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R. E. BAKER ET AL.

CONVEYER

Filed March 28, 1921

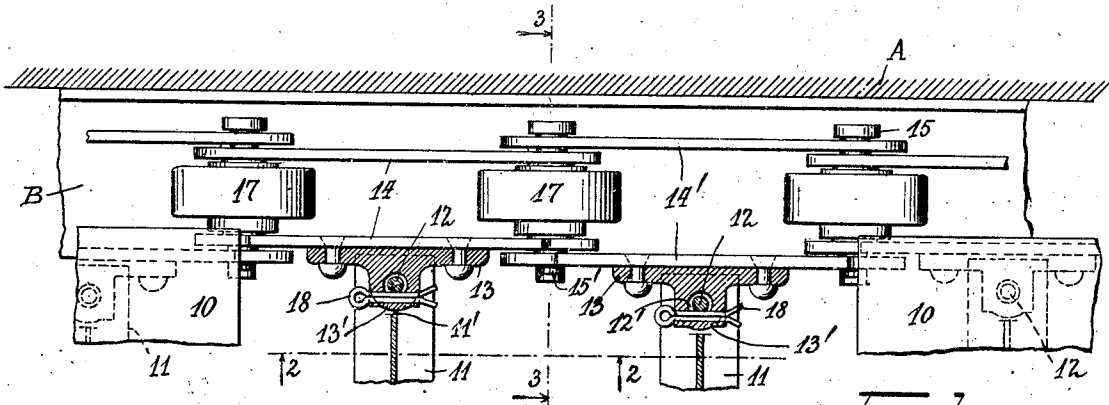


Fig. 1.

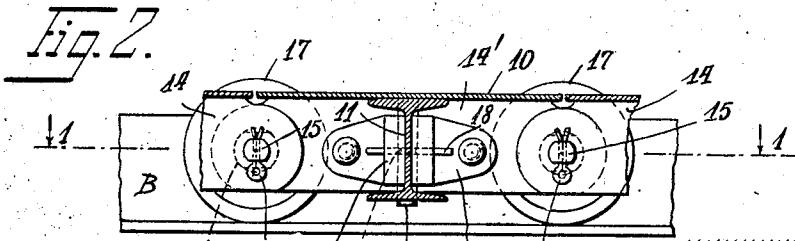


Fig. 2.

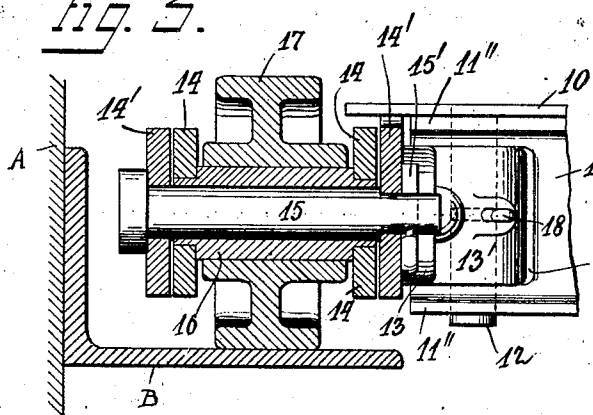


Fig. 3.

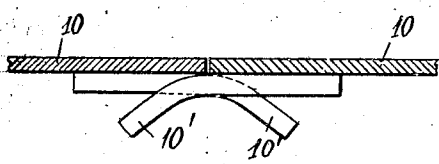


Fig. 4.

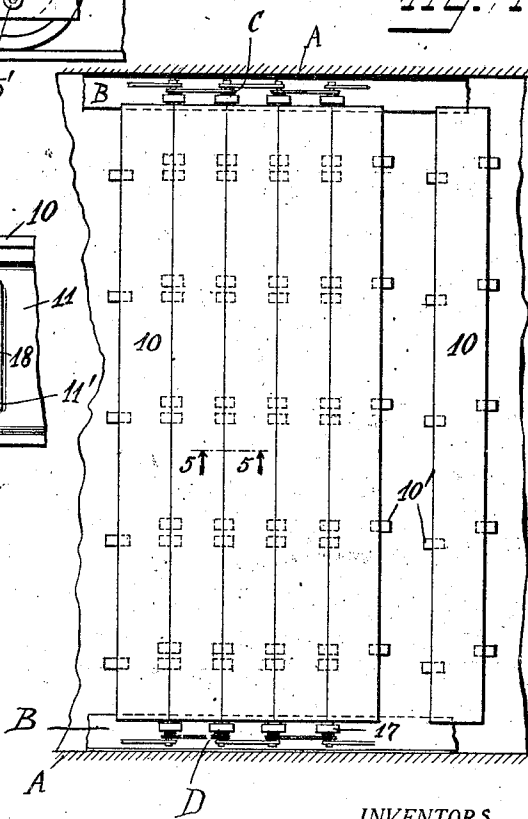
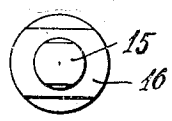


Fig. 5.

