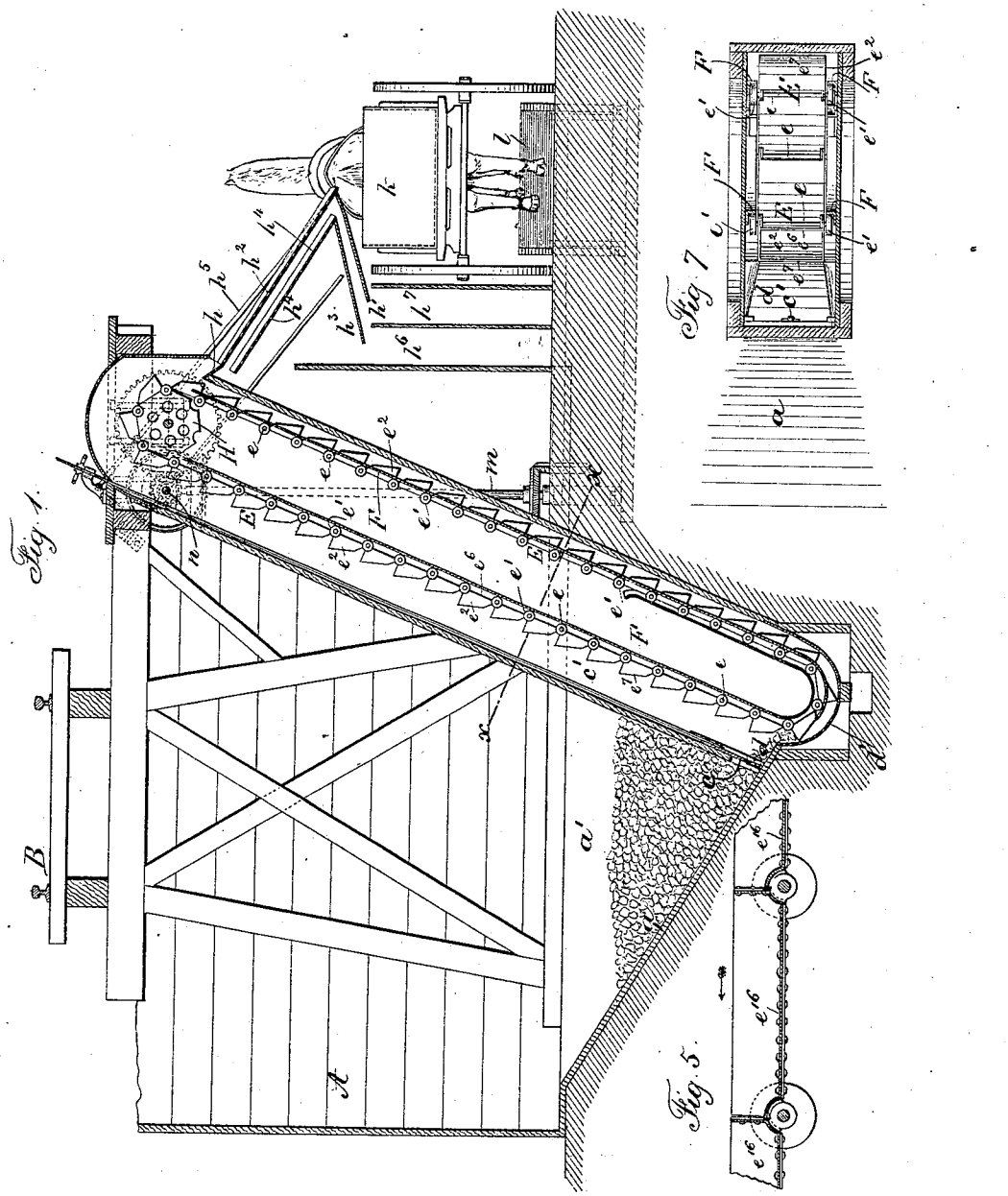
(No Model.) 2 Sheets—Sheet 1.

M. BIRD.

MACHINE FOR HOISTING, DELIVERING, AND SCREENING COAL.

No. 309,920. Patented Dec. 30, 1884.



