

Oct. 9, 1923.

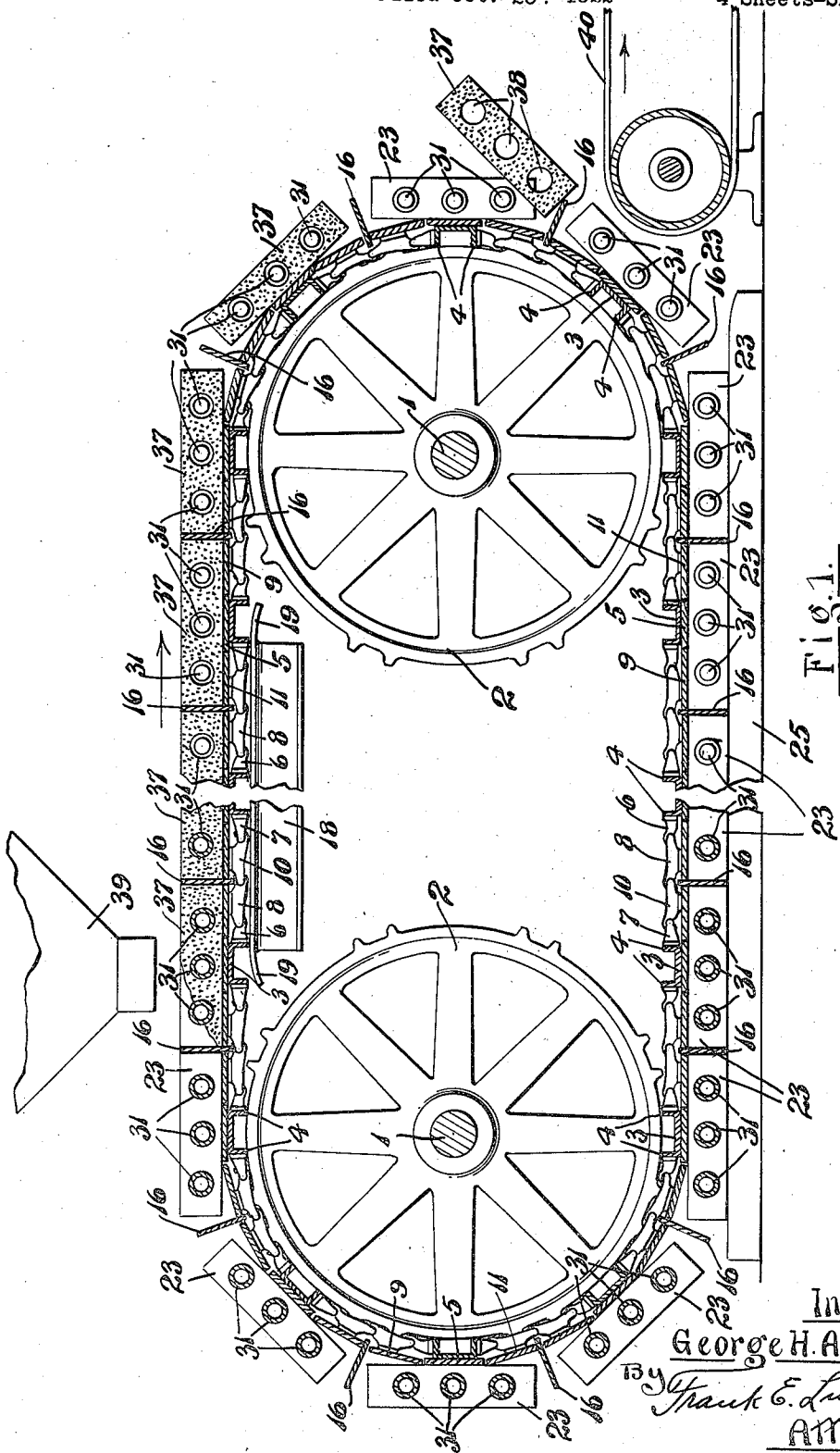
1,469,820

G. H. A. RUBY

PLASTER BLOCK MACHINE

Filed Oct. 25, 1922