Fig. 6.



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CONVEYER.

Application filed March 28, 1921. Serial No. 456,089.

To all whom it may concern:

Be it known that we, ROBERT ELMER BAKER and LAURENCE SEYMOUR HARBER, both subjects of the King of Great Britain, and residents, respectively, of Bronxville and of Katonah, both in the county of Westchester and State of New York, have invented certain new and useful Improvements in Conveyers, of which the following is a specification.

Our present invention relates to conveyers, particularly of the type which comprises two spaced chains and transverse members connecting them. We have devised our present conveyer with especial reference to the conditions arising in connection with baking ovens of the traveling plate or hearth character, in which bread, biscuit and like material is baked direct on the plate or hearth; but it will be understood that we do not wish to restrict ourselves to the specific use illustrated herein.

A satisfactory and preferred embodiment of our invention is shown in the accompanying drawings in which Fig. 1 is a partial plan view of the improved conveyer, with some parts broken away and others in section on line 1—1 of Fig. 2, the latter being a partial vertical section on line 2—2 of Fig. 1, with parts broken away; Fig. 3 is a partial vertical section, on an enlarged scale, on line 3—3 of Fig. 1; Fig. 4 is a partial plan view showing the entire width of the conveyer; Fig. 5 is a detail longitudinal section on line 5—5 of Fig. 4, on an enlarged scale; and Fig. 6 is a detail view of a chain pivot and bushing.

The conveyer is represented in connection with the walls A and stationary tracks B of a baking oven of any approved type. Such conveyer consists of a continuous series of plates 10, preferably rectangular, the long edges of which extend transversely of the direction (indicated by the section line 5—5 of Fig. 4) in which the conveyer is arranged to travel. On the straight, generally horizontal runs of the conveyer the adjacent edges of neighboring plates 10 are almost, but not quite in contact with each other, see Figs. 2 and 5. In Fig. 4, on account of the small scale on which this view is drawn, no space is shown between neighboring conveyer plates, but it will be understood that

the actual conditions are represented in Figs. 2 and 5. Each plate 10, which is a flat metal plate, is attached rigidly by welding or other suitable procedure, to a cross member 11, preferably I-shaped in cross section, arranged at the center of the plate, and extending downwardly therefrom on the upper conveyer run which is shown in the drawings. At each end, the web of the cross member 11 has an opening 11', or in other words, the ends of said web are forked, see Fig. 3, where the fork members are designated as 11''. A vertical pivot pin 12, located centrally with respect to said web (Figs. 1 and 3) and fitted loosely in suitable openings of the fork members 11'', extends through a vertically-perforated lug 13' integral with a plate or bracket 13 riveted or otherwise secured rigidly to one of the links 14 or 14' of a conveyer chain C or D, located adjacent to the respective tracks B. The chains C, D may be of any suitable construction; we have shown them as comprising pairs of links 14 set relatively close together, alternating with pairs of more widely spaced links 14', horizontal pivot pins 15 (held by cotter pins 15') being employed to connect the four adjacent ends of two neighboring pairs of links 14, 14'. On these pins are mounted to rotate, with the interposition of bushes 16, rollers 17 adapted to run on the tracks B. The inner ends of the pins 15 are shown reduced and flattened on two sides to fit into similarly shaped holes in the inner chain links 14', the outer chain links 14' having round holes to fit the body of the pin 15. The bushings 16 are loose on the pins 15, and have reduced ends, flattened on opposite sides, to fit into correspondingly shaped holes in the chain links 14. Each of the pins 12 is provided with an annular horizontal groove 12' for cooperation with a cotter pin 18 inserted through a corresponding horizontal hole in the lug 13'. In this manner the pin 12 is normally held in the connecting position, but upon removing the cotter pin 18 the pin 12 may be removed endwise, or may even drop out by itself, thus enabling the plate 10 and its supporting cross member 11 to be detached from the lug 13', and therefore from the chain C or D, for repairs or other purposes. Preferably the ends or sides of the plates 10

project beyond the ends of the supporting cross members 11 (Fig. 3) and are adapted to extend over, and rest upon, the upper edges of the respective links 14 or 14', see Figs. 2 and 3.

It will be understood that the chains C, D will usually be endless chains, the plates 10 forming an endless conveyer, guided and operated in any suitable manner, and that means of any suitable or approved type may be employed to heat the plates 10 so as to bake the bread, biscuit, etc. placed thereon.

At their adjacent edges the plates 10 are provided with fingers 10' each having one end secured to the lower surface of the plate and the other end bent away from the plate and projected toward the neighboring plate. These projections are located at intervals, see Fig. 4, and the projections at the adjacent edges of different plates are located side by side, that is to say, out of longitudinal registry; for the sake of illustrating this feature more clearly, we have shown the last plate 10 at the right of Fig. 4, as shifted or moved away from the adjoining plate to the left, it being understood that in actual use the plates 10 are almost contiguous, as illustrated by Figs. 2 and 5.

