Feb. 9, 1937. L. GELBMAN ET AL 2,069,880

BLOCK REMOVING DEVICE FOR CONCRETE BLOCK MACHINES

Filed Feb. 10, 1934

Fig. 1

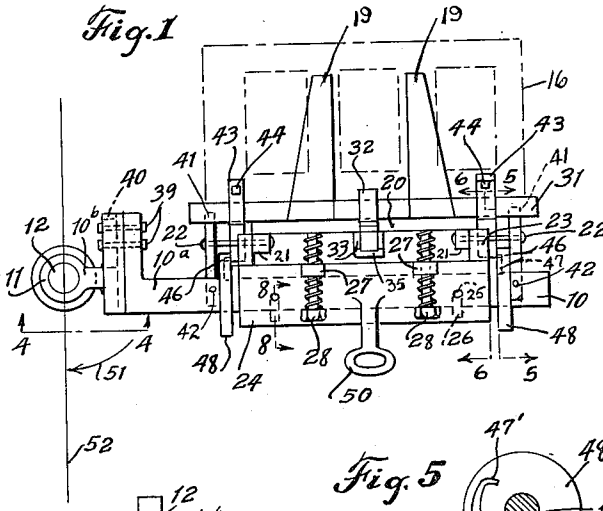


Fig. 2

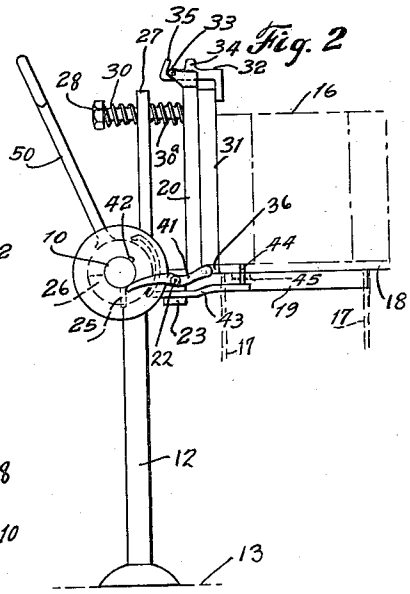


Fig. 5

Fig. 4

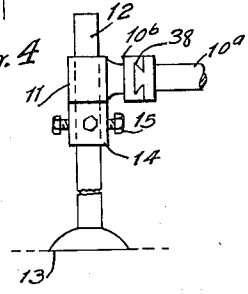


Fig. 6

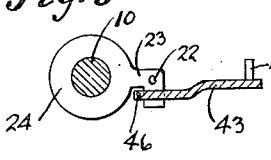


Fig. 7

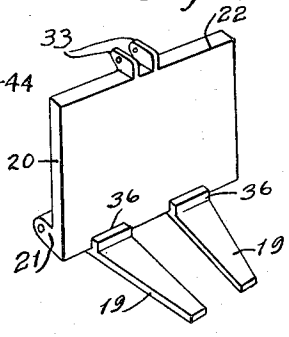


Fig. 3

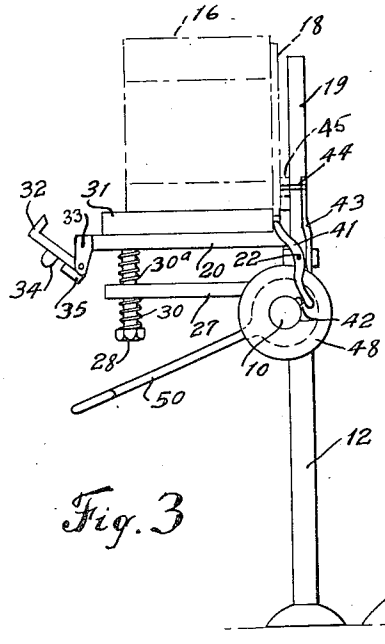


Fig. 9

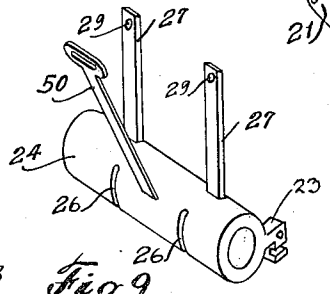
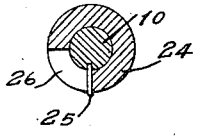


Fig. 8



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BLOCK REMOVING DEVICE FOR CONCRETE BLOCK MACHINES

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Application February 10, 1934, Serial No. 710,620

15 Claims. (Cl. 25—1)

This invention relates to new and useful improvements in a block removing device for a concrete block machine.

