Dec. 6, 1932. G. H. A. RUBY 1,889,935

PLASTER BLOCK MACHINE

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Fig. 1.

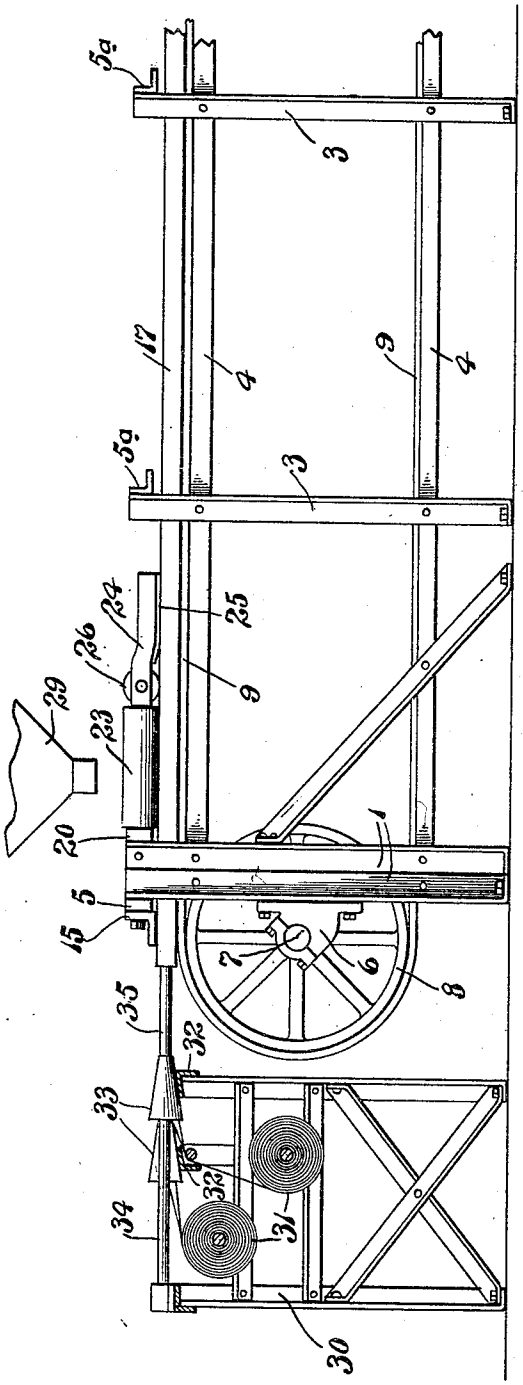
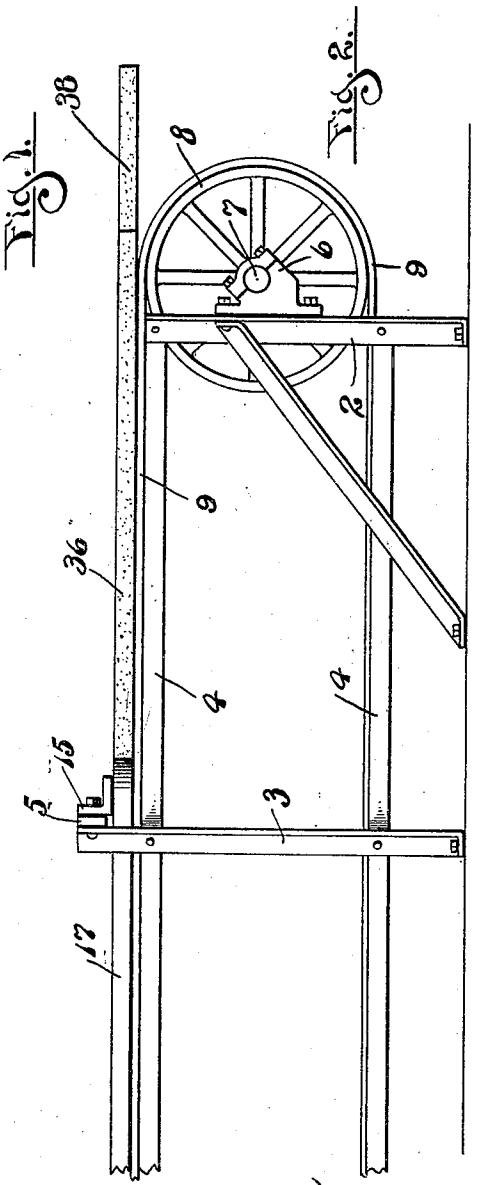


Fig. 2.



