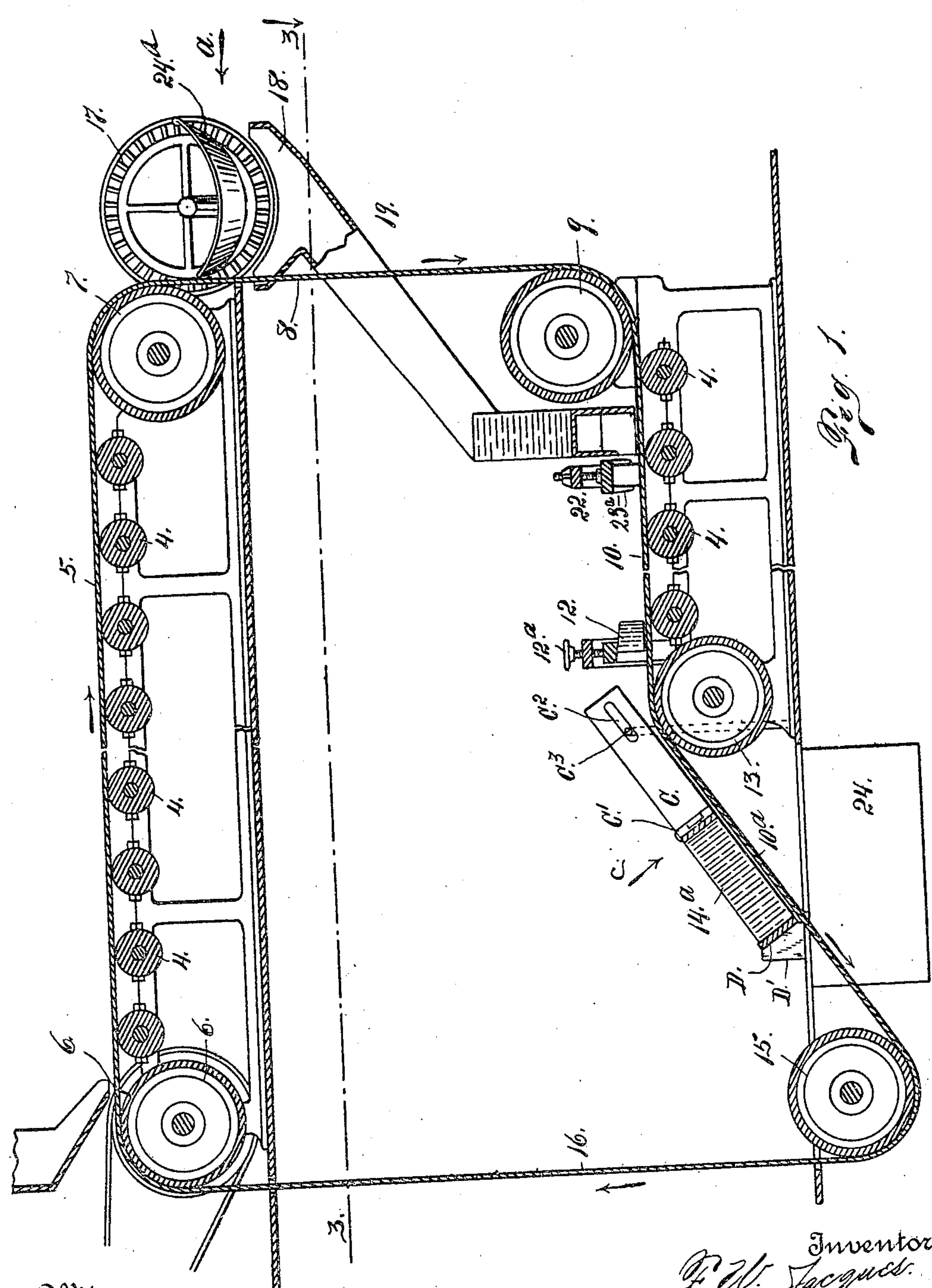


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PATENTED FEB. 13, 1906.

