July 25, 1933. A. C. MYERS 1,919,640

TILE FABRICATING MACHINERY

Filed March 16, 1931 6 Sheets-Sheet 1

FIG. 1.

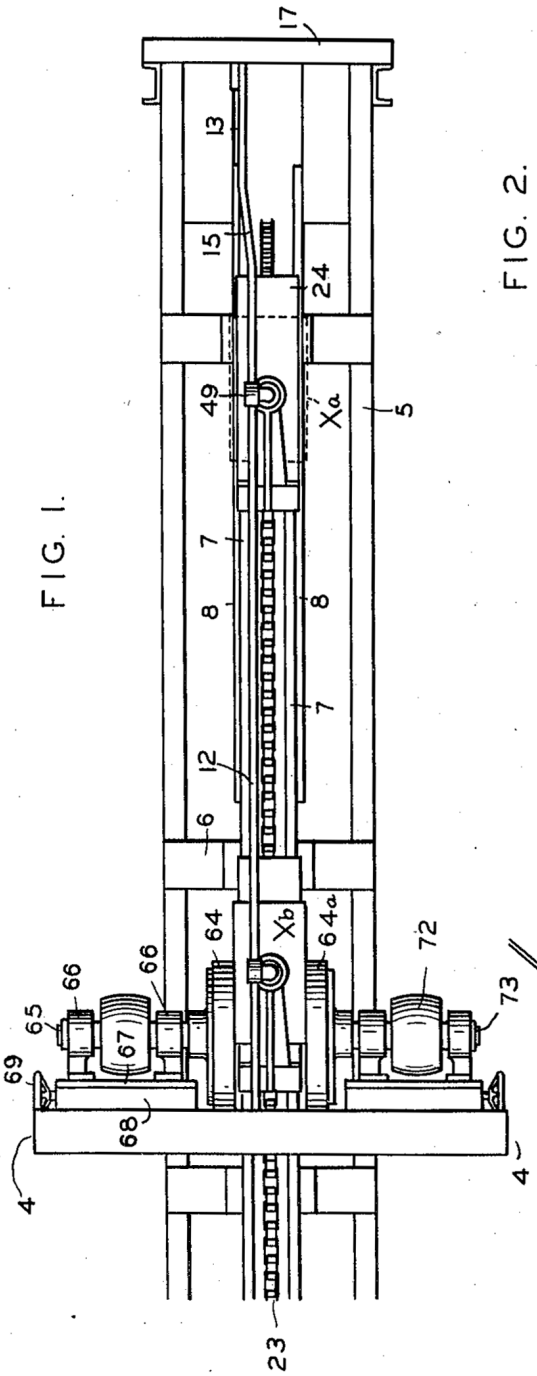
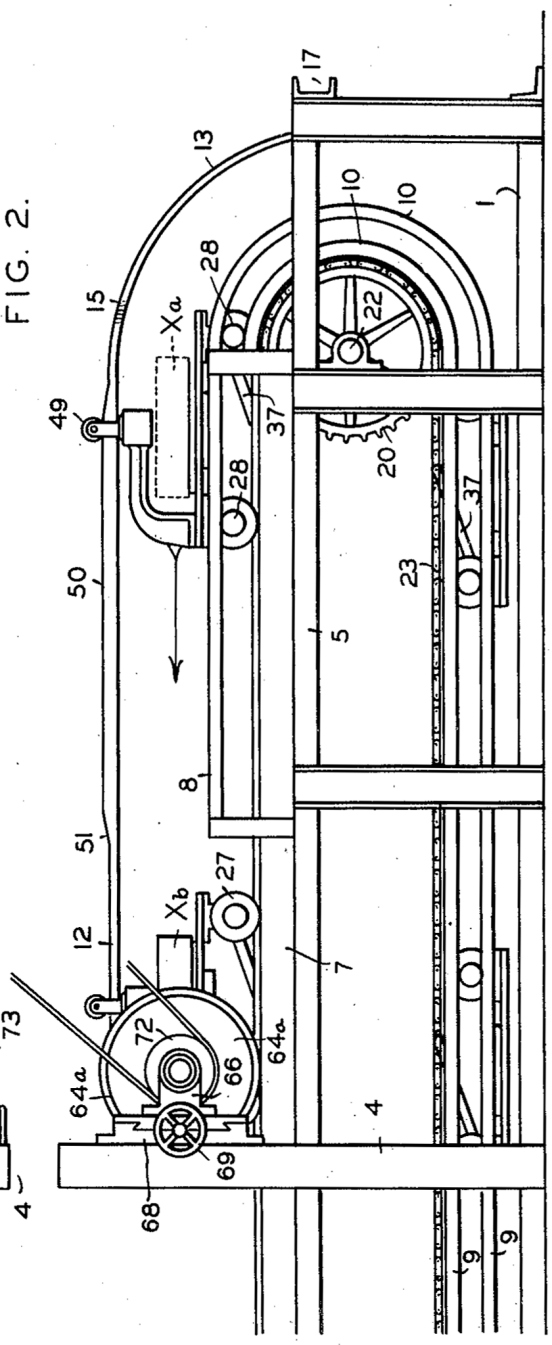


FIG. 2.