4 Sheets-Sheet 1



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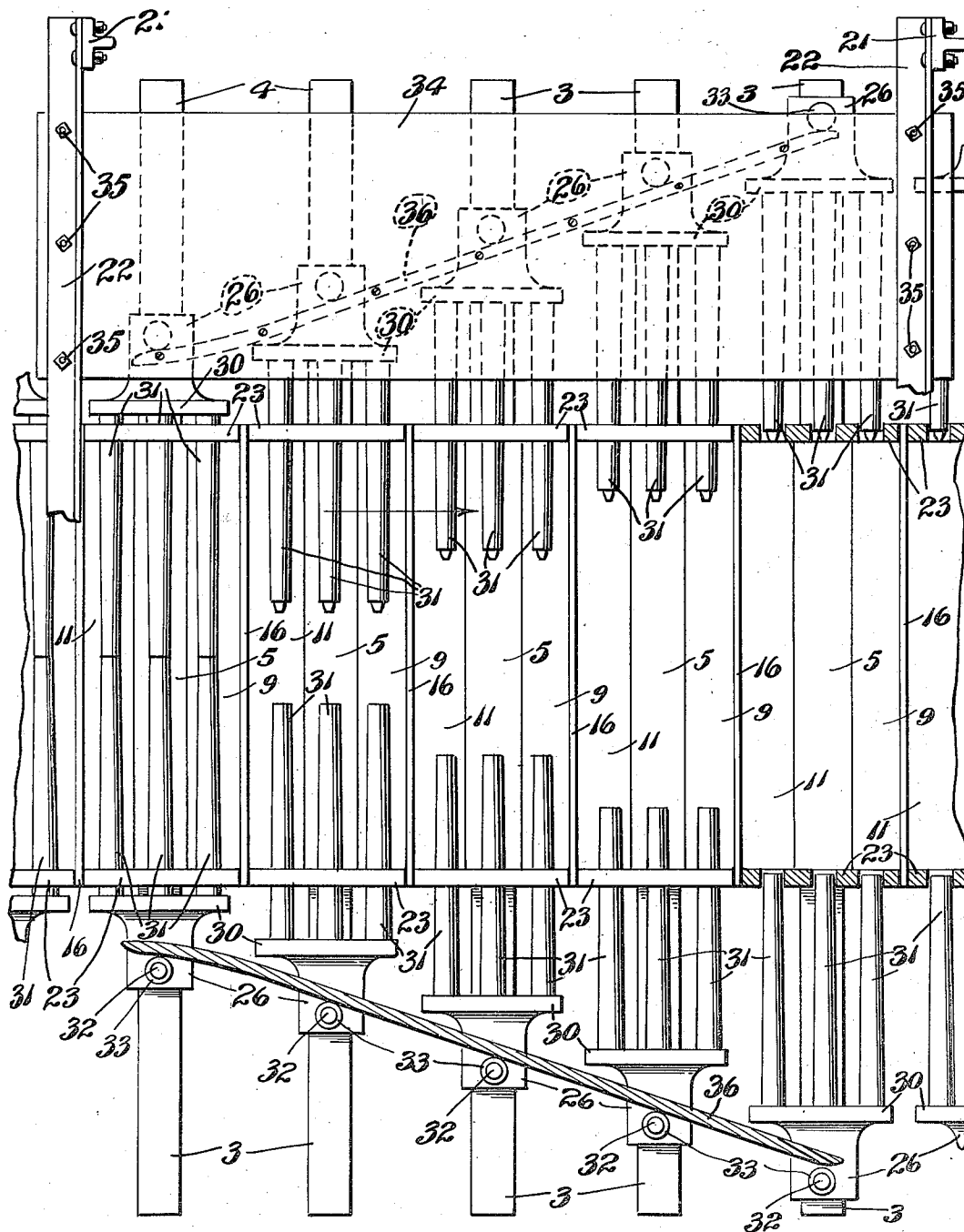


Fig. 2.

