Jan. 8, 1952 C. C. WOOLEY 2,581,568

APPARATUS FOR HANDLING CONCRETE BLOCKS

Filed June 18, 1948 3 Sheets-Sheet 1

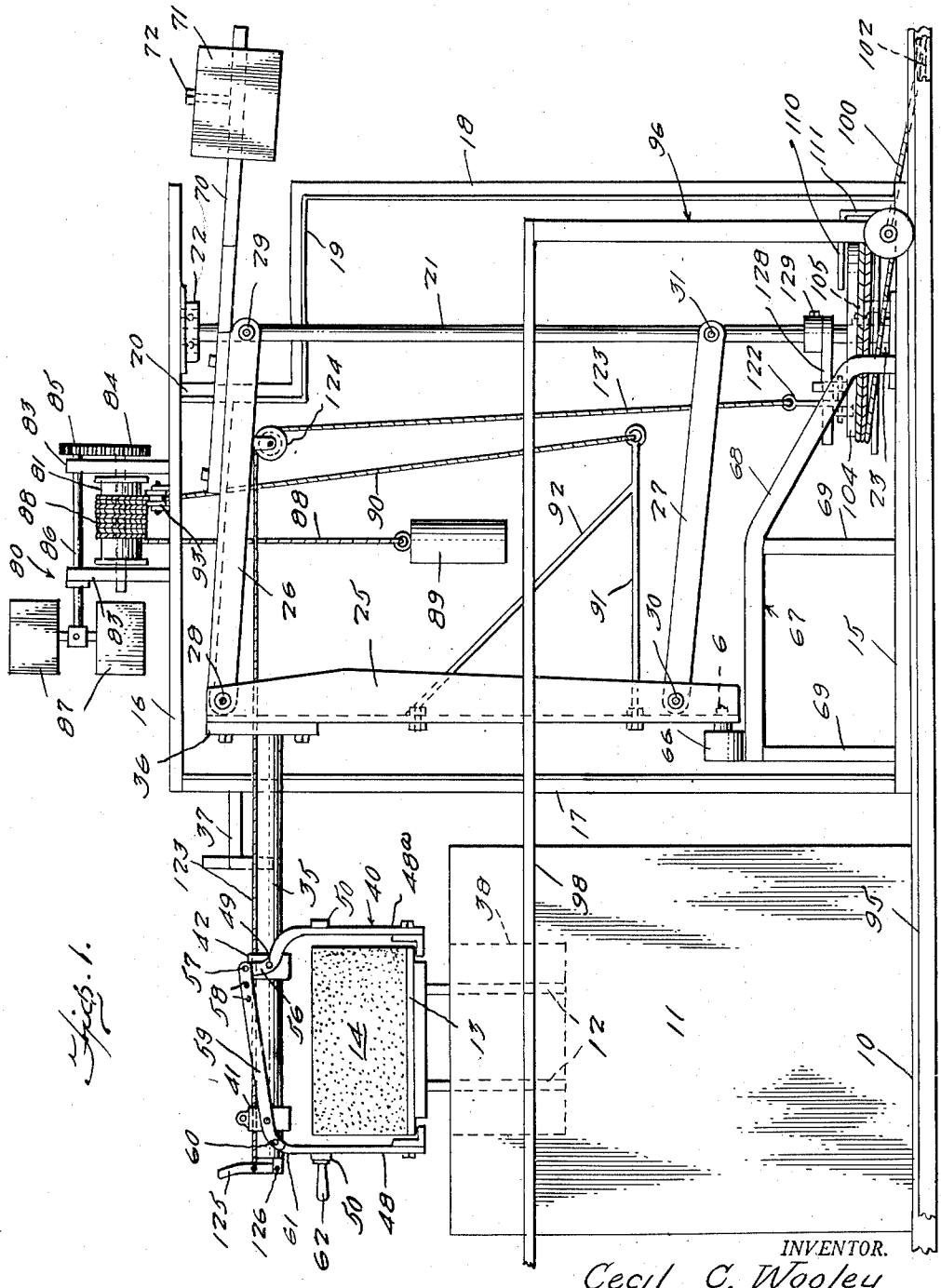


Fig. 1.

