This application is a continuation-in-part of my co-pending patent application Ser. No. 738,501, filed on May 28th, 1958, now abandoned.

This invention is concerned with the problems involved in receiving substantially parallelepipedic bodies or units of substantial size and low strength delivered in a horizontal direction as from the end of a moving conveyor belt support and more particularly the invention relates to means for receiving and forwarding to an autoclave such large, porous lightweight concrete units of parallelepiedic shape which are cast as a preliminary step in the manufacture of blocks, slabs and similar building elements of steam-hardened cellular concrete for example in a giant stationary mold of the type described in said co-pending patent application Ser. No. 738,501 or in other suitable casting molds having a movable conveyor belt structure.

It is customary in the production of such porous concrete elements to release the cast bodies or units from the mold walls as soon as the units do not longer need the support thereof and to immediately remove the semiplastic, porous units from the casting bed to make the latter ready for a new casting process. In the types of casting molds above referred to the cast units are removed from the casting bed by the movement of the conveyor belt mold bottom in order to avoid all the inconveniences and hazards involved in lifting such bulky and dangerous loads and, thus, the cast units are delivered at the one end of the casting bed in a horizontal direction to be then forwarded—after having been suitably cut through in one or more directions—to the autoclave for steam-hardening.

It will be readily understood that these semiplastic, porous concrete units, which are to be taken care of at the end of a casting bed of this kind, are not only very large and heavy but also extremely sensitive to shocks, vibrations, pressure, etcetera since the porous concrete material has a very low strength until it has been subsequently hardened in the autoclave. Therefore, an extremely careful handling of the delicate units will be necessary. This, in turn, makes it highly desirable to avoid all further shifting or reloading of the units once they have been properly delivered from the conveyor belt mold bottom. It has, however, been deemed practicably impossible to deliver the semiplastic concrete units from the casting bed directly into the autoclave for immediate steam-hardening treatment and, instead, it has been found most desirable to receive the units in such manner from the casting bed that they may be transported by means of trucks or wheeled vehicles to the autoclave. This is particularly advantageous because such trucks or vehicles may be easily moved around and shunted on suitable tracks within the factory to deliver their load into any one of several autoclaves and thus secure a more continuous utilization of the factory equipment.

Consequently, it is an object of this invention to provide adequate means for receiving such large and delicate semiplastic porous concrete units or similar bulky parallelepipedic bodies delivered in a horizontal direction as from a moving conveyor belt support and to make possible a further transport of said units or bodies—for instance to an autoclave for steam-hardening—without necessitating any further shifting of the load from the bearing surface on which it has been once received.

Other objects and features of the invention will become apparent from the following detailed description of a preferred embodiment of the invention which has been illustrated in the accompanying drawings, wherein:

FIG. 1 is a side view of the unit receiving means showing, however, for the purposes of saving space only the respective end portions thereof, it being left to understand that the intermediate portion omitted is an extension of arbitrary length of the adjacent inner ends of the portions shown,

FIG. 2 is a sectional elevation taken along the line 2—2 in FIG. 1 and thus showing the unit-receiving conveyor belt structure resting on the runways.

FIG. 3 is a partial sectional elevation similar to FIG. 2 but showing the unit receiving conveyor belt structure taken over by the transport truck received between the two runways.

FIG. 4 is a partial top plan view of one of the two runways, it being left to understand that both said two runways are similar in design throughout their lengths.

FIG. 5 is a side view of the transport truck, partially broken through to show the means for elevating the load receiving members thereof—this view being shortened similarly to FIG. 1 for the purpose of saving space, and

FIG. 6 is a fragmentary perspective view of a unit receiving conveyor belt structure.

The arrangement as illustrated in the drawing comprises, broadly, three separate but cooperating parts viz., a main supporting structure A, a sectional conveyor belt structure B, and a transport truck C. In the present case the main supporting structure A is formed as a shunting truck having wheels 1 running on stationary rails 2 on the factory floor. The frame of this shunting truck is composed of transverse beams 3 extending parallel to the rails 2 and longitudinal beams 4 extending at right angles thereto and having a considerably greater length than said transverse beams 3. There are four longitudinal beams in the shunting truck frame and these beams are grouped in two spaced apart pairs. The two beams in each pair are placed back to back rather close to one another to form between them a guiding channel for a beam-like carrier member 5 extending in the whole length of the beams 4 and having at least its one right hand end projecting beyond the ends of the beams 4. Each carrier member 5 is guided relatively to its pair of beams 4, such as by pins 6, to maintain a predetermined longitudinal position therebetween but is free to move vertically as will be explained hereinafter.