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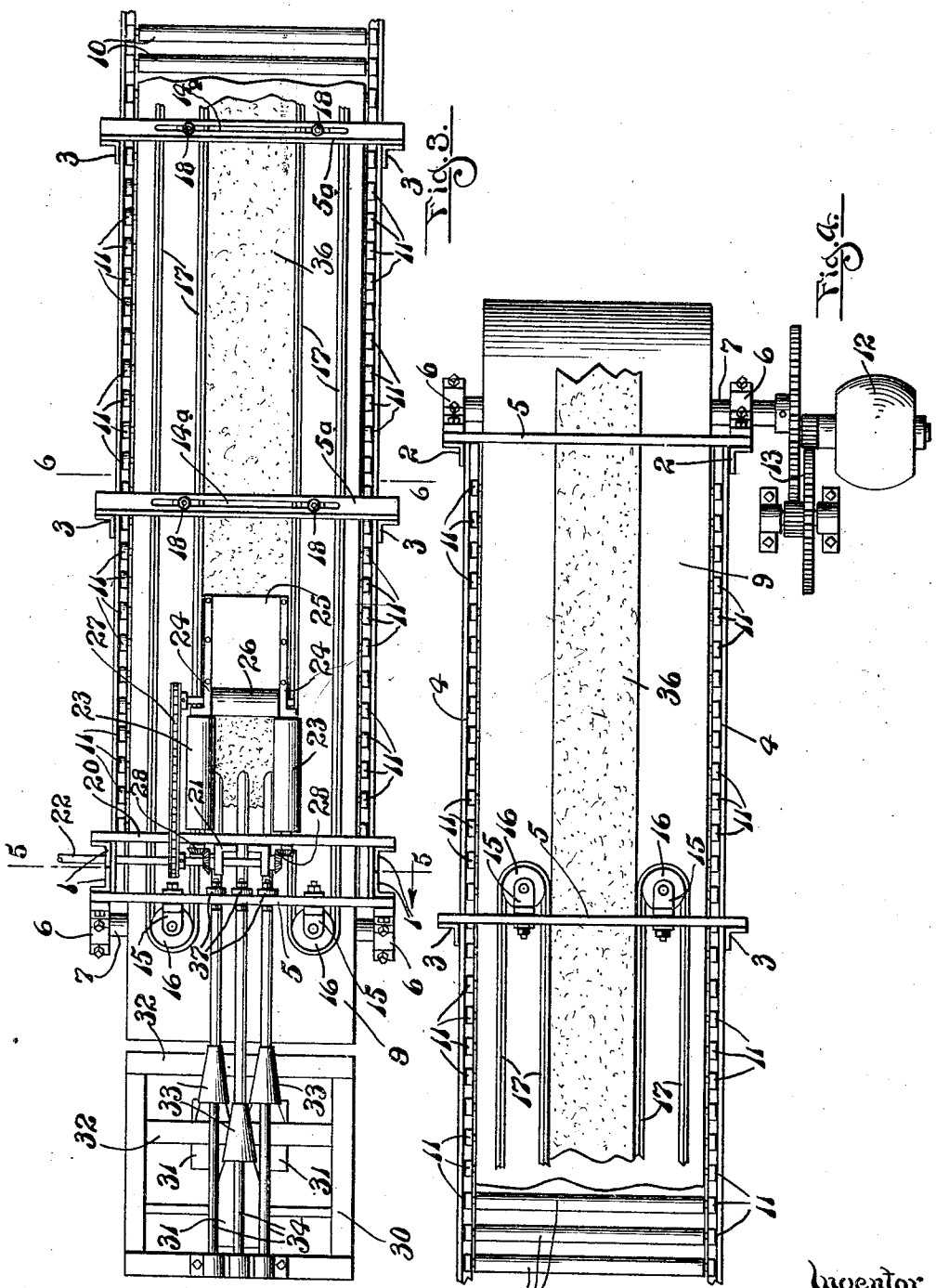


Fig. 3.

Fig. 4.

