

(No Model.)

2 Sheets—Sheet 1.

J. M. DODGE.

PROCESS OF REMOVING PILES OF COAL.

No. 409,568.

Patented Aug. 20, 1889.

FIG. 1.

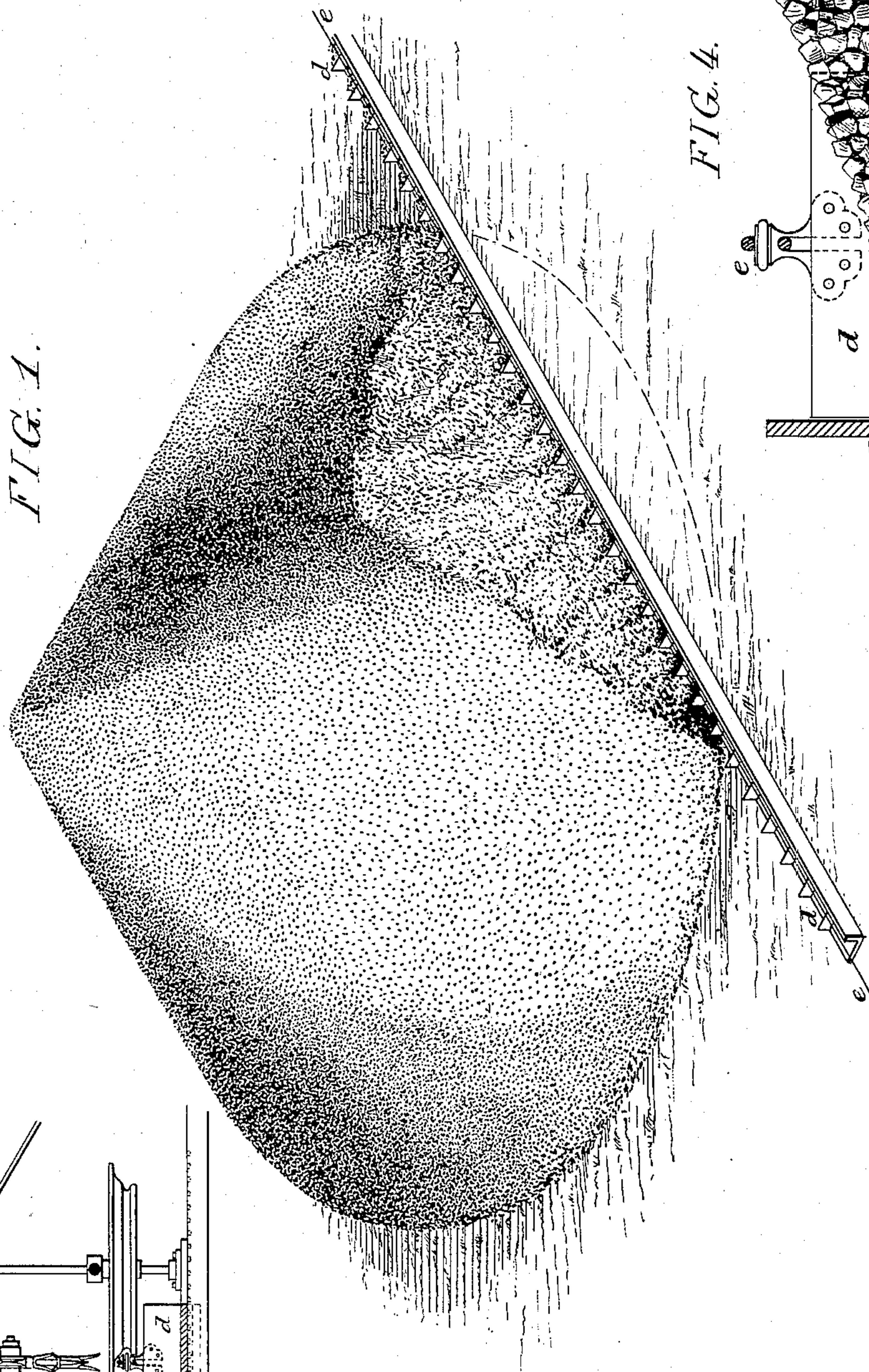


FIG. 4.