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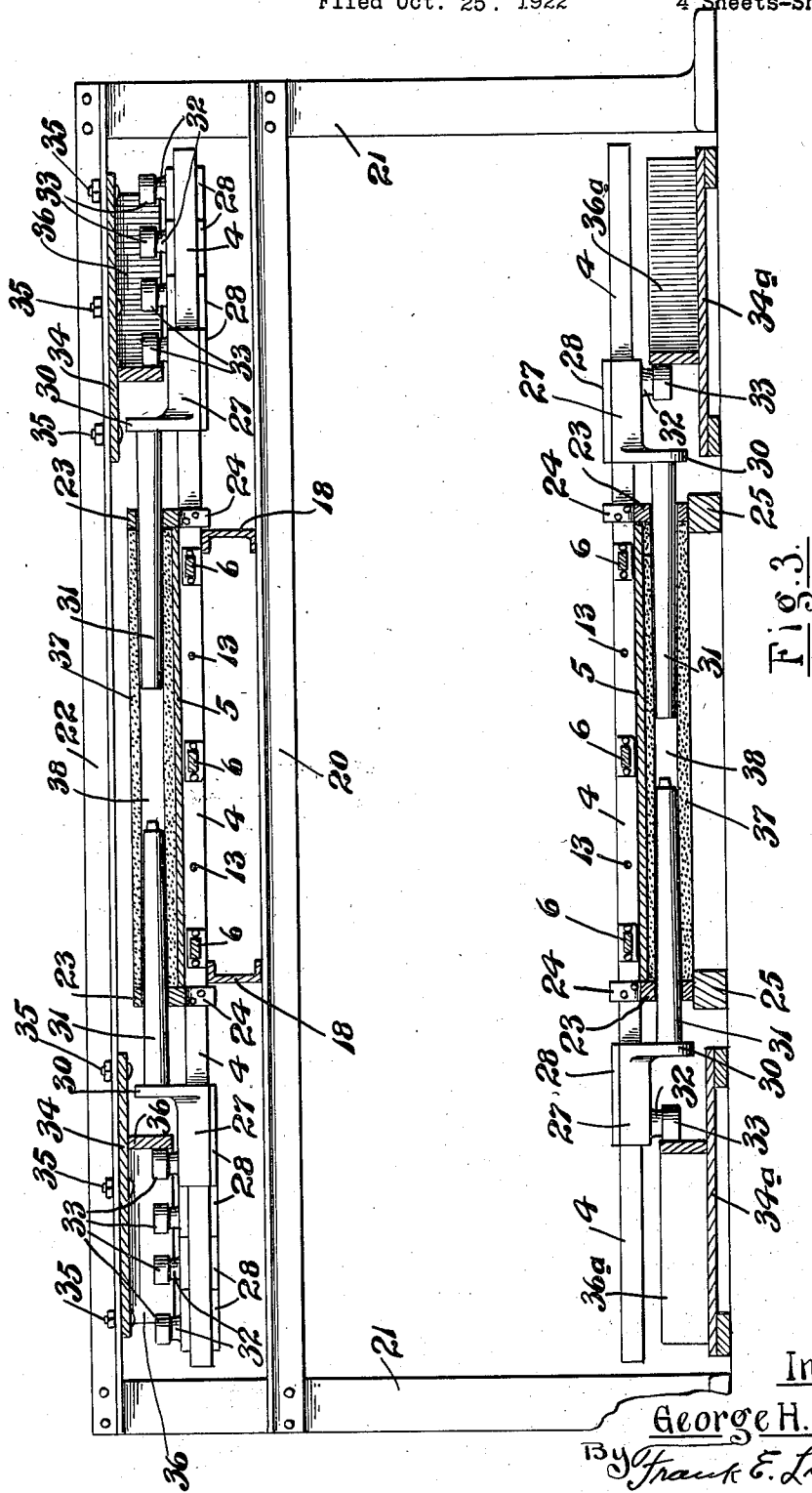


Fig. 3.

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4 Sheets-Sheet 4

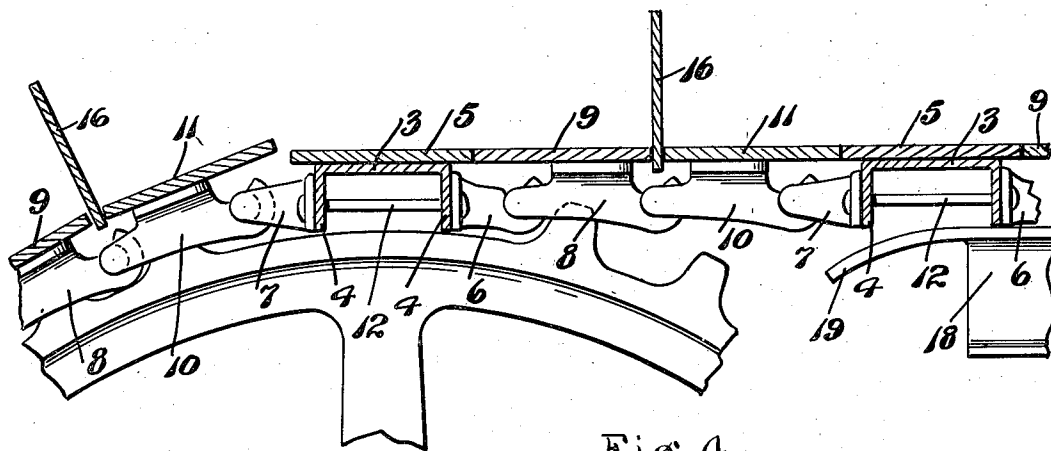


Fig. 4.