It will thus be clear that the two carrier members 5 extend parallelly to each other in the main supporting structure A and they form a pair of spaced apart runways, because each carrier member 5 has its upper edge portion formed as a channel 7 in which a considerable number of rollers 7 are mounted to be freely rotatable about parallel axes transversing the channel section. All said rollers of each runway are of the same size in that they have their axes in a common plane and they are mounted to present their top portions above the edges of the channel 7. The rollers of each runway are also, as will best be seen from FIG. 4, mounted in staggered relationship as viewed from above to present a support of maximum smoothness and continuity for the conveyor belt structure B when the latter is received on said runways.

Below the longitudinal beams 4 there are mounted a number of transverse shafts 8 passing under the lower edge of both the two carrier members 5. Said shafts 8 have eccentrics 9 secured thereto, one under each carrier member 5, and the carrier members rest on these e-
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centrics so that they will be raised and lowered in perfect synchronism between its respective pair of beams 4 which support the shafts 8. The one end of each shaft 8 has a lever 18 secured thereto and the outer end of each such lever is coupled to the corresponding levers of all the other shafts 8 by means of links 11 to permit all the shafts 8 to be rotated synchronously. The lever 19 of the one shaft has a toothed section 12 thereof which is in mesh with the pinion 13 rotatably mounted on the side of the main supporting structure A, and by turning this pinion 13 by means of a crank 14 all the shafts 8 may be rotated and set in desired positions to thereby adjust the level of the two runways carried by the members 5.

At their right hand ends the runways or carrier members 5 supporting two arms 23 mounted on an arm 15 having a pair of axially spaced sprocket wheels 16 secured there to. The shaft 15 is rotatable by means of a second crank 17 and the sprocket wheels 16 have for their purpose to engage the conveyor belt structure B when the latter is placed on the runways so that the runways 16 turn flush with the bottom level of the unit to be received and this is, of course, accomplished by turning the crank 14 a suitable, small angle. Now, when the unit 25 is received, the forward end of the unit will first abut the bracket 22 and come to rest on the end plate 22 of the conveyor belt structure B and then the unit 25 will take the entire conveyor belt structure B with it as it advances along the runways which are, of course, properly placed to extend in the direction of delivery of the unit.

As a consequence of this the conveyor belt structure B will be drawn up, section by section, over the sprocket wheels 16 from its temporary storage space on the roller ways 18 and spread out longitudinally over the runways with the unit 25 received on top of it. It should be understood that the length of the conveyor belt structure B and thus also of the runways should be so chosen that the entire length of unit 25 will become rested on the platform formed by the conveyor belt structure B.

When the entire unit 25, or a series of units as the case may be, has been properly received on the conveyor belt structure B it may be necessary to move the latter by hand, or with the aid of any suitable mechanical means, a small distance further to the left in FIG. 1 to make its right hand end entirely free from the sprocket wheels 16, and so the platform B with its load may be lifted away from the runways if the movements of the running truck formed by the belt supporting structure A is not sufficient to place the load where desired.

In the present case it is assumed to be desirable to remove the platform B with its load of unit 25 from the main supporting structure A for further transport and for this purpose there are provided rail beams 27 between the two runways and the two pairs of longitudinal beams 4. These rail beams 27 form a track for a transport truck C which is designed to enter the space between the two runways as shown in FIGS. 2 and 3 and which comprises an elongate frame 28 having wheels 29. On both sides of the frame 28 and longitudinally thereof there are provided beams 30 resting on eccentric 31 secured to the respective ends of a number of transverse shafts 32 jour- nelled in the truck frame 28. The two beams 30 are retained on the frame 28 by means of suitable bolts 33 inserted through slots 34 allowing the beams 30 to move vertically relatively to the truck frame 28 in response to the rotation of the shafts 32 with their eccentrics 31.

Substantially in the same manner as has been hereinbefore described with reference to the means 8-11 for raising and lowering the carrier members 5, the shafts 32 of the transport truck C have levers or arms 35 connected by links 36 to effect synchronous rotation of the shafts 32 and, hence, synchronous vertical movements of the beams 30, but in the transport truck C the rotation of the shafts 32 is accomplished by turning, with the aid of a removable crank 37, a spindle 38 extending through the left hand end wall of the truck frame 28 and having a threaded
portion engaging a nut-like member 39 articulatedly secured to the lower end of the left hand lever 35. Each beam 30 has a length at least corresponding to the length of the conveyor belt structure B and each beam also has a load receiving prism 40 of similar length welded to its top surface. When the beams 30 are adjusted to their lowestmost position relatively to the track frame 28, the entire transport truck C will be able to freely enter the space between the runways formed on top of the carrier members 5 also when the conveyor belt structure B is resting thereon. If, however, the transport truck C has been inserted under the conveyor belt structure B and the carrier members 5 are lowered to their lowestmost position or, alternatively, the beams 30 of the transport truck C are raised to their uppermost position, the conveyor belt structure B will be taken over from the runways by the prisms 40 of the transport truck and then be ready to follow the latter away from the main supporting structure A. It will be appreciated that, if the unit 25 has been received on the conveyor belt support B when the latter is thus taken over by the truck C, the unit 25 will follow the conveyor belt structure wherever the same will be transported and consequently no shifting or removal of the unit 25 on or from the platform, on which it was once received, will be necessary for forwarding the unit to any desired place such as an autoclave, whereas the truck C may, of course, be relieved by suitably reversing the load receiving operation such as between a pair of fixed supporting brackets or beams.

