June 2, 1925. 1,540,417

J. B. OWENS

GLAZE MACHINE

Filed Nov. 4, 1922 3 Sheets-Sheet 1

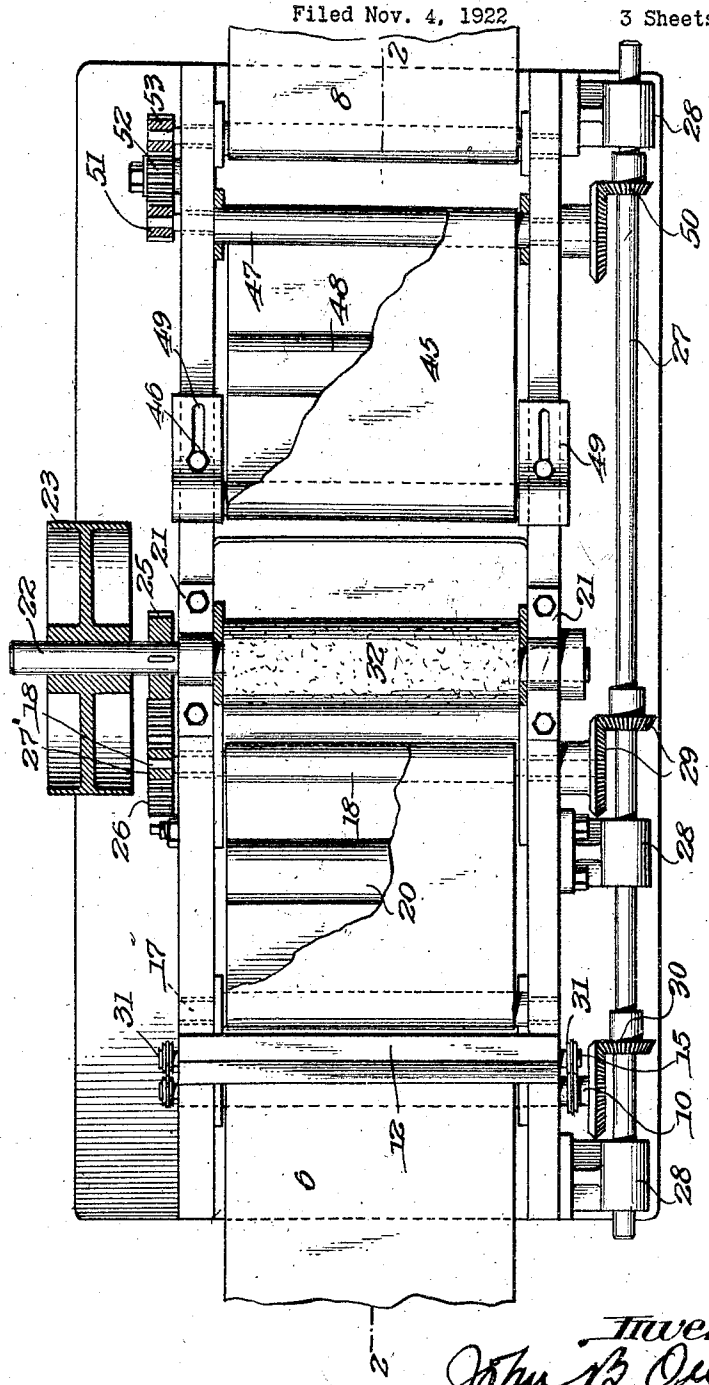



Fig. 1.