F. W. JACQUES.  
ORE SORTING BELT.  
APPLICATION FILED JAN. 24, 1905.

3 SHEETS—SHEET 1.



Witnesses  
Otto E. Haddock.  
Dena Nelson.

Inventor  
F. W. Jacques.  
By *A. H. Mier* Attorney

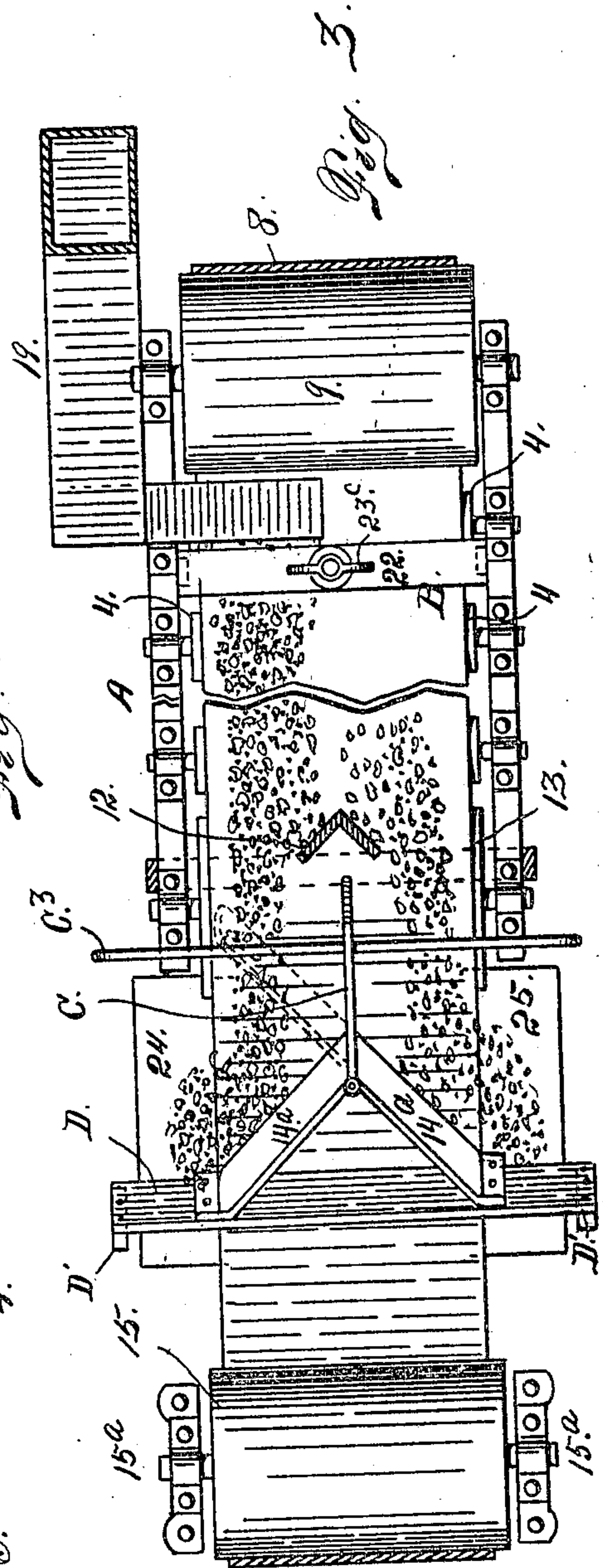
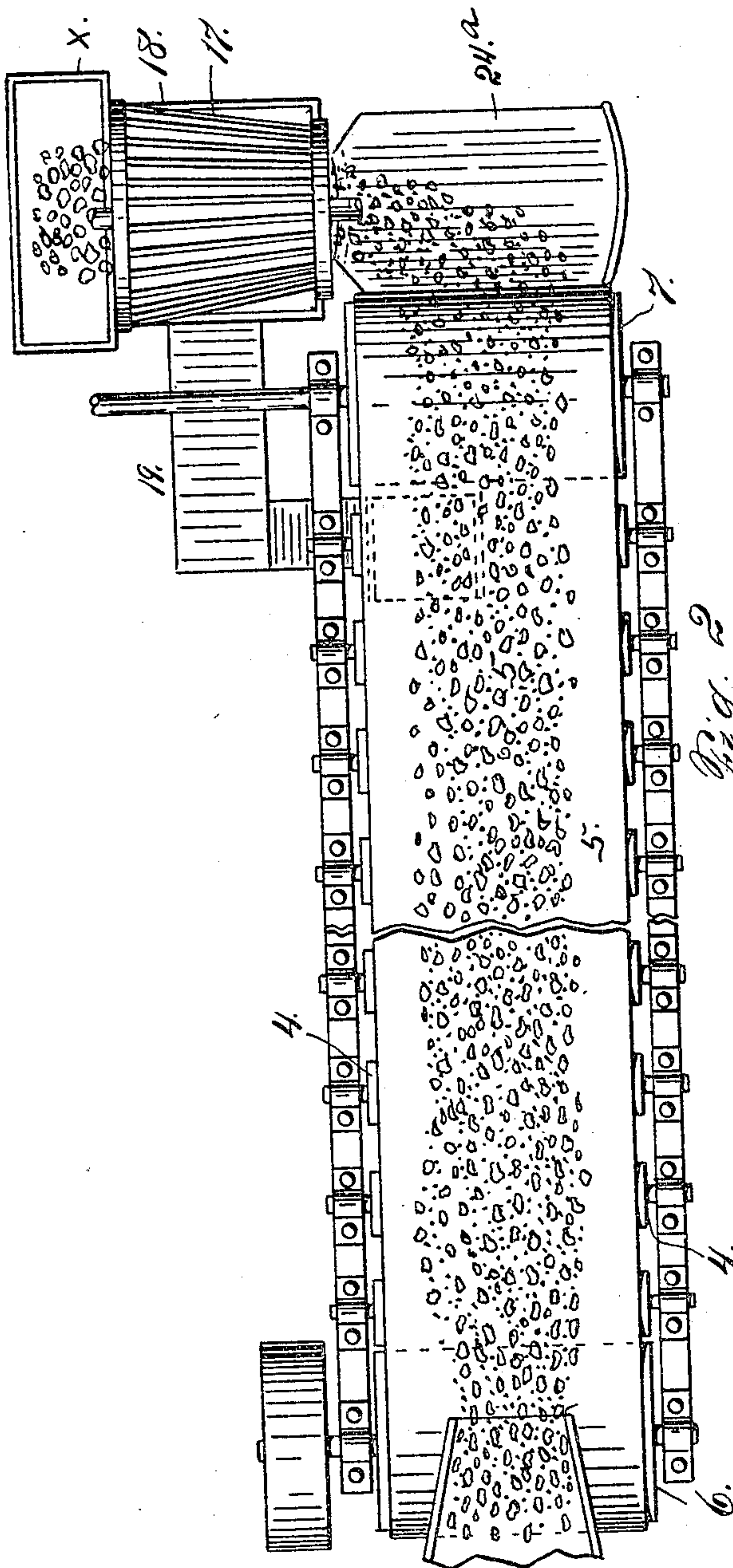
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3 SHEETS—SHEET 2.



