No. 684,859. Patented Oct. 22, 1901.

S. B. PECK.

COAL HANDLING DEVICE.

(Application filed Aug. 9, 1900.)

(No Model.) 3 Sheets—Sheet 1.

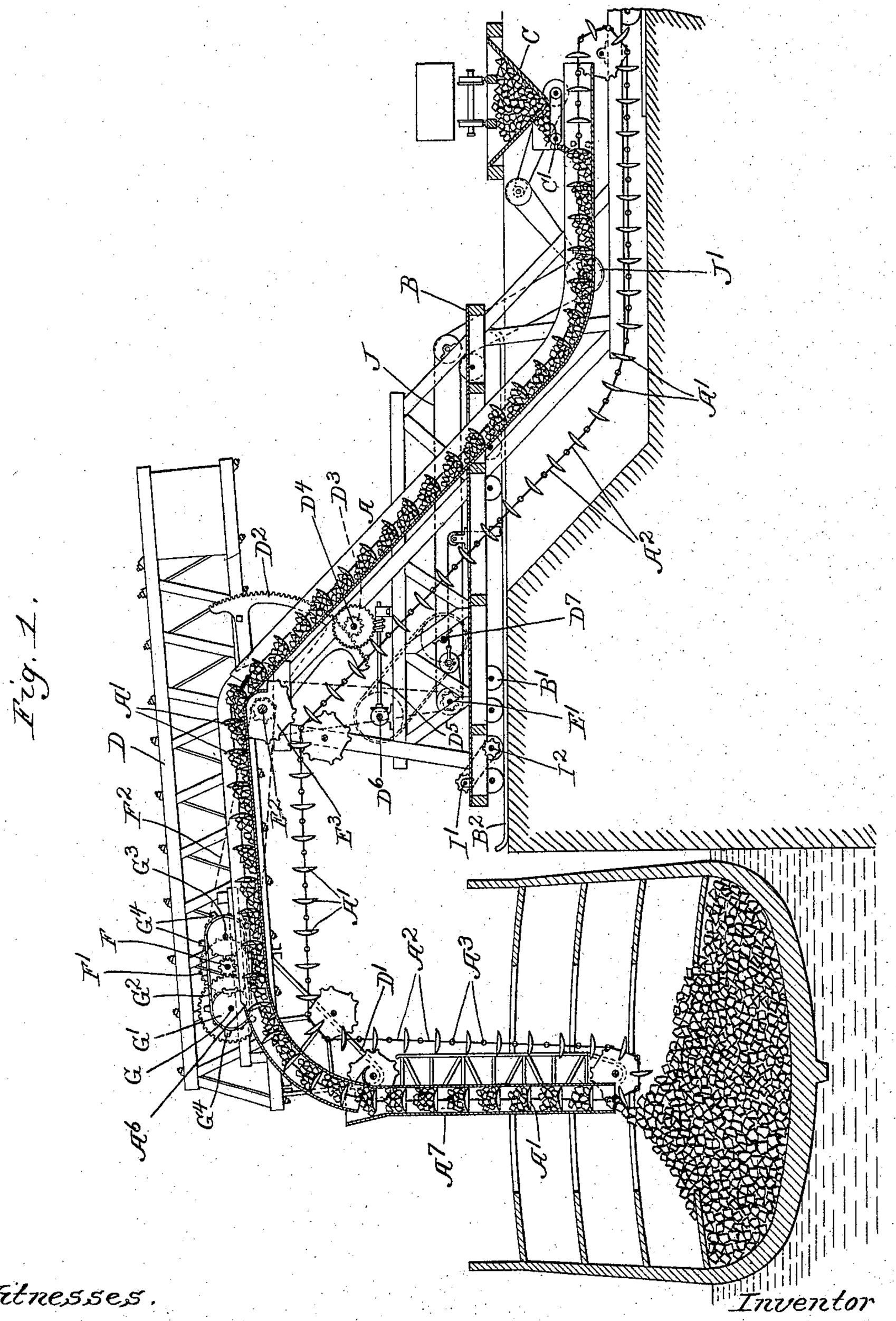

Fig. 1.