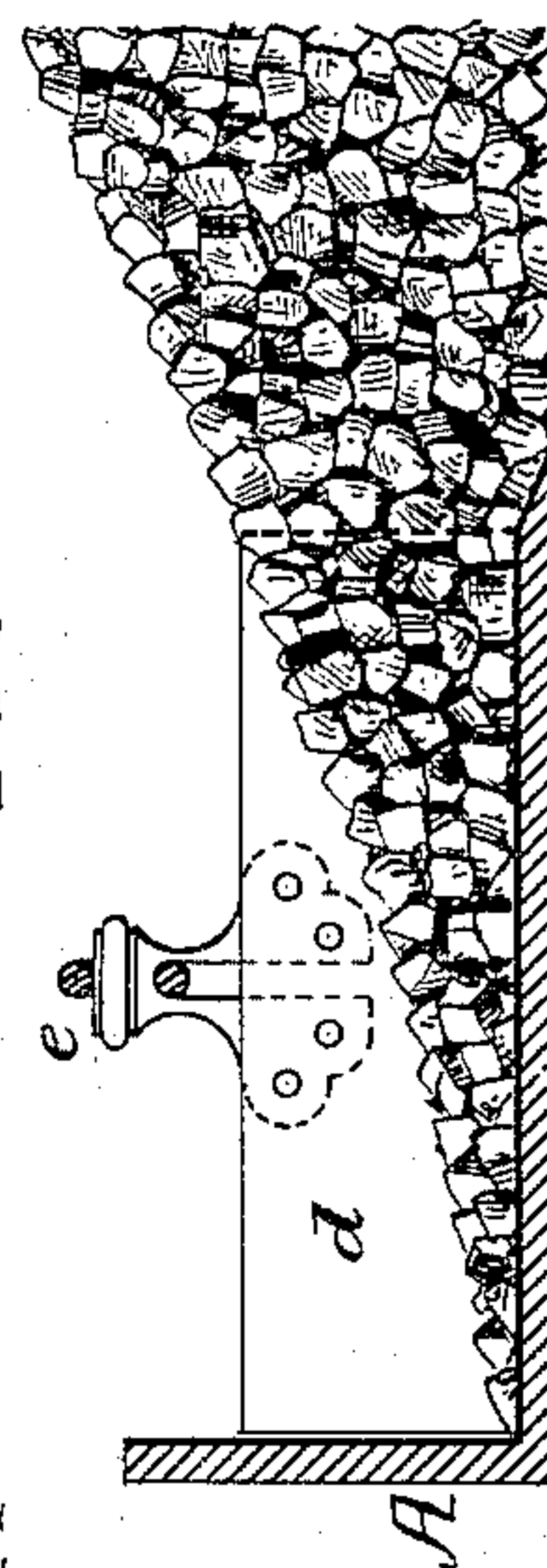