Witnesses

Otto C. Hoddick.  
Lena Nelson.

by

F. W. Jacques. Inventor  
Attorney



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3 SHEETS—SHEET 3.

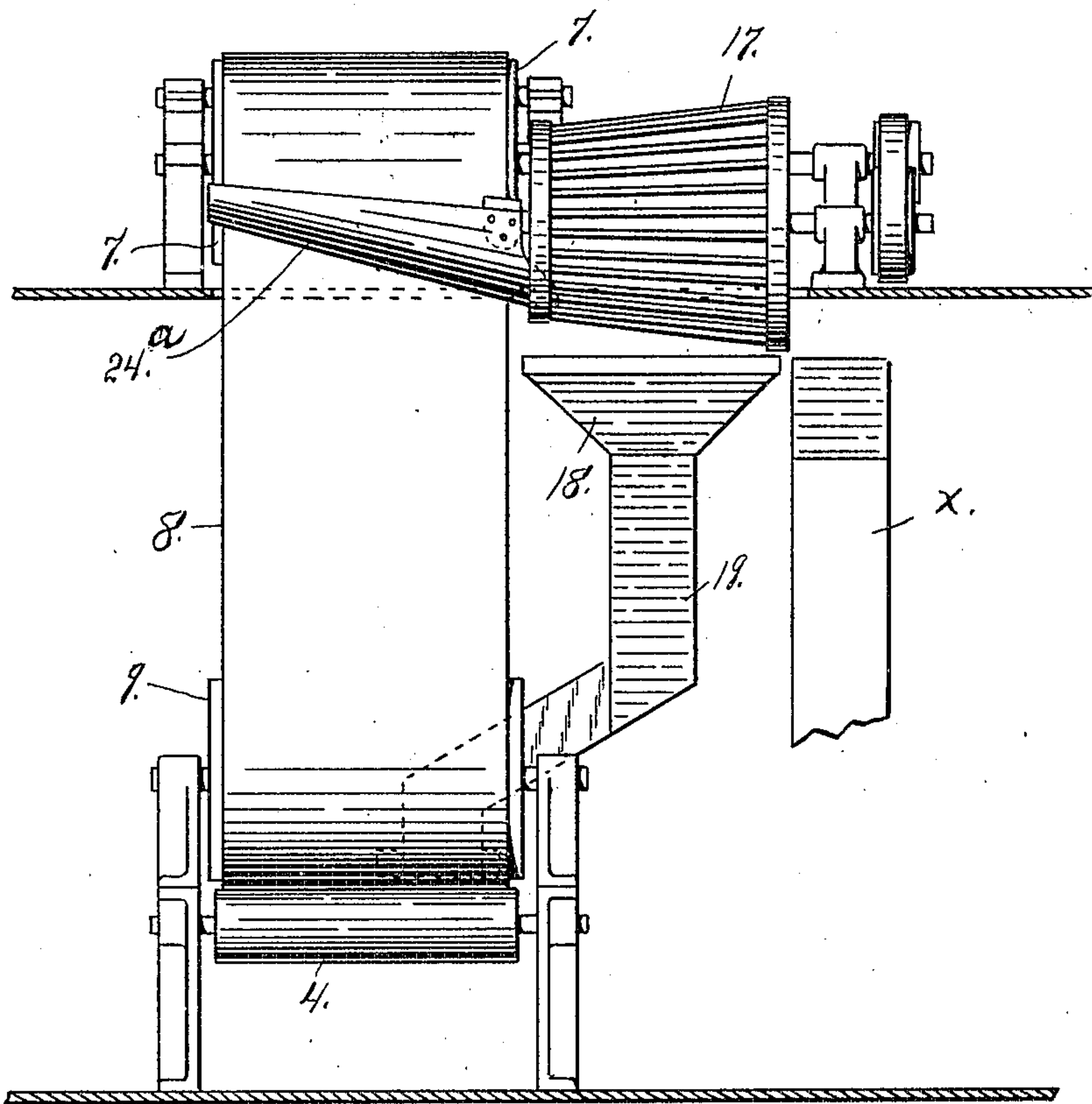


Fig. 4.

