

Aug. 26, 1952

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2,608,288

METHOD OF AND APPARATUS FOR ALIGNING CONVEYER CHAINS

Filed May 27, 1950

4 Sheets-Sheet 1

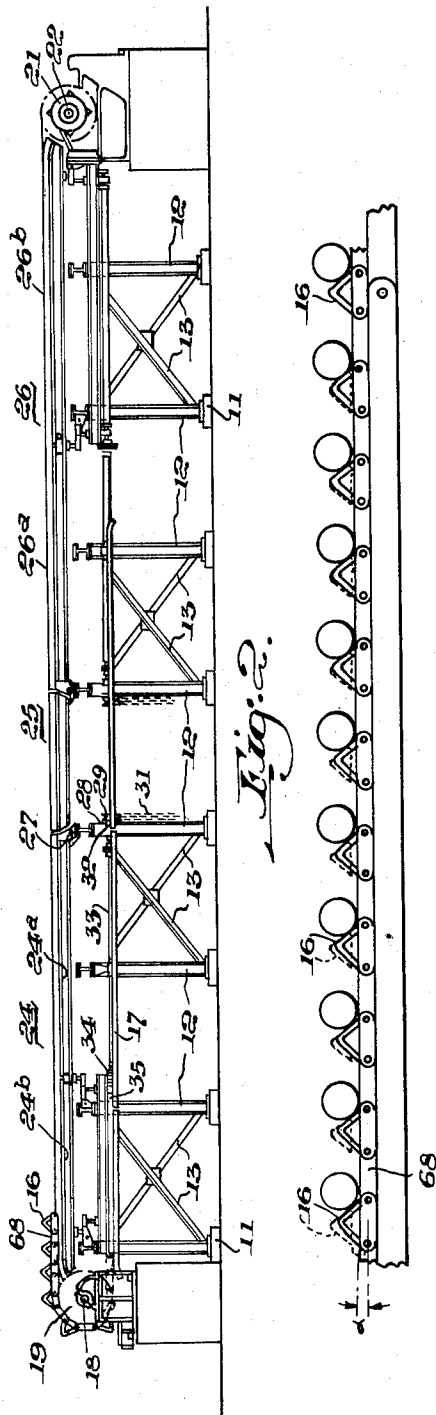


Fig. 2.

Fig. 5.

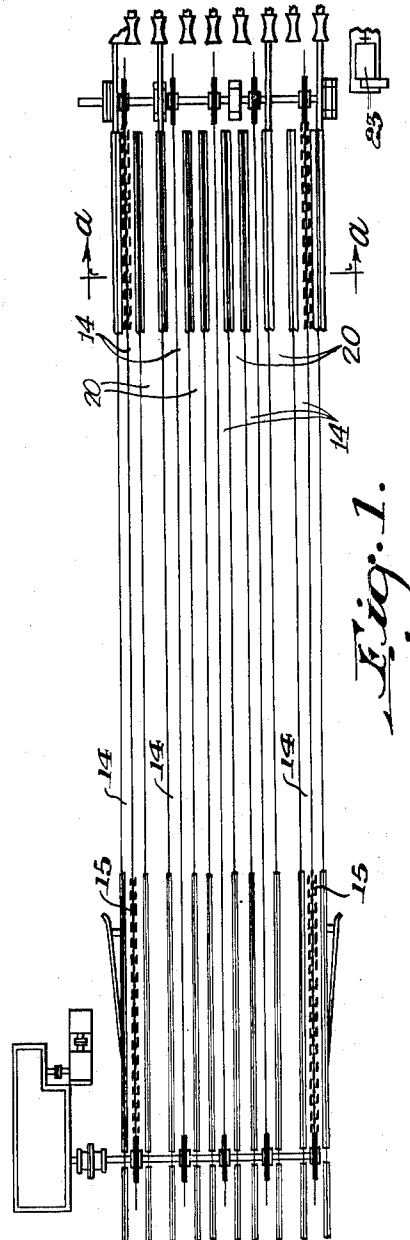


Fig. 1.

