(No Model.) 3 Sheets—Sheet 1.

W. LAWTON.

COAL CONVEYER.

No. 364,024. Patented May 31, 1887.

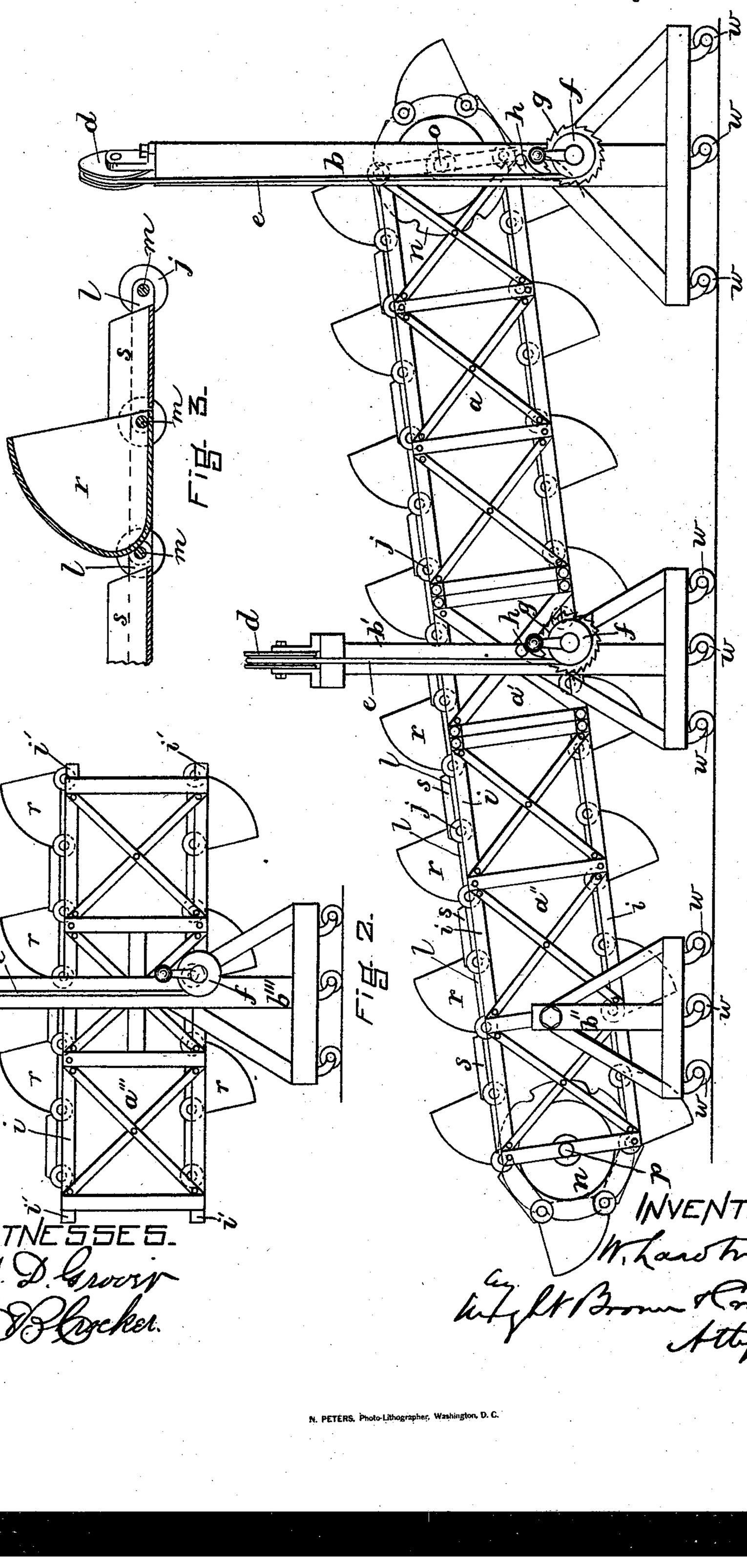

Fig. 1

Fig. 3.

