

(No Model.)

2 Sheets—Sheet 1.

M. GARLAND.
SPROCKET CABLE ELEVATOR.

No. 482,239.

Patented Sept. 6, 1892.

Fig. 1.

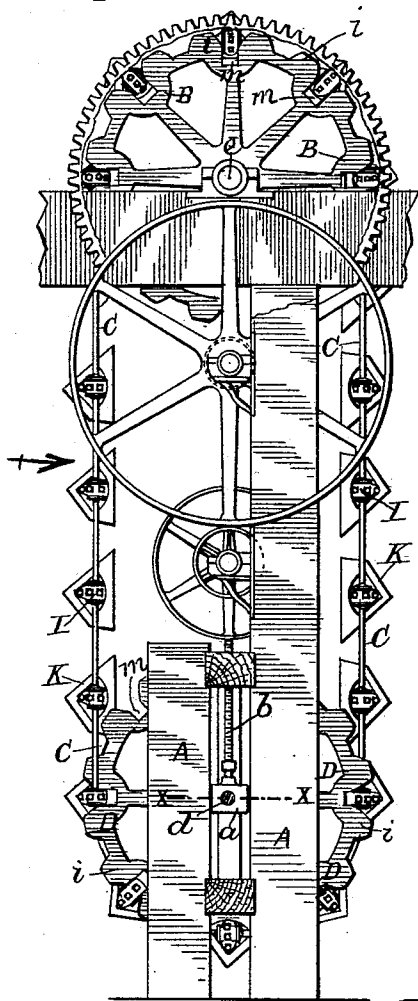


Fig. 2.

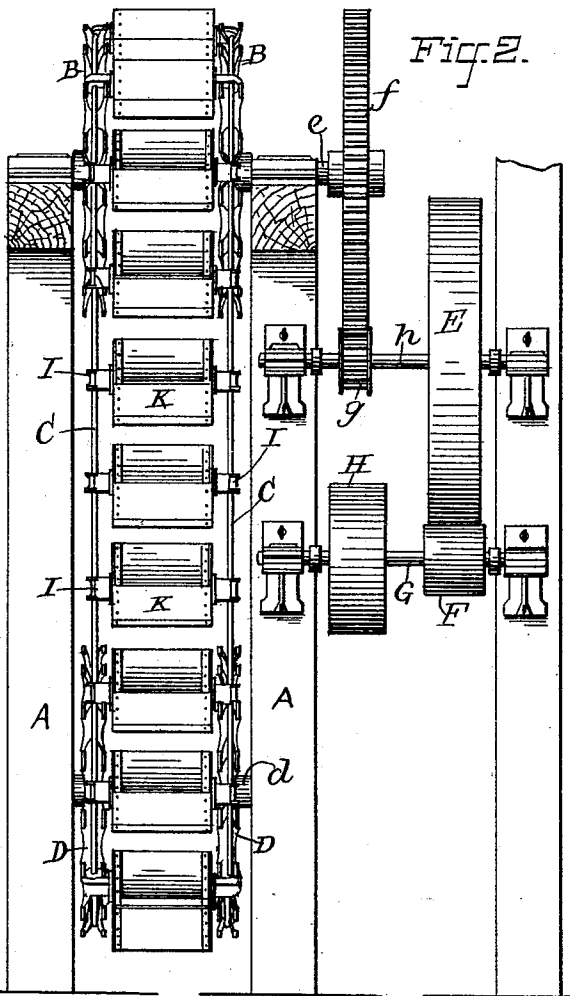
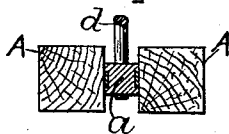


Fig. 3.



ATTEST:

J. A. Hurdle
M. E. Foster.

INVENTOR:

Michael Garland

By

BY
J. M. Sutter Attorney

(No Model.)

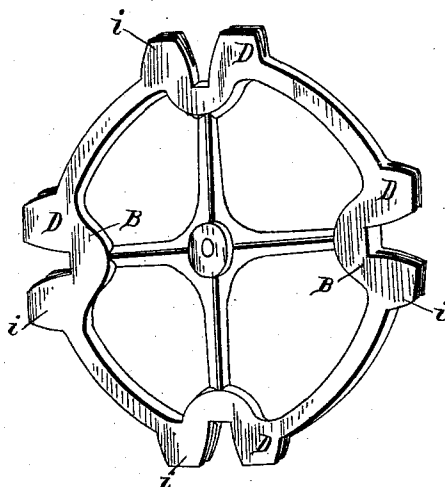
2 Sheets—Sheet 2.