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4 Sheets-Sheet 2

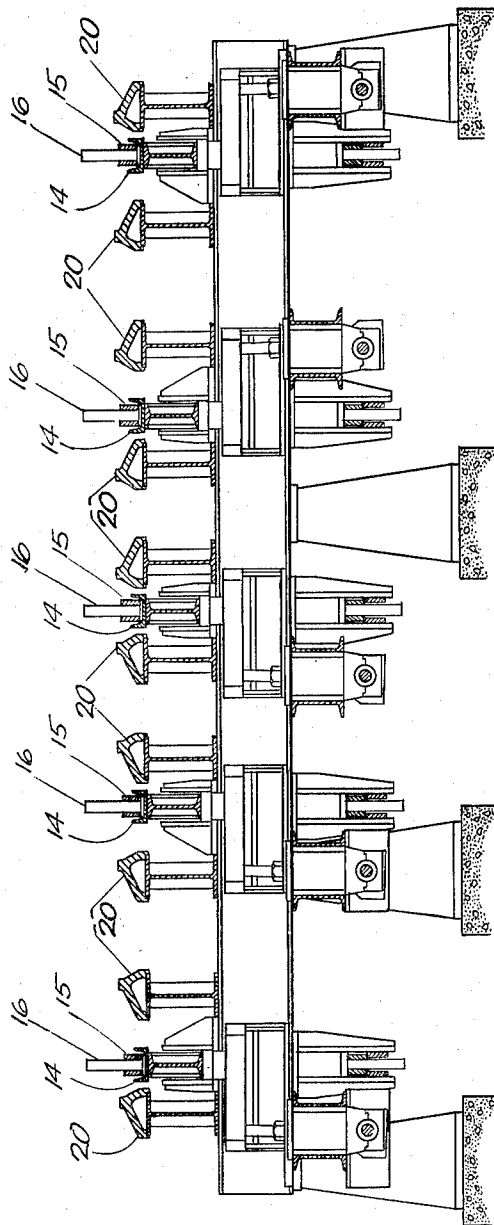


Fig. 1a

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4 Sheets-Sheet 3

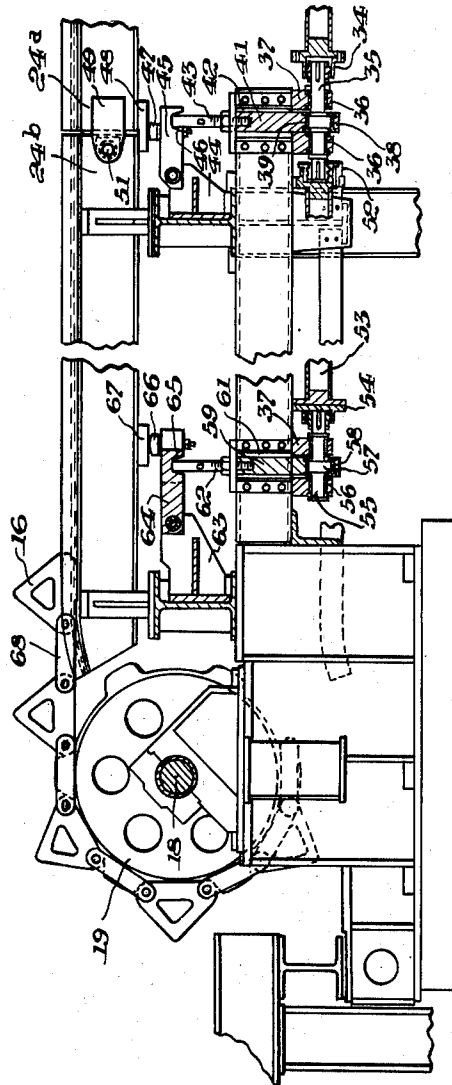


Fig. 3.