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TILE FABRICATING MACHINERY

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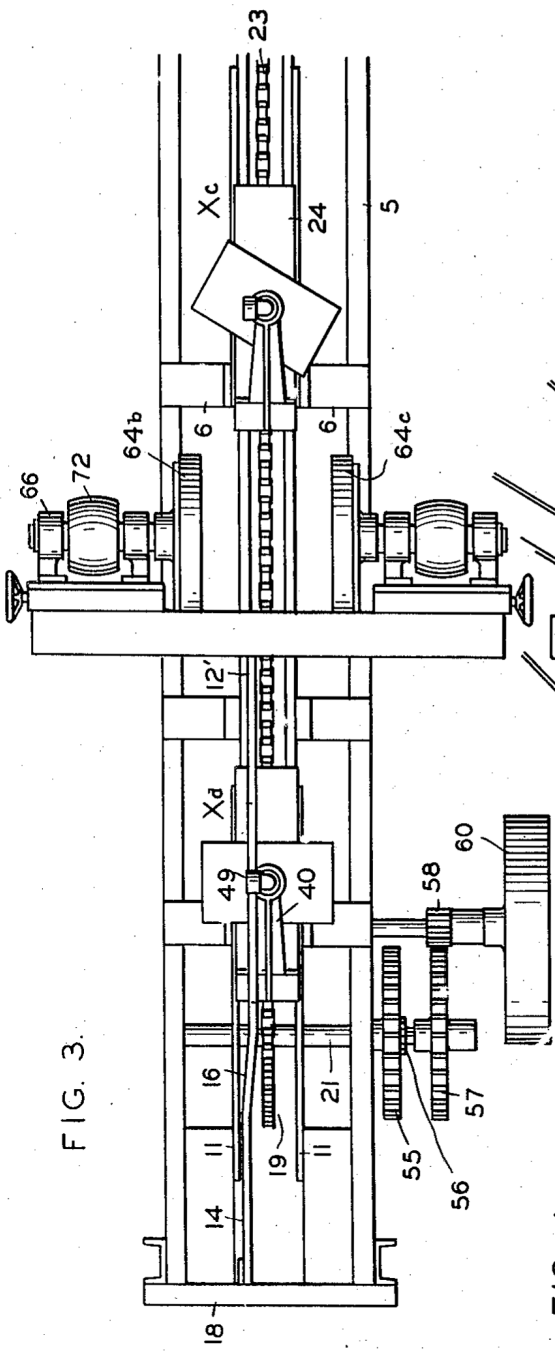

FIG. 3.

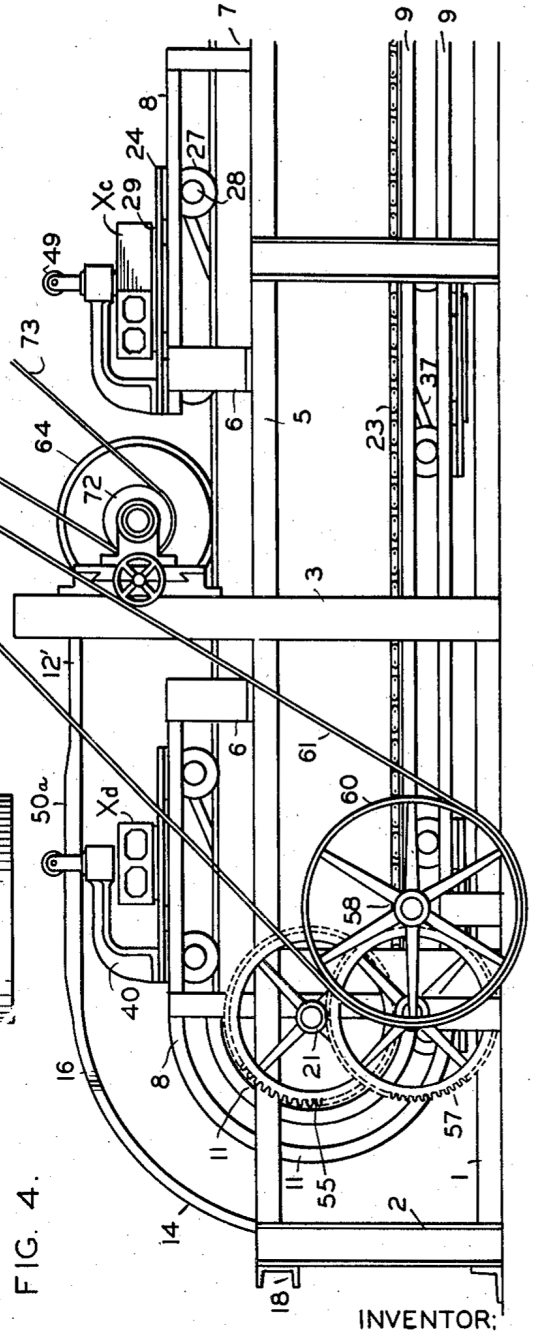

FIG. 4.