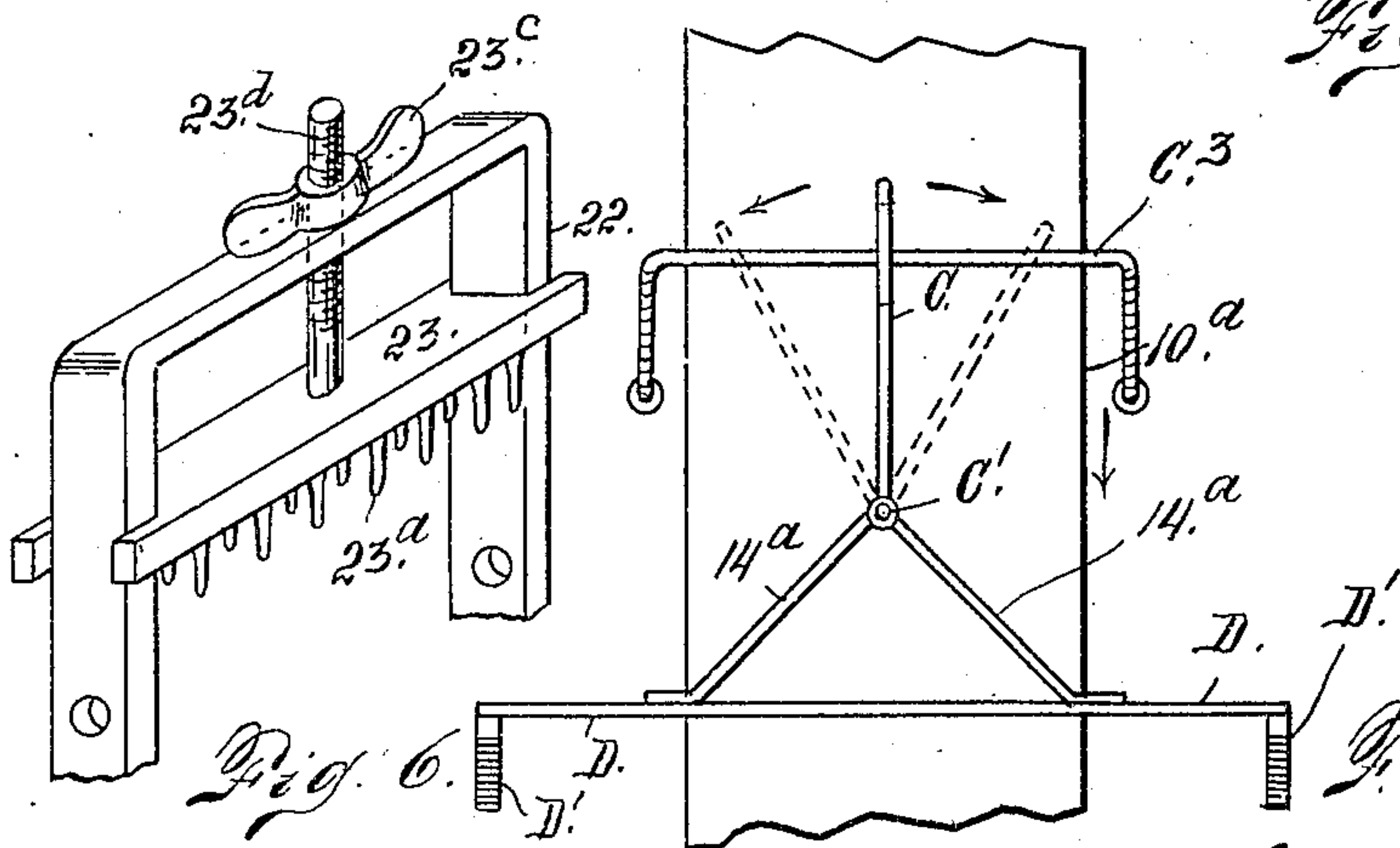


Fig. 6.

Fig. 5.

Witnesses  
Otto E. Hoddick.  
Dena Nelson.

