

(No Model.)

5 Sheets—Sheet 1.

P. BEST.  
COAL ELEVATOR.

No. 305,784.

Patented Sept. 30, 1884.

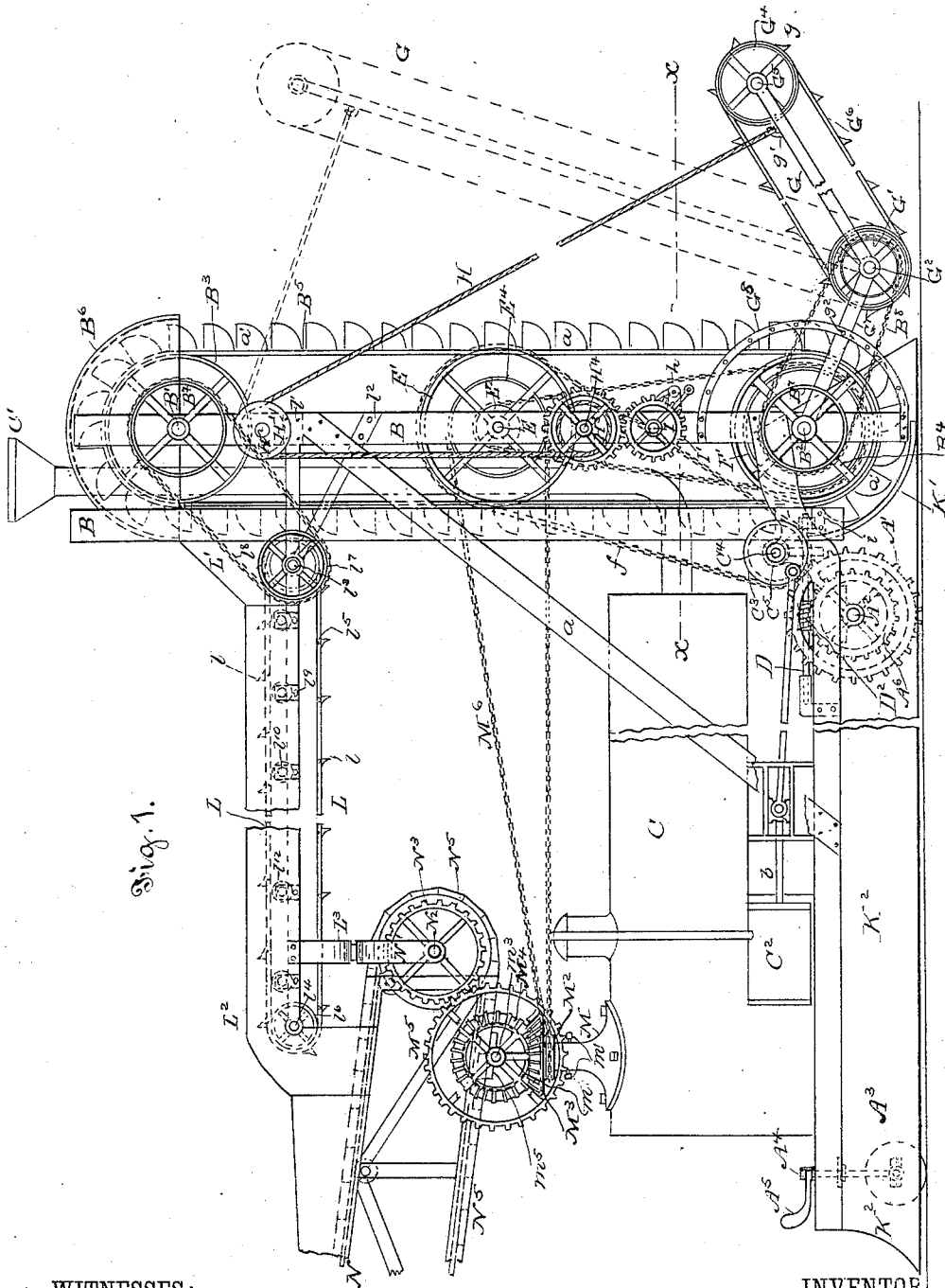


Fig. 1.