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4 Sheets-Sheet 4

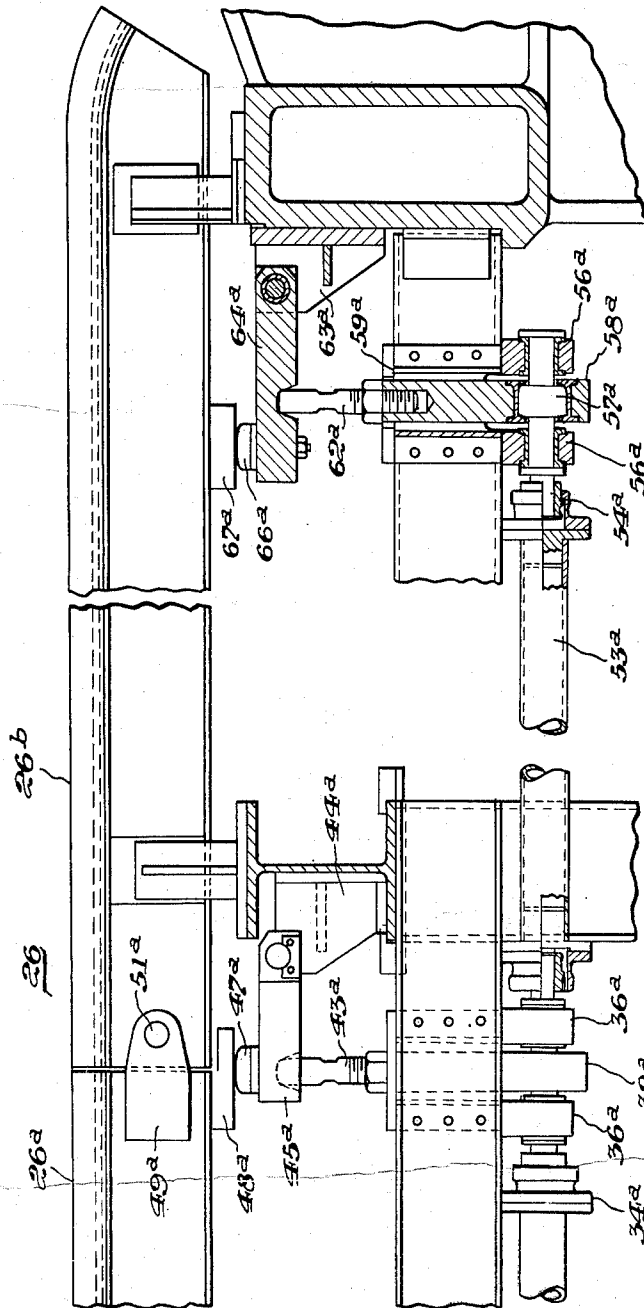


Fig. 4.

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UNITED STATES PATENT OFFICE

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METHOD OF AND APPARATUS FOR
ALIGNING CONVEYER CHAINSHoward H. Talbot, Pittsburgh, Pa., assignor to
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7 Claims. (Cl. 198-173)

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This invention relates to a method of and apparatus for aligning transversely spaced conveyor chains and, in particular, to lining up the dogs of the chains of a cooling or transfer bed especially when, due to unequal wear of the dogs or link joining members, one or more of the chains may become slightly elongated with respect to some of the others.

It has been the experience that without providing an adequate means for compensating for the misalignment which takes place relative to the transverse positions of the conveyor chain dogs, caused by unequal lengthening or stretching of the chain, the billets or rods which are carried thereby will possibly be canted, as they are moved along, and thereby cause such round billets to roll diagonally across the bed instead of in the desired straight course.

It is one of the objects of this invention, therefore, to provide apparatus by which unequal lengthening of conveyor chains may be compensated for and alignment thereof maintained at all times.

Another object of this invention is to provide readily adjustable conveyor chains for cooling or transfer beds and the like which are adapted to be quickly adjusted in order to correct for misalignment thereof caused by unequal lengthening and wear of the link joining members.

Still another object of this invention is to provide conveyor chain aligning apparatus, integral with the conveyor tables, which is simple of operation and economical to service and maintain.

Another object of this invention is to provide a method of adjusting conveyor chains having sloping members or dogs spaced therealong whereby the dogs are readily brought into such relationship with respect to the others that alignment of the points of contact with the billet urged forward thereby will be insured.

These objects, as well as the various other novel features and advantages of this invention, will be apparent from the following description and accompanying drawings of which:

Figure 1 is a plan view of a cooling bed having driven conveyor chains embodying the features of the invention herein disclosed, Figure 1a is a sectional view of the cooling bed taken at a—a of Figure 1,

Figure 2 is a side elevation view of the apparatus shown in Figure 1,

Figure 3 is an enlarged sectional view of the chain adjusting mechanism at the entry end of the conveyor,

Figure 4 is an enlarged sectional view of the

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chain adjusting mechanism at the discharge end of the conveyor, and

Figure 5 is an enlarged view of a portion of unequally lengthened conveyor chains showing the dogs thereof in their readjusted in-line relationship.

