

(No Model.)

M. GARLAND.  
CONVEYER.

No. 491,344.

Patented Feb. 7, 1893.

Fig. 1.

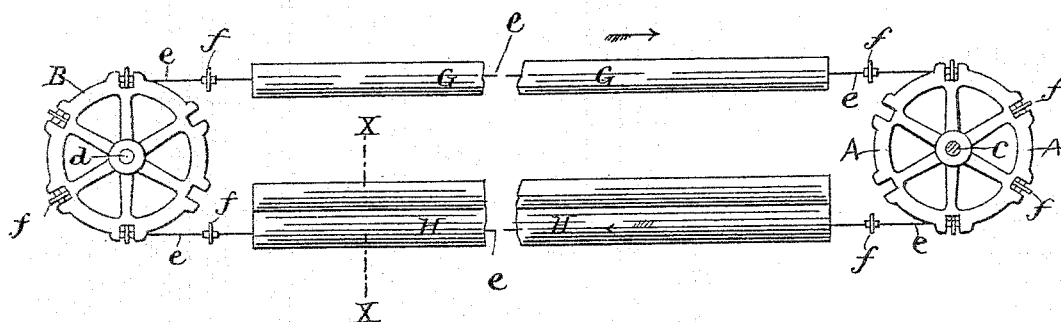


Fig. 2.

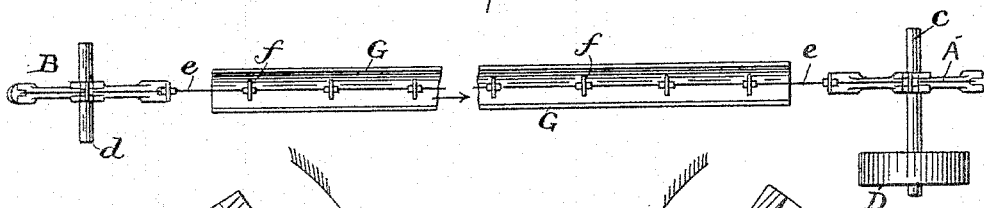
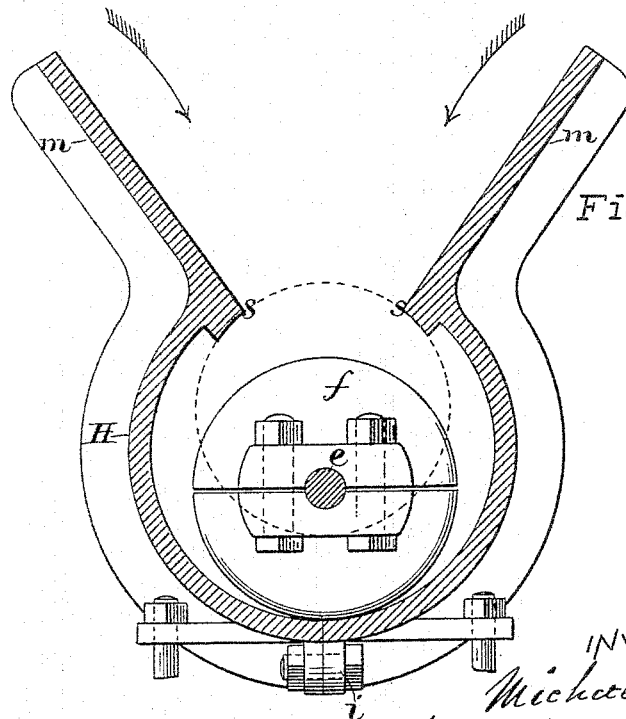


Fig. 3.



ATTEST:  
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# UNITED STATES PATENT OFFICE.

MICHAEL GARLAND, OF BAY CITY, MICHIGAN.

## CONVEYER.

SPECIFICATION forming part of Letters Patent No. 491,344, dated February 7, 1893.

Application filed October 10, 1892. Serial No. 448,274. (No model.)