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TILE FABRICATING MACHINERY

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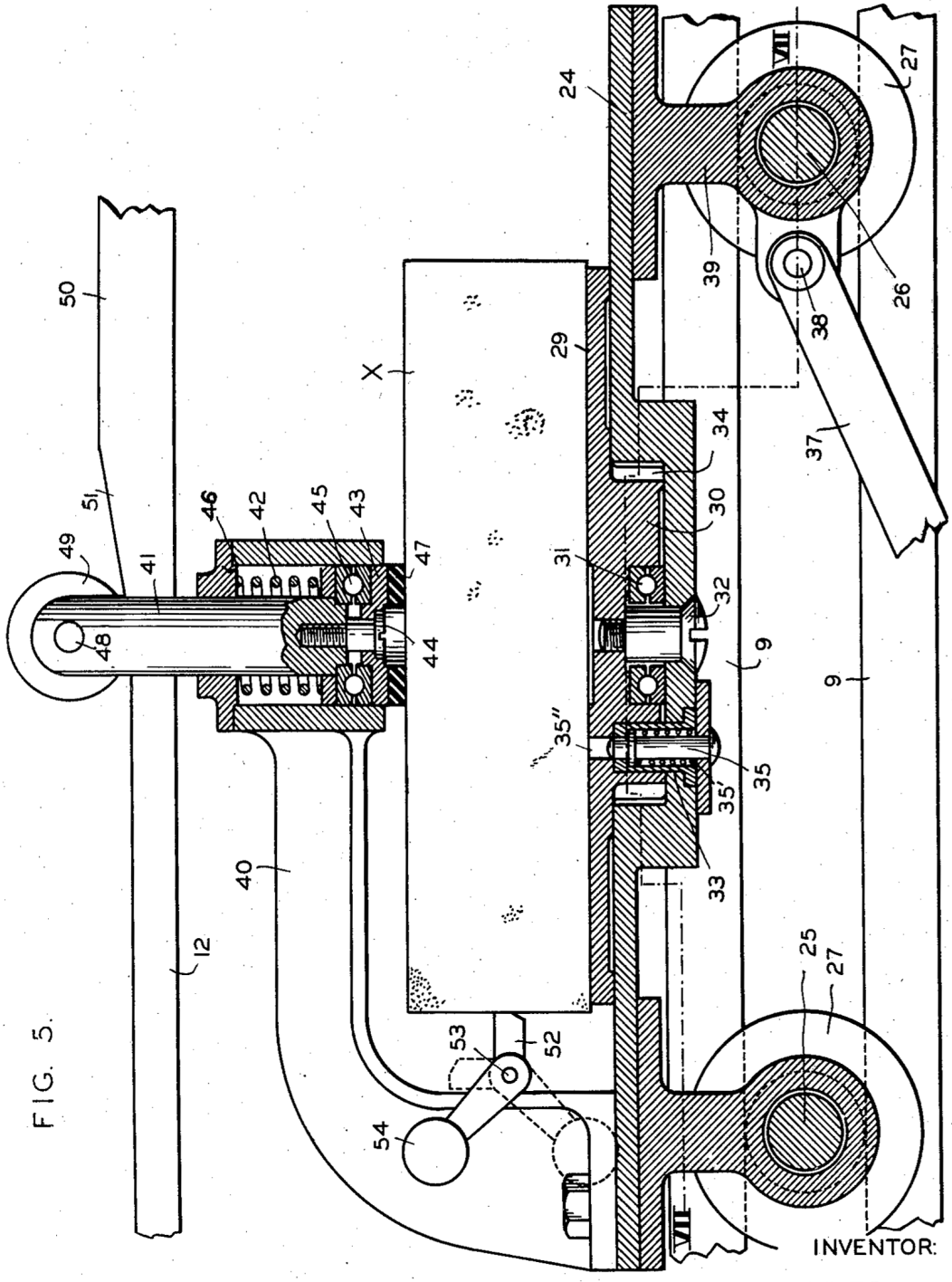

FIG. 5.