F. W. Jacques.  
Inventor

by *[Signature]*  
Attorney



# UNITED STATES PATENT OFFICE.

FRANK W. JACQUES, OF VICTOR, COLORADO.

## ORE-SORTING BELT.

No. 812,270.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed January 24, 1905. Serial No. 242,534.

*To all whom it may concern:*

Be it known that I, FRANK W. JACQUES, a citizen of the United States, residing at Victor, in the county of Teller and State of Colorado, have invented certain new and useful Improvements in Ore-Sorting Belts; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in ore-belt apparatus or in apparatus to facilitate the sorting of ores, whereby the valuable material is separated from the waste or worthless rock.

It is well known that ore when taken from the mine contains a great deal of worthless rock containing practically no values or at least that does not run sufficiently high in values to justify its treatment. For this reason it becomes necessary to the economical treatment of ores that the waste rock shall be sorted or separated from the valuable material. This is ordinarily accomplished by discharging the ore upon a traveling belt and as the ore is carried along by the belt, the sorters standing on both sides thereof, and remove the valuable material, allowing the worthless portion to pass to the dump. By this method a great deal of the finer material contained in the ore and which oftentimes runs high in values is carried to the dump and lost.

The object of my improved apparatus is to make it practicable to save the finer material without any increase in the cost of handling the ore, and in order to accomplish this after removing the coarser valuable ore from the belt the remaining portion is carried to a separating apparatus whereby the coarse rock is discharged upon the dump, while the finer material carrying values is carried to the reverse side of the belt, where the sorters are given another opportunity of separating the waste from the valuable portion thereof.

Instead of having the belt return immediately after the first discharge of ore therefrom, whereby its lower or return part is idle, in my improved construction it is carried downwardly—as to the lower floor of the same

building, for instance—and its return portion utilized for further sorting of the ore. The object of carrying the belt downwardly is to give the finer material a sufficient fall for its economical delivery upon the reverse side of the belt. This can ordinarily be done by utilizing two floors or a portion of two floors of the building, the first sorting operation being completed upon the portion of the belt upon the upper floor and the second sorting operation upon the portion of the belt upon the lower floor. For convenience I prefer to utilize a rotary grizzly for separating the finer material from the coarse gangue preparatory to the discharge of the finer material upon the lower reverse side of the belt.

Having briefly outlined my improved construction, as well as the function it is intended to perform, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a sectional side view of my improved ore-sorting apparatus. Fig. 2 is a top or plan view of the same. Fig. 3 is a section taken on the line 3 3, Fig. 1, looking downwardly. In all these views the belt is partly broken away, for the reason that there is not sufficient room on the sheet to indicate the length of belt ordinarily necessary for ore-sorting purposes and at the same time show the parts of sufficient size to clearly disclose the invention. Fig. 4 is a rear end view of the apparatus or a view looking in the direction of arrow *a* in Fig. 1. Fig. 5 is a fragmentary view looking in the direction of arrow *c* in Fig. 1. Fig. 6 is a perspective view of the ore-spreader and the frame upon which it is mounted, the same being located above the lower portion of the belt and directly in front of the place where the ore is discharged thereon.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the upper part of an endless ore-belt whose upper portion passes over pulleys 6 and 7 and is supported between these pulleys by ordinary belt-supporting wheels or rollers 4. It will be assumed that the belt is traveling in the direction indicated by the arrows placed adjacent the belt in Fig. 1. After leaving the pulley 7 the belt is carried downwardly, as indicated at 8, and passes around a pulley 9,