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BY

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ATTORNEY

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Fig. 1.

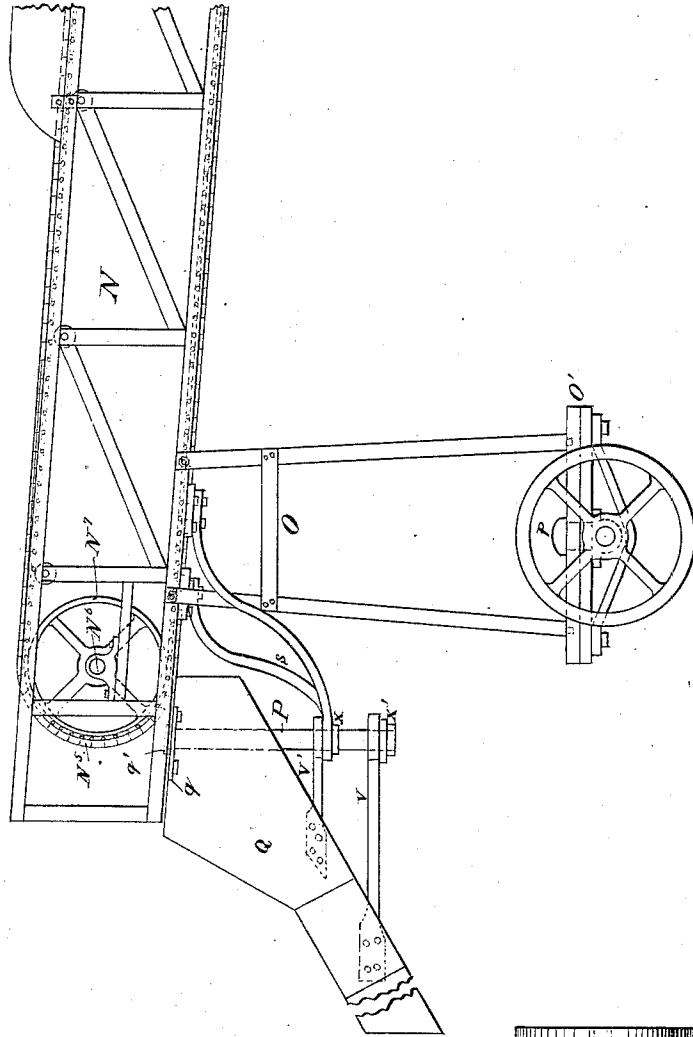
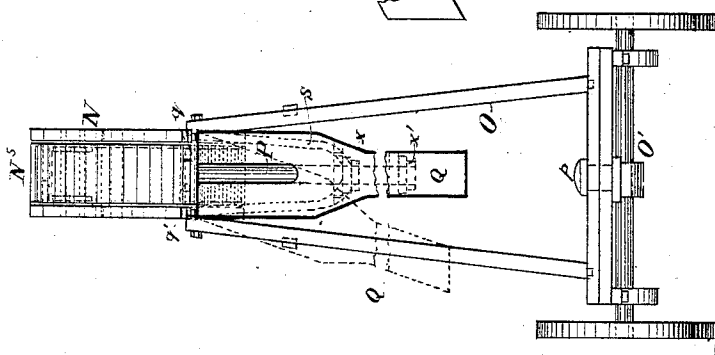


Fig. 2.



