

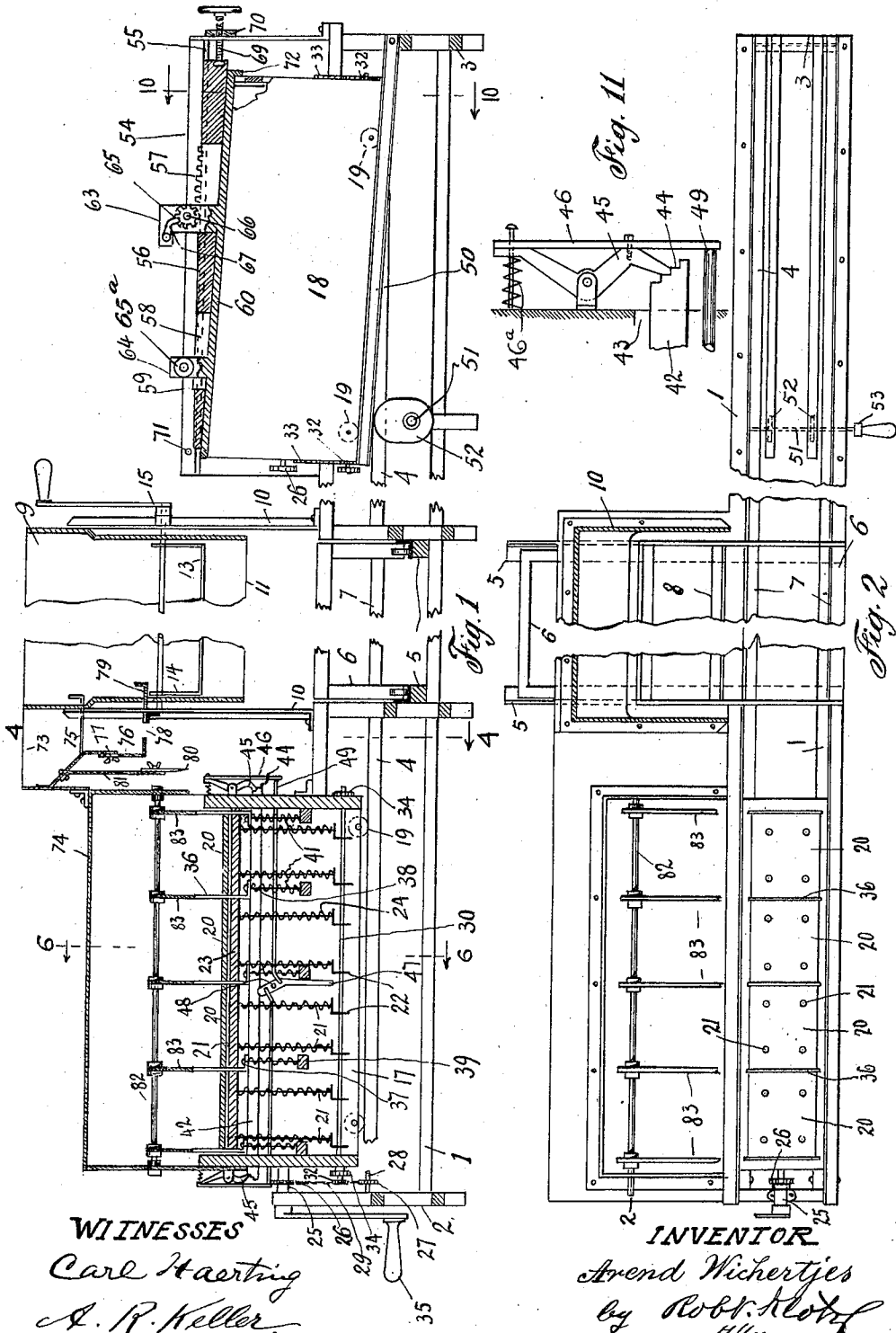
A. WICHERTJES.
TILE MACHINE.