Fig. 2.

WITNESSES.

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(No Model.)

3 Sheets—Sheet 2.

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COAL CONVEYER.

No. 364,024. Patented May 31, 1887.

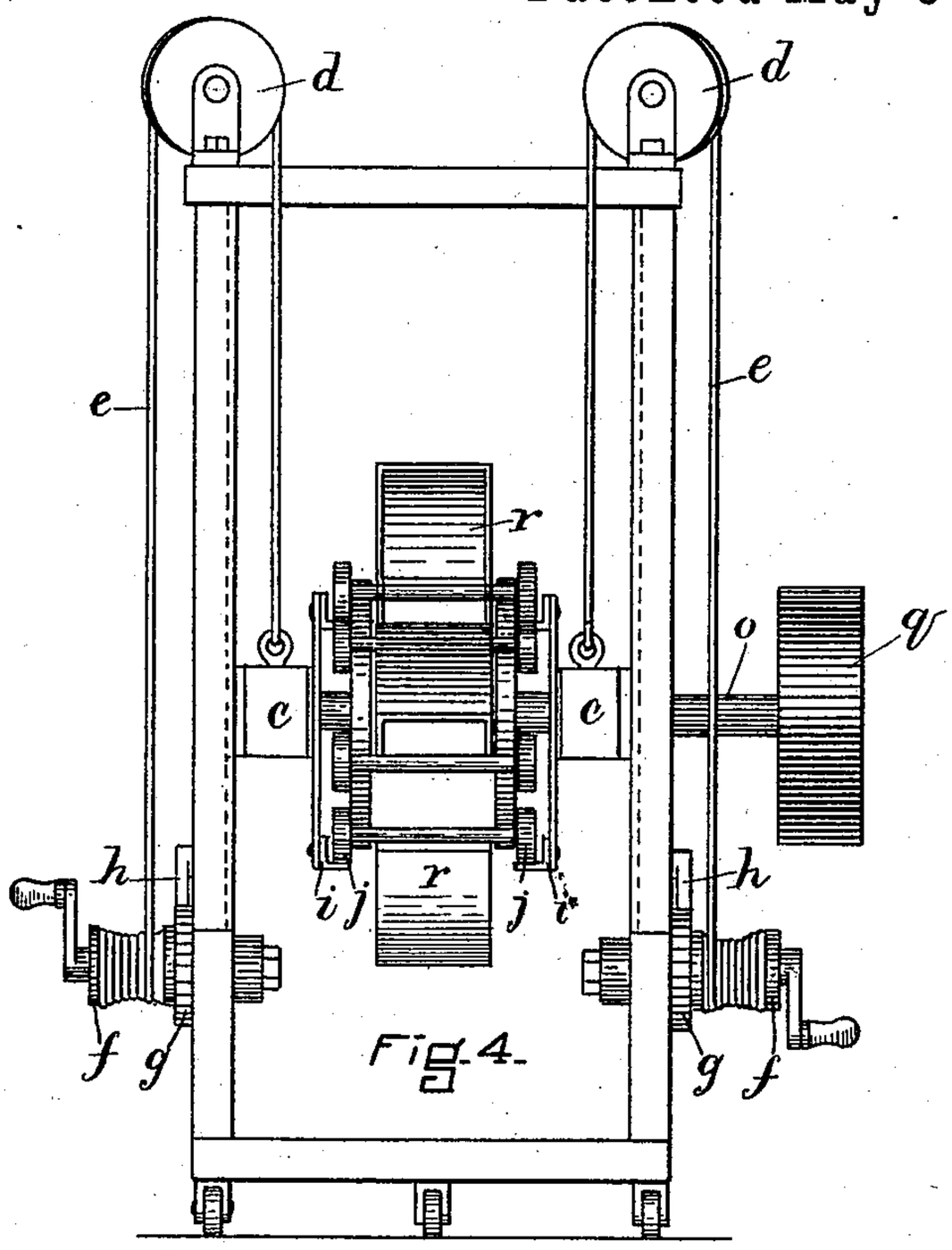

Fig. 4.

