

(No Model.)

J. M. DODGE.
CONVEYING APPARATUS.

No. 501,771.

Patented July 18, 1893.

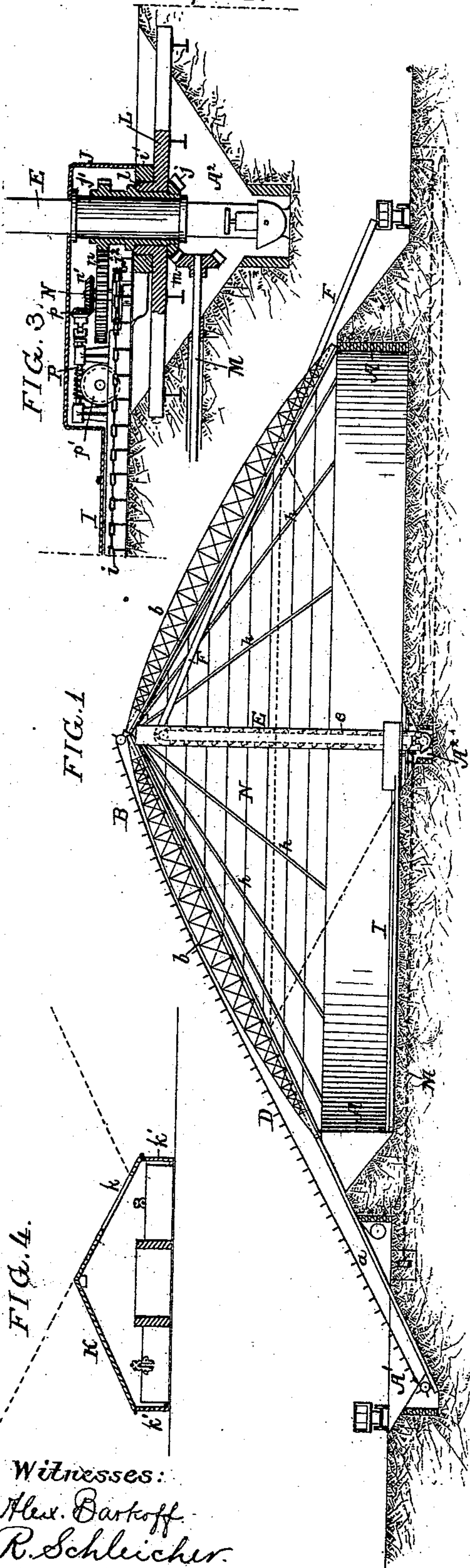
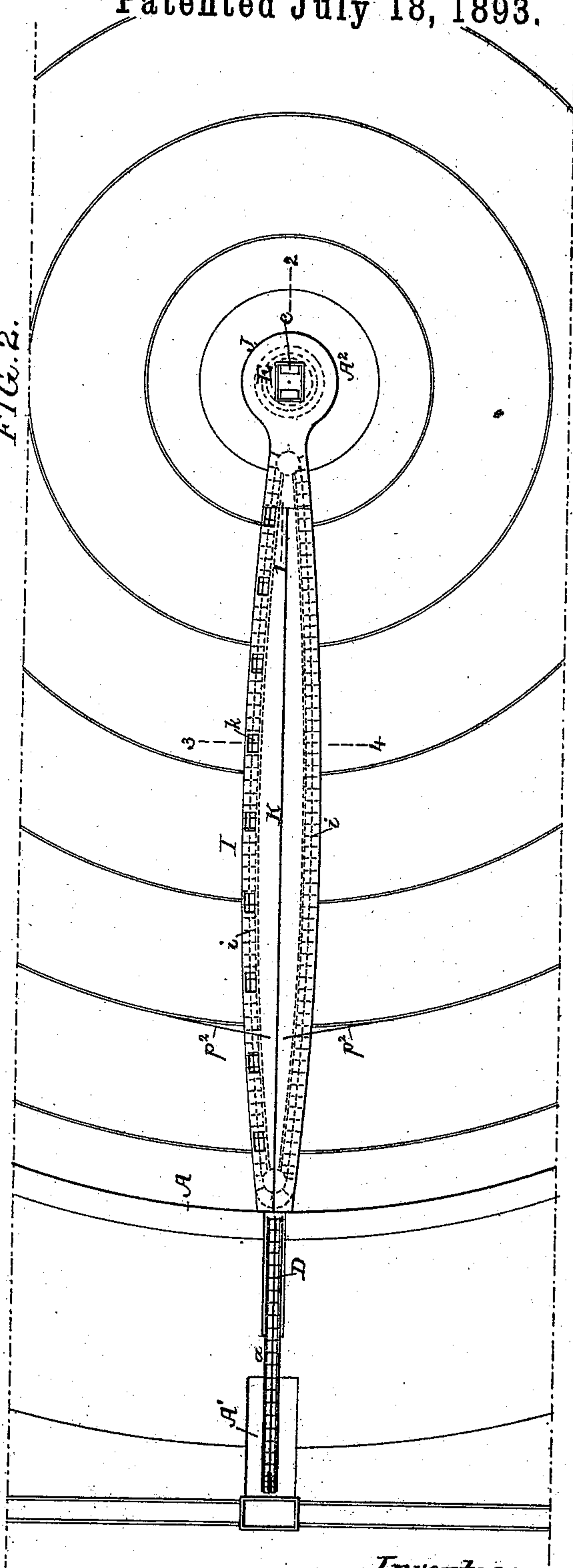


