

(No Model.)

2 Sheets—Sheet 1.

J. M. DODGE.
CONVEYER FOR PILING COAL.

No. 404,263.

Patented May 28, 1889.

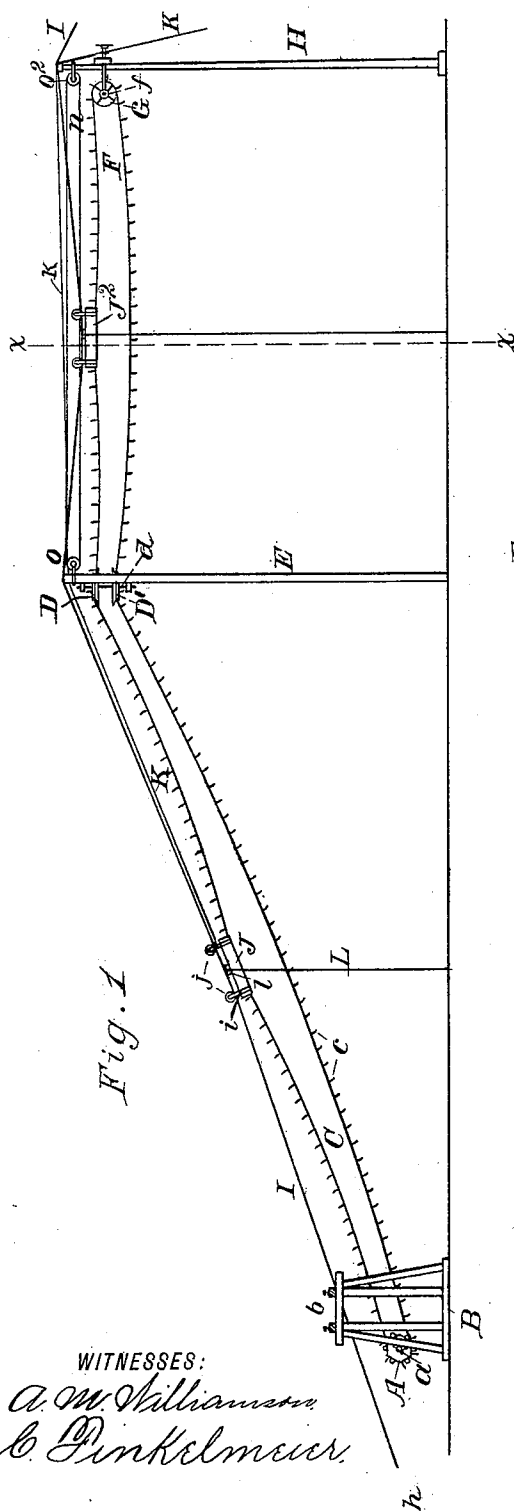


Fig. 1

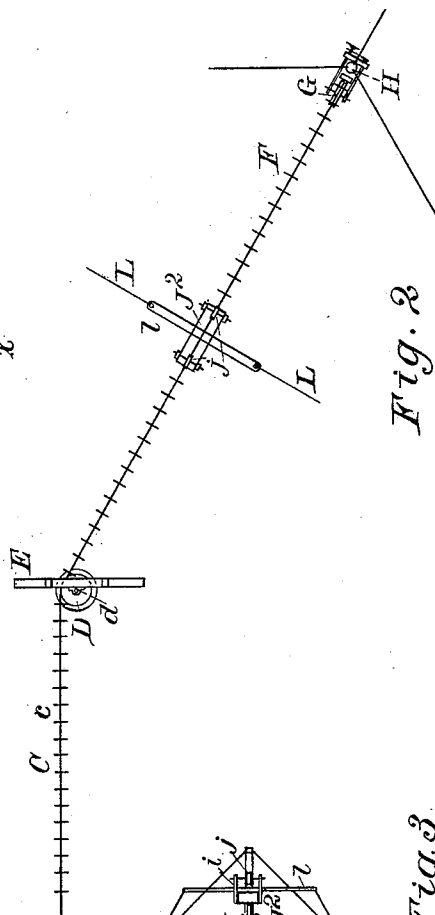


Fig. 2

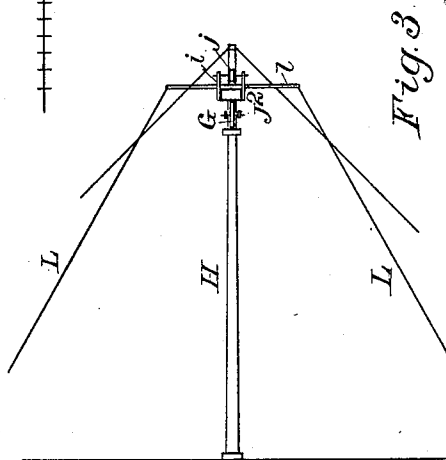


Fig. 3

WITNESSES:

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(No Model.)