The truck C may also be utilized to deliver a fresh conveyor belt structure to the runways of the main structure A in a similar way and in this case the runways may be caused to take over this fresh conveyor belt structure either by lowering the truck prism 40 or by raising the carrier members 5.

It should be understood that several changes and modifications of the details herein described may be resorted to within the scope of the appended claims, and that the invention is not confined to the preferred embodiment shown in the accompanying drawings.

What I claim is:

1. An arrangement for receiving substantially parallel-epipodic units of substantially large strength delivered in a horizontal direction as from a moving conveyor belt support, said arrangement comprising, in combination, a pair of spaced, parallel runways extending in the direction of delivery of the units, a plurality of parallel transverse rigid members hingedly coupled together to form, when resting on said runways, a hinged bridge structure capable of being raised and lowered between said runways and capable of receiving and supporting at least one complete unit, a transport truck separate from said runways and having wheeled frame capable of entering the space between said runways, means at that end of said runways, the units enter, for feeding down a main portion of said conveyor belt structure into a storage space below said runways preparatory to the receipt of a unit thereon and for guiding said belt structure up on said runways to let it form said platform thereon, section by section, as the unit enters so that the unit will become rested on said platform, means on said transport truck extending in the full length thereof and longitudinally of said runways to receive said platform with the unit thereon from said runways, and means for adjusting relative to each other the levels of said runways and said platform receiving means of the truck to thereon by effect shifting of the unit-loaded platform from said runways to said truck.

2. An arrangement as claimed in claim 1, wherein said runways are vertically adjustable relatively to said transport truck received therebetween.

3. An arrangement as claimed in claim 1, wherein said platform receiving means on said transport truck are adjustable in height relatively to said runways.

4. An arrangement for receiving substantially parallel-epipodic units of low strength delivered in a horizontal direction as from the end of a moving conveyor belt support, said arrangement comprising, in combination, a pair of spaced, parallel runways on said supporting structure, said runways extending in the direction of delivery of the units and projecting above the remainder of said supporting structure so as to form a free space between them, a separate sectional conveyor belt structure composed of parallel, transverse rigid members hingedly coupled together to form, when resting flat, a unit-supporting platform capable of bridging said free space between the two runways, when received thereon, and having a definite length at least somewhat shorter than the length of said runways but longer than the length of any unit to be received, means at that end of said runways, where the units enter, to guide said conveyor belt structure up on said runways from a temporary storage space below them so as to let it spread out longitudinally over said runways to form said platform, section by section, when the units are received thereon, a separate transport truck capable of entering said free space between the two runways and means for adjusting the relative vertical position of the top of said truck and the level of said runways in order to cause said truck to take over said platform with its load of units thereon from said runways for carrying in combination a supporting structure of said platform away from said runways and said supporting structure.

5. An arrangement for receiving substantially parallel-epipodic units for substantially large strength delivered in a horizontal direction as from a moving conveyor belt support, said arrangement comprising, in combination, a pair of spaced, parallel runways extending in the direction of delivery of the units, a plurality of parallel transverse rigid members forming together, when resting on said runways, a free and removable platform of definite length bridging the space between said runways and capable of receiving and supporting at least one complete unit, means at that end of said runways, where the units enter, for placing said transverse platform section members one by one on said runways to form said platform as the unit is received thereon, and a second support adapted to receive said unit-loaded platform from said runways, said parallel runways being vertically adjustable to deliver said unit-loaded, free platform for said second support by being lowered below the platform receiving surfaces of said second support.

6. An arrangement as claimed in claim 5, wherein said vertically adjustable runways form part of a wheeled truck.

7. An arrangement as claimed in claim 5, wherein said runways each present two rows of rotatable rollers having parallel axes transversing said runways, the rollers in said two rows of each runways being placed in staggered relationship to provide a friction reducing platform support of maximum smoothness.

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