

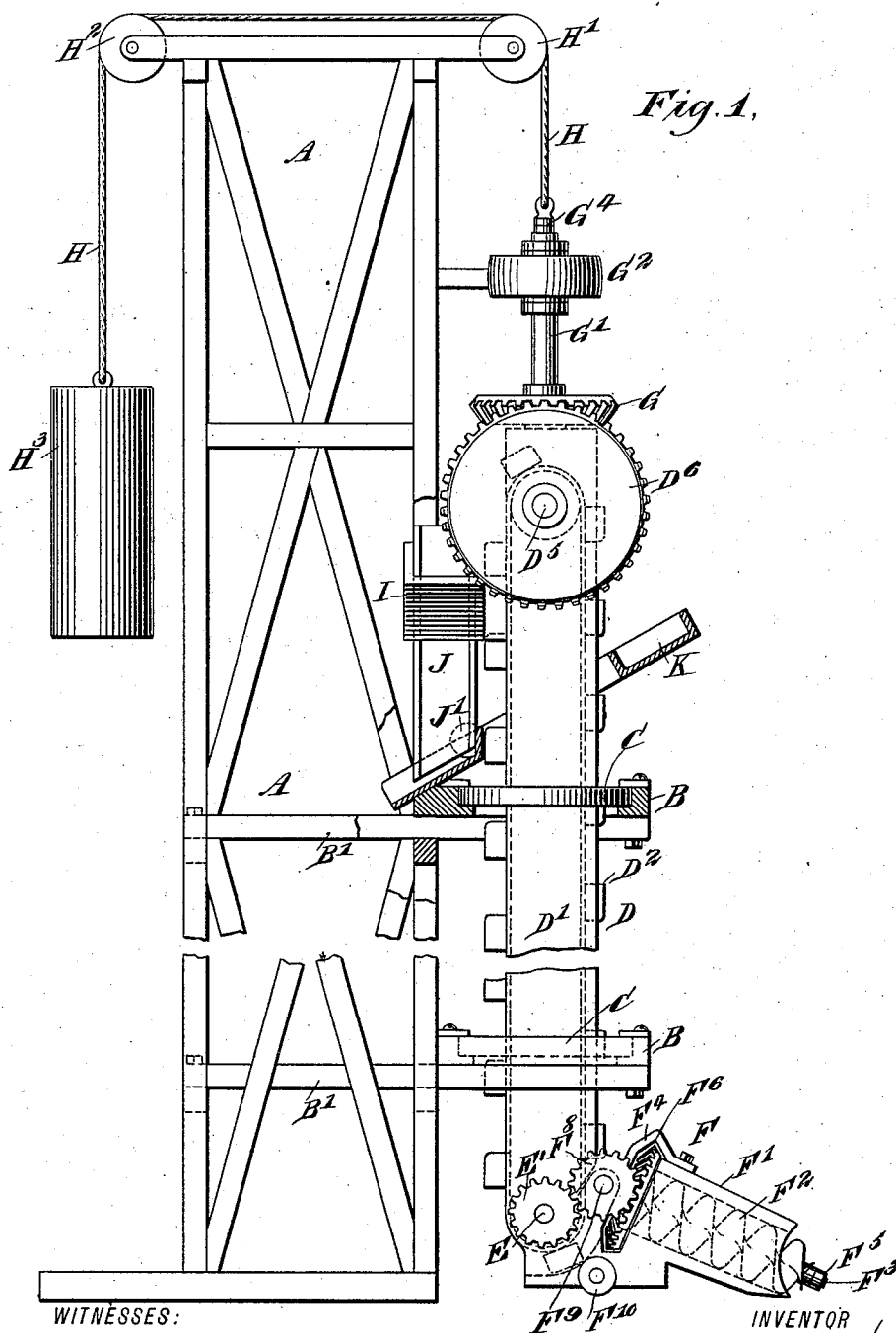
(No Model.)

2 Sheets—Sheet 1.

E. SMITH.
APPARATUS FOR HANDLING COAL.

No. 577,078.

Patented Feb. 16, 1897.



WITNESSES:

Edward Thorpe
Geo. G. Boston

INVENTOR
E. Smith
BY
Munn & Co
ATTORNEYS.

(No Model.)