2 Sheets—Sheet 2.

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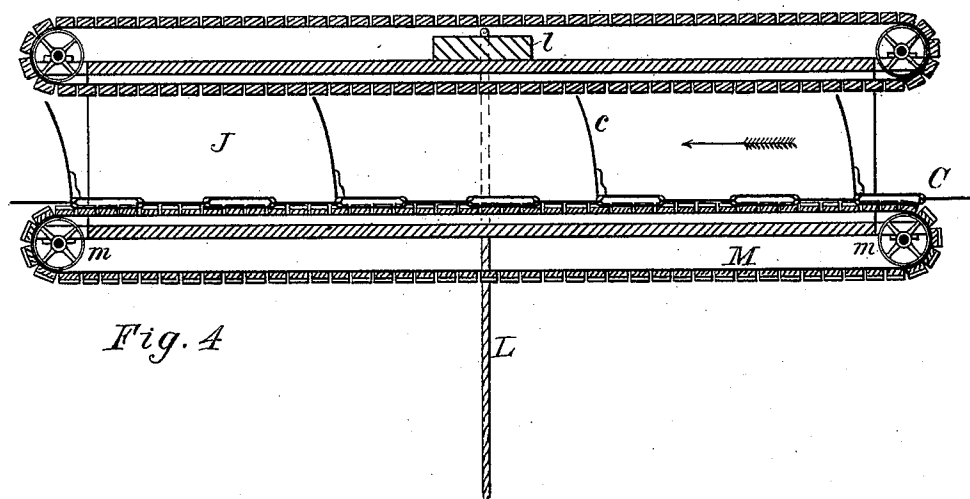


Fig. 4

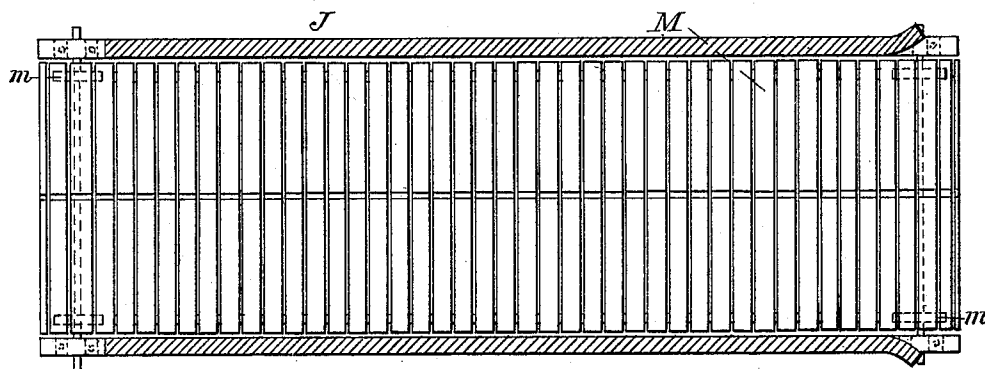


Fig. 5

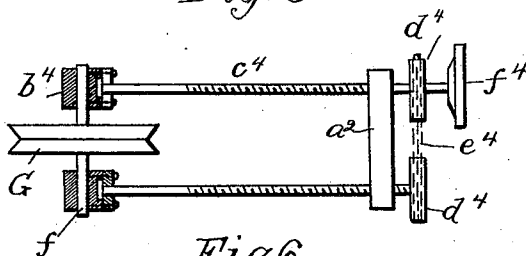


Fig. 6.

WITNESSES

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UNITED STATES PATENT OFFICE.

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CONVEYER FOR PILING COAL.

SPECIFICATION forming part of Letters Patent No. 404,263, dated May 28, 1889.

Application filed December 17, 1887. Renewed March 20, 1889. Serial No. 304,052. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. DODGE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improved Conveyer for Piling Coal; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to that kind of chain conveyers that are adapted to handling coal and other material in building the material up into piles or heaps, (an instance of which kind of chain conveyers is seen in another application by me, No. 250,316,) and has for its object to overcome the difficulty in the use of such contrivances (especially where the elevated runs of the conveyer-chain are of considerable length) that arises from the tendency of the upper run to twist or turn over owing to the tipping of the upwardly-projecting flights of such upper run. As heretofore constructed it has been found in practice, especially where the elevated upper run of the chain is of great length, (no matter whether suspended in an oblique or in a horizontal line,) that the great weight of the series of metallic flights apparently balanced edgewise on the chain causes the flights to tip over at one or the other end, and to thus twist the chain, and that this permits the flights and chain to get into improper positions at the vicinity of where they run onto and off from the sprocket-wheels, the result of which is that the chain and wheel (or wheels) are liable to get out of gear and cause derangement, breakage of parts, or serious trouble. In other words, it has been found in practice that in the use of a long double run of chain with the usual large and heavy flights and used (as is necessary in this kind of an apparatus) without any trough to confine or hold in place the flights, the latter cannot be maintained in a balanced position during the upper run of the chain, because of the inevitable slack in this part of the chain due to its great length and gravity, and increased from the fact that the lower run (with its

