Oct. 7, 1930. R. GRETSCHEL 1,777,917

ROOFING TILE MACHINE

Filed April 15, 1927 3 Sheets-Sheet 1

Fig. 1.

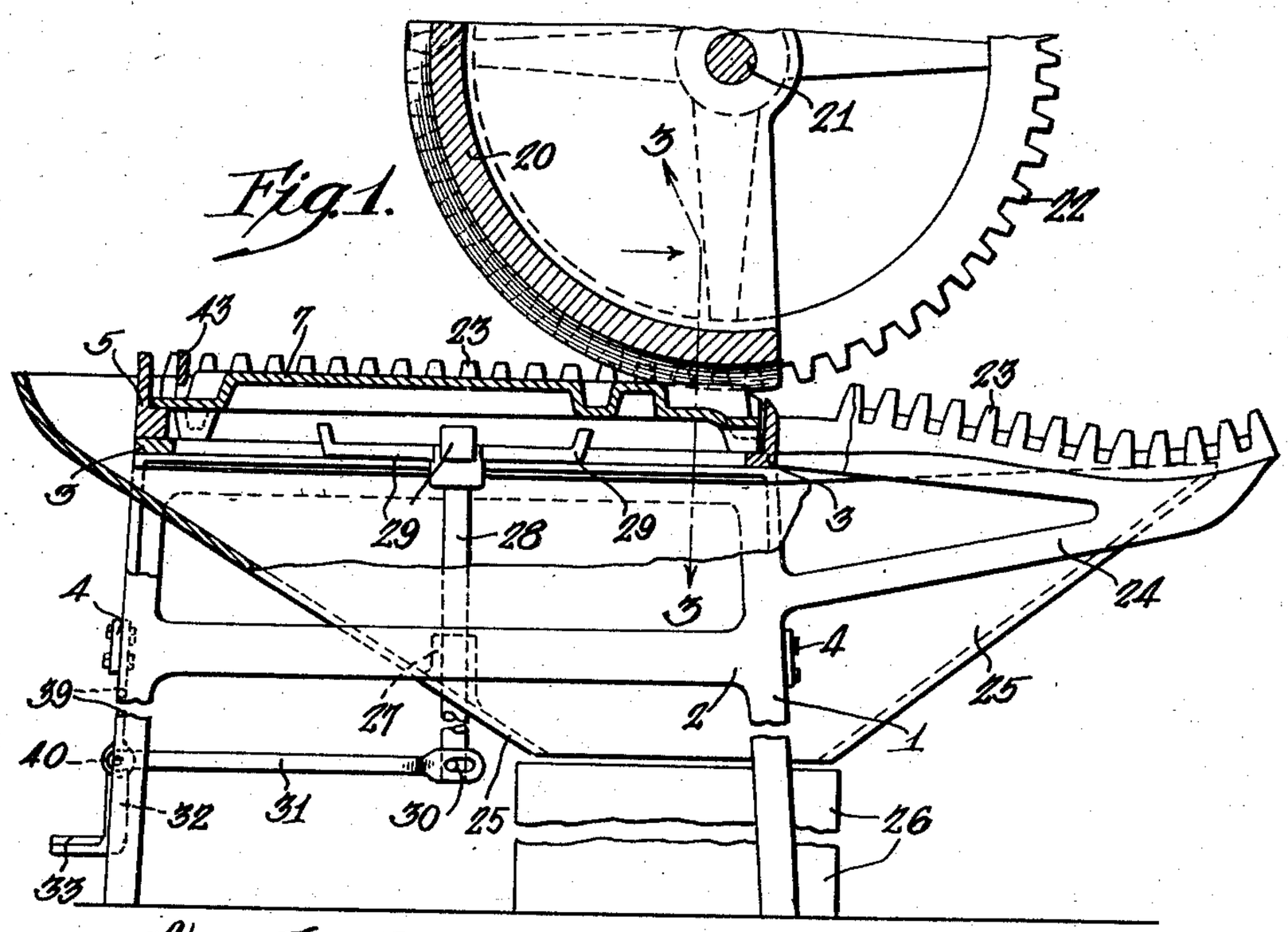

Fig. 2.

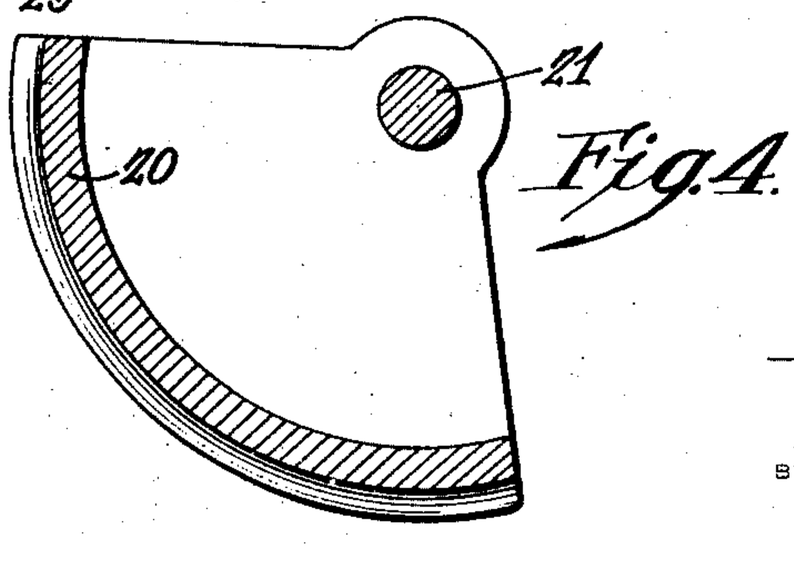

Fig. 4.