Witnesses.

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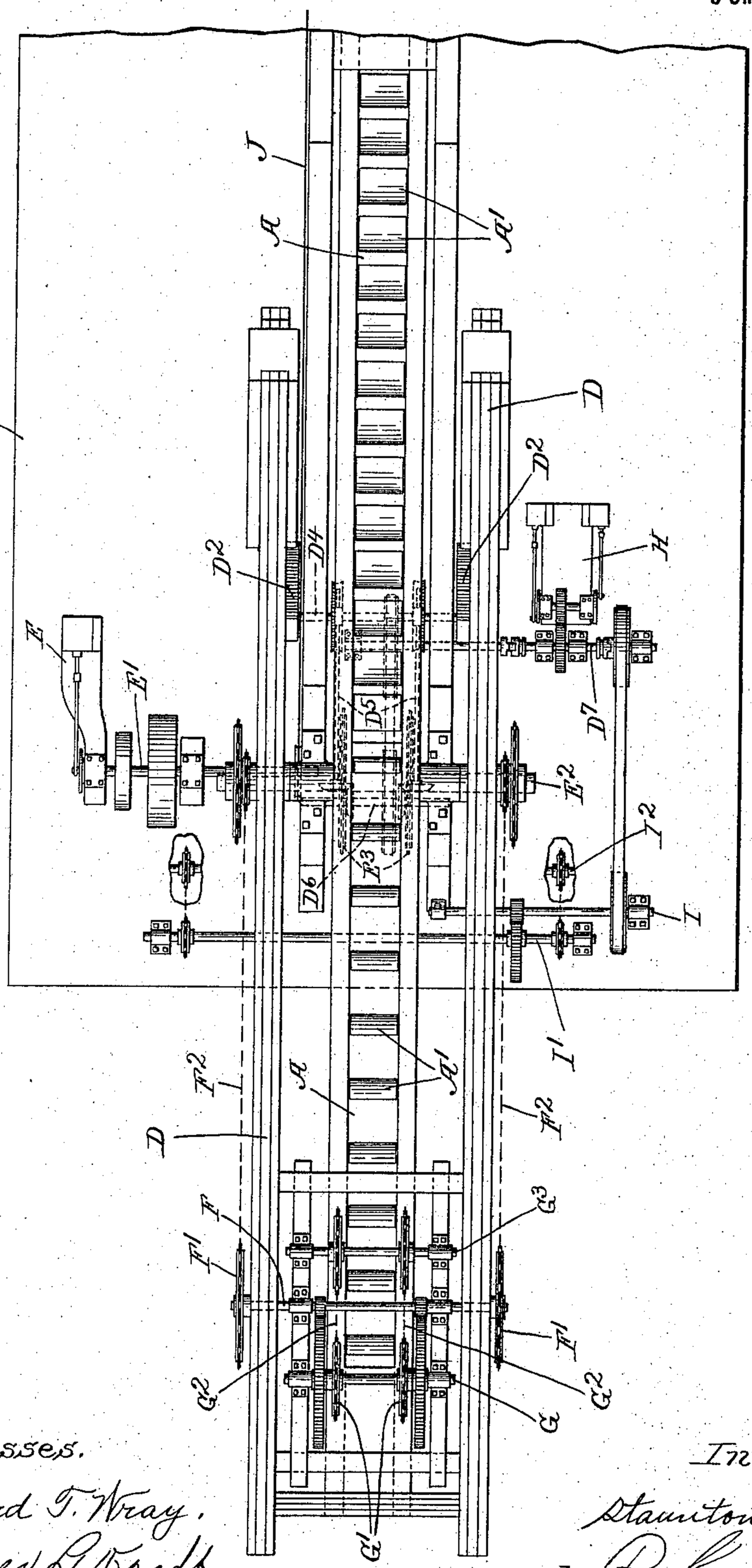