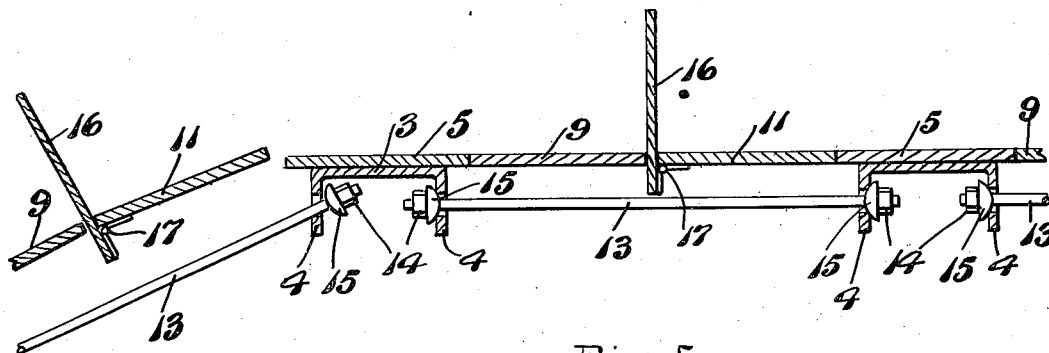


Fig. 5.

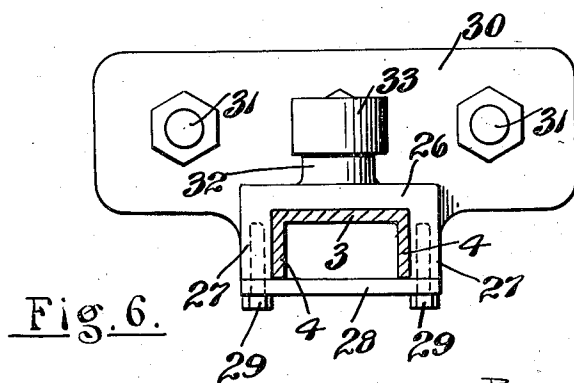


Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE H. A. RUBY, OF FORT DODGE, IOWA, ASSIGNOR TO JAMES R. OFFIELD,
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PLASTER-BLOCK MACHINE.

Application filed October 25, 1922. Serial No. 596,754.

To all whom it may concern:

Be it known that I, GEORGE H. A. RUBY, a citizen of the United States of America, residing at Fort Dodge, in the county of Webster and State of Iowa, have invented certain new and useful Improvements in Plaster-Block Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a machine for the making of building blocks of cementitious material, particularly that type of block commonly made from plaster of Paris stucco material wherein for the saving of material without appreciable or detrimental reduction in strength, openings are made lengthwise through the blocks in the making thereof. It is an object and purpose of the present invention to make a machine for the rapid quantity production of the blocks, the present machine being a very marked simplification of the construction of machine shown in my co-pending application for patent Ser. No. 509,805, filed Oct. 24, 1921, particularly in the core drawing means used, the automatic operation thereof, and in the travelling belt structure on which the block forms are secured. Many other objects and purposes than those stated will appear fully and in detail, together with operative constructions for attaining the same, as understanding of the invention is had from the following description, taken in connection with the accompanying drawings, in which,

Fig. 1 is a longitudinal vertical section through the machine of my invention, the core drawing means not being shown in this figure.

Fig. 2 is an enlarged plan view of the core drawing means, showing cores in the process of withdrawal.

Fig. 3 is a transverse vertical section through the machine at the core drawing means used therewith.

Fig. 4 is a fragmentary enlarged longitudinal section at one end of the machine, showing the construction of the belt used and the chain link drive therefor.

