

(No Model.)

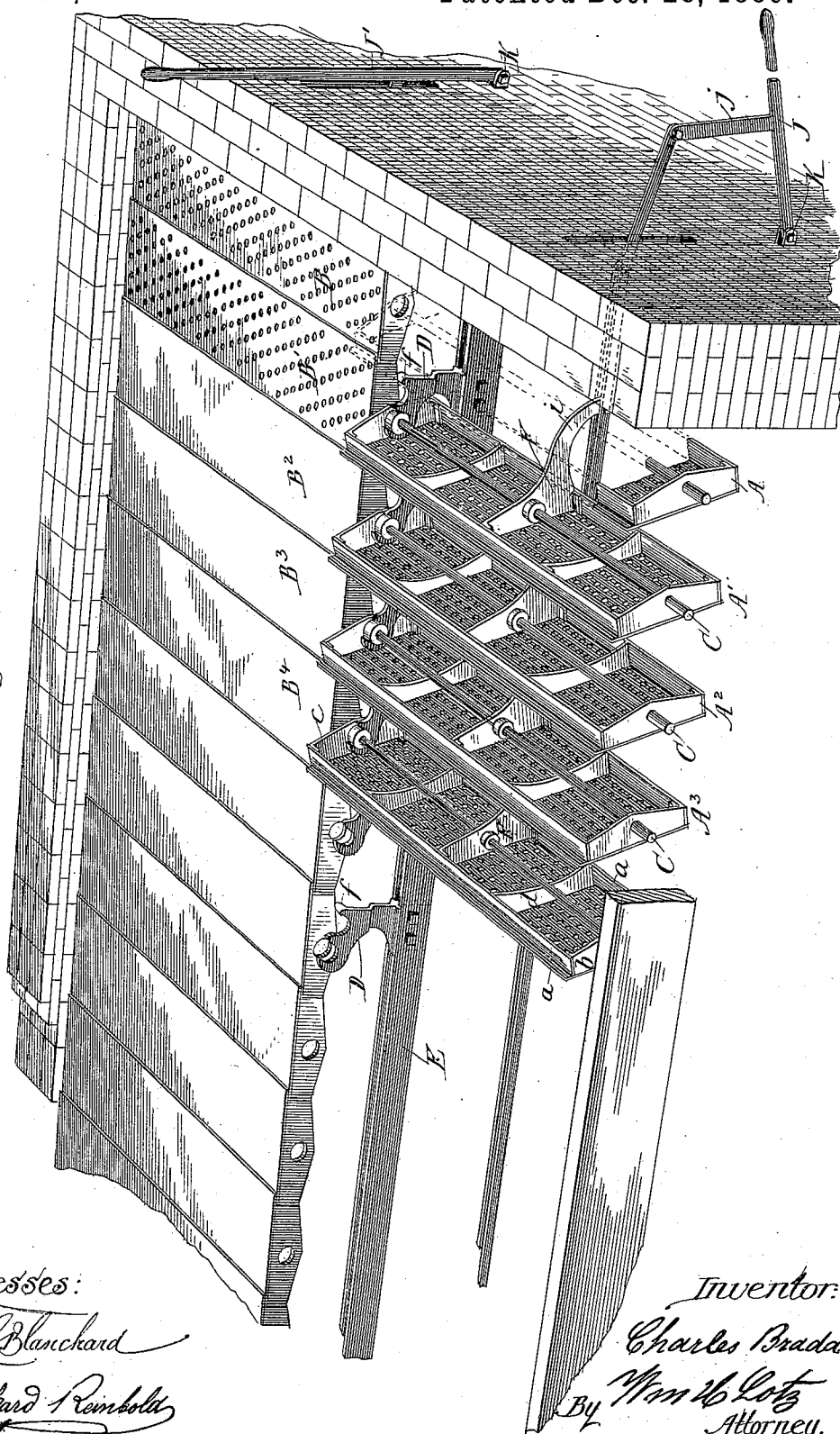
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C. BRADA.  
MALT DRIER.

No. 355,128.

Patented Dec. 28, 1886.

Fig. 1.



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Fig. 2.