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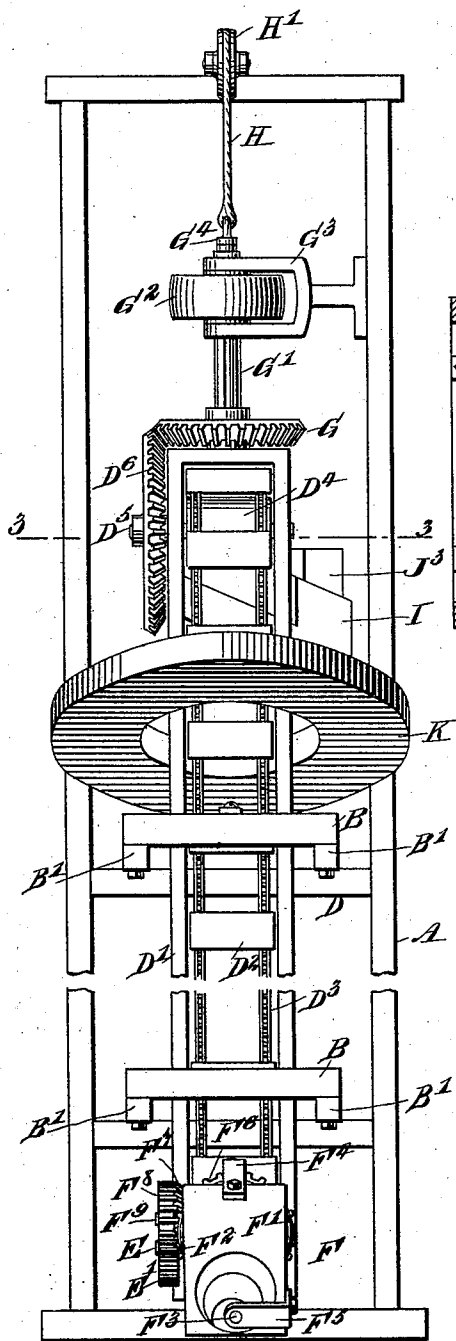


Fig. 2.

Fig. 3.

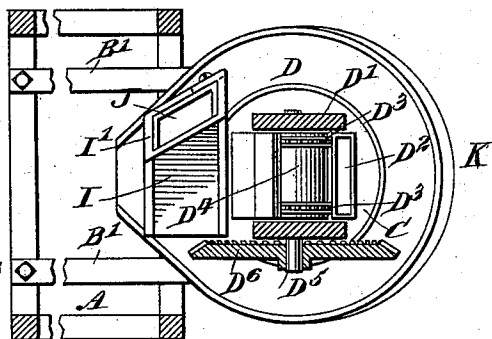
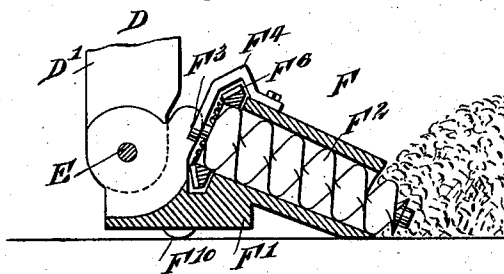


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EPHRAIM SMITH, OF WEST NEW BRIGHTON, NEW YORK.

APPARATUS FOR HANDLING COAL.

SPECIFICATION forming part of Letters Patent No. 577,078, dated February 16, 1897.

Application filed September 20, 1895. Serial No. 563,106. (No model.)

To all whom it may concern:

Be it known that I, EPHRAIM SMITH, of West New Brighton, in the county of Richmond and State of New York, have invented a new and Improved Apparatus for Handling Coal and other Matter, of which the following is a specification.

The object of the invention is to provide a new and improved apparatus which is simple and durable in construction, very effective in operation, and designed for handling coal, ore, and like material or for dredging or other purposes.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

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

Figure 1 is a side elevation of the improvement with parts in section. Fig. 2 is a front elevation of the same. Fig. 3 is a sectional plan view of the same on the line 3 3 of Fig. 2, and Fig. 4 is a sectional side elevation of the conveyer and part of the elevator.