suitably mounted upon a lower floor, for instance, than the pulleys 6 and 7. The lower return portion of the belt is designated 10. The parts 5 and 10 of the belt are preferably substantially horizontal, or approximately so. The ore-sorting operation is accomplished on the two parts 5 and 10 of the belt. At the rear extremity of the part 5, or that farther to the right in Fig. 1, is mounted what I will term a "rotary grizzly" 17, which, as shown in the drawings, consists of a frusto-conical device, whose walls are composed of separated bars or rods, whereby the material which is discharged into the smaller end of the grizzly is separated, the coarser material or that too large to pass between its bars being discharged from the larger end of the same into a chute X, while the finer material passes through the walls of the grizzly and is discharged into the top 18 of a chute 19, provided with a downwardly-extending part which is shaped to pass around the part 8 of the belt, its lower extremity discharging directly upon the belt and in front of a stationary frame 22, carrying a vertically-movable spreader 23, having depending teeth 23<sup>a</sup>, normally occupying a position close to the belt, whereby the ore is separated or spread to facilitate the work of the ore-sorters. This part 23 is vertically adjustable by means of a thumb-nut 23<sup>c</sup>, mounted on a threaded stem 23<sup>d</sup>. The lower end of this stem is made fast to the part 23, its upper portion passing through the top of the stationary frame. After the ore traveling with the belt leaves the spreader 23 the sorters separate the waste material therefrom by scraping it from the side A of the belt portion 10 to the side B thereof. This is done from the time the material is discharged upon the belt portion until it reaches a small V-shaped plow 12, which guides the material outwardly in both directions from the central portion of the belt directly in front of a swinging arm C, mounted above a downwardly-extending part 10<sup>a</sup> of the belt. This part 10<sup>a</sup> passes downwardly over a pulley or drum 13, under a pulley or drum 15, and thence upwardly, as shown at 16, to the pulley or drum 6. This arm C is hinged at its lower extremity, as shown at C', while its upper portion is provided with a slot C<sup>2</sup>, through which passes a stationary supporting-rod C<sup>3</sup>. The hinging-point of the arm C is the apex of a large V-shaped device, whose parts 14<sup>a</sup> extend outwardly to the opposite edges of the belt, whereby the ore is scraped therefrom into bins 24 and 25, respectively. The lower extremities of the parts 14<sup>a</sup> are secured to a stationary base D, supported in any suitable manner. Normally the arm C occupies a central position, in which event the valuable ore is directed into the bin 24, while the worthless portion passes into the bin 25. Now if it should happen that substantially all the ore is waste

the arm C may be thrown to the position shown in dotted lines in Fig. 3, whereby all the material is directed into the bin 25. If, however, it is desirable to save all of the material on account of its value, the arm C may be thrown to the opposite extremity, whereby all the material is directed into the bin 24. In any event this V-shaped device 14 scrapes off all the material from the belt, whereby the latter passes freely underneath the drum or pulley 15, the latter being mounted in suitable supports 15<sup>a</sup>.

The entire apparatus is mounted upon a suitable framework; but as the exact framework construction is not considered material it will not be described in detail.

Attention is called to the fact that as the material leaves the rear extremity of the belt part 5 it first enters a chute 24<sup>a</sup>, which is downwardly inclined in order to deliver the material to the interior of the rotary grizzly 17. The coarse worthless rock after leaving the grizzly enters a chute X, (see Fig. 4,) through which it passes to the dump.

As shown in Fig. 1, an adjusting-screw 12<sup>a</sup> is connected with the V-shaped plow 12, whereby the latter may be raised and lowered at pleasure in order to properly adjust it to correspond with the position of the belt and the work to be performed. If it is desired that this plow should not act upon the ore, it may be raised sufficiently to allow the material to pass thereunder.

Having thus described my invention, what I claim is—

1. In an ore-belt apparatus, the combination with suitable supporting mechanism, of an endless traveling belt one portion of which is located considerably higher than the other, and suitable means for taking the material discharged from the upper portion of the belt, grading the same, and discharging one grade of it upon the reverse surface of the lower or return portion thereof.

2. The combination with suitable supporting apparatus, of an endless traveling belt so mounted that one portion thereof is considerably higher than the other, the lower or return portion thereof having its reverse surface exposed to receive the ore, means located at the rear extremity of the upper portion of the belt for receiving the discharge from the upper portion of the belt and separating the finer portion therefrom, and means for delivering the said finer portion of the material, upon the lower reverse surface of the belt for the purpose set forth.