With reference to Figures 1, 1a and 2, the billet cooling bed embodying the features of this invention includes a supporting frame structure consisting of a plurality of base members 11 upon which are positioned a plurality of vertical channels 12 secured together by crossmembers 13. At the top of the framework and secured thereto there are five adjustable troughs 14 within each of which is guided a continuous chain 15 having a plurality of dogs 16 spaced therealong. Beneath each of the troughs 14, there is affixed to the framework a stationary trough 17, extending for a considerable portion of the length of the bed, for guiding the chain on its return path. At the entry end of the cooling bed there is mounted, on a common shaft 18, a plurality of idler sprockets 19 which mesh with the links of the conveyor chains 15. Intermediate the troughs there is a plurality of fixed skids or rails 20 upon which the billets or rods are supported in their movement along the bed. For driving the conveyor chains, there is provided, at the delivery end of the table, a plurality of similar sprockets 21 mounted upon a shaft 22 which is driven by a suitable motor and gear reduction unit 23 connected thereto.

It will be noted in Figure 2 that each of the troughs 14 is divided into three main sections, 24 consisting of portions 24a and 24b, 25, and 26 consisting of portions 26a and 26b. The central or stationary section 25 is pinned at its ends and remains in its initial fixed position. The front section 24, however, is pivotally secured at its inner end by a pin 27 so that it may be raised relative to the supporting frame, thereby carrying with it the chain which passes therethrough. Beneath each of the sections 24 and rotatably secured in suitable bearings attached to the conveyor frame, there is a shaft 28 to the outer end of which is keyed a chain wheel 29 over which passes a continuous manually-operated chain 31. The shaft 28 passes into and drives a planetary gear reduction unit 32 having extending from the opposite side thereof a driven shaft 33.

The driven shaft is supported in suitable bearings and provided with a floating coupling 34 at the outer end thereof. Secured to the floating coupling there is a short shaft 35 rotatably supported in suitable bearings 36 secured to a beam

37 affixed to the framework of the bed. The short shaft 35 is provided with an eccentric 38 which is received within a bearing 39 at the bottom of a connecting rod 41 which is free to reciprocate within an opening 42 in the beam 37. An adjustable screw 43 is threaded into the free end of the rod 41 and is rounded at the outer end thereof. To a bracket 44, affixed to the framework, a lever 45 is pivotally secured. At the free end of the lever a socket 46 is provided within which the rounded end of the adjustable screw 43 is received. A pad 47 extends from the upper portion of the lever 45 and engages with a member 48 which is secured to the end of the pivotal portion 24a having extending therefrom a plate 49 through the outer end of which is passed a pin 51 for securing together the chain trough portions 24a and 24b.

A second floating coupling 52 secured to the short shaft 35 and to one end of a shaft 53 which is also, by means of a floating coupling 54, coupled to a short shaft 55. The shaft 55 is rotatably secured in bearings 56 affixed to the end of the beam 37. The shaft 55 is provided with an eccentric 57 which is received within a bearing 58 at the bottom of a connecting rod 59 which is free to reciprocate within an opening 61 in the beam 37. An adjustable screw 62 is threaded into the free end of the rod 59 and is rounded at the outer end thereof. To a bracket 63 affixed to the framework a lever 64 is pivotally secured. Outward of the pivotal point of the lever a socket 65 is provided within which the rounded end of the adjustable screw 62 is received. A pad 66 extends from the end and upper portion of the lever 64 and engages with a member 67 which is secured near the end of the chain trough portion 24b.

In order to insure that the movable trough portions will rise substantially to the same angle of inclination, lever 64 is longer than lever 45 since it is farther away from the main pivotal point of the trough 24.

The chain trough section 26, consisting of two hinged portions 26a and 26b, pivots generally about the end of the stationary trough portion 25 and is provided with a trough raising and lowering mechanism which is similar to that employed for adjusting the trough portion 24, the numerals applied to the elements thereof being the same except with the letter "a" added thereto. In this instance, the longer lever of the two is positioned near the driven sprocket end of the trough portion 26b inasmuch as that end must be moved through a greater arc to attain the same angle of inclination as that of the portion 26a.