The invention may best be understood by first considering the present state of the art as actually practiced in concrete block manufacturing plants. The blocks are manufactured on machines in which it is necessary to first place pallets in the molds thereof, then tamp, vibrate, compress, or in any other manner engage the plastic materials into the molds with sufficient pack so the blocks may subsequently be immediately stripped from the molds by stripping rods or other mechanism engaging beneath the pallets and lifting the blocks and pallets bodily above the molds. It has been customary to remove the blocks from the machines on their pallets and store them in steam rooms, or in any other manner conclude the processing of the blocks.

The pallets are a large item of expense since one pallet is needed for each block and these pallets must be of durable material capable of withstanding shock since they are customarily thrown around when being handled and furthermore are subjected to stresses when in the molds during the manufacture of the blocks. In practice these pallets are steel stampings or forgings and approximately cost 25¢ a piece. Generally several thousand pallets are necessary with each machine to satisfactorily supply the capacity of the machine. This represents a large capital investment. After the blocks have been treated and hardened it is necessary that the steel pallets be taken off by smart blows upon the edges.

It is an object of this invention to provide a device adapted to lift the block from the concrete block machine after it has been stripped from the mold and simultaneously to transfer the block upon some cheap supporting element such as a board, sheet metal, casting or the like. It is further proposed to immediately remove the pallet from the block after it is transferred upon the supporting element so that the same pallet can be used in the mold of the block machine for the making of the next block. With this arrangement only a few expensive pallets are necessary for any one machine, the blocks being transferred to cheaper supporting elements. Consequently the capital necessary for operating the block machine is greatly reduced.

More particularly the invention proposes an arrangement whereby the block is lifted from the block machine and turned around on one side upon the supporting element.

Furthermore the invention also proposes arrangements whereby the block is not distorted during the operation explained in the previous paragraph. It should be borne in mind that when the block is stripped from the mold of a block machine it is very soft and easily deformed.

Still further the invention proposes the provision of an angle member having arms at 90° from each other and adapted to take off the block from the block machine and turn the block around on one side while simultaneously holding the 90° relation of the base of the block with the side so as not to deform the block.

Still further the invention proposes the provision of resilient means associated with the angle member in such a manner that the resilient element acts as a cushion to prevent sudden jar which would be liable to deform the block.

Still further the invention also proposes mechanism for automatically holding and releasing a supporting member upon the angle member in such a manner that the block may be transferred to the supporting member and removed therefrom without extra operation.

This invention also has for an object to pivotally support an angle member upon a member supported to swing in horizontal so that the normally horizontal arm of the angle member may be engaged beneath the pallet of the block so that subsequently the angle member may be pivoted to 90° to transfer the block upon a supporting element.

Another one of the objects of this invention is an arrangement whereby the member mentioned in the previous paragraph may be adjusted at right angles to a radial line of the vertical axis of pivoting of said member so that the vertical arm of the angle member may be engaged flat against the side of the block during the taking off of the block so that there is no undue motion of the block during the taking off operation.

Another object of this invention is to associate mechanism with a block removing device which is adapted to automatically remove the pallet from the block after the block has been transferred upon the supporting element.

Still further an arrangement is proposed to move the supporting element slightly forwards so as to move away the pallet of the block from the other arm of the angle member and then move the pallet edgewise to disengage it from the block, as the means for removing the pallet from the block mentioned in the previous paragraph.

The invention still further proposes the construction of a device as mentioned which is simple and durable and which may be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a plan view of a block removing device constructed according to this invention.

Fig. 2 is an end elevational view of Fig. 1 looking from the right hand end.

Fig. 3 is a view similar to Fig. 2 but illustrating the device in position after the block has been removed, and turned over.

Fig. 4 is a fragmentary elevational view looking in the direction of the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary sectional view taken upon the line 5—5 of Fig. 1.

Fig. 6 is a fragmentary sectional view taken upon the line 6—6 of Fig. 1.

Fig. 7 is a perspective view of the angle member used in the device, illustrated per se.

Fig. 8 is a fragmentary sectional view taken on the line 8—8 of Fig. 1.

Fig. 9 is a perspective view of the bushing illustrated per se and used in the device.

