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H. BROCK

MACHINE FOR FORMING PLASTIC TILE

Original Filed Feb. 18, 1926

3 Sheets-Sheet 1

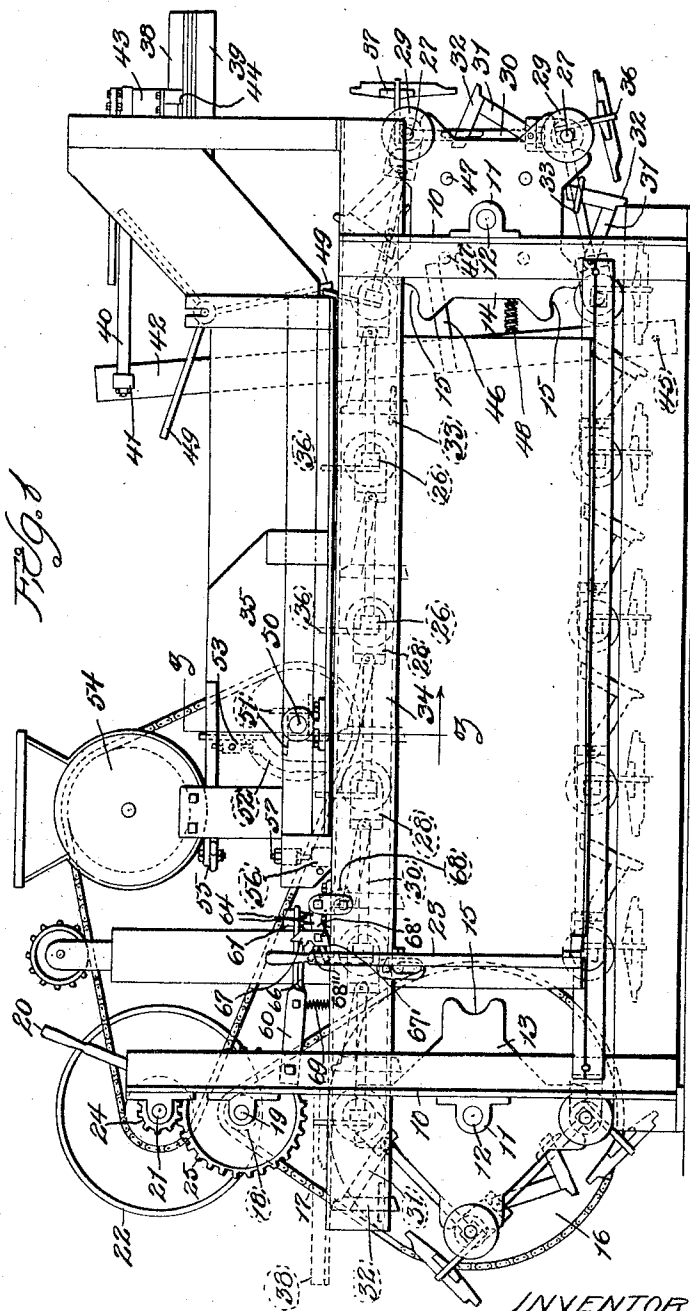