flights always depending or hanging down) is always the working or load-moving part, so that the slack goes mostly into the idle upper run of the chain, and that as a natural consequence to this inability to keep the flights of the upper run balanced their tipping over and constant tendency to assume a pendent position twists the upper run of the chain, so that it cannot properly run into and out of engagement with the sprocket-wheels of the conveyer.

I propose by my present invention to obviate this difficulty in the kind of conveyer apparatus alluded to, and at the same time render the general operation of the conveyer-chain easier and better by reason of having the upper run of the chain supported at a point (or points) intermediate of the points at which it runs in engagement with the sprocket-wheels; and to these main ends my invention may be said to consist, essentially, first, in the combination, with the upper run of the conveyer-chain, of means for maintaining the flights (at one or more localities) in an upwardly-projecting condition, and thus preventing the said run of chain and its flights from twisting or getting into a condition such as to disable it from keeping in perfect engagement with the sprocket-wheels, all as will be hereinafter more fully explained, and as will be more specifically pointed out in the claims of this specification; second, in the combination, with the upper run of the chain, of means for both preventing any undue twist of the chain and supporting or holding up the weight or sag of the chain at one or more points intermediate of the sprocket-wheels over which the chain runs, all as will be hereinafter more fully explained and as will be more specifically pointed out in the claims of this specification.

To enable those skilled in the art to which my invention relates to understand and practice the same, I will now proceed to more fully describe it, referring by letters to the accompanying drawings, which form part of this specification, and in which I have shown the several features of my invention carried out in those forms in which I have so far suc-

cessfully practiced them, though as to each of said features my improvements may, of course, be carried into effect under various modifications or in other forms.

5 In the drawings, Figure 1 is a side elevation of a pile-making chain-conveyer apparatus embracing the two features of my invention. Fig. 2 is a partial top view showing a portion of the horizontal chain-run and the
10 guide-box thereof. Fig. 3 is a cross-sectional view at the line $x x$ of Fig. 1. Fig. 4 is a detail view showing one of the guide-boxes in vertical longitudinal section and drawn on an enlarged scale. Fig. 5 is a detail view, on
15 the same scale, showing said guide-box in horizontal section. Fig. 6 is a detail view, on an enlarged scale, better showing the construction of the take-up frame, in which one of the chain-wheels is preferably mounted, as
20 will be hereinafter explained.

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

A is the lower, and, preferably, the driving,
25 sprocket-wheel of the conveyer, and it has its shaft a mounted in suitable bearing-boxes on a frame-work, B, which in the case shown is part of the trestle-work of an ordinary elevated-railroad track, b . Said wheel has the
30 necessary power and motion imparted to it, in any well-known manner, from a suitable engine or other motor, and from it extends, first obliquely upward and then off about horizontally, the endless-chain conveyer, the oblique
35 portion of which is marked C and the horizontal part F. This chain is provided with the usual flights, c , and it runs obliquely upward from the driving sprocket-wheel A to the two horizontally-located wheels D and D',
40 with which the upper and lower runs of the chain, respectively, engage laterally, and thence said chain passes about horizontally, as shown at F, to the sprocket-wheel G, around which it passes, all as clearly shown.

45 The shaft d of the wheels D and D' is in the case shown mounted in suitable boxes secured to the upper portion of the pole E, and the shaft f of the wheel G is supported, preferably, in a suitable take-up frame supported by the pole or standard H. This take-up
50 frame is composed, as will be best seen by reference to the enlarged view at Fig. 6, of suitable cross-bar, a^3 , and journal-box frames b^4 , which box-frames and bar are connected by screw-rods or shafts c^4 , each of which is
55 swiveled at one end in one of the box-frames, and both of which have their threaded portions working through female threads in the cross-bar a^3 , beyond which they are provided, preferably, with sprocket-wheels d^4 , banded
60 together by chain-belt e^4 , so that turning upon said screw-shaft will cause the other to also turn, one of said shafts being provided, as shown, with a suitable hand-wheel, f^4 .

