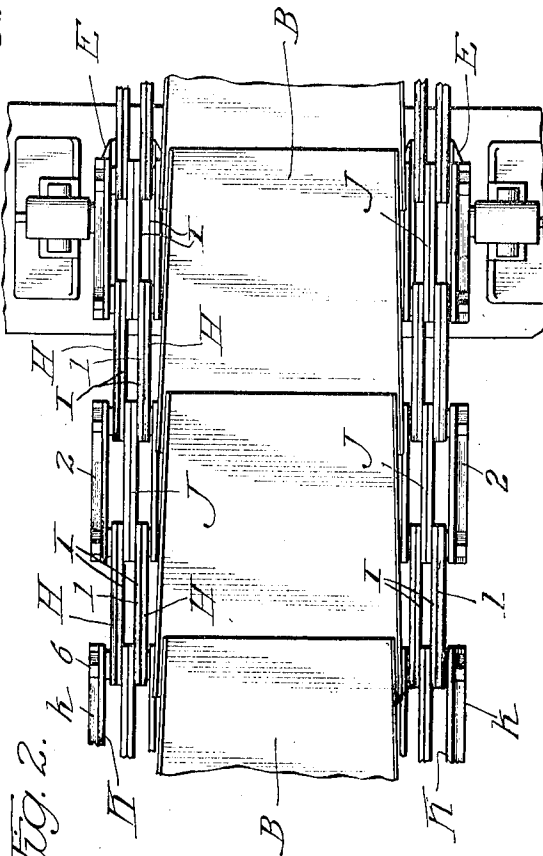
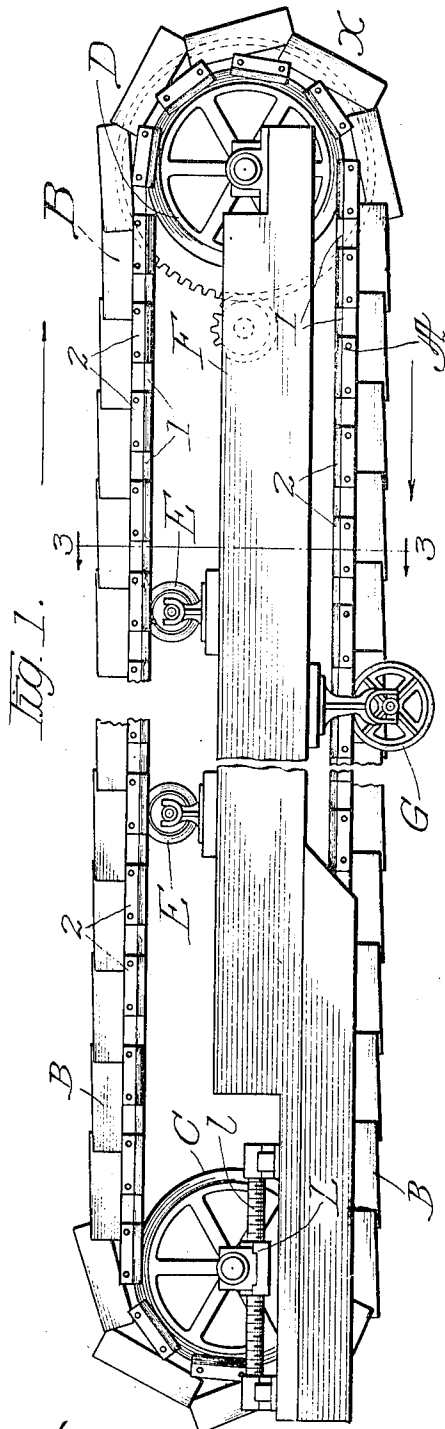


1,291,446.

Patented Jan. 14, 1919.