Witnesses:
J. Stalb
Chas. H. Smith

Inventor
Morgan Bird
per Lemuel W. Serrell atty

N. PETERS. Photo-Lithographer. Washington, D. C.

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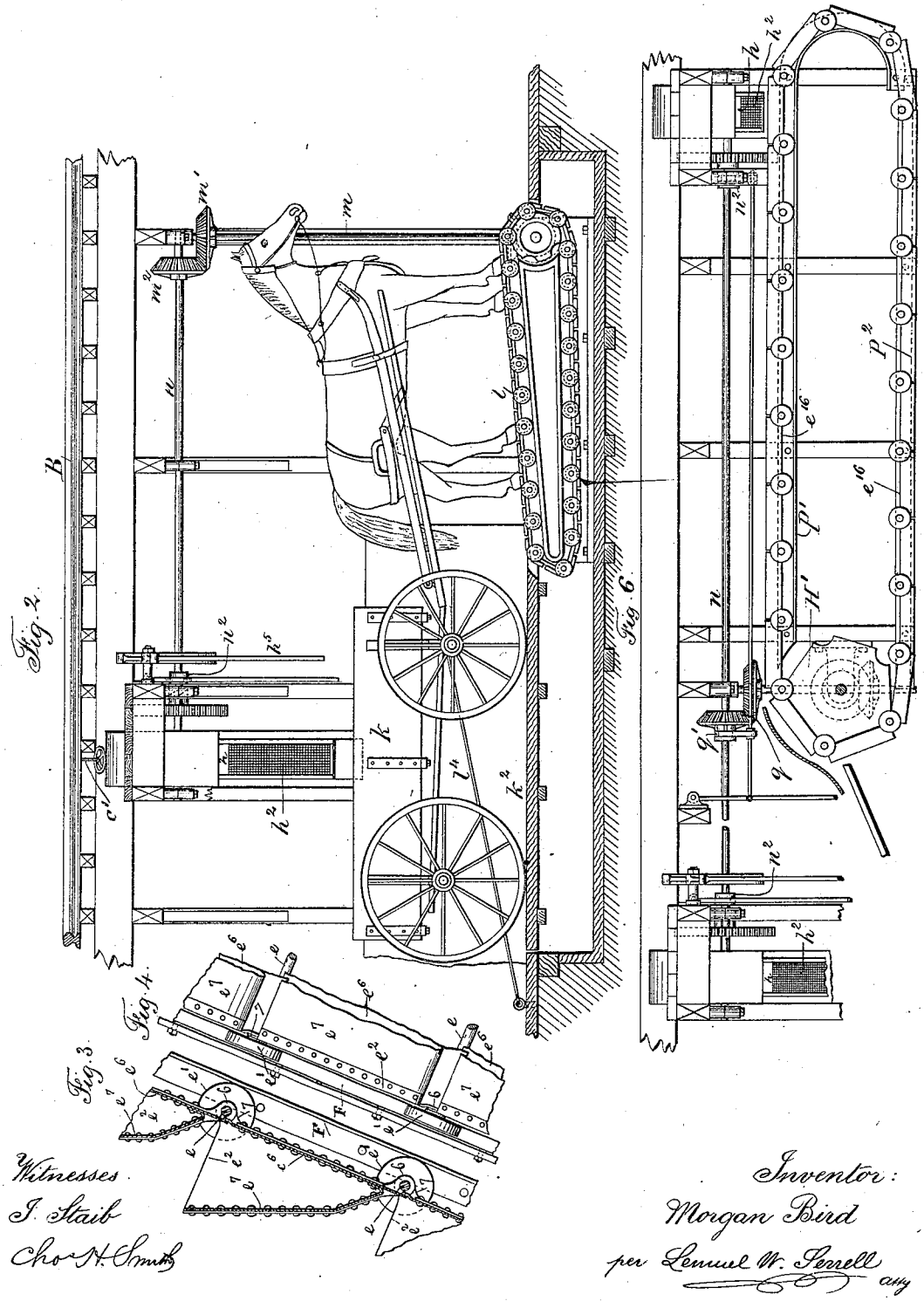


Fig. 2.

