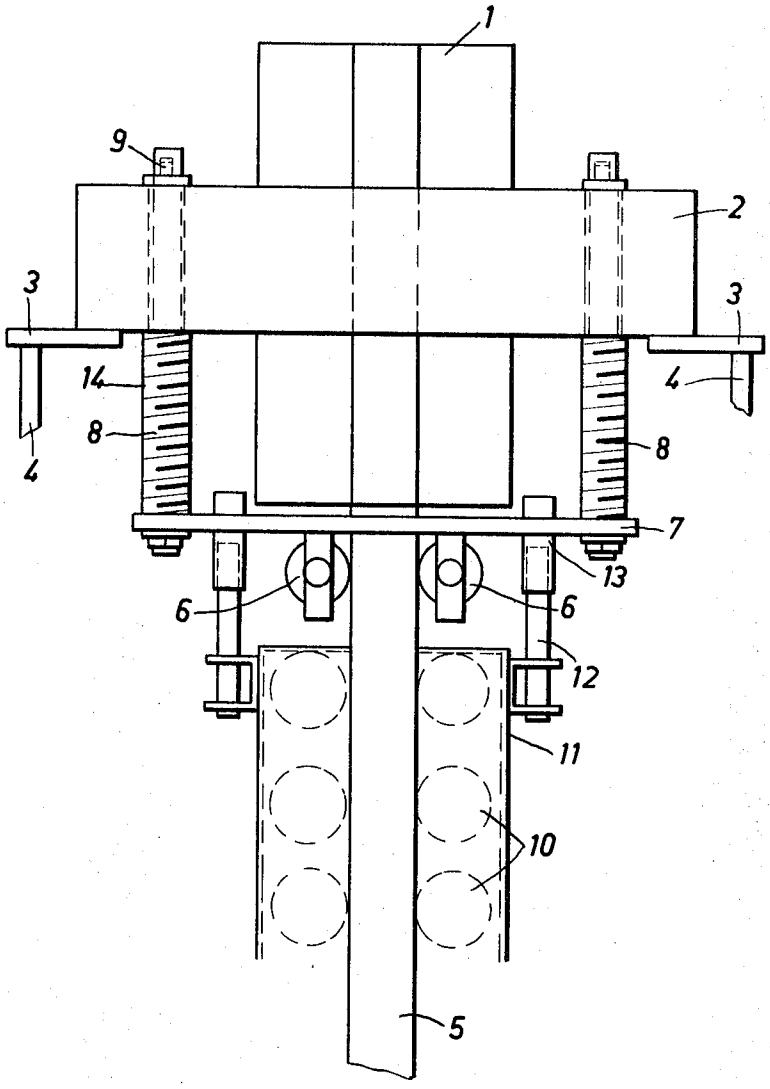
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WATER COOLED CONTINUOUS CASTING MOLD

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Fig. 1



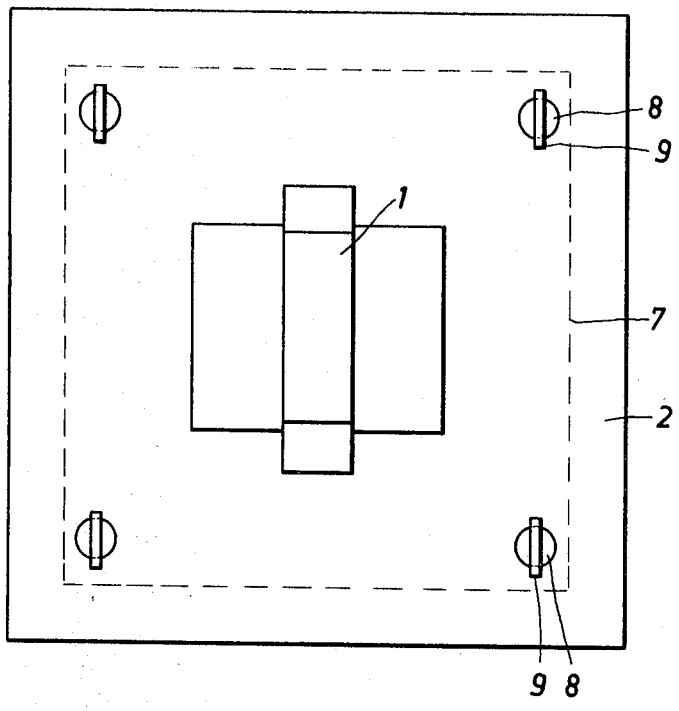
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Fig. 2



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WATER COOLED CONTINUOUS CASTING MOLD

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Int. Cl. B22d 11/12
U.S. Cl. 164—282 2 Claims

ABSTRACT OF THE DISCLOSURE

A continuous casting mold is corrected with a water box for chilling the wall of the mold to enable a chilled metal shell to form and exit from the mold as a billet. Under the water box, sets of rolls are disposed to engage the exiting billet to support and guide the moving billet. When the chilled shell of such a billet is inadequate to withstand the hydrostatic pressure of the still liquid metal in the shell, the shell will crack and the liquid metal leak out onto the rolls and freeze.

