

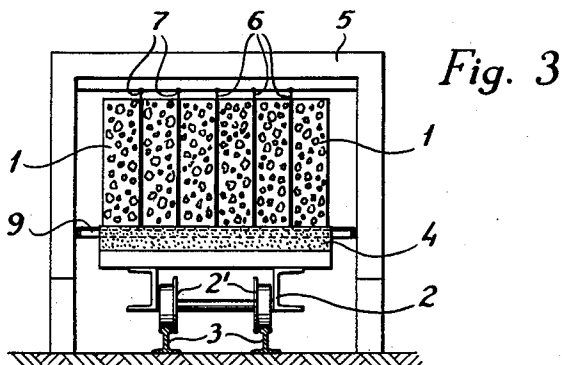
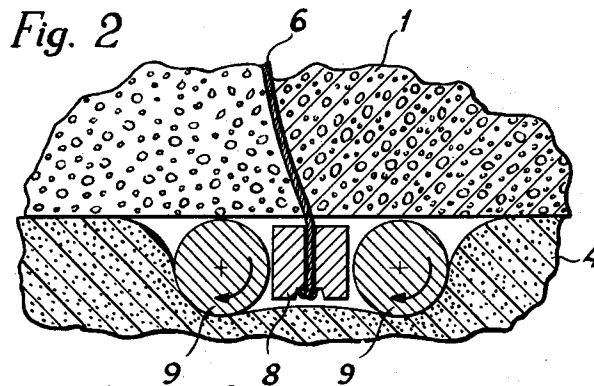
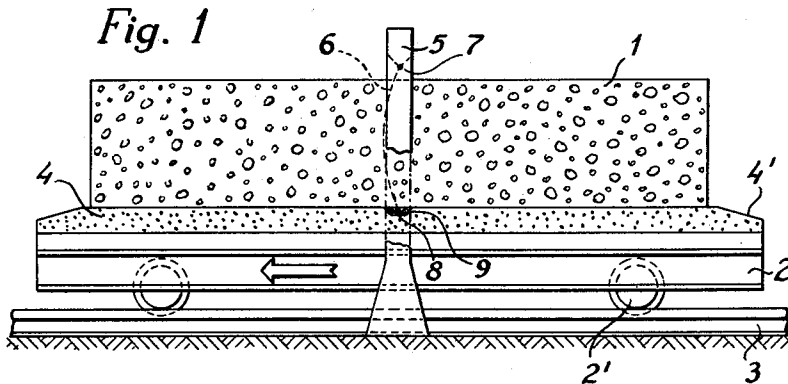
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ARRANGEMENT FOR CUTTING SEMI-PLASTIC BODIES

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ARRANGEMENT FOR CUTTING SEMI-PLASTIC BODIES

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This invention relates to an arrangement for cutting semi-plastic bodies and more particularly to the production of slabs or blocks from porous or cellular light-weight concrete bodies cast in a mold.

In the manufacture of light-weight concrete products in the form of blocks or slabs it is customary first to cast a rather large body from a light-weight concrete mass, and then to cut up this body into smaller units as soon as the light-weight concrete mass has assumed a semi-plastic consistency so that it no longer requires the support of a mold. This cutting of the cast body is commonly carried out by passing cutting wires or similar cutting members stretched in frames or yokes through the cast body in a horizontal or a vertical direction. For various reasons it has been found desirable to cause the cutting members to pass through the cast body in the horizontal direction, while the cutting members themselves extend more or less vertically in their frames or yokes.

Obviously, the cutting of the cast body in this manner cannot be carried out unless those parts of the frames or yokes, to which the lower ends of the vertically extending cutting members or wires are secured, can pass without hindrance underneath the light-weight concrete body which on the other hand must be reliably supported during the cutting operation.

Hitherto no other way to solve this problem is known within the related art than to move the light-weight concrete body away from the bottom of the casting mold to a special cutting support or cutting bed, which may either consist of spaced parallel beams extending in the direction of movement of the cutting frame and having slots between them for the passage of the cutting members, or, alternatively, of a row of transverse supporting panels adapted to be lowered away from the under side of the light-weight concrete body, one after the other, to thereby permit the free passage of the cutting frame member immediately below the body.