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ROOFING TILE MACHINE

Filed April 15, 1927 3 Sheets-Sheet 2

Fig.3.

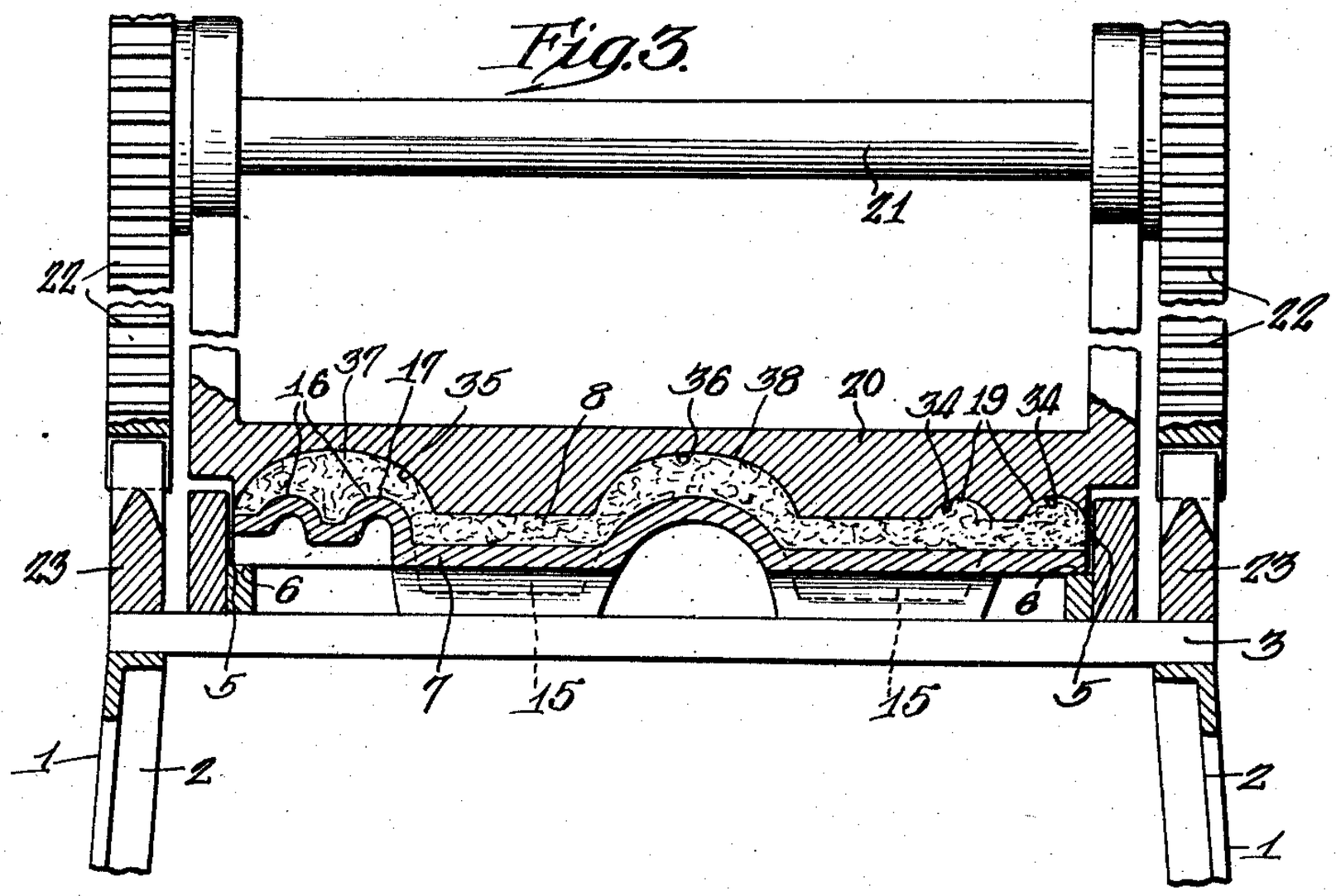

Fig.5.