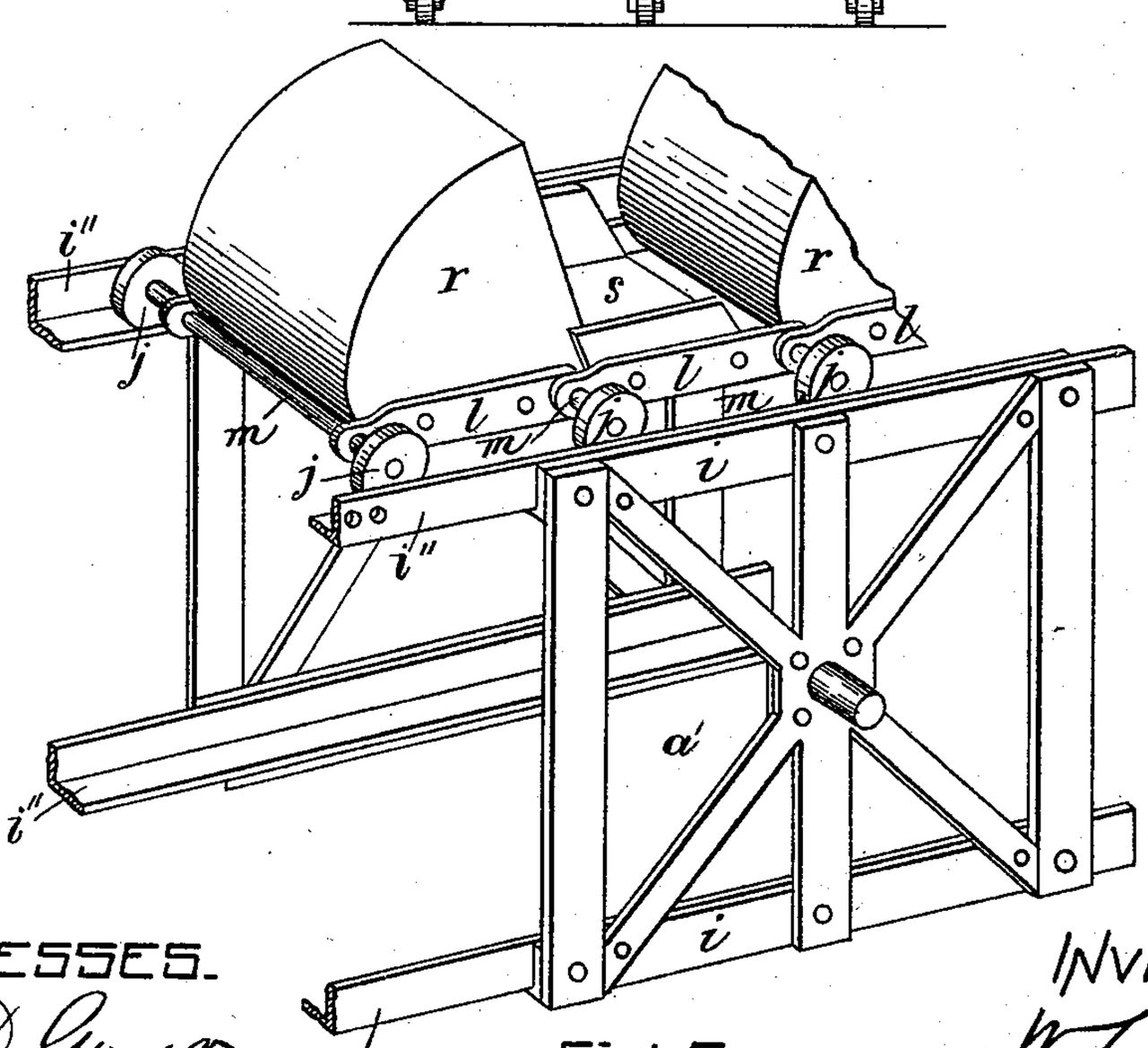

Fig. 5.