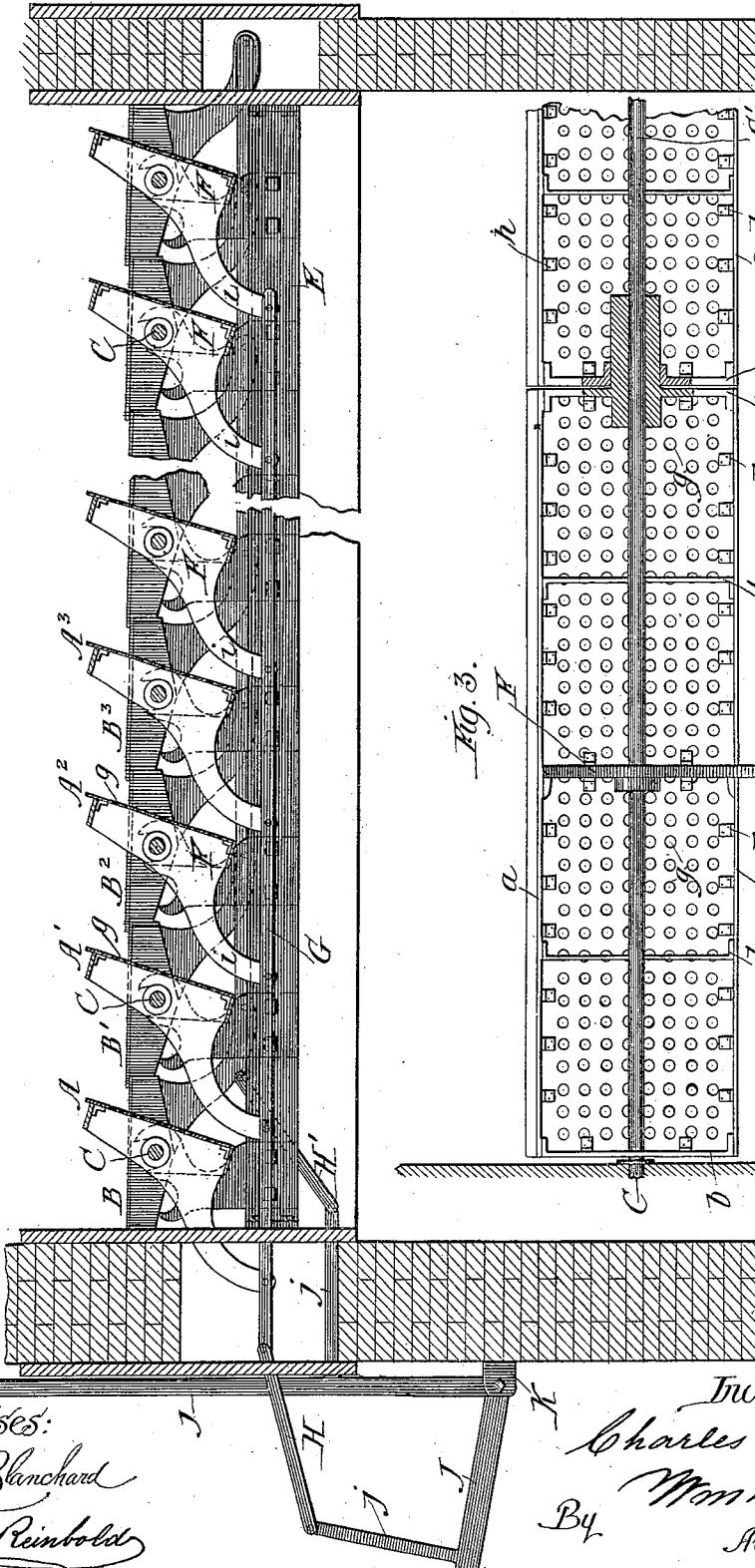
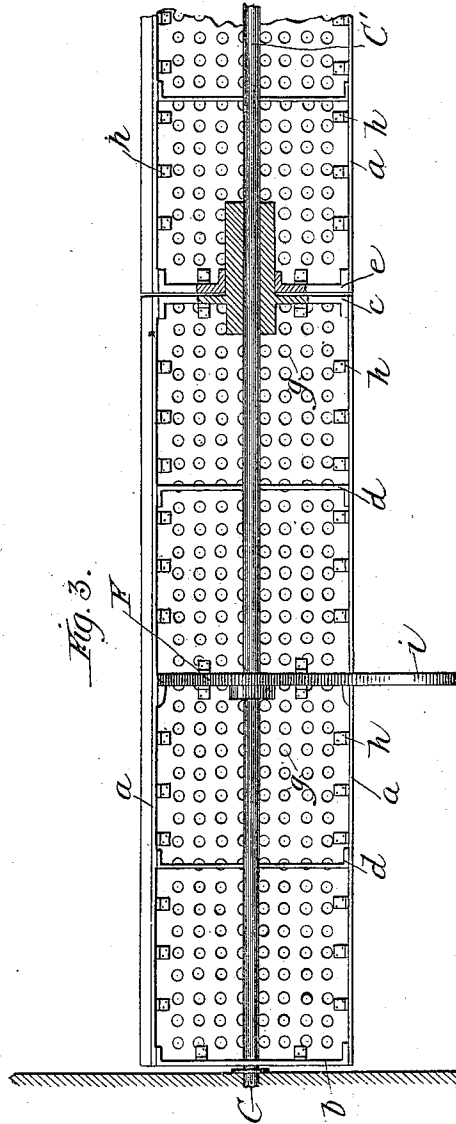


Fig. 3.