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

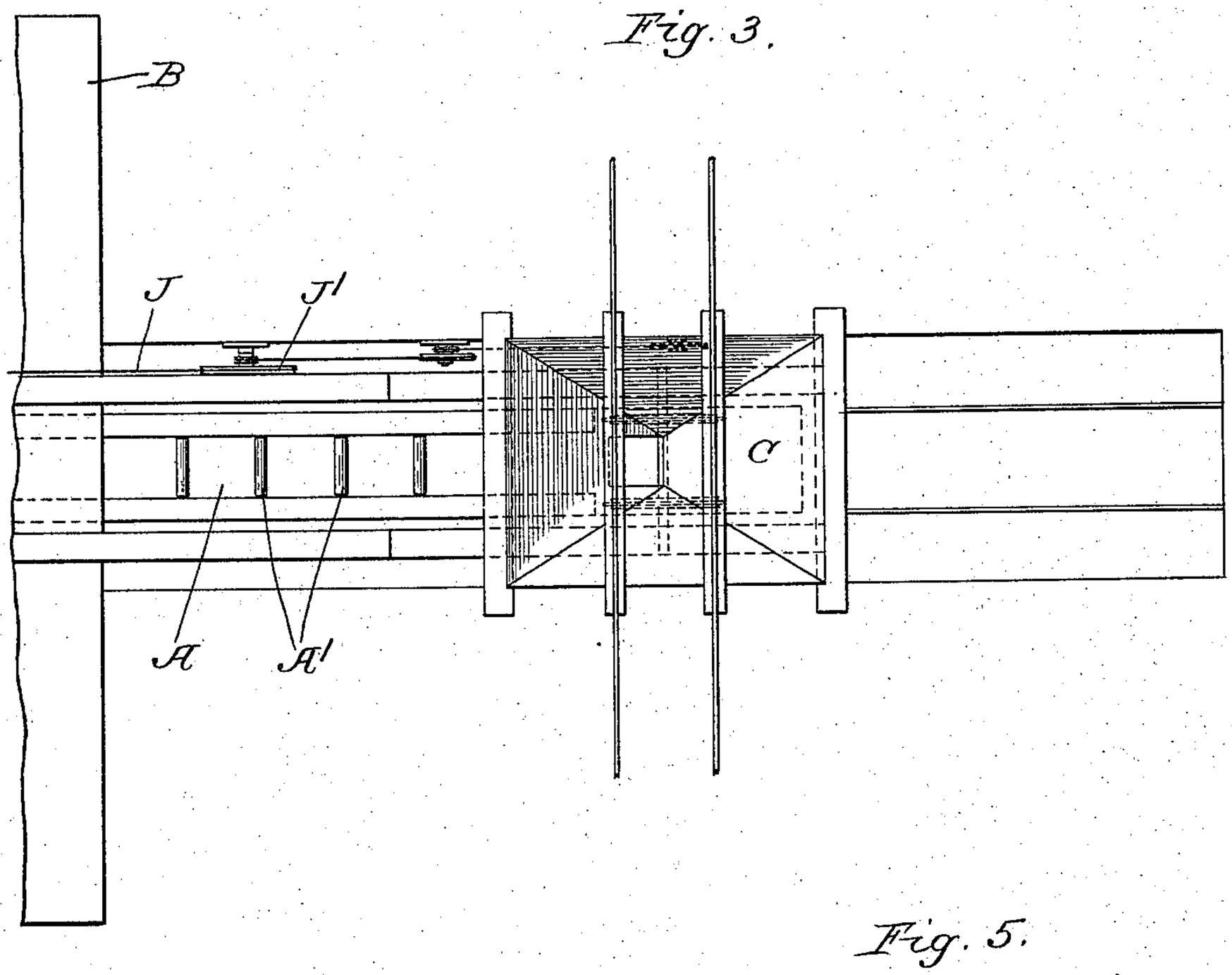
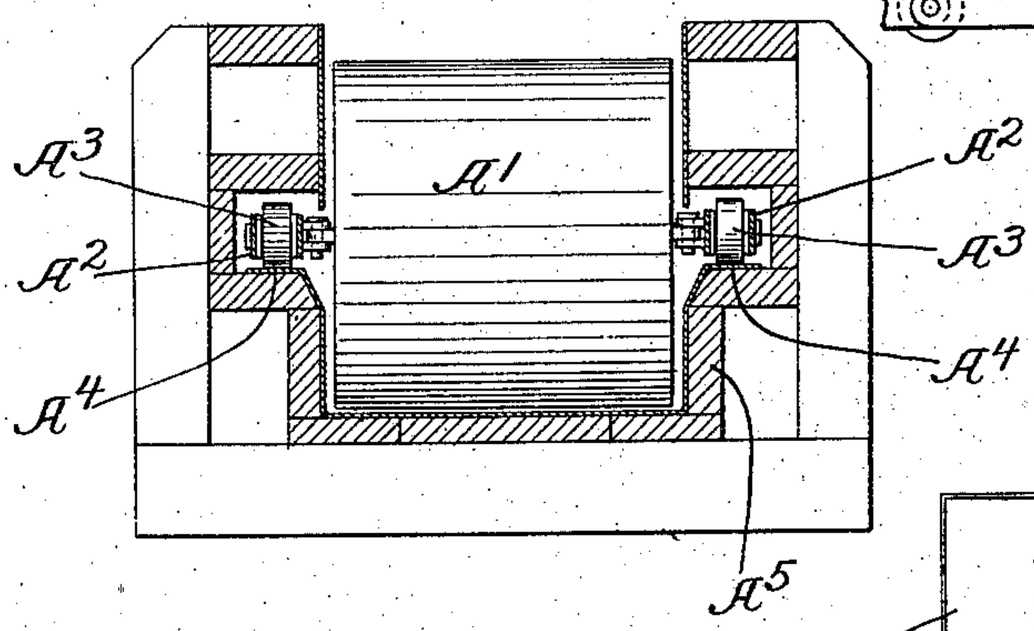