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TILE FABRICATING MACHINERY

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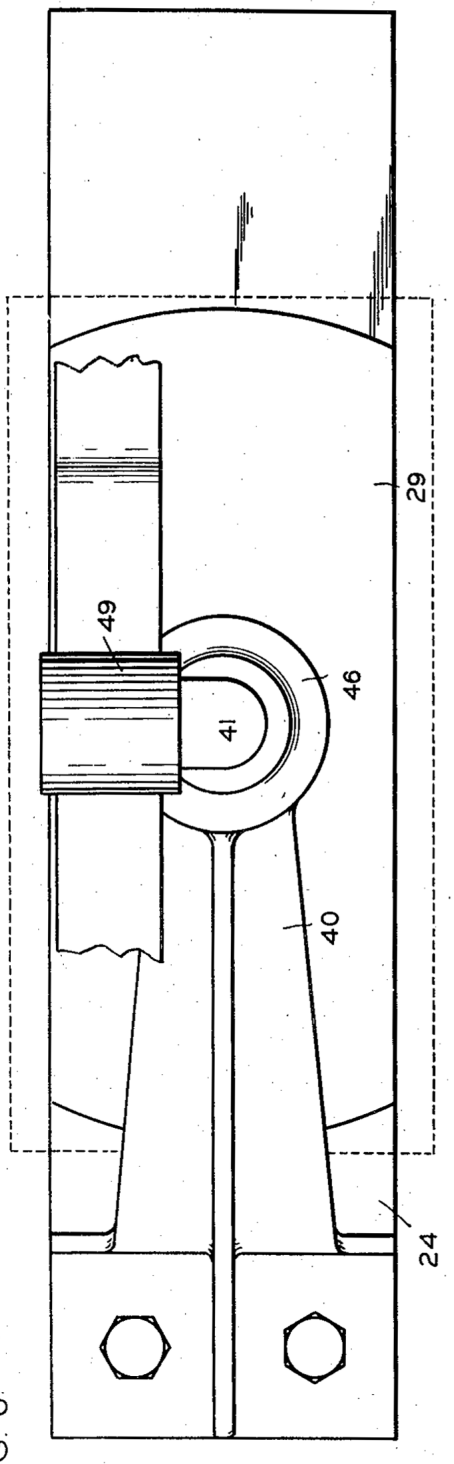

FIG. 6.

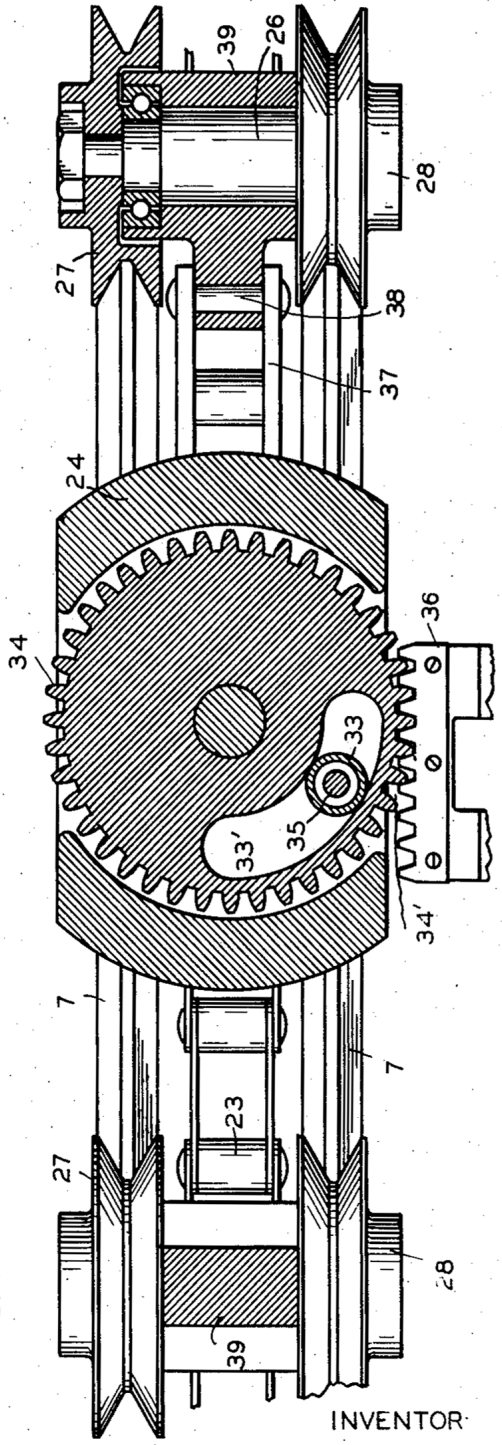

FIG. 7.

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TILE FABRICATING MACHINERY

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FIG. 9

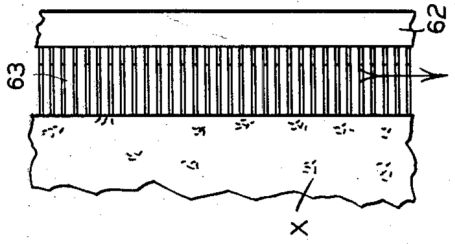


FIG. 10.