The block removing device according to this invention comprises a member 10 supported to swing in the horizontal. More particularly this member 10 has a vertical bearing 11 at one of its ends rotative upon a vertical post 12 secured to the floor 13. A collar 14 is adjustably mounted upon the post 12 and adapted to be clamped in various adjustable positions by the screw 15 so as to support the member 10 to swing in the horizontal in various adjusted altitudes. With this arrangement it is possible to adjust the height of the member 10 so that it is suitable to operate for a particular block machine. Block machines very often are mounted upon bases and for this reason it is necessary that the block removing device be adjusted to compensate such conditions and be capable of taking off blocks irrespective of their location from the floor after the stripping operation. Of course once the member 10 has been adjusted to a particular machine it need not be varied in any manner unless the machine is altered by a change of mold or such other alteration.

The concrete block machine has not been illustrated on the drawing but in dot and dash lines 16 in Figs. 1 and 2 the position of a concrete block stripped from a block machine is shown. The dot and dash lines 17 in Fig. 2 represent the stripping rods which are supporting the block 16. This block 16 is shown resting upon the pallet 18, the pallet being shown in dot and dash lines. The object of the block removing device is to remove the block 16 with the pallet 18 which adheres to it from the stripping rods 17. These stripping rods are in position extended from the mold of the block machine so that the block is located above the mold and ready to be removed. After the removal of the block 16 the block machine is ready for its operation to manufacture the next block.

The angle member consisting of a horizontal arm 19 and a vertical arm 20 is pivotally mounted upon the member 10 and limited to move through 90° to lift the block 16 from the supporting rods 17. More particularly this angle member is adapted to move to the position illustrated in Fig. 3 wherein the normally vertical arm 20 is now in the horizontal position while the normally horizontal arm 19 is now in the vertical position. The angle member 20 has a pair of lugs 21 projecting from the ends of the corner thereof and pivotally supported by bolts 22 upon the lugs 23 on a bushing 24 rotative on the member 10. The arrangement is such that the bushing 24 may rotate through to 90° for the purpose of moving the angle member 19, 20 through the stated 90°. Pins 25 project from the member 10 and engage into 90° arcuate slots 26 in the bushing 24 so as to limit turning of the bushing through the 90°. A means is provided for resiliently holding the angle member 19, 20 relative to the bushing 24 and comprises several fingers 27 projecting from the bushing 24 parallel with one of the arms, as illustrated the arm 20 of the angle member. Screws 28 are mounted upon the arm 20 of the angle member and pass through openings 29 in the fingers 27. Springs 30 are arranged upon the screws 28 and act between the fingers 29 and the nuts on the screws 28 so as to resiliently hold the angle member 19, 20 in a resilient fixed position relative to the bushing 24.

The block 16 is adapted to be transferred to a supporting element 31 which may be a wooden board or other cheap supporting element. This supporting element 31 is normally placed against the arm 20 of the angle member and held in position by an automatic latch comprising a hook element 32 pivotally mounted upon the top of the arm 20 of the angle member, upon fingers 33, and formed with a weighted portion 34 adapted to normally urge it into its operative position. A stop element 35 is mounted upon the fingers 33 and limits pivoting of the hook 32 so that it is always maintained in a position adapted to engage and hold the supporting element 31. In the operative position of the angle member 19, 20, more particularly in Fig. 2 the hook 32 is shown engaged and holding the upper edge of the supporting element 31 while the supporting element rests at its lower edge upon small projections 36 on the arm 19. When the bushing 24 is pivoted on the member 10 to assume the position shown in Fig. 3 the latch automatically opens in that the hook 32 will move and rest against the stop 35. Consequently the supporting element and the block is ready to be lifted from the block removing device. The purpose of the small projections 36 is to hold the supporting element 31 in a position slightly raised from the arm 19 so that the pallet 18 is free and easily removed from the bottom of the block 16 at the proper time. It should be noticed that the supporting element 31 does not touch the edge of the pallet 18 and consequently the pallet may be moved edgewise to cause its removal.