Fig. 5.

Fig. 4.



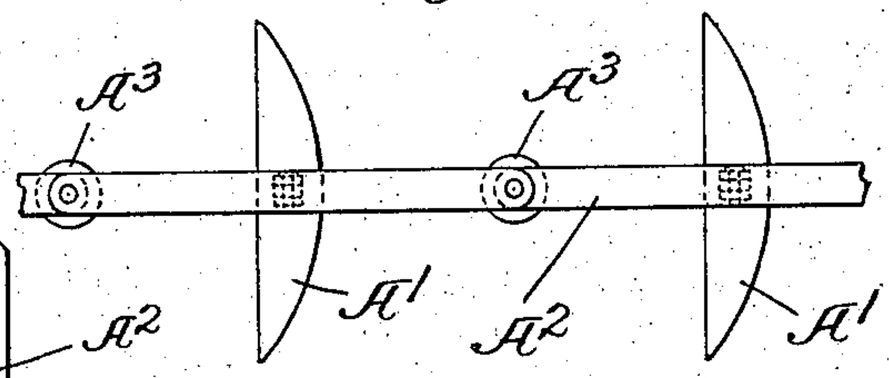
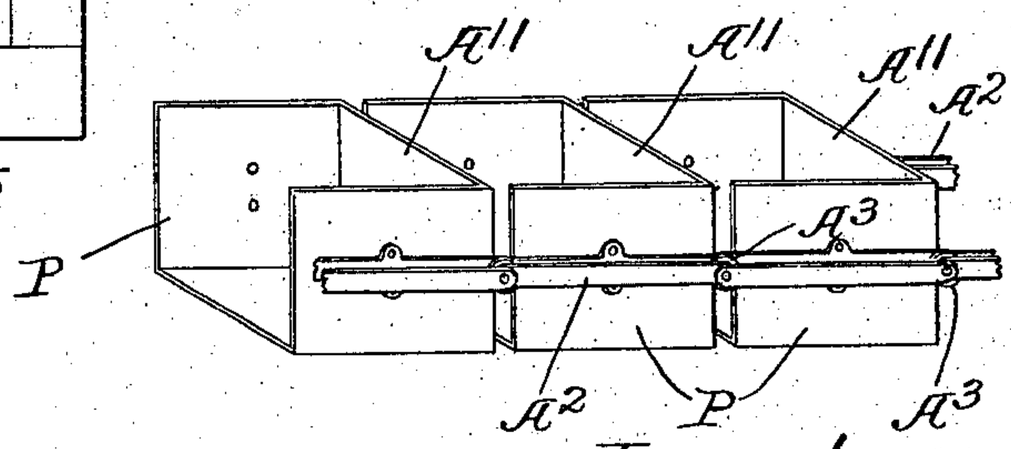


