

No. 743,434.

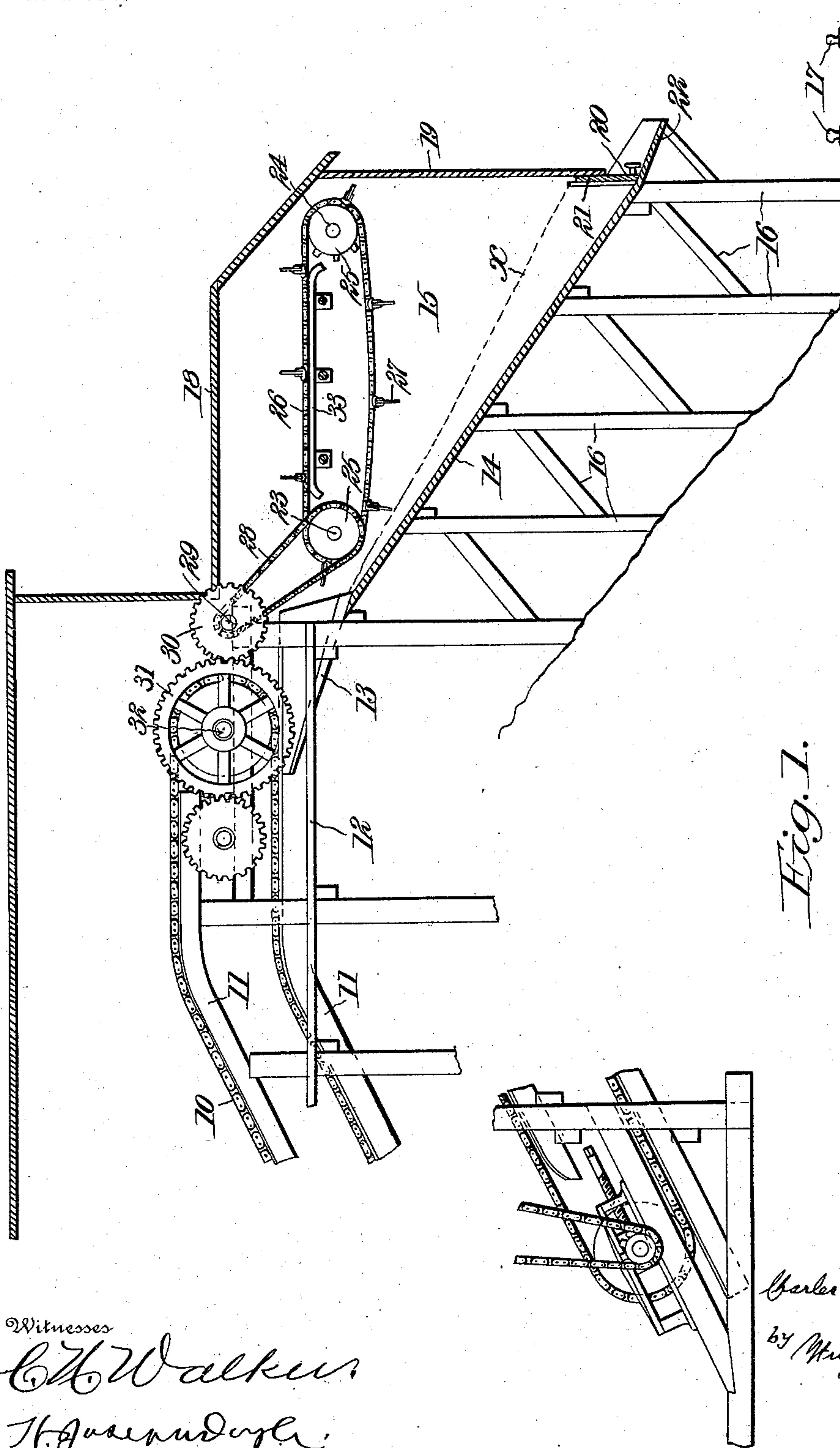
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APPARATUS FOR STORING AND DELIVERING COAL.

APPLICATION FILED AUG. 7, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR STORING AND DELIVERING COAL.

SPECIFICATION forming part of Letters Patent No. 743,434, dated November 10, 1903.

Application filed August 7, 1903. Serial No. 168,609. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. BOARDMAN, of Columbus, in the county of Franklin and State of Ohio, have invented certain new and
5 useful Improvements in Apparatus for Storing and Delivering Coal, of which the following is a specification.

This invention relates to apparatus for handling and storing coal; and the main object of the invention is to provide means for automatically storing large quantities of coal conveniently for discharge into cars and after
10 the bone, slate, &c., have been picked therefrom, the coal being constantly in transit from the time it leaves the mine-pit and passes the pickers until it is either discharged into a waiting car or is stored when no car is at hand.