The improved apparatus is mounted in a suitably-constructed frame A, on which are pivoted the arms B', arranged horizontally and supporting at their outer ends circular bearings B, located one above the other and each containing a disk C, mounted to turn in said bearings. The disks C are provided with central openings, through which extend the frame D' of an elevator D, mounted to slide vertically in the disks C and adapted to turn therewith. These disks serve as guides for the elevator-frame.

On the lower end of the frame D' of the elevator is arranged a shaft E, carrying the lower sprocket-wheel of the endless-chain bucket-elevator D, contained within the frame D', the said shaft E also forming a pivot for the casing F' of a conveyer F, provided with a conveyer-screw F², preferably of larger diameter at its discharging end than at its receiving end and mounted to revolve within the said casing F', the lower end of the conveyer-screw extending a suitable distance beyond the outer end of the said casing, so that coal, ore, and other material can be taken up by

the projecting end of the screw and be moved along the latter inside of the casing to finally discharge the material at the inner end of the casing into the boxes D³ of the elevator D. The shaft F³, carrying the conveyer-screw F², is journaled in bearings formed in brackets F⁴ and F⁵, secured to the upper and lower ends of the casing, as plainly indicated in the drawings.

On the upper end of the conveyer-screw F² is secured a beveled gear-wheel F⁶, in mesh with a beveled gear-wheel F⁷, formed on a spur-wheel F⁸, mounted to turn on a stud F⁹, secured on the casing F' of the conveyer F. The spur-wheel F⁸ is in mesh with a gear-wheel E', secured on the outer end of the shaft E, previously mentioned, the said shaft carrying at its lower end the sprocket-wheels for the sprocket-chains D³, on which the boxes D³ of the elevator are attached.

The under side of the casing F' is provided near its pivot end with a roller F¹⁰, adapted to travel on the ground, the floor of a boat, car, or the like to prevent undue friction when the casing is moved forward or backward or turned around with the elevator D. Now it will be seen that by the arrangement described the conveyer is articulated on the lower end of the elevator, and consequently any desired angle can be given to the said conveyer relative to the ground or floor whenever the elevator is raised or lowered. It will further be seen that when the elevator sprocket-chains D³ are set in motion the shaft E is rotated, and by the gear-wheels E' and F⁸ and beveled gear-wheels F⁷ and F⁶ a rotary motion is given to the conveyer-screw F², so as to move the material from in front of the said conveyer up through the casing into the boxes D³ to be raised by the elevator. It is further understood that when the elevator D is turned, as previously mentioned, the conveyer moves with it to permit of engaging the lower end of the conveyer-screw with any portion of the material to be elevated.

The sprocket-chains D³ of the elevator D pass at their upper ends over the sprocket-wheel D⁴, secured on a shaft D⁵, journaled in the frame D' and carrying at its outer end a beveled gear-wheel D⁶ in mesh with a beveled gear-wheel G, secured on a shaft G', journaled in the upper end of the frame D'.

With the shaft G' is connected a driving-pulley G² by means of a key engaging a key-way in the said shaft, so that the latter can slide up and down in the hub of the pulley G² and always be driven by said pulley. The pulley G² is connected by belt with suitable machinery for imparting a rotary motion to the said pulley, and the latter is held from vertical movement by a suitable bracket G³, attached to the frame A. The extreme upper end of the shaft G' is connected by a swivel G⁴ with one end of a rope H, extending upward and passing over the pulleys H' and H² to the rear part of the frame A, the opposite end of the rope carrying a weight H³ to counterbalance the elevator D and the conveyer F.

The boxes D² of the elevator discharge at their upper ends and at the rear into a chute I, inclined transversely and secured to the frame D' of the elevator D. The lower end of this chute discharges into a vertically-disposed chute J, fitted to slide in a bearing I', formed near the lower end of the said chute I, and the lower end of this slidable chute J is provided with a friction-roller J', resting on a circular chute K, into which the material passes from the said vertical chute J.

Now it will be seen that when the elevator D is turned with the disks C revolving in the bearings B to bring the conveyer F to the desired part of the material to be elevated then the friction-roller J' travels in the circular chute K, and consequently the chute J and the said chute K always remain in connection and the chute J likewise remains in connection with the chute I, so that the material passes down the latter into the chute J and from the chute J to the chute K, attached to the frame A, and is delivered at the desired place at the lower end of the chute K. As the elevator D is counterbalanced, the workmen at the lower end of the elevator and conveyer F can readily raise or lower the said elevator or turn it around to bring the conveyer-screw into proper position for engaging the material.