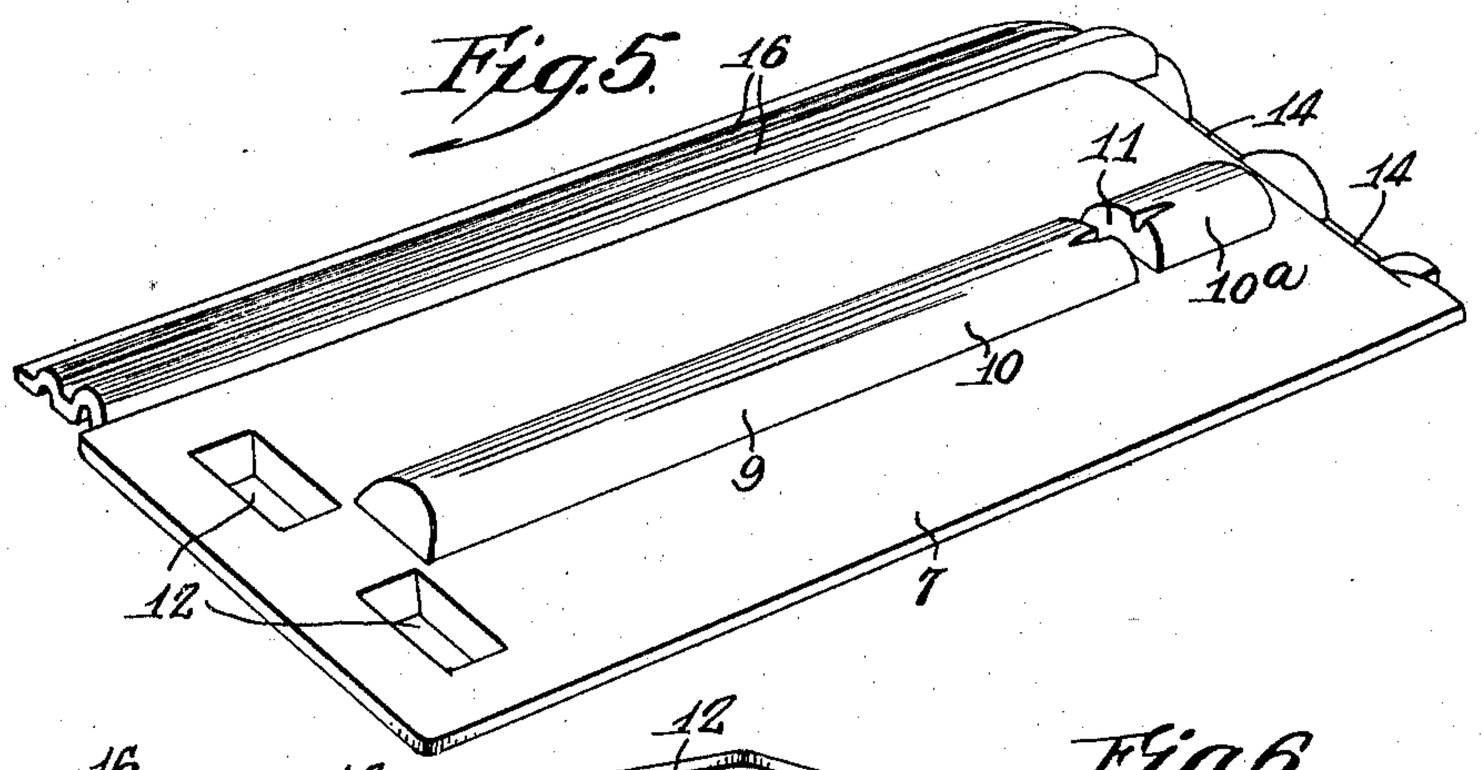

Fig.6.

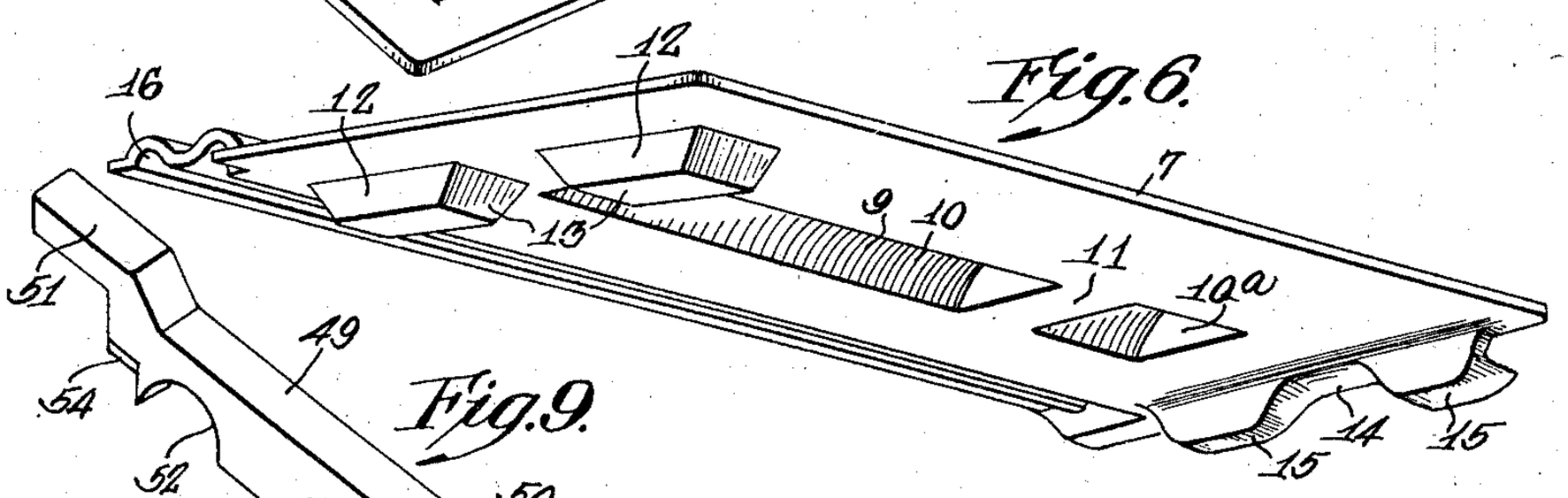

Fig.9.