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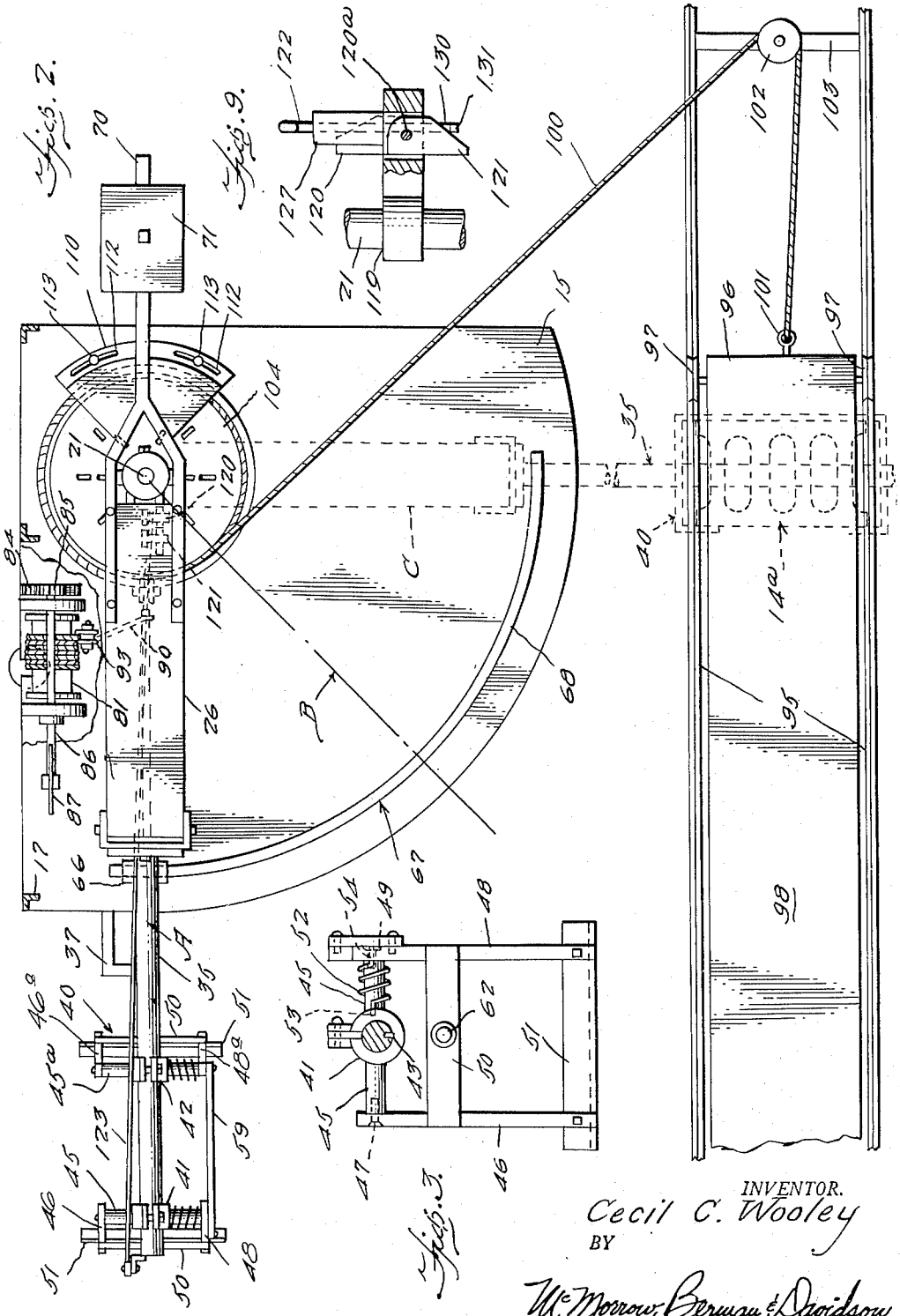


Fig. 7.

Fig. 9.

Fig. 3.

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Fig. 7.

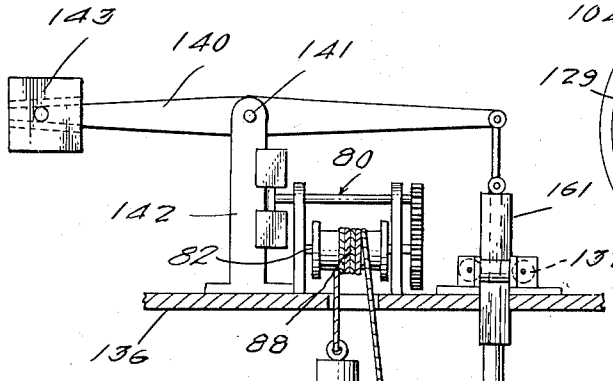


Fig. 4.