APPLICATION FILED JAN. 3, 1911.

1,000,469.

Patented Aug. 15, 1911.

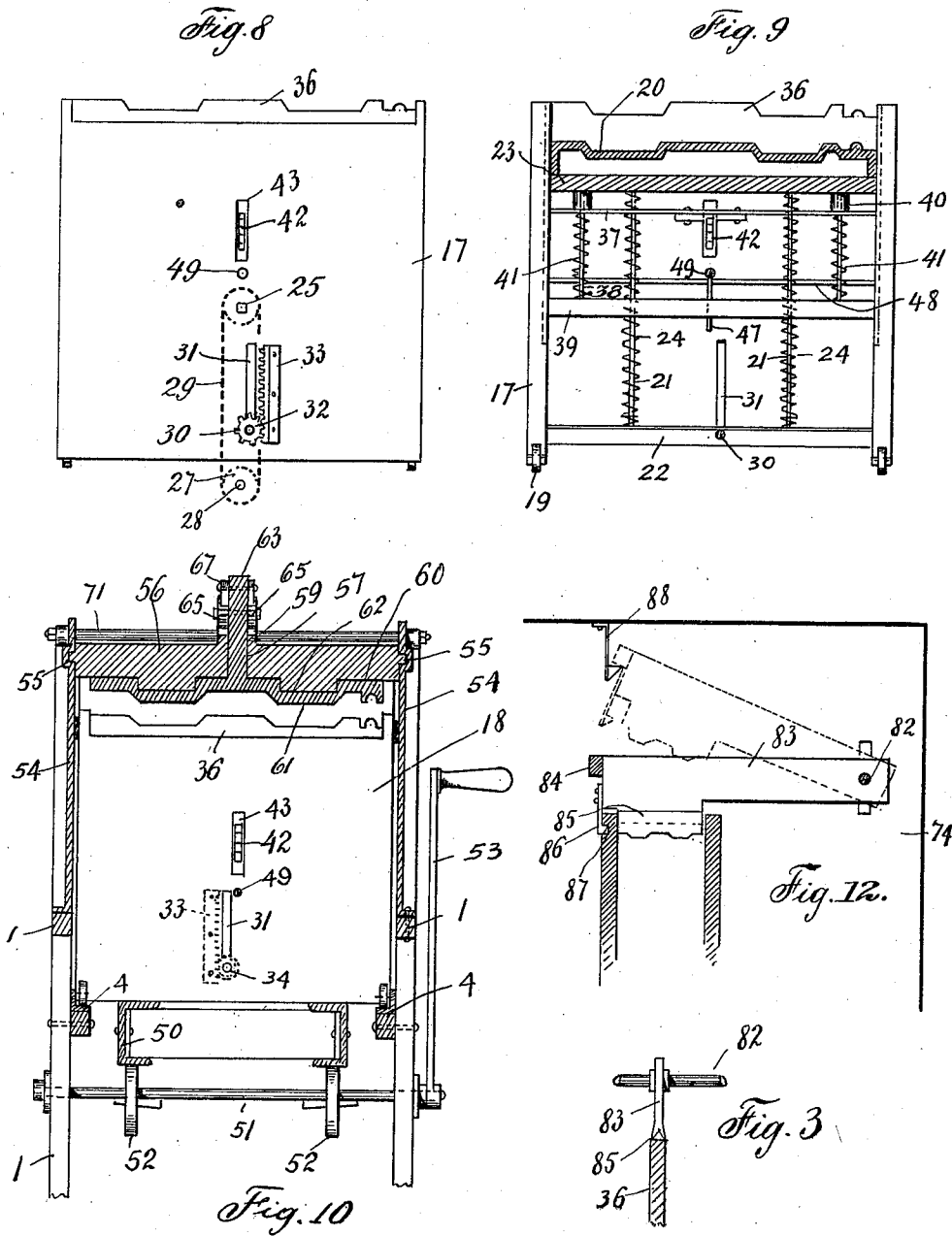
3 SHEETS—SHEET 1.