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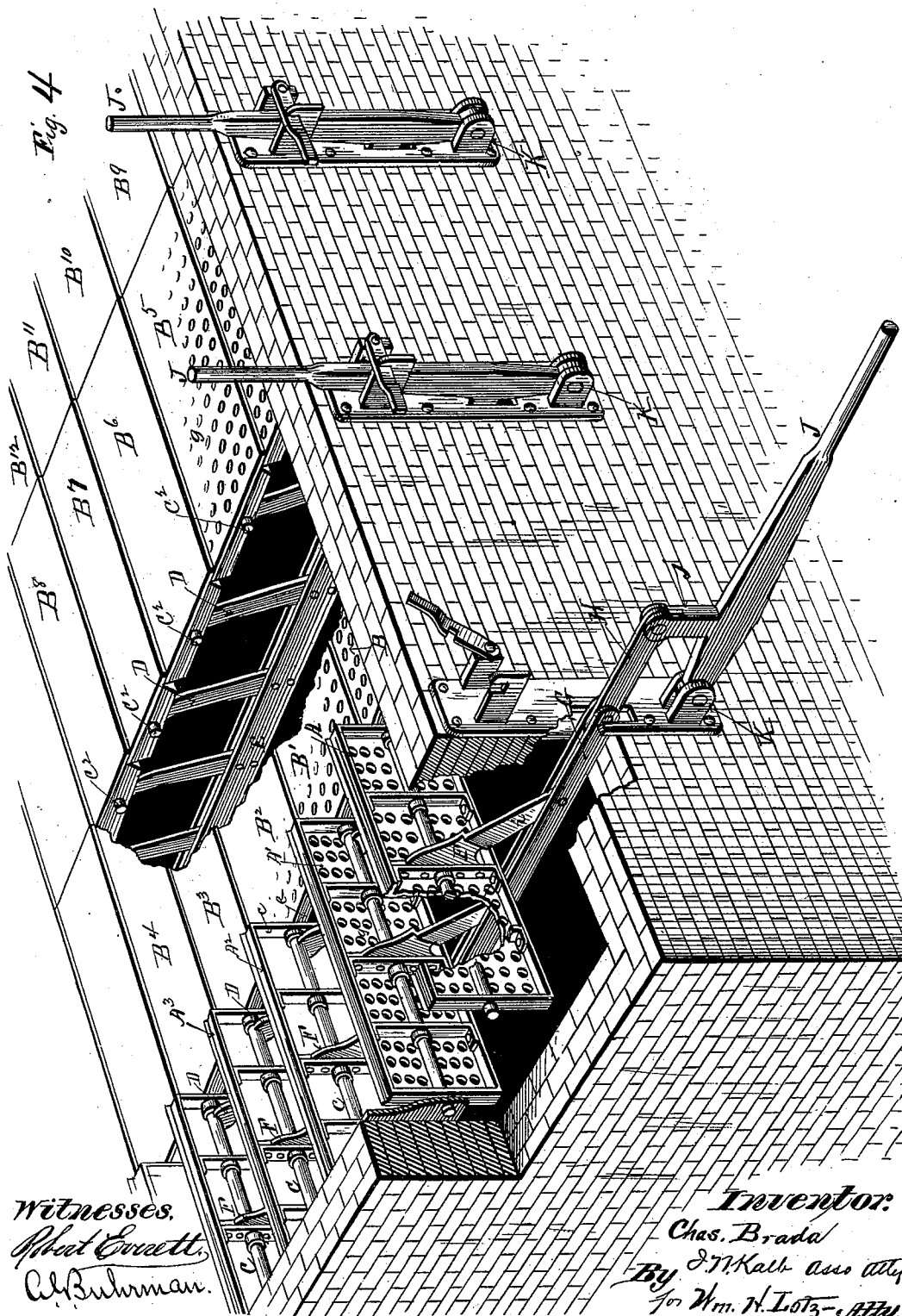
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3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

CHARLES BRADA, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO  
FRITZ GOETZ, OF SAME PLACE.

## MALT-DRIER.

SPECIFICATION forming part of Letters Patent No. 355,128, dated December 28, 1886.