As will be readily understood such known types of cutting supports suffer from the disadvantage that the location of the cutting members and thus of the cuts are predetermined by the width of the beam or panels so that the number of patterns according to which the cutting operation may be performed is rather restricted. This means in practice that no odd-sized products can be cut out from the body unless reconstruction of the cutting support is carried out.

It is also obvious that the transportation of the large light-weight concrete body from one support to another represents a considerable disadvantage not only because the body is bulky and heavy and therefore difficult to handle, but also because cracks and other damages are liable to occur in the body during such handling due to the comparatively low strength of the material of the body. In fact, the common porous light-weight concrete bodies have to be handled with extreme care until they have been cured by steam treatment or the like.

An object of the present invention is to provide improved means in the manufacture of light-weight concrete products to eliminate the necessity of moving away the large light-weight concrete body from the original support on which it has been cast to a special cutting support or bed for performing the cutting operation with the body resting thereon. A further object of the invention is to provide means for supporting the large and fragile light-

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weight concrete body in the cutting operation in a manner offering a maximum bearing surface to the body and assuring a shockfree and harmless handling thereof. A still further object of the invention is to provide an improved cutting support or bed on which the body can be cut at any desired location and in any desired direction without limitations due to construction or structure of the support. Another object of the invention is to save space in the light-weight concrete manufacturing plant by particular arrangements of such means.

In accordance with the invention, a cutting arrangement is provided including a cutting support or bed for the semi-plastic body to be cut, for example a body of cellular concrete, said support or bed comprising a layer adapted to be locally compressed when subjected to a pressure exceeding the pressure exerted by the concrete body lying thereon, with formation of channel-like recesses in the said bed layer. This cutting arrangement also includes a cutting frame or yoke with cutting members arranged therein and having a lower frame side portion transversing the cutting bed and adapted to pass just below the concrete body in said channel-like recesses when the cutting bed with the body thereon and the cutting frame are passed in relative movement to each other, means for effecting said local compression with formation of said channel recesses to allow the free passage of said lower frame side portion being also provided.

The said compressible cutting support or bed may generally consist of any suitable yielding and elastic material which is capable of supporting the body without being entirely compressed but which is adapted to be locally compressed in the manner indicated above. As suitable examples of such cutting supports may be mentioned a layer or an inflatable cushion or mattress of foamed or sponge plastics, such as a sponge rubber layer or a material with the same physical properties.

The local compression of the cutting bed to form the said channel-like recesses to allow for the passage of the lower cutting frame side portion in the cutting operation may suitably be effected by means of friction reducing rollers extending along both sides of the said lower frame portion to progressively move away the compressible layer as the frame or yoke advances under the body to be cut.

The cutting support used in accordance with the invention may also advantageously be utilized as a casting support or casting mold bottom in the casting operation, in which case a removable frame is placed thereon to serve as mold walls in the casting operation.

To facilitate the understanding of the invention a preferred embodiment thereof will now be described more in detail with reference to the accompanying drawing, wherein the invention is diagrammatically illustrated. In the drawing

FIG. 1 is a side view, partly in section, of an arrangement for cutting up large-sized light-weight concrete bodies.

FIG. 2 is a partial longitudinal sectional view showing on an enlarged scale the compression of the bed for the body to be cut, and

FIG. 3 is an end view from the right of the arrangement shown in FIG. 1.

In the drawing the light-weight concrete body 1 is carried on a truck 2 having wheels 2' running on rails 3. The body rests on a mattress-like supporting layer or bed 4 of sponge rubber arranged on top of the truck 2. During the cutting operation the truck 2 is passed through a portal 5 which forms a stationary cutting frame having substantially vertically extending cutting wires 6 stretched therein between suitable fixtures 7 in the top cross member of the portal 5 and corresponding fastening means in a lower cross bar 8 which extends between the side-posts

of the portal 5 on a level located immediately below the underside of the light-weight concrete body 1 resting on the bed 4. On both sides of the cross bar 3 parallel rotatable rollers 9 extending over the full width of the portal are mounted so that their lower sides protrude slightly below the lower side of the cross bar 3, as will be seen particularly from FIG. 2.