FIG. 1

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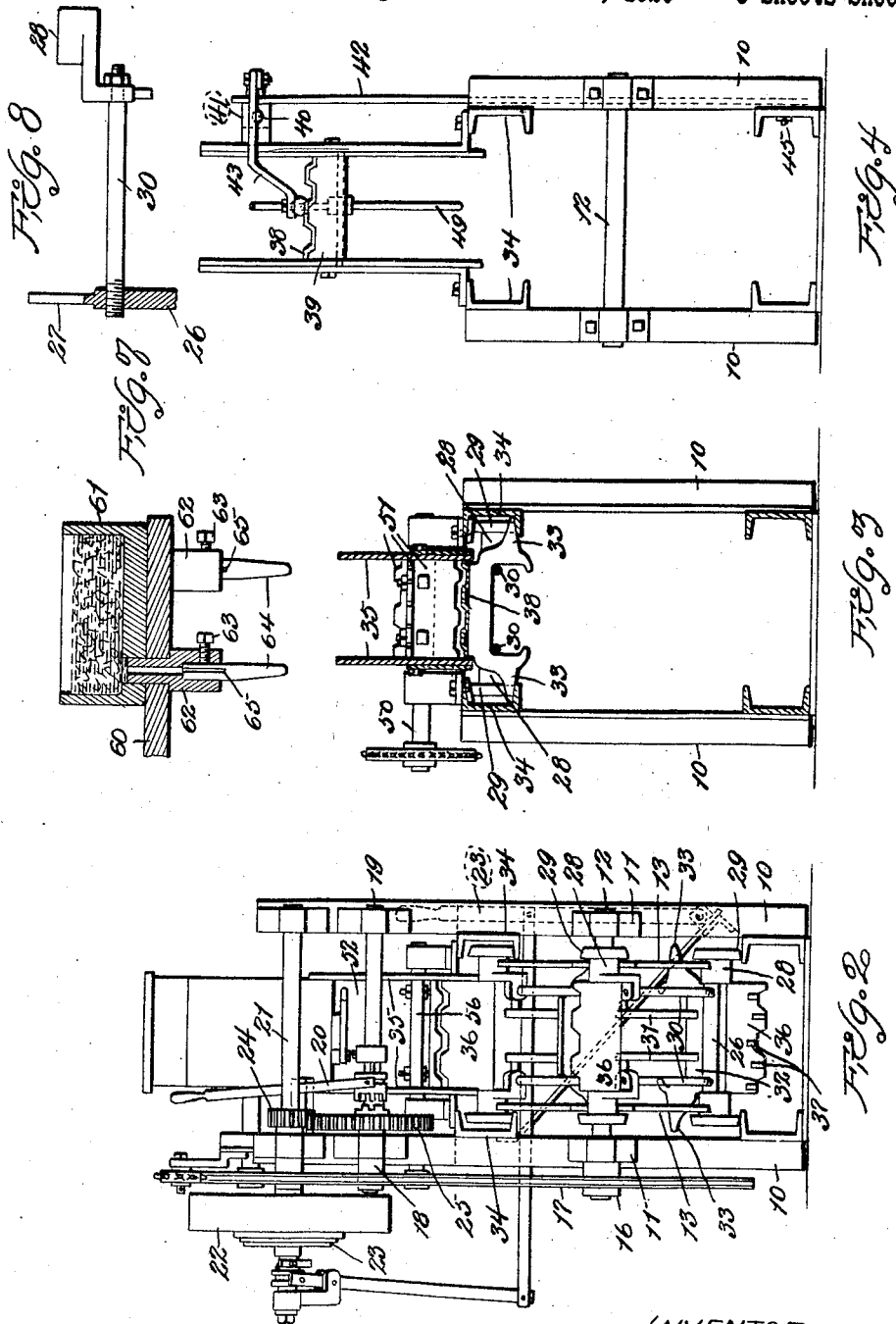
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3 Sheets-Sheet 2