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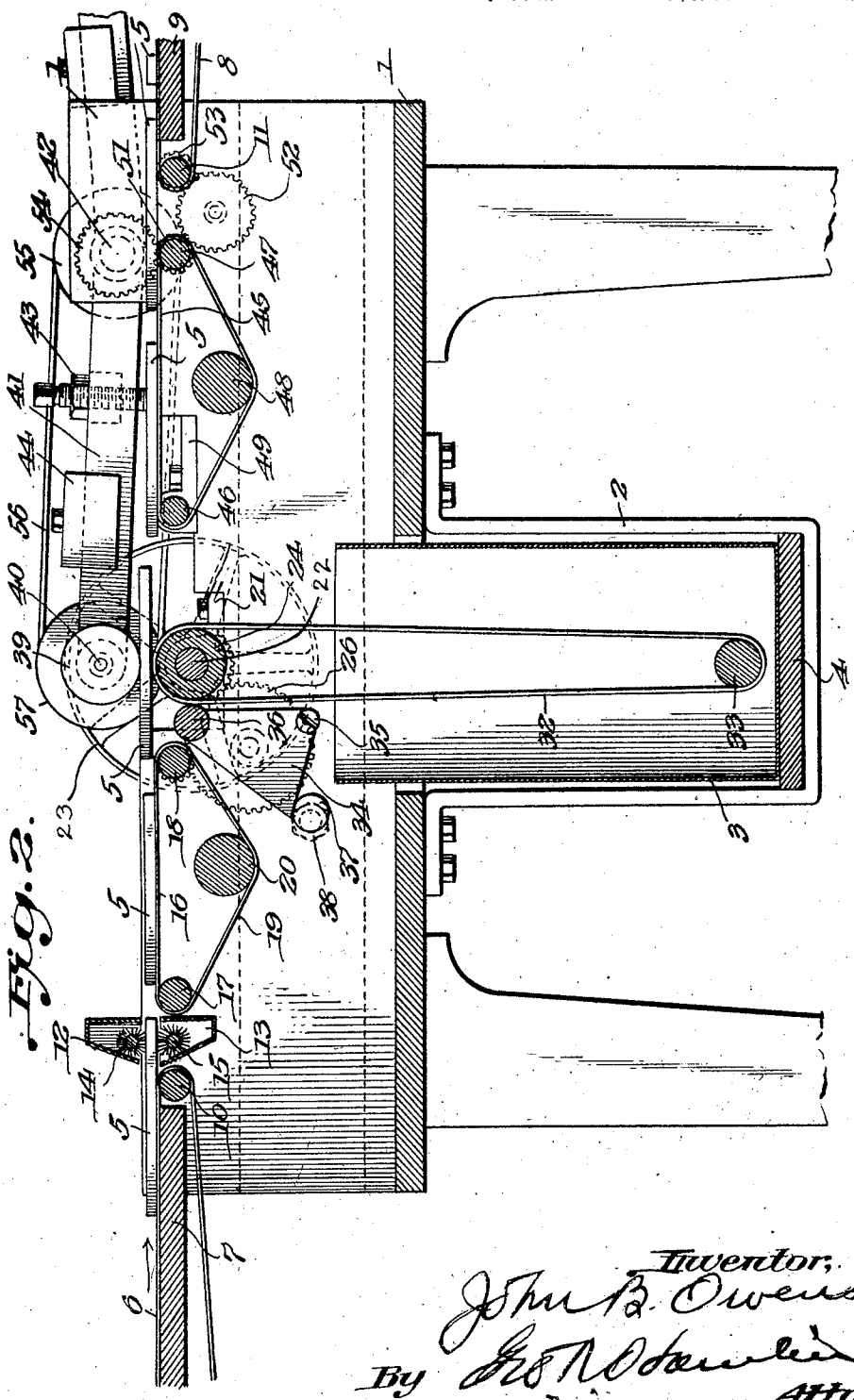


Fig. 2.

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Fig. 3.