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

STAUNTON B. PECK, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE LINK BELT MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

COAL-HANDLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 684,859, dated October 22, 1901.

Application filed August 9, 1900. Serial No. 26,348. (No model.)

To all whom it may concern:

Be it known that I, STAUNTON B. PECK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Coal-Handling Devices, of which the following is a specification.

My invention relates to devices for handling material—such, for example, as coal and the like—and has for its object to provide a new and improved construction for this purpose.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a longitudinal section through a device embodying my invention. Fig. 2 is an enlarged plan view of the front part of the construction shown in Fig. 1. Fig. 3 is a plan view of the rear portion of the device shown in Fig. 1, completing the plan view part of which is shown in Fig. 2. Fig. 4 is an enlarged section through the conveyer. Fig. 5 is an enlarged side view of the conveyer. Fig. 6 shows a modified construction.

Like letters refer to like parts throughout the several figures.

I have illustrated my invention as applied to a device for transferring such material as coal from the car to a vessel or boat. In this transfer of coal, for example, there are two principal factors to be considered—namely, rapidity and economy. If the device which handles the coal is so constructed that the coal falls through a considerable distance at any point of the transfer, it is not economical on account of the breakage resulting from this fall.

I have shown in Fig. 1 a construction which provides a continuous transfer for the coal from the car to the boat. This device consists of a continuous conveyer mounted upon a suitable movable platform and provided with means for actuating it and for controlling the position of the platform and the discharge end of the conveyer.

Referring now to Figs. 1 and 2, I have shown a continuous conveyer A, mounted upon a movable platform B, the platform being supported upon the wheels B′, engaging suitable rails B^2. The coal from the car or other device is first received into the hopper C and is then gently deposited upon the conveyer. I prefer to provide an opening in the hopper, through which the coal passes, and a suitable controlling device C′, of any desired description, which insures the gradual and proper flow of the material from the hopper. The conveyer is made continuous and, as herein illustrated, consists of what may be called a series of "independent" compartments or sections connected together, so as to travel back and forth between the hopper C and the boat. This conveyer may be constructed in various ways, and as herein shown is made up of a series of plates A′, connected to the flexible power-transmitting devices A^2, shown herein as chains. The chains A^2 are each provided with a series of rollers A^3, (see Figs. 4 and 5,) said rollers engaging guides A^4 at the side of the casing or trough A^5, in which the plates are confined. This casing or trough is open at the top for the greater part of its length, but completely incloses the plates during their vertical movement near the discharge end. This construction is shown in Fig. 1, where the casing is provided with a cover beginning at the point A^6. The discharge end of the conveyer is made adjustable, so that it may be raised as the boat is being filled, so as to adjust it with relation to the amount of coal in said boat. This adjustability may be obtained in any desired manner. As herein illustrated, a rocking beam D is suitably mounted upon the frame carried by the platform B, and the outer end of the conveyer is connected therewith. Means are provided for moving this rocking beam up and down, so as to vary the height of the discharge end of the conveyer. A series of sprocket-wheels are provided at the points where the direction of the conveyer changes, such sprocket-wheels engaging the chains at these points. The end A^7 of the casing of the conveyer is separate from the remaining portion of said casing and is suspended upon the bracket D′, connected with the beam D. (See Fig. 1.) This permits the end to swing freely to adjust itself when the beam D is moved.