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ROOFING TILE MACHINE

Filed April 15, 1927 3 Sheets-Sheet 3

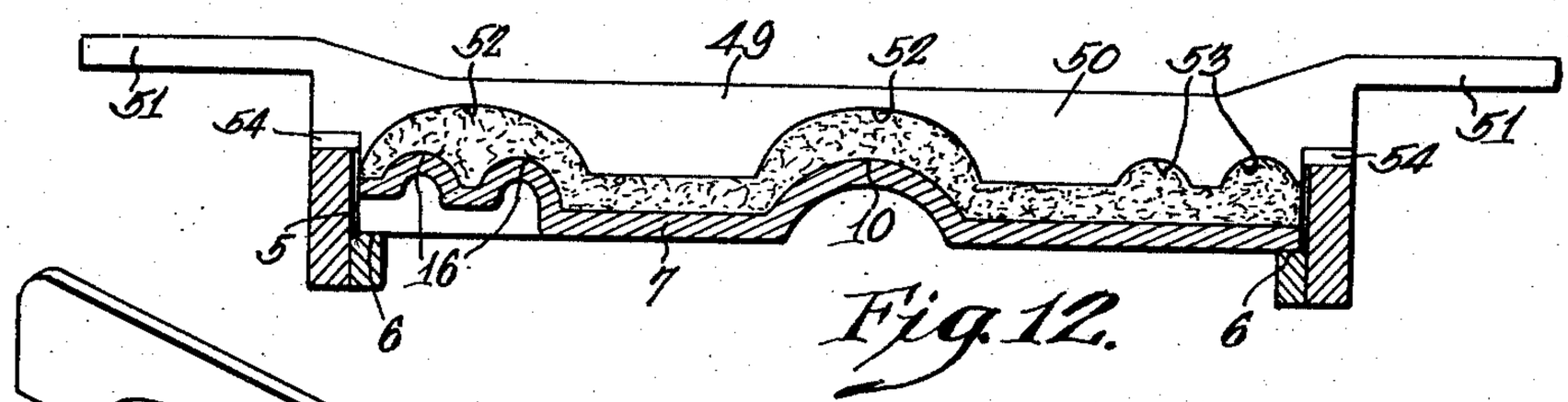


Fig. 12.

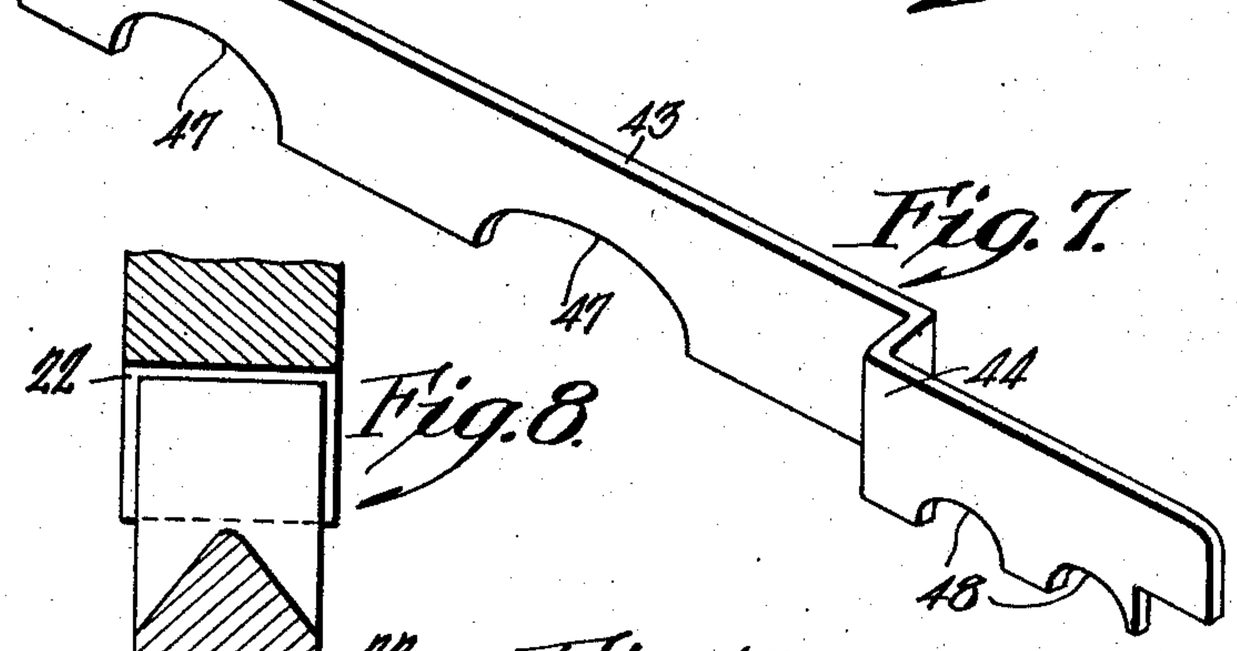


Fig. 7.