As is well known, serious loss is frequently
20 incurred at mines owing to temporary inability to get the necessary cars from the railroad to receive the coal. At such times the supply of coal to the chute employed for delivering into the cars must be stopped, and when an elevator-conveyer such as disclosed in the Patent No. 734,219, granted
25 July 21, 1903, to John H. Miskell and myself, is employed either the machinery must be closed down or the supply of coal to the conveyer must cease, and consequently the pickers, who remove the bone, slate, &c., from the coal as it is carried past them on the horizontal portion of the conveyer, must necessarily remain idle.

This present invention provides against the loss of time when there are no cars at hand to be filled by constructing the chute that delivers the coal from the elevator-conveyer to a car, as the bottom or floor of a bin of
40 large capacity, (five hundred tons or more,) a suitable door or gate being employed for controlling the outlet from the bin and means being provided for leveling the coal as it is delivered to said chute, so as to entirely fill the bin if there are no cars present and the outlet-gate is kept closed long enough to permit such filling. Without the employment of such leveling means the chute and bin could not be made to store more coal than

would be permitted by the normal incline of rest of the surface layer. The delivery of coal to the bin beyond this limit would cause a clogging of the elevator-conveyer, for the coal would be piled up until that at the upper end of the incline would be dragged back
55 by the returning blades of the conveyer. The leveling means permits the coal to gradually accumulate in the bin until its upper surface is horizontal without interfering at all with the operation of the elevator-conveyer or with the work of the pickers.

In the accompanying drawings, which represent one embodiment of the invention, Figure 1 represents an elevation, partly in section, the lower end of the elevator-conveyer being
65 shown detached and the chute and bin being shown as relatively smaller than in practice in order to avoid too great reduction of the scale of the drawings. Fig. 2 represents a detail side elevation of the leveler. Fig. 3 represents a plan view of the same. Fig. 4 represents a section on line 4 4 of Fig. 3.

Similar reference characters denote the same or similar parts throughout the several views.

Referring first to Fig. 1, 10 represents the elevating-conveyer, such as shown in the patent hereinbefore referred to, the lower end of said conveyer being represented in said figure as separated from the rest of the figure, it being understood that in practice the conveyer is a long one, the lower end thereof being located in the pit or well in or near the mouth of the mine, the coal being delivered onto the upwardly-traveling stretch of the
85 conveyer from the mine-cars or otherwise. The conveyer travels on runways 11, the upper portions of the runways being horizontal to provide a picking portion of the conveyer to enable the pickers to remove the bone or slate, suitable platforms 12 being provided for the pickers to stand upon. As so far described the apparatus is preferably constructed as shown and claimed in the before-mentioned patent.

As the coal is discharged from the upper end of the elevating-conveyer it drops upon a suitable grid-screen 13, said grid-screen be-

ing usually constructed of longitudinal bars, the spaces between which are of a width to permit the fine coal or "dust" or "slack" to fall through to any suitable chute or bin, while the picked coal slides downward over the grid-bars onto the chute or floor 14 of the storage-bin 15. A suitable framework 16 is provided to support the storage-bin at a height that will enable the coal to be discharged by gravity into a car standing on the railroad-track, (represented at 17.)

The chute or bottom of the bin 14 is inclined at an angle from the horizontal slightly greater than the natural or normal incline assumed by the surface of a body of broken coal at rest, the front and side walls of said bin being substantially vertical, a roof being preferably provided, as at 18, to protect the coal and the mechanism in the bin, as presently described, from rain or snow. The front wall 19 is formed with an opening 20 at its lower portion, a suitable slide-gate 21 being provided for closing said opening. In practice said gate 21 is provided with means whereby it may be raised or lowered by a person on or near a car standing on the track 17, so as to control the discharge of coal from the chute or bin into such car. A suitable delivering-trough is represented at 22.

It will readily be understood that with the apparatus as so far described the bottom of the bin may serve as a chute to convey coal directly from the point where the bone and slate are removed by the pickers into a car when the gate 21 is open. It will also be understood that if said gate is closed and the supply of coal by the elevating-conveyer 10 continues the coal will soon assume a level approximating that indicated by the dotted line x . A still further continuing supply of coal would soon cause a backing up of the surface layer or layers toward and to the lower returning stretch of the elevating-conveyer 10, tending to clog the machinery or deliver the coal where not wanted. To increase the capacity of the bin beyond this point and to any point according to the dimensions of the bin, I provide means for removing the coal from the upper end of the chute or floor of the bin in a direction toward the front and deeper part of the bin as soon as the coal begins to accumulate at the upper end of the chute, due to the outlet being closed and the supply of coal continuing. I will now describe said means in connection with all of the figures of the drawings.