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*By Isaac S. Starr,*  
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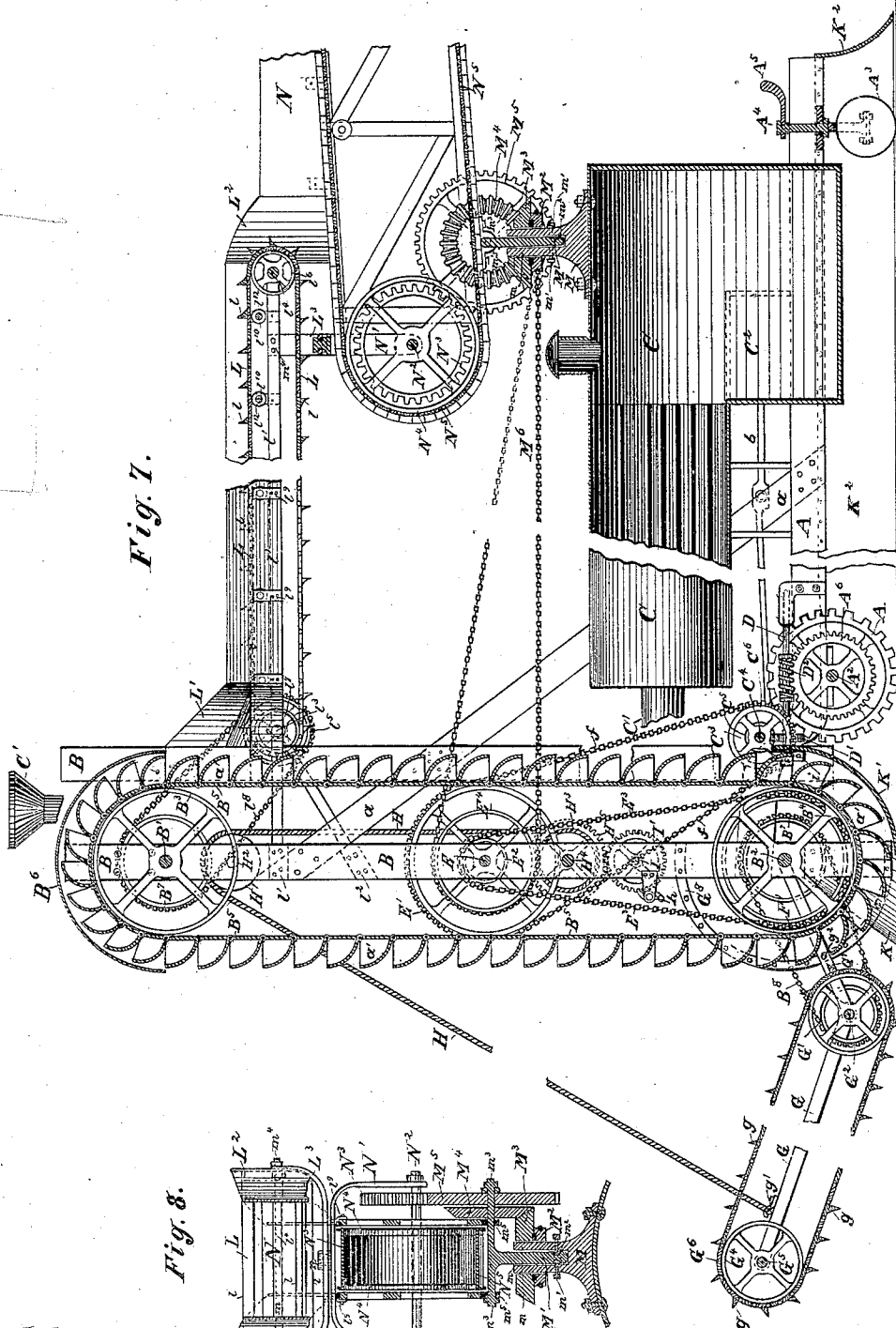


Fig. 1.

Fig. 8.

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Inventor:  
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 Attorney

# UNITED STATES PATENT OFFICE.

PETER BEST, OF ELIZABETH, NEW JERSEY.

## COAL-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 305,784, dated September 30, 1884.

Application filed February 6, 1884. (No model.)

To all whom it may concern:

Be it known that I, PETER BEST, a citizen of the United States of North America, and a resident of Elizabeth, county of Union, State of New Jersey, have invented a new and useful Improvement in Coal-Elevators, of which the following is a specification.