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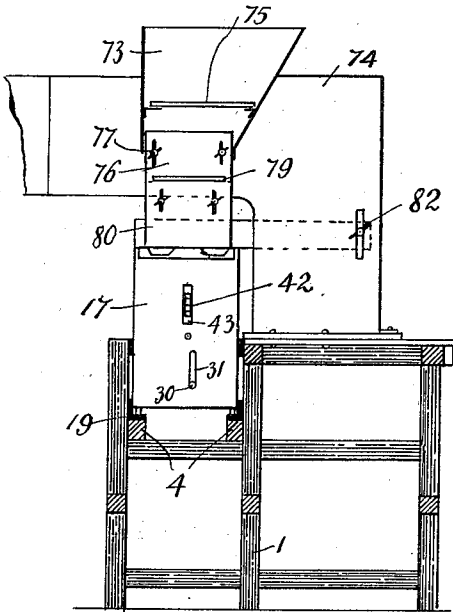


Fig. 4

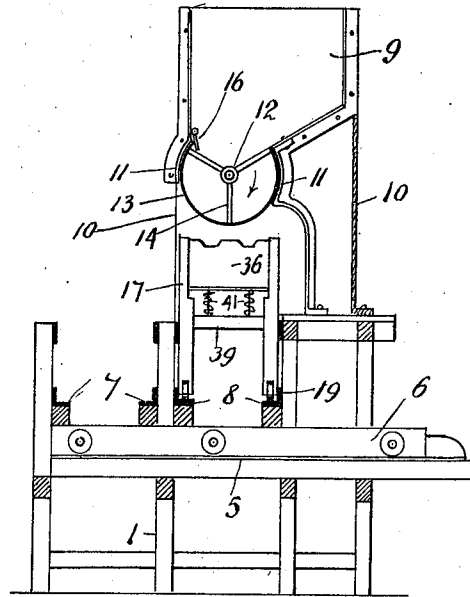


Fig. 5

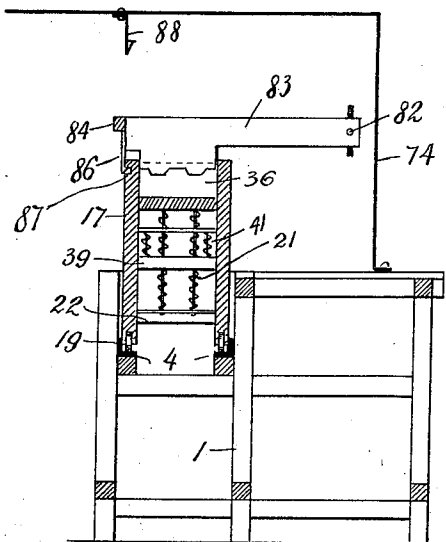


Fig. 6

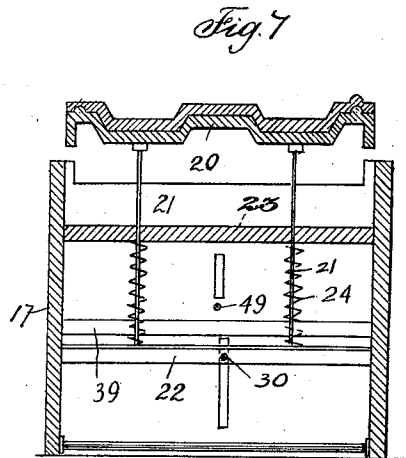


Fig. 7

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TILE-MACHINE.

1,000,469.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed January 3, 1911. Serial No. 600,456.

To all whom it may concern:

Be it known that I, AREND WICHERTJES, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Tile-Machines, of which the following is a complete specification.