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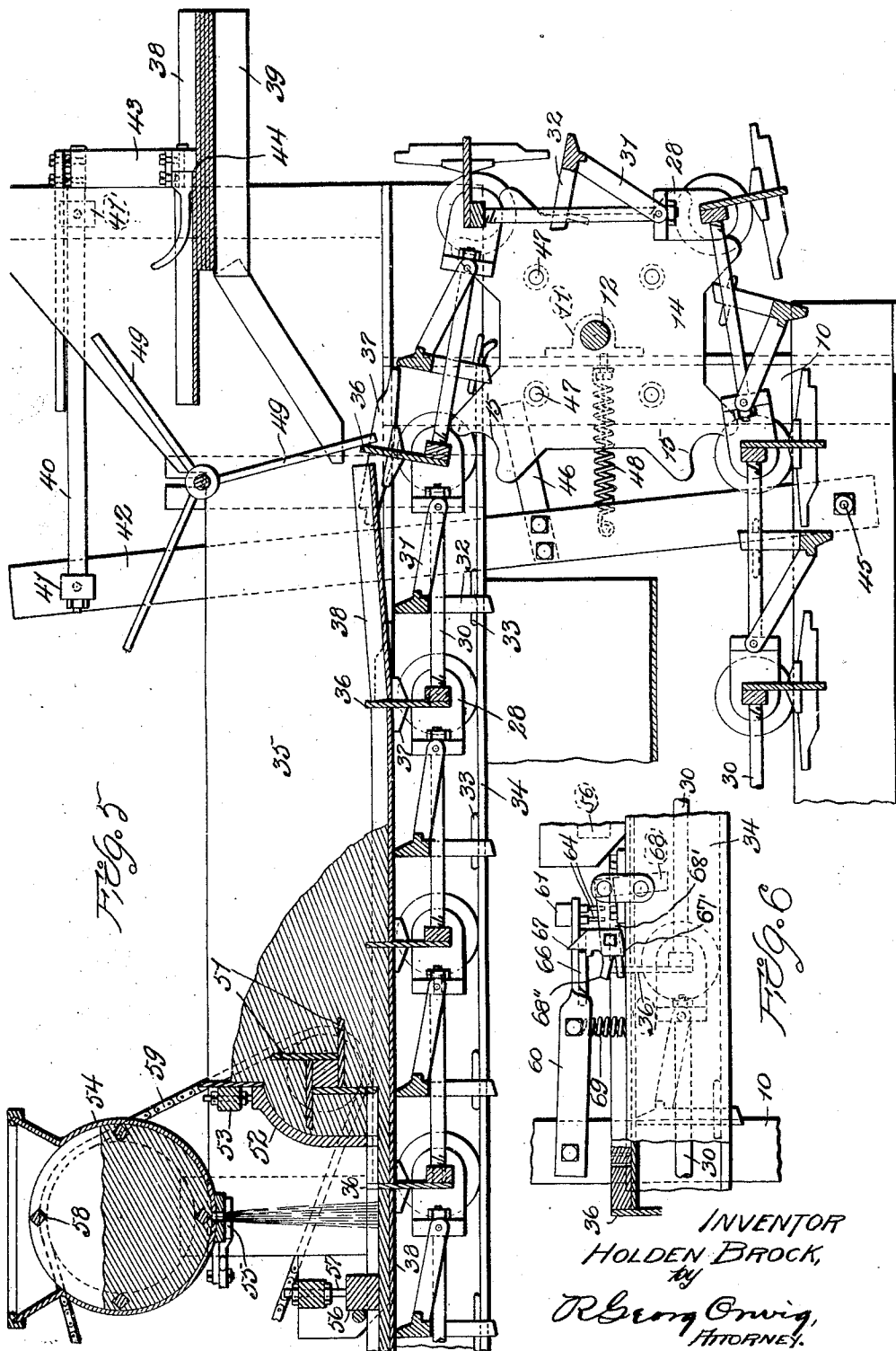
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UNITED STATES PATENT OFFICE.

HOLDEN BROCK, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO JAMES BROCK,
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MACHINE FOR FORMING PLASTIC TILE.

Substitute for application Serial No. 89,013, filed February 18, 1926. This application filed October 17, 1927. Serial No. 226,830.

My present invention relates to improvements and refinements of machines, for forming tile from plastic material, automatically and continuously, and more particularly to such machines as shown and described in Letters Patent of the United States, granted to me, Holden Brock, May 30, 1922, numbered 1,418,227.

My primary object is to provide a machine, of compact design so as to occupy a minimum of floor space, comprising a receptacle for a bed of plastic material, such as concrete, beneath which forms, or palettes, are moved in continuous succession upon a conveyor comprising tile spacing or partition plates, which forms and plates coact with rotatable material packing and initial shaping blades and a fixed trowel to shape the lower and upper faces and both end margins of the tile while the sides of the receptacle shape the side margins of the tile.

Another object of my invention is to provide simple, automatic means for feeding the forms one at a time to the conveyor properly positioned thereon between said tile spacing or partition plates.

A further object is to provide simple means for applying a finish coating to the tile.

A further object is to provide simple automatic means for perforating the tile for nailing purposes.

And a still further object is to provide means on the conveyor for cleaning the conveyor trackways whereby the forms carried thereby are moved in a constant plane. This application is a substitute for my prior abandoned application filed Feb. 18, 1926, Serial Number 89,013.

To the above purposes my invention consists in the novel construction, arrangement and combination of parts, as hereinafter fully, clearly, and concisely described, definitely pointed out in my claims and illustrated by the accompanying drawings (3 sheets) in which—

Fig. 1 is a side elevation of a machine constructed in accordance with my invention.

Fig. 2 is a rear end view of the machine.

Fig. 3 is a transverse sectional elevation taken substantially on the line 3—3 of Fig. 1.

Fig. 4 is a front end view of the machine, with the conveyor and associated tile forming elements omitted.

Fig. 5 is an enlarged longitudinal sectional

elevation showing the form feeding means, and the tile shaping and finishing means.