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PLASTER BLOCK MACHINE

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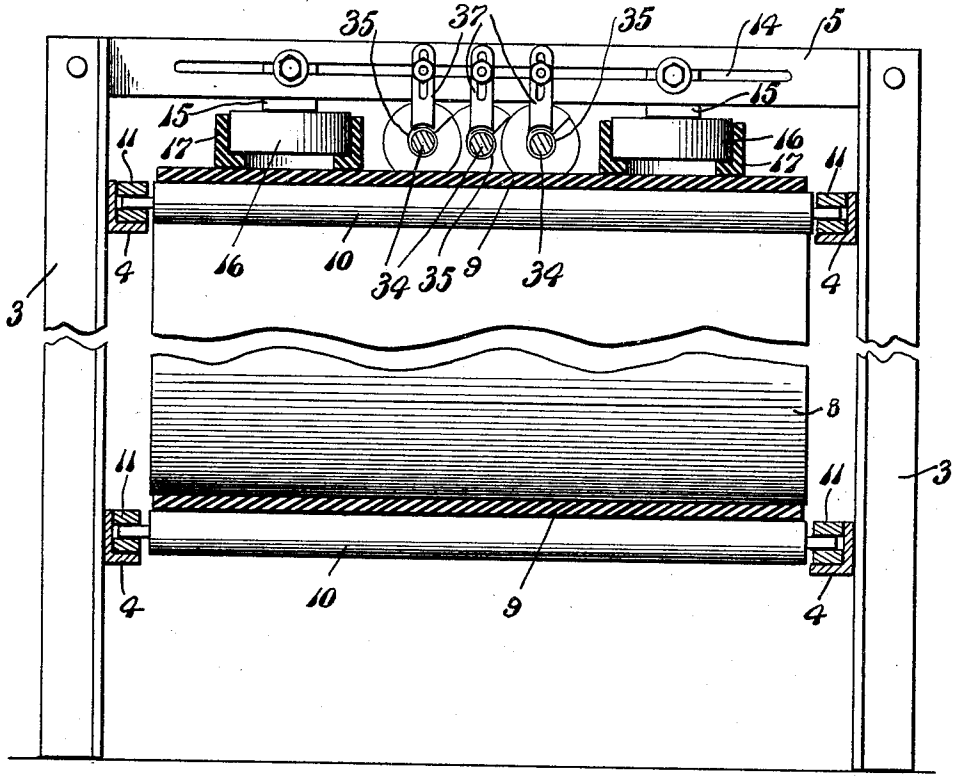


Fig. 5.

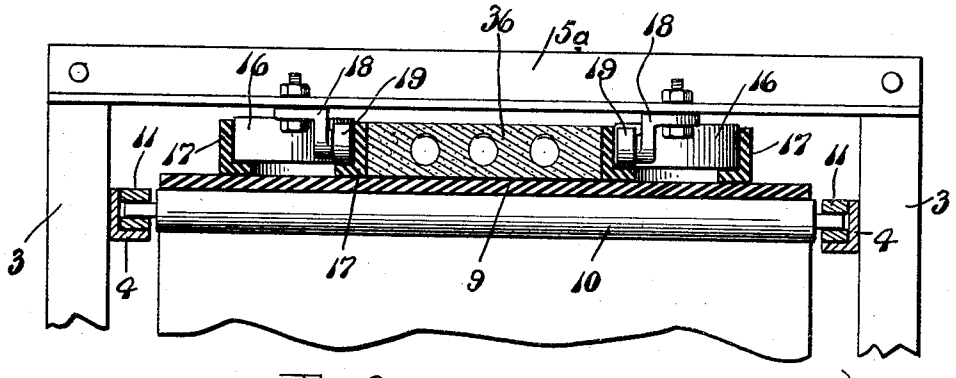


Fig. 6.