The main objects of this invention are to provide an improved tile machine of great efficiency; to provide a tile machine in which the molds may be quickly filled with tile material and having means for accurately measuring the material before delivering it to the molds; to provide a tile machine having packing or compressing mechanism associated therewith by means of which the material in the molds may be pressed to the desired form; to provide a tile machine adapted to give the freshly made tiles a waterproof or coloring coat before their removal from the molds; to provide a tile machine having mechanism adapted to sever the adjacent tiles while in the molds and provide clean cut edges therefor; and to provide an improved mechanism for removing the completed tiles from the molds.

A specific construction embodied in said invention is illustrated in the accompanying drawings, in which:

Figure 1 is a fragmentary, longitudinal, vertical section of a tile machine embodied in this invention, with parts in elevation and showing one mold carriage in section at the tile discharging end of the machine, and one mold carriage in side elevation at the compressing end of the machine, and the compressing mechanism in section. Fig. 2 is a fragmentary top plan view of the main frame, the track and the carriage at the discharging end of the machine, and with the mold filling and compressing mechanisms removed, and with the supporting frames for the cutting and filling mechanisms in horizontal section. Fig. 3 is an end elevation of one of the knives. Fig. 4 is an enlarged section taken on line 4—4 of Fig. 1 with parts removed. Fig. 5 is a transverse section taken through the measuring device and transfer truck, and looking toward the discharge end of the machine, with the glazing tank removed. Fig. 6 is a section taken on line 6—6 of Fig. 1, with parts removed. Fig. 7 is a transverse section of the mold carriage with the partitions removed and with the bottom mold plates elevated to discharge the tile. Fig. 8 is a rear end ele-

vation of one of the mold carriages with parts removed. Fig. 9 is a transverse section of one of the mold carriages. Fig. 10 is a section taken on line 10—10 of Fig. 1. Fig. 11 is an enlarged detail of the locking means for the partitions. Fig. 12 is a fragmentary section of one of the carriages and the cutting means for severing the tiles, and showing the cutting means in elevated position in dotted lines.

In the construction shown, a frame 1 is provided upon which the tile forming mechanism is mounted, and for convenience of description the end 2 of the frame will be referred to as the discharging end of the frame and the end 3 as the packing end of the frame.

Extending longitudinally of the frame along one side thereof is a main track 4 which is interrupted near the center of the frame by a transfer track 5 which extends transversely of the frame and below the level of the main track 4. Mounted to run on the transfer track 5 is the transfer truck 6, on which are two tracks 7 and 8, which extend longitudinally of the frame 1 on the same level as the track 4, and are adapted to be brought into register or alinement with said track 4.

Mounted on the frame 1 at the rear of the track 4 and above the carriage 6 is the measuring and filling hopper 9 which is supported on the frame 1 by means of a sheet metal frame 10. The hopper is open at its bottom and the bottom margins 11 thereof are curved to form the arc of a circle, as shown more clearly in Fig. 5, and a shaft 12 is journaled longitudinally of the hopper between said margins 11. Rigidly mounted on the shaft 12 and adapted to revolve between the margins 11 is the measuring cylinder 13, which is open on one side the full length thereof to receive the material from the hopper 9 when the opening is up. The walls of the measuring cylinder 13 are braced by stays 14 radiating from the shaft 12. At one end of the shaft 12, on the outer side of the frame 10, is a crank 15 by means of which the cylinder may be rotated in the direction of the arrow shown in Fig. 5 to dump the contents of the cylinder. A deflecting plate 16 is hinged in the forward portion of the hopper in position to overlap the joint between the cylinder and the hopper and when the hopper is rotated to dumping position it tilts the bottom of

the plate inwardly so that it may bear on the outer surface of the cylinder, and when the cylinder is returned to normal position said plate scrapes off the adhering material on the outer surface of the cylinder.