Fig. 6.

Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE.

MORGAN BIRD, OF PLAINFIELD, NEW JERSEY.

MACHINE FOR HOISTING, DELIVERING, AND SCREENING COAL.

SPECIFICATION forming part of Letters Patent No. 309,920, dated December 30, 1884.

Application filed July 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, MORGAN BIRD, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Machinery for Hoisting, Delivering, and Screening Coal and other Mineral Substances, of which the following is a specification.

Before my invention coal had been hoisted in a bucket by a rope or chain and delivered into a cart, and the power of a horse had been made use of in effecting this transfer of the coal from one place to another. In my improvements the coal or other mineral substance is stored in a bin with an inclined bottom, and there is a gate that can be opened more or less, and an endless chain of buckets of a peculiar construction is employed to raise the coal and dump the same upon screens that separate any small coal, and also remove the dust. The coal passes into a cart. The motive power used is the horse of the coal-cart, a horse-power being placed so that the horse stands on the same and causes it to move while the cart is being loaded. The gearing from the horse or other power connects to the elevator-drum. Those bins that are distant from the horse-power may be reached by a shaft running from the horse-power gearing; and in order to be able to have the cart always in the same position I arrange a horizontal conveyer of buckets similar to those upon the elevator, and place such conveyer in such a position as to receive coal from either one of the numerous bins and convey it to the cart and deliver it, all as hereinafter set forth.

In the drawings, Figure 1 is a section of one of the bins, and elevation of the elevator and cart. Fig. 2 is a side view of the horse-power and cart and of the elevator apparatus. Fig. 3 is a detached view in large size of the elevator-buckets. Fig. 4 is a view of the buckets at one end. Fig. 5 is a section of one of the conveyer-buckets. Fig. 6 is an elevation of the conveyer for bringing coal from a distant bin. Fig. 7 is a section at the line $x\ x$, Fig. 1.

The bin A is adapted to contain the coal or other mineral substance. It has an inclined bottom, a, and an inclined side, a', preferably of timber and plank. The coal will usually be discharged into the bin from cars that are run along upon the elevated track B. There will usually be a range of these bins, and they will receive coal of different sizes. At the bottom of the bin there is a gate, c, set in proper slides, and provided with a rod, c', by which it can be raised or lowered from the top of the coal-bin. The bottom of the coal-bin is continued below the gate c as an incline, d, with contracted sides, and below this is a segmental pit, d', for the elevator E. The elevator E is a chain of buckets with axles e and rollers e'. These axles also serve as the cross-rods for the buckets, to connect them together as an endless chain. There are inclined tracks F, with segmental bends at their lower ends, around and upon which the chain of rollers of the elevators passes, and the contracted sides of the incline d direct the coal into the path of the elevator-buckets as they are brought around, and the coal slides directly into such buckets without any concussion or liability to break the same, and when the chain of elevators is stopped the coal accumulates in the bucket at the lower end of the incline d and forms a bank that stops the further delivery of such coal. The chain of buckets passes up around the wheel H, and the coal is delivered upon the incline h. Each bucket of the endless chain is made with side pieces, e^2, of malleable cast-iron, with downward-projecting eyes 6 and 7, forming links for the cross-rods e, that become the axles for the rollers e'. The eyes 6 set inside the eyes 7 of the next bucket, as the parts are placed together to form a continuous chain. There are flanges on the side pieces, e^2, projecting inwardly, to which the sheet-metal back e^6 and front e^7 are attached by rivets or bolts, and the bottom end of one back should lap slightly upon the upper end of the back next below it, to prevent the coal falling through between one bucket and the next. The chain of buckets formed in this manner is strong, and it is adapted to the reception of coal or similar mineral substances and to conveying the same up to any desired height. The buckets receive the coal with much less concussion and risk of breaking than arises in the ordinary shoveling by hand. The coal, as drawn by the buckets up over the wheel H, is delivered from

such buckets, and slides down the incline h upon the screen h^2, and falls into the cart k. The screen h^2 has meshes of the proper size for the coal that is being delivered, so that all pieces of coal of smaller size pass through the screen h^2 and fall upon the inclined screen h^4, and which retains the useful anthracite coal, and the dust passes through and falls on the incline h^3, and is delivered into the bin h^6, while the fire-coal passes over the screen h^4 and the incline h' into the bin h^7. It is usual for a coal-cart when receiving its load to remain upon a platform-scale. This is indicated at k^2.