*To all whom it may concern:*

Be it known that I, MICHAEL GARLAND, of Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Conveyers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

My present invention has for its main object to provide for use a novel construction of conveyer, more especially adapted to the purposes of handling coal, clay, pyrites, sand, and such like other materials; which shall possess, in the most eminent degree, the combined qualities of great efficiency, with the least practicable outlay of power, in moving the material along; simplicity and economy of construction; durability, and nonliability of any derangement of any of the working parts. And to this main end and object, my invention may be said to consist, essentially, in a conveyer comprising a trough which is made tubular in form, and preferably with a longitudinal opening, or openings, in its upper portion, and a cable, or chain, running within said trough and provided with circular, or nearly circular, flights, which travel within the trough, but are of considerably less size, superficially, than the cross-sectional area of said trough; all as will be hereinafter more fully explained and as will be more particularly pointed out in the claims of this specification.

To enable those skilled in the art to which my invention relates, to make and use conveyers containing the same, I will now proceed to more fully describe my improvements, referring by letters to the accompanying drawings which form part of this specification, and in which I have shown my said invention carried into effect in that precise form of conveyer contrivance, in which I have, so far, practiced it, though it may be practiced, of course, either in part, or in whole, in some other form, or forms, of machine.

In the drawings, Figure 1, is a side elevation of a conveyer embodying my improvements. Fig. 2 is a top view of the same. Fig. 3, is a detail cross-section, on an enlarged scale, at the line *x, x*, of Fig. 1.

In the several figures the same part will be

found always designated by the same letter of reference.

A and B are two, similar, combined rope- and-sprocket wheels, of any proper and approved detail construction, the shafts *c* and *d* of which are mounted in suitable bearing boxes, properly supported; one of said shafts, for instance that one marked *c*, being supplied with a fast pulley D, or other means, for the application thereto of the motive power to drive the conveyer. The other shaft *d* may, where deemed desirable, or expedient, be arranged, so as to be adjusted, laterally and horizontally, in a well known manner for the usual purpose of keeping the flighted cable, or chain, sufficiently taut.

*e* is the cable, or chain, (in the case shown a steel wire cable) which is provided with circular flights *f*, of any known and suitable pattern, preferably each made in halves clamped together, so as to embrace securely between its parts the cable *e*, all in a well known manner. As shown, these flights are arranged at such distances apart, that they correspond with the spacing of the sprockets of the wheels A and B, and, hence, run in engagement therewith, as shown, and in a manner familiar to the mechanic who understands the construction and operation of conveyers.

H is the trough to which the material to be handled is supplied, and along in which the material is carried, or scraped, by the action of the traveling disk-like flights *f*, of the endless cable *e*; while immediately over said conveyer trough (in the case shown), is an ordinary V-shaped trough G, in which travel, or along over the bottom of which ride, the unloaded (or return) flights of the upper run of the endless cable.

The arrows at Fig. 1, indicate the directions of motion of the two runs of the endless cable, and the material to be carried along through the trough H, is supposed to be supplied to said trough near one end, or at two, or more, points, and to be discharged therefrom at the other end, or, at such other point, or points, in the length of the trough as may be desired.

The trough G, which serves, in the case shown, merely to support the traveling, empty (or return) flight, is made sufficiently large only to serve this purpose, and is preferably constructed of boards with a longitudinally

arranged metallic bar, or plate, which bridges the crotch, or angle, of this V-shaped, trough, to prevent the circular flights *f* from cramping, or wedging, down into the angle of the trough, all in a manner well known and now in use. But this return trough may, of course, so far as my present invention is concerned, be made in some other, or any other, suitable manner.

