DEVICE FOR CUTTING MOVING INGOTS, PREFERABLY THOSE OBTAINED
BY THE CONTINUOUS CASTING METHOD
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FIG. 1

FIG. 2

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DEVICE FOR CUTTING MOVING INGOTS, PREFERABLY THOSE OBTAINED BY THE CONTINUOUS CASTING METHOD

The present invention relates to metallurgy, and more particularly to devices for cutting moving ingots, especially those obtained by continuous casting.

The known devices for cutting moving ingots comprise cutting blades moving perpendicularly to the direction of movement of an ingot, one of said cutting blades being fastened on a rod of the impulse chamber with an energy carrier (such as gunpowder, gas, air, hydraulic), while another, the counter blade, is fastened on a movable block mounted on a frame common with the chamber.

A disadvantage of the conventional devices is the fact that the blades cutting into the ingot are entrained by the latter in the direction of its motion, which results in the jamming and breakdown of the blades and also in breaking the parts of said device.

An object of the present invention is to provide a device for cutting moving ingots, preferably those obtained in a continuous casting method, in which the blades after each cutting into the ingot should freely disengage from the ingot without either jamming or breaking.

According to these and other objects, we claim a device for cutting moving ingots, preferably those formed in a continuous casting machine, in which the cutting operation is effected by means of blades moving perpendicularly to the direction of movement of the ingot, one of said cutting blades being fastened on a rod of the chamber containing the energy carrier, while another, or the counter blade, is fastened on a block mounted on a frame common with an impulse chamber, with said frame being mounted in such a way as to be capable of moving during the process of cutting the ingot in the direction of its movement.

To effect the movement of the frame and its return in the horizontal position, it is expedient to articulate one end of the frame with a rigidly fixed support, while the other end must be suspended on a movable balancing support which may be made in the form of a power-cylinder, or for example, hydraulic, which operates synchronously with the rod of the impulse chamber.

The present invention will become more fully apparent from the consideration of the following description of one of the possible embodiments of the device for cutting moving ingots, taken in conjunction with the appended drawings, in which:

FIG. 1 is a schematic diagram showing a side elevation view of the device according to the present invention; and
FIG. 2 is a vertical cross-sectional view of elements 4, 5 and 6 of the device of FIG. 1.

On the frame 1 of the device and perpendicular to the direction of the movement of the ingot 2, are mounted the impulse chamber 3 and a block, consisting of a stationary plate 4 (FIG. 2) and a movable plate 5, separated with a damper 6, for example a pack of rubber. The movable plate 5 is connected with the chamber 3 by means of rods 7.

On a rod 8 of the chamber 3 and on the movable plate 5 of the block cutting blades 9 and 10 are fastened. The chamber 3 and the movable plate 5 of the block are mounted in such a manner as to be capable of moving along guides 11 of the frame 1. One end of the frame 1 is connected by means of a hinge joint 12 with a rigid support 13, while the other end is suspended on a rod 14 of a power cylinder 15 operating in a synchronous manner with the rod of the chamber 3.

The movement of the frame upwardly is limited by a rest 16. The device is provided with systems for return of the moving parts to their initial position (not shown).

The device functions as follows.

After placing the movable parts of the device into their original position in relation to the axis of the ingot 2 energy is supplied to 3 and the energy carrier is admitted, thus moving the rod 8 with the cutting blade 9 in the direction of the ingot 2.

Simultaneously with the movement of the rod 8, the chamber 3 which is not rigidly fixed to the frame 1, under the action of reaction forces, is moved along the guides 11 of the frame in the direction opposite to that of movement of the rod 8.

Due to rods 7 connecting the chamber 3 with the movable plate 5 of the block, said plate together with a cutting blade 10 fastened thereon, will be moved in the same direction as the chamber 3, thereby ensuring the movement of the cutting blade 10 against the blade 9 fastened on the rod 8; the ingot 2 is cut at the moment when the cutting blades 9 and 10 meet.

Then systems operate for returning the rod 8, chamber 3 and the movable plate 5 of the block into their respective initial positions.

At the moment the cutting blades 9 and 10 cut into the moving ingot 2, the frame, under the pressure of the ingot on the blades, turns about the hinge joint 13 in the direction of movement of the ingot, thereby insuring the movement of blades in synchronism with that of the ingot, which prevents blades jamming in the ingot and breaking.

After the blades withdraw from the ingot, the frame 1, under the action of the power cylinder 15, returns in its initial position until it thrusts against the rest 16. Then the cycle is repeated.

We claim:

1. A device for cutting moving ingots, especially those obtained by a continuous casting method, comprising a frame, guides on said frame, said frame being mounted
so as to be capable of moving during the process of cutting an ingot in the direction of the movement of the ingot; an impulse chamber mounted to travel along said guides and provided with a rod movable parallel to said guides; a block mounted on said frame consisting of two plates, one plate being stationary and the other plate movably mounted to travel along said guides; connecting rods for connecting said impulse chamber with said movable plate; and a pair of cutting blades, one blade being fastened on said rod and the other blade being fastened on said movable plate.

2. A device for cutting moving ingots, especially those obtained by a continuous casting method, comprising a frame with guides, one end of said frame being articulated with a rigidly mounted support and the other end being suspended on a movable balancing support; an impulse chamber movable along said guides and provided with a blade rod, a block mounted on said frame and consisting of two plates, one stationary and the other movable, travelling along said guides; connecting rods connecting said impulse chamber with said movable plate; and a pair of cutting blades one of which is fastened on said blade rod of the impulse chamber and the other being fastened on said movable plate.

3. A device for cutting moving ingots, especially those obtained by a continuous casting method, comprising a frame with guides, one end of said frame being articulated with a rigidly mounted support, the other end being suspended on a rod of a power cylinder; an impulse chamber mounted to be movable along said guides and provided with a blade rod; a block mounted on said frame and consisting of two plates, one stationary and the other movable along said guides; connecting rods connecting said impulse chamber with said movable plate; and a pair of cutting blades, one of which is fastened on said blade rod of the impulse chamber while the other is fastened on said movable plate.

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