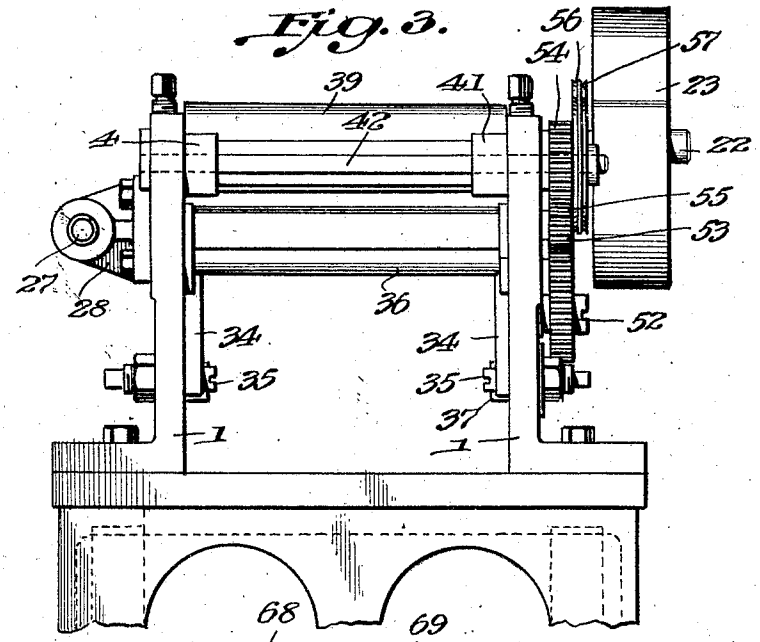
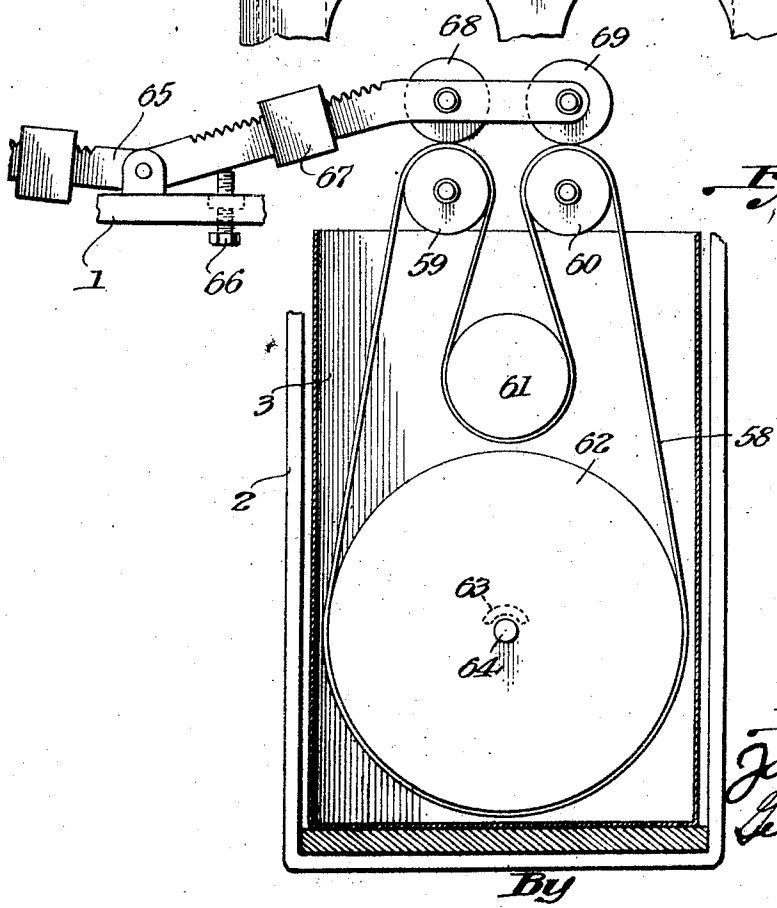



Fig. 4.




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Patented June 2, 1925. 1,540,417

# UNITED STATES PATENT OFFICE.

JOHN B. OWENS, OF NEW YORK, N. Y.

## GLAZE MACHINE.

Application filed November 4, 1922. Serial No. 599,116.

*To all whom it may concern:*

Be it known that I, JOHN B. OWENS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Glaze Machines, of which the following is a specification.

This invention relates to machines commonly known as "glaze" machines which are used for applying "glaze" or fluid enamel composition to tiles before the latter receive heat treatment for baking the glaze or enamel on them.

Among the objects of my invention are the provision, first, of a coating belt or apron which is arranged and automatically tensioned in a novel manner for the purpose of conveying the glaze from a reservoir or tank to the tiles; second, novel means for holding the tiles in proper contact with the glaze applying means and for feeding them; third, novel means for regulating the thickness of the glaze applied to the tile and insuring an even coating thereon; fourth, novel means for cleaning the tiles before they are coated; fifth, novel means for coating the tiles which also serves as an agitator for the glaze which said coating means delivers to the tiles, whereby the same means which coats the tiles automatically stirs up or agitates the glaze material and keeps it in proper condition for use without resort having to be had to separate stirring or agitating means.

I am aware that resort may be had to modifications in carrying out the essential principles of my invention and it is to be understood, therefore, that the specific embodiments of the machine which are shown in the drawings and described hereinafter are illustrative, instead of restrictive, of the scope of the invention.