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PLASTER BLOCK MACHINE

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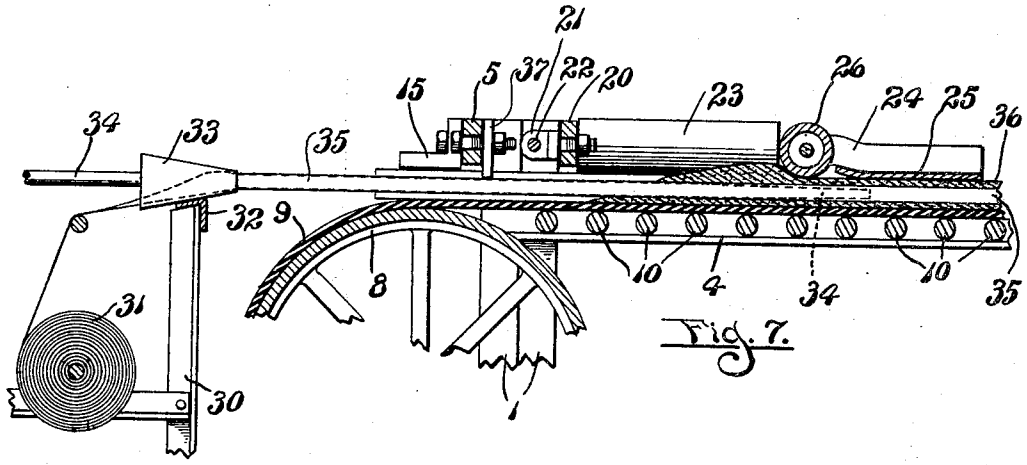


Fig. 7.

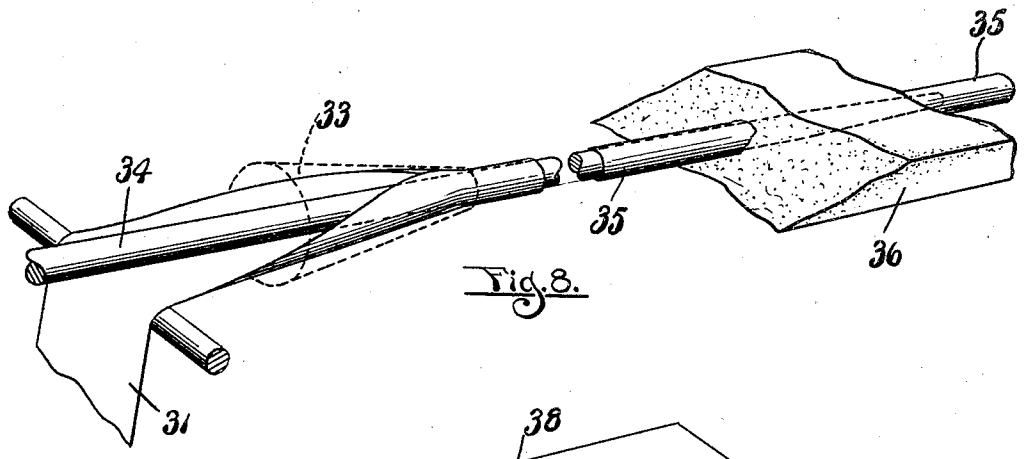


Fig. 8.

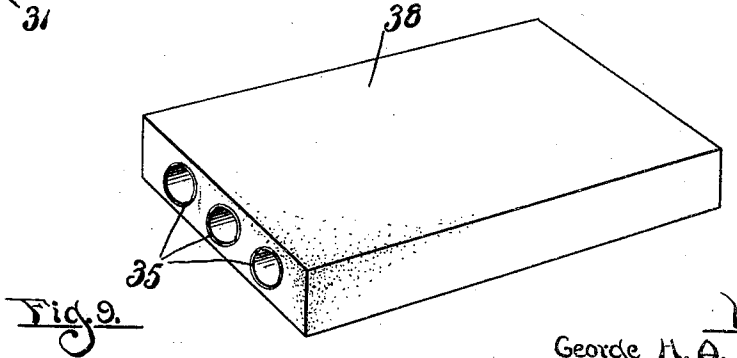


Fig. 9.

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UNITED STATES PATENT OFFICE

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PLASTER BLOCK MACHINE

Application filed January 6, 1930. Serial No. 418,792.

This invention relates to machines for manufacturing plaster blocks, that is, building blocks the major constituent of which consists of a cementitious material largely of plaster of Paris.