Fig. 8.

Fig. 10.

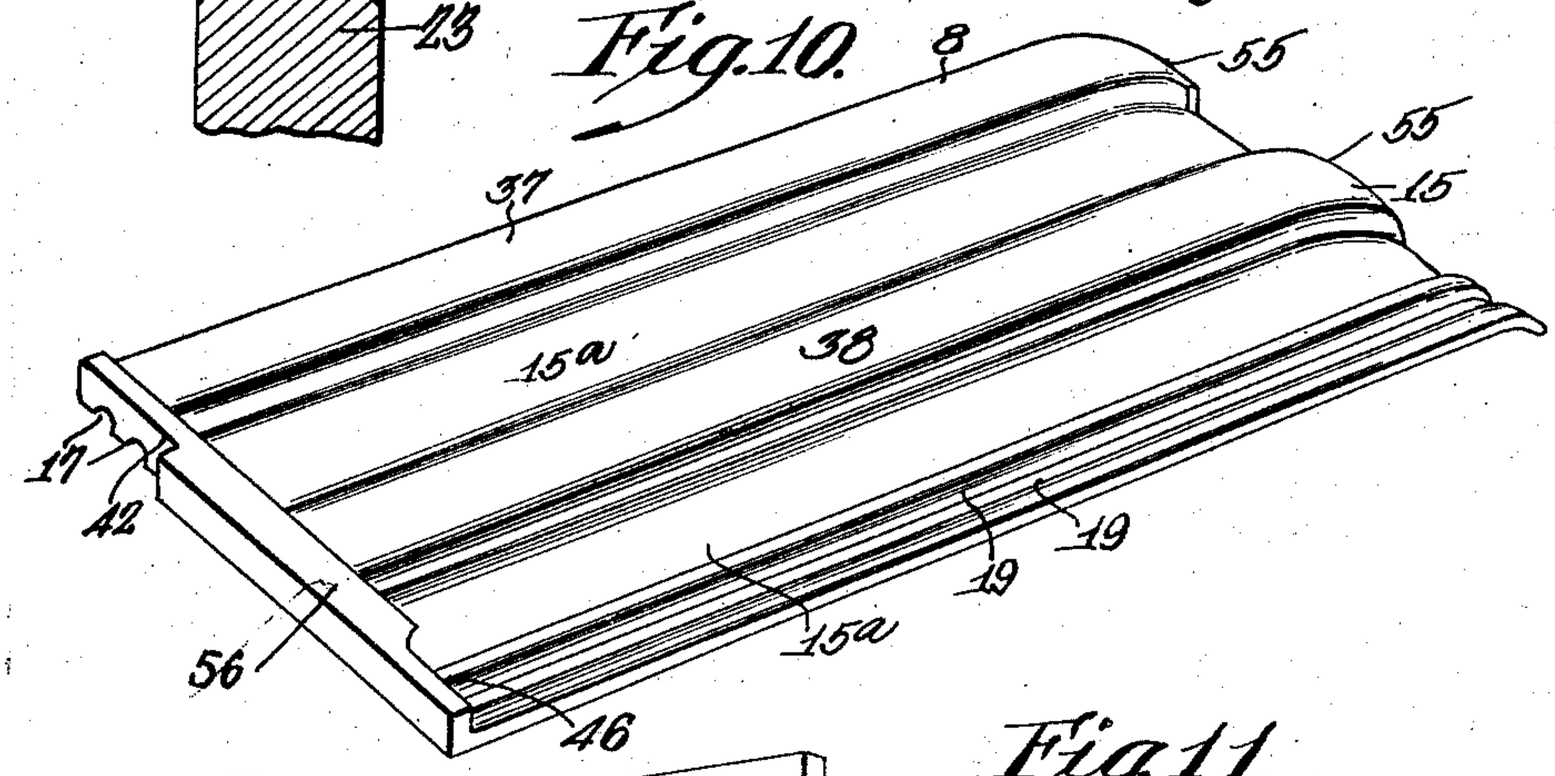
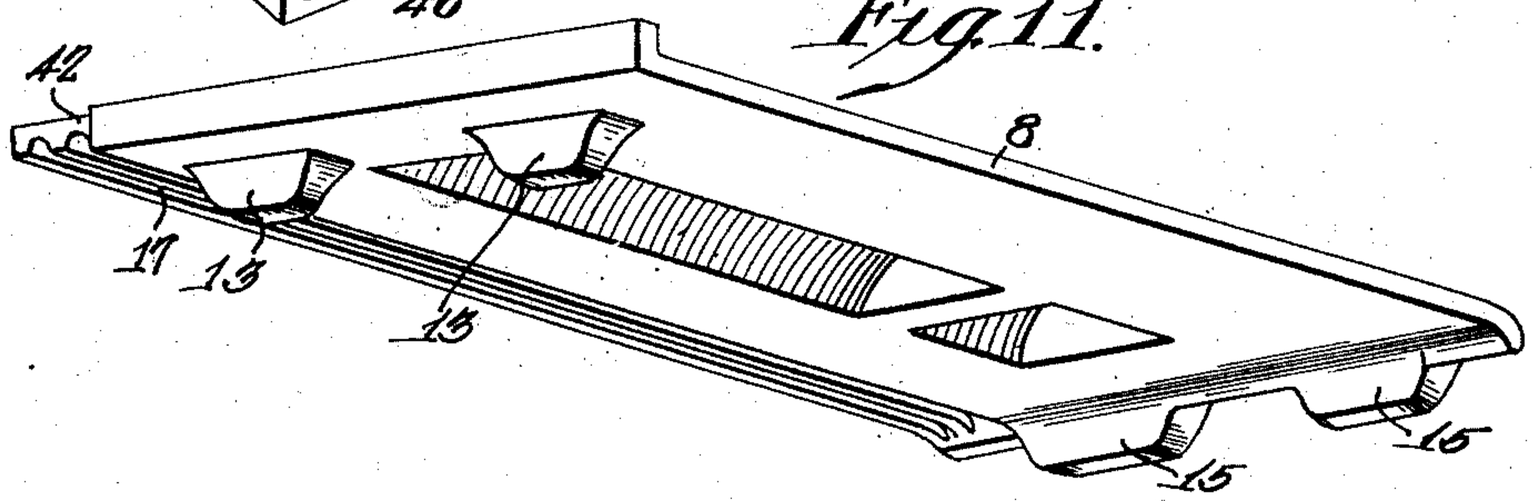