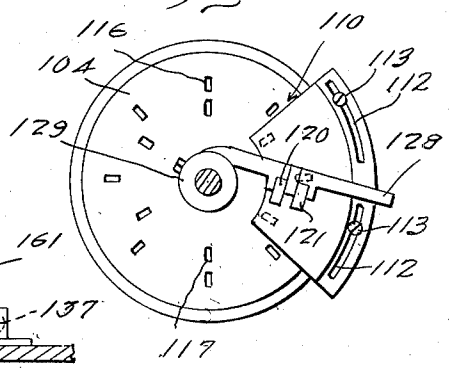


Fig. 5.

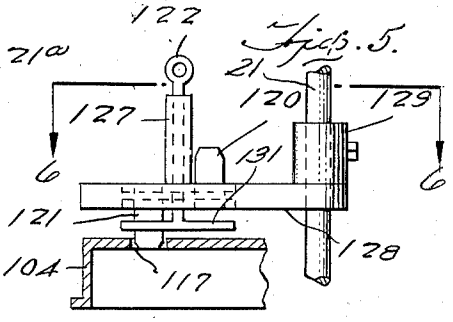


Fig. 6.

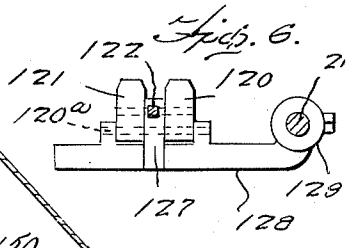
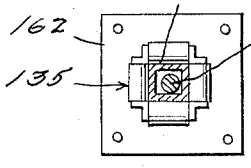


Fig. 8.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR HANDLING CONCRETE BLOCKS

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Application June 18, 1948, Serial No. 33,854

4 Claims. (Cl. 214—1)

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This invention relates to an apparatus for handling concrete blocks.

An object of the invention is the provision of an apparatus for handling concrete blocks as they come freshly molded from the block-molding machine and for carrying said blocks to the usual pallet-carrier when said blocks are transferred to a curing chamber, thereby eliminating manual handling. The various functions of the apparatus being caused to be carried out automatically by the weight of the block and by compensating weights coordinated with operating elements of the apparatus, initial manual adjustments only being required to start the apparatus for the delivery of a concrete block from the molding machine to the pallet-carrier.

A further object of the invention is the provision of an apparatus for delivering freshly molded concrete blocks to the usual pallet-carrier for transfer to a curing chamber, a radially swinging arm having means thereon for receiving and carrying a concrete block from the molding machine to the pallet-carrier said arm being supported by a track which has an inclined portion for lowering the arm to the pallet-carrier while a weight counter-balances the arm during such travel and elevates said arm when the concrete block has been released, a second counterweight cooperating with a governor for controlling the speed of travel of the arm during delivery of the block also cooperating with the first-mentioned weights for returning the arm to a position along the track adjacent the block making machine, means operated by the arm for moving the pallet-carrier by increments along a straight path for the reception of successively manufactured green concrete blocks.

This invention will be best understood from a consideration of the following detailed description in view of the accompanying drawings. Nevertheless, it is to be understood that the invention is not confined to the disclosure, being susceptible of such changes and modification which shall define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

Figure 1 is a side view in elevation of my apparatus for conveying green concrete blocks from a molding machine to the usual pallet board mounted on a carriage, the apparatus being supported by a metal frame-work on a floor of a building,

Figure 2 is a plan view of the same,

Figure 3 is an enlarged transverse section

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showing an end view of a grapple or block-supporting device of the apparatus,

Figure 4 is a plan view of a drum and a shield for controlling the operation of a pawl which is adapted to engage a slot of a series of the drum,

Figure 5 is a side view of a lever attached to a shaft for supporting a pair of pawls,

Figure 6 is a plan view of the lever taken along 6—6 of Figure 5,

Figure 7 is a side view, in elevation of a modified form of the apparatus supported by the floor of a building,

Figure 8 is a horizontal section through the lower end of the shaft taken on the line 8—8 of Figure 7 showing the bearing for said shaft, and

Figure 9 is a fragmentary side view of a pawl operating lever partly in section.

Referring more particularly to Figures 1 to 6 inclusive, 10 designates a floor of a building from which rises a metal frame work and a machine 11 for molding concrete blocks. In this machine the usual stripper bars 12 are employed for elevating a pallet 13 upon which is supported the green concrete block 14.

