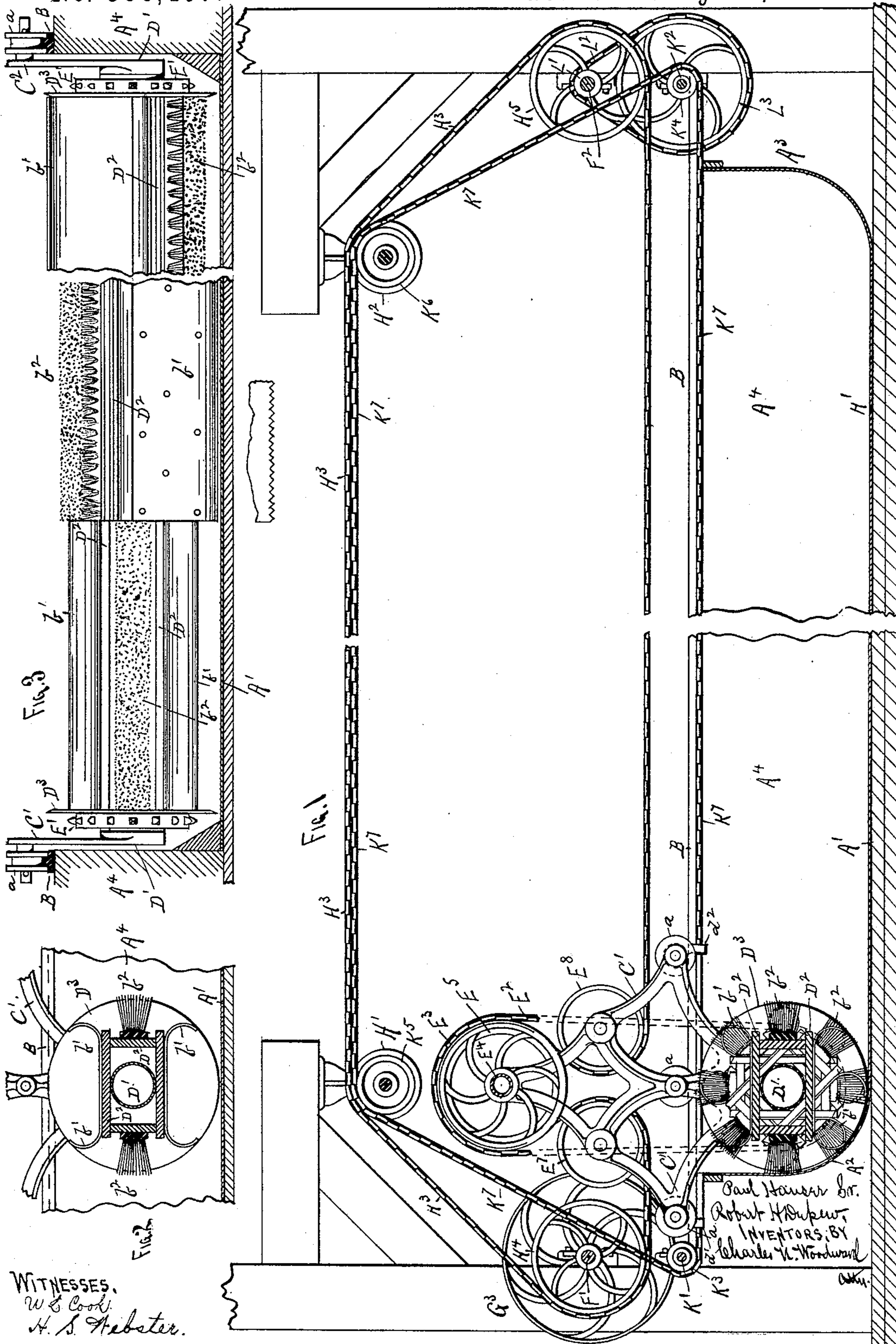


2 Sheets—Sheet 1.

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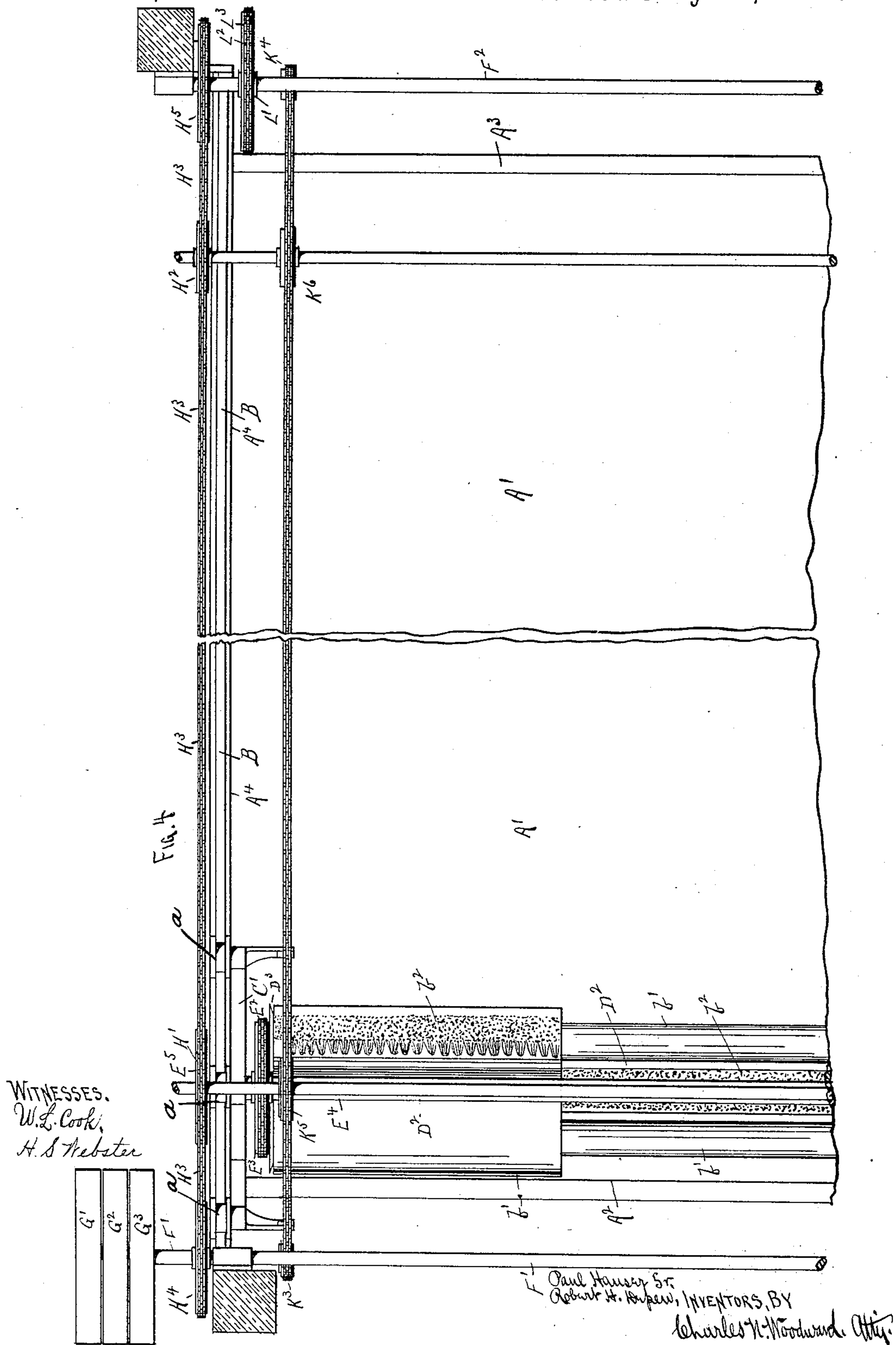
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P. HAUSER, Sr. & R. H. DEPEW.  
MALT TURNING APPARATUS.

No. 386,467.

Patented July 24, 1888.



# UNITED STATES PATENT OFFICE.

PAUL HAUSER, SR., AND ROBERT H. DEPEW, OF ST. PAUL, MINNESOTA.

## MALT-TURNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 386,467, dated July 24, 1888.

Application filed October 5, 1887. Serial No. 251,505. (No model.)

*To all whom it may concern:*

Be it known that we, PAUL HAUSER, Sr., and ROBERT H. DEPEW, both citizens of the United States, and both residing at St. Paul, in the county of Ramsey and State of Minnesota, have jointly invented certain new and useful Improvements in Malt-Turning Apparatus, of which the following is a specification.

This invention relates to machines or apparatus for turning malt in malt houses, kilns, and similar locations; and it consists in the construction, combination, and arrangement of parts, as hereinafter shown and described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a sectional side elevation. Fig. 2 is a cross-sectional view on the line X X of Fig. 4. Fig. 3 is a sectional detail of one end of the armed turning roller and brush, illustrating more fully the details of the construction. Fig. 4 is a plan view of one side of the apparatus.