Fig. 11.



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UNITED STATES PATENT OFFICE

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ROOFING-TILE MACHINE

Application filed April 15, 1927. Serial No. 184,144.

The present invention relates to an improved roofing tile machine and method for marking tiles, and the purpose of the invention is to provide such improvements as will not only simplify the construction and arrangement of such machines, but will facilitate the process of making tiles and more readily coloring them.

Heretofore tiles, building blocks, and similar articles of manufacture have been made by a pressing or tamping process, which is more or less tedious, and very unsatisfactory owing to necessitating too much care in evenly distributing the plastic material in the molds. Tiles made in this way are thicker at certain portions than at others and are consequently heavier at the thicker portions, thereby preventing the tiles from being evenly and accurately laid in order to properly fit, especially as the tiles are required to be disposed to break joints.

It is, therefore, the purpose of the present invention to provide a machine including means for first rolling the tile, subsequently to initially spreading the plastic material on the pallet by hand, and then trowelling the surface of the tile, to more evenly distribute the plastic material and to smooth off the upper surface, the trowel step also being used for spreading or distributing the surface coloring for the tile.

Another purpose is to provide the tile rolling device with a shoe, which forms a desired configuration on the upper surface of the tile and also suitable locking ribs adjacent one side of the tile, with which locking grooves on the under face of an adjacent tile may interengage, whereby the tiles for a roof may be laid in sequence, one row breaking joints with an adjacent row.

Practical tests and actual reduction to practice has disclosed the fact that a rolling and trowelling process for making tiles is an advance over the tamping or packing process, that is where a plunger is used for packing the material into a mold.

Still another purpose is to provide means to prevent lateral movement of the rolling device, which is operatively mounted on the frame of the machine through the medium of racks and gears, the inter-engagement of the latter causing the rolling device to retain its position over the tile forming pallet, the racks and gears including means to prevent the plastic material from filling up the spaces between the teeth of the racks and the teeth of the gears.

A further purpose is to provide means on the pallet for forming inter-locking connections between the ends of the tiles, that is inter-locking the tiles of one row to the ends of the tiles of an adjacent row in laying a tile roof, the inter-locking connections being so arranged as to permit the tiles to break joints.

A still further purpose is to provide a device for spanning one end of the tile former, for constructing on the upper face of the tile at one end means to insure the inter-locking connections between the ends of the tiles of one row with the ends of the tiles of an adjacent row.

Furthermore, the invention includes means manually actuated for raising the pallet with the tile thereon above the surface of the tile former, whereby the pallet with the tile thereon may be removed in order that it may be arranged on drying racks, the tile to thoroughly dry and season. Obviously the longer the tile dries the more thorough the tile seasons.

The invention also embodies means for supporting the rolling device when not in use, there being a chute or hopper below the upper part of the frame of the machine to receive the overflow of plastic material and carry it to a receptacle, from which it may be removed and reagitated and mixed with other plastic material, thereby avoiding any waste.

It is to be understood that the particulars herein given are in no way limitive and that while still keeping within the scope of the invention, any desired modification of details and proportions may be made in the construction of the device according to circumstances.

The invention comprises further features and combinations of parts to be hereinafter set forth, shown in the drawings and claimed.

In the drawings:

Figure 1 is a view in side elevation of the improved roofing tile machine constructed in accordance with the invention, and showing the rolling device in position ready to roll tile.

Figure 2 is a plan view of the machine, also showing a trowel disposed transversely of the tile former or box, to show how the trowel is used.

Figure 3 is a transverse sectional view on line 3—3 of Figure 1.

Figure 4 is a transverse sectional view of the shoe of the rolling device.

