

June 19, 1928.

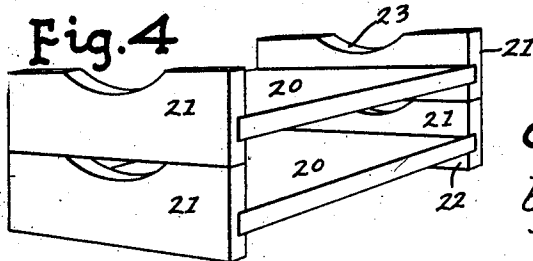
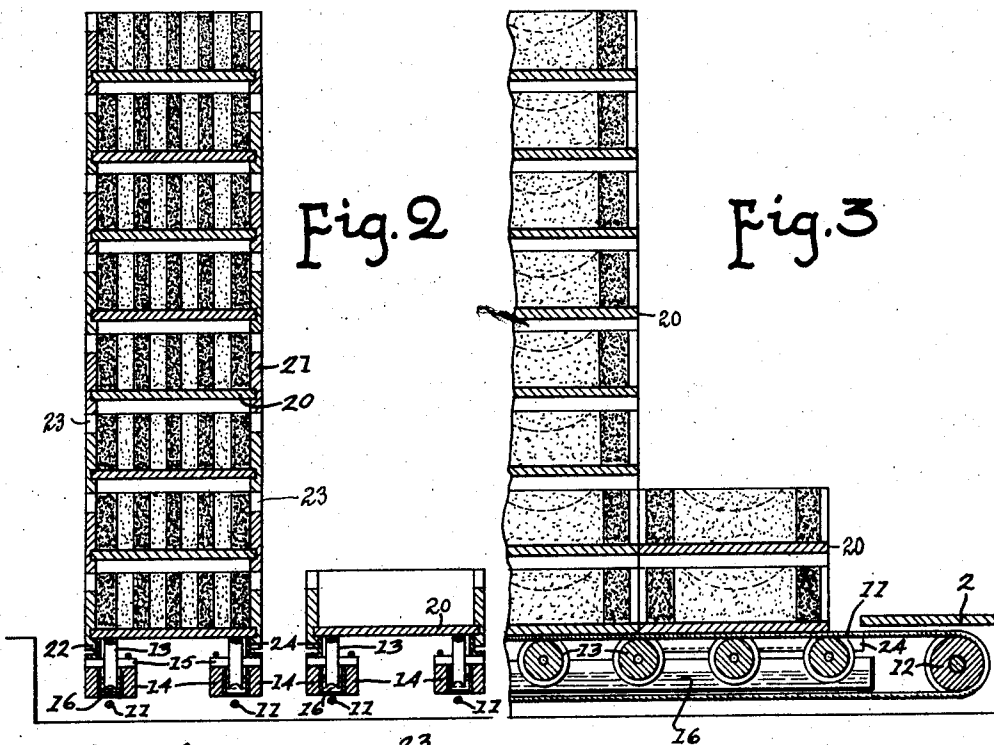
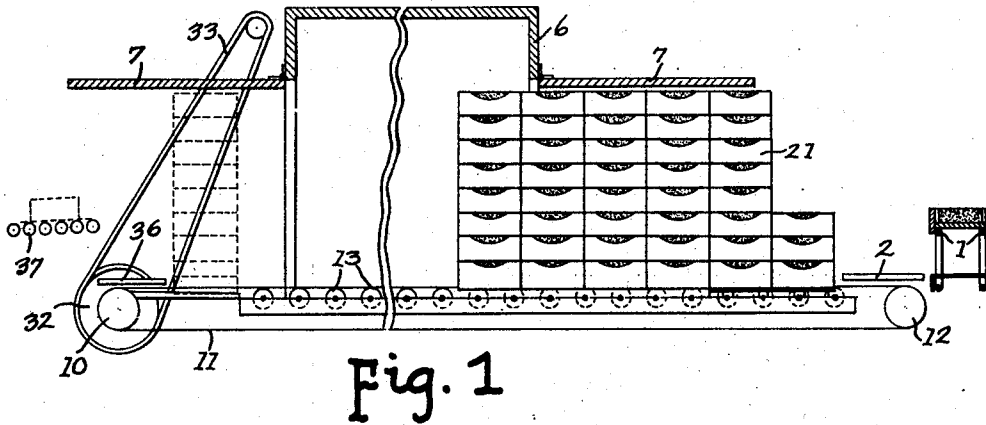
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C. M. EBERLING