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Fig. 4.



Attest.

A. B. Legges
J. J. Hoffman

Inventor.

Michael Garland
per J. W. McIntire
Attorney

UNITED STATES PATENT OFFICE.

MICHAEL GARLAND, OF BAY CITY, MICHIGAN.

SPROCKET-CABLE ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 482,232, dated September 6, 1892.

Application filed April 18, 1892. Serial No. 429,510. (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 Sprocket-Cable Elevators; 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 relates more particularly to that species of elevators in which one or more endless cables provided with sprocket-like devices and carrying suitable receptacles is or are combined with wheels adapted to run in connection with such sprocketed cable or cables, although some of the features of my invention may be used in contrivances adapted merely to the purposes of power and motion transmitters. The particular features of improvement which I have invented will be found described hereinafter, and most particularly pointed out in the claims of this specification; and to enable those skilled in the art to understand and practice, either in part or in whole, the several features of my said invention I will now proceed to more fully explain the latter, referring by letters to the accompanying drawings, in which I have shown the several features of my improvement carried out in those forms in which I have so far actually practiced the same.

In the drawings, Figure 1 is a side elevation of an elevator designed and used for elevating ore, coal, &c., and embodying my invention. Fig. 2 is a view of the elevator, looking in the direction indicated by the arrow at Fig. 1. Fig. 3 is a detail view to be hereinafter referred to, and Fig. 4 is a perspective view of one of the sprocket-wheels detached.

In the several figures the same part will be found always designated by the same letter of reference.

A is a suitable main framework for the support of the working parts of the machine.

B B are the upper and driving set of combined rope and sprocket wheels, over the peripheries of which pass two endless sprocketed cables C C, which also make half-turns beneath another pair of combined rope and sprocket wheels D D, which act merely as

idlers to keep the endless cable in a properly-distended condition. The shaft *d* of the lower pair of wheels D D has its journal-boxes *a* arranged to slide vertically, as shown, (see Figs. 1 and 3,) so that by means of adjusting screw shafts or rods *b* the said boxes can be moved downward and held in such condition as to insure the requisite tautness of the endless cables, all in a manner familiar to the skilled mechanic. The shaft *e* of the upper set of wheels has its journal-boxes arranged permanently at the top of the main frame, as clearly shown, and on one projecting end of said shaft is keyed fast a spur-gear *f*, which engages with a pinion *g*, fast on the counter-shaft *h*, while fast on said counter shaft is a spur-gear *E*, which engages with the main driving-pinion F of the main drive or power shaft G, to which the requisite power and motion may be imparted by any suitable motor through the medium of a belt banded to the pulley H of said drive-shaft. As clearly shown, the journal-boxes of both the counter-shaft *h* and the main drive-shaft G are securely fastened to the main framework of the elevator.

Securely fastened to the two endless cables in pairs, as shown, are sprocket-like devices or stops I, which are adapted to engage (in a manner to be presently explained) with alternate pairs of teeth or sprockets of the two sets of wheels B B and D D. As these wheels are duplicates and the cables, with their attached devices, are alike, I will now particularly describe only that one of the (upper set of) wheels seen at the top of Fig. 1 and that one of the cables, and its stops, which runs over said wheel, which description will answer for all the wheels and the two cables which coact therewith. The said wheel is made without the usual circumferentially-arranged groove in its periphery, (that is adapted to receive and seat the cable very much after the fashion of an ordinary rope-wheel;) but at either side of the usual locality of said groove the wheel is formed or provided with a series of equidistant teeth or sprockets *i*, which are arranged in pairs or opposite each other transversely of the wheel's periphery, as shown. At the spaces between every alternate pair of such teeth a transverse cut-out *m* is made in the periphery of the wheel for the accommo-