The framework includes a floor plate 15, a top plate 16 and vertical angle iron bars 17 and 18. The bars 18 have off-set portions 19 and 20 for a purpose which will be explained presently. A vertically disposed shaft 21 is mounted in ball bearings 22 carried by the top plate 16 and ball bearings 23 secured to the bottom plate 15.

A channel shaped bar 25 is connected to the shaft 21 by parallel arms 26 and 27. The arm 26 has one end connected by a pivot pin 28 to the upper end of the bar 25 while the other end of said bar is connected by a pivot pin 29 to the upper end of the shaft. The arm 27 has one end connected to the lower end of bar 25 by a pivot pin 30 while the other end of said arm is connected to the lower end of the shaft 21 by a pivot pin 31. All of the pins are mounted in ball bearings to reduce friction. With this mounting, the bar 25 will always move upwardly or downwardly in parallel relation with the shaft 21. The bar 25, the shaft 21 and arms 26 and 27 form a parallelogram.

A lifting arm 35 extends from a base 36 bolted to the upper front face of the bar 25 and is disposed radially relative to the shaft 21. A stop 37 is supported by a vertical bar 17 of the frame and checks the oscillating movement of the arm 35 directly over a chamber 38 of the block-making machine 11.

A grapple or block-carrying device 40 is mounted on the free end of the radial arm 35. A pair of spaced split sleeves 41 and 42 are clamped on the arm and held in place by keys 43. Axles 45 and 45a project in opposite directions in a horizontal plane from the respective collars 41 and 42. A depending bar 46 is pivotally supported on a pin 47 carried by one of the axles 45. A bar 48 depends from the other axle 45 and is pivotally supported by a pin 49. A transverse bar 50 connects the upper portions of the parallel bars 46 and 48 while a block-supporting foot 51 is secured to the lower ends of pairs of the parallel bars. Various types of feet may be substituted for the kind illustrated. A coil spring 52 is received by one of the axles 45 and has one end secured at 53 to the collar 41 while the other end 54 is attached to the bar 48 so that the spring will tend to swing the bars 46, 48 and the foot outwardly.

It will be noted from Figures 1 and 2 that the construction just described is in the form of a frame and is duplicated at the split sleeve 42 and since the constructions are substantially identical the same reference characters will be applied to similarly positioned parts. However, it is to be borne in mind that a vertical swinging bar 48a of one frame has a curved upper extension 56 where it is pivoted to the adjacent axle 45a. One end of the extension carries a bolt or pin 57 which is received by one of the openings 58 in an end of a link 59. The other end of said link is pivoted at 60 to a curved extension 61 of the other bar 48 and below the pivot pin 47 so that when one frame is swung outwardly the other frame will likewise be swung outwardly. A handle 62 is secured to the cross bar 50 connected between the depending bars 46 and 48 so that the frames may be manually operated.

The purpose of the split sleeves 41 and 42 in conjunction with openings 58 in the link 59 provides for an adjustment of the grapple to compensate for varying lengths of the concrete blocks.

The vertical bar 25 of the parallelogram is provided at its lower end with a horizontal axle 65 upon which is mounted a wheel 66 riding upon a curved track 67 having an inclined portion 68. The wheel and track support the bar 25, the arm 35 and the block carrier 40 during radial movements of said arm for a purpose which will be explained presently. The track 67 is carried by spaced posts 69 mounted on the plate 15.

A lever 70 has a weight 71 mounted slidably thereon and held in an adjusted position by a set screw 72. A fork 73 has its arms receiving the shaft 21 and secured to the bar 26. This weight is adjusted so that it will counterbalance the weight of the arm 35, the carrier 40 and the parallelogram. The offset indicated by the angle irons 19 anad 20 supported by the angle irons 18 provides sufficient space for the movements of the weight vertically and radially as the arm 35 is oscillated.

A governor designated generally by the numeral 80 is mounted on the top plate 16 and includes a drum 81 secured to a shaft 82 mounted in bearings in spaced brackets 83 carried by the plate 16. A large gear 84 is secured to the outer end of the shaft 81 and meshes with a smaller gear 85 keyed to a shaft 86 also mounted in bearings in the brackets 83. The shaft 86 drives the governor vanes 87. The ratio of the gears 84 and 85 is 10 to 1.