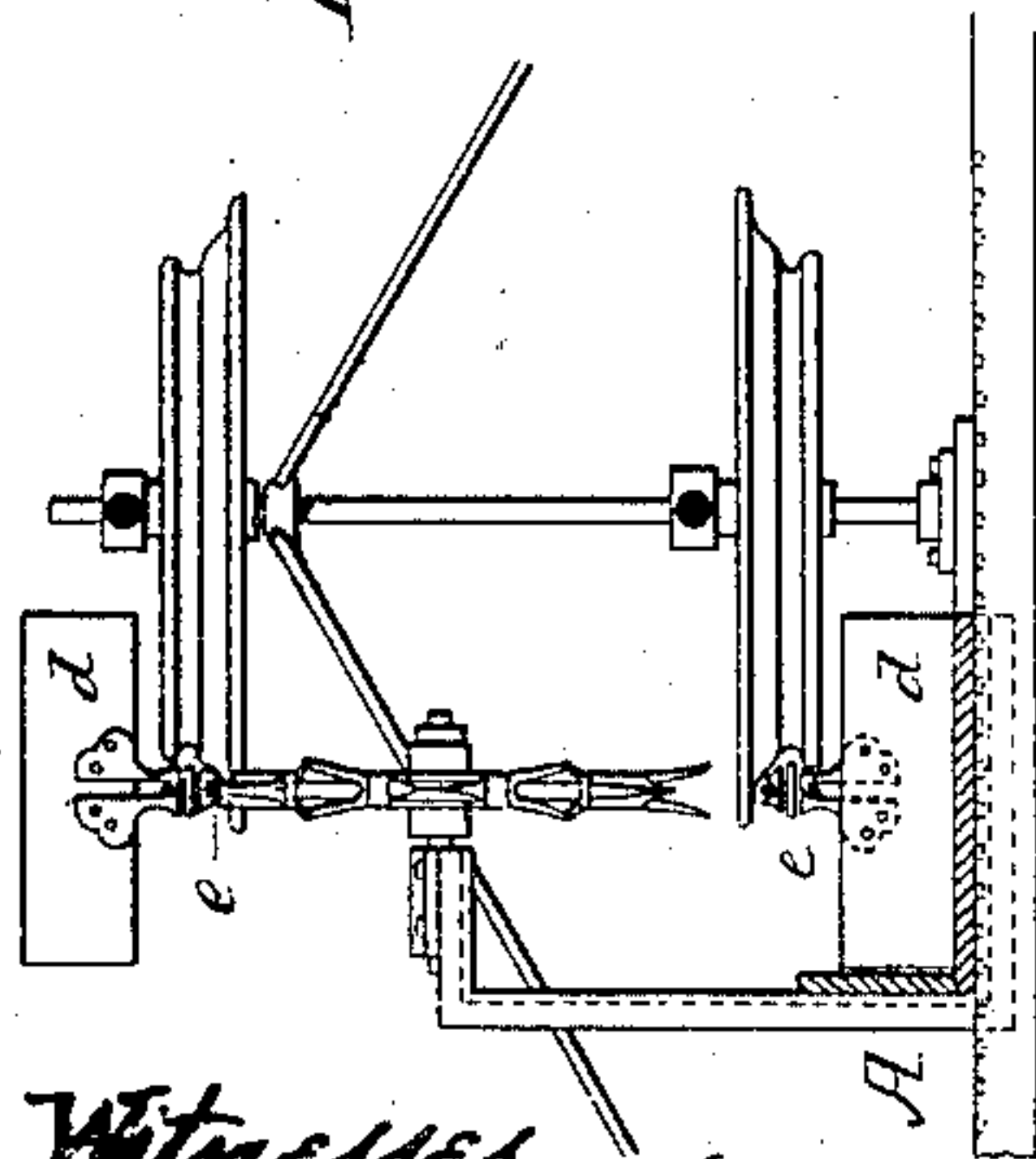


