No. 768,976. PATENTED AUG. 30, 1904.

I. CHRIST.

CONVEYER.

APPLICATION FILED DEC. 12, 1903.

NO MODEL.

Fig. 1.

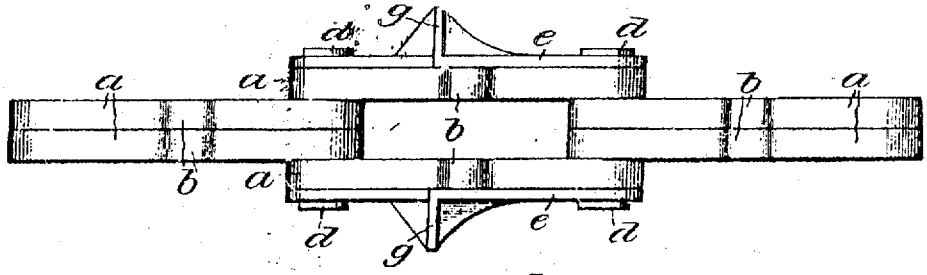
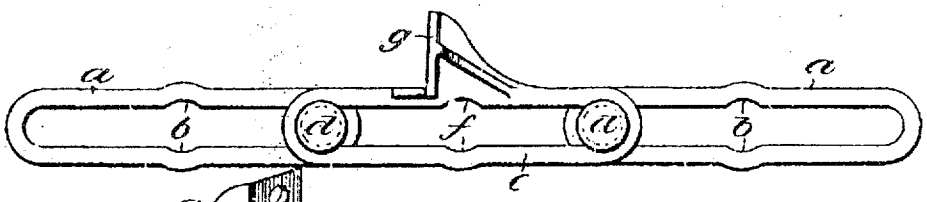



Fig. 2.



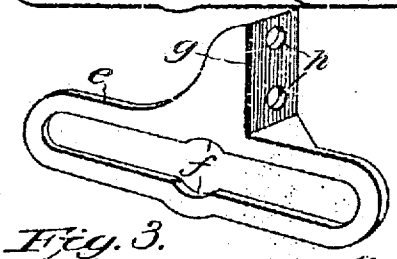




Fig. 3.

Fig. 5.

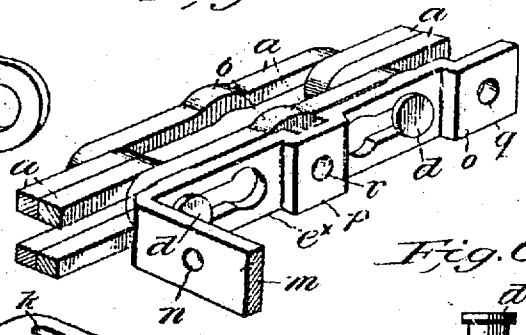



Fig. 4.

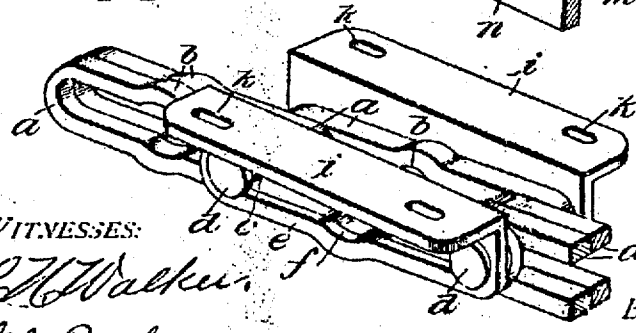



Fig. 6.




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No. 768,976. Patented August 30, 1904.

# UNITED STATES PATENT OFFICE.

ISAAC CHRIST, OF TAMAQUA, PENNSYLVANIA.

## CONVEYER.

SPECIFICATION forming part of Letters Patent No. 768,976, dated August 30, 1904.

Application filed December 12, 1903. Serial No. 184,811. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC CHRIST, a citizen of the United States, residing at Tamaqua, in the county of Schuylkill and State of Pennsylvania, have invented new and useful Improvements in Conveyers, of which the following is a specification.

This invention relates to conveyers of the type often referred to as "flight" conveyers; and the object of my invention is to provide an improved form of chain and flight links which may be readily assembled or taken apart without the use of special tools or machinery.

Endless conveyers composed of solid links having holes at their ends require the use of pivot pins or bolts, one end of which must be either riveted down or provided with a threaded head. The latter are liable to work loose, and if the ends of the pins are riveted they are liable to crystallize or otherwise deteriorate, so as to permit the pins to work loose. In either case there is difficulty in assembling or separating the parts and liability of fracturing the members or causing them to bind. To assemble or separate the parts or members of a conveyer constructed according to my invention, no special tools are required, while at the same time the pivot-pins which connect the chain-links also secure and lock the flight-links in proper position laterally adjacent to the chain-links.

Of the accompanying drawings, in which similar reference characters indicate similar parts or features of construction in all the views, Figure 1 represents a plan view of a portion of a conveyer illustrating one of the embodiments of my invention, it being understood that an endless flight conveyer in its entirety would comprise as many duplicates of the members shown in said figure as would be necessary or desirable according to the length of conveyer desired. Fig. 2 represents a side elevation of the parts or members shown in Fig. 1. Fig. 3 represents a perspective of one of the flight-link attachments shown in Figs. 1 and 2. Fig. 4 represents in perspective a portion of a conveyer-chain and illustrates a modified form or embodiment of my invention. Fig. 5 represents also in perspective still another modified form or embodiment of my invention. Fig. 6 represents a side elevation of one of the double-headed pins.