Application filed October 23, 1885. Serial No. 180,687. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES BRADA, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Malt-Kilns, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to the class of malt-kilns or grain-driers in which several floors are arranged one above the other, each floor being composed of a series of oblong sections pivotally supported in the manner like blind-slats, to be tilted simultaneously for unloading a floor by precipitating the malt or grain spread thereon onto the next lower floor, whereby such malt is turned and hand-shoveling is rendered unnecessary.

Prior to my invention the several tilting trays or sections of sectional malt-kiln floors have been formed of a length to respectively extend from one side wall to the opposite side wall of the kiln, the rock-shafts upon which said sections have been secured and supported being extended through and beyond one of the side walls of the kiln and provided at their said extended ends with cranks, which are connected together in order that all of the sections may be simultaneously tilted.

In practice the length of each section has prior to my invention varied from twenty to fifty feet, and, owing to such great length and to the torsional strain to which the sections are subjected when they are turned or tilted about the axes of their allotted rock-shafts, and particularly when they are loaded with grain and turned or tilted for the purpose of dumping the same, the trays or sections become so twisted as to render it necessary not only to straighten them out, but to re-cover them. This involves a large expense, since, in addition to the labor involved, the covering, which usually consists of finely-perforated sheet metal, is expensive.

The principal object of my invention is to avoid such twisting of the sections of a malt-kiln floor, to relieve the same from the torsional strain to which they have prior to my invention been subjected, and to further provide means whereby the sections can be tilted with greater ease.

To the attainment of such ends my invention consists in a sectional malt-kiln floor divided transversely into two or more series of tilting sections, each series being separate from and independent of the adjacent series, with separate operating means for each series, in which way the sectional floor can be subdivided into a number of short tilting sections, which, on account of their comparative shortness in length, are not liable to twist under torsional strain.

My invention further consists in certain matters of combination, construction, and arrangement, hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 represents a sectional perspective view of one of a series of malt-kiln floors; Fig. 2, a sectional side elevation of the same, and Fig. 3 a bottom view of one of the series of tilting sections of which each floor is composed. Fig. 4 represents in perspective a portion of a dumping-kiln embodying the principles of my invention, and is particularly shown to indicate the kiln-floor constructed with several series of tilting sections, some of which are, for convenience, shown imperforated, it being understood, however, that all will be perforated. In said figure a corner portion of the wall of the kiln and also portions of some of the tilting sections are, for convenience, illustrated broken away.

Corresponding letters in the several figures of the drawings designate like parts.

In said drawings, wherein, in Figs. 1, 2, and 3, but two series of tilting sections are illustrated, the floor is transversely divided into two or more series of tilting sections,  $A A' A^2$  and  $B B' B^2$ , each series being connected to be tilted independently of the other series, whereby the several sections are shortened to be lighter, stiffer, and better self-sustaining for the load of grain or malt placed thereon than where such sections are made to reach the entire width of the building. Each such section  $A$  or  $B$  may be of any desired construction. For example, it may consist of a rectangular frame composed of two flat iron side bars,  $a$ , connected by riveting between them end bars,  $b$  and  $c$ , and intermediate brace-bars,  $d$ , that have rectangularly-bent ends. Each such frame

has secured upon it a plate, *g*, of perforated and galvanized sheet metal, by small angle-plates *h*, that are riveted to both the frame-bars *a*, *b*, and *c*, and to plates *g*. These plates *g* are projecting, with one edge a short distance beyond the edge of the frame, so as to overlap the next adjoining section and to cover the joint between the two section-frames.

A shaft, *C*, is passed through a central eye in end bar, *b*, and into a long hub of end bar, *c*, into which also enters the end of shaft *C'* of the abutting section *B* of the adjoining series, the end bar, *c*, of which has a hub of sufficient size bore to be sleeved upon hub of bar *c*. The outward ends of shafts *C* and *C'* are pivoted or journaled in suitable supports, while the hubs of end plates, *c*, that hold the abutting ends of such shafts, are pivotally supported in bearings formed at the upper extremities of curved brackets *D*, that are riveted or otherwise rigidly secured to a longitudinal girder, *E*, which may be formed, as shown, of two iron bars, placed on edge, between which the brackets *D* are bolted or riveted, and which, with their ends, rest in the end walls of the building. Each bracket *D* also has a side lug, *f*, forming a stop or support for each section *A* or *B* when on a horizontal position.