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(No Model.) 3 Sheets—Sheet 3.

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COAL CONVEYER.

No. 364,024. Patented May 31, 1887.

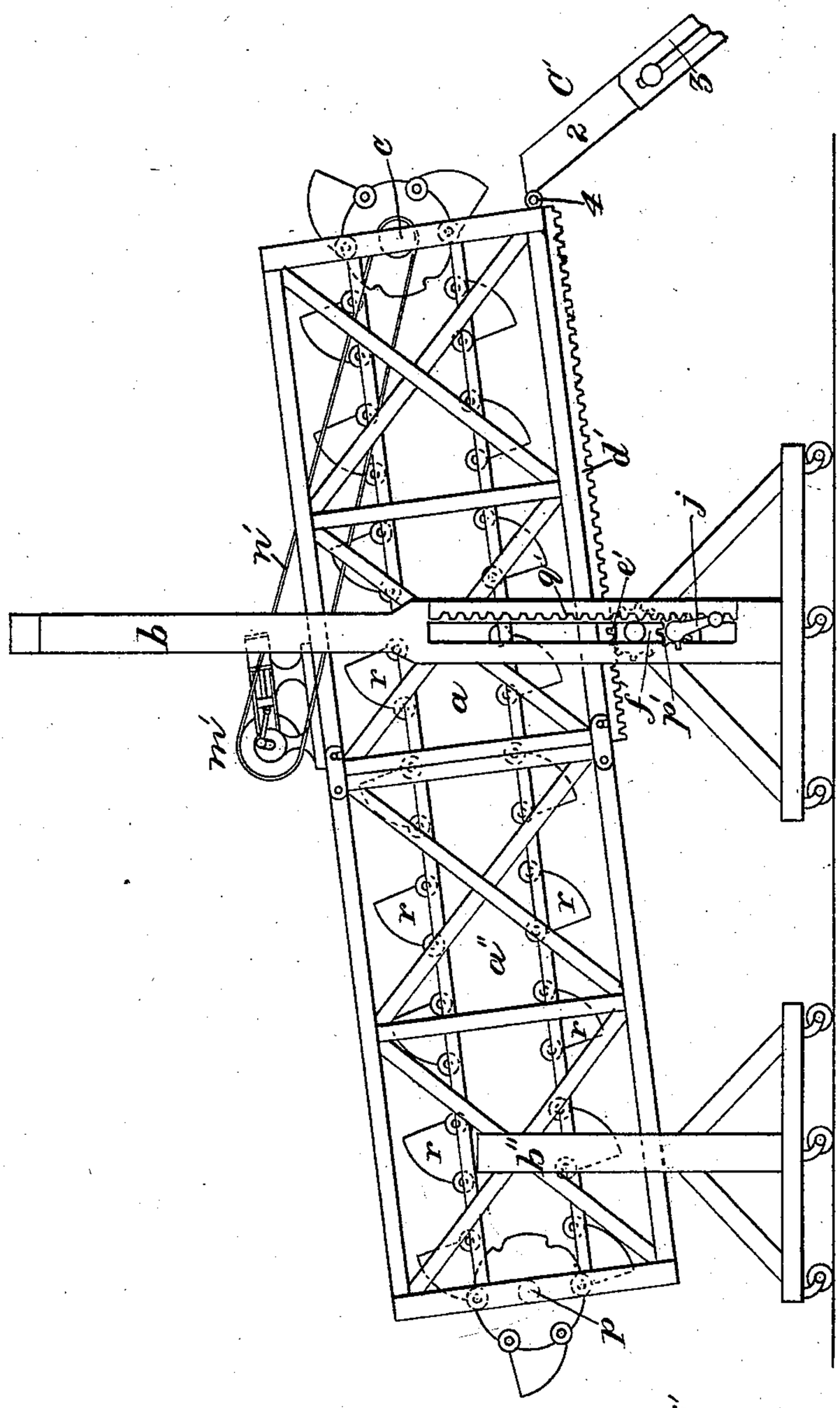

Fig. 6.