In the accompanying drawings:

Figure 1 is a plan view, certain parts being broken away and others in section to afford a clearer understanding of the machine.

Fig. 2 is a longitudinal section on the line 2—2, Fig. 1.

Fig. 3 is an elevation taken at the right hand end of Figs. 1 and 2; and

Fig. 4 is a detail of a modification of the coating belt.

The frame of the machine appears at 1 and is provided with suitable hangers 2 by which the glaze or coating-material tank 3 is removably supported. Preferably the tank will rest upon a wooden piece 4. The tank 3 is fed from any suitable reservoir, not shown, and it may be removed at will by tilting it and displacing it from the wooden support 4.

The tiles, of which a few are shown at 5, are fed to the machine by an apron or belt conveyor 6 running over the table 7, which is suitably supported; said tiles are removed from the machine, after being glazed or coated, by a similar take-off conveyor or apron 8 running over the take-off table 9 which is suitably supported. The apron or delivery conveyor 6 is driven by a roller 10, which receives power from the machine; the take-off apron or conveyor 8 is driven by a roller 11, operated by the machine, as will appear hereinafter.

The tiles 5 pass through the machine in the direction of their lengths and as many of them are placed abreast as may be accommodated by the width of the machine, it being understood that the machine may be built of any width desired.

Prior to receiving the coating of glaze which is applied as will be explained presently, the tiles are cleaned of dust so that their surfaces will be smooth and uncontaminated. For this purpose there is provided upper and lower vacuum boxes 12, 13, which are connected to pipes leading to any suitable source of suction or vacuum, said boxes having suitable mouths located closely adjacent the upper and lower faces of the tiles so as to act upon said surfaces immediately after the tiles leave the apron 6. To loosen the dust particles from the surfaces of each tile, rotary brushes 14 and 15 are provided in the suction boxes 12 and 13 in such position that they will act upon the upper and lower surfaces of the tile at the time the tile is subject to suction. The brushes 14 and 15 are driven in any suitable manner, one example of which is hereinafter described.

After passing the cleaning means previously described, the tiles are advanced by an apron or conveyor 16 which runs over rollers 17, 18, and is provided with a depending part 19 on which loosely and freely rests a belt or apron tightening roller 20 which is preferably of metal and of sufficient weight to more than counterbalance the weight of the tiles on the upper stretch

of the apron 16. The roller 20, not being journaled but being free and supported wholly by the lower stretch 19 of the apron, serves to automatically keep the upper stretch of apron 16 taut and this insures a positive and regular feed of the tiles to the glazing means. The apron 16 delivers the tiles to the glazing means.

Journaled in suitable bearings 21 on the main frame 1 is a shaft 22 which is driven by a belt pulley 23 from any suitable source. The glaze roller 24 is secured to shaft 22, said roller being of brass or other rust proof material. A pinion 25 secured to the shaft 22 meshes with a relatively large idler gear 26 which, in turn, is in mesh with a pinion 27′ secured to roller 18. Thus, suitable means is provided for driving the apron 16 so that it will feed the tiles 5.

A shaft 27 journaled in suitable bearings 28 on the frame 1, is driven from the roller 18 by bevel gears 29. Bevel gears 30 afford means for driving the roller 10 from shaft 27. The brushes 14, 15, may be driven in any suitable manner as, for instance, by pulleys on the axles of said brushes and pulleys on the roller 10 as shown at 31.

An endless glaze belt or apron 32 which runs over the glaze roll 24, hangs freely from said glaze roll and is suspended by it in the glaze tank 3, the lower part of the glaze apron or belt 32 reaching to a point well toward the bottom of the tank 3. A brass or other non-rusting roller 33 is located inside of the apron or belt 32 and is loosely and freely suspended by said belt or conveyor 32. The roll 33 serves as an automatic tightener for the belt or conveyor 32 in the same manner as does the roller 20. By providing this novel tightener for the glaze belt or conveyor 32, the latter is always kept in properly taut condition, the use of bearings subject to the corroding action of the glaze in the tank 3 is obviated, and the belt or conveyor 32 is made to serve as an agitator for the fluid glaze material in the tank. In addition to these advantages, when it is desired to substitute another tank, no special changes or adjustments are necessary as the glaze belt or conveyor 32 can be easily lifted out of the tank. As the belt or conveyor 32 is operated by the rotation of the glaze roll 24, the automatic tightening or tensioning roll 33 turns idly and freely and keeps the belt taut. By using an endless belt 32, as distinguished from a glaze roll dipping in the tank, there is obtained the great advantage of constant agitation of the glaze material in the tank, which insures more even consistency of the glaze material carried up to the roller 24.