It will be seen that when the coal is fed into the conveyer it enters the independent compartments between the plates A′ and that the coal in each compartment is independent

of the coal in the other compartments. Each quantity of coal is then forced along by the plate behind it until it reaches the point A^6. The conveyer is then traveling downwardly, and the coal instead of being pushed by the plate behind will drop forward to the plate ahead and rest upon said plate, and thus be carried down through the part A^7 of the casing until it is discharged at the end thereof. It will be seen that by this means the coal has no opportunity to fall, but is held in its distinct and separate compartment until discharged at the end of the conveyer.

Some suitable means for driving the conveyer is provided. As herein illustrated, I provide a suitable motor E, carried by the platform B and driving the shaft E′. This shaft is operatively connected with the shaft E^2, which carries the chain-driving sprocket-wheels E^3, which engage the chains of the conveyer and drive it at this point. When the conveyer is large, I prefer to have the driving mechanism made double, as shown. I also prefer to provide driving sprocket-wheels near the end of the rocking beam D. This construction is shown in Figs. 1 and 2. A suitable shaft F is mounted upon the beam D and is provided with sprocket-wheels F′. These sprocket-wheels are connected with the shaft E^2 by the chains F^2. The shaft F is connected by a suitable pinion and gear with the shaft G, carrying the sprocket-wheels G′. These sprocket-wheels are connected by suitable chains G^2 with similar sprocket-wheels on the shaft G^3. The chains G^2 are provided with the teeth or projections G^4, Fig. 1, which engage the chains of the conveyer, so as to drive said conveyer at this point. The beam D is provided with suitable means for rocking it about its supporting-point, so as to lift the discharge end of the conveyer. As herein shown, this is accomplished by providing said beam with the arc-shaped racks D^2, which engage the pinions D^3, carried by the shaft D^4. This shaft is provided with a gear which engages the worm on the shaft D^5. Said latter shaft is operatively connected with the shaft D^6 by means of suitable bevel-gears, and the shaft D^6 is connected by suitable belting and the like with the driving-shaft D^7. A reversible motor H is connected with said driving-shaft, so as to drive it in either direction. Suitable means are provided for moving the platform B back and forth. Any construction for this purpose may be used, and, as herein illustrated, the motor H is operatively connected by suitable mechanism with one of the shafts carrying the supporting-wheels of the platform. It will thus be seen that by rotating this shaft in one direction the platform will be moved backward, while by rotating it in the other direction the platform will be moved forward. The construction shown for this purpose consists of the shaft I, connected, by means of suitable belts, with the driving-shaft D^7. (See Fig. 2.) This shaft I is connected by a pinion and gear with the shaft I′, which latter shaft is operatively connected with the axle I^2, carrying two of the supporting-wheels of the platform.

I have not shown the controlling device C′ in detail, as it is no part of my present invention. This device, however, may be operated from the driving-shaft E′ by means of suitable belts, ropes, or the like. I have shown the receiving end of the controller as located in a depression or pit, so that the coal may be easily fed into it. A suitable rope J is operatively connected with the shaft E′ and passes around suitable direction-changing pulleys, so as to engage the stationary pulley J′, suitably supported at the side of the pit. This pulley is operatively connected by suitable belts or the like with the controlling device C′. The rope J is provided with a tightening device which automatically takes up the slack when the platform B is moved in one direction and lets out the rope, so as to lengthen it when the platform is moved in the other direction.

I have shown in detail a construction embodying my invention; but it is of course evident that the parts may be greatly varied in form, construction, and arrangement, if desired, and the same result produced. I therefore do not limit myself to the construction shown.

In Fig. 6 I have shown a modification in which the conveyer is made up of a series of what may be termed "boxes" P, which act as the casing, the plates A″ forming the ends of the boxes, as shown. When this construction is used, it is necessary to have the part A^7 when the device is moving downwardly, so as to confine the material between the plates A″. It will be noted that in these constructions the plates act both as pushers and retarders or shelves. When the material is being moved against gravity or in such a direction that gravity is not sufficient to move it, these plates act as pushers and push the material along. When a position is reached where gravity acts upon the material, the plates act as retarders or shelves, the material resting upon them and being retarded by them, so that injury by falls and the like is prevented.