Building blocks of this character are ordinarily built with spaced apart longitudinal and, preferably, cylindrical openings therethrough for the purpose of lessening weight of the blocks and saving material without sacrifice of necessary strength, and at the same time the openings through the blocks provide air passages, making the blocks better adapted for building purposes for air circulation and elimination of dampness. Various machines have been made heretofore for producing the blocks in large quantities and the present invention is directed to a novel and practical machine for building the blocks with the desired longitudinal openings therethrough the openings being lined their entire length with paper which increases the strength of the blocks and saves them against breakage to a large degree. A further object of the invention is to provide a machine for building the blocks wherein blocks of different widths may be made on the same machine through suitable adjustment thereof. A still further object of the invention is to provide a machine wherein the building blocks are cut off from a continuous manufactured length of gypsum block material and the blocks may be cut to any desired length, those previously made being of a single standard length. Many other objects and purposes and structure for attaining the same will be evident upon understanding of the invention from the following description, taken in connection with the accompanying drawings, in which,

Fig. 1 is a side elevation of the front end portion of the machine.

Fig. 2 is a similar side elevation of the rear end portion of the machine.

Figs. 3 and 4 are plan views, respectively, of the front and rear end portions of the machine.

Fig. 5 is a transverse vertical section on the plane of line 5—5 of Fig. 3.

Figure 6 is a similar transverse section on the plane of line 6—6 of Fig. 3.

Fig. 7 is a fragmentary longitudinal vertical section at the front end portion of the machine illustrating the manner that the paper core lining is introduced into the machine.

Fig. 8 is a fragmentary perspective view illustrative of the formation of the paper core lining, and

Fig. 9 is a perspective view of a finished block made by the machine.

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

In the construction of the machine, an elongated frame is used having a pair of side posts 1 at each side at the front end of the machine, rear posts 2 at the rear end and a plurality of spaced apart vertical side posts 3 between the front and rear, all being connected by horizontal upper and lower rails 4 of angle form in cross section. The upper ends of the front posts 1 are connected by a cross bar 5 and similarly the upper ends of the rearmost of the side posts 3 (see Fig. 2) are connected by a like cross bar 5, while the intermediate posts 3 between carry connecting cross bars 5*a* of angle form.

Bearings 6 are permanently secured to the front and rear posts 1 and 2 for the mounting of horizontal shafts 7. Drums 8 are connected with the shafts to turn therewith and around the two drums at the opposite ends of the machine a continuous endless belt 9, preferably of suitable rubber construction, is mounted. The upper and lower runs of the belt bear upon relatively small rollers 10 which extend between the horizontal side bars 4 of the frame and at their ends are rotatably mounted in suitable bearings 11 carried on the horizontal flanges of the side bars 4. The rear shaft 7 is driven by an electric motor 12 through suitable reduction gearing 13 (see Fig. 4) whereby when the motor is operating the belt continuously moves at its upper run from front to rear at a relatively slow speed of movement.

The bars 5 described are provided with longitudinal slots 14. Hanger brackets 15 are adjustably mounted on the bars 5 and

carry rollers 16 at their lower ends around which endless side belts 17, also of suitable rubber material, are placed, the lower edges of said side belts lying in close proximity to the upper side of the upper run of the belt 9 as shown in Figs. 5 and 6. There are two of the endless belts 17 spaced apart from each other and the distances at which the inner sides of said belts 17 may be spaced is controlled by the positions of the brackets 15 on the bars 5, it being evident that the same may be shifted to many different positions within the length of slots 14. The horizontal flanges of the cross bars 5*a* are likewise slotted, as indicated at 14*a* (see Fig. 3), and other brackets 18 are adjustably mounted on and located below said horizontal flanges of the bars 5*a* and carry rollers 19 (see Fig. 6) to bear against the inner runs of the two belts 17. The belts 17 are L-shaped in cross section and the rollers 19 bear against the upper sides of the horizontal portions holding the same tightly against the rollers 10 below and thereby making a trough, in which the upper run of the belt 9 is the bottom and the inner sides of the belts 17 are the vertical sides, into which the cementitious material from which the plaster blocks are made may be delivered.