The tiles are formed in molds in the mold carriages 17 and 18 which are mounted to travel on the tracks 4, 7 and 8. Preferably two carriages are used simultaneously, though three may be employed if desired. Each of said carriages 17 and 18 comprises a box frame having trucks or wheels 19 thereon adapted to travel on said tracks, and the ends of the carriage are of less height than the sides, as shown more clearly in Figs. 7, 8 and 10. In the upper portion of the box frame are a plurality of vertically movable mold plates 20 which are formed on their upper surfaces to conform to one surface of the tile to be formed. Said mold plates 20 are supported upon the upper ends of the rods 21, which are supported at their lower ends on vertically movable bars 22 which are slidably mounted in the box frame. The rods 21 pass through a floor or guide plate 23 which is secured to the side walls of the carriage at a point sufficiently below the top of the carriage to permit the plates 20 to rest thereon when at their lowest limit of movement. Coiled springs 24 are carried on the rods 21 and bear at their upper ends against the plate 23 and at their lower ends against the bars 22. At the end of the carriage adjacent to the discharge end of the frame 1 is journaled a stud shaft 25 which is slightly to one side of the center of the carriage and which has an angular outer end. On said stud shaft 25 is a sprocket wheel 26 which is in alinement with a sprocket wheel 27 on a stud shaft 28 journaled at the bottom of the carriage directly below the shaft 25. A sprocket chain 29 is carried on said sprocket wheels, and a shaft 30 extends longitudinally of the carriage and is journaled in the bars 22 centrally between their ends. The ends of the carriage are provided with vertical slots 31 through which the shaft projects.

On the end of the shaft 30 adjacent to the sprocket wheels 26 and 27, and slightly out of alinement therewith, is a sprocket wheel 32 which is also engaged by one lap of the chain 29. On each end of the carriage and adjacent to the slot 31 is rigidly secured a vertical rack 33 in which mesh gears 34 which are rigidly secured on the shaft 30. When the stud shaft 25 is rotated the sprocket chain 29 causes the shaft 30 to rotate and the gears 34 travel up or down the racks 33, and the shaft 30 thereby moves the bars 22 vertically which in turn move the mold plates 20. At the discharge end of the machine is a crank 35 having a socket adapted to receive the angular end of the stud shaft 25 when the carriage is at that

end of the frame 1. The crank is adapted to operate the mechanisms for raising and lowering the mold plates 20.

At the ends of the mold plates 20 and separating the same from each other and from the ends of the carriage are the mold partitions 36 which are slidably mounted in grooves in the side walls of the carriage. Said partitions are shaped at their upper ends to conform to the upper surfaces of the tiles and they extend downwardly through the floor or guide plate 23 and are provided at their lower edges with laterally turned flanges 37. Rods 38 are mounted at their upper ends in the guide plate 23 and at their lower ends in transverse beams 39 supported on the sides of the carriage. A buffer 40 is carried on the upper end of each rod 38 immediately below the plate 23 and acts to limit the upward movement of the partitions. Springs 41 are carried on the rods 38 and bear at their upper ends against the flanges 37, and at their lower ends against the beams 39. Extending longitudinally of the carriage beneath the partitions 36 and rigidly secured to the flanges 37 is a locking bar 42 which projects at its ends through slots 43 in the ends of the carriage. The ends of the locking bar are provided with notches or teeth 44 and pivoted on the end walls above said ends are the pawls 45 which are adapted to engage said notches with their lower ends, and between their upper ends and the end walls of the carriage are springs 46* which act to force the upper ends of the pawls outwardly and hold the lower ends thereof in engagement with the notches. For the purpose of throwing the pawls 45 out of engagement with the notches 44, each pawl is provided with an arm 46 which extends below the bar 42, and a lever 47 is pivoted on a rod 48 extending transversely of the carriage beneath the bar 42, and pivoted to said lever are push rods 49 which extend through the end walls of the carriage and bear against the arms 46. When said lever is turned in one direction it forces the push rods 49 outwardly, thereby forcing the arms 46 outwardly and carrying the pawls out of contact with the ends of the bar 42.