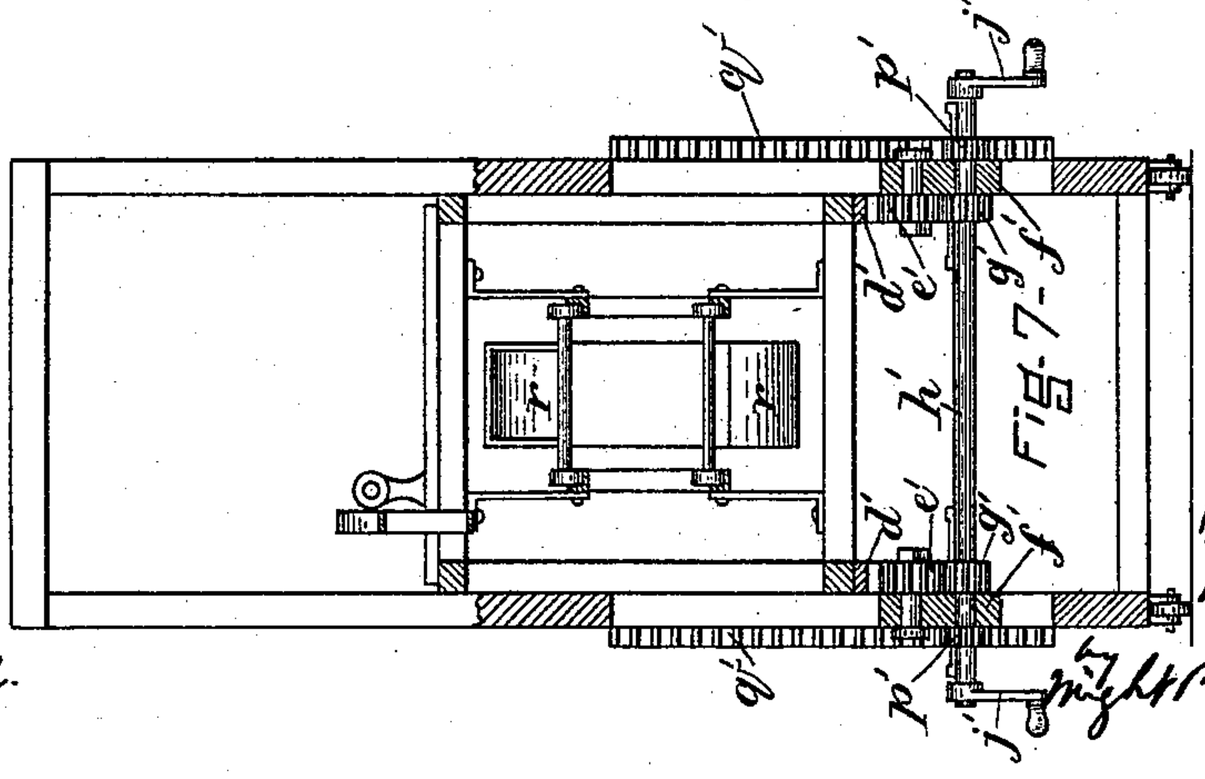

Fig. 7.

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UNITED STATES PATENT OFFICE.

WALTER LAWTON, OF WINTHROP, MASSACHUSETTS.

COAL-CONVEYER.