Various precautions are necessary to prevent deforming of the block when removed. One of the precautions has been previously described and comprises the resilient mounting of the angle member 19, 20. A second precaution is an arrangement whereby the angle member 20 may be properly set against the side of the block before the block is removed. The arrangement comprises a construction whereby the member 10 may be adjusted to properly place the angle member. More particularly the member 10 is

composed of a front section 10a and a rear section 10b. These sections are adjustably connected to be adjusted on the horizontal. More particularly each of these sections have offset adjacent ends connected with each other by a dove-tailed construction 38 or any other arrangement to joint these parts so that they may be adjusted on the horizontal. Several bolts 39 engage through openings in one of the offset parts and through a slot 40 in the other of the offset parts so that the adjustment is possible. With this arrangement it is possible to adjust the section 10a so that the face of the arm 20 will accurately and flatly engage the side of the block 16. A more detailed explanation of the actual taking off of the block will be given further on in this specification.

The method for removing the pallet 18 from the block after it has been lifted from the support rod 17 consists in moving the block so that the pallet disengages from the arm 19 of the angle member and then moving the pallet laterally to shear it from the block. The means for moving the block so that the pallet disengages from the arm 19 of the angle member comprises a pair of fingers 41 pivotally mounted intermediately on the bolts 22, the front ends of these fingers are normally disposed beneath the edge of the supporting element 31 when the latter is in the vertical position. The tail ends of these fingers 41 are in intimate contacts with the lower side of the member 10 and engageable with small projections 42 upon the member 10 and located at a position to cause pivoting of the fingers when the supporting element 31 is in the horizontal position, see Fig. 3.

An arrangement is also provided for freeing the pallet from the base of the block 16 when the block is removed from the concrete block machine to the position illustrated in Fig. 3. This means comprises a pair of bars 43 slidably mounted horizontally on the lugs 23 and provided at the front ends with pins 44 adapted to engage into openings in the pallet 18 from the bottom. The pallet 18 is provided with bosses 45 to increase its thickness at the points where the pins 44 engage through the openings so that the pins are in engagement with the material of the pallet even when the block is moved slightly away from the arm 19 of the angle member. The tail ends of the bars 43 have projecting pins 46 engaging in grooves 47 formed in discs 48 fixed upon the member 10. These grooves 47 have their upper ends 47' converging inwards in a manner so as to cause the bars 43 to move inwards when the block 16 is removed from the block machine to the position illustrated in Fig. 3. Consequently the action is such that the pallet 18 will be drawn edgewise free of the block 16. A handle 50 extends from the bushing 24 at a slight angle from the vertical, approximately 30°, see Fig. 2, so as to be conveniently held and moved downwards to the position illustrated in Fig. 3 to move the block from the block machine. Springs 30a are mounted coaxially upon the screws 28 and are positioned between the arm 20 of the angle member and the fingers 27. These springs serve to hold the angle member with the arms thereof substantially in the horizontal and the vertical as clearly shown in Fig. 3.

The operation of the device is as follows: Assume a block 16 to be supported by the stripping rods 17 immediately above the mold of a block machine. The details of the operation of the machine form no part of this invention. It is sufficient to explain that the block has been produced in the mold and then stripped from the mold by the stripping rods 17 which merely lifted the block slightly above the mold. The block 16 is resting upon the pallet 18 which in turn is resting upon the stripping rods 17. As illustrated in Fig. 1 the block removing device is shown with the lower arm 19 already engaged below the pallet 18. It is necessary that the sections 10a and 10b of the member 10 be properly adjusted so that the supporting element 31 has its face in face contact with the side of the block.

The handle 50 is then moved downwards through 90° so as to rotate the bushing 24 correspondingly. As the bushing turns, stress will first be applied, to the springs 30 and then the angle member 19, 20 will lift and move the block. It is pointed out that the lugs 21 of the angle member are pivotally mounted upon the lugs 23 and consequently the angle member will be moved around with the bushing 24. As the angle member moves from the position shown in Fig. 2 to that shown in Fig. 3 the block 16 will be lifted from the stripping rods 17 and rested on its side upon the supporting element 31.

As the block reaches its position of rest illustrated in Fig. 3, the tail ends of the fingers 41 will strike the stationary projections 42 to slightly pivot the fingers so that the forward ends move the supporting element 31 slightly forwards to move the pallet 18 out of contact with the face of the arm 19 of the angle member. Coincident with this motion or perhaps slightly after, depending merely upon design, the bars 43 will move inwards to move the pallet 18 edgewise and shear it free from the block 16. The inward motion of the bars 43 is produced by the fact that the bars are slidably supported on the lugs 23 and work between the lugs 23 and the stationary discs 48. Furthermore the pins 46 projecting from the bars 43 engage the grooves 47 which are concentric except at their ends 47' which cause the inward motion of the bars.