A cable 88 is wound on the drum 81 and has one end secured to a weight 89. The other end 90 of the cable is attached to the free end of a rod 91 bolted at its other end to the vertical bar 25. An angularly disposed rod 92 braces the rod 91 from said vertical bar. The end 90 of the cable is trained under a pulley 93 mounted on the top plate 16. The relative positions of the weight 89, the drum 81 and the pulley 93 are such that the cable will always tend to pull the arm 35 towards the stop 37. The weight of the member 89 is equal to one-half the weight of the concrete block 14. Thus, it will be seen that the energy expended by the governor fan 87 is the same when the carrier 40 is weighted by a block or when empty on its return movement from the lower inner end of the track 67.

Tracks 95 are mounted on the floor 10 at one side of the base plate 15. A carriage 96 is guided by wheels 97 having V-shaped grooves received by the V-shaped tracks 95. A pallet board 98 on top of the carriage is adapted to receive the green concrete blocks 14 from the carrier 40. A cable 100 attached at one end to an eye bolt 101 on the inner end of the carriage 96 is trained over a pulley 102 mounted on a cross bar 103 associated with the rails 95. The other end of the cable is secured to a drum 104 which is rotatably mounted on the shaft 21 above the bearing 23. However, the drum is revolved by the shaft through a predetermined angle when said shaft is revolved by the oscillating arm 35 for a purpose which will be described presently. A brake 105 embraces a collar 106 fixed to the drum 104 for restraining the drum so that the cable 100 will be maintained taut at all times.

A shield 110 has a flanged portion 111 secured to the floor plate 15 at one side of the drum 104. The flange has arcuate slots 112 receiving bolts 113 screwed into the floor plate 15 so that the shield may be adjusted over and around a portion of the drum in a limited manner. The drum 104 has a series of eight circumferentially arranged radial slots or indentations 116 and a series of six circumferentially arranged radial slots or indentations 117 disposed nearer the center of the drum than the series of slots 116. The series of slots or indentations form a pair of concentric ratchets so that pawls 120 and 121 will seat in the respective slots 117 and 116 and temporarily connect the drum to the shaft to provide a limited rotary motion of the drum and to retain the shaft and the block-carrier in an idle position midway between the pallet board and the block-making machine during the molding of succeeding blocks.

A rod 122 has its upper end connected to one end of a cable 123 which is trained on a pulley 124 carried by the bar 26. The cable is extended forwardly towards the block-making machine and is attached to a hand lever 125 pivoted at 126 on the outer end of the arm 35. The pawl-operating rod 122 is mounted slidably in a sleeve 127 rising integrally from the free end of a lever 128 secured at 129 to the shaft 21 above the drum 104.

The pawls 120 and 121 are pivotally mounted on a pin 120a carried by the lever 128. The pawls as shown in Figure 9 are movable to a depending operative position or to an upright or inoperative position. One edge of the pawl is flat while the opposite edge 130 is curved and in engagement with a horizontal bar 131 secured to the lower end of rod 122. When the rod 122 and bar 131 are raised the pawls 120 or 121 will be raised suf-

ficiently to clear the respective slots 116 and 117 in the drum 104. The pawls are raised or lowered manually.

The modified form shown in Figures 7 and 8 is substantially the same as that shown in Figures 1 to 6 inclusive and therefore only those parts will be described which are a departure from the first form disclosed. The carrier 40, the drum 104 and its associated elements, the track 67, the governor 80, the pawls 120, 121 and the operating elements therefor are substantially identical. Thus the same reference numerals employed in Figures 1 to 6 inclusive will be applied to similar parts in Figure 7.

The shaft 21*a* is supported slidably by roller bearings 135 on the floor 10 while the upper end of said shaft projects through an upper floor 136 of the building and is mounted slidably by a bearing 137 bolted to said floor. The shaft is raised and lowered by the inclined portion 68 of the track 67 which has a horizontal portion for placing the carrier 40 over the block-making machine as shown in Figure 1. A bracket 138 is secured to the shaft 21*a* and has a roller 139 riding on the track 67.

A lever 140 is pivoted at 141 on a pedestal 142 secured to the floor 136. One end of said lever is connected to the upper end of the shaft 21*a* while the other end carries an adjustable counterbalance 143. The lever 140 and the governor 80 are located above the upper floor 136.

The cable 88 which is wound on the drum 81 and supports the weight 89 of the governor 80 has one end 90 secured to an eye 145 carried by the arm 35*a* which is secured in a horizontal position to the shaft 21*a* and is raised or lowered by said shaft. A brace bar 146 is applied between the upper end of the shaft and the arm 35*a*.