Fig. 5 is a section similar to Fig. 4 but taken on a plane inwardly from the plane of the section shown in Fig. 4, and

Fig. 6 is an end elevation of one of the

core mounts, the channel bar on which it is mounted being shown in cross section.

Like reference characters refer to like parts in the different figures of the drawings.

In the construction of the machine, shafts 1 are rotatably mounted on suitable supports at a distance from each other on which a plurality of large sprocket wheels 2 are secured. I use three of these wheels on each shaft, though this number is in no sense fixed or arbitrary.

A conveyer or belt structure is adapted to pass around the wheels 2, one of the shafts 1 being driven in any suitable manner for the moving thereof. The belt or conveyer structure includes a plurality of cross bars of channel iron form with webs 3 and flanges 4, as shown, to the web of each of which a plate 5 is permanently secured, shorter than the bar which at both ends extends a considerable distance beyond the ends of said plate 5 secured thereto. Hooks 6 and 7 are permanently secured at spaced apart intervals to the outer sides of the opposite flanges 4 of each bar under the plate 5. With the hooks 6, links 8 are connected and a plate 9 is permanently secured to each three links 8 across the machine, said plate 9 lying in the same plane with plate 5 and being of the same length. Other links 10 connect the links 8 with the hooks 7 as shown and a plate 11 is secured in the same plane with plates 5 and 9 to the links 10, the plates 11 also being of the same length as plates 5 and 9. In securing the links 6 and 7 to the opposite flanges 4 of the cross bars, rods 12 are used which lie between and pass through the flanges and through suitable portions of the hooks, being headed or riveted over on their ends, thus securing the hooks and reinforcing the flanges to keep them from spreading apart.

Through the adjacent sides of flanges 4 of the consecutive cross bars, rods 13 are passed, the ends of which are threaded to receive nuts 14 to bear against washers 15, the sides of which next to the flanges are of rounder form as shown in Fig. 5. The rods serve as connecting members for the bars in addition to the links and hooks of the chain structure described and serve to hold the bars from separating under the wear and consequent stretch of the links, the nuts 14 being tightened whenever required to al-

ways keep the belt or conveyer construction adjusted properly. Vertical members or plates 16 are hinged at 17 to the plates 11 at one edge and extend upwardly as shown. 5 Between the wheels 2, the upper run of the conveyer is supported on channels 18, the upper flanges of which at the ends are curved downwardly as indicated at 19. The channels 18 are supported on cross rails 20, at 10 their ends connected to posts 21, other cross rails 22 connecting the posts at their upper ends and passing over the conveyer member, as shown in Fig. 3. There are a plurality of the posts 21 and cross rails 20 and 22 in 15 the length of the machine, one short section of the machine being shown in Fig. 2, in which the posts 21 and cross rails are shown as spaced a distance from each other.

The three plates 5, 9 and 11, the first over 20 a cross bar and the others lying one at each side thereof form the bottom of a form for receiving cementitious material. The upwardly extending hingedly connected plates 16 form the sides, and the ends for the form 25 are provided by end blocks 23 which are secured at their under edges to the upper sides of the plates 5, at the ends thereof, their end portions extending over the adjacent plates 9 and 11 at the sides of the plates 5. 30 In practice, any suitable connecting means, indicated at 24 may be used to attach the end blocks 23 to the middle plates 5 of the forms. The lower run of the conveyer is carried on rails 25 positioned lengthwise of 35 the machine in spaced apart relation so that the free edges of the end blocks 23 ride thereover, as fully shown in Fig. 3.

On the projecting end portions of the cross bars of the conveyer, core heads are 40 slidably mounted, each head having a channel-shaped form with an upper side 26 and depending sides or flanges 27 so as to bear against the web 3 and flanges 4 of the cross bars, being held against detachment there- 45 from by plates 28 passing under the lower edges of the flanges 4 and which are connected to the parts 27 by suitable set screws 29 (see Fig. 6). At their inner ends, the core 50 heads are formed with relatively wide upwardly extending integral plates 30, having a width substantially equal to the length of the end blocks 23 of the forms, a plurality of cores 31 being permanently secured to each plate 30 and projecting horizontally 55 therefrom to the end blocks 23, entering openings in said blocks and being adapted to pass through said openings so that the ends of the cores passing through the opposite end blocks in each form meet and detachably connect together substantially mid- 60 way between the ends of the forms. The cores are tapered slightly, reducing size toward their inner ends so that the cores pass freely through the openings in blocks 23 65 therefor, filling and fitting the openings

snugly when moved inwardly to inner position.