Mounted in suitable bearings supported in the upper portion of the bin are two shafts 23 24, said shafts having sprocket-wheels 25. Chains 26 are carried by the wheels 25, and the two chains are provided at intervals with blades 27, designed to scrape accumulating coal away from the upper portion of the chute 14 and in a direction toward the front 19 of the bin. The shaft 23 is driven by a belt or chain 28, connecting a pulley or

sprocket-wheel on said shaft 23 with another pulley or sprocket-wheel on a shaft 29, said shaft 29 being shown as provided with a gear 30, meshing with another gear or pinion 31 on the shaft 32 of the upper end of the elevating-conveyer.

It is to be understood that any other suitable means for operating the elevating-conveyer, and the scraping-blades of the coal-leveling apparatus may be substituted for the connections just described.

The preferred details of construction of the leveling apparatus are shown in Figs. 2, 3, and 4. The chains 26 are composed of elongated loops a , alternating with links composed of two plates b , said two plates being connected by rods c , having reduced ends d passed through and headed over or riveted upon the outer sides of the ends of the plates b . At suitable intervals two opposite loops or links a are provided with ears e , riveted thereto, said ears e having upright portions e' , against which blades 27 are held by means of angle-bars f . Said angle-bars are bolted to the bases of the ears e and are also connected to the upright portions e' by means of bolts passing through the blades. The angle-bars f are shown in Fig. 3 as extending across and connecting two ears e , thereby reinforcing and strengthening the blades 27.

Preferably the upper stretches of the chains 26 are provided with runways 33 to support said stretches, while the lower stretches of the chains are permitted to hang somewhat loosely or curved to yield to large lumps of coal.

It will now be understood that I have provided an apparatus which serves the double purpose of permitting the storage of a very large quantity of picked coal in a bin, the bottom of which may be caused to act as a delivering-chute and at the same time keeping clear the apparatus which delivers coal into such bin. In the particular embodiment of the invention shown in the drawings I have provided means for operating the apparatus which delivers coal to the bin and the apparatus which levels the coal in the bin at uniform relative speeds, one of said apparatus being connected to drive the other. Moreover, the invention provides for a great saving of time over the method commonly practiced of delivering coal from the mine-cars into the surface-railway cars and picking out the bone and slate as it is discharged into the latter, because with this invention the bringing of the coal out of the mine and the picking of it does not have to cease when there are no transportation-cars on hand to receive the coal. Moreover, the combination of the large bin and the leveling apparatus with the elevating-conveyer having the picking portion, as in the patent before referred to, provides for the storage of very large quantities of picked coal ready for immediate and rapid automatic delivery to the

transportation-cars without being subjected to any delays caused by picking of the coal as it is delivered to such transportation-cars.

I claim—

5 1. An apparatus of the character described comprising a storage-bin having an inclined floor and a door at the lower end thereof whereby the floor of the bin may be employed as a delivering-chute, and leveling apparatus
10 in the upper portion of the bin.

2. An apparatus of the character described comprising a storage-bin having an inclined floor and a door at the lower end thereof whereby the floor of the bin may be employed
15 as a chute, leveling apparatus in the upper portion of the bin, and means for delivering coal onto the upper end of the inclined bottom.

3. Apparatus for storing picked coal or delivering the same into cars, said apparatus
20 comprising a storage-bin having an inclined bottom and an opening having a controlling gate or door at the lower end of said bottom, an elevating-conveyer for delivering coal to the upper end of the inclined bottom, said
25 conveyer having a picking portion to facilitate the picking of bone or slate, and a leveling apparatus for removing accumulating coal from the upper portion of the inclined bottom of the bin.

30 4. Apparatus for storing picked coal or delivering the same into cars, said apparatus

comprising a storage-bin having an inclined bottom and an opening having a controlling gate or door at the lower end of said bottom, an elevating-conveyer for delivering coal to
35 the upper end of the inclined bottom, said conveyer having a picking portion to facilitate the picking of bone or slate, a grid at the upper end of said inclined bottom for receiving the coal from the conveyer, a leveling ap-
40 paratus for removing accumulating coal from the upper portion of the inclined bottom of the bin, the said conveyer and leveling apparatus having connections whereby one may be actuated by the other. 45

5. A coal-storage bin having an inclined bottom and a gate-controlled outlet therefrom, wheels mounted in the upper portion of the bin, endless chains mounted on said wheels and having scraping or leveling blades,
50 and means for actuating said wheels to cause the blades carried by the under stretch of the chains to move in a direction away from the upper end of the inclined bottom, substantially as and for the purpose specified. 55

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES H. BOARDMAN.

Witnesses:

FRANK M. RAYMOND,
MARY WHALEY.