When the angle member 19, 20 is moved to the position illustrated in Fig. 3, the automatic latch 32 automatically opens so that the supporting element 31 with the block can be removed. Then the arm 10 is swung about the post 12 in the direction illustrated by the arrow 51 to a position indicated by the dot and dash line 52 and a new supporting element 31 is next placed upon the arm 20 of the angle member and the angle member pivoted back through the 90° to its original position. The concrete block machine may now be operated to produce a block and when this block has been stripped then the member 10 is swung back to its original position so that the arm 19 of the angle member engages beneath the pallet 18 of the block and the device is now ready to remove the second block.

While we have illustrated and described our invention with some degree of particularity, we realize that in practice various alterations therein may be made. We therefore reserve the right and privilege of changing the form of the details of construction or otherwise altering the arrangement of the correlated parts without departing from the spirit or the scope of the appended claims.

Having thus described our invention, what we claim as new, and desire to secure by United States Letters Patent is:

1. A block removing device for a concrete block machine, comprising a member supported to swing, and an angle member pivotally mounted

on said member to pivot about said member as an axis and limited to move through substantially 90°, one arm of said angle member being adapted to engage beneath a block from said machine, whereby when the angle member is pivoted the block is deposited upon the other arm of said angle member, and a supporting element on the latter mentioned arm of the angle member for receiving and holding said block.

2. A block removing device for a concrete block machine producing concrete blocks stripped therefrom and supported on pallets, comprising a member supported to swing in the horizontal, and an angle member pivotally mounted on said member and limited to move through 90°, one arm of said angle member being adapted to engage beneath a block stripped from said machine, whereby when the angle member is pivoted the block is deposited upon the other arm of said angle member, said member being positioned substantially parallel with the side of the block, and said angle member being adapted to have one of its arms engaged flat against the side of the block, and means for adjusting said member so that the vertical arm of said angle member may truly be flat against the side of said block.

3. A block removing device for a concrete block machine producing concrete blocks stripped therefrom and supported on pallets, comprising a member supported to swing in the horizontal, and an angle member pivotally mounted on said member and limited to move through 90°, one arm of said angle member being adapted to engage beneath a block stripped from said machine, whereby when the angle member is pivoted the block is deposited upon the other arm of said angle member, said member being positioned substantially parallel with the side of the block, and said angle member being adapted to have one of its arms engaged flat against the side of the block, and means for adjusting said member so that the vertical arm of said angle member may truly be flat against the side of said block, said adjustment comprising a pair of sections composing said member and means for holding said sections in various relative positions.

4. A block removing device for a concrete block machine producing concrete blocks stripped therefrom and supported on pallets, comprising a member supported to swing in the horizontal, and an angle member pivotally mounted on said member and limited to move through 90°, one arm of said angle member being adapted to engage beneath a block stripped from said machine, whereby when the angle member is pivoted the block is deposited upon the other arm of said angle member, said member being positioned substantially parallel with the side of the block, and said angle member being adapted to have one of its arms engaged flat against the side of the block, and means for adjusting said member so that the vertical arm of said angle member may truly be flat against the side of said block, said adjustment comprising a pair of sections composing said member and means for holding said sections in various relative positions in a direction at right angles to a radius of a vertical axis through the pivotal support of said member comprising offset adjacent ends from the sections adjustably connected with each other.

5. A block removing device for a concrete block machine, comprising a member supported to swing, and an angle member pivotally mounted on said member and limited to move through substantially 90°, one arm of said angle member being adapted to engage beneath a block from said machine, whereby when the angle member is pivoted the block is deposited upon the other arm of said angle member, a supporting element on the latter mentioned arm of the angle member for receiving and holding said block, means for moving said supporting element forwards after the block has been transferred upon it for moving the block with the pallet on its base from the other arm of said angle member to allow removal of the pallet, and means for moving the pallet to free it from the base of the block.

6. A block removing device for a concrete block machine, comprising a member supported to swing, and an angle member pivotally mounted on said member and limited to move through substantially 90°, one arm of said angle member being adapted to engage beneath a block from said machine, whereby when the angle member is pivoted the block is deposited upon the other arm of said angle member, a supporting element on the latter mentioned arm of the angle member for receiving and holding said block, means for moving said supporting element forwards after the block has been transferred upon it for moving the block with the pallet on its base from the other arm of said angle member to allow removal of the pallet, and means for moving the pallet to free it from the base of the block, said latter mentioned means moving the pallet edgewise to shear it free from the block.