10 The trough H (see Fig. 3) is made, preferably, of metal in such shape that in cross section it presents about the same form as that of a cylindrical tube, with a narrow longitudinal strip preferably removed from its upper portion; and, in the case shown, the opposite upper edges of this (so to speak) split tube, are formed, or provided, with flared extensions *m*, which extend divergently upward, as shown, and give the upper portion of the trough a hopper-like construction, to facilitate and insure the reception into the trough of material that may be fed to it (or discharged into it), in the direction indicated by the arrows at Fig. 3. The top opening and 25 flared extensions *m*, may extend the entire length of the trough, or not, according to circumstances.

As will be seen, by reference to Fig. 3, the perimeter of each flight *f* as the series of 30 loaded, or working, flights travel along within, and on the inner bottom surface of the trough H rests on the trough at its lowermost point only, while the adjacent flight edges and inner wall of trough gradually recede 35 from each other, their circles being eccentric; but, in practice, in handling some kinds of material, the flights are apt to be lifted up some by an accumulation of stuff on the lower portion of the trough's curved bottom; and 40 when this happens, so that some of the flights *f* will ride on this accumulated stuff and be lifted, for instance, into the position indicated by the dotted circle at Fig. 3, then the upper portions of the flights' perimeters will 45 come into contact with the inner upper parts *s*, *s*, of the trough, and will be thereby prevented from rising farther in the trough, or climbing too much over the material, which latter will eventually yield, or move, under 50 the gravity of the flights and cable, and the scraping action of the lower portions of the perimeters of the flights and will eventually move on, while the flights settle down again to their normal plane of action.

55 The oblong aperture in the top of trough H; as well as the relative sizes of the trough and flight (in cross-section), the form of trough; and the positions of the hold-down edges *s*, *s*, are all details to be either followed, or varied, 60 as circumstances and experience may render advisable, though about the proportions and arrangement of parts shown will be found to usually work well.

65 The conveyer trough H, as shown, is composed of two, nearly semi-cylindrical parts the

flanges of which are bolted together at *i*, and said trough is, of course, supported by any proper devices as is also the return trough G.

It will be understood that, where deemed desirable, the flared extensions *m* may be 70 omitted, without affecting the operation, or detracting from the advantages, of the other parts of my invention, and that portions of the trough H, (especially where the trough may be inclined, or runs obliquely upward,) 75 may be closed at the top; the most important feature of which is the tubular trough having arranged to travel within it, but capable of being lifted within it, flights smaller than the cross-sectional area of the trough. And I wish 80 it to be understood that I do not limit myself to a machine containing all of the, separable, novel features of my invention; but

Having shown and described a conveyer containing them all, what I claim as new and 85 desire to secure by Letters Patent is:—

1. In a trough-conveyer, the combination of a tubular trough substantially circular in cross-section, having an opening extending along its uppermost portion as specified; a 90 suitable traveling cable, or chain, arranged to travel within said trough; and flights substantially circular in contour, but of materially less face area than the cross-sectional area of the trough, mounted on said cable or 95 chain; the whole arranged and operating together in substantially the manner and for the purposes hereinbefore set forth.

2. In a trough conveyer the combination with a tubular trough, having an opening extending along its uppermost portion, as specified; and suitable means for conveying through said trough the material supplied to it, of flared, or divergent, extensions *m*, *m*, to the upper edges of said trough opening; all in 105 substantially the manner and for the purposes hereinbefore set forth.

3. In a trough conveyer, the combination of the following named instrumentalities, arranged and operating together substantially 110 as and for the purposes hereinbefore described; first, a conveyer trough partially tubular in cross-section, being open along its uppermost portion; second, a suitable cable, or chain, arranged to travel within said conveyer trough; third, flights secured to said cable, or chain, that are substantially circular in contour, but each of less superficial area than the cross-sectional area of the conveyer trough; and fourth, longitudinal flight-confining devices, or detaining stops, at *s*, *s*, which 120 prevent the flights from being lifted beyond a predetermined point.

In witness whereof I have hereunto set my hand this 26th day of September, 1892.

MICHAEL GARLAND.

In presence of—

MORRIS L. COURTRIGHT,  
A. B. LENNOX.