dation of one of the sprockets or stops I of the
 cable, while the spaces between the roots of
 the other pairs of teeth simply present the
 circumferential surfaces of the wheel for the
 5 accommodation of the cable itself. In other
 words, as plainly illustrated, the peripheral
 rope-surface of the wheel has its continuity
 broken only at the locality of the alternately-
 arranged pairs of the teeth *i* by the depres-
 10 sions or cut-outs *m*, which run across the
 entire width of the periphery and extend in-
 wardly or toward the center of the wheel
 much farther than does the uncut peripheral
 rope-seat. Each of the stops or sprocket-like
 15 devices I is composed in the case shown of
 two similarly-shaped castings between the ad-
 jacent grooved surfaces of which the cable C
 is clamped, and said castings are securely
 fastened together and to the cable by two ma-
 20 chine bolts and nuts; but these details of
 construction with reference to the devices I
 are not material, as other forms of stops may
 be employed. In the case shown (see Fig. 2)
 each of the devices I is formed with a verti-
 25 cal flange-like part adapted to be bolted to
 one end of a bucket K, and a series of said
 buckets is arranged between the two cables,
 one bucket being fastened at either end to
 every pair or oppositely-arranged set of stops
 30 I; but a fewer number of such buckets may
 be used, and the receptacles K may be differ-
 ent in form from those shown and may be
 differently connected with or attached to the
 stops or sprocket-like devices of the cables.
 35 In the general operation of the contrivance
 shown, power being applied to the main
 drive-shaft G, the requisite motions will be
 imparted through the system of gearing
 shown to all the working parts to cause the
 40 top set of wheels B B to drive the two similar
 endless cables C C in the proper direction,
 and thus through the medium of their buck-
 ets K elevate the material to be conveyed in
 the usual manner; but the drive-wheels B B
 45 may of course receive the requisite motion
 by other means than that shown, and so far
 as any novel structural features of the wheels
 B B and the sprocketed cables are concerned
 these devices may be used together without
 50 any buckets attached to the cables and for
 the purposes only of transmitting power and
 motion. It will be observed that each of the
 combined rope and sprocket wheels is made
 so that between each pair or between every
 55 two of the cut-outs or gaps *m* there is a long
 unbroken plain peripheral bearing or seat for
 the cable, and so that the cable runs in con-
 tact with an almost unbroken circular bear-
 ing or circumferential seat in the periphery
 60 of the wheel, the continuity of the circular
 bearing for the cable being broken only at
 the vicinity of the narrow transverse gaps
m, and it will also be seen that at these points

practically the whole extent of cable that is
 unsupported by the periphery of the wheel 65
 is confined within one of the sprocket-like de-
 vices I, so that there is substantially no an-
 gular bending strain on the cable at any
 point. The cable runs onto the periphery of
 the wheel tangentially, thence makes a half- 70
 turn on the periphery of the wheel in a curve
 substantially identical with the circular curve
 of the periphery of the wheel, (being practi-
 cally in contact with the periphery of the
 wheel at every point throughout said half- 75
 turn,) and then leaves the face of the wheel
 tangentially, so that there is the least possible
 injurious strain and wear on the cable. I
 consider this structural feature of the im-
 proved contrivance shown of great impor- 80
 tance, and of course this characteristic fea-
 ture may be embodied in a contrivance hav-
 ing the wheels made with less teeth and the
 cables provided with fewer sprocket-like de-
 vices than I have shown, the pith of my im- 85
 provement in this direction resting in the
 idea of a wheel made without any rope-groove
 and with the continuity of its peripheral
 cable-seat broken only at the points at which
 the gaps *m* are located and a cable combined 90
 therewith which has only the sprocket-like
 stops to coact with such cut-outs *m* of the wheel,
 and this structural feature it will be under-
 stood may be used in either an elevator 95
 (such as shown) or in a contrivance adapted
 only to the purposes of transmitting motion
 and power.

Having now so fully explained my im-
 proved machine that any one skilled in the
 art can make and use my invention, what I 100
 claim as new, and desire to secure by Letters
 Patent, is—

1. A combined rope and sprocket wheel
 having some of the spaces between the pairs
 or sets of sprockets or teeth gapped or cut 105
 out, as specified, and having the rest of such
 spaces ungrooved circumferentially of the
 wheel to seat the sprocketed rope which may
 be run on such wheel, substantially as and
 for the purposes described. 110

2. The combination, with a combined rope
 and sprocket wheel having gaps *m* between
 some of the pairs of sprockets and having its
 periphery ungrooved at all points except im-
 mediately at either side of where the said 115
 gaps are formed, of a cable arranged to run
 on the ungrooved periphery of said wheel and
 provided with sprocket-like devices which
 engage with said gaps, all substantially as
 and for the purposes hereinbefore set forth. 120

In witness whereof I have hereunto set my
 hand this 8th day of March, 1892.

MICHAEL GARLAND.

In presence of—
 MORRIS L. COURTRIGHT,
 SAMUEL LANDAU.