The delivery of the cementitious material to the belt 9 between the inner sides of the belts 17 is adjacent the front end of the machine. A feeding and leveling mechanism is located near the front end of the machine being mounted on a cross bar 20 similar to the bars 5 but secured to the rear of the two vertical posts which are located at the front of and each side of the machine. A bracket 21 (see Fig. 3) is secured to the front side of the bar 20 in which a shaft 22 is mounted for driving the feeding device, said shaft extending to one side of the machine and adapted to be driven through any suitable power source. Two rollers 23 are mounted on shafts, the front ends of which extend through the bar 20 while the rear ends are mounted on side bars 24 at the underside and rear portions of which a smoothing and leveling plate 25 is secured. A cross roller 26 is mounted on and extends between the front ends of the side bars 24 and its shaft extends outwardly, at one end carrying a wheel around which end an aligned wheel on the shaft 22, an endless driving chain 27 is placed. The front ends of the shafts of rollers 23 have each a beveled gearing driving connection with the shaft 22, as indicated at 28, so that the two rollers 23 are rotated in opposite directions inwardly and the roller 26 is driven. The rollers 23 are located directly above the upper edges of the belts 17 and the plate 25 lies between said belts so that when cementitious material is delivered from the mixer through a delivery spout, indicated at 29 in Fig. 1, it is delivered in the space between the rollers 23 and in front of the roller 26; and with the movement of the upper run of the belt 9 to the rear, the cementitious material is leveled and smoothed by the roller 26 and plate 25 and the side rollers 23 prevent overflow of the mixture at the sides above the upper edges of the side belts 17.

The construction thus far described is all that is necessary for making solid so-called gypsum blocks. There is a continuous movement of the belt 9 and the equivalent of a continuous feed of the cementitious material. The cementitious material is leveled and smoothed and is held at its sides by the side belts 17. The machine is of a sufficient length that the material will set and harden enough to maintain its shape when it reaches the rear ends of the belts 17. The blocks may be sawed from the continuous length of the product made at or shortly after it leaves the machine and it is evident that the length of the blocks may be anything desired. The usual cut off saw which is old and well known in plaster board machines is available for the block sawing cut-off. It is not shown herein as it is not of my invention and is old and well known.

One of the primary purposes of the present invention is to make the blocks in this machine with the desired plurality of spaced apart longitudinal openings therethrough. To this end a supporting frame 30 is located in front of the front end of the machine thus far described, which is adapted to carry a plurality of rolls 31 of paper on suitable cross shafts. The drawings illustrate three of these rolls located in different planes relative to the longitudinal axis of the machine. On upper cross bars 32 of the frame 30 fustro-conical or funnel members 33 are mounted with their axes horizontal, with their larger ends to the front and their smaller ends toward the rear. Through these funnel members cylindrical rods or cores 34 extend passing to the rear to a point underneath the smoothing plate 25 of the feeding and leveling device. The paper from the rolls 31 is lead upwardly to the funnels 33 and around the core rods 34 and automatically wound into spiral cores around the core rods as it is drawn through the funnel members 33 with the movement of the belt 9 and the cementitious material thereon, indicated at 36, to the rear.

In order that the paper in its cylindrical form spirally wound around the core rods 34 shall not tend to unfold and separate, fingers 37 having concave lower ends are fastened on the front bar 5 and bear against the paper cylindrical core linings 35 (see Fig. 5) holding the same against unwinding and separation.

It is evident from the construction described that the continuous formation of a length of set cementitious material of the proper cross sectional dimensions for build-

ing blocks and with spaced apart longitudinal openings therethrough is provided using the machine as described. The paper is drawn continuously from the rolls 31, automatically spirally wound around the core rods 34 and carried with the cementitious material to the rear by the belt 9. The rear end portions of the core rods 34 are of reduced or tapered form so that the paper readily leaves the same. The paper in its cylindrical form is sufficiently strong to resist any tendency of the cementitious material to crush the same inwardly, particularly as the material sets rapidly and by the time that the paper leaves the core rods 34 there is little or no tendency for the material to settle inwardly and cause an inward crushing of the paper cylinders which line the longitudinal passages through the elongated block being made. The blocks are cut in any desired length at or adjacent the rear end of the machine and, as indicated in the block 38 in Fig. 9, the longitudinal openings therethrough are lined with paper which adds to the strength of the block and is of great assistance in reinforcing the same against transverse breakage liable to occur in blocks of this character, from which cause the greatest loss in plaster blocks occurs.

The construction described in very practical and with large quantity production of gypsum blocks, either in solid form or with the spaced apart longitudinal openings therethrough, may be readily produced. The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a machine of the class described, a horizontally located endless conveyor mounted for movement to carry its upper run in one direction, means for driving said conveyor, a pair of endless belts located in substantially parallel and spaced apart relation above said conveyor and having inner sides located in vertical planes, the lower edges of the inner sides of said belts contacting with the upper side of said conveyor, and means for adjusting said belts to different distances apart above the conveyor whereby cementitious material may be delivered adjacent the front end of said conveyor between said belts and held by said belts until set, said cementitious material being carried to the rear by the movement of the conveyor for the purposes described.