SPECIFICATION forming part of Letters Patent No. 364,024, dated May 31, 1887.

Application filed March 9, 1887. Serial No. 230,197. (No model.)

To all whom it may concern:

Be it known that I, WALTER LAWTON, of Winthrop, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Coal-Conveyers, of which the following is a specification.

This invention has for its object to provide improved means for conveying coal from various parts of a vessel's hold or other large reservoir or shipping-points to a central point, from which the coal is taken by buckets or other carriers whereby it is removed.

The invention consists, as a whole, in a telescopic frame composed of sections, each pivotally connected with a movable supporting-frame, and chains adapted to run on said frame, and provided with buckets adapted to take up coal from the receptacle at one end of the frame and carry it along the frame to the opposite end and there deliver it, and pans between the buckets to catch the coal falling therefrom, the construction and arrangement being such as that the frame and chains can be lengthened from time to time as the supply of coal at its taking end becomes exhausted, so that the conveyer can be extended as far as may be desirable from the delivering-point and in any desired direction therefrom, thus making it possible to bring the coal from all parts of a vessel's hold or pocket on a wharf to a central point, at a material saving in time and expense as compared with the usual methods of handling coal by manual labor.

My invention also consists in various details and sub-combinations, all of which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of my improved conveyer. Fig. 2 represents a side elevation of a detached section thereof. Fig. 3 represents a sectional view of a bucket and the adjoining pans. Fig. 4 represents an end view of the conveyer. Fig. 5 represents a perspective view of a part thereof. Fig. 6 represents a side elevation showing a different construction. Fig. 7 represents an end view of the construction shown in Fig. 6.

The same letters of reference indicate the same parts in all the figures.

In carrying out my invention I construct a frame in sections which are detachable from each other, each section being pivotally attached to a portable supporting-frame. In Fig. 1 I have shown a frame composed of three of said sections, *a a' a''*, supported, respectively, by supports *b b' b''*. The supports *b b'* are provided with vertically-movable blocks *c c*, Fig. 4, in which are the bearings for trunnions or shafts affixed to or passing through the sections *a a'*, said blocks being adapted to slide in vertical ways on the side pieces of said supports by ropes or chains *e e*, passing over pulleys *d d* at the upper ends of said supports to drums *f f* at the lower portions of said supports, said drums being provided with cranks, whereby they may be rotated to raise or lower the blocks, and with ratchets *g g*, engaged by pawls *h h*, pivoted to the support, whereby the drums may be locked to hold the blocks *c c* at any desired height. The trunnions of the section *a''* are not vertically adjustable, said section being at the end of the frame where the buckets which run on said frame take up their load; hence it is desirable that said section be always as near the bottom of the compartment or receptacle from which the coal is taken as possible.

Each section is provided with L-shaped parallel beams *i*, which constitute tracks or ways, on which are adapted to run a series of wheels, *j*, on the endless chains which carry the buckets and intermediate pans, hereinafter described. Said chains are composed of links *l*, pivotally connected by means of transverse rods *m*, extending across from chain to chain, and having their ends projecting from the outer sides of the chains and constituting projections to engage with the indentations of chain or sprocket wheels *n* on shafts *o p*, journaled, respectively, in the outer ends of the end sections, *a a''*. The shaft *o* is driven by power communicated from any suitable motor through a belt or chain (preferably the latter) running on a chain-wheel, *q*, on said shaft, so that the chains are impelled by said power, the wheels *j* on said chains running on the tracks *i*, and enabling the chains and the load carried thereby to move smoothly and easily.

r represents buckets, which are shaped substantially as shown in Figs. 3 and 5, and are securely riveted at their ends to the links of

the chains, each bucket being riveted at one end to one link of one chain and at the other end to the corresponding link of the other chain.