3. In ore-belt apparatus, the combination with a suitable support, of an endless traveling belt having one portion higher than the other, a chute for receiving the discharge from the rear extremity of the upper portion of the belt, a rotary grizzly into which the said material is discharged by the chute, and another chute for receiving the finer portion of the



material from the grizzly and discharging it upon the reverse side of the lower or return portion of the belt.

4. The combination with a suitable support, of an endless traveling ore-belt having one portion located considerably higher than the other, the lower belt portion being the return portion thereof, having its reverse surface exposed to receive the ore, means for receiving the discharge from the upper portion of the belt and grading the same, and means for delivering one grade of the material to the lower reverse surface of the belt, and a device mounted to act on the material to remove it from the lower portion of the belt for the purpose set forth.

5. The combination with a suitable support, of an endless traveling ore-belt having horizontal upper and lower portions, a part of the lower run being inclined, the upper portion being considerably more elevated than the lower portion, the lower portion having its reverse side exposed to receive the ore, the inclined portion being located at the forward extremity of the lower portion, and a device placed above the inclined portion of the belt whereby the material is automatically discharged therefrom, substantially as described.

6. In an ore-belt apparatus, the combination with suitable supporting mechanism, of an endless traveling belt, one portion of which is located higher than the other, suitable means for taking the material discharged from the upper portion of the belt and discharging it upon the reverse surface of the lower or return portion thereof, means mounted above the lower portion of the belt and adapted to separate the same to facilitate the ore-sorting operation, and means mounted above the lower portion of the belt remote from where the ore is fed to the latter, for removing the material from both sides of the belt, and receptacles mounted on opposite sides of the belt to receive the said discharge, substantially as described.

7. In ore-belt apparatus, the combination of an endless traveling belt or apron one portion of which is located above the other, suitable means for taking the material discharged from the upper portion of the belt grading or classifying it and delivering one grade of it to the reverse surface of the lower or return portion thereof, and a device for removing the material from the lower portion of the belt, the said device being located remote from the point of discharge and consisting of inclined wings or blades adapted to remove

the material from the belt as the latter travels thereunder, and discharge the same at suitable points on opposite sides.

8. The combination with an endless traveling belt or apron having upper and lower parallel or approximately parallel portions, means for feeding the material to be treated upon the upper surface of the upper part of the belt, means for receiving the discharge from the upper portion of the belt, and delivering it to the reverse side of the lower portion of the belt, and a device mounted above the lower portion of the belt remote from the point of discharge, and consisting of inclined wings occupying a position close to the belt and adapted to remove the material thereon and discharge the same on opposite sides of the belt, and an arm pivoted at the apex or angle of the inclined wings and adapted to swing in either direction, whereby all of the material may be discharged on either side of the belt as desired.

9. In an ore-belt apparatus, the combination of an endless traveling belt or apron one part of which is considerably higher than the other, means for delivering the ore to be treated, to the upper portion of the belt, a rotary grizzly for receiving the discharge from the upper portion of the belt, a chute for receiving the finer material which passes through the grizzly between its extremities, and arranged to discharge the said material upon the lower portion of the belt, a vertically-adjustable spreader located adjacent the point of the discharge and extending transversely of the belt, and a discharge device mounted above the belt remote from the spreader and consisting of stationary inclined wings located to scrape the material from the belt and discharge the same on opposite sides thereof, an arm pivotally connected with the apex or angle of the inclined wings and adapted to be swung in either direction for the purpose of discharging the whole of the material on either side of the belt, and a small V-shaped device located above the central portion of the belt and directly in front of the pivoted arm when in its central position whereby the material upon the belt is prevented from interfering with the action of said arm.

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

FRANK W. JACQUES.

Witnesses:

M. J. MCCARTHY,  
E. C. WILLEY.