Oct. 30, 1962 R. L. NOFFSINGER 3,061,077

ELEVATING CONVEYOR CHAIN

Filed July 3, 1959

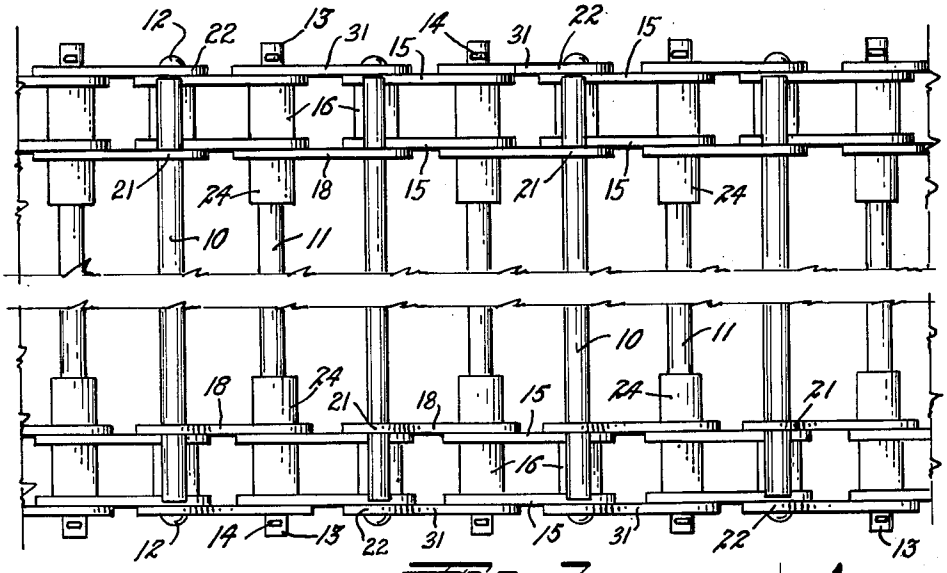


FIG 1

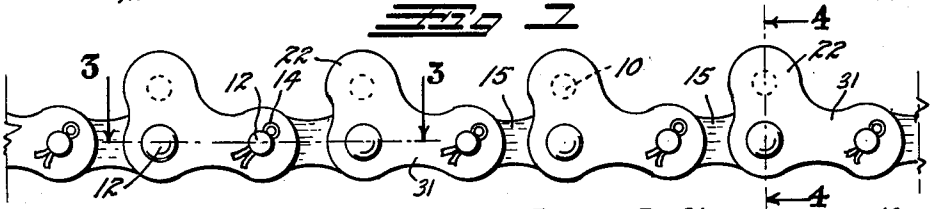


FIG 2

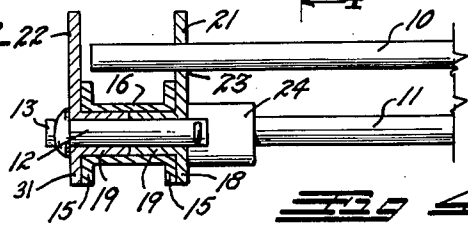


FIG 4

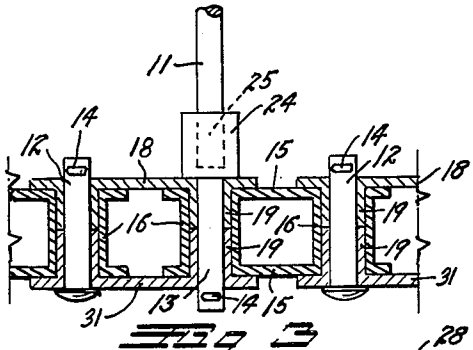


FIG 3

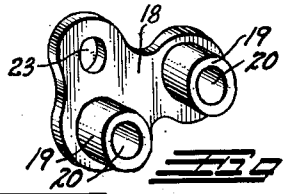


FIG 5

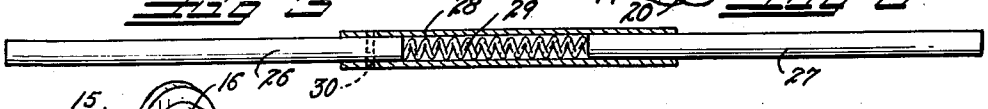


FIG 7

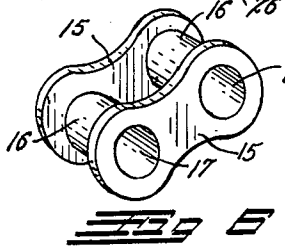


FIG 6

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3,061,077

Patented Oct. 30, 1962

3,061,077

ELEVATING CONVEYOR CHAIN

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Filed July 3, 1959, Ser. No. 824,894
1 Claim. (Cl. 198—195)

This invention relates to an elevating conveyor chain of the bar type and more particularly to a digger chain of the type used upon potato diggers and similar implements. Such chains usually comprise a plurality of parallel, spaced apart bars, the extremities of which are bent to form hooks arranged to engage an adjacent bar to form a continuous series of parallel traveling bars. Such chains must operate in sand and soil and the hooked terminal connections of the bars rapidly wear the bars until breakage occurs. There is very little wear upon the straight portions of the bars, yet the entire bar must be discarded when the terminal portions become worn.

This invention has for its principal object the provision of a highly efficient bar chain of the digger chain type in which all bent bars and all troublesome, interlocked bar extremities will be entirely eliminated and in which all of the bars will be simple, straight bars of substantially uniform length which will not be subjected to interlinkage or sprocket wear so that the replacement costs will be materially reduced.

Another object is to provide highly efficient, endless, link belts for engaging the conveyor sprockets and carrying the bars so constructed that the improved straight bars can be quickly and easily attached thereto without disassembling the conveyor.