Figure 5 is a detail perspective view of the pallet showing the upper face thereof.

Figure 6 is a detail perspective view of the pallet showing the under face thereof.

Figure 7 is a detail perspective view of a knife to be disposed transversely of one end of the tile former, to assist in forming parts of inter-connections between the ends of the tiles.

Figure 8 is an enlarged detailed sectional view showing the construction of the gear teeth of the rack and the gears of the rolling device.

Figure 9 is a detail perspective view of the trowel.

Figure 10 is a detail perspective view of a tile, showing the upper face thereof.

Figure 11 is a detail perspective of a tile showing its under face.

Figure 12 is a sectional view in detail showing the use of the trowel.

Referring to the drawings:

1 identifies a frame, which comprises two side sections, 2, identically constructed. These side sections are each cast in one piece. The legs and the upper bars of these side castings or sections are angular in cross-section. The side castings or sections are connected by upper cross-bars, 3, and by lower end bars, 4.

This frame supports a tile former or box 5, which is open top and bottom, and arranged on the interior of this former or box is a pallet supporting ledge 6, and as shown clearly in Figure 3 a pallet 7 rests upon the ledge, the plastic material to be rolled out on the pallet to form a tile 8, the pallet on its upper face is provided with a longitudinal rib 9 semi-circular in cross-section, and this rib consists of two parts 10 and 10ª, which are spaced as at 11.

Also formed in the upper face of the pallet adjacent one end thereof are two cavities 12 to receive plastic material to form lugs 13 on the under face of the tile at one end, the lugs 13 to assist in holding the tiles in position when laid to form a roof.

The other end of the pallet on its upper face also has recesses or cut-away portions 14 to form lugs 15 on the end face of the tile to engage longitudinal grooves 15ª on upper face of the tiles of an adjoining row.

The pallet on its upper face adjacent one of its longitudinal edges is formed with ribs 16, which when the plastic material such as cement or the like is spread upon the pallet form grooves 17 in the end face of the tile, to lock in engagement with ribs 19 formed on the upper face of the tile adjacent the opposite edge. The ribs 19 are constructed on the upper face of the tile through the medium of an oscillating shoe 20, which has a rolling action over the surface of the plastic material. The shoe is constructed segmental in cross-section and is operatively suspended from an axle or shaft 21.

Suitable gears 22 move with the shaft 21 and with the shoe. These gears 22 co-operatively engage with racks 23, which are mounted upon the upper part of the frame 1. The teeth of the racks 23 are of substantial pitch, and their crotches, that is between the teeth, are V-shaped, the purpose being to permit the plastic material to be discharged from between the teeth as the gears 22 engage therewith. Heretofore it has been found that the plastic material collects between the teeth and prevents the gears of the rolling device from accurately and properly engaging with the racks, it being possible for the rolling device to not only disengage from the racks but also raise, and thereby prevent the plastic material from being evenly distributed in the forming box and upon the pallet. The teeth of the gears are made to discharge the material from between the teeth of the racks, to further insure accuracy of engagement of the teeth of the gears with those of the racks.

The side castings or sections of the frame have rear extensions 24, which also support certain ends of the racks to permit the rolling device to be moved rearwardly out of the way and enabling the pallet and tile to be raised out of the tile forming box.

Extending below the frame of the machine is a chute 25 which is long enough and wide enough to catch the overflow of plastic material, there being a receptacle 26 below the discharge end of the chute to receive the overflow of plastic material, allowing it to be returned to and through the chute or be more thoroughly mixed with other plastic material to be consumed therewith and thereby reducing waste to a minimum.

A portion of the chute 25 has a bearing 27 through which a plunger or shaft 28 operatively engages. The shaft or plunger 28 operatively supports a spider 29, which when the pallet is receiving the plastic material assists in operatively supporting the pallet. The lower end of the shaft or plunger 28 has a slot and pin connection 30 with a long arm 31 of an angle lever 32. The short arm of the lever 32 terminates in a foot pedal 33, with which the foot of an operator may engage for tilting the lever and moving the shaft or plunger 28 longitudinally through

the bearing 27 and thereby elevating the spider 29. When the shaft or plunger 28 is so moved, the spider engages under the pallet, raises the pallet bodily and with it the tile. The pallet with the moist tile thereon may be removed from the spider and disposed in drying frames, where a uniform temperature of heat acts to thoroughly season and dry the tile.

The rolling device as previously stated is segmental in cross-section, the arcuate face of the shoe of the rolling device being of sufficient area that when the device is moved from the position shown in Figure 1 to the front end of the machine, the full area of the shoe will roll over the entire surface of the plastic material in one operation, that is when the device is moved toward the operator and then back again to the rear end of the frame where the rolling device is supported, until it is desired to form another tile.

The face of the shoe near one end has grooves 34 for forming the ribs 19, while the other end of the face of the shoe and its intermediate portion is provided with relatively wide grooves 35 and 36, which form longitudinal ribs 37 and 38 on the upper face of the tile, the relatively wide rib 37 being adjacent one edge of the tile, while the rib 38 being substantially centrally of the tile.

The teeth of the gears 22 are formed correspondingly to the teeth of the racks so as to prevent lateral movement of the rolling device.