After the material has been placed in one of the mold carriages from the hopper 9, the carriage is moved to the packing end 3 of the frame 1 where the material is pressed into shape. For the purpose of compressing the material a tilting frame 50 is pivoted at one end to the end 3 of the frame 1. Said tilting frame lies between the track rails 4 and normally on a level therewith. Journaled in the frame 1 beneath the free end of a tilting frame is a shaft 51 on which are cams 52 adapted to bear on the under side of the frame 50. On one end of the shaft 51 is a crank 53 by means of which the shaft

may be rotated to cause the cams 52 to tilt the frame 50, and thereby tilt the carriage, as shown at 18 in Fig. 1.

The frame 1 is provided at the end 3 with side members 54 which extend above the top of the carriage and are provided in their inner faces, near the tops thereof, with longitudinal grooves 55. Slidably mounted in said grooves 55 is a wedge member 56, having its thick end directed toward the end 3 of the frame 1. The upper surface of the member 56 is parallel with the tracks 4 while the under surface inclines downwardly toward the end 3. Said wedge member 56 is provided with longitudinally extending, centrally disposed slots 57 and 58, the upper edges of which are built up at 59 so that they are parallel with the lower edges, or in other words, they incline downwardly toward the end 3 of the frame 1, so that each slot is of the same depth throughout its length.

Mounted on the underside of the wedge member 56 is the upper mold plate 60 which is provided in its upper surface with grooves 61 adapted to receive tongues 62 on the wedge member, as shown more clearly in Fig. 10. The tongues 62 and grooves 61 act to hold the plate 60 in proper relation to the member 56. Arms 63 and 64 project upwardly from the plate 60 through the slots 57 and 58 respectively. The arm 63 is provided with gears 65 which are journaled on a shaft 66 in the arm, and are adapted to travel on cogs at the sides of the slot 57. Pawls 67 are pivoted on the arm and are adapted to engage the gears 65 and lock the plate 60 to the wedge member during the backward movement of said member toward the end 3 of the frame, so that the plate will be pulled longitudinally off from the tiles with the wedge member after the compressing operation. The arm 64 is provided with rollers 65^a which travel on the wedge member at the sides of the slot 58. For the purpose of operating the wedge member 56 a screw shaft 69 has threaded engagement in a cross bar 70 carried on the ends of the side members 54 which are adjacent to the end 3 of the frame 1. The inner end of said shaft is rotatively connected in the end of the wedge member and is adapted to move the wedge member longitudinally. The bar 70 serves to brace the side members 54 at one end, and at their other end is a tie rod 71.

The mold plate 60 is of a width to fit between the side walls of the carriage, and is formed on its under side to conform to the upper surface of the tile and the upper edges of the partitions 36. Said plate 60 is provided at its end adjacent to the end 3 of the frame 1 with a down-turned flange 72 which engages over the end of the carriage, as shown in Fig. 1, and prevents the plate from

slipping on the carriage when the wedge member 56 is being advanced.

After the tiles have been sufficiently packed or pressed the carriage is lowered back onto the track 4 and is moved toward the end 2 of the frame 1 to the position which the car 17 occupies in Fig. 1. As the carriage approaches the limit of its movement in that direction the tiles may be given a coating of water-proofing or coloring material from a tank 73 which is supported over the track 4 by means of a supporting frame 74 on the end 2 of the frame 1, and at the rear of the track 4. The tank 73 is provided with a slide bottom 75, below which is a measuring compartment 76 which is adjustably secured on the lower portion of the tank by bolts 77 passing through slots in the measuring compartment. The compartment 76 is provided with an outlet 78 in its bottom which is controlled by a slide 79. A knife or wiper 80 is adjustably supported on a bracket 81 suspended from the hopper, and its lower edge is shaped to conform to the upper surface of the tiles. Said knife is adjusted so that as the carriage passes beneath it, it will wipe or scrape off from the tiles any excess of coloring or waterproofing material.