Projecting upwardly from each part 26 of each core head is a short post 32, at the upper end of which a roller 33 is rotatably 70 mounted to turn about a vertical axis. An overhead supporting plate 34 is detachably connected by means of bolts 35 to and lies between any two consecutive upper cross rails 22 at each side of the machine, being 75 located at the proper position where the cores should be drawn from the building blocks, after the cementitious material thereof has set to a proper hardness. On the under side of the plates 34 cam bars 36 are secured in any 80 suitable manner being curved somewhat at one end and extending outwardly at an angle to the longitudinal center line of the machine whereby when the core heads come 85 thereto, the rollers 33 are engaged thereby and forced outwardly drawing the heads and attached cores outwardly so that the inner ends of the cores are left just within the openings in the end blocks 23 of the build- 90 ing block forms. This withdrawal is slow and easy at the start or during the time when the cores have to be broken from the cementitious material, afterward being more rapid. After the cores are drawn, the con- 95 tinued movement of the conveyer carries the cores with it until the same have passed over one of the ends of the machine, whereupon at any desired place in the length of the machine other bars 36^a carried on and ex- 100 tending upwardly from supporting plates 34^a are reached, being reversely positioned so as to have the rollers 33 engage against the same with a consequent movement of the cores back into place in the forms for the building blocks. The blocks 37 made in the 105 forms have longitudinal openings 38 there-through as many as there are cores used to each form, this number being varied in different sizes of building blocks in accordance with standard specifications. 110

In the operation of the machine, the same is continuously run, the different block forms on the belt or conveyer successively passing below the lower end of a discharge 115 hopper 39 from which the plastic cementitious material is delivered into the forms. With the upper run of the conveyer held horizontally and supported by the under channel supports 18, the ends, bottom and sides of the building block forms are tight 120 and the material does not escape to be wasted. The cementitious material when plaster of Paris stucco is used sets rapidly, and at the proper place beyond the hopper 39 during the time of traverse to which the 125 cementitious material has set sufficiently, the core removing cam bars 36 are located, the cores being automatically withdrawn on passing by the same. When the conveyer carrying the building blocks with the cores 130

removed comes to the end of the machine and passes over the wheels 2 at such end, the bottom plates of the block forms take different angular positions with respect to each other than the straight position held during the time the material is received, is setting and is having the cores withdrawn so that the bottom plates 9 and 11 are broken loose and move away from the under side of the blocks 37. Also the division vertical plates 16 instead of being parallel are moved farther apart at their outer portions, separating from the edges of the blocks 37, the blocks being free to drop from the forms to a conveying belt 40 which carries them away to any proper place of storage. The building blocks 37, accordingly are dropped successively to the belt 40 from the succeeding forms and the production of the blocks is a continuous procedure, a large quantity production being had with little labor expenditure.

This construction of building block making machine is relatively simple in construction, continuous in its working, durable and efficient in all particulars. The points where the cores are to be withdrawn are readily changed by merely changing the position of the cam bar holding plates 34, this sometimes being desirable with different setting materials. No parts or materials therefor are used which are liable to deterioration. The construction has proved practical and with it building blocks of the character outlined are produced in quantity at small cost.

I claim:

1. In combination with an endless conveyer mounted horizontally, of a plurality of individual block forms attached to the outer sides of the conveyer, said forms having ends provided with openings therethrough, a plurality of core members inserted through said openings, said core members for each form having inner ends adapted to detachably join together, a head slidably mounted at each end of each form to which the core members for each end of a form are secured, a roller on each head, and cam bars mounted one at each side of the conveyer with which said rollers successively engage to automatically move the heads and attached core members outwardly as the same pass with the conveyer by said cam bars, substantially as described.

2. A construction containing the elements in combination defined in claim 1, combined with additional cam bars located one at each side of the conveyer with which the said rollers engage to move the heads and attached core members inwardly as the heads are moved by said additional cam bars, substantially as described.

3. In combination with an endless conveyer mounted horizontally, of a plurality of individual block forms attached to the

outer side of the conveyer, said forms having ends provided with core passing openings therethrough, a plurality of core members adapted to pass through said openings, a head at each end of each form to which the core members for each end of a form are secured, outwardly extending bars connected with the conveyer on which said heads are slidably mounted, means with which said heads automatically engage at a predetermined point in the travel of the conveyer to move the said heads and attached core members outwardly, and additional means with which said heads engage at a second predetermined point in the travel of the conveyer to move said heads and core members thereon inwardly, substantially as described.