2 SHEETS—SHEET 1.



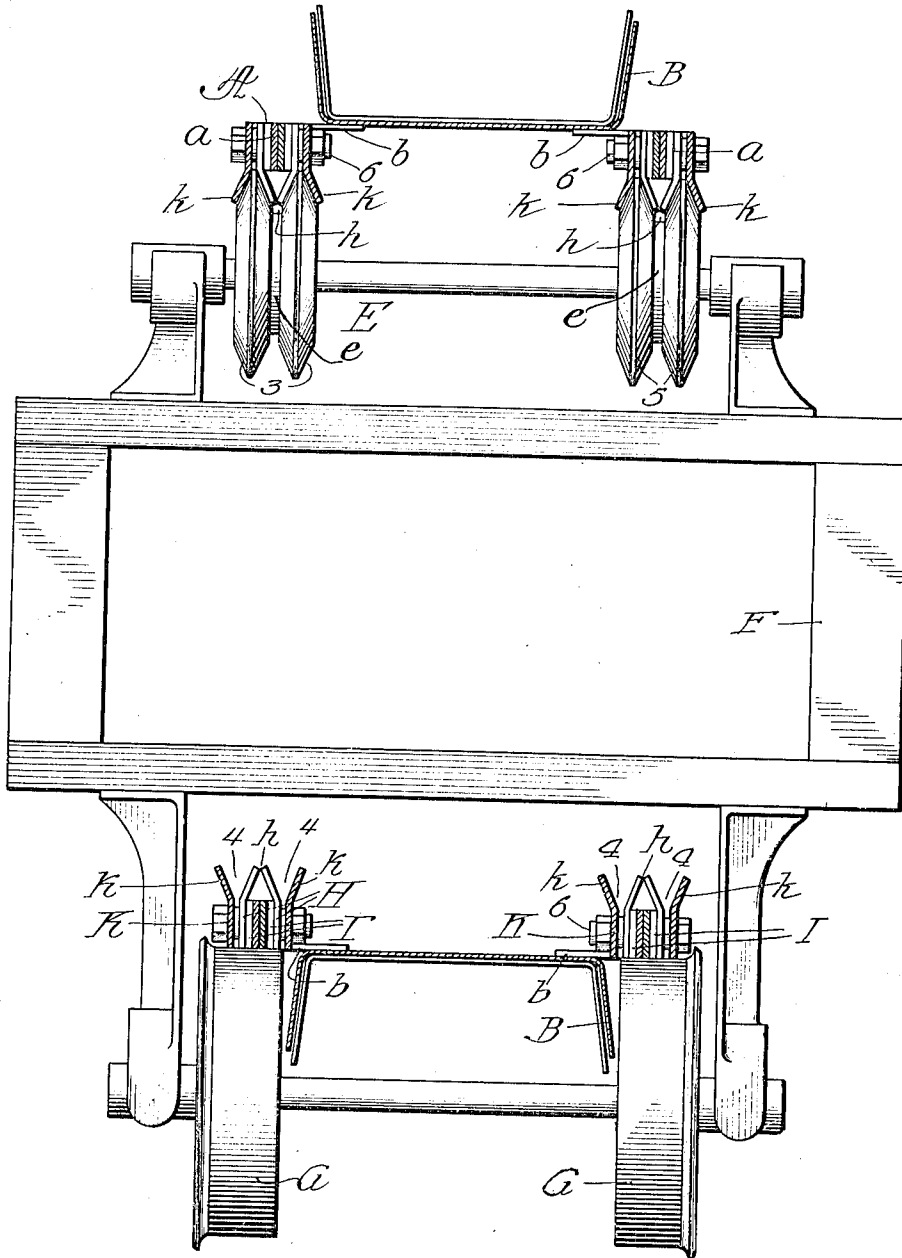
witnesses
Robert H. Weir
Arthur W. Carlson

Inventor
Raymond W. Dull
By Arthur F. Durand
Att'y.

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2 SHEETS—SHEET 2.

Fig. 3.



Witnesses
Robert H. Stein
Arthur W. Carlson

Inventor
Raymond W. Dull
By Arthur F. Fenwick
Atty.

UNITED STATES PATENT OFFICE.

RAYMOND W. DULL, OF LA GRANGE, ILLINOIS.

PAN-CONVEYER.

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Specification of Letters Patent.

Patented Jan. 14, 1919.

Application filed October 27, 1916. Serial No. 127,979.

To all whom it may concern:

Be it known that I, RAYMOND W. DULL, a citizen of the United States of America, and resident of La Grange, Cook county, Illinois, have invented a certain new and useful Improvement in Pan-Conveyers, of which the following is a specification.

My invention relates to conveyers of that kind in which an endless belt is provided with a series of pans forming a trough which travels more or less horizontally in the desired direction, and in which the gravel or crushed rock or other materials can be placed and carried to the desired point.