A shaft 82 extends longitudinally of the frame 74 at the rear thereof, and slightly above the top of the carriage. Journaled on said shaft is a plurality of arms 83 which are spaced the same distance apart as the partitions 36, and are adapted to extend forwardly directly above said partitions when the carriage is at the limit of its movement toward the end 2 of the frame 1. The outer ends of said arms 83 are rigidly connected together by means of a bar 84, and on the under side of each arm, at its outer end, is a knife 85 which extends slightly below the under surface of the arm and the edge of which is of the same shape as the upper edge of the partitions 36. On the outer end of one of the arms 83 is a spring hook 86 adapted to engage in a notch or recess 87 in the front side of the carriage when the knives are down, and hold the knives from rising. Secured on the frame 74 above the outer ends of the arms is a hook 88 adapted to hold the knives up out of contact with the partitions, so that the carriage may clear the knives when it is being moved on the track 4.

The operation of the construction shown is as follows: The mold carriage is run onto the track 8 of the transfer truck 6 and the truck is moved rearwardly to bring the carriage beneath the measuring hopper 9 where the desired quantity of material is emptied into the mold by means of the cylinder 13. The truck 6 is then run forwardly to bring the carriage into alignment with the track 4. The carriage is then run

beneath the mold plate 60 and one end is tilted by means of the cam 52 acting on the tilting frame 50. The screw 69 is then operated to force the wedge member 56 away from the end 3 of the frame 1. The wedge member slides on the mold plate 60 thereby forcing the plate down onto the top of the material in the mold. Inasmuch as the lower mold plates 20 rest on the guide plate 23 the strain is transmitted directly to the side of the carriage. The downward movement of the plate 60, which rests on the partitions 36, moves the partitions downwardly against the action of the springs 41. The partitions carry the locking bar 42 downwardly and the pawls 45 engage the notches in the ends of the bar and prevent the partitions from returning upwardly. After the material has been compressed the carriage is lowered back to the track 4 and is moved toward the opposite end of the frame 1. As the carriage passes beneath the tank 73 coloring or waterproofing material may be placed on the tiles if desired. As the carriage reaches the limit of its movement toward the end 2 of the frame 1, the end of the stud shaft 25 enters the socket in the crank 35. The knife arms 83 are then lowered to bring the knives down onto the partitions and sever any material which may overlap the partitions. The hook 86 holds the arms down while the tiles are being elevated from the carriage. The crank 35 is then operated to cause the shaft 30 to travel upwardly in the slots 31 thereby carrying the mold plates 20 up out of the carriage against the tension of the springs 24, as shown in Fig. 7. The tiles may then be removed from the plates 20 and the plates are returned to normal position by the springs 24 or by the aid of the crank 35. The lever 47 is then operated to release the pawls 45 from the locking bar 42, and the partitions return to normal position by the action of their springs. The carriage may then be returned to the transfer truck 6 to be again filled.

By means of the truck 6 which brings the carriage out of alinement with the track 4 when being filled, it is possible to use two or three carriages on the machine at the same time.

While I have shown and described but one specific embodiment of my invention, it will be understood that many details of the construction shown may be varied or omitted without departing from the scope of the claims.

I claim:

1. A tile machine, comprising a track, a mold carriage adapted to run on said track, a movable mold plate in the carriage, means adapted to fill the carriage above said plate with tile material, means at one end of the track adapted to tilt the carriage, means

adapted to compress the material, and means at the opposite end of the track adapted to elevate said plate from the carriage.

2. A tile machine, comprising a frame, a track on the frame, a mold carriage movable on the track, a vertically movable mold plate in the carriage, measuring means adapted to deliver material to the carriage, means at one end of the frame adapted to tilt the carriage, compressing means above the tilting means adapted to compress the material, and cooperating means on the carriage and on the opposite end of the frame adapted to elevate said plate to lift the tiles from the carriage.