In each embodiment shown the form of the chain-links remains substantially identical, the differences residing in the flight-links or the brackets or arms carried thereby, according to the particular use for which the conveyer is intended. Various changes may be made in the form of the flight-links and their arms or brackets, according to the type of blade, carrier, or bucket that is to be attached to said arms or brackets, without departing from the scope and spirit of my invention. For this reason I have not illustrated any such blade or bucket, as my invention resides, as aforesaid, in the construction of the chain and flight links, which enables said parts to be readily connected or disconnected for repairs or the substitution of new members for damaged ones without the employment of wrenches or riveting or other tools.

Each of the chain-links *a* is formed with an elongated opening or slot, a portion of which is enlarged, as at *b*, for the purpose hereinafter described. These links are preferably arranged in pairs, each two pairs, which rest side by side and in contact, being connected by another pair lying against the outer sides of and overlapping the ends of the first-mentioned pairs and pivotally connected therewith by the double-headed pins *c*, having integral heads *d*. The heads of the pins are of a diameter slightly less than that of the enlarged portions *b* of the slots, so that the pins may be passed endwise through said enlarged portion. The same pins which unite and pivotally connect the chain-links also secure in the desired positions the slotted plates *e*. These plates are in the form of links, and they are provided with integral wings, lugs, brackets, or arms, to which the carrier blades or buckets (not shown) are to be secured. Partly because of their shape and partly for convenience I term said plates, with their projections, "flight-links." Their slots and the enlargements *f* thereof are similar to the slots and enlargements *b* of the chain-links *a*.

The flight-links shown in Figs. 1, 2, and 3 are formed with integral angular wings or lugs *g*, having holes *h* for the reception of bolts by means of which suitable blades or

scrapers (not shown) may be secured to their flat faces.

To assemble the parts shown in Figs. 1, 2, and 3, all that is necessary is to place four chain-links side by side and two flight-links against the outer surfaces of the two outer chain-links. Then insert a pin *c* through the enlargements of the slots, and then move the two inner chain-links lengthwise and carry the pin with them. Two more chain-links are now inserted between the outer chain-links of the first-mentioned set until the enlargements of their slots register with the slot enlargements of the said outer links, and then a second pin *c* is inserted. Upon then drawing apart the two pairs of end links the pins are carried to the ends of the slots, in which position the heads of the pins lock all the members together. Obviously the conveyer may be built up to any length desired in this manner, and the flight-links may be applied where wanted laterally adjacent to the chain-links at suitable intervals. It is also obvious that the reverse of the operation described enables the conveyer to be taken apart or new members readily substituted for damaged ones. Of course if the flight-links are not used adjacent to the sides of each alternate pair of chain-links the double-headed pins *c*, used to connect merely four chain-links, will be suitably shorter in length, so that their heads will rest snugly against the outer sides of such links.

As shown in Fig. 4, the wing or web of each flight-link may be formed as an elongated bracket *i* at a right angle to the plane of the link to form a more convenient and better support for a bucket to be attached to the faces of the two brackets, the latter having suitable holes or slots *k* for the bucket-attaching bolts. Preferably the flight-links in this case are somewhat wider at one end than at the other, as shown, so that the faces of the brackets *i* will be somewhat inclined to the line of travel of the conveyer.

In Fig. 5 I show a form of flight-link designed to support a bucket at one side of the chain-links instead of adjacent to the edges of the chain-links. In other words, Fig. 5 shows a form to support a bucket by attaching one end wall instead of its back to the flight-link. Moreover, in said Fig. 5 but one flight-link is employed instead of two. In said figure the flight-link $e^x$ is formed with an arm *m*, having a hole *n*, and with raised portions *o p*, having holes *q r*, respectively. The holes *n q r* are to receive suitable bolts, by means of which a bucket (not shown) may be attached, with its bottom resting on arm *m*. The portions *o* and *p* of the flight-link are raised to provide spaces behind said link for the heads of the bolts, said heads fitting in the spaces so that they cannot turn. Furthermore, the said end wall of the bucket will be prevented from resting against the heads of the pins. In Fig. 5 I have shown the flight-link as having its slot divided into two parts and having two enlargements for the passage of the heads of the pins. This is because of the presence of the raised portion *p*. Obviously if the said raised portion *p* were omitted the slot might be continuous, as in the other forms of flight-links shown.

Among other advantages not hereinbefore referred to I will mention that owing to the formation of the heads of the pins as described the said heads may be utilized as the means engaged by a suitably-formed sprocket, so that the latter may operate the conveyer or be operated by it, as will be readily understood.

Having now described some of the embodiments of my invention, although without attempting to describe all of the forms in which it may be made or all of the modes of its use, I claim —

1. A conveyer comprising slotted chain-links and slotted flight-links, and double-headed pins pivotally connecting the ends of the chain-links and also supporting and locking the flight-links in position, all of said links having their slots formed with enlargements to permit the passage of the heads of said pins, the flight-links corresponding in length with the chain-links and supported against the sides thereof by said pins.

2. A flight attachment adapted to be connected to an endless conveyer and having a projection for the connection thereto of a carrier member and having also a slot formed with an enlargement to permit the passage of a headed attaching member, said slot being elongated to permit movement of said headed member lengthwise of said slot when assembling or separating the members.

3. A flight attachment adapted to be connected to an endless conveyer and having an integral projection for the connection thereto of a carrier member and having also a slot formed with an enlargement intermediate its ends to permit the passage of a headed connecting-pin, said slot being elongated to permit movement of said pin lengthwise of the slot when assembling or separating the parts.

4. A conveyer comprising slotted chain-links alternately arranged in contacting and spaced pairs, slotted flight-links on the outer faces of the spaced chain-links, the slots of all the links having enlargements, and pins having integral heads adapted to pass through the enlargements of the slots, the said pins pivotally connecting the chain-links and their heads locking the flight-links in position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ISAAC CHRIST.

Witnesses:
H. A. Brereton,
John F. Wagner.