This invention relates to that class of devices which are designed for elevating coal from bins or other places of deposit, and discharging it into cars, lighters, or other vessels.

The invention consists of a portable elevator having two parallel sets of buckets for vertical lifting, between the lower extremities of which is fixed a double mold-board for turning or directing the coal equally to each set of buckets as the device advances into a coal pile; and it consists, further, of an adjustable elevator-leg arranged at an angle in front of the vertical sets of buckets, and designed for breaking down the coal to within reach of the vertical elevators, or to elevate the coal and discharge it into said elevators; and it consists, further, of a scoop or guard fixed on the timbers of the device and extending forward beneath the vertical elevator-buckets, for the purpose of preventing any of the coal in the pile operated upon from falling or sliding rearward of the vertical buckets, and for the purpose of affording a receptacle from which said buckets may conveniently raise the coal; and it consists, further, of certain novel devices for transmitting power to the elevator mechanism, and devices for directing the discharge of the coal-elevator, all of which will be hereinafter set forth.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figures 1 and 1<sup>a</sup> (illustrated on two sheets) is a side elevation of my improved elevator. Fig. 2 is an end elevation of that portion of the device designed for directing the discharge of coal. Fig. 3 is a front elevation with parts broken away to exhibit other parts. Fig. 4 is a rear elevation of the same with parts broken away to exhibit other parts. Fig. 5 is a reduced plan of the elevator. Fig. 6 is a sectional plan on one side of a central longitudinal line on line *x x*, Fig. 1. Fig. 7 is a sec-

tional side elevation of a portion of the device. Fig. 8 is a partly-sectional elevation of certain details of the device.

The elevator-platform A is supported at its front end by two traction-wheels, A<sup>1</sup>, fixed on an axle, A<sup>2</sup>, and at its rear end by a steering-wheel, A<sup>3</sup>, the vertical shaft A<sup>4</sup> of which passes up through the platform A, and is provided with a handle or tiller, A<sup>5</sup>, that is designed to be within easy reach of the operator, that he may thereby guide and direct the elevator at will. Vertical frames B B, suitably secured to the prolonged side timbers of the frame or platform A, and braced by braces *a a*, support on shafts B<sup>1</sup> B<sup>2</sup>, respectively, four sets or pairs of spiders, B<sup>3</sup> B<sup>4</sup>, over which are stretched belts or chains B<sup>5</sup>, to which are attached in the usual manner the elevating-buckets *a' a'*. Preferably hoods B<sup>6</sup> are secured to the frames B B over the tops of the vertical elevating devices, as shown.

Secured on the platform A are a boiler, C, furnished with smoke-stack C', and on either side thereof engine-cylinders C<sup>2</sup>, from which power for operating the device is transmitted through piston-rods *b* and pitmen *b'* to eccentrics C<sup>3</sup>, that are secured on opposite ends of a transverse shaft, C<sup>4</sup>, which is suitably journaled in the sides of the frame A. On this same engine-shaft C<sup>4</sup> is rigidly fixed a worm, C<sup>5</sup>, that gears with a cog-wheel, D<sup>1</sup>, which is secured on the counter-shaft D, that is journaled to suitable standards supported on the frame A. This shaft D, extending across from the shaft C<sup>4</sup> to the shaft A<sup>2</sup>, has on its other end a worm, D<sup>2</sup>, that is designed to engage with a cog-wheel, A<sup>6</sup>, on said shaft A<sup>2</sup>, so that the motion of the shaft C<sup>4</sup> shall be transmitted to the shaft or axle A<sup>2</sup>. The cog-wheel A<sup>6</sup> is loose on its shaft, and is designed to be made tight by means of a clutch, *d*, on said axle A<sup>2</sup>, whereby when power is applied to the device the axle A<sup>2</sup> may be rotated and the machine be propelled, and when the clutch *d* is withdrawn the wheel A<sup>6</sup> remains loose on its shaft and the propulsion of the machine ceases. Fixed also on the shaft C<sup>4</sup> is a loose sprocket-wheel or peripherally-grooved pulley, C<sup>6</sup>, that may be made tight by the engagement with it of the clutch *d*, and power is transmitted from this wheel C<sup>6</sup> by an endless chain, *f*, to the wheel E' on the shaft E, which latter, journaled in the frames

B B, is thereby made to revolve and transmit power for moving the vertical elevator-buckets by means of pulley E<sup>2</sup>, fixed on shaft E, and chain E<sup>3</sup> to the pulley F<sup>1</sup>, keyed on the shaft B<sup>2</sup>.