A' represents the floor of the malt house or kiln, having curved upturned ends A<sup>2</sup> A<sup>3</sup>, and with tracks B along the upper edges of its sides A<sup>4</sup>. Only one of the sides A<sup>4</sup> is shown in Fig. 4, but the two sides will be precisely alike, and will each be provided with its own track B, as shown in Fig. 3.

C' C<sup>2</sup> represent frames suspended from the tracks B by grooved rollers a, and adapted to support a shaft, D', preferably formed of gas or other tubing to secure strength and lightness. Each of the tracks will be provided with one of the frames C' C<sup>2</sup>, so that each end of the shaft D' will be properly supported and adapted to be carried back and forth over the floor A', when the frames C' C<sup>2</sup> are moved back and forth along the tracks B. Surrounding this shaft D' is an oblong boxing or frame, D<sup>2</sup>, in sections, the long sides of the sections armed with curved sheet-iron or steel blades b' and the shorter sides armed with brushes b<sup>2</sup>. The edges of the blades b' do not quite touch the floor A' when the shaft D' is revolved; but the brushes are adapted to run in contact with the floor, so that the thin layers of the malt which the blades fail to reach will be swept up by the brushes.

The sections of the armed boxing D<sup>2</sup> will be arranged in progressive positions, so that the blades will act one at a time upon the malt

and lift a small portion at a time, no two of the blades being in operation at the same time. By this means the strains upon the shaft are greatly reduced; hence a longer shaft may be employed without a center support.

Upon each end of the shaft D' is a disk, D<sup>3</sup>, and between these disks and the sides A<sup>4</sup> of the floor A' is a chain-sheave, E', connected by a chain, E<sup>2</sup>, to another chain-sheave, E<sup>3</sup>, on a shaft, E<sup>4</sup>, connecting the upper ends of the frames C' C<sup>2</sup>. On the ends of the shaft E<sup>4</sup>, outside the frames C' C<sup>2</sup>, are sheaves E<sup>5</sup>, and on the frames C' C<sup>2</sup> below the sheaves E<sup>5</sup> are idler-sheaves E<sup>7</sup> E<sup>8</sup>.

F' F<sup>2</sup> are two main shafts journaled to the frame or walls of the building in which the apparatus is erected, and one of these adapted to be driven by belts running over pulleys G' G<sup>2</sup> G<sup>3</sup>, (see Fig. 4,) the central pulley, G<sup>2</sup>, being loose upon the shaft F' and the belt running over the pulley G<sup>3</sup> being crossed, the mechanism being precisely the same as that employed in the ordinary metal-planing machines and adapted to reverse the shaft F' at regular intervals, as hereinafter shown.

H' H<sup>2</sup> represent two hanger pulleys or sheaves adapted to support a chain, H<sup>3</sup>, which passes over these hanger-sheaves, thence around sheaves H<sup>4</sup> H<sup>5</sup> on the shafts F' F<sup>2</sup>, and thence around sheaves E' E<sup>5</sup> E<sup>8</sup>, as shown, so that when the shaft F' is revolved the chain H<sup>3</sup>, acting through the sheaves and chains, transmits its motion to the shaft D', carrying the blades b' and brushes b<sup>2</sup>.

Journaled upon the frame or walls of the building containing the apparatus are two shafts, K' K<sup>2</sup>, similar to and beneath the shafts F' F<sup>2</sup> and carrying small chain-sheaves K<sup>3</sup> K<sup>4</sup>, as shown.

Upon the shafts of the hanger-pulleys H' H<sup>2</sup> are two other hanger-sheaves, K<sup>5</sup> K<sup>6</sup>, in line with the sheaves K<sup>3</sup> K<sup>4</sup>. A chain, K<sup>7</sup>, is connected by one end, at d', to the lower part of the frame C', and passes around the sheave K<sup>3</sup>, thence over the sheaves K<sup>5</sup> K<sup>6</sup>, and thence around the sheaves K<sup>4</sup>, and thence to the frame C', where it is connected at d<sup>2</sup> by its opposite end.

On the shaft F<sup>2</sup> is a small chain-sheave, L', connected by chain L<sup>2</sup> to a sheave, L<sup>3</sup>, on the shaft K<sup>2</sup>, by which the motion may be trans-

mitted from the shaft  $F^2$  to the shaft  $K^2$ . By this simple construction the revolution of the shaft  $F'$  in one direction will cause the shaft  $D'$  to be revolved, and at the same time, by reason of the arrangement of the sheaves, the frames  $C'$   $C^2$ , carrying the shaft  $D'$ , will be drawn backward and forward along the tracks  $B$  and cause the revolving blades  $b'$  and brushes  $b^2$  to elevate and turn the malt or other material on the floor  $A'$ .