It will be seen that by supporting the circular bearing on the pivoted arms B' the whole elevator and its conveyer part can be swung to either side out of the way of an approaching vessel, &c. The elevator is suspended at a point in the vertical axis of the elevator, so that the latter can be conveniently turned or raised or lowered to bring the conveyer to the desired angular position without stopping the movement of the buckets and conveyer-screw.

It will be seen that this device can be used for transferring coal from barges, boats, and cars to bins, or from the latter to steam vessels, and it can also be used for dredging and other purposes.

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

1. An apparatus of the class described, com-

prising an elevator, guides in which the said elevator is mounted to slide, and bearings in which the said guides are mounted to turn, the said elevator being mounted to turn with said guides, substantially as shown and described.

2. An apparatus of the class described, comprising bearings mounted to swing laterally, guides mounted to turn in said bearings, and an elevator mounted to slide vertically in said guides and to turn therewith, substantially as shown and described.

3. An apparatus of the class described, comprising an elevator, guides in which the said elevator is mounted to slide vertically, bearings in which the said guides are mounted to turn, and a conveyer pivotally connected with the lower end of the said elevator and discharging therein, substantially as shown and described.

4. An apparatus of the class described, comprising an elevator, disks in which the said elevator is mounted to slide vertically, circular bearings in which the said disks are mounted to turn, and a conveyer pivotally connected with the lower end of the said elevator and discharging therein, substantially as shown and described.

5. An apparatus of the class described, comprising a supporting-frame, bearings pivotally supported on said frame and adapted to swing laterally, disks mounted to turn in said bearings and provided with openings, an elevator mounted to slide vertically in said disks and to turn therewith, a conveyer-screw pivotally connected with the lower end of the said elevator, and a gearing connecting the conveyer-screw to said elevator, substantially as shown and described.

6. An apparatus of the class described, comprising an elevator mounted to slide and to turn, a conveyer pivotally connected with the lower end of the said elevator, and adapted to discharge into the boxes of the elevator, a chute into which discharge the said elevator-boxes and fastened to the elevator-frame, a second chute fitted to slide in the said first-named chute, and a fixed inclined chute made circular and engaged by the lower end of the said slidable chute, so that when the elevator is moved up or down or turned, a connection between the three chutes is maintained, substantially as shown and described.

7. An apparatus of the class described, provided with an elevator mounted to slide vertically and adapted to be turned, a chute fixed on the elevator-frame and into which discharge the boxes of the said elevator, a second chute fitted to slide in the said first-named chute, and a circular fixed chute engaged by the lower end of the slidable chute, substantially as shown and described.

8. An apparatus of the class described, comprising a supporting-frame, circular bearings supported by said frame, disks mounted to turn in said bearings and provided with openings, a suspended and counterbalanced ele-

vator mounted to slide vertically in the said disks and to turn therewith, a conical conveyer-screw pivotally connected with the lower end of said elevator, and a gearing connecting the conveyer-screw to said elevator so that the movement of the elevator will actuate the conveyer-screw in whatever angular relation it may be to the elevator; the parts being so combined that the elevator and conveyer may be raised, lowered and turned, or their angular relation varied, while the said elevator and conveyer-screw are in motion or at rest, substantially as shown and described.

9. An apparatus of the class described, comprising a supporting-frame, arms pivotally connected with said frame, circular bearings supported at the outer ends of said arms and located one above the other, a disk mounted to turn in each of said bearings, the said disks

being provided with a central opening, an elevator mounted to slide vertically in the said disks and to turn therewith, a conical screw conveyer pivotally jointed to the lower end of said elevator, and a gearing connecting the conveyer-screw thereto, so that the operation of the elevator will actuate the conveyer-screw, the said elevator and conveyer being adapted to be raised, lowered and turned or their angular relation varied, while the said elevator and connected screw conveyer are in operation or at rest, and the combined elevator and screw conveyer being constructed to slide or roll upon a floor or supporting-platform, substantially as shown and described.

EPHRAIM SMITH.

Witnesses:

THEO. G. HOSTER,
C. SEDGWICK.