CONCRETE MACHINERY

Filed Feb. 13, 1926

2 Sheets-Sheet 1



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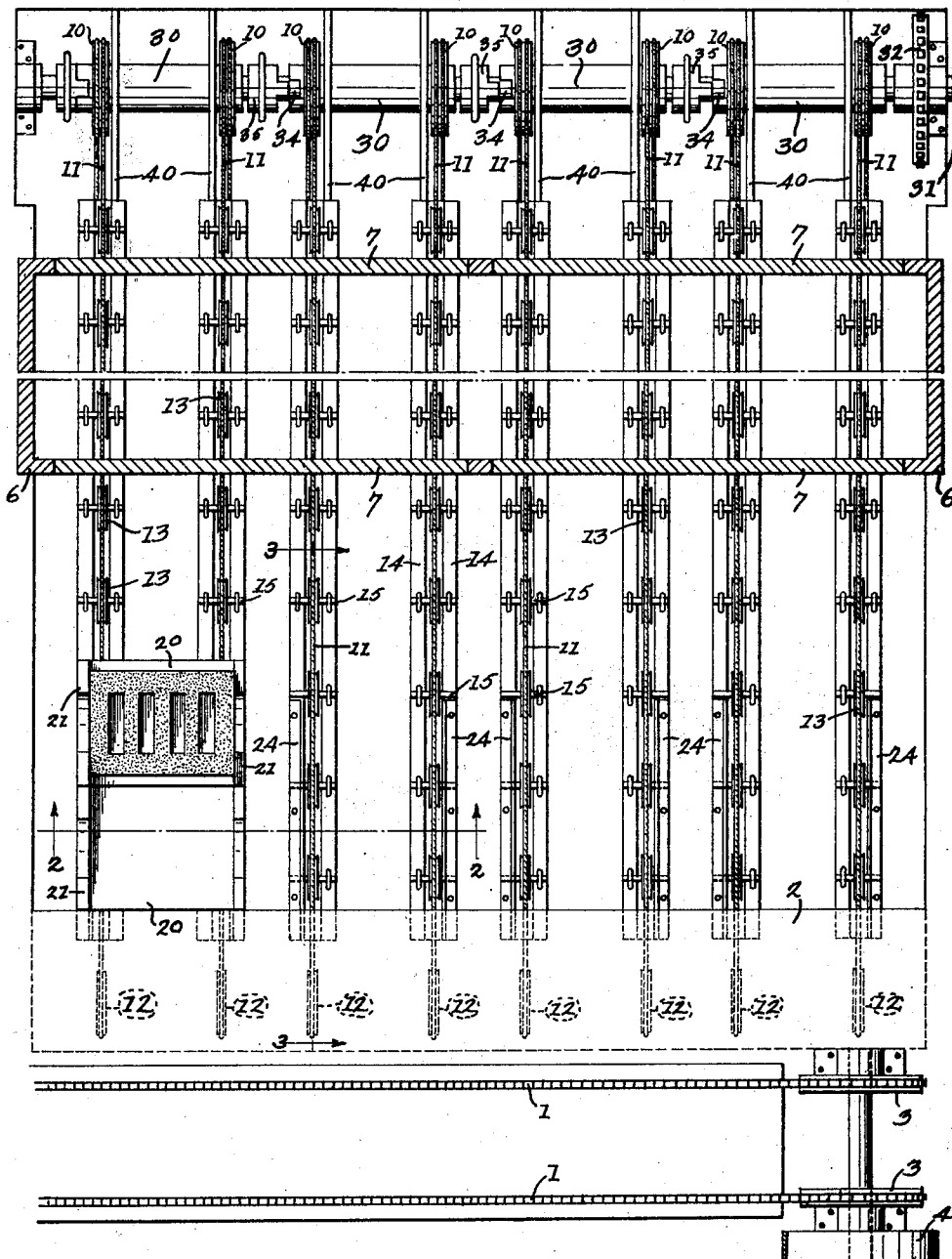


Fig. 5

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UNITED STATES PATENT OFFICE.