In accordance with Figure 5, each of the chains consists of a plurality of triangular dogs 16 which are secured together by a plurality of links 68 pivotally attached thereto. When the chains are installed, the chain troughs are all in their lowermost in-line horizontal positions and the dogs of the chains lined up laterally across the bed. When the chains are in use for some time unequal stretching thereof occurs, so that the billets, or rods, being transferred across the bed, will not make positive contact with the inclined surfaces of all of the transversely spaced dogs of a group, possibly causing the workpieces to be thrown out of their right angle positions with respect to the chains. In order to compensate for unequal stretch of the chains, and to present a surface of the dog with which contact will be made for insuring that the billets or rods will be maintained at right angles to the chains, the

chain which stretches unequally with respect to the others is adjusted by raising the trough portion through which it passes. The lengthening of the chain is progressive so that the adjustment which is made will compensate for the stretch throughout the portion of the chain which is raised and hence insure positive contact with the workpiece of all of the laterally-spaced dogs of a group. In passing over the sprockets at each end of the transfer, however, the chain dogs are always in their in-line positions.

In accordance with the provisions of the patent statutes, I have explained the principle and operation of my invention and have illustrated and described what I consider to represent the best embodiment thereof. However, I desire to have it understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. In apparatus for transversely realigning the workpiece engaging portions of a plurality of laterally spaced driven conveyor chains, substantially horizontally disposed guide means through which each of said chains passes, fixed workpiece supporting means adjacent said chain guide means and means adjacent to and adapted to adjust substantially vertically at least a portion of said guide means whereby transversely misaligned workpiece engaging portions of said chains are realigned.

2. In apparatus for transversely realigning the workpiece engaging portions of a plurality of laterally spaced driven conveyor chains, separate substantially horizontally disposed guide means for each of said chains, fixed workpiece supporting means adjacent said chain guide means and separate means adjacent to and adapted to adjust substantially vertically each of said guide means whereby transversely misaligned workpiece engaging portions of said chains are realigned.

3. In apparatus for transversely realigning the workpiece engaging portions of a plurality of laterally spaced driven conveyor chains, a base, substantially horizontally disposed chain guides pivotally secured to said base, fixed workpiece supporting means adjacent said chain guides, means adjacent to and adapted to adjust substantially vertically each of said guides whereby transversely misaligned workpiece engaging portions of said chains are realigned.

4. In apparatus for transversely realigning a plurality of laterally spaced driven conveyor chains each provided with a plurality of outwardly extending workpiece engaging projections, a base, chain guides pivotally secured to said base, fixed workpiece supporting means adjacent said chain guides, means adjacent to and adapted to adjust vertically each of said guides and chains whereby transversely misaligned workpiece engaging projections of said chains are realigned.

5. In apparatus for transversely realigning a plurality of laterally spaced driven conveyor chains each provided with a plurality of outwardly extending workpiece engaging projections, a base, chain guides pivotally secured to said base, fixed workpiece supporting means adjacent said chain guides, vertically adjustable supporting means spaced along each of said guides and means for simultaneously adjusting said supporting means of a particular guide whereby transversely misaligned workpiece engaging projections of the chain carried thereby are realigned.

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6. In apparatus for transversely realigning a plurality of laterally spaced driven conveyor chains each provided with a plurality of outwardly extending workpiece engaging triangular projections, a base, chain guides pivotally secured to said base, fixed workpiece supporting means adjacent said chain guides, vertically adjustable supporting means spaced along each of said guides and means for simultaneously adjusting said supporting means of a particular guide whereby a portion of the inclined edges of said projections are placed in transverse alignment with corresponding edges of similar projections of chains spaced laterally therefrom.

7. A method of realigning transversely the workpiece engaging elements of unequally lengthened conveyer chains supported in substantially horizontally disposed guides and having inclined workpiece pusher elements for transferring a plu-

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ality of workpieces over fixed workpiece supporting members which comprises vertically adjusting chains having misaligned workpiece pusher elements thereby to cause at least some portion of corresponding transversely spaced workpiece engaging elements of a group to become aligned.

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