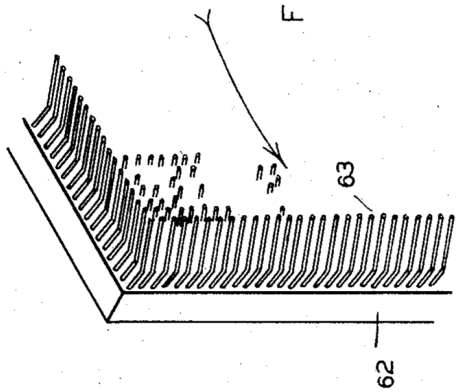
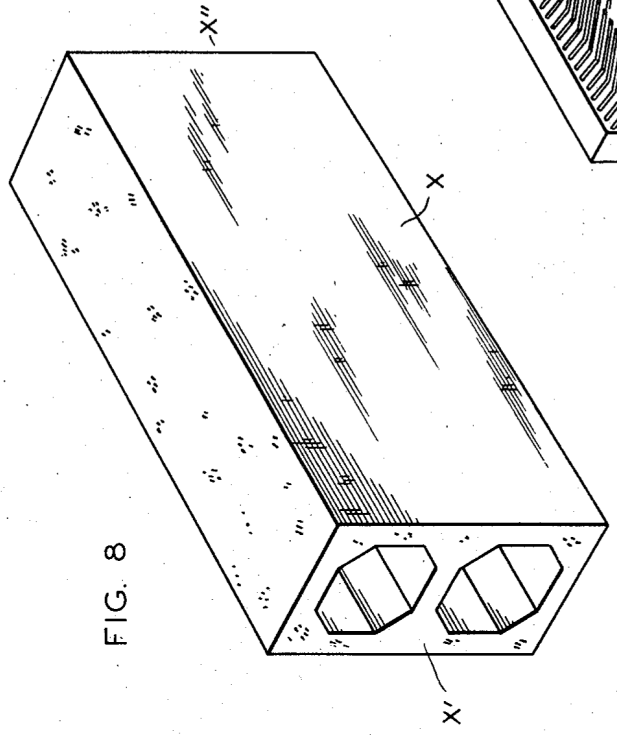


FIG. 8



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TILE FABRICATING MACHINERY

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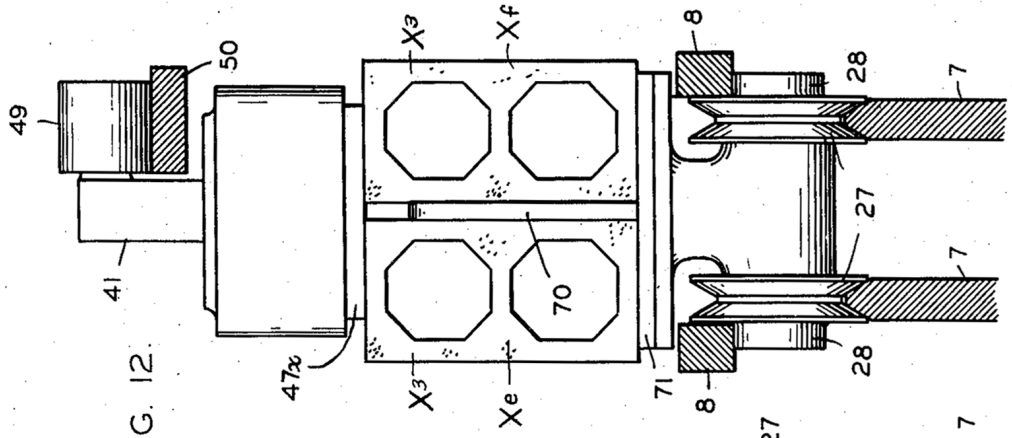

FIG. 12.