FIG. 1.

FIG. 2.



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UNITED STATES PATENT OFFICE.

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CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 501,771, dated July 18, 1893.

Application filed March 11, 1893. Serial No. 465,615. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. DODGE, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Conveying Apparatus, of which the following is a specification.

The object of my invention is to construct apparatus for removing coal, sand, rock or analogous material from large piles of said material, by carrying the material to a central point from which it is discharged, and a further object of my invention is to provide a roof for the pile.

Referring to the accompanying drawings—
Figure 1, is a view in elevation, partly in section, illustrating my invention. Fig. 2, is a plan view drawn to an enlarged scale. Fig. 3, is a section on the line 1—2, Fig. 2, and Fig. 4, is a section on the line 3—4, Fig. 2.

I have illustrated my invention in combination with a shear truss piling apparatus, but it will be understood that it can be used with any other apparatus, without departing from my invention.

Mounted on suitable foundations A A is a shear truss structure B, the two legs *b b* of which are attached at the upper ends, and are suitably anchored in the foundations A A. On one of said legs is an inclined plane forming a continuation of the inclined plane *a* which extends into a pit A', into which the coal or other material flows as it is delivered from the car or boat. Adapted to travel on the inclined plane *a* is a flighted conveyer D, in the present instance an endless chain carrying suitable flights, and this chain passes around a wheel at the top and a wheel at the bottom of the truss, and is driven so as to convey the material from the pit and up the inclined plane to the discharge point. The inclined plane of the truss may consist of a movable band so as to alter the point of discharge of the material, or may have a series of openings through which the material is discharged, as the material is first discharged so as to form an initial pile, and the point of discharge is moved forward and upward as the pile increases as fully set forth in earlier patents granted to me relating to this subject, for instance in the Patent No. 446,436, granted February 17, 1891.

As shown in Fig. 1, I form a wall A around the floor which is to receive the material, and

mount on this wall a roof N in the shape of a cone, extending to the apex of the truss structure and supported thereby, suitable chords, rafters and beams being used to stiffen and support the roof. This roof I prefer to make of sheet metal, but it may be made in some instances of canvas. I am enabled to roof the area in this instance without forming side openings, as I provide a central discharge for the material, and in the drawings I have shown a vertical elevator E, in which is mounted a conveyer *e* preferably of the bucket type, the chain of the conveyer passing around wheels at the top and bottom. At the upper end of the conveyer is a chute F or inclined plane which is supported preferably by one of the legs of the truss, and is so arranged in the present instance as to extend out over a track or wharf so that a car or boat may be loaded. In some instances, however, the material may be conveyed through a tunnel shown by dotted lines in Fig. 1, extending beyond the base line of the pile.

The boot of the conveyer is mounted in a suitable pit A² so that the material will flow to the pit or be conveyed thereto, and from this point it is carried up the conveyer and discharged onto the chute.

Adapted to travel on the floor A is a re-loader I on which is a conveyer *i* composed of an endless chain with flights. The chain is adapted to wheels on the re-loader and is driven from the hollow shaft J. The re-loader is pivoted at the center and suitable mechanism is employed for traversing the re-loader over the floor, and the conveyer is so driven that the material which flows into the re-loader is carried to the central pit A², from which it is removed by the conveyer E to the discharge chute. The re-loader is provided with a cover K, as shown in Figs. 2 and 4, and in this cover are openings *k* preferably provided with valves through which material can flow from the pile into the path of the conveyer *i*, which is driven so as to carry the material to the central discharge opening.