The cable 123 is trained over an eye 150 carried by an arm 151 rising from an axle 152 which is secured to the floor 10. The drum 104 is rotatably mounted by means of the collar 106 on the axle. The cable 123 is connected to the pivoted hand lever 125 for actuation by the operator.

A link 155 has a universal connection at 156 with a stud 157 attached to a brace bar 158 between the shaft 21*a* and the bracket 138. Said link also has a universal connection at 159 with a pin 160 secured to the lever 126*a* which is rotatably mounted on the axle 152. The universal connections on the ends of the link permit oscillation thereof in a vertical plane when the post or shaft 21*a* is raised and lowered. Said connections also permit oscillation of the link in a horizontal plane when the shaft is rocked back and forth through an angle of 90 degrees.

In Figure 8 is shown a plan view of the bearings 135 for the lower reduced end of the shaft 21*a*. The bearings 135, 137 at the ends of the shaft are identical in construction and a description of one will suffice for the other. The reduced ends of the shaft are mounted rotatably in sleeves 161 which are square in cross-section and which have a cylindrical passage to receive said ends. Plates 162 are each bolted to the lower floor 10 and top floor 136. These plates are provided with mountings for the roller bearings 135 and 137. The bearings for the square sleeve relieve drag during the vertical travel of the shaft 21*a*.

It will be noted from Figures 1 and 2 that the roller 66 is wider than the roller 139 in Figure 7. When the bar 25 (Figure 1) is raised it is drawn towards the shaft 21 by the parallelogram arrangement so that the roller 66 must be wide enough to remain on the track 67 at all times. On the other hand the roller 139 is raised and lowered in a vertical line.

The operation of my device is as follows:

Before starting operation of the machine one of the pawls 120 or 121 must be selected. If the molded concrete blocks are wide the pawl 120 is depressed while pawl 121 is raised. On the other hand the positions of the pawls are reversed so that the pawl 121 will take care of the spacing of the narrower blocks on the pallet-board 98 as will be seen presently.

When the blocks 14 are being molded in the machine 11, the carrier 40 is supported by the roller 66 on the track 67 at the position indicated by the letter B in Figure 2. The pawl 120 or 121 is seated in the respective ratchet slot 117 or 116 which alines with the position B of the carrier for retaining the carrier in such position against the pull of the weight 89 (Figure 1) on the cable 88. The brake 23 which controls the speed of rotation of the drum will tend to prevent rotation of the drum and shaft at this time.

When the the operator has completed the molding of the block, he will pull the carrier 40 from position B to position A so that the feet 51 of the carrier will be placed in alinement with the bottom edges of the raised block 14. The handle 62 (Figure 1) will be depressed causing the side bars 46, 48 and 48 to be moved to the block so that when the member 13*a* is lowered the block will be supported by the feet 51.

It is to be borne in mind that when the carrier 40 is shifted from position B to position A (Figure 2), the pawl 121 being in engagement with a ratchet slot in the drum 104, will revolve the drum through an angle of 45° or through an angle of 60° when the pawl 120 is used so that the cable 100 will be wound on the drum thereby drawing the board 98 along the tracks 95 a distance equal to the width of the molded block 14. The cable is wound on the drum only during such shift. During the remaining rotary movements of the shaft the pawls are released and the brake 23 retains the drum stationary except for a purpose which will be described presently. The arm 35 and carrier 40 are retained in position A by the stop 37.

When the block 14 is in position on the carrier 40 the pawl 121 will automatically allow the arm 35 to move from position A towards position B. As the roller 66 riding on the track 67 passes position B it will descend on the inclined portion 68 of said track whereby the arm 35 and carrier 40 will be lowered until said carrier will straddle the pallet board 98 to permit the pallet to rest on the pallet board at position C which will take the load of the block 14 so that the springs 52 will move the feet 51 outwardly from the block. The movement from position A to position C has been resisted by the weight 89 so that when the carrier 40 has released the block 14 on the board, the arm 35 and likewise the carrier will be returned automatically by the pull of the cable through the weight 89. It will be noted from Figure 2, that the angular disposition of the cable 88 from the drum 81 and the pulley 93 is such that the arm 35 will always be drawn towards position A.

After the block has been deposited on the board 98, the arm 35 and carrier 40 are returned towards position but are stopped at position B. The carrier is retained in such position until the operator has completed the mold-

ing of a succeeding green concrete block in the molding machine 11.

