Feb. 1, 1966 E. WENNSTRÖM 3,233,027

METHOD OF MAKING PRESTRESSED CONCRETE BEAMS

Filed Dec. 27, 1961

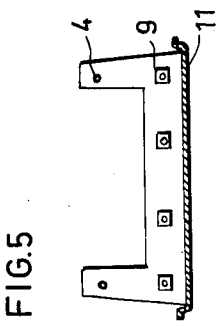


FIG.5

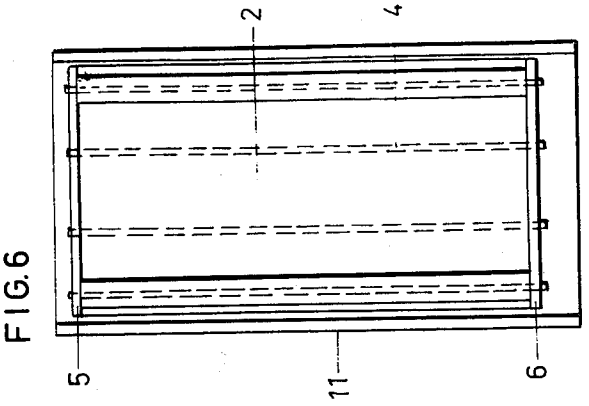


FIG.6

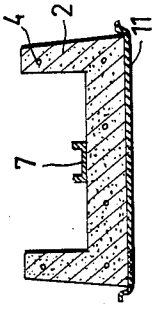


FIG.3

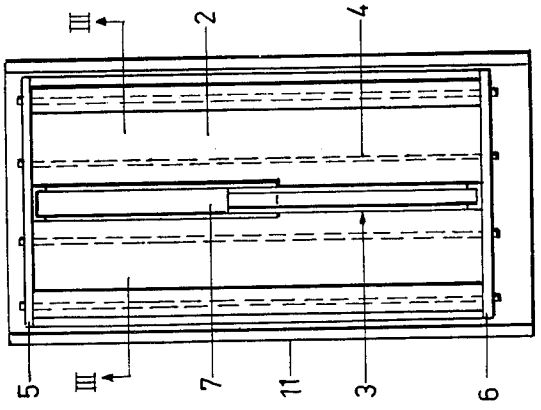


FIG.4

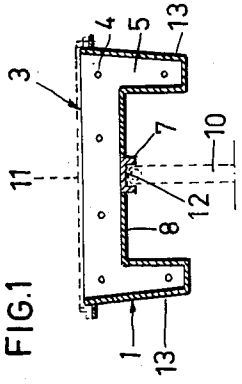


FIG.1

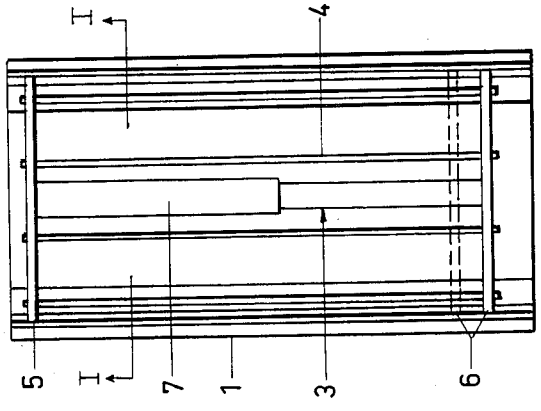


FIG.2

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United States Patent Office 3,233,027 Patented Feb. 1, 1966

3,233,027

METHOD OF MAKING PRESTRESSED CONCRETE BEAMS

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Filed Dec. 27, 1961, Ser. No. 162,542
2 Claims. (Cl. 264—228)

This invention relates to a process for using a device for making prestressed concrete beams and is essentially characterized by the fact that the device is a combination of a mould and means introduceable into said mould for putting the reinforcing rods under stress, said stressing means being adapted for removal from the mould together with the concrete beam cast in the mould and having the stressed reinforcing rods embedded therein.

The invention is also concerned with a method of making prestressed concrete beams with the use of the device according to the invention. This method is essentially characterized by the fact that the stressing means is removed from the mould together with the concrete beam cast in the mould and having the stressed reinforcing rods embedded therein, before the beam has set so that the final setting of the concrete around the reinforcing rods takes place outside the mould.

The invention makes it possible to make prestressed concrete beams in ordinary moulds substantially at the same rate as customary reinforced concrete beams. As the device for making the prestressed concrete beams moreover is not very expensive, the invention permits manufacturing prestressed concrete beams at considerably lower costs than has hitherto been possible.

For a better understanding the invention will be more fully described in the following, reference being made to the accompanying drawing which illustrates the method using an embodiment, chosen by way of example, of the device suggested by the invention. In the drawing:

FIG. 1 is a cross section of the device on line I—I in FIG. 2 before the mould has been filled with concrete;

FIG. 2 is a top plan view of the device shown in FIG. 1;

FIG. 3 is a cross section on line III—III in FIG. 4;

FIG. 4 is a top plan view of a concrete beam immediately after it has been removed from the mould;

FIGS. 5 and 6 are respectively an end view and a plan view of a concrete beam some time after it has been removed from the mould.