Fig. 6 is a detail elevation, partly in section, showing the tile perforating means, and

Fig. 7 is a sectional elevation of the holder for the perforators which furnishes a continuous liquid supply thereto, and Fig. 8 is a detail plan view of the conveyor-length adjustment.

Referring by numerals to the drawings, 10 designates vertical frame elements, on which are fixed bearings 11 in which are mounted shafts 12, for the support of spiders 13 and 14, located respectively at, or near, the rear, or discharge end and front or receiving end of the machine frame. These spiders are arranged in pairs as best shown in Fig. 2 and each comprises a plurality of uniformly circumferentially spaced dwells 15 and form the driving means for the conveyor.

The spider 14, at the front end of the machine, is an idler, while the spider 13, at the rear end of the machine, is power driven, having connected therewith a sprocket wheel 16, which is connected by a chain 17 and sprocket wheel 18 with a shaft 19, carrying, as best shown in Fig. 2, a clutch 20. A shaft 21, having a pulley 22 for connection with a source of power and a control clutch 23, is connected with shaft 19 by a reduction gear comprising gear wheels 24 and 25.

By preference the conveyor comprises cross-pieces 26, of rectangular section and which have trunnions 27 at each end for the support of links 28 and rollers 29. Connecting each link 28 with a cross piece 26 are rods 30. Each link 28 pivotally supports an arm 31 of a track cleaning and form supporting device 32 carrying shoes 33 which ride the track 34, which track is by preference a pair of opposed channel irons disposed lengthwise of the frame, immediately beneath the material receptacle 35 which consists of upright plates supported on the frame.

Carried by each cross piece of the conveyor is a tile spacing, or partition plate 36, whose outer margin is shaped to the section of the tile to be formed and carried by each plate 36, on both its forward and rearward faces, are lugs 37 which constitute rests for the forms 38, which forms each are sectionally shaped, as are the margins of the plates 36.

Supported over the trackway, at the forward end of the material receptacle, is a form

rack 39 upon which a stack of forms, manually supplied, are supported, to be fed, one at a time, to the conveyor. This feeding means comprises an actuating rod 40 carried in
 5 pivot blocks 41, one of which is fixed to the machine frame and the other of which is carried on a rocker arm 42. Pivotal-ly carried at the forward end of the rod 40 is a feed arm 43 comprising a shoulder 44 for en-
 10 gagement with the forward margins of the tile forms for their rearward movements toward the conveyor.

The rocker arm 42 is carried on a fulcrum 45, and carries a push bar 46 for operation of
 15 the rock lever in its effective stroke, disposed in the path of projections 47 carried on the forward spider 14. A contractile coil spring 48 serves to move the rocker arm in its non-effective stroke.

For coaction with the feeding means I provide a form positioning element in the form of a freely rotatable retarder comprising radially disposed fingers 49, which com-
 20 prehend the paths of the tile spacing plates 36, and which are held thereby to control the "drop" of the forms, as best shown in Fig. 5.

By the means just described, the forms are placed on the lugs 37 and between each pair of the spacing plates 36 to comprise with the
 25 spacing plates a continuous bottom for the receptacle 35 and upon which the material (concrete) is supplied.

In the movement of the forms and spacing plates beneath the bed of material the bottom
 35 faces of the tile are shaped while concurrently therewith the ends of the tile are defined by the spacing plates.

For the shaping of the upper faces of the tile I employ a packer comprising a shaft 50
 40 upon which is detachably secured a plurality of radially disposed blades 51 whose outer, free, margins are shaped to the desired shape of the upper faces of the tile.

Immediately to the rear of the packer is a dam 52 which forms the rear end of the
 45 receptacle and whose lower margin is shaped to conform with the upper faces of the tiles, and which acts as a final shaping trowel for the tile as packed and initially shaped by the packer.

To vary the thickness of tiles the dam is vertically adjustable as by the adjustable
 50 hangers 53, as best shown in Fig. 5.

Supported over the train of forms as carried on the conveyor is a hopper 54, for con-
 55 taining a finish coating for the tile such as liquid cement, which may be colored if desired, and whose flow is controlled by a valve 55, and which operates to apply a continuous stream of finish coating to the shaped tile.

Immediately following the hopper is a final finishing trowel 56, which like the dam 52 is vertically adjustable as by hanger 57.
 60 Within the hopper 54 is an agitator 58 rotatable as by a sprocket gear 59 which includes

the power driven shaft 21 and the shaft 50 of the packer.