7. A block removing device for a concrete block machine producing a concrete block stripped therefrom and supported on pallets, comprising a member supported to swing in the horizontal, and an angle member pivotally mounted on said member and limited to move through 90°, one arm of said angle member being adapted to engage beneath a block stripped from said machine, whereby when the angle member is pivoted the block is deposited upon the other arm of said angle member, a supporting element on the latter mentioned arm of the angle member for receiving and holding said block, and means for automatically freeing the pallet from the block as the block is transferred upon said supporting element.

8. A block removing device for a concrete block machine producing a concrete block stripped therefrom and supported on pallets, comprising a member supported to swing in the horizontal, and an angle member pivotally mounted on said member and limited to move through 90°, one arm of said angle member being adapted to engage beneath a block stripped from said machine, whereby when the angle member is pivoted the block is deposited upon the other arm of said angle member, a supporting element on the latter mentioned arm of the angle member for receiving and holding said block, and an automatic latch for holding the supporting element in one position of the angle member and releasing it in another position.

9. A block removing device for a concrete block machine manufacturing blocks supported on pallets, a member supported to swing in the horizontal, a bushing rotative on said member and limited to move through 90°, and an angle member mounted upon said bushing and having one arm adapted to engage beneath said block and pallet and another arm for location along the side of said block, an element supported upon said latter mentioned arm for receiving and holding said block as the angle member is moved through said 90°, and adjustable means for ad-

justing the angle member so that the supporting element is in intimate contact throughout its front face with the side of said block.

10. A block removing device for a concrete block machine manufacturing blocks supported on pallets, a member supported to swing in the horizontal, a bushing rotative on said member and limited to move through 90°, and an angle member mounted upon said bushing and having one arm adapted to engage beneath said block and pallet and another arm for location along the side of said block, and an element supported upon said latter mentioned arm for receiving and holding said block as the angle member is moved through said 90°, and resilient means associated with said bushing and angle member so that the angle member is moved with resiliency when said bushing is turned.

11. In a block removing device, a pivotally mounted angle member limited in its pivoting to substantially 90°, one arm of said angle member being adapted to engage beneath a block, whereby when the angle member is pivoted the block is deposited on the other arm of the angle member, resilient means associated with said angle member, and means associated with said resilient means for moving the angle member with resiliency through said limit of pivoting when said resilient means is moved.

12. In a block removing device, a pivotally mounted angle member limited in its pivoting to substantially 90°, one arm of said angle member being adapted to engage beneath a block, whereby when the angle member is pivoted the block is deposited on the other arm of the angle member, resilient means associated with said angle member, and means associated with said resilient means for moving the angle member with resiliency through said limit of pivoting when said resilient means is moved, said resilient means including a spring, and said means associated with the resilient means being connected with said spring to move the spring which in turn moves the angle member so that the angle member is indirectly moved.

13. In a block removing device for block machines producing blocks stripped therefrom and supported on pallets, a member swingingly and pivotally mounted to pivot about an axis radially of said swinging and limited to pivot through a substantially 90° angular distance and having one arm adapted to engage beneath a block stripped from the machine, whereby when the said member is pivoted the block is discharged on said arm.

14. In a block removing device for concrete block machines producing blocks stripped therefrom and supported on pallets, an angle member swingably and pivotally mounted and limited to pivot through 90°, one arm of said angle member being adapted to engage beneath a block stripped from said machine, whereby when the angle member is pivoted the block is deposited upon the other arm of said angle member, a supporting element on the latter mentioned arm of the angle member for receiving and holding said block, and means for moving said supporting element forwards after the block has been transferred upon it for moving the block with the pallet on its base away from the other arm of said angle member to allow removal of the pallet.

15. In a block removing device for block machines producing blocks stripped therefrom and supported on pallets, a member supported to move in a pre-determined path, an angle member pivotally mounted on said member and limited in its pivoting to substantially 90°, one arm of said angle member being adapted to engage beneath a block stripped from said machine, whereby when the angle member is pivoted the block is transferred from said arm, resilient means associated with said angle member, and means associated with said resilient means for moving the angle member with resiliency when the resilient means is moved.

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