5 On each end of the shaft B<sup>2</sup> is also secured a peripherally-grooved pulley or sprocket-wheel, B<sup>1</sup> B<sup>1</sup>, from which power and motion are transmitted by chains B<sup>3</sup> to the wheels G<sup>1</sup> on the shaft G<sup>2</sup> at the lower end of the adjustable elevator-leg G. On the same shaft, G<sup>2</sup>, are wheels G<sup>3</sup>, and at the upper end of this elevator-leg are wheels G<sup>4</sup>, fixed on a shaft, G<sup>5</sup>, which is journaled in the frame-timbers of said leg. A wide belt, G<sup>6</sup>, carrying buckets or shovels *g*, is stretched over these wheels G<sup>3</sup> G<sup>4</sup>. This elevator-leg G is adjustably held in front of the vertical elevating portion of the device by means of arms G<sup>7</sup>, whose terminal eyes embrace the ends of the shafts B<sup>2</sup> G<sup>2</sup>, respectively, and by ropes H H, that have ends engaged in hooks or staples *g'* in the frame-timbers of the said leg, and are carried upward over pulleys H<sup>1</sup>, fixed on a shaft, H<sup>2</sup>, in the frame B, and then downward and secured to pulleys H<sup>3</sup>, that are fixed on a shaft, H<sup>4</sup>, also journaled in frame B. On one end of this shaft H<sup>4</sup> is also fixed a cog-wheel, H<sup>5</sup>, as shown. Below the shaft H<sup>4</sup> and journaled in frame B is a shaft, I, on which is a pinion, I<sup>1</sup>, which gears with the wheel H<sup>5</sup>. A crank on the end of shaft I enables the operator to revolve the said shaft I and pinion I<sup>1</sup>, whereby the pulleys H<sup>3</sup> are made to wind up the ropes H H, and thereby raise the elevator-leg G to any desired inclination.

35 By this means said leg G may be brought to the position shown in dotted lines, Fig. 1, or be lowered to the position shown in full lines, as may be best adapted to the slope of the pile of coal operated upon. A pawl, *h*, is designed to prevent, when desired, the reverse movement of the pinion I<sup>1</sup>. The braces G are adapted to move in vertical planes, and may be held at any desired angle by pins *g'*, passing through them and into the semicircular racks G<sup>8</sup>, that are fixed on the timbers B. The double mold-board K is secured by bolts or other suitable devices between the inside front timbers of the frame B, and in front of the guard or scoop K<sup>1</sup>, which latter is firmly secured to the rear timbers of the frame B by bolts *i*, as shown, or, if desired, to the front of the frame or platform A. When the elevator is advanced against a pile of coal, the mold-board K operates to deflect the coal equally to either side to the upright elevator-buckets, and, together with the scoop K<sup>1</sup>, operates to keep the track clear for the further advance of the elevator. The scoop or guard K<sup>1</sup> is designed to have its front edge about on a level with the floor, so that no coal can work beneath it, and it also serves as a receptacle from which coal may be taken by the vertical elevator-buckets *a*. A guard, K<sup>2</sup>, of sheet metal, is secured to the side timbers and rear end of the platform A, and extends straight down at the sides to near the floor on which the machine rests, while at the rear it projects

in a triangular point, as shown, and at the front the said guard is designed to be fastened to the edges of the scoop K<sup>1</sup>, the purpose being to prevent coal from getting beneath the elevator when it is at work, and interfering with its forward and backward movements. Coal elevated by the buckets *a a* falls into the chutes L' L' and thence upon the endless belt L, provided with carrying-plates *l*, which is partly inclosed in a horizontal conductor, L<sup>2</sup>, open at top and bottom. This conductor L<sup>2</sup> is partially supported by stringers *l'*, that form the lower edges of its sides, and are secured by bolts or otherwise to the frame B, and braced by braces *l''*, that are also secured to said frame.