Alternating with the buckets, and riveted in like manner to the chain-links, are pans *s*, having sides which overlap the ends of the buckets sufficiently to prevent the coal that may escape therefrom during the passage from the receiving to the delivering end of the frame from falling out into the hold or receptacle. It will be seen that the chain-links and the buckets and pans attached thereto are connected wholly by the rods *m*, so that by making said rods removable, which I do by any suitable means, the continuity of the chains can be broken at any desired point or points for the purpose of shortening the chains by taking out one or more each of the pans and buckets, or lengthening them by inserting additional pans and buckets. This fact being remembered in connection with the sectional construction of the supporting-frame and the separability of its sections, it will be seen that both the frame and the chains thereon may be shortened or lengthened, so that the coal or other material to be transported may be brought from points at various distances from the delivering-point.

The length of the frame may be increased by disconnecting two of its sections, at the same time disconnecting the chains at the same point, and moving said sections apart and inserting an additional section, *a'''*, such as is shown in Fig. 2, in the opening thus created, said section being provided with any suitable devices whereby it may be coupled to the adjacent ends of the other section, and with sections of chain-links and buckets of sufficient length to restore the continuity of the chains on the other frame-sections.

The added section *a'''* may be of any desired length, preferably about ten feet, and is pivotally attached to a movable support, *b'''*, which is similar to the support *b'*. The ends of one of the frame-sections, *a'''*, may be provided with ears *i'*, adapted to enter corresponding recesses in the corresponding frame-sections and to be bolted or otherwise detachably secured to the latter.

It will be seen that by providing a sufficient number of sections the frame and series of pans and buckets may be extended from time to time, as occasion may require, until the farthest limit of the hold or receptacle from which the coal is to be taken has been reached.

The section *a'* has rigidly attached to its L-shaped beams *i* supplemental L-shaped beams *i''*, which project from one end of the said section and fit within and are adapted to slide on the beams *i* of the section *a''*, thus making the frame telescopic at that point, so that it may be lengthened a short distance without inserting an extra section *a'''*, it being my purpose to extend the frame from time to time by operating this telescopic portion until the increase in length thus obtained is nearly equal to the length of a section *a'''*, (which is preferably about ten feet,) and then slide the section *a'* up to the section *a''*, (closing the telescopic portion,) and inserting a section *a'''* in the opening thus formed between the sections *a'* and *a*. I then proceed to lengthen the frame telescopically step by step, as before, until the conditions are suitable for the insertion of another section *a'''*, and so on. It will be seen, therefore, that the telescopic action enables the frame to be lengthened by short steps enough for the insertion of one extra bucket and pan at a time, so that I am not obliged to increase the length of the frame at each adjustment by the length of a section *a'''*.

The supplemental or telescopic beams *i''* may be provided with racks engaging with pinions journaled on the section *a''*, whereby the telescopic beams may be moved out or in. I do not limit myself, however, to the telescopic construction last described. In Figs. 6 and 7 I have shown the frame as non-telescopic and composed of sections *a a''*, and have supplemented it at its delivering end by a telescopic chute, *c'*, the length of which can be varied as may be desired, said chute consisting of sections 2 3, adapted to slide telescopically on each other, like the sections of chutes now employed for delivering coal from coal-carts. The chute is hinged at 4 to the delivering end of the frame, and is capable of rising and falling therewith. The frame is pivotally connected at its receiving end with the support *b''*, as in the construction previously described; but its other end, which is provided with racks *d'*, rests on pinions *e'*, which are journaled in vertically-movable bearings *f' f'*, adapted to slide in slots or guides in the supporting-frame *b*, the racks *d* meshing with said pinions. The pinions *e'* mesh with pinions *g'* on a shaft, *h'*, which is journaled in said bearings *f'*, and is provided with cranks *j'*, whereby it may be rotated and be caused to impart motion to the pinions *e'*, and thus move the carrier-frame longitudinally to increase the distance between its receiving end and the delivering end of the chute *c'*, the latter being extended telescopically when the carrier-frame is moved away from its delivering end into the deposit of coal to be carried. It will be seen that in this way I effect an increase of several feet in the length of the conveyer as a whole (considering the telescopic chute a part of the conveyer) without adding buckets and pans to the chain, thus avoiding the delay and inconvenience of rupturing the chain and adding buckets every time the receiving end of the carrier is advanced into the hold or receptacle from which the coal is being conveyed. When all the increase in the length of the carrier has been effected which is practicable by the telescopic action of the chute, the sections *a a'* may be separated and a section *a'''*, like that shown in Fig. 2, interposed between them, the chute being at first contracted to compensate for the increase in the length of the carrier-frame, and then extended step by step as