FIG. 5.



Witnesses
John Wilson
John J. Seary

Inventor:
James M. Dodge
by his Attorneys.
Howson & Howson

(No Model.)

2 Sheets—Sheet 2.

J. M. DODGE.

PROCESS OF REMOVING PILES OF COAL.

No. 409,568.

Patented Aug. 20, 1889.

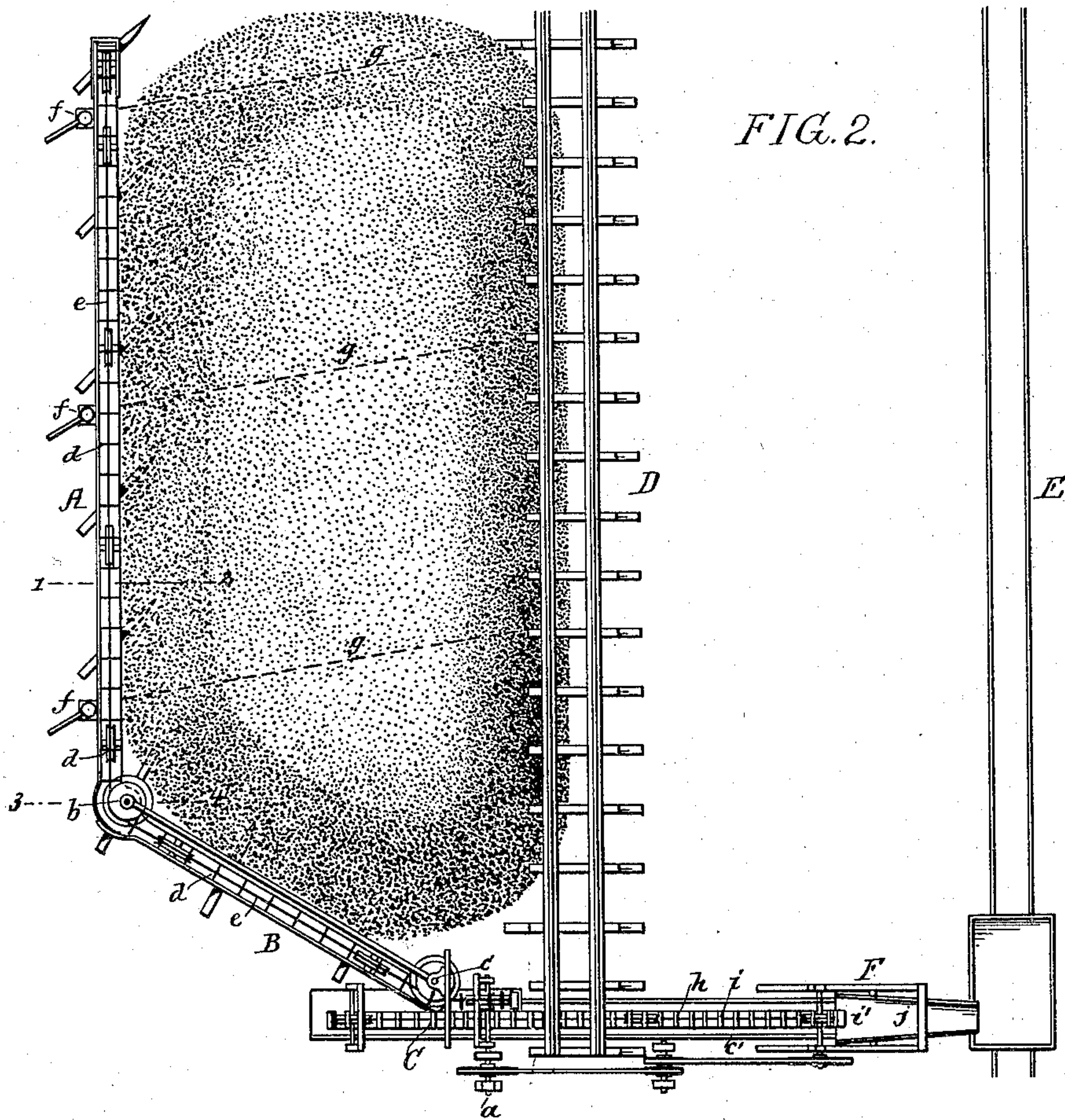


FIG. 2.