When the truck 2 with the cast light-weight concrete body 1 resting thereon is passed through the portal 5, the said rollers 9 will roll up on the bed 4 and compress the latter locally to provide a channel-like recess for the cross bar 3 between them, as indicated in FIG. 2, so that the cross bar can pass unhindered beneath the body 1 during the cutting operation.

To ensure that the rollers 9, in the case illustrated in the drawing, actually roll up on the upper side of the bed 4, they may be vertically adjustable together with the cross bar 3 in the portal 5 so that they may be pressed down from above into a projecting end portion of the bed 4 at the front end of the truck before cutting begins, or, preferably, the front end of the bed 4 may be bevelled, as indicated at 4'.

It is obvious that the concrete body, when still resting on the bed 4 on top of the truck 2, may also be cut in the transverse direction, by means of cutting wires stretched in ordinary cutting yokes, the lower shank of such yokes being then held pressed down into the bed 4 as it is pushed in under the body 1. Such a yoke-like cutting wire holder may, of course, also be provided with roller or the like to reduce the friction between its lower shank and the bed 4 during the cutting movements.

As indicated above, the bed 4 is also adapted to form an excellent, uninterrupted casting support or mold bottom so that the light-weight concrete body 1 may be cast thereon, if desired, and in such a case a suitable mold frame serving as mold walls is placed on the bed on the truck during casting and expansion of the body and is then again removed before the actual cutting operation is performed. The truck with the body resting thereon may also be used to transport the cut up body into the autoclave without reloading, provided that the bed material 4 is adapted to withstand the steam treatment to which the products are subjected in the steam curing operation.

It will be clearly understood that the embodiment of the invention now described and illustrated is not intended to limit the scope of the appended claims. Thus, rather extensive modifications may be made both in the arrangement of parts and in the detailed construction of the yieldable supporting bed.

For example, in the embodiment described above, the upper side or face of the yielding support may be said to perform a function similar to that of a diverting conveyor belt when passing under the advancing rollers, and consequently the top surface of the bed need not necessarily be elastic but may consist, for example, of a flexible steel band resting on suitable springs or other elastic cushion members, or of a reinforced rubber skin forming the upper side of a gas- or liquid-filled mattress, etc.

Further, the cutting support for the concrete body may be stationary and the cutting frame arranged to be movable.

What I claim is:

1. An apparatus for cutting semi-plastic cellular concrete bodies comprising a bed for the body to be cut, a cutting frame, vertical cutting means mounted in said cutting frame the lower side portion of said frame positioned to pass beneath the body resting on said bed when cutting of the body is carried out, moving said bed in a horizontal direction relative to said frame, a compressible supporting element on said cutting bed for supporting a load of the cellular concrete body to be cut, the thickness of said supporting element even in its loaded condition exceeding the thickness of the lower side portion of the cutting frame, means adjacent the lower portion of the frame which com-

presses the compressible element at localized areas, and said compressible element yielding at localized areas when subjected to a localized pressure by said means adjacent the lower side portion of the frame exceeding the pressure exerted by the body whereby said frame member may pass beneath said body and not disturb it during the cutting operation.

2. In an arrangement for cutting light-weight concrete bodies in a semi-plastic condition, the combination of a yieldable elastic bed for the body to be cut, said bed comprising a layer adapted to be locally compressed when subjected to a pressure exceeding the pressure exerted by the body lying thereon, a substantially vertical cutting frame arranged at substantially right angles in relation to the cutting bed and having a lower side portion arranged beneath the upper face of the elastic bed and transversing said cutting bed and contacting and compressing in sequence adjacent sections of said yieldable elastic bed, means for effecting relative movement between said frame and said cutting bed, vertical cutting members arranged in said frame to cut said body during said relative movement, and means adjacent said lower-side portion of said cutting frame for locally compressing said bed layer to form a channel-like space therein to allow for the passage of said lower side portion of said cutting frame immediately underneath said body in the cutting operation.