In order to furnish the power required for elevating the coal the horse of the coal-cart is made use of. The animal passes upon the inclined horse-power l.

The cart may be held from moving by a bar, l^4, passing to a stationary eye, and having a loop at the front end to pass over the hub of one of the wheels, so that the horse can exert his power in propelling the horse power while the cart remains stationary, receiving its load.

The horse-power l is preferably of the kind known as "endless-chain horse-power," and it is of a width that is less than the distance between the wheels of the cart, so that when the horse draws off the loaded coal wagon or cart the wheels thereof pass at the outer sides of the horse-power without touching the same.

From the horse-power the gearing and vertical shaft m connect, by bevel-gearing m' m^2, with the horizontal shaft n, upon which or geared to the same is the sprocket-wheel H of the chain elevating apparatus, so that the coal-elevator is operated by the horse while he is waiting for the wagon or cart to be filled.

The brake-lever h^5 is applied to a wheel on the shaft n, to stop the rotation of the parts, when required.

In fitting up this apparatus the gearing and parts are to be proportioned, so that the given weight of coal in the full buckets of the chain may be moved as rapidly as the horse can easily accomplish, so that the power may be advantageously expended and time economized.

In many coal-yards the coal is placed in bins arranged side by side; hence it is advantageous to extend the shaft n along in front of the entire range of bins, and apply to each bin a chain elevating apparatus such as before described. In this case there will be a coupling or clutch, n^2 to each wheel H, so that all the wheels and chain elevators, except the one in use, may be uncoupled and remain quiescent.

It is usually preferable to have the horse-power and scale at one fixed place, and to add to the devices before described the conveyer which is made of an endless chain of buckets, the same as before described, only the sides are parallelograms instead of being triangular, and the back pieces, e^{16}, only are made use of and form the bottoms of the conveyers.

The tracks P' P^2 are placed and sustained in such position as to receive the coal from either of the elevator inclines or chutes h in the range and bring the same along to the cart, and discharge the coal upon inclines and screens similar to those before described.

The sprocket wheel or drum H' of the conveyer is connected by gearing q with the main shaft n, and there is a coupling or clutch at q', by which the gearing is disconnected when the conveyer is not in use.

This elevating apparatus is specially adapted to cases where the horse of the coal-cart can be employed as the power for raising the coal; but I do not limit myself in this particular, as any suitable power may be used, the chain of buckets and the devices employed therewith remaining unchanged.

I claim as my invention—

1. In an endless-chain conveyer or elevator, the combination of the malleable cast-iron side pieces, having eyes 6 and 7 with the sheet-metal back or front, and the rods e passing through the eyes, and the rollers e' upon the ends of the rods e, substantially as set forth.

2. The endless chain of buckets and the rollers, in combination with the fixed inclined tracks and the segmental stationary tracks at the bottom of the inclined tracks, the delivery-incline h, and the wheel H, over which the elevator-buckets pass, substantially as set forth.

3. The combination, with the endless-chain elevator, of the bin having an inclined bottom, the gate to regulate the discharge from the bin, the screen over which the material is discharged, a horse-power, and the gearing connecting the elevator to the horse-power, substantially as set forth.

4. The combination, with the endless-chain elevator and bin for coal or other material, of a horse-power and gearing connecting the horse-power to the chain elevator, and a chute or incline to receive the material and deliver it into a wagon or cart at the horse-power, substantially as set forth.

5. The combination, with a range of chain elevators, of a chain conveyer, the connecting gearing and clutches or couplings, the horse-power, and the gearing connecting the same to the elevators and conveyer, substantially as set forth.

Signed by me this 2d day of July, A. D. 1884.

MORGAN BIRD.

Witnesses:
LEMUEL W. SERRELL,
LEMUEL W. SERRELL, Jr.