2. In a machine of the class described, an elongated frame support, drums mounted at opposite ends thereof, an endless conveyor mounted around, located between and carried by said drums, means for driving one of said drums, cross bars carried by said support above the upper side of said conveyor, a pair of rollers mounted on each of two spaced apart cross bars in spaced apart relation to each other to turn about vertical axes, and endless belts around said rollers, the inner sides of said belts being substantially parallel and spaced apart and contacting at their lower edges with the upper side of said conveyor.

3. In a machine of the class described, an elongated frame support, drums mounted to turn on horizontal axes adjacent the ends of the support, an endless conveyor carried around and between said drums, means for driving one of said drums, a plurality of horizontal cross bars carried by the frame above said conveyor, a pair of brackets connected to each of two spaced apart cross bars, rollers mounted at the lower ends of said brackets to turn on vertical axes said brackets being spaced from each other on each cross bar, a pair of endless belts located around said rollers having their lower edges closely adjacent the upper side of said conveyor, other brackets mounted on intermediate cross bars, other rollers mounted on said other brackets to engage against the inner sides of said belts and press the same into engagement with the upper side of said conveyor, said other rollers being mounted to turn on horizontal axes and said belts having inwardly extending horizontal flanges against which said other rollers bear.

4. A construction containing the elements in combination defined in claim 3, said cross bars being provided with horizontal slots, and means for connecting the brackets to their respective cross bars through said slots, whereby the brackets and attached rollers may be adjusted to distances apart to thereby position the inner sides of the belts at different distances from each other.

5. In a construction of the class described, a horizontally located endless conveyor, means for driving said conveyor, two means located above and in engagement with the upper side of the conveyor spaced from each other adjustable toward and away from each other and located lengthwise of the conveyor forming sides between which cementitious material may be delivered to the conveyor to hold said material until set, and means for leveling the upper side of the cementitious material whereby its upper side is substantially parallel with the upper side of said conveyor.

6. A construction containing the elements in combination defined in claim 5, combined with a plurality of horizontal core rods spaced from each other and located at the front end of the conveyor and extending at their rear ends above the upper side thereof and between said sides, and means through which said core rods extend through which lengths of paper are drawn by the cementitious material as it moves to the rear on said conveyor to form said lengths of paper into cylindrical core linings around said core.

7. A construction containing the elements in combination defined in claim 5, combined with a supporting frame located at the front end of the conveyor, a plurality of spaced apart horizontal core rods mounted on said frame, said rods extending rearwardly and at their rear end portions lying above the upper side of the conveyor between said sides means on said frame for supporting a plurality of rolls of paper, one for each rod, and individual means through which each of said rod passes carried by said supporting frame and through which the paper is fed to automatically and spirally wind the paper around said rods into cylindrical core linings.

8. A construction containing the elements in combination defined in claim 5, combined with a supporting frame located in front of the front end of said conveyor, a plurality of spaced apart horizontal core rods located in substantially the same horizontal plane and supported at their front portions on said frame and extending rearwardly therefrom above the front end portion of the conveyor and between said sides, means on said frame for carrying a plurality of rolls of paper, one for each core rod, and a plurality of funnel shaped guides carried by said frame, one for each core rod, through which the core rods extend, the larger ends of said guides being located to the front and the smaller ends to the rear.

9. An apparatus for manufacturing plaster blocks, comprising a horizontally located endless conveyor, means for driving said conveyor, means for delivering cementitious material onto the conveyor and means for leveling said material and forcing it downwardly against the conveyor, said means comprising opposed rollers having their axes parallel to the direction of movement of the conveyor and located thereabove and means for revolving said rollers so that their top portions move inwardly toward each other.

10. An apparatus as set forth in claim 9 but further characterized by the fact that a third roller is positioned crosswise with respect to the other two rollers and located in substantially the same plane and along the belt in the direction in which the belt is moving, and means for revolving the last mentioned roller.

In testimony whereof I affix my signature.

GEORGE H. A. RUBY.