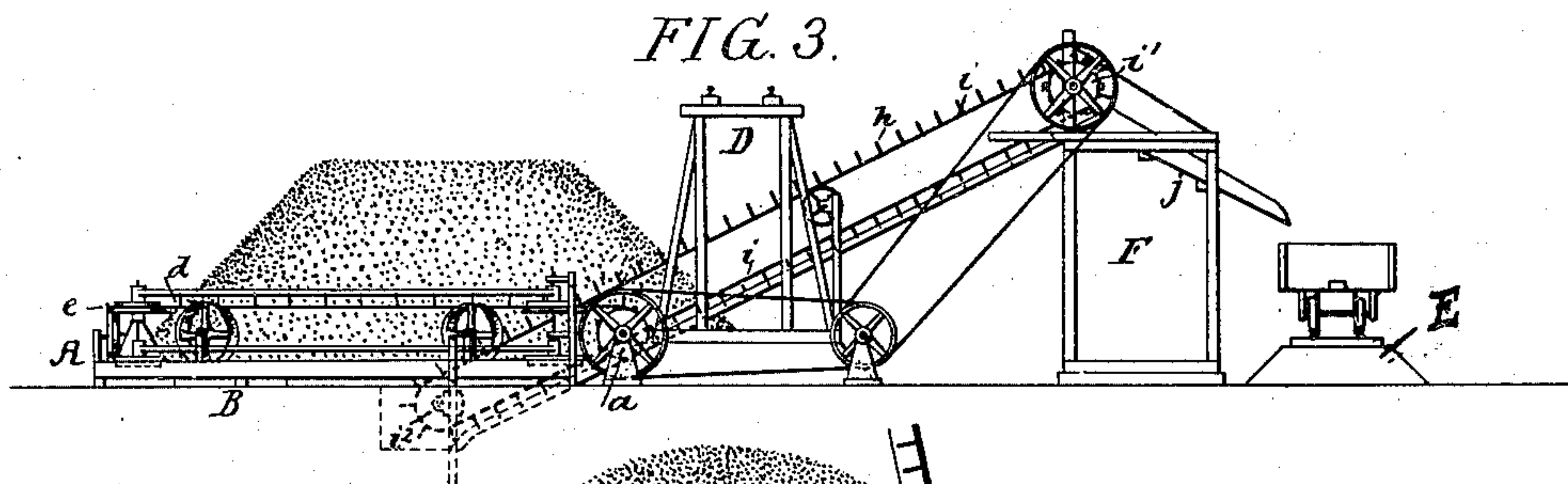


FIG. 3.