3. In an arrangement for cutting light-weight concrete bodies in a semi-plastic condition, the combination of a bed for the body to be cut, said bed comprising a layer of sponge rubber adapted to be locally compressed when subjected to a pressure exceeding the pressure exerted by the body lying thereon, a movable truck for supporting said cutting bed, a stationary substantially vertical cutting frame arranged at substantially right angles in relation to the cutting bed and having a lower side portion transversing said cutting bed, means for moving the cutting bed relative to the cutting frame vertically arranged cutting wires arranged in said frame to cut said body when the truck with the concrete body resting on the cutting bed is passed in a direction at right angles to the cutting frame with the lower side portion of the frame passing under the bottom of the concrete body, rotatable rollers being mounted on each side of said lower side portion of the cutting frame for progressively pressing down the compressible sponge rubber layer to allow for the passage of said lower side portion of the cutting frame immediately underneath said body in the cutting operation.

4. In an apparatus for cutting light-weight concrete bodies while they are still in a semi-plastic condition, the combination of a bed for the body to be cut, a cutting frame having cutting members arranged therein and comprising upper and lower horizontal frame portions transversing said bed, means for supporting said cutting frame in a manner to keep the lower horizontal frame portion at a level entirely below the bottom side of said body to be cut and the upper one of said frame portions at another level well above the top of the body to be cut, said frame supporting means and said bed for the body to be cut being arranged for relative horizontal movement in a direction substantially perpendicular to said frame members in order to effect cutting of the body resting on said bed by means of said cutting members of said cutting frame, a compressible body supporting element on said bed, said compressible element having its body supporting top surface, when subjected to the load of the body to be cut, at a level slightly above the top of said lower frame portion, said body supporting element being of a type capable of yielding when a localized pressure is applied to a small area so that the top surface of said element may be locally separated and spaced in a vertical direction from the bottom side of the body resting thereon by such localized pressure, means adjacent the lower portion of the frame which compresses the compressible element at localized areas, said means and said lower frame portion maintained at a level beneath the body to be cut

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and said means being formed and arranged so as to exert such pressure on said compressible element when being forced to pass said bed due to horizontal movement between said frame supporting means and said bed thereby to depress said compressible element below said lower frame portion and cause it to permit free passage of said frame portion under the body.

5. An apparatus for cutting semi-plastic bodies comprising, in combination, a bed for the body to be cut, a substantially vertical cutting frame comprising upper and lower frame portions transversing said bed, respectively, at a level above and immediately below the body to be cut, and cutting members extending between said upper and lower frame portions, said bed and frame being arranged for relative horizontal movement to effect cutting of the body while maintaining said positions of said upper and lower frame portions relative to the body, said bed comprising a compressible body supporting layer which, at the time when subjected to the load of the body, is capable of being further compressed within a localized area to such an extent that said lower frame portion may pass between such further compressed area of said layer and the bottom side of the body, means for causing said relative movement, and said lower frame portion comprising means for effecting such further compression of said body supporting layer when relative movement of said bed and frame occurs.

6. An apparatus as stated in claim 5, wherein said compressible body supporting layer is an elastic layer of foamed plastic.

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7. An apparatus as stated in claim 5, wherein said compressible body supporting layer is an elastic sponge rubber mattress.

8. An apparatus as stated in claim 5, wherein said means in said lower frame portion for effecting further compression of said body supporting layer are friction reducing means.

9. An apparatus as stated in claim 5, wherein said layer compressing means comprises friction reducing rollers rotatably mounted on said lower frame portion.

10. An apparatus as stated in claim 9, characterized in that one roller is rotatably mounted on each side of said lower frame portion, and said rollers are of such size and so positioned to progressively depress said compressible layer and keep it out of contact with said frame portion during the relative movement of said bed and cutting frame.

11. An apparatus as stated in claim 5, wherein said compressible body supporting layer is mounted on a wheeled bed while said cutting frame is stationary mounted so as to pass by said bed during cutting of the body.

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