The steps set forth, above, are then repeated until the board 98 has been supplied fully with molded blocks. The board is removed from the carriage by a conventional conveyor or by transfer chains and delivered to a curing chamber. When the loaded board has been removed, the operator moves the lever 125 to a vertical position for releasing the pawl 120 or 121 thereby allowing the cable 100 to rotate reversely the drum 104 when the carriage is returned to the starting position. The brake 23 restrains a rapid rotation of the drum and maintains the cables 100 taut at all times.

The shield 110 is adjustable by means of the bolts 113 so that the shield may be positioned properly. The shield is so positioned that the selected pawl may ride over the same through a predetermined angle before dropping into engagement with a slot of the aligned ratchet. This shield prevents the pawls from engaging more than one slot of a ratchet during the 90° angular movement of the arm 35 and carrier 40 from position C to position A.

While the weight 89 tends to resist movement of the arm from position A to C, nevertheless, the added weight of the block 14 will more than counterbalance the weight 89. When the load on the arm 35 and carrier has been released to the board 98, the weight 89 will take control of the arm and empty carrier and return said carrier to position B as previously described.

The governor by means of the adjustable blades 87 will control the speed of the carrier 40 particularly between positions B and C when said carrier is descending along the inclined portion 68 of the track 67. The speed at which the governor is set remains the same throughout the cycle of operation and the over-run of the governor is sufficient to insure the release of the block 14 on the pallet board.

The operation of the machine illustrated in Figure 7 is substantially the same as machine shown in Figures 1 and 2 with some exceptions. In the modified form the shaft 21*a* is reciprocated vertically thereby eliminating the parallelogram, rods 91, 92 and the lever 70 and bar 26 arrangement. However, the weight 143 and lever 140 counterbalance the weight of the shaft 21*a*. The weight 71 (Figure 1) also counterbalances the weight of the parallelogram.

The drum 104 in Figure 7 is mounted loosely on the axle 152 instead of on the main shaft 21*a* as shown in Figures 1 and 2. In view of this difference, the drum is advanced by increments through the medium of the link 155 which is connected between the radially disposed rod 158 and the free end of the lever 128*a*. Said rod forms a brace between the bracket 138 and the shaft 21*a*. When the rod 158 is rocked by the shaft 21*a* from position B to position A (Figure 2) and when one of the pawls such as 121 has been depressed, said pawl will engage a slot on the ratchet formed in the drum 104 and be moved through an angle of substantially 45° by the oscillating lever 128*a* and by the link 155 thereby rotating the drum through the same angle and winding the cable thereon. The pawl allows the lever 125 to move automatically from the vertical to the horizontal position so that the carrier 40 may be shifted to the pallet board.

The shaft 21*a*, the arm 35*a* and the carrier 40 are raised and lowered by the portion 68 of the track 67 and the roller 139. The operation is substantially the same as the raising and lowering of the carrier 40 shown in Figures 1 and 2 although in the modified form the elements are directly atached to the shaft which is reciprocated vertically.

The governor 80 is mounted on the floor 136 above with the ends of the cable 88 passing downwardly through openings in said floor. One end of the cable carries the weight while the other end is connected directly to the carrier arm 35*a*. The governor controls the speed of travel of the shaft 21*a*.

It will be noted that no motive power is required for operating the machine and only a few manual operations are required. Otherwise the machine is automatically actuated by weights, a cooperating track and pawls.

The circumference of the drum 104 is forty-eight inches which is a common multiple of any block width. Thus, when the slots 116 are employed in connection with the pawl 121, the drum will be rotated through eight steps during one revolution. On the other hand the slots 117 will provide for a step-by-step rotation of the drum through six cycles of operation of the block-handling machine.

What I claim:

1. An apparatus for delivering concrete blocks from a block molding machine to a pallet board comprising a frame, a vertically disposed shaft rotatably mounted on said frame, a horizontally disposed arm extending radially of said shaft and having one end spaced therefrom, linkage means interposed between said one end of said arm and said shaft and operatively connected therebetween for mounting said arm for vertical oscillation, a block carrier connected to the other end of said arm, a curved track including a horizontal portion and an inclined portion supported below said arm, roller means carried by said linkage means and successively engaging said horizontal and inclined portions respectively for guiding said arm from a block receiving position over said block molding machine to a block discharging position over said pallet board, a track guided carriage adapted to receive said pallet board, a rotatably supported drum provided with a plurality of circumferentially spaced slots, a cable connected between said drum and said carriage for imparting a step by step movement to the latter in response to the rotary movement of said drum through predetermined angles, a rocking lever carried by said shaft, a pawl carried by said lever and engaging one of said slots upon movement of said arm to a point midway between said pallet board and said molding machine whereby manual shifting of said arm from said midpoint to said block receiving position causes said cable to be wound onto said drum, manually actuable means operatively connected to said pawl for selectively releasing the latter, and means operatively connected to said arm tending to return the latter to said block receiving position.