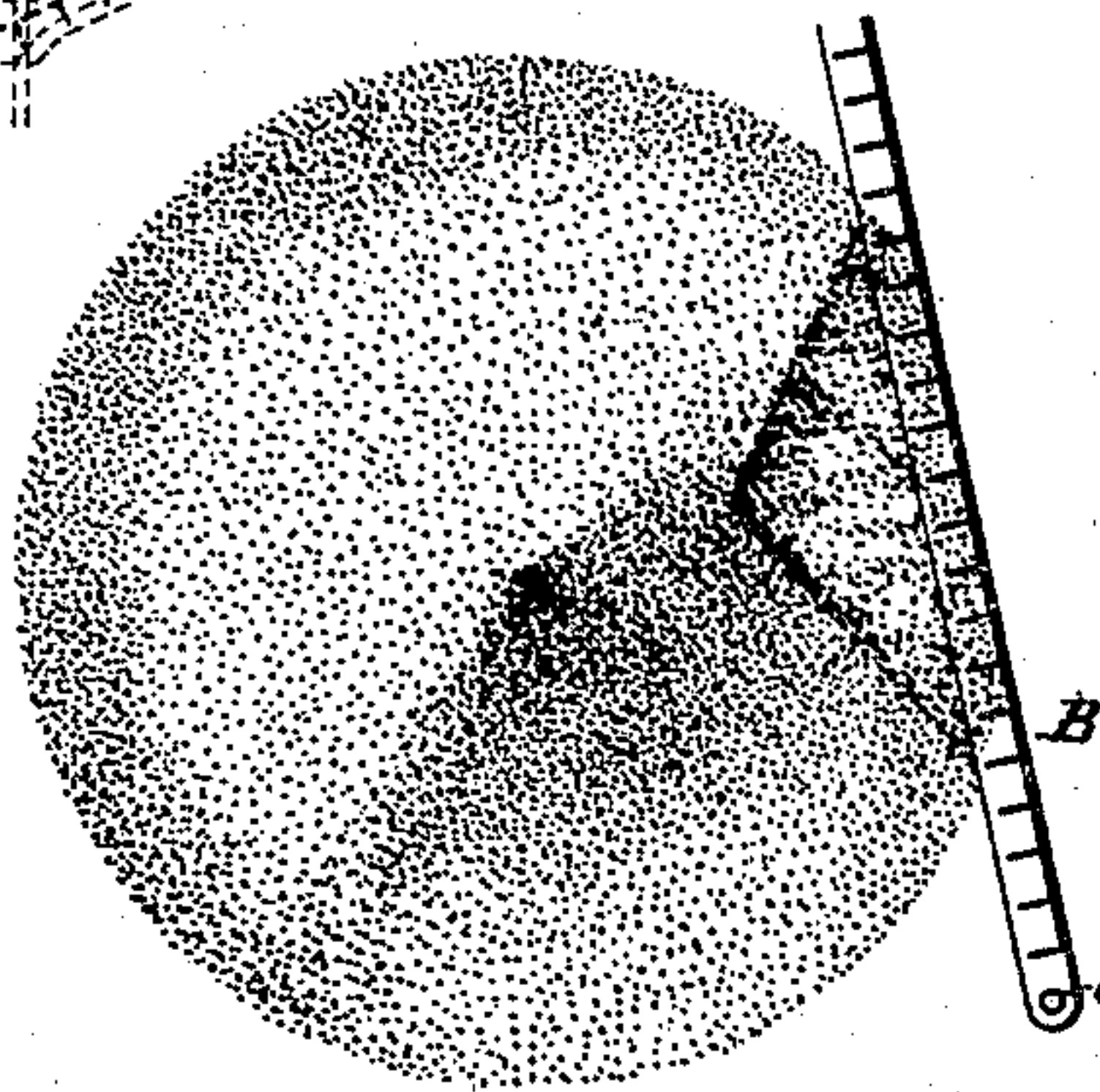


FIG. 6.

Witnesses:
John Wilson
John Geary.

Inventor:
James M. Dodge
by his Attorneys
Hewson & Hewson

UNITED STATES PATENT OFFICE.

JAMES M. DODGE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
DODGE COAL STORAGE COMPANY, OF NAUGATUCK, CONNECTICUT.

PROCESS OF REMOVING PILES OF COAL.

SPECIFICATION forming part of Letters Patent No. 409,568, dated August 20, 1889.

Application filed February 8, 1888. Serial No. 263,322. (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 the Process of Removing Piles of Coal, of which the following is a specification.

One object of my invention is to remove a pile of coal or analogous material in a constant stream derived from the base of the pile, a further object being to prevent as much as possible the disintegration or breakage of the coal during the process of removal; and a still further object of my invention is to dispense with the usual cumbersome elevators and to do away entirely with hand labor at the pile.

Coal or analogous material is usually stored in piles, generally under trestle-work, and has lately been stored in immense piles without the use of trestle-work, by a process for which I have filed application for patent on the 12th day of April, 1889, Serial No. 306,980.

In removing piles of coal it is the common practice to employ men, who shovel the coal into wheelbarrows and wheel it to the point of delivery but this method is very expensive, as all hand labor must be when the operations involved are on a very extensive scale. The plan of removing coal by what is known as the elevator system is also objectionable, as the coal must be fed to the elevator, or if an elevator of the bucket type—such as used in excavators—is used for removing the pile of coal the position of the entire elevator must be continually changed in order to keep it up to its work. I overcome all these difficulties by my process.

In the drawings accompanying this application, Figure 1 is a perspective view of a pile of coal, illustrating my improved process by removing the same. Fig. 2 is a plan view of one style of machine for carrying out my process. Fig. 3 is an end view of the same. Fig. 4 is an enlarged sectional view on the line 1 2, Fig. 2. Fig. 5 is a section on the line 3 4, Fig. 2, and Fig. 6 is a view showing the apparatus in its simplest form.

Referring to the diagram, Fig. 1, the coal there shown has been piled by the process set forth in my application, Serial No. 306,980,

above alluded to, the coal in some instances forming a cone about eighty feet in height, the angle of said cone being the angle of repose of gravitating granular material, and it is required to remove the coal quickly and economically for reloading cars or vessels, as the case may be.