Each section is provided at a point intermediate of its ends with a pendent arm, *F*, conveniently formed by a plate having flanged portions, which can be secured by bolts or rivets to the side bars of the tilting-section frame. Each such plate *F*, thus forming an additional brace-bar, has a hub through which the shaft *C* or *C'* is passed and secured therein, and has a curved or angular portion, *i*. The ends of all the arms *F* of a series of sections, *A A' A''*, and so on, or *B B' B''*, and so on, are pivotally connected with a reciprocating bar, *G*, which can be divided longitudinally or composed of two parts, in order to permit the lower ends of said arms to be received and pivotally held between its two parts or divisions. One of these reciprocatory bars *G* is provided for each series of tilting sections, and each bar is by a link, *H*, connected to the rectangular arm *j* of a lever, *J*, the end of which is pivoted in a wall-bracket, *K*. When this lever *J* is in its vertical position, all the sections *A A' A''*, &c., coupled therewith will be on a horizontal position, forming an unbroken level floor; but by swinging the lever nearly a quarter-turn downward the row of sections will be turned more than a quarter-revolution, to occupy, with their sheet-metal faces, an oblique downward position, thereby throwing off every corn of grain thereupon. A hook or other suitable locking device may be fixed to the wall for rigidly securing each lever *J* on its vertical position, and thereby preventing the tilting of the sections.

The advantages of the above, as compared with former constructions of tilting malt-floors, will be readily seen. In the first place, a floor thus composed of short sections arranged trans-

versely in two or more series, as shown, is more substantial, and then, again, while the sections can be tilted more than a quarter-turn, the operation of such tilting requires less time and manual labor.

It is obvious that, while but two series of tilting sections are herein shown, three or more of such series could be provided without further invention or experiment, and, in fact, more than two series will, in practice, usually be used; hence, while in Figs. 1, 2, and 3 I have shown but one beam or girder *E* arranged transversely to the axes of the tilting sections, and have shown the rock-shafts of one series supported in a wall-plate at one side wall of the kiln, and the rock-shafts of the other series similarly supported at one end, the beams or girders *E* can be duplicated or multiplied, according to the number of series of sections employed. Thus, if more than two series of tilting sections are provided, the tilting section, herein shown supported by the rod or shaft *C'*, can at one end have a hub similar to the hub of plate *c* of the adjacent tilting section and adapted to receive both the shaft *C'* and the shaft of a third tilting section, and so on.

It is understood that while the arrangement of rods or rock-shafts *C C'* herein shown constitutes efficient means for permitting the desired rocking or tilting motion of the floor-sections other ways of pivoting or journaling the tilting sections could be adopted without departing from my invention, and that, irrespective both of said particular devices and of the devices for operating the sections, I desire to broadly cover the feature of a sectional malt-kiln floor divided transversely into two or more series of tilting sections, each series being separate from and independent of the adjacent series, with any suitable separate means for tilting the sections of one series independently of the sections of the adjacent series.

Fig. 4 represents portions of four series of tilting sections in accordance with the principles of my invention, and hence fully illustrates the way in which a malt-kiln floor can be divided up into any desired number of independent series of tilting sections, the sections of the first two series being lettered as in Fig. 1, while the sections of the remaining series are indicated as *B<sup>5</sup> B<sup>6</sup> B<sup>7</sup> B<sup>8</sup>* and *B<sup>9</sup> B<sup>10</sup> B<sup>11</sup> B<sup>12</sup>*, with the rods of the second series denoted by *C<sup>2</sup>*.

What I claim is—

1. In a malt-kiln, a sectional floor divided transversely into a plurality of series of tilting sections, each series being separate from and independent of the adjacent series, combined with separate operating means, substantially as described, for each series, substantially as set forth.

2. A malt-kiln floor having a series of tilting sections, each provided at a point intermediate of its ends with a pendent arm, com-

bined with a reciprocatory bar connecting together said pendent arms, and means, substantially as set forth, for reciprocating said bar.

5 3. The sectional floor of a malt-kiln divided transversely into a plurality of separate and independent series of tilting sections, combined with separate operating devices, one  
10 for each of said series, said operating devices being connected with the tilting sections at points intermediate of the ends of the latter, substantially as and for the purpose described.

4. The sectional floor of a malt-kiln divided  
15 transversely into a plurality of separate and independent series of tilting sections, each tilting section being provided with a pendent arm, combined with a set of reciprocatory bars for tilting the said sections and levers for actuating said bars, each reciprocatory bar being

connected with the pendent arms of the tilting sections of but one series of said sections, substantially as described. 20

5. A sectional malt-kiln floor divided transversely into a plurality of separate and independent series of tilting sections, combined  
25 with supports, substantially as described, for upholding said sections where the ends of the sections of one series are in opposition to the ends of the next adjacent series, and separate operating means, substantially as described, 30 for each series, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES BRADA.

Witnesses:

RICHARD REINBOLD,  
FRANK S. BLANCHARD.