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APPARATUS FOR A CONTINUOUS CASTING FLAME CUTTING MACHINE

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Fig. 1

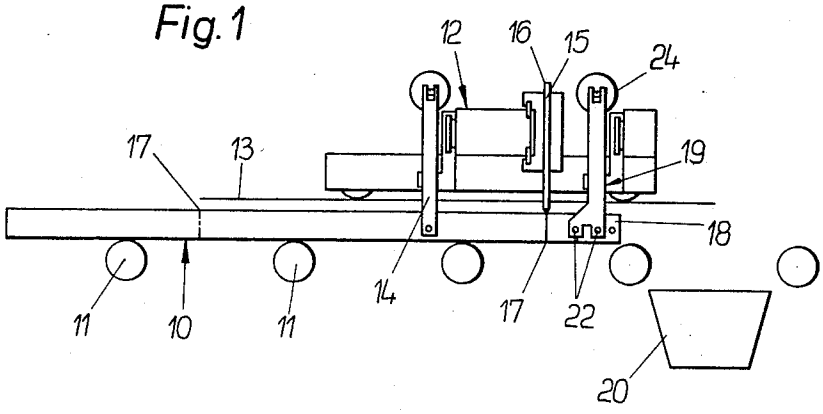
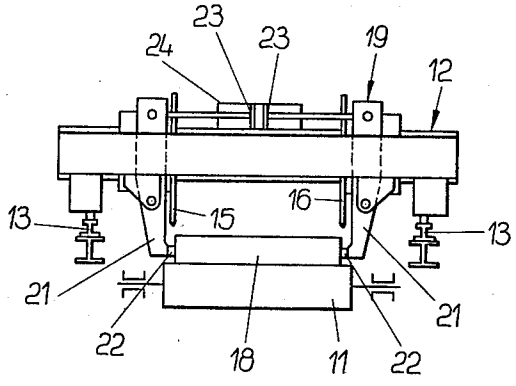


Fig. 2



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APPARATUS FOR A CONTINUOUS CASTING FLAME CUTTING MACHINE

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U.S. Cl. 266—23 6 Claims

ABSTRACT OF THE DISCLOSURE

An apparatus for cutting a continuous casting includes a flame cutting machine adapted to move synchronously with the casting, the flame cutting machine has burners for cutting the casting as it moves, releasable holding means are provided for the flame cutting machine to engage a portion of the casting to be cut off before completion of the cutting operation.

The present invention is concerned with an apparatus for a continuous casting flame cutting machine adapted to move synchronously with the casting, particularly for slabs, in which the cut is made from two sides by two burners moving towards one another.

Flame cutting machines of the above kind are usually adapted to travel on rails in the direction of casting. Synchronisation of the longitudinal advance of the flame cutting machine with the speed of the casting is effected during the cutting operation in a simple manner by clamping the flame cutting machine to the casting, which is guided on a roller table. After completion of the cutting, this clamping connection is released and the flame cutting machine travels in the reverse direction for a distance corresponding to a casting length, in order to commence a new cut. The separated casting is carried forward by the roller table and transported away for further use. In order to prevent the casting from tipping over between the rollers of the roller table and, consequently, interrupting the transport operation in an undesirable manner, as well as damaging the flame cutting machine, the length of the individual casting must correspond to at least twice the distance between the rollers of the roller table.

It is a disadvantage that the head portion of the casting is useless and must be removed before the actual cutting up of the continuous casting into the individual castings is commenced. However, this head portion is relatively short in comparison with the individual castings, so that the above-mentioned danger of tipping over and consequent damage to the burner exists here.

The problem with which the present invention is concerned is to obviate the above disadvantages. In order to solve this problem, it is essentially proposed, according to the present invention, that the flame cutting machine should be provided with a releasable holding device for the portion of the casting to be cut off, this device engaging with the portion to be cut off before completion of the cut.

The head portion of the casting can now be gripped by the holding device directly before or shortly after the commencement of the cutting operation, so that a turning or tipping of the head portion is avoided in an advantageous manner. After completion of the cutting operation, the head portion or the individual castings can be transported away by the holding device for further use.

In principle, the construction of the holding device may be of any desired type. According to the present invention, however, it is preferred to use a clamping device operated by a pressure medium. A clamping device of this

type, for example, one operated pneumatically, can be installed in an advantageous manner without particular expense, since compressed air is certainly available in metallurgical works.

More particularly, it is proposed, according to the present invention, that the holding device should comprise two clamp jaws disposed on both sides of the individual casting and articulated like levers, on the flame cutting machine and that one end of each of the clamp jaws should be associated with the individual casting and the other end with a piston to which pressure is applied.

Furthermore, it is expedient for the ends of the clamp jaws associated with the individual casting to be constructed in such a manner that a twisting of the individual casting is impossible.

The clamp jaws may, for example, have comparatively large dimensions in the casting direction. For reasons of weight, however, it is preferred that the ends of the clamp jaws associated with the individual casting should, in each case, be forked and that at the end of each of the arms of the fork there should be secured a pin which, during the holding of the individual casting which has been cut off, engages with the individual casting, so that the latter is held at at least four points.