In carrying out my process I use what may be termed a "conveyer," said conveyer being of any suitable construction, and is open at one side and at the top throughout its entire length. The conveyer may, for instance, be constructed as shown in Figs. 2, 3, and 4, in which A is a trough having one side removed. In this trough travels a series of flights *d*, secured to a chain or rope *e*, driven in any well-known manner. In the drawings the rope is driven from a driving-shaft *a*, which is connected to suitable power mechanism. The trough A in the present instance is pivoted to a second trough B at *b*. This trough B is pivoted at a stationary point *c*, and can travel in the arc of a circle having the pivot-point *c* as its center, while the trough A can travel in the arc of a circle having the pivot-point *b* as its center. These troughs can be moved by suitable windlasses *f*, connected to chains or ropes *g*, attached to any suitable fixture.

In Figs. 2 and 3 I have represented the pile of coal to be removed at one side of a trestle-work D, having tracks thereon. The coal has been dumped from these tracks and shoveled or otherwise removed to the point indicated between the conveyer-troughs and the trestle-work. At one side of the trestle-work D is a track E, on which are the cars to be loaded through the medium of the conveyer. The conveyer-flights attack the coal at the base of the pile—in the present instance at two points, as shown—that is to say, along one side and along one end—and convey the coal to the elevating-conveyer C, which has flights *h*, similar to the flights in the conveyers A and B, these flights being attached to a chain, cord, or rope *i*, which passes around a suitable driving-pulley *i'* at the top and around a suitable pulley *i''* at the bottom. The coal is dumped onto this conveyer, which has a bottom *c'*, and the coal is carried by the flights to the top of the trestle-work F and allowed to flow into the chute *j*, which directs

the coal into the car or other receptacle to be filled.

The trestle-work F, instead of being placed in close proximity to the track, may be placed on a wharf, and the chute may direct the coal into vessels to be loaded, or the chute may be so constructed as to direct the coal into a second conveyer or chute and carry it to a distant point, if necessary.

I have given a brief description of one of the machines for carrying out my process in order to clearly set forth the process; but it will be understood that other forms or styles of machines may be used without departing from my invention.

In Fig. 6 I have shown a conical pile of coal piled by the mechanism set forth in my application, Serial No. 306,980, and have shown merely the conveyer B, pivoted at a fixed point c, dispensing entirely with the conveyer A.

It will be understood that in piling the coal the piles will vary according to the locality and the extent of ground available for the purpose, so that different styles of conveyers must necessarily be used to accord as much as possible with the shape of the pile to be removed, and therefore I do not limit myself to the precise construction of mechanism shown.

The conveyer attacks the pile of coal, as shown in Fig. 1, along its base, and disturbs the integrity of the pile—in fact, eats into the pile throughout the entire extent of contact of the conveyer, and not at a single point, as in the case of shoveling by hand or by an excavat-

ing-machine. The coal, as soon as disturbed by the action of the conveyer, flows by gravity into the conveyer-trough and is carried along by the flights of the conveyer to the point of delivery. It will thus be seen that the coal is handled gently and flows onto the conveyer by gravity when the angle of repose is broken, and when once on the conveyer the coal is carried to the point of delivery without any breaking or disintegration of the same, as would be the case in carrying out the processes usually employed prior to my invention, the direction of removal being laterally past and away from the pile, and the conveyer being advanced toward the constantly, receding point of supply until the entire pile has been disposed of.

I claim as my invention—

The mode herein described of effecting the removal or distribution of storage-piles of coal or like gravitating granular material, which consists in continuously attacking the pile along one side of its base, thus causing the material to flow by gravity on that side of the pile which is attacked, catching said flowing material and removing it laterally in contact with and past the pile to a predetermined point of delivery, all substantially as specified.

In witness whereof I have hereunto set my hand this 3d day of February, 1888.

JAMES M. DODGE.

In presence of—

JOHN DUNN,
M. GETZ.