1 denotes the upwardly open mould in which the prestressed concrete beam 2 is cast. According to the embodiment shown the concrete beam 2 is of U-shaped cross section but it is understood that other cross sectional forms can also be chosen.

According to the invention, the mould 1 is combined with means 3 introduceable thereinto for stressing the reinforcing rods 4, and said stressing means 3 is adapted for removal from the mould 1 together with the concrete beam 2 cast in the mould 1 and having the stressed reinforcing rods 4 embedded therein.

As will appear from the drawing which shows a preferred embodiment of the stressing means 3, said means comprises two end wall members 5 and 6 for the concrete beam 2, which members are constituents parts of the mould 1, and a telescoping stressing element 7 arranged between said end wall members 5 and 6 which are provided with, or formed as, fastenings for the reinforcing rods 4.

In the position of the stressing means 3 introduced into the mould 1, the stressing element 7 is arranged to lie outside that part of the mould 1 in which the concrete beam 2 is cast. As shown in the drawing, the stressing element 7 thus lies beneath the bottom 8 of the mould 1, which bottom has a recess for accommodating the stressing element 7. During casting a plate or like member is to cover said recess in the mould bottom 8.

The stressing element 7 is removably secured to the end wall members 5 and 6 in a per se known manner. The ends of the stressing element 7 can be arranged to engage either the facing sides of the end wall members 5 and 6, as is shown in the drawing, or the sides of said members 5 and 6 which face away from each other.

After the reinforcing rods 4 have been secured to the end wall members 5 and 6 with the aid of nuts 9, keys or like means the end wall members are moved apart by means of any suitable device so that the reinforcing rods 4 are given the desired prestress. Then the two parts of the stressing element 7 are fixed relative to each other in a suitable manner so that the prestress is maintained. The end wall members 5 and 6 can be moved apart before the stressing means 3 is introduced into the mould 1, but as will be seen from the drawing where the position of the end wall member 6 before prestressing is indicated by dash lines, the end wall members 5 and 6 can be moved apart also with the stressing means in position in the mould.

According to the preferred embodiment shown the mould 1 is pivotally mounted in a frame 10. Associated with the mould 1 is a cover 11 which can be secured thereto. After the mould 1 with the stressing means 3 therein has been filled with concrete and possibly also vibrated the cover 11 is mounted in position on the mould which is then swung about the shaft 12 to the position in which the opening of the mould 1 is turned downwards. The cover 11 is now caused to engage a base whereupon it is loosened from the mould 1. By displacing the mould 1 and the cover 11 relative to each other the beam 2 with the stressed reinforcing rods 4 therein and the stressing means 3 will leave the mould 1 and be deposited on the cover 11, as will be seen from FIGS. 3 and 4. The beam 2 can be deposited on the cover 11 practically immediately after casting and thus long before the concrete finally sets around the reinforcing rods 4. As a consequence, the mould 1 is immediately available for casting a new beam with the use of another stressing means 3, since the earlier stressing means 3 still fulfills its function on the beam just cast. A given time after the concrete beam 2 has been removed from the mould 1 but before the final setting of the concrete takes place, the stressing element 7 can be removed from the end wall members 5 and 6 and used in the casting of another prestressed concrete beam. This removal of the stressing element 7 is possible because the concrete beam 2 is now capable, during the final setting of the concrete, of maintaining the end wall members 5 and 6 at the distance determined for the prestressing. FIGS. 5 and 6 are meant to illustrate this. The time after which the stressing element 7 is removed has to be determined from case to case.

In the embodiment illustrated it is only the four reinforcing rods 4 located in the web of the beam 2 that are put under prestress. However, in other embodiments all or other reinforcing rods 4 can be put under prestress.

During casting the suction between the concrete and the converging outwardly facing sides 13 of the mould 1 shall thus give the corresponding sides of the concrete beam 2 rough surfaces to facilitate joining of the concrete beams 2.

The above embodiment of the invention was described for purpose of illustration rather than limitation. All conceivable variations or modifications of the invention are understood as being included in the scope of the appended claims.

What I claim is:

1. A method for making prestressed concrete beams comprising pouring concrete into a mold having end wall members located in said mold with reinforcing rods extending between said end wall members, placing said end wall members and reinforcing rods under stress by a stressing element removably attached to said end wall members, inverting said mold prior to final setting of said concrete and removing the mold but not said end wall members from the concrete beam formed, then removing said stressing element from said end wall members and allowing the concrete to finally set.

2. A method as set forth in claim 1 wherein said stressing elements are removed from said end wall members after said concrete beam has been removed from the mold with said end wall members but before the final setting of the concrete.

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