into the passageway as the casting material flows therepast.

6 Claims, 2 Drawing Figures



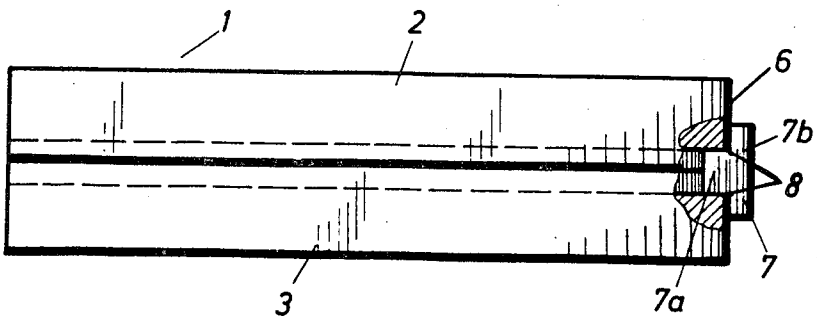


Fig. 1

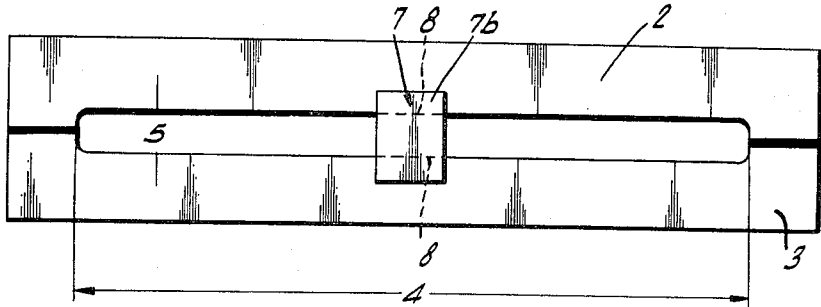


Fig. 2

DEVICE FOR HORIZONTAL CONTINUOUS CASTING OF PLATES

BACKGROUND OF THE INVENTION

The invention concerns a device for horizontal continuous casting of plates, in particular a die for this process.

Devices for the continuous casting of plates or wide profiles are known. When casting such profiles continuously, it may occur that two opposite sides of the strand or bar are not produced parallel to each other and straight, the strand may show varying thickness. Thus, it may happen that the strand is thicker on the outside of the profiles than in the middle. Improvements for such casting devices have already been suggested to eliminate such difficulties. On one of these devices the cooler for the die has been reinforced accordingly. This method can only be efficient, if the strand solidifies directly in the cooler. Many continuous casting plants have a die, however, for instance of graphite, fit in the cooler. In this case the die deflects, and the strand does not have parallel sides.

The die can be machined from the very beginning in such a way that after a deflection of the die the strand emerges with parallel sides. In this case, however, the die detaches itself from the cooler, and productivity is very low, because of the low heat transfer between die and cooler.

The object of the invention is to obtain by means of a cooler with fit-in die a strand with parallel sides and to guarantee a good attachment of the die to the cooler.

This problem was solved in such a way that a distance piece of fireproof refractory material is mounted between upper and lower part of the die of the casting material entrance end of the die, so that a deformation of the die, due to the thermal stress, is impossible and a strand with parallel sides is obtained.

BRIEF DESCRIPTION OF THE DRAWINGS

An example of the invention is shown in the drawing and will be described in the drawings,

FIG. 1 shows a side elevational view of the die and

FIG. 2 is a view from the right of FIG. 1 looking from the furnace into the entrance end of the die.

DETAILED DESCRIPTION

Within a surrounding cooler, which is not shown in the drawing, the die 1 is housed and consists of an upper part 2 and a lower part 3. The die as depicted in the example has an aperture or passageway therethrough for casting a rectangular in transverse cross section strand of a width 4 and a height 5. The width 4 is relatively much larger than the height 5. Due to the thermal stress it may occur that the central part of the upper part 2 deflects, so that the height 5 of the strand is smaller in the middle and the strand is thinner there. To remedy this deformation a distance piece or

spacer 7 is placed between the upper part 2 and the lower part 3 on the furnace end of the die. Thus the upper part 2 of the die is prevented from deflection towards the inside of the die. The die and its surrounding housing is fabricated in such a way that no cooling takes place around the area of the distance piece 7, so that no solidification occurs in this part of the die. The molten metal entering the die 1 is not obstructed by this distance piece because it can flow around it and flow together again behind the distance piece 7 and then form the strand without any disturbance. The distance piece 7 as viewed in FIG. 1, is T-shaped having a stem 7a and a cap portion 7b there on. Between the stem and cap are formed right angle recesses or steps 8 which serve to hold the spacer 7 on the end of the die adjacent to the furnace and the metal flows against and past the cap portion 7b.

What is claimed is:

1. In a device for horizontal continuous casting of bars or strands, a die for receipt in an outer cooler and having a lower part and an upper part forming therebetween a passageway for continuous casting, the improvement therewith of a distance piece of solid fireproof refractory material mounted between said lower and upper die parts at the casting material entrance end thereof so that a deformation of the die due to thermal stress is impossible and a stand with parallel sides can be drawn.

2. A device according to claim 1 wherein said distance piece has means thereon preventing it from being drawn into the passageway of the die by the flow of the casting material or by premature solidification thereof.

3. A device according to claim 2 wherein said distance piece has a stem extending into said passageway between said lower and upper parts of the die and a cap on said stem abutting the adjacent ends of the die thereby forming said means thereon preventing the distance piece from being drawn into the die.

4. In a device for continuous casting of bars or strands, a die having two parts forming therebetween a passageway for continuous casting, the improvement therewith of a distance piece of solid fireproofing refractory material mounted between said die parts at the casting material entrance end thereof so that a deformation of the die due to thermal stress is impossible and a strand with parallel sides can be drawn.

5. A device according to claim 4 wherein said distance piece has means thereon preventing it from being drawn into the passageway of the die by the flow of the casting material or by premature solidification thereof.

6. A device according to claim 5 wherein said distance piece has a stem extending into said passageway of the die and a cap on said stem abutting the adjacent ends of the die thereby forming said means thereon preventing the distance piece from being drawn into the die.

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