Our improved conveyer is superior in several respects to those of constructions ordinarily employed. It will be noted that the plates 10 and their supporting members 11 are not connected rigidly with the lateral chains C, D, but pivotally, by means of the pins 12, each plate 10 thus being able to swing, to a limited extent, relatively to the two chains C, D, about two parallel axes formed by the two pins 12 at the sides of said plate. On the other hand, each chain link or chain unit is also capable of turning on such pins or pivots, relatively to the plate 10, that is to say, each chain link or unit and the corresponding plate 10 can swing in parallel planes, the plate 10 swinging in its own plane. This peculiar connection is of great practical advantage. Assuming, for instance, that on account of defects in some of the links, or of unequal wear, one of the chains C should at a certain moment advance or lag behind, relatively to the other chain D, at the points where such chains are connected with one of the plates 10, the improved construction described above will permit the particular links involved to swing slightly on the pins 12, and at the same time will avoid any strains that would tend to distort the plate and to warp it from its proper plane condition. This will be understood best by considering the conditions that obtain when a plate of the character set forth is secured rigidly, and not pivotally, to the two chains which cause it to travel, such rigid connection being customary in similar constructions employed hitherto. It will be obvious that with the

earlier construction, any tendency of one of the chains to advance or lag relatively to the other chain, at the points where the said chains are connected with the same plates, will result in either distorting the flat surface of the plate and thus upset or destroy the flush character of the joint between adjacent plates, or else the plate, in order to preserve a flat surface, will tend to become detached from or loosened on the chains. The lagging behind of one of the chains will also tend to twist each chain unit diagonally across the center line of the strand of chain, producing abnormal stress in the chain links and chain pivots, and therefore necessitating a heavier construction of the chain than is normally required to resist the direct pull employed in feeding the chain and plate along the guides and through the oven. It will be clear that with our improved construction all stresses in the chains, with the exception of tension stresses and of stresses resulting from the weight of the plates 10 and cross members 11 supported by the chains, will be entirely eliminated, also that no stresses tending to produce warping will be produced in the plate by any differential or irregular motion of one chain relatively to the other. Therefore, so far as any stresses arising from the movement of the parts are concerned, there will be no tendency to produce warping of the plates 10.

However, the plates 10 are also exposed to the warping influence of the heat applied for the treatment of the bread or other material resting on the plates and conveyed thereby. To guard against this warping by heat, we have provided the projections or fingers 10' referred to above, these strips being secured to the neighboring edges of adjacent plates in pairs, the two fingers of the same pair being in close proximity to each other. Since each plate 10 extends over the ends of the fingers 10' projecting from the adjacent plate, and since the edge of such overlapping plate is in engagement with said fingers 10', adjacent to the points at which they project from the plate carrying them, it will be evident that (in view of the reciprocal arrangement of fingers and plates) the plates will be kept from being warped by the heat, or at least the adjacent plate edges will be preserved in flush and close relation, almost in abutment with each other. On the straight portions of the conveyer, the plates 10 will therefore form a practically continuous and level or plane surface.

Inasmuch as the transverse members 11 are not subject to any strains except those resulting from the weight of the plates 10, these members 11 may be made relatively weak or light.

Various modifications may be made with-

out departing from the nature of our invention as set forth in the appended claims.

We claim:

1. A conveyer comprising spaced longitudinal traveling members, cross members each comprising a plate and a central bar perpendicular to the plane of said plate and forked at the ends, lugs projected from said longitudinal members into the forked ends of said bars, and means for connecting said lugs and bars pivotally.

2. A conveyer comprising spaced longitudinal traveling members, cross members each comprising a plate bridging the space between said traveling members and a bar perpendicular to the plane of said plate extending along said plate and in longitudinal contact therewith, and means for connecting said bar pivotally with the respective longitudinal members.

3. A conveyer comprising spaced longitudinal traveling members, cross members connecting said longitudinal members and including plates having adjacent edges perpendicular to the direction of travel, and anti-warping fingers projected from each of

two adjacent plates toward and beyond the near edge of the companion plate.

4. A conveyer comprising spaced longitudinal traveling members, cross members connecting said longitudinal members and including plates having their transverse edges adjacent to each other, and fingers projected in pairs from adjoining points of two adjacent plates toward and beyond the near edge of the companion plate and engaging the same.

5. A conveyer comprising spaced longitudinal members, cross members connecting said longitudinal members and including plates having their transverse edges adjacent to each other, and fingers projected from each of two adjacent plates toward and beyond the near edge of the companion plate and engaging said edge, the free end of each finger being bent away from the adjacent plate.

In testimony whereof we have signed this specification.

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LAURENCE SEYMOUR HARBER.