CHARLES M. EBERLING, OF CLEVELAND, OHIO, ASSIGNOR TO THE EBERLING MACHINES SALES COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

CONCRETE MACHINERY.

Application filed February 13, 1926. Serial No. 88,008.

This invention relates to concrete machinery and has especial reference to conveying mechanism for freshly moulded concrete articles. The objects of the invention are the provision of new and improved conveying mechanism whereby the fragile, newly-made, articles can be conveyed away from the point of manufacture to a curing place without injury by vibration or jarring; the provision of improved means for supporting and transporting and curing the articles, so as to save time, space, and labor; while further objects and advantages of the invention will become apparent as the description proceeds.

It has long been customary in the manufacture of clay brick to pile the freshly moulded bricks on wheeled cars running on rails and thereby convey the bricks into drying chambers called dry-kilns. It has long been known that concrete can be caused to set more quickly and produce a harder product if subjected to the action of wet steam. Attempts were naturally made to employ the existing mechanism used in brick making, steam being turned into the kilns, but the jarring and vibration produced by the trucks caused serious injury to the concrete, especially in case the design was at all delicate or thin walled. Clay products, being tough and generally thick-walled, would stand the jarring but concrete, especially the dry-pressed varieties made by tile-machines, was disintegrated unless made extravagantly thick in section and rich in cement. In order to make a low priced tile the ratio of cement to aggregate needs to be small; in order to stand the press operation the mixture must be handled rather dry; the requisite moisture being supplied by the steam; in order to save material, and to produce easily handled articles and also to enable ready hydration as well as to save freight and cartage costs it is desirable to make the articles cellular and thin walled; such an article exhibits ample strength after steaming for a few hours but prior to steaming it is very fragile and the usual conveying mechanism has been unable to handle it without excessive breakage.

The important feature of my invention is the use of a kind of flexible-cable conveyor running on closely spaced rollers and carrying the tiered pallets from the press to the curing kiln. For purposes of this application I have shown cellular building tile, although it applies to all moulded concrete articles.

Fig. 1 is a vertical sectional view through a concrete curing kiln equipped with my invention and illustrating the relation of the concrete press thereto; Figs. 2 and 3 are vertical sectional views corresponding to the line 2—2 and 3—3 respectively of Fig. 5; Fig. 4 is a perspective view of two empty pallets; and Fig. 5 is a top plan view of my improved transporting system showing the relation of the same to the kiln and to the concrete press.

The press may be of any suitable or desired type and is symbolized here by the horizontal off bearing chains or cables 1—1 which lead from the press mechanism (not shown) in horizontal direction past a platform or runway 2 on which a workman may stand to lift off the pallets as they are delivered by the rotation of the sprockets 3—3 produced by the belt wheel 4. Located upon the opposite side of the platform from the offbearing mechanism 1 and spaced a little distance therefrom is a curing kiln 6 which may be of any desired length and width depending upon the capacity of the press and is preferably provided with means (not shown) for the injection of steam or moisture. I have shown the two sides of the kiln as provided with hinged doors 7—7 which can be opened to permit the insertion and removal of the concrete articles, or closed to retain the heat and moisture. Supported upon the farther side of this kiln with their axes horizontal and preferably in line are a plurality of spaced rollers or sheaves 10—10 having cables 11 wrapped therearound. Companion wheels or sheaves 12—12 are located beneath the platform 2, one for each of the sheaves 10 and in the same plane therewith and each of the cables is looped about such companion sheave. The arrangement is such that the upper runs of

all these cables are substantially horizontal, and in the same plane. Underneath each of these runs of cable are located a plurality of spaced grooved rollers 13 adapted to support the same at frequent intervals and prevent the same from sagging. According to a very simple mode of construction a pair of spaced rigid rails 14—14 are supported, one at each side of the vertical plane which contains the cable 11, and to these rails are rigidly secured the transverse horizontal studs 15 on which these supporting rollers 13 are journaled. In order to lubricate the bearings an oil trough 16 is preferably provided between each pair of rails into which the bottom part of each roller projects.