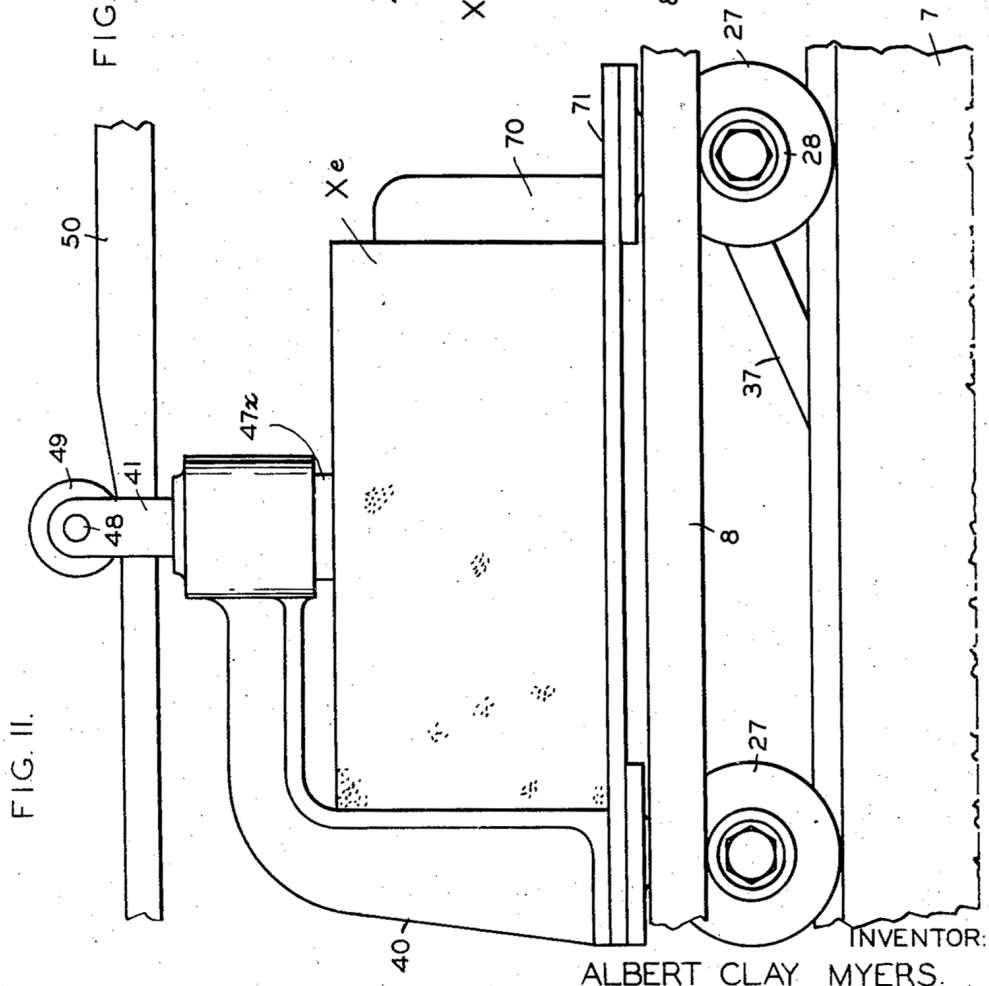

FIG. 11.

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Patented July 25, 1933 1,919,640

UNITED STATES PATENT OFFICE

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TILE FABRICATING MACHINERY

Application filed March 16, 1931. Serial No. 522,955.

This invention relates to improvements in tile fabricating machinery and the method of producing and dressing building tile.

For further particulars see my copending application Serial Number 464,839, filed June 30, 1930, entitled Tile machinery.

Among the objects of the invention is to produce a structural tile unit uniform in three dimensions and suitable as an integer in the construction of building walls.

Another object is to reduce the cost of production by minimizing the loss from breakage, prior to the more expensive firing operation.

A further object is to provide dressing and gaging machinery capable of reducing unfired tile to a standard of accuracy in three dimensions of thickness, height and width, with the minimum of breakage.

Other objects and advantages will appear as the description progresses.

The form of tile illustrated in Fig. 8, to which the present disclosure is particularly adapted, combines hollow tile wall construction with faience tile finish. It is obvious, however, that flat and other forms of tile may be similarly dressed by changes in the form of the machine without departing from the spirit of this invention.

Tile fabricated in accordance with this invention is true to size and shape, will lay perfectly with one-sixteenth inch joint and when pointed up, compares favorably with the finest tile setting. The saving in labor cost and time is obvious. The cost is far less than that of erecting a wall or partition finished with even the cheapest glazed wall tile. It is less than that of finishing an exterior wall, lobby or vestibule with architectural terra cotta, enameled or pressed brick. It is obvious, however, that the success of this combined effect is due to the accurate gaging and squaring of the tile units forming the integers of the wall.

The tile is molded and wire-cut in the usual manner and air dried in ovens. From the ovens the dried tile is subjected to the dressing operation in accordance with this invention, prior to firing the tile.

In this specification and the accompanying drawings the invention is disclosed in its preferred form. But it is to be understood that it is not limited to this form because it may be embodied in other forms. It is also to be understood that in and by the claims following the description it is desired to cover the invention in whatsoever form it may be embodied.

In the six sheets of drawings:

Fig. 1 is a plan view from above of the forward portion of a tile dressing machine constructed in accordance with this invention.

Fig. 2 is a rear elevation of the same.

Fig. 3 is a plan view of the terminal portion of the machine, to be read as a continuation of Fig. 1.

Figs. 1, 2, 3, 4 are viewed from the rear of the machine facing the operator.

Fig. 4 is a side elevation of the same to be read as a continuation of Fig. 2.

Fig. 5 is a side elevation of the turntable carriage for progressively presenting the tile to the successive dressing units.

Fig. 6 is an enlarged fragmentary detail view from above of the upper pivotal clamp of the carriage.

Fig. 7 is a similar view of the lower turntable pivot, below the horizontal sectional line VII—VII, Fig. 5.

Fig. 8 is a perspective view of one form of building tile suitable for fabrication in accordance with this invention.

Fig. 9 is a fragmentary detail in side elevation of the facing for the dressing brushes.

Fig. 10 is a perspective view of the same.

Fig. 11 is a side elevation of a modified form of carriage suitable for dressing the sides of the tile in a subsequent operation.

Fig. 12 is an end elevation of the same.

In detail the construction illustrated in the drawings, referring to Figs. 2–4 comprises: The main frame consisting of the side sills 1—1, the pillars 2—2, 3—3, and 4—4, supporting the laterally spaced, parallel side rails 5—5. The main frame is preferably composed of structural steel shapes properly cross braced to form a supporting structure for the operating parts.