Conventionally, the roll supporting structure is rigidly connected to the water box and supporting structure. Consequently, when molten metal leaks out of a moving billet and freezes on the rolls, it is necessary to burn off the jammed base rollers and their supporting frames.

A rigid structure is provided for separably coupling the roll frame to the water box to permit quick and easy removal of the rolls and supporting frame for cleaning the rolls and for then restoring them to service.

The invention relates to a continuous casting mold with a water box and base rolls arranged in fixed distance below the mold. The apparatus is especially applicable for the pouring off of iron and steel.

Conventionally, as a billet is poured off the continuous casting apparatus and exits the mold, it is grasped and supported by base rolls which are in a framework tightly connected to the mold. In some cases, the bearings of the base rolls may be provided with springs in such manner that a very limited shifting of the rollers in perpendicular direction to the billet is possible. The base rolls serve to limit the curvature or deformation of the billet caused by irregular cooling in the mold or due to other causes. They thereby guard the mold from damages by the billet.

Below the base rolls the billet is transported and supported by supporting rolls. In conventional apparatus, these supporting rolls are connected fixedly to the non-oscillating mold. Normally, the billet exiting from the mold has a liquid core and only a thin rigid crust. Therefore, the danger exists that the crust may not be able to withstand the hydrostatic pressure and will crack, so that the liquid metal flows out.

In such a case the liquid metal flows onto the base rollers and the supporting rolls situated below the mold and freezes and binds them.

In order to correct that disturbance, the mold must be separated from the billet and the frame of the supporting rolls. In present conventional apparatus, this is only possible by burning off the jammed base rollers in a laborious manner.

A principal object of the instant invention is to avoid these drawbacks by arranging the base rollers and their supporting frame in a manner that permits the mold to be easily separable therefrom.

Another object of the invention is to provide a rigid supporting structure for rigidly coupling the casting apparatus and the base rollers and guide rolls for normal operation, and that will permit relatively easy uncoupling for cleaning access to the rolls in case of a break in an existing billet and spill-out of metal onto the rolls, and that will permit subsequent rigid recoupling of the roll structure to the mold to resume casting operation.

According to the invention this is attained by rigidly connecting the mold by separable means to a base plate on which the base rollers are fixedly mounted. For that purpose, the base plate carrying the base rollers is provided with supporting and tie columns that extend through the water box which receives the mold; there the columns are bolted by a releasable connection that normally holds the base plate rigidly connected to the water box, but permits relatively easy separation. Thus, with the aid of the apparatus according to the invention, it is possible to separate the mold from the billet, without difficulties and waste of time, and to clean or exchange the base rollers with relative ease and convenience.

The apparatus of the invention is explained in more detail in the following specification and in the drawings, in which:

FIG. 1 is a side view of the device; and

FIG. 2 is a plan view of the same.

A water cooled mold **1**, to receive the molten metal, is mounted on and in a water box **2** through which the cooling water is led to cool the mold **1**.

The water box **2** and the mold **1** receive an oscillating movement from a supporting table **3** (not shown in detail) through support rods **4**, the table being suitably connected to the water box **2**.

A billet **5** exiting from the mold **1** is gripped and supported by base rollers **6**, which are rigidly connected to a base plate **7** in accordance with the invention.

On the base plate **7** there are mounted rods or columns **8** which extend through the water box **2** for mechanical coupling thereto. By means of the spacing tubes **14** a fixed distance is maintained between the water box **2** and the base plate **7**. With the aid of wedges **9**, the base plate **7** and with it the supported base rollers **6** are rigidly mechanically connected to the water box **2** and to the mold **1**, so that they join in the oscillation of the mold **1**. As a modification, instead of using the wedges **9**, the columns **8** may be mounted by screwing onto the water box **2**.

Below the base rollers **6**, supporting rolls **10** are arranged in a frame **11** to support and guide a billet in passage. For adjustable orientation relative to the mold **1**, the frame **11** for the supporting rolls **10** is provided with adjustable bolts **12** which are adjustably mounted in guides **13** secured to the base plate **7**.

If a functional disturbance is caused by a break-through of a billet, and the base rollers must be exchanged, the wedges **9** are loosened. Thereupon the mold **1** is simply and readily dismountable and the base rollers **6** made to lie free. A straight mold has been shown in the instant example. The invention is likewise successfully applicable when curved molds are used.

Having thus described the invention, what we claim as new and desire to be secured by Letters Patent, is as follows:

1. Continuous casting apparatus comprising

a liquid cooled, continuous casting mold;

a water box connected to and surrounding said mold for supplying cooling liquid to said mold;

a supporting structure for said water box;

a base plate;

a set of rollers for guiding an ingot as it exits from said casting mold, the bearings of said rollers being secured to said base plate;

and coupling means for quick-releasably connecting said base plate to said water box.

2. Continuous casting apparatus, as in claim 1, said coupling means including connecting rods extending through said water box and said base plate and each rod being secured near one end to said plate and near the other end quick-releasably connected to said water box.

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U.S. Cl. X.R.

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