The concrete articles are delivered from the press on suitable pallets, which preferably consist of flat rectangular boards 20 having upright end pieces 21—21 of sufficient height to shield the concrete when successive pallets are stacked one above the other. Each of these end pieces preferably extends below the board 20 as shown in Figs. 2 and 4 so as to depend beneath the supporting cables in guiding relation as shown at 22, and the upper edge of each end piece is preferably notched as shown at 23 to enable the insertion of the workman's fingers. In order to center these pallets upon the cables I have shown short lengths of angle iron 24 fastened to the rails at the loading end, their upstanding flanges fitting within the depending edges of the end-boards. The pallets are preferably piled to about four feet high which is about as far as a workman can conveniently lift the weight. The distance between adjacent supporting rollers is preferably not greater than half the width of the pallets so that there may be no swaying or shaking.

The cables are driven by rotating the sheaves 10, and a great many arrangements to this end may be employed. I have shown herein a preferred arrangement whereby the sheaves are coupled together in pairs and these pairs driven selectively. To this end the sheaves are secured to hollow sleeves 30 rotatably sleeved on the drive shaft 31 which in turn is rotated by the sprocket 32 and chain 33. One end of each sleeve is notched as at 34 for the engagement of a clutch spool 35, slidably mounted on the shaft but compelled to rotate therewith by a key or spline. Preferably I couple only one sleeve to the shaft at a time, and rotate the same continuously at such a speed that each tier will have moved just far enough while being built up to permit a new tier to be started between it and the platform. As soon as the first tier reaches the far side of the kiln, the power is shifted to the next pair of cables. When it is desired to empty the kiln the same procedure is followed further, the pallets being drawn beyond a kiln to a platform 36 on

which the workmen stand to remove the articles from the pallets and place them on suitable conveyors 37 by which they are transported to loading or storage stations (not shown) while the empty pallets are returned to the press. In order to prevent overdrawing of the pallets I have shown inclined friction rails 40 at the discharge end on which the same come to rest.

I do not restrict myself to any of the details of construction herein shown but claim my invention broadly as set forth in my annexed claims.

Having thus described my invention what I claim is:

1. The combination with a concrete curing kiln, of a plurality of rows of rollers leading from a point without to a point within said kiln, all the rollers having their axes horizontal and parallel, the rollers of each row being spaced apart and having their planes in line, endless cables lying on said rollers, one cable to each row, means for moving said cables, equally in pairs, pallets adapted to lie on said cables, each pallet being of a length to engage simultaneously a pair of cables, and guiding means at the loading end to center said pallets on the respective pairs of cables.

2. The combination with a concrete curing kiln, of a plurality of pairs of spaced parallel horizontal rails extending into said kiln, spaced, parallel, horizontal, transverse studs carried by said rails, grooved rollers journaled on said studs, said rollers arranged in rows and the rollers of each row having their grooves in line, terminal rollers at each end of each row, endless cables looped around said terminal rollers and having their upper runs lying in the grooves of the first named rollers, the lower runs of said cables being located below said first rollers, and power connections for revolving said terminal rollers in pairs, selectively.

3. The combination with a kiln for concrete articles of a plurality of cable conveyors extending horizontally therethrough, pallets resting on said cables adapted to receive pressed concrete articles, guides for said apparatus located symmetrically as regards said cable conveyors and supporting rollers for said cables spaced apart a distance not greater than about one-half the width of a pallet.

4. In concrete machinery, a pallet comprising a flat supporting element, parallel depending members extending below the lower surface of the same adapted to overlap the carrying members of a cable conveyor in anti-shifting relation, and parallel upstanding members projecting above the upper surface of the same adapted to elevate a superposed pallet out of contact with articles thereon.

5. In concrete machinery, a conveyor for

concrete articles comprising a pair of parallel horizontally spaced flexible cables, means for pulling said cables horizontally, spaced rollers engaging the bottoms of said
5 cables in supporting relation, guiding means adjacent to said cables at certain points, and pallets adapted to overlap said cables, each
pallet comprising a flat supporting element and depending end piece adapted to overlap said cables and cooperate with said guiding 10 means.

In testimony whereof I hereunto affix my signature.

CHARLES M. EBERLING.