At each end of the conductor L<sup>2</sup> is a shaft, *l'* *l'*, respectively, the one carrying two wheels, *l'* *l'*, and the other two wheels, *l'*, over which the belt L is stretched.

On the outer end of the shaft *l'* is a wheel or pulley, *l'*, and a belt or chain, *l'*, connecting this pulley with the pulley B<sup>1</sup> on the shaft B<sup>1</sup>, transmits motion to the belt L.

From the stringers *l'* rise standards *l'*, that support shafts *l''*, carrying rollers *l''*, which hold up the belt L.

On the top of the boiler C is firmly secured a standard, M, having a tubular upward projection, *m*, in which is held the perpendicular leg of a T-shaped support, M<sup>1</sup>. Set-screws *m'*, entered through the sides of the tube *m*, and having their points engaged in the annular groove *m''* of the support M<sup>1</sup>, permit the latter to revolve, while preventing it from moving vertically. The head *m''* of this support M<sup>1</sup> serves as a support for the front end of an adjustable conductor, N, open at top and bottom, which incloses a belt, N<sup>5</sup>, designed to receive coal falling from the belt L, said conductor being adapted to be adjusted in a horizontal plane, for the purpose of delivering the coal to any desired point. A journal-box, *m''*, secured on the bottom of the conductor N and embracing the head *m''* of the support M<sup>1</sup>, holds the two together. The rear end of the conductor L<sup>2</sup> is supported on the front end of the conductor N, and near the rear end of the former, secured by transverse rods or bolts *m'*, is a depending clevis or yoke, L<sup>3</sup>, to which is connected, by a pivot, *n'*, a yoke or clevis, N<sup>1</sup>, turned in the contrary direction, and having suitably journaled in its depending ends a shaft, N<sup>2</sup>, on which are secured a cog-wheel, N<sup>3</sup>, and two spiders or pulleys, N<sup>4</sup> N<sup>4</sup>, for driving and supporting, respectively, the belt N<sup>5</sup> of the conductor N.

Fitted over the tube *m*, on which they are designed to revolve, are a grooved pulley, M<sup>2</sup>, and a beveled cog-wheel, M<sup>3</sup>, respectively, that are designed to be so connected with each other as to move in unison in horizontal planes; and on an extremity of the head of the support M<sup>1</sup> are fitted, so as to revolve together loosely thereon in vertical planes, a beveled cog-wheel, M<sup>4</sup>, gearing with the wheel M<sup>3</sup>, and an ordinary cog-wheel, M<sup>5</sup>, gearing with the

wheel N<sup>2</sup>. A chain, M<sup>6</sup>, extending from the pulley E<sup>1</sup> on the shaft E around the pulley M<sup>2</sup>, consequently transmits motion to the belt N<sup>3</sup>, which is provided with suitable carrying-plates, n<sup>4</sup>.

In the rear end of the conductor N is journaled a transverse shaft, N<sup>6</sup>, carrying two spiders, N<sup>7</sup> N<sup>7</sup>, that, together with the above-mentioned spiders N<sup>4</sup>, support the belt N<sup>5</sup>. This rear end of the conductor N is supported by a frame, O, pivoted by a pivot, p, so that it can turn thereon on a truck, O'. It will be seen, then, that, being supported at one end by the support M' and at the other end by the pivoted frame O and truck O', the conductor N may readily be swung laterally.