3. A tile machine, comprising a frame, a track thereon, a carriage movable on said track, measuring means at one side of the track adapted to deliver material to the carriage, means extending transversely of the track and adapted to transfer the carriage from the track to said measuring means, means adapted to compress the material in the carriage, and coating means on the frame and carriage adapted to elevate the completed tile from the carriage.

4. A tile machine, comprising a frame, a track extending longitudinally of the frame, a mold carriage movable on the track, vertically movable partitions in the carriage dividing it into separate molds, means for filling said molds, means on the frame adapted to compress the material in the molds and force the partitions downwardly, means on the carriage adapted to lock the partitions against return, and means pivoted on the frame and adapted to act in conjunction with the partitions to sever the tiles at the joints between the molds.

5. A tile machine, comprising a frame, a track on the frame, a carriage movable on the track, measuring means supported on the frame at one side of the track, a transfer truck movable transversely of the track and adapted to move the carriage to and from the measuring means, compressing means at one end of the frame adapted to compress the material in the carriage, and means at the opposite end of the frame adapted to elevate the completed tiles from the carriage.

6. A tile machine, comprising a frame, an interrupted track extending longitudinally of the frame, a mold carriage on said track, a filling device supported on the frame at one side of the track, a transfer truck movable on the frame between the track and the filling device, tracks on said truck on a level with the interrupted track, tilting means pivoted on the frame at one side of the transfer truck and adapted to tilt the carriage, tile compressing means movably supported on the frame above the tilting means, and means movably supported on the frame at the opposite side of the trans-

fer truck and adapted to sever the material on the carriage when the carriage is beneath the same.

7. A tile machine, comprising a frame, a track on said frame, a mold carriage movable on said track, vertically movable mold plates in the carriage, vertically movable partitions between said plates and providing a plurality of molds, means adapted to fill the molds with tile material, tilting means pivoted at one end of the frame and adapted to tilt the carriage, compressing means slidably mounted on the frame above said tilting means and adapted to compress the material in the molds and move said partitions downwardly, locking means on the carriage adapted to lock said partitions at the downward limit of their movement, means on the carriage adapted to release said partitions, and coacting means on the opposite end of the frame and on the carriage adapted to elevate the mold plates.

8. A tile machine, comprising a frame, a track extending longitudinally of the frame, a carriage movable on the track, mold plates in the carriage, means on the carriage adapted to raise and lower said plates, movable partitions between the plates, a locking bar connecting said partitions, means on the carriage adapted to lock the bar against upward movement, means on the frame adapted to supply material to the carriage, a tilting frame at one end of the track, means adapted to tilt the frame when the carriage is above the same and thereby tilt the car, means mounted on the frame above the tilting frame and adapted to compress the material in the carriage and move the partitions downwardly, and means mounted on the opposite end of the frame and adapted to coact with said partitions to sever the tile material.

9. A tile machine, comprising a frame, a broken main track on the frame, a transfer

truck movable on the frame through the break in the main track, tracks on the truck on the level with the main track, a measuring hopper adjacent to the break in the main track, a carriage mounted to run on said tracks and receive material from the measuring hopper, compressing means at one end of the main track adapted to co-operate with the carriage to compress the material, means supported on the frame and adapted to deliver a coating to the material after it is compressed, means for severing the material, and means for discharging the material from the carriage.

10. A tile machine, comprising a frame, a main track on the frame, a transfer track extending laterally from the main track, a measuring device adjacent to the transfer track, a carriage adapted to run on the main track, means adapted to transfer the carriage on the transfer track from the main track to the measuring device and back, means adapted to compress the material in the carriage, and means adapted to eject the material from the carriage.

11. A tile machine, comprising a frame, a track on the frame, a carriage on the track, vertically movable mold plates in the carriage, vertically movable partitions separating the mold plates, compressing means adapted to compress material on said plates and move the partitions downwardly, means adapted to lock the partitions against upward movement, and coacting means on the carriage and frame adapted to elevate the mold plates.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

AREND WICHERTJES.

Witnesses:

JOHN KREKEL,
ROBT. KLOTZ.