65 Each of the poles or standards E and H is, of course, suitably braced in the proper directions by guy ropes or cables extending from

its upper end to anchorages at the surface of the ground and from the top of pole H to that of pole E, and thence obliquely to the anchorage h extends a wire or other cable, I, which
70 sustains in depending positions two (more or less) guide-boxes, J J², one of which, J, in the case shown, is combined with the upper run of the obliquely-arranged portion of the conveyer-chain, and the other of which, J², is combined
75 with the upper run of the horizontal portion F of the conveyer. As these guide-boxes are substantial duplicates, a description of one of them—for instance, J—will explain 80 the construction of both. The one lettered J is made, preferably, in the form of a simple rectangular tube, though it might be open at its upper side, (or might be a simple tubular frame-work,) and is provided with upwardly-
85 projecting arms i , by which, through the medium of small sheaves or anti-friction wheels j , it is suspended from the cable I in such manner that it can be held at any desired point beneath the obliquely-arranged portion of
90 said cable, being held in place longitudinally of said cable by a rope or cable, K, one end of which is made fast to the upper end of J and the other portion of which extends down, as shown, to within convenient reach for
95 manipulation by hand. To the top of J is secured a cross-bar, l , (there may be more than one, if desired,) from each end of which descend obliquely, as shown, (see Fig. 3,) a guy-rope, L, the lower end of which is suitably
100 anchored, the said guys operating to prevent the device J from swinging (or vibrating) to any material extent about its points of suspension from the cable I. One of the open
105 ends of J is preferably made slightly flaring, as shown, to insure the easy entrance thereto of the flights c , which at their opposite ends travel in easy contact with the vertical sides of said device J, so that the said sides
110 operate to hold the upper run of the chain C and its flights in the proper condition, or, in other words, operate to prevent this upper run of the conveyer-chain from twisting.

In order to make the device J perform, also, the office of vertically supporting the upper
115 run of the chain C, where it would otherwise sag considerably and thus diminish the strain on the chain and the draft-power necessary to run the conveyer, said device J is arranged so that the upper run of the chain C rests and
120 travels along on top of the inner surface of the bottom of said device J, which, for the purpose of diminishing friction, may be either provided with a series of anti-friction idler-rolls, (having their axes transverse to the tube,) or,
125 as shown, with an endless band, M, mounted on idlers $m m$ at each end of the device J, and having its upper run located above and its lower run beneath the bottom or floor of J, all as shown, (see Figs. 4 and 5,) the said endless
130 band being made, of course, so that the links of the conveyer-chain C will engage with its upper run, which latter thus serves to ride the chain C through the guide-box with the

least possible friction. Made and operating thus this device J performs, it will be seen, the functions of both a lateral guide to the flights *c* of the upper run of chain C, to prevent said chain from twisting, and a support to the said upper run of the conveyer-chain at a point intermediate of its supporting sprocket-wheels A and D. Each of these functions is an important and useful one, and though it is better to have this device J capable of performing both it might be made to serve either one only of these purposes and still be a very useful addition to the conveyer as heretofore made.

To adjust the device J to any point lengthwise of the upper run of the chain C at which it will best operate to produce the desired results, it is either permitted to descend on the tramway-cable I or is pulled upwardly thereon by the rope K and secured in place by the latter. The guide-box J² (though similar to the one marked J) being mounted on the nearly-horizontal portion of the cable I, has connected with it a band-rope, *n*, that passes over sheaves or rope-wheels at *o* and *o*², either of which may be turned (in either direction) by any suitable means to move the band *n*, and thus traverse the device J² to set it at any desired position.

The general operation of the apparatus shown is about the same as that of the one seen in my other case, hereinbefore alluded to, except as to the horizontal extension of the conveyer (which is made the subject of another case filed simultaneously with this one) and the supplemental devices J and J² and their attachments and connections, the operations of which devices I have above explained.

It will be understood that in cases where either the obliquely or the horizontally arranged portion of the conveyer-chain may be

comparatively very short only one of the devices (J or J²) may be necessary.

In lieu of the form of device shown and described a device of different construction might be used to hold the chain (against twisting) by contact with some other portions than the vertical edges of the flights.

What I therefore claim, broadly, as of my invention is—

1. In a coal-piling chain conveyer composed wholly of an endless chain provided with flights which project laterally in one direction, the combination, with said chain and its said flights, of a device which operates, as specified, to prevent the flighted chain from twisting at its upper run, and means for properly supporting said device independently of the chain, the whole arranged and operating together in substantially the manner hereinbefore set forth.

2. In a coal-piling chain conveyer composed wholly of an endless chain provided with flights which project laterally in one direction, the combination, with said chain and flights, of a device operating, as specified, to prevent any undue twisting of the upper run of the chain, and provided with means for partially supporting the gravity of said upper run, all substantially as hereinbefore set forth.

3. A device for both supporting and preventing the twisting of the chain and its flights, composed of a tube or tubular framework and provided with a traveling endless carrier, M, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand this 23d day of October, 1887.

JAMES M. DODGE.

In presence of—

GEO. M. BAKER,
A. J. B. BERGER.