At each side of the re-loader I are plates *k'* which extend from the cover K to the base and when the conveyer is moved laterally the plates *k'* at the side of the carrying run of the conveyer are removed or so operated as to expose the flights and allow material to flow into the re-loader by gravity.

The re-loader in the present instance is mounted on what might be termed a "spider" L, supported by suitable beams which cross the central pit A²; an extension *i'* in the form of a ring fits snugly around a flange *l* on the spider L. The hollow shaft J is also mounted in the spider and around the vertical conveyer. This shaft has at its lower end a bevel wheel *j* meshing with the bevel wheel *m* on the driving shaft M extending through a tunnel under the piling floor and having at its opposite end a belt or gear wheel through which the shaft is driven by any suitable mechanism.

In the upper portion of the hollow shaft J is a gear wheel *j'* meshing with a gear wheel *n* on the vertical shaft N and on this shaft is a chain wheel *i'*² around which passes the conveyer chain *i* and by which the said chain is driven. Also mounted on the shaft N is a bevel wheel *n'* meshing with the pinion *p* on the worm shaft P and on this shaft is a worm gearing with the worm wheel *p'* over which pass the ropes or chains *p'*² which extend to a point on the conveyer some distance from the pivot and then pass one to one side and the other to the opposite side of the conveyer and are anchored to a certain point on the conveyer so that on winding one rope and unwinding another the reloading conveyer can be traversed on the floor around the center.

It will be understood that the mechanism for driving the conveyer chain and for traversing the conveyer can be modified without departing from my invention.

The operation is as follows:—If a conical pile is formed on the piling floor the material is first discharged at the center flowing into the central pit *a*² from which it is carried by the conveyer E; the flow of material continuing until the angle of repose is reached and the pile will be then in the form of a ring having an open center and an annular apex. The conveyer chain *i* is then operated and as the conveyer I extends on a radial line from the center to the outer limits of the pile it will be understood that when the openings *k* in the cover K are opened the material of the pile will flow into the path of the flights of the conveyer and be carried to the central pit A² from which it is removed by the conveyer E. During this step the shaft P of the traversing mechanism is thrown out of gear with the shaft N so that the conveyer I will remain stationary. The operation of the conveyer chain is continued until the conveyer I is exposed. Thus the ring is broken by a V-shaped radial cut. The next step is to move the conveyer I on its pivot so as to force it against one side of the pile causing the material to flow into the conveyer and be fed to the center. This movement is continued preferably at intervals until the conveyer has made one complete revolution over the floor around its center and as the removal of the material is continuous during this operation the entire pile on the floor will be removed.

I claim as my invention—

1. The combination of a piling floor having a discharge opening, with a horizontal movable conveyer, a cover for said conveyer, openings in the cover, with mechanism for operating the conveying apparatus and moving the conveyer upon the floor, substantially as specified.

2. The combination in apparatus for moving piles of material, of the piling floor, a central discharge pit, a vertical elevator adapted to receive material from said pit, a movable horizontal conveyer pivoted at the center and adapted to move upon the floor around the pit and convey material to the pit, substantially as described.

3. The combination in storage apparatus, of the circular pit, conveyer for storing material in said pit, a discharge conveyer for removing material from the pit, with a conical roof covering the pit, substantially as described.

4. The combination in storage apparatus, of the shear truss structure, conveyer mounted upon one of the legs of said structure, a piling floor thereunder, with a conical roof for said piling floor supported in part by the truss structure, substantially as described.

5. The combination of the piling floor, the central pit therein, an elevator extending into said pit, a horizontal conveyer pivoted at the center and adapted to move around the elevator, an endless chain conveyer, flights thereon, a hollow shaft mounted on the elevator trunk, a driving shaft geared to the said hollow shaft which in turn is geared to the mechanism for driving the chain and for turning the conveyer, substantially as described.

6. The combination of the piling floor having a central pit, a vertical elevator extending into said pit and receiving material therefrom, a supporting spider, a hollow shaft mounted in said spider, a driving shaft geared to said hollow shaft, a horizontal conveyer having a pivot portion adapted to the spider, mechanism for traversing the conveyer over the floor around the elevator, flighted conveyer chain, a shaft, chain wheel on said shaft, the gear wheel on the shaft meshing with the gear wheel on the hollow shaft, substantially as described.

7. The combination of the piling floor, a horizontal conveyer adapted to travel on said floor, a cover for said conveyer and sides therefor, one or both of said sides being adapted to be moved so as to expose the flights and allow the material to flow into the conveyer from the side by gravity, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES M. DODGE.

Witnesses:

HENRY HOWSON,
JOSEPH H. KLEIN.