Across the bottom of the conductor N, near the rear end thereof, is secured a plate, q, down through the center of which hangs a post, P, that is retained in place by its head q' resting on the plate q, and that serves as a pivot on which swings a discharge-chute, Q, that is designed to conduct to any desired point the coal falling from the belt N<sup>3</sup>. This post P is held in place also by passing through the eye of brace s, whose other ends are rigidly secured to the conductor N, as shown; and the chute Q is held in position by braces v v', secured thereto, and having their eyes encircling the post P, and further support for the said chute Q is furnished by collars v v', one of which is fitted on the post P beneath the eye of the brace v', while the other encircles said post beneath the eye of the brace s. Because of this construction and arrangement the chute Q can be swung laterally, as indicated in dotted lines, Fig. 2.

I am aware that in many of its features this coal-elevator is not new, and hence strictly confine myself in my claims to such features as are novel and that experience has proven to be of great practical value.

I am also aware that grain-elevators have been designed with a swinging leg adapted to be lowered into the hold of a vessel, so that it can remove grain from a point below the body of the elevator; but I do not claim such a device.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A coal-elevator constructed substantially as herein shown and described, embracing the following elements: a boiler and engine for operating the device, two parallel vertical sets of belts and buckets, a double mold-board, an adjustable elevator-leg, a scoop or guard extending forward beneath the vertical belts and buckets, a side and rear platform-guard, worms and gear for transmitting power to the driving-wheel axle, and an adjustable horizontal conductor, and a chute adapted to be swung laterally, all arranged and operating as set forth.

2. In a coal-elevator of the character herein specified, an attached scoop or shovel projecting forward beneath the elevator-buckets,

which are designed for vertical lifting, substantially as herein shown, and for the purpose described.

3. In a coal-elevator provided with two parallel sets of buckets for vertical lifting, a double mold-board arranged and adapted to direct the coal into both sets of buckets, substantially as herein shown and described.

4. In a coal-elevator of the character substantially as herein specified, the combination, with the engine-shaft C<sup>1</sup>, provided with worm C<sup>2</sup>, and axle A<sup>2</sup>, provided with cog-wheel A<sup>3</sup>, of counter-shaft D, provided with cog-wheel D' and worm D<sup>2</sup>, substantially as herein shown and described, whereby power is transmitted from the engine-shaft to the driving-wheels, as set forth.

5. In a coal-elevator, the combination, with the conductors L<sup>2</sup> and N, yokes L<sup>3</sup> N', pivoted together, shaft N<sup>2</sup>, cog-wheel N<sup>3</sup>, spiders N<sup>4</sup> N<sup>7</sup>, and belt N<sup>5</sup>, of standard M, support M', pulley M<sup>2</sup>, and gear-wheels M<sup>3</sup> M<sup>4</sup> M<sup>5</sup>, all arranged substantially as herein shown and described, whereby the conductor-belt N<sup>5</sup> may be operated by power applied to the pulley M<sup>2</sup>, as set forth.

6. The combination, with the conductor N and tubular support M, resting on a suitable base, of the T-shaped support M' and journal-box m<sup>5</sup>, all arranged substantially as herein shown and described, whereby the front end of said conductor is supported so that it can be swung laterally, as set forth.

7. In a coal-elevator, as a means for supporting the conductor N and giving it freedom of lateral movement, the combination, with said conductor, of the frame and truck O O', pivoted together, substantially as herein shown and described.

8. In a coal-elevator, the combination, with the conductor N, plate q, and post P, of the chute Q, adapted to be swung laterally, as and for the purposes substantially as herein set forth.

9. The combination, with a coal-elevator provided with belt and buckets for vertical elevating, of an adjustable elevator-leg arranged in front of the vertical elevating-buckets, and adapted for breaking down a pile of coal to within reach of the elevator, substantially as herein shown and described.

10. The combination, with a coal-elevator, of an attached elevator-leg arranged in front of the elevator-buckets, and adapted to be adjusted at various angles of inclination in a direct line in front of the same, substantially as herein shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 17th day of October, 1883.

PETER BEST.

Witnesses:

ALBERT P. MORIARTY,  
JACOB J. STORER.