The use and operation of my invention are as follows: When the device is not in use, the outer end of the beam D is moved upwardly and the platform B is moved backwardly, so that the end of the conveyer will not project out over the edge of the pier. When it is desired to load the vessel, the platform B is moved forward and the outer end of the beam D is lowered until the discharge end of the conveyer is in the proper position with relation to the vessel to be loaded. The conveyer is then started up, and the coal is allowed to pass from the hopper C into the spaces between the plates A′. It is then carried along up the incline in what may be termed "independent" sections, the sections being pushed by the plates A′.

When the coal reaches the point A^6, where the conveyer starts downwardly, the coal instead of being pushed by the plate behind it is supported upon the plate in front of it, and is thus carried down the vertical portion until it is discharged without any fall whatever at the discharge end of the conveyer.

It will thus be seen that by this device the coal is taken from the car to the boat without any fall, although in its passage it is sometimes traveling in a horizontal direction up an incline and again downwardly in a substantially vertical direction. There is therefore no breakage of the coal in transit, and the device permits a rapid, economical, and safe transfer. As the vessel is filled the beam D is moved upwardly, so as to lift the discharge end of the conveyer in order that it may be in a proper position at all times.

The lower or outer or discharge end of the device is in some forms of the device inclosed or tubular, (this latter expression I use in its broadest sense,) so as to make an outer tube-like discharge portion. The part which connects, as illustrated in Fig. 1, the vertical with the horizontal portion is similarly shaped, having a gradually-inclined bottom, as indicated, this being necessary to make the transition from the horizontal to the vertical position.

I claim—

1. A device for handling material such as coal, consisting of a flexible supporting-frame with means for moving the outer end, a continuous chute open toward the receiving end and closed so as to form a tube-like portion toward the discharge end, a continuous flexible conveyer running from end to end of said chute and provided at intervals with plates or partitions which act successively as pushers in the receiving portion and as retarders in the discharging portion of the chute, so as to confine the material in moving compartments throughout its course.

2. A device for handling material such as coal, comprising a conveyer-chute, the discharge end of which is inclosed to form a tube-like portion, a flexible device adapted to travel through said chute, a series of plates or partitions on said device adapted when moving in the chute to act as pushers or retarders, said partitions having an area approximately equal to a cross-section of the inclosed or tube-like portion of the chute, and a section of the chute adapted to present a gradually-inclining bottom and to open into the upper end of the discharge portion, so as to obviate the fall of the material at any point along the line of its travel.

3. A device for handling material such as coal, comprising a conveyer-chute, the discharge end of which is inclosed to form a tube-like portion, a flexible device adapted to travel through said chute, a series of plates or partitions on said device adapted when moving in the chute to act as pushers or retarders, said partitions having an area approximately equal to a cross-section of the inclosed or tube-like portion of the chute, and a section of the chute adapted to present a gradually-inclining bottom and to open into the upper end of the discharge portion, so as to obviate the fall of the material at any point along the line of its travel, said last-mentioned section of the chute being also inclosed or tube-like and having a cross-section approximately equal to the area of the plates or partitions.

4. In a device for handling material such as coal, the combination of a flexible frame and chute with a continuous flexible device passing therethrough, said chute tube-like at its discharging end, said device provided with a series of plates or partitions whose area is substantially equal to a cross-section of the tube and which are distributed at comparatively frequent and regular intervals so that a series of substantially uniform movable compartments are provided, said compartments being inclosed at those portions of the chute where the direction of motion is such that otherwise the material would fall out.

5. In a device for handling material, such as coal, the combination of a suitable carrying mechanism or frame, with a material-conveying device carried thereby, and comprising a chute or trough-like portion, an outer substantially vertical end piece, and a continuous conveyer which travels through said chute or trough-like portion and along such outer end, the parts of the chute or trough-like portion and outer end coöperating with the parts of the continuous conveyer so as to form a series of compartments substantially uniform throughout the line of travel, so that the material received at one end is carried along to the lower end of the discharge-way without any sudden drop or fall.

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Witnesses:
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