Preferably, although not necessarily, there is employed the improved means now to be described by which any excess of glaze material carried by the belt or conveyor 32 is removed for the purpose of insuring an even coating of glaze being conveyed to the stretch of belt 32 running over the roll 24 and, hence, an even coating of the tiles 5.

Two plates 34 are pivotally connected to the frame 1 at 35. A roller 36 is journaled in the plates 34 and is adapted to be positioned so that it will remove any excess of glaze material from the belt or conveyor 32 and to insure an even film of glaze on that part of the belt 32 which runs over the upper half of the glaze roll 24. Adjustment of the plates 34 may be had in any suitable manner as, for instance, by eccentrics 37 carried by screws mounted in the sides of the frame 1 and provided with clamping nuts 38.

I do not limit the belt or conveyor 32 to any particular construction as it is within the scope of the invention to provide any absorbent belt or conveyor for this purpose. I prefer, however, to provide a glaze belt or conveyor 32 composed of plies or layers of fabric having relatively large interstices and with fine mesh wire fabric interposed between said plies or layers as such a belt or conveyor will readily absorb and hold the glaze material and carry it up from the tank 3 and apply it in an even film to the tiles 5.

The tiles as they pass over the glaze roller 24, receive the glaze material from the conveyor 32. To hold the tiles 5 against that part of the glaze belt or conveyor 32 that runs over the glaze roll 24, there is provided an upper glaze roll 39 which is journaled at 40 in the arms 41, the latter being pivotally mounted intermediate their ends on a shaft 42 journaled in the frame 1. Set screws 43 provide means for limiting the downward movement of the arms 41 as may be desired so that the distance between the peripheries of the upper glaze roll 39 and the lower glaze roll 24 may be accurately predetermined and the upper glaze roll 39 prevented from dropping after a tile has passed between it and the glaze roll 24. This adjustment also permits regulation to suit tiles of different thicknesses. Adjustable weights may be so set on one side or the other of the pivots of the arms 41 as to enable any desired pressure to be applied by the glaze roll 39 to the tiles 5.

After the tiles have had the glaze or coating applied thereto, they pass on to apron 45, similar to the apron 16, which runs over rollers 46, 47, and is provided with a tensioning roller 48 similar to the roller 20 and serves to automatically tension the apron 45. To enable the apron 45 to be adjusted so that it will properly take off the tiles 5 from the glaze rolls 39 and 24, the roller 46 is mounted in adjustable bearings 49 on frame 1; these bearings can be fastened where moved and thus the upper stretch of

the apron 45 may be lengthened or shortened.

The roller 47 is driven from shaft 27 by bevel gearing 50. A pinion 51 carried by the shaft of roller 45 meshes with an idler gear 52 mounted on frame 1, said gear 52 meshing with a pinion 53 on the roller 11, by which the apron 8 is operated.

A gear 54 carried by the shaft 42 meshes with pinion 51 for the purpose of driving a sheave 55 which has a round belt 56 connecting it to a similar sheave 57 carried by the shaft 40 of the glaze roll 39. The ratio of the gears is such that, through the sheaves 55 and 57 and the belt 56, the upper glaze roll 39 is driven at the same speed as the lower glaze roll 24.

After the tiles 5 have been coated they pass onto the apron 45 which, in turn, delivers them to the apron 8 which takes them from the machine.

In the modification shown in Fig. 4 provision is made for greater agitation of the glaze in the tank 3 and for a greater part of the glaze conveyor or belt 58 being constantly immersed in the glaze, beside affording means for applying the glaze twice to the tile, thereby insuring the tile having an adequate and even film of glaze applied to it. This modification may be substituted for the glaze roll 24, glaze belt 32, and tensioning roller 33, and for the principal glaze roll 39 of the machine shown in Figs. 1, 2 and 3.