Immediately following the final finishing trowel 56 is a tile perforator comprising a
 70 pivotally supported arm 60 carrying at its forward, free end a cup 61 through whose bottom is extended one, or more, punch holders 62 formed as tubes and which hold, by set-
 75 screws 63, the punches 64, there being a groove, such as 65, in each punch body where- by liquid, water, may be fed to the function-
 ing portion of the punch bodies to prevent their sticking in the plastic tile. As best shown in Fig. 6, the arm 60 carries a finger
 80 66 arranged to be engaged and support the punches out of functioning position by a latch 67, with which latch is associated a releasing mechanism comprising a trigger 68 resident
 85 in the path of the conveyor and engageable thereby at intervals corresponding with the length of the tile forms. The trigger is constructed as a bell crank and includes an arm 68', which carries the recited latch 67, and from which arm is extended a lifter 68'' for
 90 the arm 60. The latch is eccentrically mounted to fall away from the finger 66 during a lifting of the arm 60, and the latch is automatically restored to arm supporting,
 95 or latching, position by engagement of its heel 67' with the trackway 34 when the conveyor releases the trigger 68.

The spring 69 is carried by the arm 60 and serves to cushion the drop of the perforating punches and serves with the latch to obviate
 100 vibrating of the arm 60.

Assuming the machine connected with power, a bed of prepared concrete in plastic form in the receptacle and a finish fluid in the
 105 hopper, and forms disposed in the conveyor, as best shown in Fig. 5, it will be obvious that the forms will be automatically fed and properly positioned on the conveyor, that the moving forms will each receive a charge of cement of uniform quantity and density and that the
 110 charge will be shaped and finished, automatically and continuously, with a minimum of manual effort.

Among the advantages of the construction of this present invention is that all of the elements which enter into the shaping of the
 115 tile may be removed and replaced to the end that the machine is readily adaptable to making differently shaped tile.

By reason of the track cleaning and form supporting elements 32, serving as form sup-
 120 ports between the supported ends of the forms, as upon the lugs 37, relatively light weight and inexpensive forms may be employed, and in addition to this advantage the elements 32 serve to carry the forms in a
 125 straight line beyond the path of the conveyor proper (as shown by dotted lines in Fig. 1) whereby the forms are readily converted to a second "carrying off" conveyor.

As best shown in Fig. 8 each of the rods 130

30, of the conveyor has at its one end a threaded connection with a cross-piece 26 and a nut at its other end for its securing to a link 28. This feature permits compensation for wear and affords maintenance of constant conveyor lengths so that, the partition plates 36 may be uniformly relatively spaced, at all times.

I claim:—

10 1. In a machine of the class described the combination of a conveyor, a normally open-bottomed receptacle, palettes supported by the conveyor to form a bottom for the receptacle, a packer, a dam, a trowel, and a perforating device.

15 2. In a machine of the class described, the combination of a conveyor, a normally open-bottomed receptacle, palettes supported by the conveyor to form a bottom for the receptacle, a packer, a dam, a trowel, a perforating device and means for automatically feeding the palettes to the conveyor.

20 3. In a machine of the class described, the combination of a conveyor, a normally open-bottomed receptacle, palettes supported by the conveyor to form a bottom for the receptacle, a packer, a dam, a trowel, and a perforating device, said conveyor having plates forming partitions between the forms as carried by the conveyor.

30 4. In a machine of the class described, the combination of a conveyor, a normally open-bottomed receptacle, palettes supported by

the conveyor to form a bottom for the receptacle, a packer, a dam, a trowel, a perforating device, and means for automatically operating the perforating device, at intervals corresponding with the palette lengths.

5. In a machine of the class described a conveyor comprising palette supporting and spacing elements, a receptacle whose bottom is formed by palettes carried on the conveyor, means for moving the conveyor and palettes relative to the receptacle, a packer comprising blades, means for moving the blades in a direction opposed to the movements of the palettes and a fixed trowel.

6. In a machine of the class described a conveyor comprising palette supporting and spacing elements, a receptacle whose bottom is formed by palettes carried on the conveyor, means for moving the conveyor and palettes relative to the receptacle, a packer, comprising blades, means for moving the blades in a direction opposed to the movements of the palettes and a fixed trowel, a hopper having a controllable outlet arranged over the palettes and a finishing trowel to the rear of the hopper.

7. In a machine of the class described, a palette conveyor comprising palette spacers, and means for adjusting connected elements of the conveyor for maintaining uniform distances between said spacers.

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