Generally stated, the object of my invention is to provide an improved and more efficient conveyer of this general character.

A special object is to provide an improved construction and arrangement which will enable the conveyer to travel at higher speed than heretofore.

Another object is to provide an improved construction and arrangement whereby the stretching of the belt which results from long continued use thereof will not interfere with the proper operation of the conveyer.

Another object is to provide an improved construction and arrangement which will enable the conveyer to operate with less liability of wearing out and becoming impaired than has heretofore been the case with the conveyers of this kind.

It is also an object to provide certain details and features of construction tending to increase the general efficiency and serviceability of a pan-conveyer of this particular character.

To the foregoing and other useful ends, my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings:—

Figure 1 is a side elevation of a pan-conveyer embodying the principles of my invention, showing certain portions thereof broken away for convenience of illustration.

Fig. 2 is a plan, on a larger scale, of a portion of the structure shown in Fig. 1.

Fig. 3 is an enlarged cross-section on line 3—3 in Fig. 1.

As thus illustrated, my invention comprises an endless link-belt A having pans B secured thereto, on the outer surface thereof, with the front end of each pan overlapping the next, so that one pan telescopes into the other, thereby providing in effect an end-

less trough. The link-belt is supported on wheels C and D, one of which may be rotated to drive the link-belt. The intermediate stretch of the upper portion of the belt is supported by idlers E suitably mounted on the frame or body F, which latter may be of any suitable character. The lower portion of the belt is supported by idlers G which are mounted in any suitable manner on said frame or body. Referring to Figs. 2 and 3, it will be seen that the belt A is composed of two parallel chains *a* which are spaced apart, and to which the pans B are secured by angle-brackets *b* in any suitable or desired manner. Preferably, these brackets *b* are secured to the under side of the rear portion of each pan, so that each pan is rigid with the alternate links 1 of the two chains, while the intermediate links 2 are not attached to said pans, thus permitting the latter to tilt as they are passing on the wheels C and D, in the manner shown in Fig. 1. The alternate links 1 are each composed of two outer strips H which are bent together to provide a wedge *h* which engages in the central V-shaped groove *e* of the idlers E, the wheels C and D having a similar formation. Each link 1 also comprises a pair of inner strips I which reinforce the strips H and strengthen the link. Each link 2 is composed of a pair of inner strips J which are interposed between the strips I of the other links, and which serve merely to strengthen the chain. The links 1 are each provided with a pair of outer strips K provided with outwardly bent portions *k* which engage the outer beveled sides 3 of the idlers E, the wheels C and D having a similar formation. When the two chains are viewed in cross-section, it will be seen that the portions *h* combine with the portions *k* to form V-shaped pockets 4 to receive the V-shaped peripheries 5 of the idlers E and the wheels C and D, whereby the two chains have a firm frictional grip on said idlers and wheels. The links are held together by bolts 6 inserted transversely through the chains. With this construction the portions *h* and *k* successively engage the idlers E, and also the wheels C and D, but as each portion *h* is long enough to overlap or extend between the ends of the adjacent portions *k*, it follows that the contact with the idlers and supporting wheels is practically continuous, so that the chains travel over these wheels without any break

in the engagement thereof, and without rattling or jarring. With an ordinary link-belt, such as those heretofore employed for various purposes, the contact of the belt with the wheels would not be continuous, but would be broken by gaps at regular intervals, so that the travel of the belt over the wheels would be accompanied by a rattling and jarring action, which would not only be disagreeable and annoying, but which would also be more or less injurious to the mechanism itself. The pans B are tapered toward their forward ends (see Fig. 2), and they overlap to an extent that they never draw apart, even when traveling around the wheels C and D, so that the materials will not fall between the pans at any point—that is to say, the pans always overlap to some extent, although their ends may move out of engagement while traveling around the wheels. The pans are narrower than the entire belt A, so that the two chains *a* will travel on the idlers G (see Fig. 3), while the pans pass between these idlers.