the frame in the subsequent operation of the apparatus is moved away from the delivering end of the chute.

I have here shown an engine, *m'*, of any suitable type, mounted on the section *a*, and connected by a belt or chain, *n'*, with the shaft *o*, which impels the conveyer-chains. By thus mounting the motor directly on the conveyer-frame I avoid disturbing the operative connection between the motor and the shaft by the movements or adjustments of the conveyer-frame.

The conveyer-frame may be raised and lowered by any suitable means. I have shown in Figs. 6 and 7, as the means for raising and lowering said frame, pinions *p'* on the shaft *h'*, meshing with vertical racks *q'* on the support *b*. The pinions *p'* and *g'* should, however, be capable of being made loose on the shaft, so that either can be made inoperative, as it is not desirable that the pinions *e'* be rotated simultaneously with the pinions *p'*, as in that event the carrier-frame would be moved vertically and longitudinally at the same time.

It is obvious that various modifications may be made in the details of construction without departing from the spirit of my invention.

The movable supports of the frame-sections are preferably mounted on wheels or casters *w*, which enable said supports to be easily moved about. When the conveyer is in operation, the supports should be blocked so that they cannot move.

I claim—

1. The combination of the series of movable supports, the frame composed of separable sections, each pivotally connected to one of said movable supports, and the chains provided with buckets and pans adapted to run on said frame, said chains being separable at suitable points to permit them to be lengthened or shortened, as set forth.

2. The combination of the frame-sections, the chains supported thereby and provided with buckets and pans, as set forth, the movable supports, to which said sections are pivotally attached, chain or sprocket wheels on the end sections of the frame, and means for rotating the wheels of one section, and thereby impelling the chains and their buckets.

3. The combination of a movable support and a frame-section pivoted thereto and adapted by its pivotal connection to assume any desired angle, said section being constructed, substantially as described, for separable connection with a like frame-section, as set forth.

4. A frame-section, constructed substantially as described, for separable connection with a like frame section or sections, combined with a movable support, vertically-movable bearings on said support, with which said section is pivotally connected, and means for adjusting said bearings and holding them at any position to which they may be adjusted, as set forth.

5. The combination of the sectional frame, constructed to be lengthened and shortened by telescopic action, the movable supports for the section of the frame, the chains composed of separable links or members, and the alternating buckets and pans attached to said links, as set forth.

6. The combination of the telescopic sections *a' a''* and the section *a*, detachably connected to the section *a'*, whereby an additional section may be inserted between the sections *a* and *a'*, as set forth.

7. The combination of a supporting-frame composed of sections detachably connected, and a conveyer composed of chain-links, also detachably connected, and buckets and pans attached to said links between the chains and alternating with each other, as set forth.

8. The combination of a sectional supporting-frame, means, substantially as described, for adjusting the same, a motor supported by said frame, and conveyer-chains, also supported by the frame and operatively connected with the motor, as set forth.

9. The combination of the sectional frame, the conveyer-chains thereon, having buckets and pans, means, substantially as described, for moving said frame longitudinally, and the telescopic chute engaged with the delivering end of the frame, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 3d day of March, 1887.

WALTER LAWTON.

Witnesses:
C. F. BROWN,
A. D. HARRISON.