The arm 39 depends from one of the transverse bars 4 of the frame, and pivotally supports the lever 32 as at 40.

At one end of the former or box, in which the tile is formed and which receives the pallet is an offset shoulder 41, which forms an angular recess 42 in one end of the tile.

As shown in Figure 7 a relatively thin knife 43 is provided and near one end thereof an angular offset or shoulder 44 is formed. The opposite sides of the former or box of the tile machine have notches 45 and 45[a], which receive the opposite ends of the knife 43, shown clearly in Figure 2 of the drawings, when the knife is disposed transversely of the former or box. Obviously when the knife is in position as in Figure 2 its offset or shoulder 44 forms an angular recess 46 in one end of the tile adjacent certain ends of the ribs 19.

The knife 43 has its lower edge formed with recesses or notches 47 and notches 48. Notches 47 act to more accurately smooth the upper faces of the ribs 38, while the notches 48 act to smooth off the grooves 19, provided the knife is moved along the face of the tile. However, the knife subsequently remains in engagement with the notches 45 and 45[b].

Disclosed in Figure 9 is a trowel 49 comprising a body 50 and the extending handles 51. The end face of the body 50 of the trowel has grooves or notches 52, and adjacent one end of the trowel are grooves or notches 53. Also adjacent the handles 51 of the trowel are shoulders 54 which ride upon the longitudinal sides of the box or former, when the trowel is moved backward and forward over the former or box. The purpose of the trowel is to smooth off the upper face of the tile after the roller has evenly distributed the plastic material in the former or box. To operate the trowel the operator grasps the two handles 51, holding the trowel accurately in position and thereby moving it longitudinally of the box or former. When the trowel is moved toward the rear end of the box or former the operator curves or moves it downwardly to form a rounding surface 55 at one end of the tile, to insure a particular design or configuration to the tile.

The rib 8 of the pallet forms hollows longitudinally of the tile while the cavities 12 form lugs 13 on the end face of the tile.

In the operation, a pallet is disposed in the former or box in a position to rest upon the ledge 6, and then a suitable plastic material such as concrete, cement or the like, is distributed over the surface of the pallet by hand.

The rolling device is then moved from the rear end of the machine, that is the end where the rolling device is supported when not in use, to a position indicated in Figure 1, the segmental shoe being so positioned that when the rolling device is moved toward the operator the face of the shoe will act to spread the plastic material more evenly over the pallet, the face of the shoe forming the grooves 19 and the ribs 37 and 38. The knife 43 is then placed in position to engage the notches 45 and 45[a]. A thin bladed knife is then used by the operator to spread the plastic material between the knife 43 and the front end of the former or box, thereby constructing the transverse rib 56 at one end of the tile, the rib having the angular recesses 42 and 46. The trowel 49 is then placed in position as indicated in Figure 2, and it is moved longitudinally of the face of the plastic material, more thoroughly smoothing it off, more evenly distributing the particles of plastic material, and as the trowel is moved toward the rear end of the tile, the trowel is given an arcuate movement downwardly, so as to impart to one end of the tile a curved design or configuration. When the trowel is so operated the rolling device is moved to a position at the rear end of the frame, that is supported by the extension 24. In case the tile is to be colored, a suitable coloring matter or liquid of the proper consistency is poured on the centre of the tile, and then the trowel is again passed two or three times over the face of the tile, spreading the coloring mater over he entire face. The coloring matter will easily spread and run as the trowel is moved back and forth. Such action of the trowel will

further act to spread and more thoroughly compact the plastic material. After so coloring the tile the operator may apply foot pressure on the pedal 33, tilting the lever 32, imparting an upward movement to the plunger or shaft 28, causing the spider to engage under the pallet and lift up sufficiently above the marginal edge of the former or box, whereby the operator by hand may remove the pallet and the tile thereon, and place the pallet in a drying frame, allowing the tile to readily dry and sufficiently season.

The invention having been set forth, what is claimed is:

In a roofing tile machine, the combination with a frame having side and end rabbeted flanges at the top of the frame including a tile forming pallet in the rabbets of the flanges, said frame having a rear end extension, the tops of the sides of the frame having racks adjacent the flanges, the rear end extension having racks in a line with and spaced from the first racks, of an oscillating segment shoe, a pair of gears riding on the first racks and having a shaft connecting the gears, the shaft carrying the oscillating shoe, which is formed on its curved face to cooperate with the pallet to form a tile as the shoe oscillates over the pallet, the arcuate end edges of the shoe being riveted or recessed to receive the side flanges of the frame to prevent endwise movement of the shoe and the pair of gears, the crotches between the teeth of the racks being V-shaped to prevent clogging between the gears and the racks, the racks of the rear extension being curved to conform with the gears to prevent the gears from rolling off when the shoe is oscillated from over the pallet, and means to elevate the pallet for permitting its removal with the tile thereon, the side flanges at the top of the frame acting as guides for a trowel which moves over and forms the face of the tile, and a trough between the sides of the frame and the sides of the rear extension, said trough extending forwardly beyond the pallet and rearwardly to the extreme end of the rear extension frame to insure catching the surplus plastic material.

In testimony whereof I affix my signature hereto.

RUDOLPH GRETSCHEL.