2. An apparatus for delivering concrete blocks from a block molding machine to a pallet board comprising a frame, a vertically disposed shaft rotatably mounted on said frame, a horizontally disposed arm extending radially of said shaft and having one end spaced therefrom, linkage means interposed between said one end of said arm and said shaft and operatively connected therebetween for mounting said arm for vertical oscillation, a block carrier connected to the other end of said arm, a curved track including hori-

zontal portions and an inclined portion supported below said arm, roller means carried by said linkage means and successively engaging said horizontal and inclined portions respectively for guiding said arm from a block receiving position over said block molding machine to a block discharging position over said pallet board, a track guided carriage adapted to receive said pallet board, a rotatably supported drum provided with a plurality of circumferentially spaced slots, a cable connected between said drum and said carriage for imparting a step by step movement to the latter in response to the rotary movement of said drum through predetermined angles, a rocking lever carried by said shaft, a pawl carried by said lever and engaging one of said slots upon movement of said arm to a point midway between said pallet board and said molding machine whereby manual shifting of said arm from said midpoint to said block receiving position causes said cable to be wound onto said drum, manually actuable means operatively connected to said pawl for selectively releasing the latter, means operatively connected to said arm tending to return the latter to said block receiving position, and a shield extending over part of said drum for preventing said pawl from engaging slots other than the one positioned midway between said board and said molding machine.

3. An apparatus for delivering concrete blocks from a block molding machine to a pallet board comprising a frame, a vertically disposed shaft rotatably mounted on said frame, a horizontally disposed arm extending radially of said shaft and having one end spaced therefrom, linkage means interposed between said one end of said arm and said shaft and operatively connected therebetween for mounting said arm for vertical oscillation, a block carrier connected to the other end of said arm, a curved track including a horizontal portion and an inclined portion supported below said arm, roller means carried by said linkage means and successively engaging said horizontal and inclined portions respectively for guiding said arm from a block receiving position over said block molding machine to a block discharging position over said pallet board, a track guided carriage adapted to receive said pallet board, a rotatably supported drum provided with a plurality of circumferentially spaced slots, a cable connected between said drum and said carriage for imparting a step by step movement to the latter in response to the rotary movement of said drum through predetermined angles, a rocking lever carried by said shaft, a pawl carried by said lever and engaging one of said slots upon movement of said arm to a point midway between said pallet board and said molding machine whereby manual shifting of said arm from said midpoint to said block receiving position causes said cable to be wound onto said drum,

manually actuable means operatively connected to said pawl for selectively releasing the latter, and means operatively connected to said arm tending to return the latter to said block receiving position and for controlling the speed of movement of said arm between said block receiving and block discharging positions.

4. An apparatus for delivering concrete blocks from a block molding machine to a pallet board comprising a frame, a vertically disposed shaft rotatably mounted on said frame, a horizontally disposed arm extending radially of said shaft and having one end spaced therefrom, linkage means interposed between said one end of said arm and said shaft and operatively connected therebetween for mounting said arm for vertical oscillation, a block carrier connected to the other end of said arm, a curved track including a horizontal portion and an inclined portion supported below said arm, roller means carried by said linkage means and successively engaging said horizontal and inclined portions respectively for guiding said arm from a block receiving position over said block molding machine to a block discharging position over said pallet board, a track guided carriage adapted to receive said pallet board, a rotatably supported drum provided with a plurality of circumferentially spaced slots, a cable connected between said drum and said carriage for imparting a step by step movement to the latter in response to the rotary movement of said drum through predetermined angles, a rocking lever carried by said shaft, a pawl carried by said lever and engaging one of said slots upon movement of said arm to a point midway between said pallet board and said molding machine whereby manual shifting of said arm from said midpoint to said block receiving position causes said cable to be wound onto said drum, manually actuable means operatively connected to said pawl for selectively releasing the latter, means operatively connected to said arm tending to return the latter to said block receiving position and for controlling the speed of movement of said arm between said block receiving and block discharging positions, and a shield extending over part of said drum for preventing said pawl from engaging slots other than the one positioned midway between said board and said molding machine.

CECIL C. WOOLEY.

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