With the foregoing construction, the pan-conveyer thus provided can run at much higher speed than was heretofore possible with conveyers of this type, and in this way the capacity of the conveyer is increased without increasing its size or weight. When a belt stretches, as will always be the case after continuous use thereof for some time, the slack can be taken up by adjusting the bearings L of the wheels C, screws *l* being provided for this purpose, and the method of adjusting the bearings to tighten the belt is obvious. It will be understood, though, that any suitable means can be employed for this purpose. The advantage is, however, that the belt can stretch and then be tightened without interfering in any way with its required mode of operation. In other words, it will, after being thus tightened, continue to properly engage the wheels C and D, and the idlers, and will continue to run smoothly and practically without rattle or other noise, and without any jolting or jarring, even when operated at high speed. When worn or impaired by use, the belts of the two chains can be readily removed, by removing the bolts 6, and repairs of this kind are very easily and economically made whenever they are necessary.

It will be seen that the wedges *h* on the alternate links cooperate with the flanges *k* on the intermediate links to form V-shaped channels, when the belt is viewed in cross-section, and that the wheels C and D have V-peripheries to engage these channels. By V-formation is meant, of course, either a construction which is actually V-shaped, or a construction which is substantially V-shaped, or any construction in which the equivalent of the V-shaped formation is employed, so that a channel-formation is ob-

tained and preferably a wedging effect produced, thereby to cause sufficient friction to prevent slippage between the belt and the driving wheels D when the conveyer is operated. It will be understood, of course, that any suitable means can be employed for transmitting power to these wheels D to operate the conveyer at the desired speed. The pans B, it will be seen, are supported entirely by the two link-belts, and the pans do not support the link-belts at any point in their path of travel. The arrangement is thus adapted to operate at high speed and with comparatively a minimum amount of friction.

What I claim as my invention is:—

1. A pan-conveyer of the class in which a link-belt is provided with a series of pans secured thereto and arranged to form an endless trough having a horizontally disposed portion for holding materials, characterized by this, to-wit:—that the belt is friction-driven and wider than the pans, and that high speed anti-friction rotary means are provided and arranged in position to form guides for supporting and guiding the horizontally disposed portions of the belt without engagement of said pans with anything except the belt itself and so that the pans when operating at high speed are supported and controlled throughout their path of travel entirely by said link-belt.

2. The structure specified in claim 1, said belt having a V-formation for the friction-drive thereof, and to hold the pans against lateral displacement from their path of travel on said means.

3. The structure of claim 2, said V-formation being of such character that the belt has practically an unbroken or continuous friction-drive-engagement to prevent vibration of said pans.

4. The structure specified in claim 1, said belt comprising parallel endless chains, each chain composed of alternate links provided with wedges and intermediate links provided with flanges cooperating with said wedges to form V-shaped channels, when the belt is viewed in cross-section, and said supporting means including idler wheels having V-peripheries to engage said channels, so that said pans are held by said wheels against lateral displacement, obviating the necessity for any antifriction means on the belt, and permitting the high speed necessary for the pans when in operation.

5. A structure as specified in claim 1, said belt comprising a chain having flat out-turned flanges to form a flared channel for engaging said means, with gaps in each side of said channel, the gaps at one side alternating with the gaps at the other side, so that said pans are held against lateral displacement, and said chain having links with straight edges to travel smoothly on said

means, obviating the necessity for any anti-friction means on the belt, and permitting the high speed necessary for the pans when in operation.

- 5 6. The structure of claim 5, in which the flanges at each side are longer than the opposite gaps at the other side, so that said chain has continuous engagement with said means.
- 10 7. The structure of claim 5, in which the flanges of one side are on the alternate links and the flanges of the other side on the intermediate links, so that each link has a flange.
- 15 8. The structure of claim 5, in which said chain is provided with other flanges forming another flared channel, with the gaps at one side of the chain opposite the gaps at the other side thereof, and with the inner
- 20 flanges of said channels forming wedges,

said means having a groove to receive said wedges.

9. A structure as specified in claim 1, said belt being arranged with upper and lower horizontally disposed portions, and having 25 links formed to provide practically an unbroken or continuous frictional engagement with said means, to prevent vibration, and to prevent lateral displacement of the belt, and said means including rotary elements 30 for engaging the underside of the lower horizontally disposed portion of said belt to sustain the weight thereof and to support said pans in an upside-down position for the return portion of the path of travel 35 thereof.

Signed by me at Chicago, Illinois, this 9th day of October, 1916.

RAYMOND W. DULL.