Referring to Fig. 4, there are two lower glaze rolls 59, 60, a brass or other non-rusting roller 61 which is used for tensioning the glaze belt 58, and a large, light, roller 62. The endless glaze belt 58 passes around the large roller 62 and thence upwardly and over the glaze rolls 59, 60, thence downwardly around the tensioning roller 61. This system affords greater agitation for the glaze material in the tank 3 and enables two glaze rolls 59, 60, to be used which, in turn, not only afford a level support for the tile 5 so that the latter cannot tilt, but they also make provision for the glaze conveyor 58 applying the glaze material twice to the tile before it passes onto the apron 45.

As the large roller 62 may be overbalanced by the weight of the roller 61, suitable abutments or stops 63 are preferably provided on the inside of the tank 3 for the purpose of arresting the upward movement of the projecting axle ends 64 of the roller 62 before the roller 61 can contact with the roller 62.

Pivoted to the frame 1 are two arms of which only one, 65, is shown. These arms correspond to the arms 41 and they are arrested in their downward movement at any desired point by set screws 66, of which only one is shown. Weights 67, of which one is shown, are adjustably mounted on the arms 65 and adapted to be used on either side of the pivots thereof, according to circumstances. Two upper glaze rolls 68, 69, are journaled in the arms 65. Any suitable means may be employed for driving the upper glaze rolls 68, 69, so that their timing will be the same as that of the lower glaze rolls 59, 60, the latter being driven in any suitable manner.

The belt or glaze conveyor 58 may be of any preferred material and construction and it may be constructed as hereinbefore described, if desired. Means for removing the excess glaze from the conveyor or belt 58 may be used, as previously described, or said means may be entirely omitted.

I claim:

1. In a machine for glazing tiles, the combination with means for applying the glaze to the tiles, of an endless apron for delivering the tiles to said glazing means, means for cleaning the tiles before they pass to the endless apron, and another endless apron to which the glazing means delivers the tiles after they have been glazed, said last named apron removing the glazed tiles.

2. In a machine for glazing tiles, the combination with means for applying the glaze to the tiles and aprons for moving the tiles to, and from, the said glaze applying means, of pressure means for holding the tiles in position while the glaze is being applied thereto, and means for regulating pressure exerted by said holding means on said tiles.

3. In a glazing machine, the combination with a glaze roll for applying the glaze to the tiles, of a companion pressure glaze roll for holding the tiles against the first named glaze roll, aprons for moving the tiles to, and from, said rolls, and means for arranging the last named glaze roll in any predetermined desired relationship to the first named glaze roll.

4. In a machine for glazing tiles, the combination with a glaze roll for applying glaze to the tiles, of pivoted arms, a companion glaze roll carried by said arms and adapted to hold the tiles against the first named glaze roll, adjustable weights on the arms, and screws for determining the extent of movement of the arms.

5. In a machine for glazing tiles, the combination with a glaze roll, of a glaze container located below the roll, an endless glaze conveying belt or apron depending from the glaze roll into the glaze container, and a roller located between the stretches of the belt or apron and serving as an automatic tensioning means for said belt or apron, said belt or apron and roller also acting to agitate the glaze in the glaze container.

6. In a machine for glazing tile, the combination with a glaze container, of a glaze roll located above the container, an endless belt or apron depending from, and driven

by, said glaze roll, said apron running in the glaze in the container, and a tensioning roll wholly supported by the belt or apron and located inside the glaze container, said roll serving to keep the belt or apron properly taut.

7. In a machine for glazing tiles, the combination with a glaze container, of a pair of glaze rolls located above the container, an endless belt or apron on said rolls and having a loop depending in the glaze container, and means in the glaze container which engages the depending loop of the endless belt or apron.

8. In a machine for glazing tiles, the combination with a glaze container, of a pair of glaze rolls located above the container, an endless belt or apron on said rolls and having a loop depending in the glaze container, means in the glaze container which engages the depending loop of the endless belt or apron, and companion glaze rolls cooperating with the aforesaid glaze rolls to hold the tiles against those parts of the belt or apron which pass around the aforesaid glaze rolls.

9. In a machine for glazing tiles, the combination with a glaze container, of a pair of glaze rolls located above said container, an endless belt or apron running over the said rolls and having two loops immersed in the glaze in the container, and rolls freely and wholly suspended by the loops of the belt or apron, one of said rolls last named serving as a tensioning means for keeping the belt or apron taut.

In testimony whereof I affix my signature.

JOHN B. OWENS.