The reversing mechanism will be so arranged as to reverse the shaft  $F'$  and the mechanism connected with it. When the shaft  $D'$  carrying the blades and brushes has reached the curved ends  $A^2$   $A^3$ , as shown in Fig. 1, shaft  $F$  is reversed, reversing the other mechanism and causing the revolving armed shaft to travel back and forth across the floor  $A'$  and pick up all of the malt and turn it over twice during each complete stroke or travel of the shaft. Every particle of the malt is thus acted upon equally; hence there will be no variation in its condition or treatment, which generally occurs when operated by hand.

The shaft  $D'$  will be arranged to be revolved in the direction opposite to the travel of the frames  $C'$   $C^2$  on the tracks, so that the malt will be more readily and thoroughly gathered up by the blades and brushes.

The blades  $b'$  may be serrated to break the sprouts loose from the kernels, and a detached section of a portion of one of the blades thus serrated is shown beneath Fig. 3.

The malt is turned evenly and regularly, and the kernels are separated so as to allow the steam and hot air to be dissipated.

The machines run with very little attention, thereby requiring fewer operatives than when the malt is treated in the ordinary manner.

When the machines are operated in kilns, the temperature will be so high that ordinary lubricants cannot be employed upon the bearings, and under such circumstances the bearings must be arranged to run in rawhide, corn-cob, or other bearings requiring no liquid lubrication.

Having thus described our invention, what we claim as new is—

1. In a malt-turning apparatus, the combination, with a malt-floor, of a transverse shaft provided with means for drawing it over the floor, from one end to the other, and with means for revolving it, rectangular box-sections secured upon said shaft, blades formed with flat central portions and with upturned and curved ends or edges and secured with said flat central portions to the wide sides of said box-sections, and brushes secured to the narrow sides of said box-sections, substantially as described.

2. In a malt-turning apparatus, the combination, with a malt-floor, of a transverse shaft

provided with means for drawing it over the floor, from one end to the other, and with means for revolving it, rectangular box-sections secured upon said shaft in progressive positions, or with their faces in spiral lines around said shaft, blades formed with flat central portions and with upturned and curved ends or edges and secured with said flat central portions to the wide sides of said box-sections, and brushes secured to the narrow sides of said box-sections, substantially as described.

3. In a malt-turning apparatus, the combination, with a floor having tracks upon its sides, upright frames traveling upon said tracks and provided with means for drawing them from one end of the tracks to the other, and a turning roller journaled with the ends of its shaft in the lower portions of said frames, of transverse shafts  $F'$   $F^2$  at the ends of the floor, pulleys  $H^4$   $H^5$  upon said shafts, guide-pulleys  $H'$   $H^2$  above said pulleys, a transverse shaft,  $E^4$ , journaled in the upper portions of the frames  $C'$ , pulleys  $E^3$  and  $E^5$  upon said shaft, guide-pulleys or idlers  $E^7$   $E^8$  upon the frames  $C'$ , chains  $E^2$ , passed around pulleys  $E^3$  and around pulleys upon the roller-shaft, and chains  $H^3$ , passed around the pulleys  $H^4$   $H^5$ , around the guide-pulleys  $H'$   $H^2$ , around the idler-pulleys, and around the pulleys  $E^5$  upon the shaft of the carriage, substantially as described.

4. In a malt-turning apparatus, the combination, with a floor having tracks upon its sides, upright frames traveling upon said tracks, and a turning roller journaled with the ends of its shaft in the lower portions of said frames, of a transverse drive-shaft,  $F'$ , at one end of the floor, pulleys  $H^4$  upon said shaft, a corresponding transverse shaft,  $F^2$ , at the other end of the floor, pulleys  $H^5$  upon said shaft, pulleys  $L'$  upon said shaft, transverse shafts  $K'$   $K^2$  at the ends of the floor, pulleys  $K^3$  and  $K^4$  upon said shaft, pulleys  $L^3$  upon said shaft  $K^2$ , chains  $L^2$ , passed around pulleys  $L^3$  and  $L'$ , guide-pulleys  $H'$   $K^5$  and  $H^2$   $K^6$  above the floor, chains  $K^7$ , secured to the frames  $C'$  and passed around the pulleys  $K^3$   $K^4$  at the ends of the floor and over the guide-pulleys  $K^5$   $K^6$ , and chains  $H^3$ , passed around the drive-pulleys  $H^4$ , over the guide-pulleys  $H'$   $H^2$ , around the pulleys  $H^5$  and around pulleys in the frames, which pulleys drive the turning roller, substantially as described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

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ROBERT H. DEPEW.

Witnesses:

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