The brackets 6—6 at intervals, are fixed to the rails 5—5 and support the tracks 7—7 and the guard rails 8—8 above, and the guide rails 9—9 below, on opposite sides of the main frame. These latter rails 9—9 are bent into the semi-circular curves 10—10 and 11—11 at the opposite ends of the machine with their interspaced dimension maintained.

The overhead cam rails 12—12′ are arranged above and in spaced relation to the traction rails 7—7. The opposite ends 13–14 of these cams are curved downwardly and laterally at 15–16 and are fixed to the end bolsters 17–18 of the main frame respectively. The inner ends of the cam are fixed to the supports 3–4.

The sprocket wheels 19, 20 are mounted upon their respective shafts 21, 22, journaled in suitable bearings fixed to the supports 2—2 at opposite ends of the main frame. The endless sprocket chain 23, encircles the sprockets 19–20 and travels intermediate the traction rails 7—7 and tracks 9—9.

Referring to Fig. 5, the tile carriage comprises a suitable chassis 24 having journals for the transverse axles 25–26, with the traction wheels 27—27. These wheels have grooved treads to fit the beveled tops of the traction rails 7—7. The wheels 27—27 also have the extended hubs 28, of reduced diameter to travel freely between the vertically alined guide rails 9—9, to suspend the carriage in its return travel and around the bends 10—10 at opposite ends of the main frame. These guide rails 9—9 are offset laterally to the traction rails 7—7 to clear the sides of the wheels 27.

The turntable 29, on top of the chassis 24, overhangs the rails 7—7 and 8—8. This turntable has the central hub 30 counterbored to receive the annular antifriction bearing 31. This bearing rests within a recess formed in the chassis 24. The turntable is held in assembly by the screw 32 threaded into the hub 30, with its head bearing under the chassis.

The gear 34 is cut in the periphery of the hub 30. The teeth of the gear extend laterally at 34′ beyond the edge of the chassis bed into the path of the rack 36 fixed to the inner side of the adjacent rail 8. This rack is properly located and of a length to time the rotation of the turntable 90° after passing the first dressing operation, see Fig. 7.

A rack similar to 36 may be provided to restore the turntable to normal position after the carriage passes the second dressing operation.

The bushing 33 is fixed in the bed of the chassis and extends into the quadrant slot 33′ and serves as a stop to limit the rotary movement of the turntable 29. The pin 35 passes through the interior of the bushing 33 and is pressed upward by the encircling compression spring 35′. The holes 35″—35″ are drilled at each end of the slot 33′. The end of the pin 35 is adapted to frictionally engage these holes 35″ to prevent rebound of the turntable as the gear 34 disengages from the rack 36.

The carriage is provided with a spring tile clamp, see Fig. 5. This clamp comprises the overhanging arm 40 bolted to the chassis 24 and overhanging the pivotal center of the turntable. This arm is recessed to guide the stem 41 and encloses the spring 42. The swivel head 43 is attached to the end of the stem by the shouldered screw 44. The antifriction bearing 45 is interposed between the swivel head and the end of the stem. The spring 42 expands between the cap 46 of the recess and the swivel head to force the latter down against the tile X. The swivel head can be provided with the rubber facing 47 to prevent injury to or slipping of the tile X.

The upper end of the stem 41, see Fig. 5, is provided with the laterally projecting stud 48, upon which the roller 49 is mounted. This roller engages the top of the cam rail 12 at the offset 15 and rides up the inclined cam 50, which lifts the clamp 40 for a period sufficient to permit the insertion of the title X upon the turntable 29, before the roller 49 descends from the cam at 51. When the roller leaves the cam 50, the full expansion of the spring 42 is exterted against the title X to hold it in position on the turntable 29.

To aid in centering the title X on the turntable, the bell crank gage 52 is pivoted at 53 on the arm 40. The counter weight 54 throws the gauge up into the inoperative position shown in dotted lines in Fig. 5, when the gage is released by the operator placing the tile. It is necessary to remove the gage beyond the corner of the tile while the turntable is revolving.

The carriage is pulled forward by the drag link 37, see Fig. 5, pivoted at 38 to the journal bearing 39. The lower end of the drag link 37 is properly pivoted to the sprocket chain 23 of the conveyor.

This sprocket chain is driven by the sprocket 19 on the shaft 21, see Fig. 3. This shaft is driven by the train of reduction gears and pinions 55, 56, 57, 58, the pulley 60 and the belt 61, from any prime mover, not shown.

The tile dressing "brush" consists of a surface composed of carding strips, see Figs. 9, 10. These strips 62, of heavy fabric, form a base through which the stiff wire "bristles" 63 protrude. These strips are cut into tapered segments and fixed to the face of a flat disc. The bristles 63 are thus applied to the tile across the length of the strips, not lengthwise as in carding cotton. The effect is to scratch off the excess width of

the tile, which is dissipated in the form of dust. This scratching operation is not to be confused with grinding tile after it is fired. The scratching operation can be performed with little or no breakage, whereas grinding is a more costly operation in itself and is accompanied by a prohibitive degree of breakage of the more valuable fired tile.