4. In a machine of the class described, an endless conveyer mounted horizontally, a plurality of individual block forms attached to the outer sides of the conveyer, said forms having ends provided with core passing openings therethrough, a bar attached to the conveyer below and lengthwise of each form, the bar at each end extending a distance beyond the ends of its form, a head slidably mounted on each projecting end portion of the bar, core members attached to each head to pass through the openings in the end members of the forms, means for automatically sliding the heads and attached core members outwardly on reaching a predetermined point in the travel of the conveyer, and means for moving the heads and core members back to inner position, substantially as described.

5. In a machine of the class described, an endless horizontally located conveyer, a plurality of individual block forms attached to the outer sides of the conveyer, said forms having ends provided with core passing openings therethrough, a head mounted on the conveyer and movable therewith at each end of each form, means for mounting said heads for outward and inward sliding movements with respect to the conveyer, a cam bar mounted in fixed position at each side of the conveyer, and means on said heads engageable with the cam bar for moving the heads outwardly, said heads having core members attached thereto for passage through the openings in the adjacent end of the associated block form, substantially as described.

6. In a machine of the class described, an endless horizontally located conveyer, channel bars located transversely across and on the inner sides of the conveyer at spaced intervals, said bars being longer than the width of the conveyer, a plurality of individual block forms attached to the outer sides of the conveyer, one over each channel bar, each having ends provided with core passing openings therethrough, a head

mounted at each end of each channel bar for free sliding movements thereon, core members attached to the heads and passing through the openings in the end members of the forms, and means for moving said heads back and forth on the channel bars, substantially as described.

7. In a machine of the class described, an endless horizontally located conveyer, cross bars located transversely across and on the inner sides of the conveyer at spaced apart intervals, said bars being longer than the width of the conveyer, a plurality of individual block forms attached to the outer sides of the conveyer, one over each cross bar, each form having ends formed with core passing openings therethrough, a head slidably mounted on each end portion of each cross bar, core members attached to the heads and passing through the said openings in the ends of the forms, an outwardly extending cam bar located at each side of the conveyer and positioned at an angle to the length of the conveyer, and means on the heads to engage with said cam bars for drawing the heads and core members attached thereto outwardly on passing said cam bars.

8. In a machine of the class described, spaced apart shafts, wheels thereon, an endless conveyer construction mounted on the wheels to pass around the same, comprising a plurality of spaced apart cross bars, hooks attached to opposite sides of the cross bars, links connecting the hooks and adapted to engage with teeth projecting from the wheels, a plate secured to the outer side of each cross bar, other plates secured to the links to lie in the same plane with the plates on the cross bars, outwardly extending plates hingedly connected to one of said other plates at one side of each plate attached to the cross bars, and end members connected to each cross bar plate at each end thereof, substantially as described.

9. A construction containing the elements

in combination defined in claim 8, combined with heads slidably mounted at each end of each cross bar, said end members having a plurality of openings therethrough, core members attached to the heads and passing through said openings, means for automatically moving the heads and attached core members outwardly at a predetermined point in the movement of the conveyer, and additional means for automatically moving said heads and core members inwardly at a further predetermined point in the movement of the conveyer.

10. An endless conveyer construction comprising spaced apart cross bars, links located between and connecting the cross bars, wheels over which the connected links and cross bars pass, a plate attached to the outer side of each cross bar, and additional plates lying alongside of the first plates and connected to said links, substantially as described.

11. In a machine of the class described, spaced apart shafts, wheels thereon and endless conveyer construction mounted to pass around the wheels, a plurality of block forms carried by the conveyer, each form having ends with core passing openings therethrough and each of said forms comprising a bottom having a central plate, and a plate lying at each side of the central plate, the ends of the form being attached to the ends of said central plate and extending over the plates at each side of the central plate, division plates for the forms pivotally connected to the edges of one of each of the said side plates, a head having a plurality of core members thereon mounted at each end of each form, the cores passing through the openings in said end members of the forms, and means for moving said heads and attached core members inwardly and outwardly, substantially as described.

In testimony whereof I affix my signature.

GEORGE H. A. RUBY.