A further object is to provide a link belt construction for digger chains which will be exceedingly economical to manufacture and assemble and which will be long wearing in sandy abrasive soils and which can be repaired and renewed without it being necessary to discard any of the bars.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

FIG. 1 is a fragmentary plan view of a typical portion of the improved bar chain with the midportion thereof broken away to conserve drawing space;

FIG. 2 is a side view of the portion of chain shown in FIG. 1;

FIG. 3 is an enlarged horizontal section taken on the line 3—3, FIG. 2;

FIG. 4 is a similar enlarged vertical cross section taken on the line 4—4, FIG. 2;

FIG. 5 is a detail perspective view of an inside half-link employed in the improved chain;

FIG. 6 is a similar perspective view of a connecting link employed therein; and

FIG. 7 is a side view partially broken away of a type of cross bar which may be employed in the improved chain.

The improved bar chain comprises a plurality of spaced apart straight bars 10 and 11 extending between two endless link belts of the type arranged to travel about terminal sprockets.

Each link belt is assembled from six different elements, to wit, connecting links, as illustrated in FIG. 6, inside half-links 18, outside half-links 31 to be later described, chain pins 12, socket pins 13, and cotter keys 14.

A typical connecting link is illustrated in FIG. 6. It

comprises two side bars 15 between which two sprocket-engaging tubes 16 extend. The sprocket tubes 16 are spaced apart a center-to-center distance equal to the pitch of the link belt and the tubes open through the side bars as shown at 17. The complete connecting link can be cast or forged as a complete unitary element.

Two similar hollow studs 19 project from one side of each of the half-links 18 and 31. The studs are spaced and have a diameter to fit snugly and rotatably into the openings 17 of the sprocket tubes 16 of the connecting links and have a length of slightly less than one-half of the width of the connecting links.

The studs 19 are provided with axial bores 20 for receiving the chain pins 12 and the socket pins 13. Each inside half-link 18 is provided with an upstanding ear 21 having a bar-receiving opening 23 positioned over and above one of the hollow studs 19. Each outside half-link 31 is provided with a similar imperforate upstanding ear 22 which will align with the ear 21 of the inside half-link when the two half-links are in opposed relation on the connecting links as shown in FIGS. 1 and 4. The socket pins 13 are provided with enlarged socket heads 24 containing bar receiving sockets 25.

The link chains are assembled by inserting the hollow studs 19 of an outside and an inside half-link into the holes 17 of two connecting links so the latter two links will be connected together by the side plates 18 of the half-links. Each pair of outside and inside half-links is prevented from separating, at one extremity by means of one of the chain pins 12 and its cotter key 14 and at its other extremity by one of the socket pins 13 and its cotter key 14 as shown in FIG. 3. The assembled link chains extend along the opposite extremities of the chain bars 10 and 11 with the outside half-links positioned outwardly from the inside half-links with the extremities of the longer chain bars 10 extending through the bar openings 23 in the ears 21 of the inside half-links 18 so that they will be prevented from moving endwise by the imperforate ears 22 of the outside half-links, as shown in FIG. 4. The extremities of the shorter chain bars 10 are positioned in the sockets 25 of the heads 24 of the socket pins 13, as shown in FIG. 1.

The chain bars 10 and 11 are simple straight bars of a length to accommodate the width of a given bar conveyor. They are not subjected to sprocket wear since the sprockets supporting and driving the link belts contact only the tubes 16 of the connecting links. A bent or damaged bar can be quickly removed and replaced by simply pulling the reaches of the link belts away from each other. The ears 21 maintain the short bars 10 elevated or raised above the bars 10 to provide traction for elevating articles such as potatoes on the bar conveyor and the ears 22 prevent the bars 10 from sliding through the ears 21.

In FIG. 7 an alternate form of conveyor bar is illustrated to provide for quick and easy insertion or removal of a bar. This bar is formed in two bar sections 26 and 27, the inner, adjacent extremities of which extend into the opposite extremities of a spring sleeve 28 containing a suitable compression spring 29. The sleeve 28 is secured to the bar section 26 in any suitable manner such as by means of a rivet 30. It can be seen that by forcing the sections 26 and 27 together, the entire bar can be shortened sufficiently to allow it to be placed in the socket heads 24 to replace one of the bars 11 or in the ears 21 to replace one of the bars 10 as desired. In fact, bars of the type shown in FIG. 7 may be used throughout if desired.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied within the scope of the ap-

pended claim, without departing from the spirit of the invention.

Having thus described the invention what is claimed and desired secured by Letters Patent is:

A bar type conveyor chain comprising two parallel endless link belts and a plurality of straight spaced-apart parallel bars extending between said belts, each of said belts comprising: a plurality of connecting links, each connecting link having two side bars and two spaced-apart sprocket tubes maintaining said side bars in parallel, spaced relation; a pair of link plates having hollow pivot bosses extending into the sprocket tubes and connecting each of said connecting links to two adjacent connecting links; a chain pin extending through said pivot bosses at one extremity of each pair of link plates and securing each pair of link plates to one of said adjacent connecting links; a socket pin extending through said pivot bosses at the other extremity of each pair of link plates securing that pair to the other of said adjacent connecting links, said socket pins being provided with bar receiving sockets for receiving alternate ones of said parallel bars; an ear formed on each of said link plates, said ears extending above the plane of their associated belt, the inner link plate of each belt being provided with a bar receiving opening in the ear thereof, said opening being located immediately above said chain pin, the outer link plate ears being imperforate; the remaining parallel bars being received within said openings and being restrained from axial movement by said outer link plate ears.

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