The dressing units consist of the disc 64 fixed upon the end of an adjustable shaft 65, mounted in suitable bearings 66—66. These bearings are fixed to the base 67 slidable in the guide 68, fixed to a bracket on the support 4, see Figs. 1–2. A screw spindle is swiveled in the guide 68 and threaded through a lug on the base 67. This spindle is manually operated by the hand wheel 69 on the spindle to advance or retract the base 67. A similar unit 64*a* is mounted in opposed relation on the opposite support 4 so that the opposed discs 64—64*a* operate simultaneously on opposite sides of the tile X*b* passing therebetween.

The discs 64, 64*a*, 64*b*, 64*c* are driven by the pulleys 72—72 mounted on the shafts 66. The belts 73 encircle the pulleys 72 and are driven from a suitable prime mover (not shown.)

This invention operates substantially as follows: Referring to Figs. 2, 5, the operator lifts the weight 54 which swings the centering gage 52 into position. He then places the tile X upon the turntable 29, beneath the clamp 47, which is elevated by the cam 50. The lifting action of this cam 50, lifts the hubs 28—28 up against the rails 8—8, opening the clamp. When the roller 49 passes off the end of the cam at 51 the clamp descends upon the tile X*a*, with all the tension of the spring 42. The tile securely clamped to the carriage is passed between the scratch brush discs 64—64*a*, see X*b*, Fig. 2. This dressing removes the surplus and reduces the height of the tile, see Fig. 8, to the adjusted distance between the discs 64—64a, see Fig. 1.

The carriage moves forward until the gear 35 engages the rack 36 which swings the turntable 29, ninety degrees, to present the tile crosswise between the scratch brush discs 64*b*, 64*c*, which remove the surplus from the ends X′—X″ of the tile.

The continued progress of the carriage, see Fig. 3, 4, releases the clamp when the roller 49 rides up the cam 50*a*, permitting the tile to be removed by the operator. The carriage then descends between the curves 10—10 to repeat the operation continuously.

The tile thus dressed to two exact dimensions, the height and width are transferred to a similar machine, except that the turntable is not required on the carriage. The carriage is modified as shown in Fig. 11. The longitudinal upright plate 70 is fixed in the center of the table 71. Two tiles X*e*, X*f* are placed upright on the table 71 and clamped by the clamp 47*x*, similar to the clamping mechanism described in the previous carriage. The carriage then passes between two disc scratch brushes similar to 64—64*a* which remove the surplus from one of the sides X3, of each of the tiles X*e*, X*f*. After this dressing the clamp is released by a suitably placed cam like 50. The operator then reverses the tiles X*e*, X*f*, on the table 71 to present the opposite sides of each tile. The carriage then passes between another opposed pair of disc scratch brushes which are set to remove the surplus to reduce the pair of tile to the standard thickness. This completes the operation of dressing the three dimensions of the tile to a fixed standard.

After the dressing of the tile is completed it may be glazed and otherwise treated and fired in the usual manner.

Having thus described this invention what I claim and desire to secure by Letters Patent is:

1. A tile machine including a conveyor; a tile carrier on said conveyor; and a scratching element located laterally to said carrier.

2. A tile machine including a conveyor; a tile carrier on said conveyor; means for turning the tile on said carrier; and tile dressing means arranged in the path of said tile.

3. A tile machine including a conveyor; a tile carrier on said conveyor; a turntable and a clamp on said carrier; means for automatically operating said clamp and turntable and dressing means arranged in the path of said tile.

4. A tile machine including a conveyor; a tile carrier on said conveyor; a turntable and a clamp on said carrier; clamp operating means in the path of said clamps; turntable operating means in the path of said carrier; and tile dressing means arranged laterally to said carrier.

5. A tile machine including a conveyor; a tile carrier on said conveyor; a tile clamp on said carrier; a turntable pivoted on said carrier; means for operating said turntable and said clamp at predetermined points respectively, in the travel of said carrier.

6. A tile machine including a conveyor; a tile carrier on said conveyor; a tile clamp on said carrier; a gear driven turntable pivoted on said carrier; a rack and a cam fixed in the paths of said gear and clamp respectively; and rotary scratch brushes arranged in the path of said tile.

7. A tile machine including a continuous conveyor; upper and lower spaced tracks; a carrier having wheels operating between said tracks; a cam above said tracks; a tile clamp on said carrier cooperating with said clamp; and scratch brushes arranged in the path of said tile.

8. A tile machine including a tile carrier adapted to move in a fixed path; and a driven scratching element located adjacent said carrier and consisting of carding brushes having relatively short stiff wire bristles adapted to remove the excess material to size said tile.

9. A tile machine including a tile carrier adapted to move in a fixed path, a driven scratching element located in juxtaposition to one of the surfaces of the tile on said carrier and consisting of conventional carding brushes adapted to reduce the dimensions of said tile; and means for actuating said carrier and scratching element.

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