The two pistons to which pressure is applied may each be disposed in a separate cylinder independently of one another. Preferably, however, the two pistons to which pressure is applied should be slidable in a common cylinder and the pressure medium should be applied to the cylinder between the two pistons. This form of construction is preferred because of its simplicity and the little space which it requires.

For a better understanding of the present invention, one embodiment thereof will now be described with reference to the accompanying drawings, in which:

FIGURE 1 shows diagrammatically a continuous casting flame cutting machine in elevation; and

FIGURE 2 is a diagrammatic view in the direction of the arrow A in FIGURE 1.

As can be seen from FIGURES 1 and 2, a continuous casting **10** is guided on a roller table comprising rollers **11**. A continuous casting flame cutting machine **12** is disposed for travelling on rails **13** in the direction of the casting **10** and is fastened to the latter by means of a clamping device **14** operated by a pressure medium, so that the movement of the flame cutting machine **12** takes place synchronously with the movement of the continuous casting **10**. The flame cutting machine **12** has two cutting torches **15, 16** which travel towards one another as far as a determined point during the cutting operation, the casting thereby being cut into from both sides. One torch then moves in the reverse direction, while the other completes the cut. The cutting points are designated by **17** in FIGURE 1. The distance between two cutting points **17**, which constitutes the length of an individual casting, must correspond to at least twice the distance between two rollers **11** of the roller table in order to ensure the satisfactory further transport of the individual casting cut off.

The head portion **18** of the continuous casting **10**, which is useless, has a comparatively short length compared with the individual castings. When the head piece **18** is cut off, there is, consequently, on the one hand, a danger that this piece will drop, so that, at the same time, the cut gaps will be narrowed, while, on the other hand, the head portion **18** may be tipped over sideways because the two cut gaps meet one another in an eccentric position, so that one side of the head portion **18** is slightly raised and may damage the cutting torch in question.

In order to eliminate these dangers, a holding device **19** is provided on the flame cutting machine, this device holding the head portion **18** approximately at the com-

mencement of the cutting operation and releasing it only on completion of the cut. The separated head portion **18** then falls into a container **20** held in readiness.

The clamping device **19** comprises two jaws **21** articulated at the side of the flame cutting machine **12** in the manner of levers. The ends of these jaws **21**, which are associated with the head portion **18** or with any individual casting, are forked, a pin **22** being fastened to each arm of the fork. The pins **22** engage with the head portion or individual casting and prevent it from dropping or twisting. The other ends of the jaw **21** are each connected to a respective piston **23**. The two pistons are slidably mounted in a common pressure cylinder **24**. The pressure medium is supplied between the two pistons **23** in a manner which is not illustrated. The pistons **23** and the associated ends of the jaws **21** are thereby moved outwards and the pins **22** are pressed firmly against the head portion **18**.

The clamping device **14** previously mentioned may, of course, also be of similar construction to the holding device **19**. The two devices **14**, **19** are, in this case, advantageously connected to the same pressure medium system.

What we claim is:

1. An apparatus for cutting a continuous casting comprising means for moving the casting in a substantially horizontal direction, a flame cutting machine adapted to move synchronously with the casting, said flame cutting machine including burner means for cutting completely across the casting as the casting is moving whereby a portion of the casting will be cut off from the remainder of the casting, said flame cutting machine being provided with releasable holding and removal means for engaging the portion to be cut off before completion of the cutting operation and removing the cut off portion after completion of the cutting operation, and said holding and removal means having a plurality of contact points disposed longitudinally of the path of motion of the portion to be cut off for engaging the portion to be cut off and preventing it from dropping and twisting during engagement thereof.

2. An apparatus according to claim **1**, including pressure medium means for operating said holding means.

3. An apparatus for cutting a continuous casting comprising means for moving the casting, a flame cutting machine adapted to move synchronously with the casting, said flame cutting machine including burner means for cutting completely across the casting as the casting is moving whereby a portion of the casting will be cut off from the remainder of the casting, said flame cutting machine being provided with releasable holding means for engaging the portion to be cut off before completion of the cutting operation, including pressure medium means for operating said holding means, said holding means including two clamp jaws adapted to be disposed on both sides of an individual casting, said jaws being connected to said flame cutting machine for articulation in a lever-like manner, and a piston associated with one end of each clamp jaw for disposing the other end of each clamp jaw against a casting.

4. An apparatus according to claim **3**, including twist preventing means at said other end of each clamp jaw for preventing the casting from twisting.

5. An apparatus according to claim **4**, wherein said other end of each clamp jaw is forked, at least two pins being connected to each forked end whereby the casting is engaged at at least four points to comprise said twist preventing means.

6. An apparatus according to claim **3**, including a common cylinder, said pistons being slidably mounted in said common cylinder, and said pressure medium means being supplied to said cylinder between said pistons.

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